2020 Flood Damage and Needs Assessment

Field Validation and Community Based Disaster Risk Reduction

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

GFDRR
Global Facility for Disaster Reduction and Recovery

IOM
UN MIGRATION

This report has been made possible by the generous support of the Global Facility for Disaster Risk Reduction and Recovery (GFDRR).

2020 Flood Damage and Need Assessment

Field Validation and Community Based Disaster Risk Reduction

October 2021

The World Bank

1818 H Street NW

Washington DC 20433

Telephone: 202-473-1000

Internet: www.worldbank.org

Table of Contents

Acronyms

(I)NGO	(International) Non-Governmental Organization
ACTED	Agency for Technical Cooperation and Development
BDMC	Boma disaster management committees
BQ	Boma Questionnaire
CBDRM	Community Based Disaster Risk Management
CLTS	Community led total sanitation
CRPC	Community Resilience Planning Committees
DRM	Disaster Risk Management
DTM	Displacement Tracking Matrix
ECRP	Enhancing Community Resilience and Local Governance Project
FAO	Food and Agriculture Organization
FDNA	Flood Damage and Needs Assessment
FGD	Focus Group Discussions
FIFIS	Flood Impact on Facility, Infrastructure and Service
GDP	Gross domestic product
GFDRR	Global Facility for Disaster Reduction and Recovery
GPAA	Greater Pibor Administrative Area
HNO	Humanitarian Needs Overview
IDP	Internally Displaced Person
IGAD	Intergovernmental Authority for Development
IOM	International Organization for Migration
IPC	Integrated Food Security Phase Classification
MSLA	Multi Sectoral Location Assessment
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PHCC	Primary Health Care Clinic
PHCU	Primary Health Care Unit
RRC	South Sudan Relief and Rehabilitation Commission
SNFI	Shelter / Non Food Items
SPLA-IO	Sudan People's Liberation Movement-in-Opposition
TPA	Temporary Protection Area
UN	United Nations
UNICEF	United Nations Children's Fund
UNMISS	United Nations Mission in South Sudan
UTI	Urinary tract infection
VAS	Village Assessment Survey
WASH	Water Sanitation and Hygiene

Executive Summary

1. This report provides field-level data to complement and validate findings from the 2020 Flood Damage and Needs Assessment (FDNA) on the 2020 seasonal floods (June-December) in South Sudan which largely relied on the analysis of remote sensing and geodata. The World Bank tasked IOM to conduct field assessments in three payams (administrative level 3) to collect empirical data from flood-affected areas in to verify and substantiate findings from the FDNA.

2. The FDNA Field Validation combines four sources of primary data: two quantitative tools mapping the flood impact and exploring community responses of which one was conducted at the boma level (administrative level 4) and one at a more granular level (facility, livelihood area and settlement level), as well as two qualitative tools of which one is a set of Focus Group Discussions (FGDs) at the boma level and the other is a series of Key Informant Interviews (KIIs) with participants recruited from key stakeholder groups at the national level. IOM interviewed and consulted more than 1,131 individuals for the exercise across all tools.

3. This report provides insights on multiple levels of granularity concerning the 2020 floods in terms of the extent and severity of impact on public infrastructure, shelter, displacement, livelihoods, Health, Water, Hygiene and Sanitation (WASH), and education.

- In terms of infrastructure, findings confirm and illustrate the floods' debilitating impact on public buildings, roads and livelihood institutions. Some 21 per cent of 709 accessed facilities were found to be dysfunctional. Half of all remaining functional facilities were affected by the floods in 2020. Diminished road access was observed across sectors as communities were unable to access important locations such as healthcare, markets, and educational facilities. Access constraints not only limited movement out of flooded areas, but also prevented aid from reaching populations in need. Impacts on damaged facilities were not only severe (more than 50% reported medium to severe damage) but also protracted (more than 80% of damage facilities were still affected between one and six months later).

- For a population largely dependent on the land, the floods made most forms of livelihood activities impossible. Farmers reported being unable to harvest anything in half of the accessed bomas where farming is practiced. Waterlogged fields meant that farming was rendered impossible

long after the rains had stopped, and a lack of harvest made planting in the subsequent season impossible. The analysis also indicates that tensions arose between farmers and cattle keepers, and also among various cattle keeping groups, as a result of flooding on usable land. Communities reported losing a large number of cattle which often drowned or succumbed to diseases that spread after the floods subsided.

- The 2020 floods caused displacement within 11, from 9 and to 9 out of 16 assessed boma. Movements remained localized in most cases, with exceptions in Bor, where population movement was more common across county and state lines. Communities quickly switched from being hosts communities to being hosted by other communities as IDPs, while many struggled to support arriving IDPs because of the additional stress the floods had put on available resources. IOM found that recurrence of flooding and longevity of stagnant water has changed the patterns and temporality of displacement, which after the 2020 flood was often long-term with periods of displacement lasting up to the time of assessment (September 2021) in half of the assessed boma.

- Shelter damage was severe and widespread in all assessed boma. On a settlement level, the FIFIS tool revealed that, with few exceptions, the floods damaged shelters in almost all assessed areas (97% or 63 of 65 flooded settlements). Floods moreover hindered access to common shelter building materials, preventing the rehabilitation of homes. In the majority of settlements, shelters had not been repaired in any way and remained largely inhabitable (56% or 35/63).

- Respondents reported an increase in disease outbreaks, notably malaria upsurges, and a simultaneous decrease in access to healthcare.

- Access to education was similarly stressed, most commonly due impassible roads but also damaged educational facilities.

4. This report also explores community-based disaster risk management (CBDRM) in South Sudan, with a focus on identifying current capacities at the local level, and gaps that stakeholders can address through strategic support and programming. In line with South Sudan's nascent National Disaster Risk Management Policy, and the recurrence of devastating floods and the heightened vulnerability of communities to climate-related shocks, , government, humanitarians and development partners are seeking to strengthen disaster preparedness and response across the country, including at the community level. The analysis shows a range of ad hoc CBDRM initiatives, primarily through the form of mobilization to build dykes using local materials, the establishment of disaster risk management committees, and mobilization to safe areas. Additionally, while women and youth often bear tremendous responsibility in flood-affected communities, including caring for vulnerable household members, as well as building and maintaining dykes, they continue to be marginalized in local decision-making. Local and indigenous knowledge is often used as one mechanism for communities to anticipate and prepare for floods, however this knowledge has not been integrated into early warning systems and formal coordination mechanisms developed by partners and government institutions. Key gaps were identified in terms of coordination amongst partners and government stakeholders, as CBDRM mechanisms continue to operate at an ad hoc level. Lastly, compounding factors have made it challenging for stakeholders to support CBDRM initiatives, particularly in relation to inter-communal violence and displacement.

IOM staff Denis Allau visits Emma Secondary school in Nyadiar, Leer that was flooded in 2020 and again in 2021 (September 2021)

1. Introduction

Background

South Sudan – the youngest sovereign country in Africa, having gained independence from Sudan in 2011 – is highly prone and vulnerable to disasters and climate-related shocks, especially floods and droughts. A landlocked country in East-Central Africa, bordering Sudan (North), Ethiopia (East), Kenya (South-East), Uganda (South), the Democratic Republic of Congo (South-West) and the Central African Republic (West), South Sudan has equatorial climate with alternating wet and dry periods, while seasonal rainfall varies under the influence of the annual shifts of the Inter-Tropical Convergence Zone. Since independence in 2011, the country suffered severe droughts (2011, 2015) and floods (2014, 2017, 2019, 2020 and 2021) with high numbers of casualties, displacement and loss of livestock severely impacting people's livelihoods and the country's development efforts. With a strong reliance on subsistence farming and pastoralism as the primary livelihoods, rural communities are particularly vulnerable to extreme weather events and climate-related shocks.[1,2] Following decades of marginalization, underdevelopment, armed conflicts and violence, the country's humanitarian situation is dire and deteriorating, after communities were hit hard by the triple shock of intensified conflict and sub-national violence, a third consecutive year of major flooding, and the impacts of COVID-19. In the past few years, overall food security has worsened in South Sudan, and 8.3 million people (of in total 11.1 million) are estimated to need humanitarian assistance in 2021 and 1,7 million remain displaced, unable to return to their homes, mainly due to insecurity and a lack of services at intended destinations.[3]

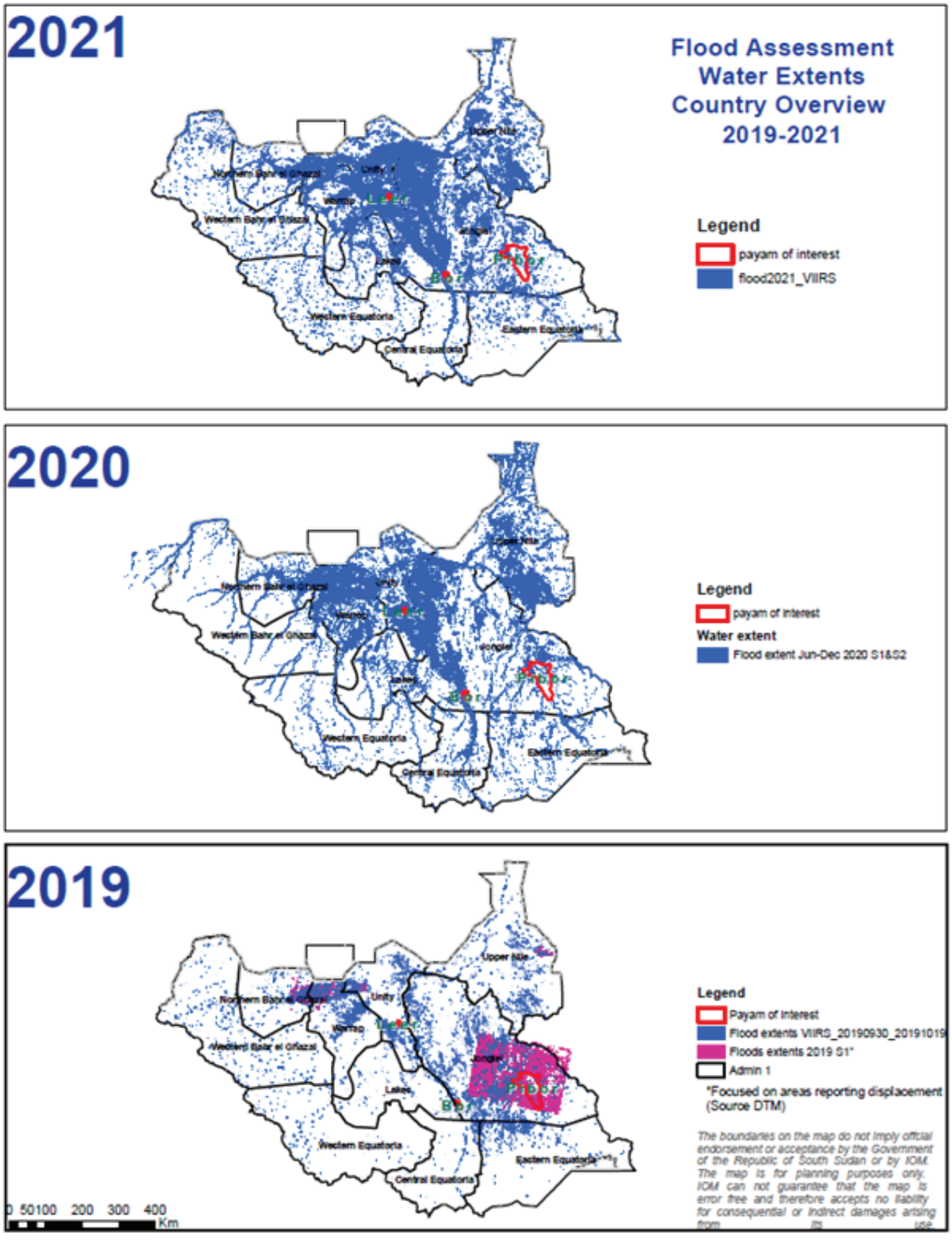
South Sudan has one of world's highest joint occurrences of poverty and flood exposure. Reports show a strong overexposure of South Sudan's poor to flooding[4] and a sub-national comparison across Sub-Saharan Africa – the region with the world's highest share of the population being poor and flood-exposed – highlights that some parts of South Sudan, such as the Greater Upper Nile region, have a particularly strong convergence of poverty and flood exposure.[5]

1. *World Bank, 2020. Disasters, Conflict, and Displacement Intersectional Risks in South Sudan.*
2. *Government of South Sudan, 2018. Initial National Communication to The United Nations Framework Convention on Climate Change.*
3. *OCHA, 2021. South Sudan Humanitarian Snapshot (September 2021)*
4. *Hallegate et al., 2020. Unbreakable. Building the Resilience of the Poor in the Face of Natural Disasters.*
5. *World Bank, 2020. Reversals of Fortune.*

It is estimated that in South Sudan, 3.5 million poor people (at $1.90/day), or 21 % of the total population, are exposed to 1/100 year flood events. No other country in the world has a higher proportion of flood-exposed poor, and even in absolute terms South Sudan ranks among the top ten countries globally.[6] In addition to being overexposed, the poor in South Sudan – as elsewhere – are also disproportionately vulnerable to flooding.[7] Their houses and huts, generally constructed using traditional architecture with local materials, are not able to withstand longer periods of extensive flooding. Their livelihoods, which are overwhelmingly based on subsistence farming and animal husbandry, are susceptible to flooding, increasing the risk of food insecurity and the dependency on food aid. Moreover, flood damage to water and sanitation, as well as roads and connective infrastructure, reduces the accessibility of basic services and increases health risks for the poor.

South Sudan has suffered three consecutive years (2019, 2020 and 2021) of severe flooding, with devasting impacts on peoples' lives and livelihoods. Following the floods in 2020, which affected more than one million people and displaced an estimated 500,000 people, the World Bank conducted a remote flood damage and needs assessment (FDNA).[8] The assessment drew on remote sensing techniques and geospatial analysis, and reviewed field reports from government agencies and development partners, to develop a comprehensive overview of the flood damage in selected sectors and priority needs across the country. Findings of the remote assessment show that in total 15,092 km2, or about 2.4% of South Sudan's land area, were affected by flooding during June-December 2020. The floods affected an estimated 1,214 km of roads and severely damaged other public and community infrastructure (including boreholes and dikes), affected an estimated 110,800 buildings across the country, inundated 1.481 km2 of cropland, and devastated livelihood sources with severe impacts on food insecurity, while displacing hundreds of thousands of people and livestock. The FDNA provides detailed assessments down to the county level and has identified both urban and rural flood hotspots in the most affected states. However, it was beyond the scope of the assignment to conduct field assessments to validate the remote diagnostics of the FDNA.

6 *Rentschler and Salhab, 2020. People in Harm's Way. Flood Exposure and Poverty in 189 Countries.*
7 *Hallegate et al., 2020. From Poverty to Disaster and Back: a Review of the Literature*
8 *World Bank/GFDRR. Remote Flood Damage and Needs Assessment. South Sudan Floods 2020.*



Map1: Flood overview by year

Objective and Scope

Building on the remote FDNA, the International Organization for Migration's (IOM) Displacement Tracking Matrix (DTM) and Shelter and Settlement units conducted a field-level flood assessment in three payams (administrative level 3) of South Sudan, in September and October of 2021. The **South Sudan Flood Damage and Recovery Needs Assessment – Field Validation** aims to corroborate findings of the FDNA through a mixed methods approach of targeted primary data collection. The FDNA was conducted by the World Bank and partners, in coordination with the Government of South Sudan, with the aim to i) estimate the flood-related damages to physical assets and infrastructure, ii) identify flood and damage hotspots, iii) document the flood impact on people's lives and livelihoods, and iv) determine priority needs for recovery. The Field Validation seeks to corroborate FDNA findings on flood related damages of physical infrastructure, their impact on lives and livelihoods, recovery needs in selected flood-affected areas, and the scope of community-based approaches to enhance disaster preparedness and response.

For this study, **IOM selected the three most flood-affected counties** – Leer (Unity State), Bor South (Jonglei State) and Pibor (Pibor Administrative Area) – through a composite vulnerability index[9]. Here, vulnerability is understood as the "diminished capacity of an individual or group to anticipate, cope with, resist and recover from the impact of a natural or man-made hazard," making it necessary to maximize our understanding of existing capacities and their influences within the current context.[10] As such, the vulnerability index takes into account a variety of factors that combine climatic and demographic data, as well as relevant multisectoral needs, conflict, displacement and food security aspects, as part of a comprehensive vulnerability assessment. The selection of flood-affected counties for the field validation also takes into consideration urban and rural areas. The most flood-affected payams were selected from the target counties of the ECRP[11] was further narrowed down, based on a Multi-Sectoral Location Assessment (MSLA, IOM DTM's Mobility Tracking),[12] Integrated Food Security Phase Classification data (IPC)[13] and Mobility Tracking data on the presence of IDPs and Returnees.[14] As a last step, a selection was made whereby chosen payams would include at least one (partially) urban area and whereby selected payams would not cluster within the same flooded area.

Based on these criteria, the choice of payams was **Pibor (Jonglei State), Leer (Unity State), and Bor (Jonglei State)**. Other payams in the list below were initially chosen, but access challenges made empirical data collection impossible. For example, Wunkur in Pariang proved too insecure to access in the aftermath of the split of two rival military factions of the Sudan's People's Liberation Army-in Opposition (SPLA-IO). Similarly, access issues following current floods as well as unanticipated security concerns made a visit to Akotweng in Baliet County impossible.

Table 1: Payam selection based on vulnerability index. Final choices are marked with a grey background

County	Payam	MSLA severity	IPC severity	IDP/Ret severity	Rationale
Bor South	Bor	high	middle	high	[urban] Although Bor (Jonglei state, Bor South county) ranks 26 (of the 457 payams under consideration), it ranks first among the urban payams. In general, Bor hosts a high number of IDPs and returnees. While other payams in Bor South (such as Makuach and Kolnyang) host more, the fact that Bor is the only payam within the county to have an urban area makes it a good case for looking at how larger population is affected by floods (and also individuals from other parts of Bor South being displaced to the urban area).

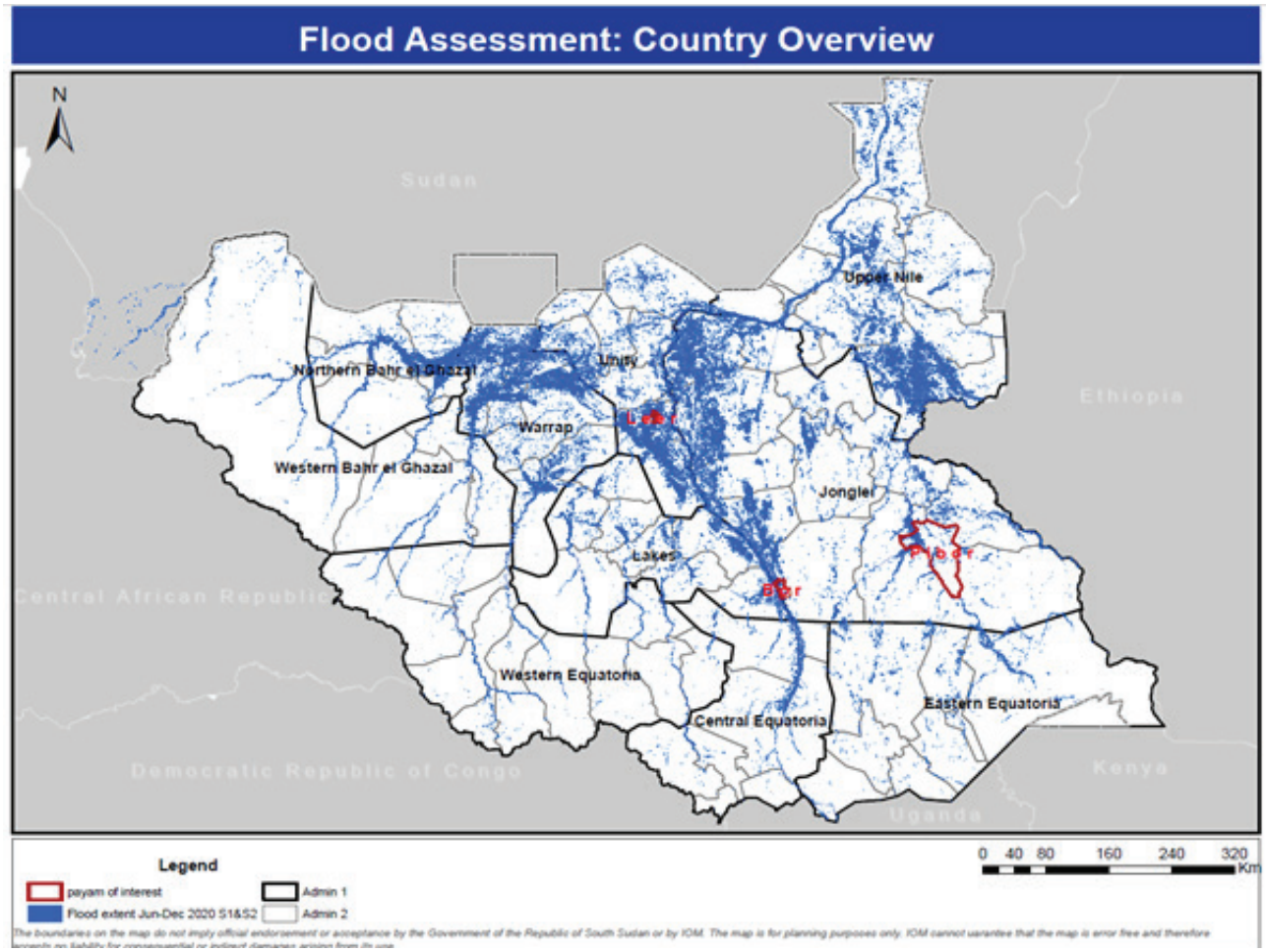
9 *see Annex F for a more detailed account of the selection process*
10 *https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/what-is-vulnerability/*
11 *The ECRP covers almost a third of the country geographically, benefitting an estimated 630,000 people. It started in September 2020 for a period of 3 years and is being implemented in partnership with the United Nations Office for Project Services (UNOPS) and International Organization for Migration (IOM).*
12 *IOM DTM South Sudan - Village / Neighborhood Assessment – Round, 10 November – December 2020*
13 *Integrated Food Security Phase Classification data South Sudan: IPC Results October 2020 - July 2021*
14 *IOM DTM South Sudan Mobility Tracking Round 10, November – December 2020*

County	Payam	MSLA severity	IPC severity	IDP/Ret severity	Rationale
Pibor	Pibor	middle	high	high	[urban] There are flooded areas throughout the payam, with the highest concentration of affected areas in the North-West. In Pibor County, a higher percentage of the population is affected by the floods, compared to other counties. Along with Uror and Akobo, Pibor was among the hardest hit counties in Jonglei during the floods in 2019. The first half of 2020 was marked by an escalation in inter-communal violence throughout the country, and Jonglei State and the Greater Pibor Administrative Area (GPAA) have been major hotspots for such violence.
Bor South	Bor	high	middle	high	[urban] Although Bor (Jonglei state, Bor South county) ranks 26 (of the 457 payams under consideration), it ranks first among the urban payams. In general, Bor hosts a high number of IDPs and returnees. While other payams in Bor South (such as Makuach and Kolnyang) host more, the fact that Bor is the only payam within the county to have an urban area makes it a good case for looking at how larger population is affected by floods (and also individuals from other parts of Bor South being displaced to the urban area).
Pibor	Pibor	middle	high	high	[urban] There are flooded areas throughout the payam, with the highest concentration of affected areas in the North-West. In Pibor County, a higher percentage of the population is affected by the floods, compared to other counties. Along with Uror and Akobo, Pibor was among the hardest hit counties in Jonglei during the floods in 2019.[15] The first half of 2020 was marked by an escalation in inter-communal violence throughout the country, and Jonglei State and the Greater Pibor Administrative Area (GPAA) have been major hotspots for such violence.[16]
Pibor	Lekuangole	middle	high	middle	Among all payams in Pibor, Lekuangole is most affected by floods. Significant parts in the East and South, as well as some areas in the North-West, are affected.
Leer	Leer	middle	low	low	[rural] Leer payam has a higher population compared to the rest of the county and was also significantly affected by floods.
Leer	Pileny	low	low	middle	Of all payams, Pileny is the most affected by flooding in terms of area. With the exception of some locations in the center of the payam, all areas are affected.
Baliet	Akotweng	high	middle	low	Akotweng is affected by floods, particularly in the center and in the north. Affected areas by flooding do not seem to follow a pattern. Within Baliet County, it is the most affected payam. Due to security concerns, Baliet remained inaccessible during the time of assessment.
Pariang	Wunkur	high	middle	low	Large areas in the south of the payam are affected by floods. Within Pariang county, this is the most affected payam.

Table2: Key indicators of final payam selection

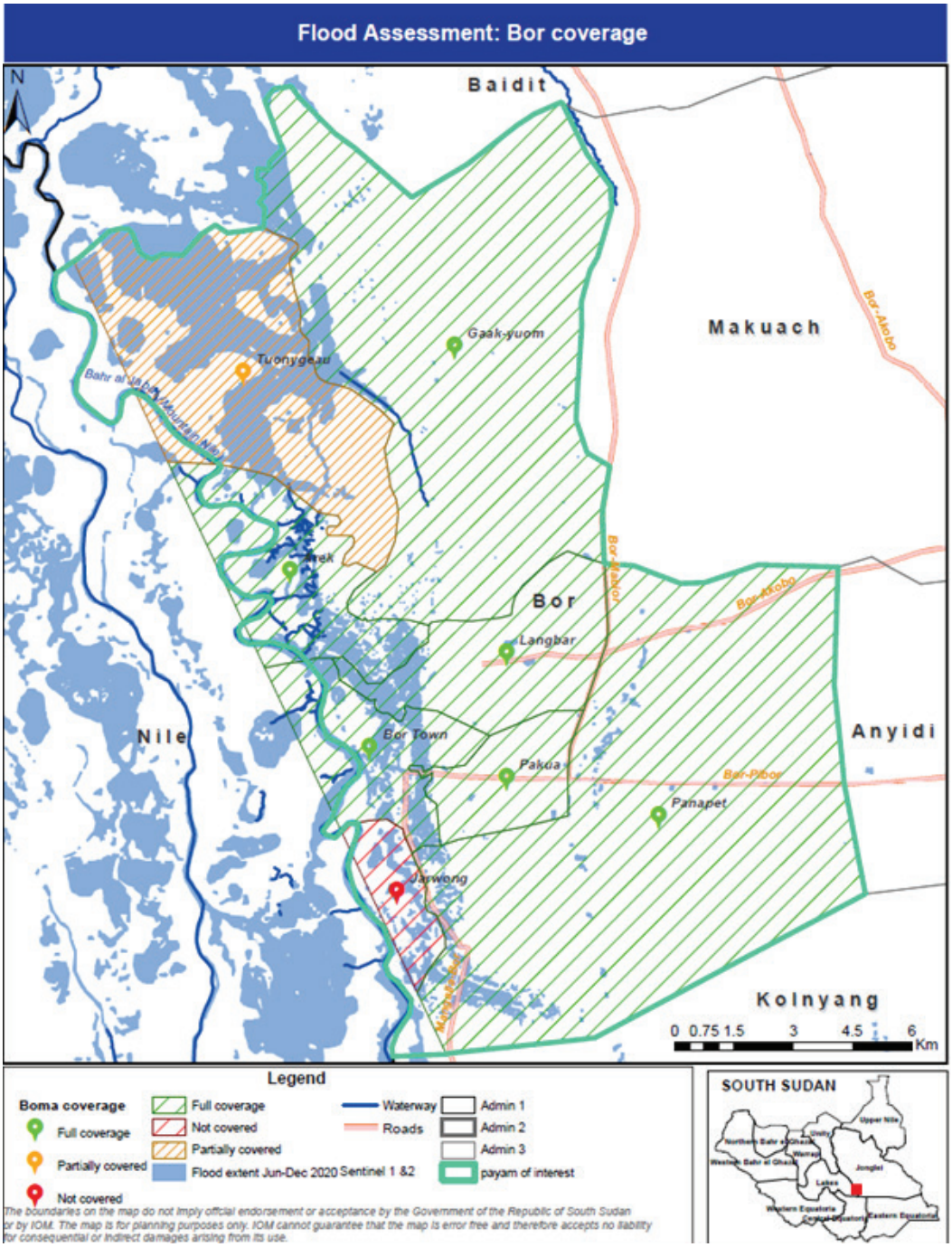
Payam[17]	Approximate payam size[18]	Total population	IDPs	Returnees	Host Community
Bor	250 km2	105,455	22,543	19,538	63,374
Leer	80 km2	11,846	3,492	3,520	4,834
Pibor	3,600 km2	40,941	5,032	3,379	32,530

15 *OCHA, South Sudan Humanitarian Snapshot, August 2019*
16 *IOM DTM, Pibor UNMISS AA Site Flow Monitoring Summary (7—18 August 2020)*
17 *IOM DTM Mobility Tracking Round 10 (Dec 2020) for IDPs and Returnees. In combination with Mobility Tracking, WorldPop data was used to calculate host community figures as done in the context of FSNMS+ 2021*
18 *These figures are estimates based on geodesic data. The boundaries and names cited in the tables, text and maps of this report do not imply official endorsement or acceptance by the Government of the Republic of South Sudan or International Organization for Migration (IOM).*



Map 2: Flood assessment areas

Bor is a payam within Bor South County of Jonglei State, composed of eight boma, and inhabited by approximately 105.455 people. For data collection purposes, IOM continues to classify the region according to the ten-state system. Bor has historically been one of the country's most flood-prone areas. Bor's population experienced a number of violent clashes, namely the Battle of Bor during the Civil War in 2013/14. While 69 per cent of Pibor Administrative Area's (GPAA) population are classified as equal to and above IPC Phase 3, i.e., crisis levels of food insecurity, the UN has announced it would suspend food assistance in Bor displacement sites due to funding shortages. Bor's population is most commonly engaged in farming, but as in the other two payams, communities spoke of waterlogged fields and lack of harvests after the 2020 floods.



Map 3: Map of Bor Assessment Coverage

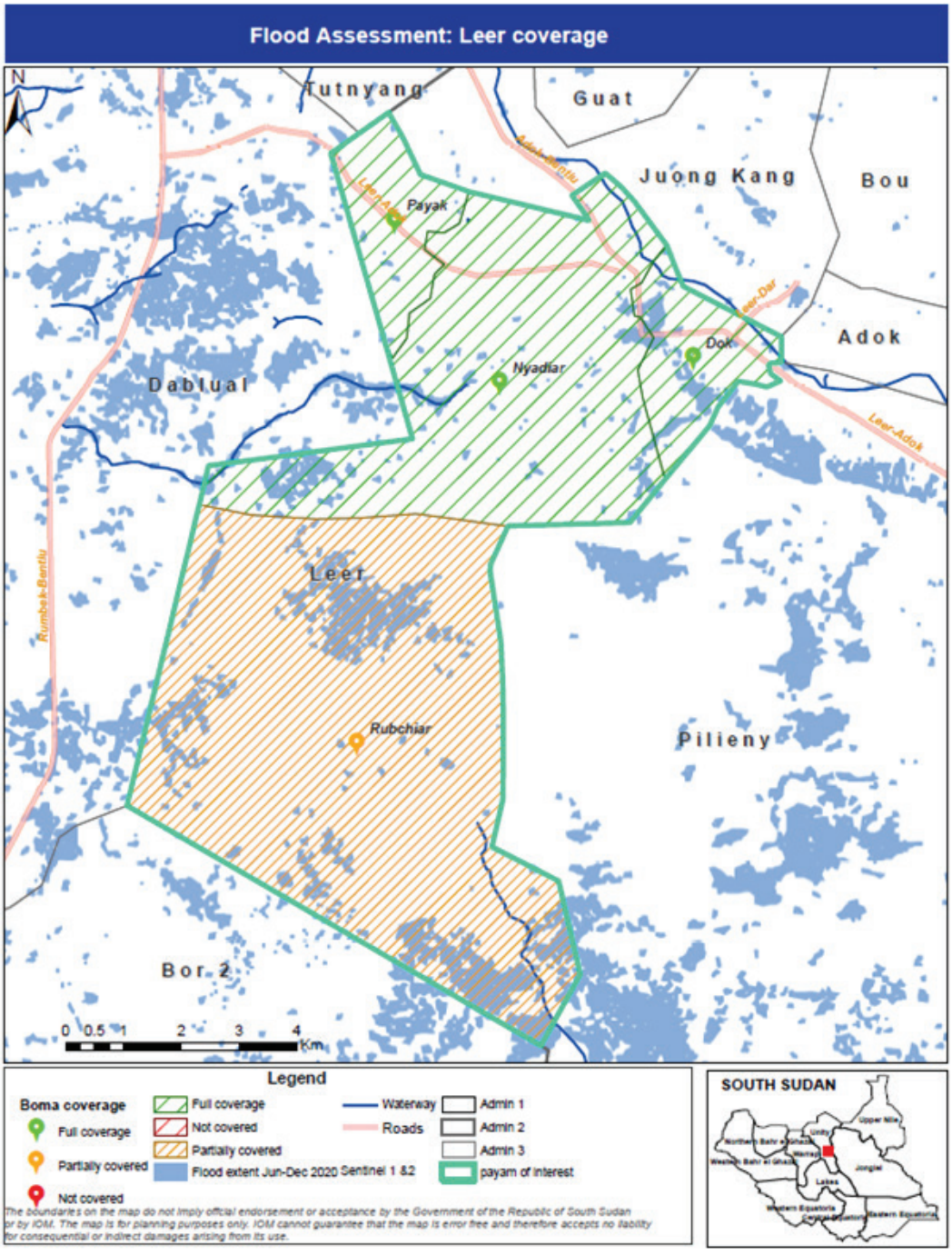
Leer is a payam within Leer County of Unity State, composed of four boma in the heart of South Sudan, located along the edge of the Sudd, a vast wetland formed by the White Nile. The payam is inhabited by approximately 11,846 people. Leer is home to the Leer Protected Area (TPA), adjacent to the UNMISS Temporary Operating Base hosting over 1,700 IDPs.[19] increased vulnerability in the face of seasonal flooding in all accessed boma.

The area is marked by armed conflict, as violence including state actors was recorded in 2018.[20] Some 64 per cent of Unity and Ruweng Administrative Area is classified as equal to and above IPC Phase 3, i.e. crisis levels of food insecurity.[21] Leer is located 135km from Bentiu, home to South Sudan's largest IDP site, which can be considered the country's second largest city, with over 100,000 inhabitants. According to IOM DTM's Displacement Site Flow Monitoring, Leer became the main destination of return from Bentiu IDP site in the months following the signing of the national peace agreement.[22] According to

19 *IOM DTM South Sudan – Mobility Tracking Site Assessment Round 10 Public Dataset, Nov-Dec 2020*
20 *Amnesty International, War Crimes In Leer And Mayendit, South Sudan, 2018*
21 *IPC Phase 3: Households either: have food consumption gaps that are reflected by high or above-usual acute malnutrition; or Are marginally able to meet minimum food needs but only by depleting essential livelihood assets or through crisis-coping strategies. IPC Consolidated Findings from the IPC Technical Working Group and External Reviews. Oct-Nov 2020*

inhabitants interviewed for this field validation, returns did not last as floods in 2019 and 2020 displaced populations again – this time to Juong and the TPA. At the time of this assessment, many areas in Leer remained flooded or otherwise unreachable due to repeated flooding since 2020. While recent floods have caused damage to local buildings, much of the infrastructure remains damaged and unrepaired since the conflict in 2014.

Fishing was cited as the area's main livelihood activity, but the area also contains oil reserves.[23] While overflowing rivers (e.g. Wathhok, Dhoar, Rotluoth, Polbar and Bar) in the rainy season is the most common cause for floods, boma questionnaire (BQ) respondents cited damaged dikes as a reason for



Map 4: Map of Leer Assessment Coverage

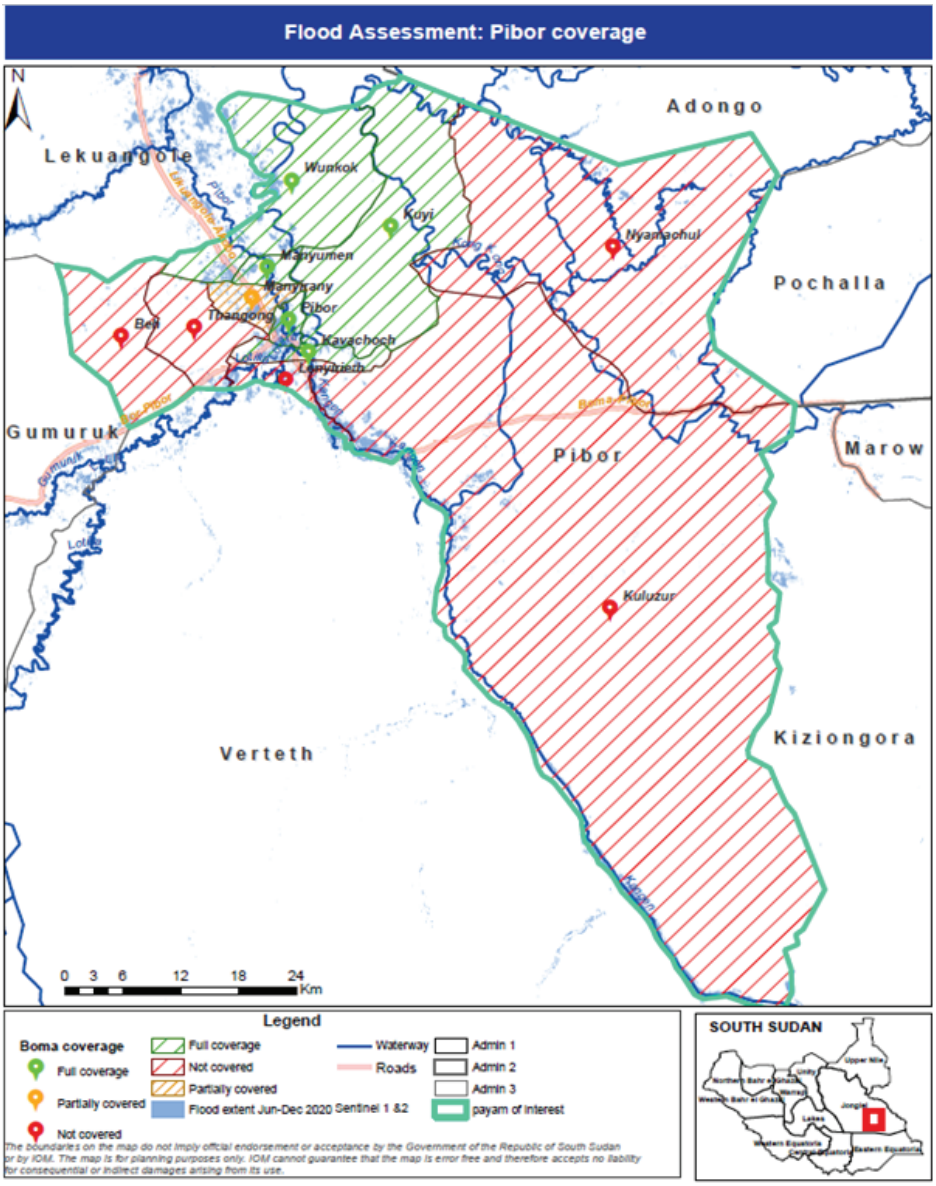
22 *IOM DTM Displacement Site Flow Monitoring, example: April 2019, p2*
23 *Coalition for Humanity South Sudan (CH), Conflict Dynamics in Leer County, South Sudan: Issues, Barriers and Opportunities Towards Conflict Transformation, November 2018*

Pibor is a payam within Pibor County of Jonglei State, composed of 11 boma in eastern South Sudan, near the border with Ethiopia with a population of approximately 40,941 people. Pibor is officially a county under the Greater Pibor Administrative Area (GPAA), but not all local governance structures have adapted to the change; for data collection purposes IOM continues to classify the region according to the ten-state system.[24]

Jonglei and Pibor Administrative Area have been plagued by inter-communal clashes, as highlighted by the Special Representative of the Secretary-General, Nicholas Haysom in May 2021.[21] Some 69 per cent of the GPAA's population are classified as equal to and above IPC Phase 3, i.e. crisis levels of food insecurity, including 44,000 people (2%) in IPC Phase 5 classified as catastrophe / famine levels of food insecurity.[26]

The most common livelihood activity is farming, followed by fishing and cattle husbandry. Communities also engage in charcoal production. Tukul (mud walls with thatched roofing) are the most common type of shelter, while many inhabitants live in emergency shelters / tents.

The Pibor River is prone to flooding, with river flooding remaining the most common type of flooding. However, locals have described the 2020 floods as the worst experienced in living memory, even surpassing historic floods in 1964, with one respondent noting: "Our parents and grandparents experienced this kind of flood in 1964, but it was not so damaging like for 2020" (FGDs, Kuyi in Pibor, September 2021).



Map 5: Map of Pibor Assessment Coverage

24 *The Names and boundaries used in this report are for data collection and presentation purposes and do not imply official endorsement or acceptance by IOM.*
25 *UN Press Release, UNMISS expresses deep concern at ongoing violence in Pibor, 16 May 2021*
26 *IPC Phase 3: Households either: have food consumption gaps that are reflected by high or above-usual acute malnutrition; or Are marginally able to meet minimum food needs but only by depleting essential livelihood assets or through crisis-coping strategies. IPC Consolidated Findings from the IPC Technical Working Group and External Reviews. Oct-Nov 2020*

Several payams were not chosen, despite a high ranking on the vulnerability index, due to new information on current accessibility and security concerns.

Further limitations relate to the availability and granularity of flood-related data. As the first study of its kind, conducted over a relatively short period of time, IOM chose only three locations. Findings will not be representative for the entire country, but provide insights based on field-level data and help validate the conclusions derived under the FDNA. In order to avoid reporting on outliers, IOM chose payams from geographically distinct areas, as well as rural and urban areas.

Representatives are interviewed by IOM during a Boma Questionnaire, Leer, September 2021

Methodology

Four simultaneous data collection exercises, with both quantitative and qualitative approaches, were carried out between 31 August and 14 October 2021 by IOM's Displacement Tracking Matrix and the Shelter and Settlement units. A research focal point consultant has been engaged and four key custom data collection tools were created for the purpose of the validation exercise. The tools can be found in the appendices to the report (A, C, D and E). Over the course of several days, IOM trained enumerators (either from or familiar with each area) in data collection methods and the use of the individual tools. Data was collected in coordination with local government representatives of the Relief and Rehabilitation Commission (RRC). In total, over 1,100 people were consulted and interviewed in 828 data collection interactions consisting of consultations, interviews and focus group discussions throughout the data collection exercise.

Interviews / Focus Group Discussions conducted: 806

Individuals consulted: Over 1,113

Table3: Reach of the four tools

	Sum of data collection interactions consisting of consultations, interviews and focus group discussions					Sum of the number of individuals consulted, interviewed and included in focus group discussions				
	FIFIS	BQ	FGDs	CBDRM country level	TOTAL	FIFIS[27]	BQ	FGDs	CBDRM country level	TOTAL
Bor	511	6	30	NA	547	511	6	56	NA	573
Leer	61	4	20	NA	85	61	4	44	NA	109
Pibor	115	6	30	NA	151	115	6	188	NA	309
Total	**687**	**16**	**80**	**23**	**806**	**687**	**109**	**288**	**29**	**1,113**

27 *more than the below - at least one person per unit of analysis*

1. Boma-level flood questionnaire (BQ)

Each payam (administrative level 3 after county, state and country) is composed of several boma (administrative level 4). Boma in turn are groupings of villages. The BQ was developed in reference to the FDNA and seeks to provide more granular insights of the impacts of the 2020 floods on productive, infrastructure and social sectors at the community level.

In line with the DTM's Village Assessment Survey (VAS) methodology, the BQ was directed towards authorities, i.e. boma chiefs and community representatives for host communities, IDPs, returnees, women and youth, and/or relevant groups identified at boma level.[28] In total, 109 representatives were consulted across 16 accessible boma in Bor South, Leer and Pibor between 2 September and 11 October 2021. A multiple-choice questionnaire (quantitative) was developed by IOM to compare findings across the targeted payams more efficiently. The team triangulated findings among multiple interviewees and recorded data on Kobo toolbox (mobile application). While the questionnaire's approach resembles that of DTM's VAS tool, new and modified questions assured that only data relevant to the validation of the 2020 FDNA findings were collected in line with ethical data collection standards. To this end, the questionnaire was developed in alignment with the thematic areas covered under the FDNA: (i) Infrastructure, (ii) Settlement, Housing & Displacement, (iii) Agriculture & Livelihoods, and (iv) Health & Education.

Table 4: Boma Questionnaire coverage

Payam	Boma covered	Total number of boma
Bor	6	8
Leer	4	4
Pibor	6	11
Grand Total	**16**	**23**

2. Flood Impact on Facility, Infrastructure and Service (FIFIS)

While the boma questionnaire provides a thorough overview on how the floods impacted communities at the boma level, the FIFIS captured geo-referenced information on types of facilities, infrastructure, services, settlement and livelihood areas in targeted payams, as well as their functionality, accessibility and potential rehabilitation in the context of flooding. The questionnaire is based on DTM's tool for mapping functionality and geo-location of facilities, infrastructure and services, but was modified and expanded for the project's purposes, both in terms of questions which are more focused on flood-related topics and targeted infrastructure relevant to the study, such as bridges and dams.

FIFIS was administered through interviews with technical focal points (e.g. head teachers for education facilities or representatives from relevant Government authorities, medical staff in health facilities, partners supporting or operating the facility), through direct observation by enumerators and consultations with community leaders (e.g. regarding flood-damaged bridges, market functionality, rebuilding of schools etc.) at a location level in targeted payams. Data was collected between 31 August and 14 October 2021, using Kobo Toolbox with embedded mbtiles (file format) containing information on water extent, satellite imagery of the area and building footprints, together with existing settlement layers (including displacement sites).

A total of 687 questionnaires were administered across 16 out of 23 boma including 587 facilities, 16 livelihood areas and 84 settlement areas. Livelihood areas do not include smaller, individual family farms.[29]

28 *See VAS example: Wau, Rubkona And Bor South Village Assessment Survey (August - November 2019) with methodology section on p6*

29 *Farms of 1.38 acres of land and above intended for commercial purposes. Communal grazing ground is defined as a grazing land with pasture and water ranging from 1acre to 1000 acres and is collectively used and managed by the community.*

Table 5: FIFIS coverage

	Bor	Leer	Pibor	Total
Accessed boma for FIFIS	**7/8**	**3/4**	**6/11**	**16/23**
Facility	**454**	**43**	**91**	**587**
Education	66	10	12	88
Healthcare	23	3	2	28
Water point / facility	187	16	45	248
Religious building	72	6	9	87
Market	18	2	1	21
Transport	6	2	2	10
Administrative /community	41	10	6	57
Connective infrastructure (roads and bridges)	25	2	12	39
Water infra. (dikes, culverts and drainage)	16	3	2	21
Livelihood area	**7**	**0**	**9**	**16**
Farm (agriculture)	3	0	4	7
Cattle grazing ground	4	0	3	7
Fishery	0	0	1	1
Industrial compound	0	0	1	1
Settlement area	**50**	**18**	**16**	**84**
Permanent village	19	5	11	35
Nomadic settlement	0	5	0	8
Neighborhood	25	7	3	40
IDP site	5	1	2	9
Other temporary site	1	0	0	1
Grand Total	**511**	**61**	**115**	**687**

3. Focus Group Discussions (FGDs):

IOM administered 80 FGDs between 2 September and 11 October 2021, with 283 key informants in separate groupings, namely host communities and IDPs by gender (4 groups) followed by a group including the elderly and persons with disabilities in targeted areas using a semi-structured questionnaire to gather qualitative information on areas of interest. Findings from the FGDs complement quantitative data collected through the boma- and facility-level questionnaires and gauge a better understanding of community perceptions on the flood impacts, their recovery needs as well coping mechanisms. Insights contextualize previous FDNA findings, as well as those from quantitative tools, allowing for more evidence-based programming in community-based disaster risk management (CBDRM).

Table 6: Boma Questionnaire coverage

Payam	Boma covered	Total number of bomas
Bor South	6	8
Leer	4	4
Pibor	6	11
Grand Total	**16**	**23**

4. Key informant interviews (KIIs)

IOM administered 23 KIIs between 29 October and 17 September 2021 providing primary data to conduct qualitative disaster risk analysis for the report, with participants recruited from key stakeholder groups at the national level in Juba. This includes academic and research experts, civil society organizations, humanitarian partners (UN agencies, INGOs and NGOs), the Relief and Rehabilitation Commission, and the following relevant line ministries:

1. Ministry of Humanitarian Affairs and Disaster Management
2. Water Resource and Irrigation
3. Forestry and Environment
4. Gender, Child and Social Welfare
5. Land, Housing and Urban Development
6. Roads and Bridges
7. Education and Instruction
8. Agriculture and Food Security
9. Livestock and Fisheries

A semi-structured questionnaire was used to guide KIIs conducted in Juba. Data from the KIIs was analyzed, in conjunction with data from the three previous tools, to provide a broader analysis of disaster risk in South Sudan, with an emphasis on understanding the impact of community-based floods and risk management initiatives in the country. Grounded theory was used to guide the analysis and identify themes organically emerging from the data. Interviews were transcribed, and prevalent themes were identified within each transcript. Following this, emergent themes were synthesized across all interviews to structure the findings presented in this study.

Findings from the four tools are summarized and contrasted against those from the remote flood damage assessment of the FDNA.

IOM staff travelled by canoe, as much of Leer continued to be or repeatedly flooded, September 2021

2. Insights from the Field: Flood Impacts and Community Needs

This section lays out the findings from the field validation gleaned from quantitative and qualitative tools, in order to understand hazard characteristics, exposure, vulnerability, types and levels of damage incurred, as well as adaptive capacities at the local level. The findings are structured along the lines of the FDNA, i.e. 1) infrastructure, 2) settlement, housing and displacement in the flood context, 3) agriculture and livelihoods, and 4) health, WASH and education. This allows the analysis to juxtapose and complement the findings from the country-wide, remote-based FDNA with the more granular insights which have been generated at the community level.

Out of 343 flooded facilities, livelihood areas and settlements recorded in the FIFIS tool, only 150 (44%) were located in areas marked as flooded through Sentinel 1 and 2 satellite imagery-based flood extent data. This represents a substantial difference between remote and field-based 2020 flood information. The highest level of accuracy was achieved in Pibor where over three-quarters (76%) of flooded areas were in areas marked as flooded by satellite imagery as described in the FDNA report. For Bor, this value was less accurate as only 38 per cent of flooded areas were located in areas marked as flooded in the remote assessment. The lowest level of accuracy was found in Leer, as only 2 out of 45 (4%) flooded areas (FIFIS) were found in areas assumed flooded in the FDNA.

Infrasctructure

IOM mapped and assessed 587 infrastructure facilities through the Flood Impact: Facility, Infrastructure and Services (FIFIS) tool, across 16 boma in Leer (43), Pibor (90) and Bor (454). Of the 587 facilities, 116 or 20 per cent were not functional at the time of assessment, meaning that for a range of reasons and impacts, notably flooding, the facilities' intended purpose was no longer fulfillable). Administrative and community buildings were especially hard hit, with only 62 per cent (33/53) functioning at the time of assessment. These were followed by healthcare facilities, of which 71 per cent were dysfunctional (20/28). By payam, Leer hosted the largest percentage of dysfunctional infrastructure, with more than half not working (51% or 22/43). Facilities were out of service for a variety of – and usually a combination of – external shocks. Overall, the 2020 floods were the most common contributing factor, causing dysfunctionality in more than half of all cases (54%), while 2021 floods played a role in 31 per cent of cases. While conflict led to dysfunctionality in 26 per cent of cases overall, it played a role in 68 per cent of dysfunctional facilities in Leer.

Table 7: Facility coverage by Payam

	Bor	Leer	Pibor	Total
Educational facilities[30]	**66**	**7**	**12**	**88**
Nursery	**27**	**0**	**3**	**30**
Primary school	26	5	8	43
Secondary school	11	3	1	15
University	2	0	0	2
Vocational school	3	0	0	3
Healthcare	23	3	2	28
Hospital	1	1	0	2
PHCC (Primary Health Care Center)	13	1	2	16
PHCU (Primary Health Care Unit)	9	1	0	10
Water point / facility	187	14	45	248
Borehole	**149**	**14**	**37**	**202**
Hafir (Water Basin)	3	0	2	5
Spring	0	0	1	1
Stream	2	0	1	3
Water tap	33	0	4	37
Religious building	**72**	**5**	**9**	**87**
Church	70	5	8	84
Mosque	2	0	1	3
Market (daily)	18	2	1	21
Transport	**6**	**2**	**2**	**10**
Airstrip	1	2	1	4
Bus station	3	0	0	3
River port	2	0	1	3
Administrative /community	**41**	**6**	**6**	**57**
County or State administration	17	0	1	18
Court of justice	3	0	1	4
Local administration	5	1	2	8
Other offices	7	1	0	9
Police station	3	1	1	6

30 *Please note that one facility functions as more than one type of educational facility (e.g.: a building used as primary school for the first half of the day and as a secondary school for the second half). Therefore, the number of educational facility sub-types will not add up to the total number of educational facilities.*

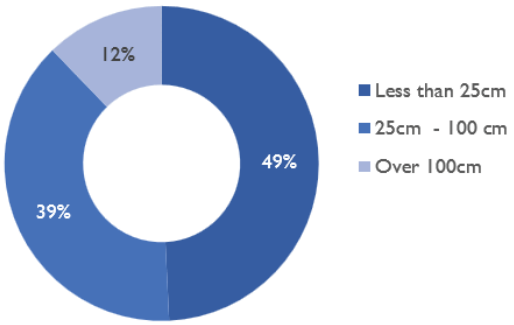
Women's Center	6	2	1	10
Youth Centre	0	1	0	2
Connective infrastructure (roads and bridges)	**25**	**1**	**12**	**39**
Road	25	1	10	37
Bridge	0	0	2	2
Water infrastructure (dikes, culverts and drainage)	**16**	**3**	**2**	**21**
Culvert	14	3	0	17
Dyke	2	0	2	4
TOTAL	**454**	**43**	**90**	**587**

One fifth of the assessed functional infrastructure (n=471) were managed by the UN or (I)NGOs, of which the share was significantly higher for water infrastructure (e.g. bridges and culverts) (60% or 12 /20) and water points (31% or 61/198).

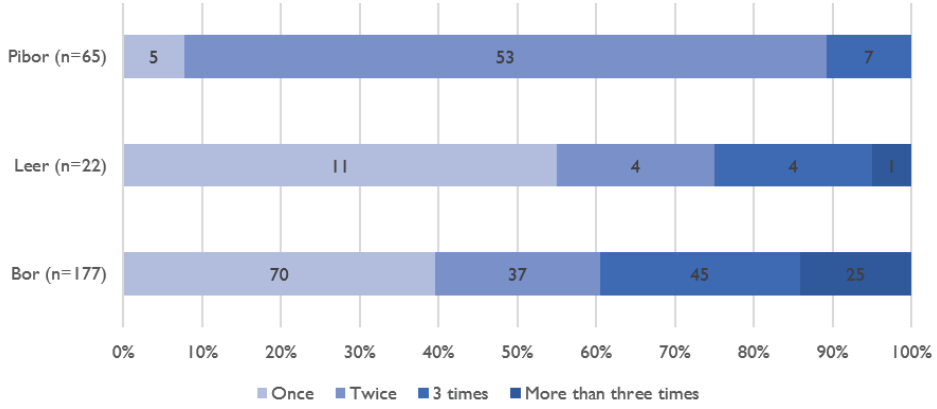
Nearly one third of assessed functional facilities had been affected by floods in 2019 (31% or 144/471), and nearly all of these had again been damaged by floods in 2020 (90% or 125/139). Bor South ranked as one of the most heavily impacted counties in the FDNA, which reported an estimated 22 per cent of approximately 84,000 buildings being affected. IOM found that an even higher percentage of buildings were flooded, as out of 379 mapped infrastructure elements (including public buildings such as community centers, markets, churches and bridges), 177 or 47 per cent were flooded.

IOM assessed the severity of the floods by tracking water depth, frequency and combined durations of flooding at included facilities. The 2020 floods affected more than half of all functional facilities (56% or 262/471). Water depths exceeded 25cm for just over half of the assessed facilities (51% or 133/262).

Graprh 1. How deep was the water at the deepest pointin the facility (n=262)



Graph 2: How often was the facility flooded in 2020?



Over two-thirds of facilities affected by floods in 2020 were flooded more than once (67% or 176/262). Frequent flooding of three or more times was especially common in Bor (14% or 25/177).

At nearly three-quarters of flooded facilities, the total duration of combined flooding instances in 2020 added up to over a month (74% or 192/262). Flooding lasted less than a week in only six per cent of cases (15/262). For 15 per cent, or 40 facilities, flooding lasted longer than three months.

For the majority of facilities, flooding represented more than a temporary inconvenience / access challenge. More than two-thirds of facilities were damaged (67% or 175/262). Damage levels were described and estimated as little (49%), medium (48%) and severe (3%).[31,32] A large proportion of available infrastructure was damaged to a point of becoming dysfunctional as described further above. Damage was especially pronounced in Pibor, where damages were categorized as medium or above in 66 per cent of cases (40/61).

Table 8: Facility damage level

Facility type across all boma	Little damage (1%-33%)	Medium damage (34%-66%)	Severe damage (Approx. 67%-99%)	Total facilities damaged by floods in 2020
Education	55%	45%	0%	29
Healthcare	0%	100%	0%	3
Water point / facility	53%	45%	2%	58
Religious building	48%	45%	6%	31
Market	0%	100%	0%	5
Transport	29%	71%	0%	7
Administrative /community	73%	27%	0%	15
Connective infra. (roads and bridges)	37%	53%	11%	19
Water infra. (dikes, culverts and drainage)	50%	50%	0%	8
Grand Total	**49%**	**48%**	**3%**	**175**

While **damage to infrastructure caused by the 2020 floods most commonly lasted between one and three months,** for seven per cent of buildings, especially in healthcare and education, damages lasted over six months. Damages lasted especially long in Leer, where 4 out of 17 damaged facilities (24%) remained damaged for over six months. Repair works at damaged facilities were reportedly rare, as complete repair was described at only 19 per cent (34/175) of facilities since the 2020 floods. In Pibor, repair was especially rare, as nearly 72 per cent had "no repair work" at all (44/61).

Where repairs were possible, they were conducted by the UN / (I)NGOs (30%), followed by the government (22%), private individuals / companies (20%), the local community (19%) and religious entities (10% of 81 repaired facilities). The highest UN / (I)NGO part in repairs were found in Pibor, most commonly in the form of water points (65% or 11/17) whilst only one out of nine facilities in Leer was repaired by the UN / (I) NGOs.[33]

Among 81 repaired or partially repaired facilities, **only 15 (19%) included measures to prevent future flood-induced damage** by using stronger materials (6), by relocating the facility (4) or by building dikes around the facility (5). This still only represents 15 facilities with some modification to reduce vulnerability out of 178 (8%) that were damaged by the floods and excludes facilities that were completely destroyed.

31 *Damage as estimated percentage of the facility rendered dysfunctional: little damage (1-33%); medium damage (34-66%) and severe damage (67-99%)*

32 *It should be noted that facilities marked as severely damaged remain among the group of technically functional assessed facilities whereas it was not possible to assess completely dysfunctional and deserted facilities.*

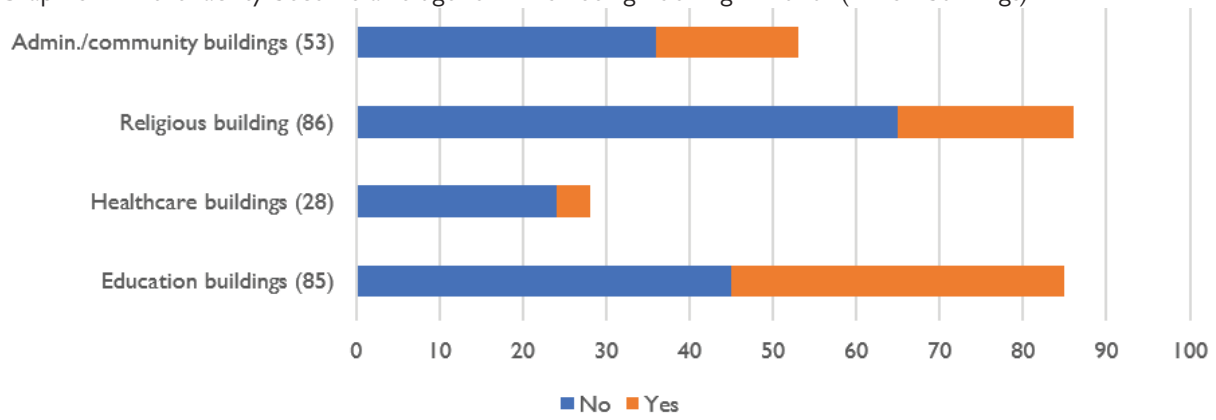
33 *Please note that these accounts are based on interviews with the local population and might differ from actual aid activities.*

Table 9: Facility flood duration

Facility type	Up to 1 month	1 - 3 months	3 - 6 months	Over 6 months	Total facilities damaged by floods in 2020	
Education	17%	55%	10%	17%	100%	31
Healthcare	0%	67%	0%	33%	100%	3
Water point / facility	14%	72%	10%	3%	100%	58
Religious building	23%	52%	23%	3%	100%	31
Market	0%	40%	60%	0%	100%	5
Transport	43%	29%	29%	0%	100%	7
Administrative /community	33%	40%	13%	13%	100%	15
Connective infra. (roads and bridges)	11%	63%	21%	5%	100%	20
Water infra. (dikes, culverts and drainage)	0%	88%	0%	13%	100%	8
Grand Total	**17%**	**60%**	**15%**	**7%**	**100%**	**178**

During the 2020 floods, **civilians sought refuge** at higher altitudes and in available public infrastructure as most homes in the assessed areas are tukuls made of wooden poles, mud and straw (most common in 13 out of 16 boma) or less solid emergency shelters (3/16). IOM DTM asked interviewees whether buildings such as schools, healthcare and education purposed buildings were occupied by IDPs during the floods. Teams discovered that 36 per cent (37/102 buildings) had indeed been used as temporary shelters by people displaced by the floods. This was especially true for educational facilities, of which 47 per cent (40/85) became temporary shelters.

Graph 3: Did the facility become a refuge for IDPs fleeing flooding in 2020? (n=252 buildings)



In a different vein, teams also asked if facilities had been **occupied by armed forces** and found that nine per cent had turned into temporary barracks (23/252). Public administrative or community buildings, as well as religious and educational facilities, were most commonly chosen for these purposes.

Settlement, Housing and Displacement in the Flood Context

Boma Flooding Profiles

General flood related questions formed part of the BQ, for which IOM interviewed five representatives per boma in 16 boma across the three payams (see methodology). This aggregated data is complemented by settlement-level data from the FIFIS (a settlement can form part of a village or be a neighborhood of a more urban environment – a collection of homes in one area with similar attributes). IOM collected data on 84 settlements in Bor (50), Leer (18) and Pibor (16) as a part of the FIFIS. Combined, the two quantitative tools provide a more comprehensive understanding of flooding in the target areas, and allow for triangulation of overlapping data points.

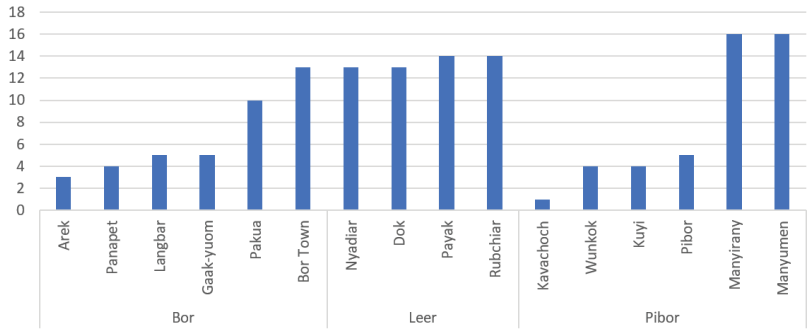
All 16 boma experienced flooding in 2020, and in each boma most of the population was directly affected according to the BQ. The FIFIS questionnaire revealed that 70 per cent of settlements within these boma were flooded in 2020 - to varying degrees in the different payams. While just over half of Bor settlements (54% or 27/50) had flooded, this was true for all accessed settlements in Pibor (100% or 16/16). Of eight IDP sites mapped during the exercise, five were reportedly flooded in 2020. Over two-thirds of flooded settlements reported that either the entire settlement (29% or 17/59), or more than half of the settlement, had been under water (43% or 26/59). Flooding was particularly severe in areas of Pibor, where only 1 in 16 settlements reported inundations that spread across less than half of their settlement.

Table 10 Settlement flood status

Was this settlement flooded in 2020?	No	Yes	Total
Bor	**23**	**27**	**50**
Permanent village	10	9	19
Neighborhood	10	15	25
IDP site	3	2	5
Other temporary site	0	1	1
Leer	**2**	**16**	**18**
Permanent village	1	4	5
Nomadic settlement	0	5	5
Neighborhood	1	6	7
IDP site	0	1	1
Pibor	**0**	**16**	**16**
Permanent village	0	11	11
Neighborhood	0	3	3
IDP site	0	2	2
Total	**25**	**59**	**84**
	30%	**70%**	**100%**

Field data showed that **flooding in 2020 often lasted longer than might be suggested by start and end dates of the rainy season.** Looking at the longest consecutive flooding periods starting in and / or ending in 2020, all 16 assessed boma experienced an average of 8.8 months of flooding, while some boma (e.g. in Pibor) were flooded for as long as 16 months. Several locations within assessed boma remained flooded before and after the end of 2020, highlighting the unusually extreme subsequent flooding that affected the country between 2019 and 2021, compared to previous years. In boma, such as Kavachoch (Pibor), flooding might not have lasted as long as in other locations in 2020, but damages from combined seasonal floods were nonetheless substantial in areas such as agriculture, due to fields that were waterlogged long-term: "No more cultivation ever since 2019." (Kavachoch, Pibor, September 2021).

Graph 4: Number of months for longest period of flooding (beginning and / or ending in 2020)



While flooding periods were not the longest in Bor, **flood-levels** were higher than in other assessed areas according to settlement-level data. Some 78 per cent of settlements (21/27) stood in water higher than 25cm, with nine settlements citing water depths of over a meter (especially in Bor Town and Langbar).

More than half of interviewed communities at the boma-level (all boma in Bor) reported that floods happen multiple times in a single year (9/16). Only one boma in Leer estimated floods to appear (approximately) only every five years or less (Payak).

The regular but unpredictable nature of flooding in these areas was summed up well in FGDs, during which many responded to the question on whether floods were a regular or exceptional occurrence in the boma in this, or similar, ways:

Leer: Peter is a community leader in Payak Boma. Peter was born in 1946 in a place called Pullual in Mayendit. His family moved to Payak in 1950, and in 1961 severe floods hit Leer displacing approx. 70% of the local population to Warrap and Lakes states. According to Peter, flooding in their area usually happens every 7 to 10 years. However, now major floods seem to occur every one or two years.

"We experience the flood regularly and it always comes by surprise" (FGDs, Gak Yum, Bor September 2021).

Table 11: Settlement flood frequency

Estimated Flood Frequency	Multiple times a year	Every year	Every second year	Every 5 years	Total # Boma
Bor	6	0	0	0	6
Leer	0	1	2	1	4
Pibor	3	2	1	0	6
Grand Total	**9**	**3**	**3**	**1**	**16**
	56%	**19%**	**19%**	**6%**	**100%**

IOM asked communities about the **origin of the local population's vulnerability** to floods. While proximity to flood-prone rivers was cited as the number one reason, **damaged dikes** (or damaged coping mechanisms, FGD respondents reported "we rely on little raised ground for everyone. Constructing the temporary dikes which was washed away by flood." (Gak Yuom, Bor, FGDs, September 2021).

In an effort to leverage local knowledge, in line with Community-based Disaster Risk Management (CBDRM) efforts, IOM asked communities **what they needed from the humanitarian community** to better cope with floods. Plastic sheets (and plastic carpets for dry floors) for the construction of temporary shelters were one of the most mentioned items, especially in Pibor. Respondents in Pibor also often mentioned boats and canoes, needed for transport during floods, as being a priority need. After shelter and transport, focus groups most reported the need for empty sandbags for the construction of dikes. Dyke building and dike repairing materials were among the most cited needs in the FGDs across groups (host communities, IDPs, and gender specific groups). IDPs reported as most needed: "support by mechanical tool and material to build better durable dikes in the boma" (Dok, Leer, FGDs, September 2021). The elderly and persons with disabilities reported as one of their main needs: "We need tools like hoes and sandbags" (Pibor, Pibor, FGDs, Sept.2021). When asked what women needed, requests also included to "provide them with sandbags" (Pibor, Pibor, Host Community

Women and Girls FGDs, Sept.2021). On this note, it should also be mentioned that while fetching water and firewood remained an activity largely carried out by women and girls only, the construction of dikes included everyone: "girls stop schooling due to helping parents making dikes together" (Dok, Leer, FGD, Sept. 2021). While all parts of society were involved in the building of dikes, women and girls were more commonly involved in building individual/household shelter flood protection: "Women and girls were affected most because we are the people who make dikes around the house when water reaching home. We are the only ones who scoop the water out after the dike construction, and this has caused a lot more diseases like urinary tract infections (UTIs) (Rubchair, Leer, FGDs, Sept. 2021).

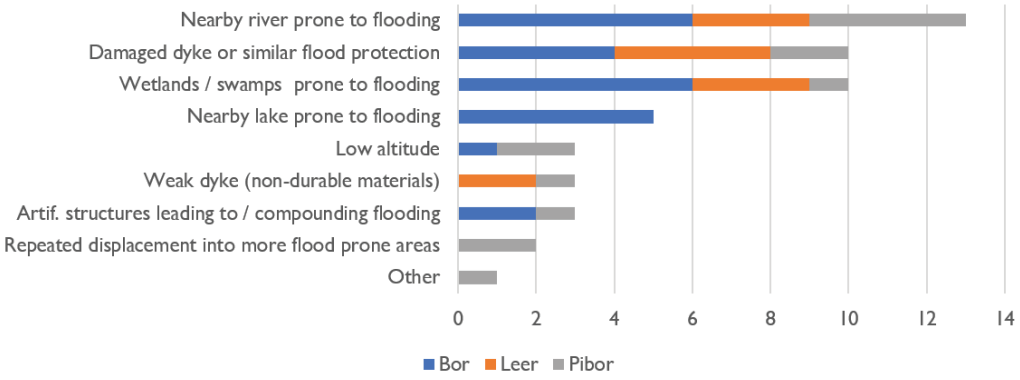
Plastic sheets and empty sandbags were followed by food, hoes and other dike building tools, medicine, and fishing nets. Local populations also spoke of a need for flood training or awareness raising, as well as an encouragement to move to higher raised areas. Other forms of support with flood resistant infrastructure, such as support in the construction of drainage canals and heavy machinery for dikes, were also requested.

> *"We need boat, plastics sheet. We need medicines. We need tools like hoes and sandbags" (Kuyi, Pibor FGDs, September 2021).*

Support requested in Bor and Leer was similar with requests for assistance in the construction of dikes as well as plastic sheets for temporary shelters at first place. Communities here also often mentioned the need for dignity kits during FGDs with women and girls. Other needs included food and NFIs such as mosquito nets, soap, underwear, kitchen utensils and blankets.

> *"Construction of dikes. Provision of plastics sheet to build temporary shelter. Provision of NFIs. Provision of mosquitoes. Provision of sanitary kits for women and girls" (Gak Yuom, Bor, FGDs, September 2021).*

Graph 5: In your opinion, why is the population here prone to experience flood-related shocks? (n=16 boma with multiple answers possible)



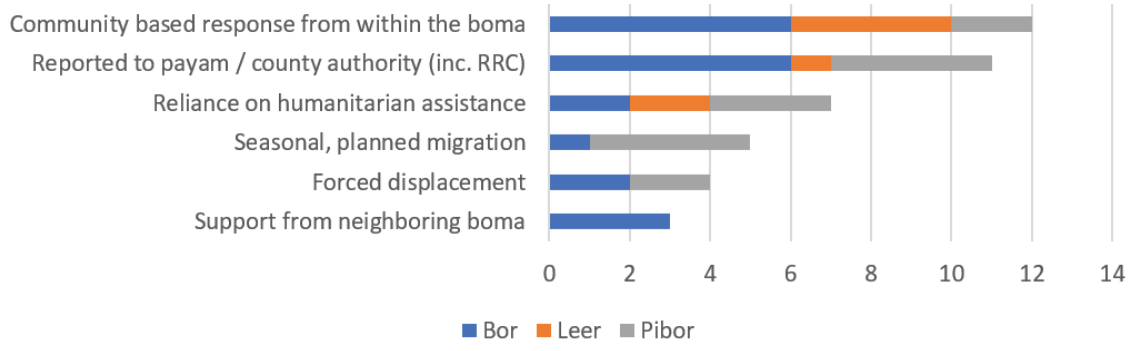
While most boma in Bor and Leer had **flood committees** to discuss and organize around flood related issues – or at the minimum dike committees to organize the construction of dikes, Pibor showed a lack thereof. Approximately half of existing flood committees (5) also helped the community during displacement or after conflict (known for 9). In 3 out of 10 boma with committees (and 16 boma total), respondents to the BQ reported that these committees had been able to give early warnings about floods. Wunkok was the only boma reporting the presence of a warehouse where the UN/(I)NGOs or government pre-positioned emergency food or Non-Food Items (NFIs).

Table 12: Presence of flood and dike committee by boma

Flood / Dyke Committee	Yes	No	Grand Total
Bor	**5**	**1**	**6**
Arek	1		1
Bor Town	1		1
Gaak-yuom	1		1
Langbar	1		1
Pakua	**1**		**1**
Panapet		1	1
Leer	4	0	4
Dok	1		1
Nyadiar	1		1
Payak	**1**		**1**
Rubchiar	1		1
Pibor	1	5	6
Kavachoch		1	1
Kuyi		1	1
Manyirany		1	1
Manyumen		1	1
Pibor		1	1
Wunkok	1		1
Grand Total	**10**	**6**	**16**
	63%	**38%**	**100%**

Most boma reported **responses to flooding originated primarily from within local communities.** The second most common response was to report the crisis to the payam or county authorities. Reliance on humanitarian assistance ranked third, but before seasonal or forced migration as a last resort.

Graph 6: Response to 2020 floods by boma (16 boma and multiple answer options possible)



The targeted payams were not only prone to frequent flooding – some **57** out of **84** settlements **(80%) reported having experienced conflict in the past five years.** This includes 47 settlements which experienced flooding in 2020. During FGDs, residents in most boma mentioned the lack of external support, which was according to respondents often due to impassible roads but also hypothesized to be due to a shifting focus to COVID-19. The combination of floods, the effects of COVID-19 and armed conflict left little room for recovery: "COVID-19 in 2020, the conflict of the Lou Nuer of 2020 and floods made life more difficult, because of multiple shocks at the same time on the residents of Pibor. People have been displaced more than once. In 2020, flooding, and some were displaced before by the Lou Nuer attack of last year" (Pibor Boma, FGDs, September 2021).

Displacement

Findings suggest that **displacement caused by floods in 2020 remained localized but long-term**.

Almost all boma included some villages that were completely deserted (Bor 32, Leer 31, Pibor 13) – reportedly largely due to the 2020 floods; however, populations did not migrate far. When asked where most of these displaced population groups had gone, the answer was 'to somewhere in the same payam' in 9 out of 16 boma (56%), and 'to somewhere within the same county' in 13 of 16 boma (81%). First and foremost, it should be noted that all but two boma (in Pibor) reported a current presence of IDPs, which have been displaced for a variety of reasons and often a combination of factors. However, flooding remained the most common reason in all but one boma in Pibor (Kuyi), where conflict involving local communities was cited as the top reason for displacement. In four out of 12 boma reporting frequent flood-induced displacement, respondents reported that inhabitants were usually able to flee before the arrival of the floods (not in relation to 2020), and that in most cases people escaped the floods on foot or by boat. While IDPs in Leer and Pibor most frequently remained within the same boma, or at times neighboring boma in nearby payams, IDPs from Bor crossed state borders into Central Equatoria and Lakes State.

Multiple instances of displacement during the past three years were mentioned in all focus group discussions, due to floods but also due to conflict: "Yes, some people have been displaced in 2019 and again displaced in 2020 because of the repeated flooding. There was also displacement in 2020 because of Lou Nuer attack." (Pibor Boma, Elderly and Disabled FGD, September 2020).

Flood-induced displacement remained relatively local, and not all persons fleeing the 2020 floods reached completely dry settlements.

The 2020 floods caused **displacement within 11, from 9 and to 9 out of 16 assessed boma.** Those leaving the boma largely targeted their habitual destinations as described above.

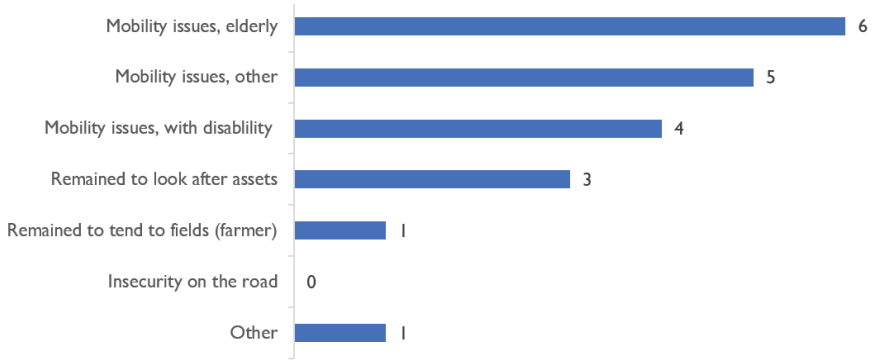
Over a third of all flooded settlements received IDPs during the 2020 floods (39%, or 23/59). In Leer, 11 out of 16 settlements that experienced flooding received persons fleeing floods elsewhere (69%), while the assessment team only encountered 5 settlements out of 27 in Bor to which IDPs fled. While flood-induced displacement had been understood as repeated and short-term in previous research (see IOM Mobility Tracking round 7, November 2019, p5)[34] , teams found that displacement following the 2020 floods had not subsided completely a year later (time of assessment was September 2021). Key informants in half of all flooded settlements that reported arrivals of persons fleeing the floods in 2020 claimed "yes, most" IDPs were still there (11/23). Especially in Bor, the majority of settlements informed IOM that most IDPs had not yet left. Settlements in Panapet (Bor Payam) and Dok (Leer Payam) were among the boma with the most settlements reporting a lack of return. Many other IDP-hosting settlements retained "some" of the 2020 IDPs (30% or 7/23), with only five settlements reporting all IDPs had left at the time of assessment (September 2021). Boma-level data confirms these long-term displacement patterns following the 2020 floods, as eight out of nine boma from which inhabitants fled the 2020 floods reported that displacement lasted longer than three months (longer than six months in four boma).

This finding stands in contrast to the more common **durations of flood-induced displacement** reported at the boma level. Respondents in 12 boma with frequent flooding claimed common displacement periods were between one and six months in 7 out of 12 boma (58%), with a third reporting that common displacement periods lasted longer than half a year (33% or 4/12 boma). These longer periods were especially common in Bor Payam. The most common reason for non-return for those citing displacement periods of over a month was that homes remained flooded (55% or 6/11 boma), followed by 'washed away shelters or assets' (27% or 3/11) and lost livelihoods (18% or 2/11).

When asked whether parts of the population were **left behind during the 2020 floods,** in nine boma from which populations fled eight responded affirmatively. Mobility issues represented the most common reason for remaining. As key informants in Kuyi, Pibor stated: "Yes, the elderly and the disabled people remained, because they have no one to help since the rest of the people are carrying their children, and some of them ended up in being drowned in the water" (Kuyi, Pibor, FGDs, September 2021). The elderly and persons with disabilities were also otherwise often mentioned in **FGDs** as the most vulnerable groups during flooding.

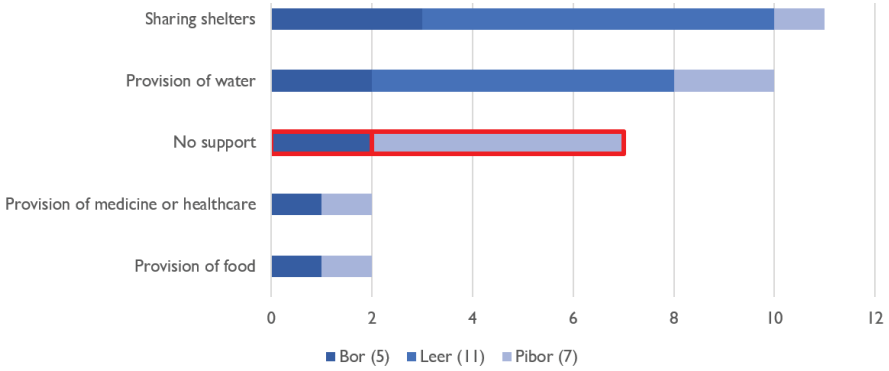
34 *IOM DTM, Mobility Tracking Round 7, November 2019*

Graph 7: Why did poeple stay behind during the 2020 floods (n=8 boma from which IDPs fled)



Relations between host and IDP communities during and after the 2020 floods were not always harmonious (23% or 6/23) but fine most of the time in 15 of 23 IDP-hosting settlements (65%). Relations were described as tense in one settlement of Nyadiar Boma (Leer Payam), and antagonistic in another one located in Pibor Boma (Pibor Payam). FGDs in Nyadiar confirmed these BQ, findings as inhabitants responded to a question regarding tensions in the face of limited resources: "It affected us badly. People fought over water points. Schools were

Graph 8: How were you able to support arriving IDPs in the context of the 2020 floods? (n=23 settlements)



overcrowded" (Nyadiar FGD, September 2021). Nyadiar was also one of the few locations where inhabitants said IDPs did not receive support from the local population, as many there struggled themselves. Similarly, in Pibor Boma, FGD key informants informed IOM, "No, the community was not able to support the IDPs because they don't have anything [themselves]" (Pibor Host Community Women and Girls FGD, September 2021). However, information varied among respondents, and IDPs themselves in Pibor claimed "the relationship between the host community and the IDPs is good because they share the same home and the public resources like water sources and public infrastructure" (Pibor IDP Men and Boys FGD, September 2021). FGDs showed that in contrast to Leer and Bor, Pibor inhabitants more often than not thought that apart from land, there was not much they were able to provide IDPs with. Support from host communities was most commonly in the form of shelter and water provision, while communities were less often able to provide food or healthcare.

While respondents in Bor Payam more often than not reported being willing and able to support arriving IDPs with more than just land, an example from Bor Town demonstrates how **quickly persons living in these flood-prone areas switch from being a host community member to being displaced** or vice versa, as one respondent shared, "the community was able to support IDPs with shelters, beds and utensils before the area was flooded.

Now both the community and IDPs are suffering from flood." (referring to 2021 floods in this case, Bor Town FGD, 2021).

Host communities in Leer were most commonly **able to support IDPs** as the example from Payak Boma illustrates: "We allow them to come because its problems. Our norm and culture are same. We share cattle, goat and problems".

Sources for tensions between IDPs and host community during and after flooding were often linked to an increased scarcity of basic resources such as water, which was reportedly the main issue in Pibor, and to a lesser extent in Leer. Leer Boma also reported tensions over grazing or farmland – an issue that will be further explored under livelihoods. Communal tensions due to past conflicts furthermore put pressure on relations between host and displaced communities in Pibor and Leer. IDPs in Pibor reported during FGDs: "Yes, there is competition for food - some days we go without eating. Water points are too congested due to long queuing. Health facilities are congested" (Manyumen, Pibor, IDP Men and Boys FGDs, September 2021). While

displacement was not unseen or less complex in Bor, relations tended to be less contentious between host communities and IDPs there.

Just under half of all settlements hosting IDPs fleeing floods reported having received external aid (48% or 11/23). Settlements in Pibor were the least likely to report having received aid in the displacement context (1/7). Respondents at two-thirds of assessed settlements in Leer reported receiving aid (73% or 8/11), while only three out of five settlements in Bor reported this support.

Support was in all cases (11 settlements) provided by the UN / (I)NGOs as opposed to government or private entities.

Table 13: External IDP support provision

Did you receive external aid to support the hosting of IDPs after the 2020 floods?				
(# of settlements with IDPs)	Bor	Leer	Pibor	Total
No	3	3	6	12
Yes	2	8	1	11
Grand Total	**5**	**11**	**7**	**23**

Shelter

Damage to shelters (mainly mud wall tukuls or emergency shelters in all 16 boma) was widespread and severe according to field assessments. On a settlement level, the FIFIS tool revealed that with rare exceptions, shelters were damaged in all assessed areas by the 2020 floods (97% or 57 of 59 flooded settlements).

Table 14: Shelter damage

Have shelters been damaged by the 2020 floods?					
	Bor	Leer	Pibor	Total	
No	2	0	0	2	3%
Yes	25	16	16	57	97%
Grand Total	**27**	**16**	**16**	**59**	**100%**

A quarter of settlements with damaged shelters (28% or 16/57) reported that all shelters had been damaged, and in 53 per cent of assessed settlements more than half of all shelters had been damaged (53% or 30/57). The FDNA reported Bor South to be one of the most heavily impacted counties with an estimated 22 per cent of its buildings affected.

Table 15: Shelter damage prevelance

How many shelters have been damaged in your settlement?	Bor	Leer	Pibor	Total	
All shelters	4	3	9	16	28%
More than half of the shelters	15	8	7	30	53%
Less than half of the shelters	6	5	0	11	19%
Total	**25**	**16**	**16**	**57**	**100%**

Only 1 in 63 settlements reported that all shelters had been repaired since the 2020 floods (2%). The majority had not been repaired at all and remained largely inhabitable (60% or 34/57). In settlements where shelters had been partially or completely repaired (combined 23 settlements or 40% of settlements with damaged shelters), repairs were commonly not supported by either government or UN / (I)NGOs, as 12 settlements cited financing by individuals or companies (52%) or by the local community (25% or 7/23). Government support was still more prominent than that of UN / (I)NGOs (13% or 3/23 compared to 4% or 1/23, respectively).

Repairs included **measures to make shelters less likely to be damaged by future floods** in 30 per cent of settlements where repairs had been undertaken (7/23). The most common measure taken was the construction of a dike around the shelter (4/7). The use of stronger shelter materials or relocations were less common.

The BQ confirmed that **homes in most boma (10/16) were "severely damaged"** (e.g. roof or wall missing), or that people lived in emergency shelters (3/10). The floods in 2020 remained the most common reason for these damages, according to key informants (as opposed to other floods or conflict for example).

Communities in most boma acquired shelter materials from the immediate environment. The majority of boma confirmed that the floods had reduced the availability of these materials (14/16). IOM inquired about the type of materials that were the most lacking, but found that all common building resources were scarce in similar measures, including dried grass, poles, ropes and plastic sheets, as well as tools such as axes, hoes and sickles.

IOM staff visit a flooded tukul in Leer, September 2021

Agriculture and Livelihoods

Communities in **assessed boma largely relied on the land for their livelihoods.** The most common crops in Bor and Pibor were found to be maize and sorghum, followed by groundnuts. Sustained flooding and flood-damage rendered livelihoods near impossible to carry out in most areas. IOM mapped 16 livelihood areas (agriculture, cattle and fishing), out of which 2 were abandoned in 2020 and 2021 and 11 were flooded in 2020. Flooding was reported to last most commonly between 1 week and 3 months. However, waterlogging and a lack of harvests meant that the effects of the floods were felt beyond this timeframe. The two abandoned livelihood areas were a cattle station in Pibor, which closed for economic reasons in 2020, and a ranching ground in Bor that closed in 2020 due to the floods. In-use agriculture areas were represented by seven farms, seven cattle grazing grounds and one fishery.

Resources were not only more scarce, especially arable land, but everyday activities also became more demanding and dangerous. Out of 16 boma, 15 confirmed that women and girls faced heightened threats during the collection of wood and water while areas were flooded. Sexual and gender-based violence was listed as most common threat, followed by snake bites and then criminality.

"The 2020 flood impacted agriculture in many ways, like water log made it hard to cultivate, pests and diseases destroyed crops. Cattle like cows, goats and sheep was carried away as well" (Manyumen, Pibor, FGDs, Sept. 2021).

"…the farm is water logged. The water level is too high for fishing. Cattles likes cows, goats, sheep but most of them died from diseases related to flooding" (Panapet, Bor, FGDs, Sept. 2021).

In all boma, key informants confirmed that at least half or a majority of the population's livelihoods had been negatively affected by the floods in 2020.

Farming was the most common livelihood activity in 14 out of 16 boma, and in 13 boma respondents reported that the size of arable land had decreased since the 2020 floods. In 13 out of 14 farming boma the availability of seeds had decreased after the 2020 floods. A lack of re-useable seeds due to a lack of a harvest was cited as the most common reason for this, followed by damage to seed storage facilities and decreased seed trade due to impassible roads. FIFIS data confirmed that five out of seven farms in Bor (3) and Pibor (4) normally used previous harvests as a source of seeds, while three (multiple sources possible) relied on UN / (I)NGO distributions in part (2) or fully (1).

Most boma were unable to harvest much of their expected and needed yield, as described in the table below. Only 2 out of 14 boma (in Leer and Pibor) were able to harvest half or more of the expected yields in 2020.

Table 16: Flood impact severity

Farming Boma (14): How severe was the impact of the 2020 floods?	Bor	Leer	Pibor	Total	
The boma lost up to a quarter of the expected yields	0	1	0	1	7%
The boma lost about half of the expected yields	0		1	1	7%
The boma lost about three quarters of the expected yields	4	0	1	5	36%
The boma's farmers were unable to harvest anything due to the floods	2	1	4	7	50%
Total	**6**	**2**	**6**	**14**	**100%**

Some 13 boma in the three assessed payams reported engaging in large-scale livestock keeping. Four out of 13 boma reported having received livestock vaccines since January 2019. In 5 out of 13 boma, respondents reported that grazing land was seasonally insufficient (during the dry season). In four out of 13 livestock raising boma, residents reported that limited grazing land availability had influenced relations between communities. Tensions arose between cattle keepers and farmers in these boma (3 in Pibor and 1 in Leer). In two boma, additional tensions were felt between the various cattle keeping groups. On a farm level, this equated to 10 out of 15 in-use large-scale farms / cattle grounds and fisheries that confirmed disputes over the use of land following the 2020 floods.

Disputes were reported in all livelihoods areas in Pibor (9) but only one in Bor (out of six). The data illustrates the ways in which flooding can have a direct influence on communal and political relations.

Support to individual farms was provided to only one (Pibor) out of five that were flooded and in use. This support came from the government in the form of food aid and farming equipment. One out of five cattle keepers received support located in Bor receiving cattle vaccines from UN / (I)NGO.

Flooded fishery in Leer, September 2021

Health / WASH and Education

Health: IOM mapped a total of 28 health facilities, of which 8 were not functional / deserted. All facilities encountered in Leer were dysfunctional.

Table 17: Shelter damage

Is the health facility functional?				
	Bor	**Leer**	**Pibor**	**Total**
No	4	3	1	8
Yes	19		1	20
Grand Total	**23**	**3**	**2**	**28**

"The road to healthcare was impassable due to high level of water. The health centers were far away. Transport became too high for the people to be taken to the hospital by boats" (Langbar, Bor, FGDs, Sept. 2021).

Residents in 15 out of 16 boma reported an increase in disease outbreaks in 2020, which they believed to be linked to the floods. Malaria upsurges and cholera were most frequently mentioned as diseases thought to have broken out at higher rates after the flooding. Only one boma in Leer reported having received healthcare support from UN / (I)NGOs in response to the flooding.

WASH: Drinking water was sourced from rivers in Pibor, streams in Leer and boreholes in Bor.[35]

Table 18: Drinking water

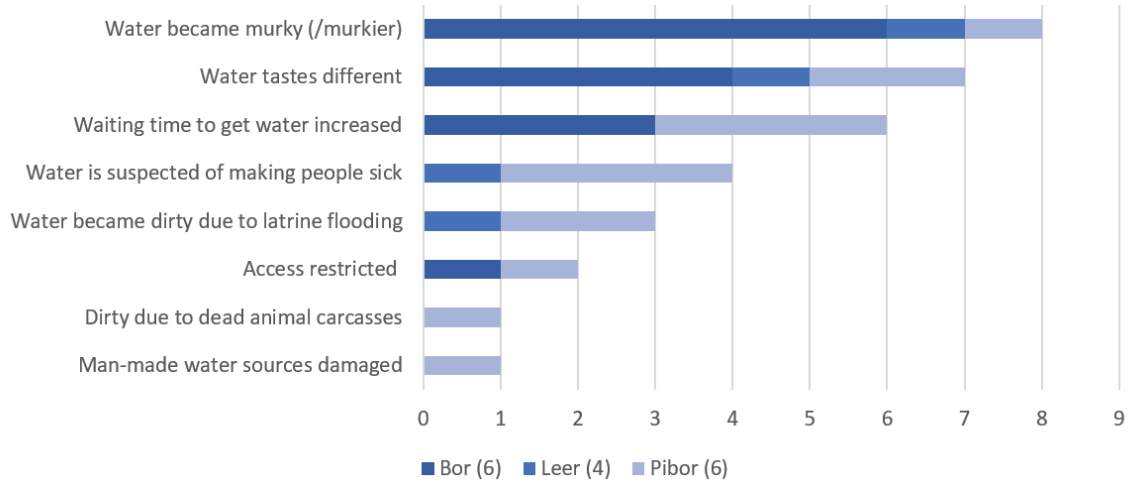
Has there been a change in the quality / quantity / accessibility / availability of drinking water after the floods in 2020?				
	Bor	**Leer**	**Pibor**	**Total**
No	6	1	5	12
Yes	0	3	1	4
Grand Total	**6**	**4**	**6**	**16**

In three-quarters of boma, the quality / quantity / accessibility / availability of drinking water after the floods in 2020 had changed. The most common complaint was that water became murky / murkier and tasted different. In Pibor, especially, respondents suspected that the consumption of available drinking water made people sick.

"Most of the water points ha[ve] collapsed. Some water points are over-populated. It is hard to reach the water point. The water is yellow, which is not suitable for human consumption" (Arek, Bor, FGDs, September 2021).

"The drinking water became contaminated with soil and dirt carried by flood water, making the water unsafe for drinking. Feces mixed with water as it flows since the latrines got flooded" (Manyirany, Pibor, FGDs, September 2021).

Graph 9: Water change post-2020 floods (16 boma with multiple answers possible)



35 *The same answers across boma of the same payam.*

Water user committees were reportedly present in 10 out of 16 boma. Only two out of six boma in Pibor reported organizing a water committee. Four out of 16 boma had received support in maintaining water sources after the 2020 floods – none of these were located in Leer. Support mostly came from within local communities. Only one boma reported UN / (I)NGO support and one support from the government.

Open defecation was generally the most practiced form of defecation (10/16 boma) while household latrines used to be common in only six boma. Half of the assessed boma reported that defecation practices had changed after the floods. During FGDs many respondents often complained about destroyed latrines: "Open defecation is common because toilets were destroyed by flood" (Wunkok, Pibor, FGDs, September 2021). Seven out of eight boma which reported changes in defecation practices reported that the practice of open defecation had increased, while the use of public and private latrines had decreased.

Education: in 14 out of 16 boma, access to education had been affected by the 2020 floods. Some 16 per cent of mapped educational facilities were not functional at the time of assessment. Six of 14 dysfunctional facilities stopped operating in 2020, and five in 2021, with only two ceasing to operate before 2020. The 2020 and 2021 floods were mentioned as the main reasons for school closures. Conflict contributed to the closures of four schools in Leer (2) and Pibor (2).

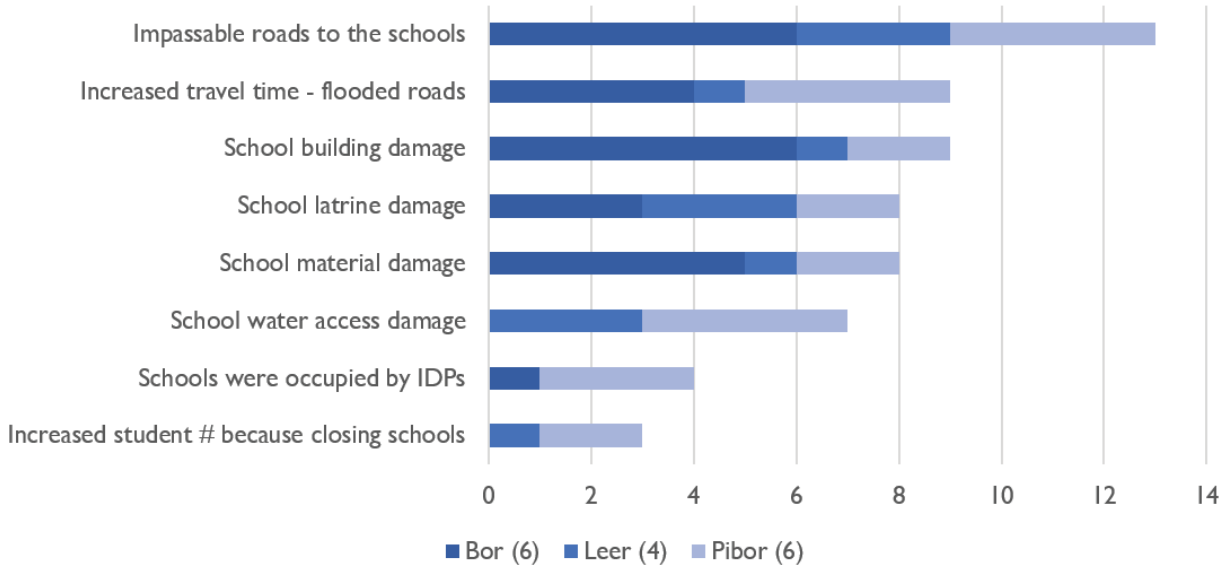
Table 19: Educational facilities functional vs non-functional

Number of functional and dysfunctional education facilities					
	Bor	Leer	Pibor	Total	
Dysfunctional	9	3	2	14	16%
Functional	57	4	10	71	84%
Grand Total	**66**	**7**	**12**	**85**	**100%**

> *"Yes, schools are fully damaged, books are washed away, the desks are taken by running water. Because of that child have nowhere to study." (Wunkok, Pibor, FGDs, Sept. 2021).*

The flood impacted access to education due to a variety of interrelated factors. Physical access to educational facilities was the main issues faced by students.

Graph 10: Flood-related reasons for reduced access to education (n=16 boma with multiple answers possible)



IOM assesses the inside of Emma Secondary school in Nyadiar, Leer that was flooded in 2020 and again in 2021 (September 2021)

3. Community-Based Disaster Risk Management in South Sudan: Lessons Learned from 2020 Floods

Introduction

Community-based disaster risk management (CBRM) has become an increasingly important component of DRM and DRR approaches in South Sudan. This has become particularly evident as the nature and scope of the impact of floods in South Sudan has changed in recent years. The UN has recently stated that floods observed in recent years are the worst experienced since the 1960's, and in the last two years at least half of the counties in the country have been flooded. Similar to other African counties, recent reports indicate that climate change has led to more severe and varying weather patterns, even though South Sudan is not considered to be a significant contributor to climate change. Both the duration and severity of floods are said to be increasing, leaving some communities flooded with stagnant water for up to a year or more, particularly in the Greater Upper Nile Region – this was evident in both the KII and FGD data that was collected during this study. Prolonged flooding has impacted livelihoods, including agriculture and cattle keeping, and has led to protracted displacement. This has in turn has had consequences for food security levels in impacted areas. As a result, stakeholders are increasingly questioning how to best support communities in building disaster risk management capacities, so that emergency responses are no longer the primary source of interventions provided. A better understanding of existing CBDRM approaches, and opportunities for further growth in this area, are critical to supporting communities in South Sudan that are facing multiple shocks and struggling to build their resilience. This section of the report aims to provide an overview of the existing mechanisms and structures that guide CBDRM in the country, as well as provide recommendations that government institutions and partners can use to guide their planning and programming.

By December 2020, OCHA[36] reported that over 1 million people had been affected by floods between July-December, and almost half of those individuals were

residing in Jonglei State (including Pibor). A total of 43 counties (out of 78) were flood affected at the time, resulting from overflow of the Nile, Pibor, Sobat, and Lol rivers. In addition to Jonglei State, a further seven states (out of ten total), were also impacted, including Lakes, Unity, Upper Nile, Warrap, Western Equatoria, Central Equatoria and Northern Bahr el-Ghazal. Access issues, resulting from flooding, made it challenging for humanitarian actors to provide life-saving resources to communities.

The humanitarian context in South Sudan provides several compounding factors in communities impacted by flooding. In 2020 alone, IDMC[37] estimated that 443,000 new displacements occurred from disasters, and led to the creation of 106,000 individuals with IDP status. This contrasted with 271,000 new displacements resulting from conflict and violence, indicating that insecurity may no longer be the greatest threat to South Sudan's communities, compared to the civil war. In the same year, South Sudan, along with the rest of the world, grappled with closed international borders and cessation of movement due to COVID-19, which exacerbated an economic crisis and hyperinflation. This compounded a dire level of food insecurity in country, which was highlighted by humanitarian stakeholders with the release of new IPC projects in late 2019, estimating that 5.5 million people were expected to be at Crisis levels of food insecurity (IPC Phase 3) or higher, further hindered by depleted food stores in communities and disruptions to livelihoods due to displacement, natural disasters, and insecurity.[38] Incidents of inter-communal violence, which spiked after the signing of the revitalized peace agreement in 2018, also contributed to displacement and insecurity. In the Greater Equatoria region, hold out groups from the peace agreements continued to be involved in clashes with government forces, inhibiting returnees of IDPs and refugees and development in the area. Lastly, the year began with key aspects of the peace agreement left to be implemented, which included the appointment of key government positions, from the national to the local level. This complex context compounded already dire levels of humanitarian needs – the Humanitarian Needs Overview for 2021 estimated that there were over 8 million individuals in the country with significant humanitarian needs, constituting the majority of the population of South Sudan, and the highest level observed of people in need in the country since 2017. The humanitarian/emergency response to floods in 2020 were multi-sectoral and comprehensive in nature, with particular consideration for reaching vulnerable populations. However, the 2021 Humanitarian Needs Overview indicated that partners often fell short of their cluster targets in terms of the number of beneficiaries reached.

While community-based disaster risk management approaches have been attempted in the past, primarily through the creation of disaster risk management committees and support for building dikes, this report finds that these efforts have been implemented in an ad hoc manner. The finalization of the draft of the National Disaster Risk Management policy[39] provides a timely opportunity to coordinate, standardize and strengthen CBDRM initiatives to ensure that they are responsive to local and national needs, and that learning and knowledge sharing opportunities amongst stakeholders are not missed.

Community-Based Disaster Risk Management

In a general understanding, Community-Based Disaster Risk Management (CBDRM) aims to "actively engage at risk communities in the identification, analysis, implementation, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities"[40]. This is achieved through a grassroots approach that engages local government and community partners. Furthermore, CBDRM leverages local knowledge and first-hand experience with disasters to identify responsive, effective and relevant solutions to preparing for disasters and mitigating their impact.

According to the Asian Disaster Preparedness Center's (2006) guidelines[41] on CBDRM, four principles should guide this line of work, namely: (i) ethics and core value principles, (ii) strategic principles, (iii) tactical principles, and (iv) implementation principles, each of which build upon the previous level of principles. The guidelines also emphasize the use of evaluation tools, and sharing of learning and knowledge amongst partners. Furthermore, engaging in, and strengthening, both structural and non-structural measures are key for enhancing resilience at the local level.

36 *OCHA. 2020. South Sudan: Flooding Situation Report. Inter-Cluster Coordination Group. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/TC%20YASA%20-%20Sitrep%20%234%20-%2024%20Dec%202020_0.pdf*

37 *IDMC. 2021. South Sudan. Retrieved from https://www.internal-displacement.org/countries/south-sudan*

38 *FEWSNET. 2019. South Sudan Food Security Outlook Update: Further scale up of food assistance required to prevent Crisis (IPC Phase 3) or worse outcomes. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/FEWS%20NET%20South%20Sudan%20Food%20Security%20Outlook_Update_12_2019__final.pdf*

39 *Ministry of Humanitarian Affairs and Disaster Management (MHADM), 2021. National Disaster Risk Management Policy, South Sudan (Draft), , Juba.*

40 *World Bank. u.d.. Gender and Disaster Risk Management – Guidance Notes: Integrating Gender Issues in Community-based Disaster Risk Management. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/F_R_448.pdf*

41 *ADPC. 2006. Critical Guideline of CBDRM. Retrieved from http://www.adpc.net/V2007/Programs/CBDRM/Publications/Downloads/Publications/guidefull.pdf*

Common examples of CBDRM in South Sudan include the use of local knowledge to predict adverse weather, including flooding, the mobilization of community members to build and reconstruct dikes using locally available materials, as well as the establishment of dike and or disaster risk management committees.

Legislative and Policy Frameworks

The National Disaster Risk Management Policy for South Sudan (2021) was finalized at the time of writing this report, and has been endorsed by the Cabinet. The policy outlines two specific tenets related to CBDRM, which are as follows:

- "Ensure the sustainability of disaster recovery, rehabilitation and reconstruction work through enhanced participation of communities, by initiating Community Based Disaster Risk Management" (p.17)

- "Encourage research and documentation that strengthen restoration of traditional prevention mechanism for hazards and disasters and linked with CBDRM approach" (p.17)

Additionally, a Disaster Risk Management bill has been drafted, with support from partners, which provides a legislative framework to guide the policy that has been established.

In addition to the national DRM policy, South Sudan also maintains a number of policy and legal frameworks that can guide and facilitate approaches to CBDRM. For example, the country's transitional constitution advocated for a decentralized approach to governance, which supports the empowerment and mobilization of state and local level institutions to support the implementation of government services. The National Adaptations Programme of Actions (NAPA) to climate change published in 2016 and the South Sudan National Environmental Act, 2015, also serve as guiding documents for CBDRM initiatives in the country. The documents outline causal factors impacting the severity of climate change and the resulting impact on the environment and people, while also outlining strategies that can be used to mitigate these impacts. Intergovernmental Authority on Development (IGAD) policies and resources have also been made available to government stakeholders involved in disaster risk management, and these linkages continue to be strengthened, particularly in light of climate change and flooding impacts encompassing regional trends and linkages. From a governance perspective, the establishment of committees at the payam and boma levels are supported by the Local Government Act of 2009[42], which outlines a decentralized approach which empower local governance institutions to support self-reliance and self-governance.

Findings

Perceptions on the growing intensity and frequency of floods

In regard to the causes of flooding, climate change has been identified by key informants as a primary factor resulting in more severe flooding and longer durations of floods, particularly in the Greater Upper Nile region. Heavier and more frequent rainfalls, combined with atypical weather patterns, have inundated communities, which do not have the infrastructure, resources or coping mechanisms in place to adequately prepare for or responds to the floods.

One of the key factors that key informants identified as contributing to the growing intensity flooding that was repeatedly mentioned for the Greater Upper Nile region relates to the predominance of black cotton/clay soil. This type of soil has low saturation rates, which subsequently increases the likelihood of stagnant water remaining in the region, and results in communities being affected by flooding long after the initial rainfall occurs. Prolonged flooding in the Greater Upper Nile Region emerged from both KII and FGD data, noting the subsequent impact on livelihoods, food security and protracted displacement, minimizing the ability of communities to exercise resilience in the face of such disasters.

42 *Local Government Act of 2009. 2009. Southern Sudan Legislative Assembly*

In seeking to address the challenges brought about by the type of soil prevalent in the region, a direct solution is not possible – rather, stakeholders emphasized the need to adapt or seek alternative and technical interventions that allow for stagnant flood water to be discharged from communities, and thereby reduce the intensity and longevity of flooding. Key informants noted that this could be in the form of drainage mechanisms and water pumps, as IOM has already piloted in Bor Town. Other alternatives provided by key informants included better urban planning approaches, which consider the need for appropriate drainage systems when dikes, new roads, and other infrastructure are built – at present, key informants noted that this is a missing element in planning in severely impacted areas such as Bor Town. Since communities and local governments often do not have the financial resources to obtain the machinery needed, nor the technical expertise to operate and maintain the equipment, additional support from partners will be needed in this area. Key informants and focus group participants noted the need for larger machinery and sturdier materials to build dikes that they are currently unable to construct through manual labor and locally available materials. Strengthening dikes in this way was noted as one solution to reduce the level of flooding, and to reduce the likelihood of stagnant water impeding recovery in communities.

Box 1: Building Climate Resilience in Fragile Contexts (BRACED Consortium, 2015-2018): Concern Worldwide, ACTED, Oxfam, FAO and the Sudd Institute (2015-2018)

- Aimed to "build the resilience of flood and drought affected communities in Northern Bahr el Ghazal, Warrap and Lakes states
- Activities included:
- Agro-pastoral field schools
- Training of community animal health workers
- Value chain development
- Establishment of village savings and loan associations
- Establishment of Community Resilience Planning Committees (CRPCs)
- Establishment of School Environment Clubs
- Cash for assets activities
- Community led total sanitation (CLTS)
- Climate forecasting
- Advocacy and policy influencing

In addition, one key informant noted that more research is needed on the role of vegetation blockages in rivers contributing to the increased levels of flooding observed in some parts of the country. As indicated in Douglas Johnson's[43] previous work on histories of floods in the Greater Upper Nile region, blockages created by extensive vegetation, which are perpetuated by "alternations between low and high rivers" (p.612), were identified as a cause for flooding in South Sudan in the 1900s. Johnson also notes that sudden rises in water levels can also assist in clearing blockages. A key informant in this study reflected that community members may be able to support clearing blockages on a small scale, as they are already doing this on some level, however larger blockages would require machinery and technical expertise that is currently unavailable.

Community-led capacity

The ability of communities to prepare for and mitigate the impact of floods in their localities was deemed to be largely insufficient by key informants that participated in this study. The primary mechanism identified for mobilization and management at the community level was through the building of local dikes. This was apparent in different parts of the country, however the process for mobilizing community resources and labor varied. In many instances, key informants indicated that local leaders hold the responsibility to assess when dikes needed to be built or repaired, how to acquire the necessary local materials, and requesting community members to contribute time and labor. Similar findings were observed from the FGDs, where participants indicated that their primary response to preparing for floods was through building dikes using

Box 2: IOM South Sudan, Shelter and Settlement, Bor Flood Mitigation and Response, 2020-2021

1. Repair, maintenance and reinforcement of primary dike to protect the town,
2. Formation and capacity building of Boma disaster management committees (BDMC),
3. In-kind distribution of shelter and non-food items (SNFI), and
4. Multipurpose cash assistance to persons with disability.
5. Delivery and operationalization of water pumps

43 *Johnson, D.H. 1992. Reconstructing a History of Local Floods in the Upper Nile Region of the Sudan. The International Journal of African Historical Studies 25(3) p. 607-649.*

local materials and supplies provided by partners, such as mud, sand and sandbags. Dykes are usually built manually due to the lack of machinery and technical expertise, instead using hands, shovels and hoes to create the structure. As further detailed below, community dikes are often built by male youth, however women may play supporting roles such as building smaller dikes around homes, helping to prepare materials for construction, and at times contributing manual labor to the efforts – the gender dynamics and role of women varied across the country, according to both key informants and focus group participants.

Establishment of disaster risk management committees were the second most frequently cited form of CBDRM mechanisms that key informants were familiar with, however this was not perceived as a widespread approach, and the sustainability of such measures was unknown. Partners have introduced CBDRM committees in strategic locations in previous years. Specifically, BRACED (see Box 1), which was led by a consortium of partners in South Sudan targeting communities in Northern Bahr el-Ghazal, Warrap and Lakes from 2015-2018, which included support to livelihoods in impacted areas and the establishment of CBDRM committees. However, key informants that were involved directly with BRACED, or otherwise familiar with the project, indicated that they did not know if the disaster risk management committees were still operational, and if they had been successful in supporting their communities throughout the 2020 floods.

Box 3: FAO Strengthening Preparedness of Vulnerable Communities to Climate Shocks and Natural Hazards

1. Training and engagement of national Geographic Information Staff
2. Training of Disaster Risk Reduction national stakeholders
3. Establishment and training of DRMCs in Maban, Pibor, Aweil Center and Aweil North
4. Vegetable and fishing kits distributed to households

World Vision is currently implementing the second phase of its Fortifying Equality and Economic Diversification for Resilience (FEED) program, which seeks to learn lessons from the first phase of implementation, which established CBDRM committees in different communities. Namely, disaster risk management committees that had previously been set up were no longer is existence, and consideration of how to ensure the sustainability of these mechanisms following the end of a project was critical going forward. This dilemma was also observed by other key informants, as an NGO representative shared: "Partners probably just do committee setup…the project ends and they leave. And those communities do not have a structure to continue to exist. Another partner probably has the same project [and] forms a new committee…continuity is not there." An additional challenge in sustaining committees, identified by an NGO representative, is that members are simultaneously beneficiaries, and may fear losing access to services and resources if they take on positions of power and decision-making.

Box 4: World Vision FEED II

1. Fortifying equality and economic diversification for resilience
2. Development oriented (rather than humanitarian/emergency)
3. Established disaster risk management committees
4. Provided training and support on:
5. organization and fiscal sustainability
6. economic development and livelihood activities

Furthermore, World Vision also aims to ensure that in addition to have the knowledge necessary to successfully maintain their committees, they are also proactive in identifying manageable risks and actions that the community can mobilize around. This approach is embodied through a participatory approach that identifies hazards and risks, as well as viable solutions. The membership constitution of such committees tends to vary – at times key informants that local government officials, leaders and elites were often recruited to represent their communities and make decisions. Other examples provided noted the importance of emphasizing an inclusive approach that targets under-represented and marginalized groups such as women, youth, the elderly, and people with disabilities, who are often the most impacted by floods, and also maintain the primary proportion of the burden in caring for and protecting their communities. A key informant that had worked closely with communities in Bor noted the success of committees there to its membership being composed of people who were most impacted by the floods, and thereby were the most motivated and invested in supporting their communities.

Local leadership is essential in both flood preparedness and mitigation of impact, particularly when it comes to supporting IDPs, as they often provide the initial frontline response to receiving and supporting displaced persons.

However, further resources and planning are needed to better support this. A key informant indicated limitations in their capacity when stating, "I have seen a lot of local leadership mobilizing people to move, though it was not very effective…it was a little bit effective because of the people had indeed started to move to areas of higher ground…The only challenge usually is that people usually don't have somewhere to move". The housing, land and property issues remain a challenge, as multiple stakeholders are involved – while land is technically owned by communities in South Sudan, according to legal frameworks, the government plays a regulatory role, particularly in urban areas. The decision to allocate land to IDPs also appears to occur in an ad hoc manner, according to the data collected in this study. As a result, leasing of land can be contentious, particularly for women and other vulnerable groups that have few assets and leverage. A separate interview revealed that "if they don't have relatives, [land] has to come from the government. Some people complain about the access to land, and where to put them. There now has to be engagement with the RRC and other departments to ensure that they put them in a certain location. Even when they put them there, they probably still lack access to basic services". This has been highlighted in Bor where IDPs were initially placed adjacent to rivers following advocacy efforts by the local government, in areas that had not previously experienced flooding – however, when these areas flooded in 2020, they were displaced for a second time. Data from focus group discussions indicated that host community support for IDPs varied across the Greater Upper Nile region, however protracted and indefinite displacement into host communities that are already facing humanitarian challenges has the potential to increase tensions between the two groups.

Aside from these two themes, the key informants cited humanitarian aid as the most frequent mechanism through which basic needs are met at the local level when floods occur. This mostly occurs through food distribution, acquiring shelter materials, and also the provision of WASH supplies. This primarily occurred because assets and structures were destroyed by flood waters, and were not able to withstand the magnitude of destruction that occurred in the 2020 floods. As further discussed elsewhere in this report, the prioritization of saving lives when floods occur also meant that any action to preserve assets became a secondary priority. Instead, households opted to assist vulnerable family and community members, including children, the elderly and people with disabilities, as they would not be able to navigate paths to safety independently. This finding contrasted with FGD data, which indicated that community-based responses were often the frontline response to flood-impacted communities, highlighting that communal perspectives on flood response may vary from stakeholders based in Juba.

Gender and youth dynamics

The gender dynamics of supporting CBDRM was also noted as an area that needs further attention by stakeholders supporting flood affected communities. In Unity, all households are seen as being responsible for contributing to dike (re)construction, regardless of circumstances. Even female-headed households and widows are expected to participate. If they are unable to build it themselves, they are given the option to instead contribute money or other resources to the overall effort. This is further supported by FGD data that indicated women in communities that do contribute to building communal dikes, may still contribute to efforts by building smaller barriers around their homes.

In other parts of the country, women may be given particular tasks to support the building of dikes such as feeding those contributing labor, or even assisting in preparing the materials needed. One reason noted for this is that it is usually men and male youth know how to swim, and as women often do not get the opportunity to learn, they are at risk of drowning in areas that are experiencing relatively high levels of flooding. A government official at the national level noted that due to the childcare responsibilities that women bear, they are often not involved directly in the building of dikes – rather they are tasked with maintaining households while male household members contribute labor to the community cause. However, if needed, women may build smaller dikes around their homes to prevent flood waters from entering, which was also observed in the FGD data for this study. Focus group participants also noted the increased risk women face of contracting urinary tract infections when remaining in contaminated flood waters for an extended period of time. The findings drawn from key informant interviews indicate that the role of women in dike-building may vary from community to community, and thus requires gender sensitivity, flexibility and local responsiveness when working with community entities to support CBDRM initiatives.

In addition to the division of labor in flood response, it was also noted that due to the high number of female-headed households, the responsibility to bring family members to safety often fell on women in the community. For women that were caring for multiple children, elderly family members, and people with disabilities, being able to simultaneously carry or support them through flood waters to higher land was a considerable challenge. One key informant recounted instances in which children have drowned as a result of this. Consequently, having

established familial and communal networks are critical in lifesaving efforts during flood response.

Women and girls are said to be particularly impacted by floods and other hazards, as they often maintain the primary burden of feeding families, fulfilling domestic chores, caring for children and elderly family members, and accessing medical care for the household. Their livelihoods, often relegated to the informal economy, also relies on access to forestry products and other materials found in the natural environment. As flooding, and the resulting displacement, limited access to forestry materials found in the natural environment, the ability of women to generate income or meet the basic needs of their household, is subsequently impacted. This is further supported by FGD data in which the majority of bomas assessed reported that shelter materials available were insufficient during the 2020 floods.

Youth also take on significant responsibility in supporting their communities when floods occur – namely through providing the labor skills and capacity needs to build and maintain dikes. Depending on the length of floods, these responsibilities may be taken on for an extended period of time with minimal renumeration. The role of youth in decision-making processes within community-based disaster risk management mechanisms is less clear. Some communities, and the stakeholders that support them may choose to create committees that are inclusive of historically marginalized and under-represented groups such as youth. However, as DRM committees are not created in a standardized manner across the country, this is not guaranteed.

Vulnerable populations

Particular consideration needs to be given to children, among South Sudan's vulnerable populations, who often have minimal assets, resources, capabilities and decision-making powers when flooding occurs. The 2021 Humanitarian Needs Overview (HNO) indicated that 54% of the 8.3 million people with humanitarian needs were children. According to UNICEF's new Children's Climate Risk Index[44], the severity of risk to children in South Sudan is extremely high, ranking it one of the highest in the world, at number seven. The index "ranks countries based on children's exposure to climate and environmental shocks, such as cyclones and heatwaves, as well as their vulnerability to those shocks, based on their access to essential services." Flooding and drought, as well as vector-borne diseases, are key factors contributing to the risks to children in South Sudan under this measure. Key informants in this study indicated that children remain vulnerable also because their mobility is limited in the event of flooding, and they may not be tall enough or have sufficient swimming skills to navigate flood waters. Women seeking to bring multiple children and other household members to safety may not be able to carry all of them physically, and thus it has been reported that children have drowned as a result. Makeshift floats using plastic tarps are one strategy that community members used to transport small children, however the safety and viability of this strategy is limited.

In March 2020, schools in South Sudan were closed following a government directive, due to the COVID-19 pandemic. However, even prior to that, some schools had already closed due to ongoing insecurity. Pibor is a notable example, as towards the end of 2019 the communities in the area alternated between cycles of flooding and insecurity. The 2021 HNO report indicated that "some 400 schools in nine states were affected and damaged by the floods and violence in 2020 and half of them are now occupied by IDPs. This has delayed the re-opening of schools in many areas" (p.21). This is further supported by DTM data discussed previously, which indicated that schools and other key social services infrastructure were used as flood shelters by IDPs in 2020. Schools are often given the responsibility of providing safe spaces and structure, both of which are critical to child development. Furthermore, schools in South Sudan often serve as sites for the distribution of food, feeding programs, supplication of WASH and menstrual hygiene materials, and programming designed to encourage peacebuilding and development of soft skills. Long-term interruption to schooling also means that partners' implementing programs in these areas do not have adequate access to monitor and support children and adolescents in the community. For female learners in particular, schools provide access to role models, peers, and adult support systems that assist them in delaying marriage early/forced marriage and early/teenage pregnancy. In addition to damage to school facilities, or obstruction in access, schools in South Sudan also become IDP sites due to the lack of infrastructure in communities across the country.

44 *UNICEF. 2021. Children of South Sudan are at 'extremely high risk' of the impacts of the climate crisis – UNICEF. Retrieved from https://www.unicef.org/southsudan/press-releases/children-south-sudan-are-extremely-high-risk-impacts-climate-crisis-unicef*

Inhibiting barriers for CBDRM

Numerous barriers were cited as undermining the efforts of communities to manage the risks posed by disasters such as floods. Even in areas where communities were able to effectively mobilize CBDRM mechanisms, the severity of floods often meant that the types of adaptation measures taken by the communities– e.g. small dikes made with locally resourced materials – were not able to withstand flooding, and support from government and stakeholders was still required. This finding was reiterated in focus group discussions with communities, who shared that the dikes they had built in response to the 2020 floods were not strong enough to withstand the level of flood waters their communities experienced.

Furthermore, key informants and FGD participants cited the lack of machinery, technical skills, and other necessary resources as being a key barrier to engage in disaster risk management at the local level. Heightened poverty levels also make it difficult to consolidate financial resources to access these resources, necessitating further support from government and partner stakeholders.

Local knowledge

Indigenous knowledge was frequently cited as a community-based mechanism for preparing for floods in South Sudan. There is currently no standardized approach to collecting and documenting this information, and as a result the mechanisms and processes used varies by community. In Unity, a trusted individual is appointed as being the person to build the dike – this includes determining at which point in the rainy season construction should begin, as well as allocating places for each household to build their portion of the dike. If a household is unable to contribute to the construction, they are asked to pay a "fine" instead, which could be in the form of cash, assets (such as cattle), or even in the form of food items. This individual is also a key figure in observing the local environment, and reporting any unusual observations to local leaders. However, in other parts of South Sudan, local leaders take on the responsibility for mobilizing labor to build and maintain the dikes.

Fishermen, who are familiar with rivers and other water ways due to their livelihoods are deemed to be knowledgeable about normal water levels. They maintain responsibility for monitoring the level of water over the time, and are able to compare it to previous years given their familiarity with historical patterns. Similarly, elders in the community are said to be able to identify unusual weather patterns and water trajectories, based on historical knowledge, and play a role in reporting concerns to local leaders. Key informants also noted the importance of tracking the migration patterns of animals, birds and insects, which were often indicative of impending floods.

Additionally, knowledge about constructing dikes using locally available materials such as sand, bags, and wooden poles, has been passed down through generations, according to FGD data.

According to key informants that participated in this study, the Ministry of Humanitarian Affairs and Disaster Management has previously collected information on localized and indigenous knowledge during community consultations on disaster risk management capacities, and the Sudd Institute has a research focus in this area – this provides two entry points for additional data collection to be conducted on local knowledge.

It is important to note that there are usually no formal mechanisms for collating this knowledge and subsequently making decisions at the community level. Rather, localities rely on 'informal' leadership, knowledge sharing and decision-making processes to determine the level of threat and make decisions about migration patterns.

Impact on the natural environment

The impact on the natural environment, as a result of flooding, has been varied across the country, depending on flood levels, migration patterns, and duration of floods and stagnant water.

Historically, populations have settled near rivers to be able to easily access water and support water-dependent livelihoods and access water transport routes for riverine communities. This may result in trees around these areas being diminished, as forestry products are used to meet basic needs and engage in livelihoods. However, trees can also reduce flood risks and minimize the severity of floods. During the British administration, tree nurseries were established in different parts of the country to support local industry and exports to support the British Empire. Additionally, trees were also planted along riverbanks, in part to mitigate the risk and impact of floods. Depletion of forestry reserves along riverbanks is exacerbated when IDPs and other communities settle in

these areas, and require extraction of forestry products to build shelters, obtain fuel sources for cooking and heating water, as well as support livelihoods and small income generating activities – particularly for women and girls.

In addition to forestry considerations, further examination of the impact of floods on the natural environment is still needed, as this remains a gap in ongoing knowledge production in South Sudan. Humanitarian assessments, including Inter-agency Rapid Needs Assessments (IRNAs), do not include an environmental component. A key informant in this study suggested that prolonged exposure to stagnant water may deplete forestry resources. This is compounded by the lack of afforestation and reforestation programs in the country, and the reliance on forestry products to generate income by women and other groups who lack access to more skilled employment.

External and government support

The findings from data collection in field locations that were significantly impacted by flooding in 2020 indicated that many communities reported that they did not receive external support, from government or partners. Stakeholders and government institutions that participated in this study highlighted several challenges in being able to adequately respond to the needs of flood-impacted communities, as discussed further in this section.

The support provided by aid partners in response to the 2020 floods, and flooding more broadly, tends to focus on humanitarian and emergency response. In these instances, saving lives is the priority, rather than mitigating and preventing hazards. One representative from an international NGO observed that the beginning and end dates of funding cycles often overlaps with flood seasons, and as a result there may be less leverage and flexibility for NGOs to request additional flooding to support affected communities. Furthermore, it was also noted that many partners who had observed the impact of the 2019 floods were seeking to prepare comprehensively for the potential impact of flooding in 2020 – this included prepositioning of supplies and nurturing community resilience at the local level. This contrasted with DTM data provided above, which noted that only one boma had indicated that supplies had been pre-positioned in warehouses in their community. However, the advent of the COVID-19 pandemic meant that many implementing partners had to engage in re-programming, as donor priorities and local needs changed, accordingly. Furthermore, delays in releasing IPC results in 2019 due to tensions over the findings also led to delays in funding arrangements.

Multiple NGO partners interviewed as a part of this study indicated that their offices had flooded in 2020, making it even more challenging to provide support to flood affected communities. This was compounded by access challenges to communities and government offices, particularly in Bor Town. Because of this, "it was a serious interference of movement, and the only way to move people and goods was either by air or by the river."

Government institutions also currently experience significant challenges in being able to support community-level response to floods. The primary responsibility that the national government is deemed to hold is coordination amongst stakeholders and facilitating requests for support. In terms of the government's current role in flood response in South Sudan, key informants often cited gaps in capacity, technical expertise, and financial resources. While information through early warning system is distributed from IGAD to the local level, through government mechanisms, access to such information is reported to be available only in select communities.

Early warning systems have been developed in South Sudan, in various government ministries, with support from partners and regional institutions such as IGAD and WFP. However, at present, the coordination between these different systems is unclear, including how information can be distributed to communities, in addition to stakeholders in Juba that are supporting disaster risk management approaches and flood responses.

In Bor Town, which has been severely impacted by flooding for an entire year, the government at the state level was reported to have provided coordination and support to repairing the road leading into town. As a NGO key informant shared, "when the state government in Jonglei decided to reconstruct the roads, they did this new model of the road that goes into Bor Town, that is almost like a road and a dike at the same time, where the road is raised up so that it forms like a dike on both sides to block the water." This was critical in increasing access to essential services, including government offices and institutions, which had been cut off from many partners and community members, and for a long period of time were only accessible by boat.

Information gaps

Knowledge production relating to floods in South Sudan is disconnected and limited in access. While UN agencies, NGOs, the government, and even regional stakeholders such as IGAD, have structural mechanisms that allow for knowledge sharing, these are often out of reach for state, county and local stakeholders, including communities themselves. The disconnect between information sharing at the national and local levels has made it challenging for communities to take timely and effective action when floods pose a threat.

When asked if they themselves knew where to go to access early warning information relating to flood impacted communities, several key informants stated that they were unsure. Furthermore, these tend to be top-down approaches that supply regional information, from IGAD, through radio programming, to communities at the local level. However, it was noted that not all communities have radio infrastructure, and widespread access to radios is lacking, resulting in the information reaching select communities or individuals. Additionally, while information that predicts the risk of floods may be shared, there is no accompanying mechanism, action or support that accompanies flood warnings, to support communities grappling with these threats.

There is also currently no mechanisms for local knowledge to feed into higher levels of governance and decision-making, which renders nationalized top-down approaches less effective, due to the disconnect with real-time, locally responsive, and nuanced information that is available at the community level. The current multi-sectoral EWS system being coordinated by the Ministry of Humanitarian Affairs ad DM, and supported by WFP, will allow for data obtained at the community level to be shared with the office in Juba. The system is still being set up, and is anticipated to be operational in 2022. Furthermore, World Vision has currently provided meteorological tools to committees that they are working with, to assess water levels on an ongoing basis.

Compounding Factors: Conflict Sensitivity, Climate Change and Displacement

Compounding Factors: Conflict Sensitivity, Climate Change and Displacement

Inter-communal violence and insecurity were cited as the main inhibiting factors for capacity building for CBDRM. Key examples provided include Bor, where communities historically impacted by flooding have sought higher ground to remain safe. However, given ongoing tensions with communities residing at the higher ground, migration and displacement patterns have changed. Rather, IDPs from Bor have travelled to Mangalla, in Juba County, to seek safety and shelter. This has led to the creation of new tensions amongst the IDPs and host community, including among pastoralists and farmers, over access to natural resources (land and water), as well as shared infrastructure, resources and services. An NGO representative described the new challenges that arose as follows: "There are a good number of people who are displaced from Bor, who settled in Mangalla… most of those people have never been able to return home, they still come at the IDP site…And initially, when that site was chosen by the government, I remember we had gone there for an assessment, and the local leaders have been very clear that they thought of this as a very, very temporary kind of arrangement. And that once the water was able to recede, people would go back home." However, IDPs remain in Mangalla, with no certain timeline for returning to their original areas of habitation.

Similarly, in Leer, Unity State, it was recounted that while people had initially tried to mobilize to build a dike and protect their community, a lack of social cohesion and sustained distrust resulting from the civil war prevented them from effectively working together. This contrasted with Panyijar, another community in Unity, which had strong cohesiveness amongst community members, and were able to successfully mobilize to build a dike – however, the severity of floods meant that their community-built dike would not be sustainable. At the time of the interview, the key informant reported that the dike had already been built as high as an average person residing there. Furthermore, as additional key informant noted, a flood impacted community is perceived to be vulnerable for revenge attacks, leading to an increased risk of inter-communal violence, particularly cattle raiding.

In addition to inter-communal violence, the increasing longevity of hazards has also impacted displacement patterns resulting from floods. While in previous years, flood water receded relatively quickly, key informants noted that they are increasingly seeing stagnant water that can remain in a community for up to a year or more, making it uninhabitable, and keeping IDPs displaced for longer periods of time. The increased longevity of floods was also supported by data obtained from focus group participants. One key informant also relayed they had observed community members migrating to more urban areas in anticipation of the rainy season to ensure they could access services, relaying, "It's the quickest way for them to adapt; when they come to the center, they get more aid." However, the extent to which this is being

used as a coping mechanism by communities is unclear.

Participants repeatedly noted that the multiple humanitarian crises and hazards faced by South Sudanese communities had made it increasingly difficult for communities to develop resilience strategies, let alone engage in the type of long-term planning required to prepare for floods. Pibor's context in early 2020 was particularly notable, as communities in the county experienced multiple and successive crises, varying between inter-communal violence and flooding, over a period of several months.

Reccomendations

While the context in South Sudan provides multiple challenges to CBDRM initiatives being implemented by government institutions and partners, the findings of this study and lessons learned from previous attempts to implement CBDRM mechanisms have highlighted steps that can be taken by these stakeholders to chart a path forward. The following recommendations build upon the data collected from field locations impacted by flooding in 2020, as well as from key informant interviews conducted with relevant stakeholders. The recommendations suggest methods to build upon and strengthen existing mechanisms and initiatives, while also indicating where key gaps have been identified that need to be addressed in order to strengthen disaster risk management at the community level. This will be imperative given the increasing frequency and severity of flooding in South Sudan, and also in consideration of the reduced resilience observed in communities facing multiple shocks such as flooding, conflict and displacement.

Further develop early warning systems and knowledge sharing mechanisms

Numerous key informant interviews highlighted the presence of indigenous knowledge and mechanisms for predicting floods at the community level. The type of knowledge obtained, and the people responsible for acquiring it, vary by community. However, despite the historical reliance of this knowledge and practice, there is currently no established institutional mechanism for feeding information from indigenous knowledge, upwards, to government and stakeholder partners. Furthermore, despite knowledge that they live in flood prone areas, communities and key informants that participated in this study noted that data regarding the scope, nature and timing of floods still proves to be elusive for them, which inhibits their ability to plan and respond adequately. Providing communities with a coordinated and systematic method of sharing their knowledge is critical in ensuring that higher-level decision-making processes are informed by local dynamics, which may change quickly and frequently. Integrating these mechanisms such as the national early warning systems would allow for both a top-down and bottom-up approach in exchanging information. Furthermore, knowledge sharing mechanisms would allow for government stakeholders and partners to adopt an evidenced-based approach to determining where and when to implement interventions and allocate resources, ensure local needs are considered and efficiently met, and also incorporate conflict and gender sensitive approaches to their work.

A number of different early warning systems for communities were identified during key informant interviews with key stakeholders, however there is currently no process for coordinating between these different structures. Providing a centralized approach to EWS and information, that also addresses gaps in information flow, will be critical in ensuring that the EWS resources being developed in different ministries is well utilized to inform decision-making at all levels of governance.

The development of early warning systems also allows for all stakeholders to anticipate floods and plan in advance. Findings indicate a very low level of preparation for future flood shocks. Communities are often unable to recover in an intertwined web of emergencies related to disaster, conflict, disease and economic hardship. The humanitarian community must continue to find patterns in flood disasters and map prioritized flood-prone areas to act preemptively. Flood related data based on remote satellite imagery should be verified with local data collection to create an accurate evidence-base for such prioritizations. At the most basic level, the humanitarian community should coordinate the placement and upkeep of pre-positioned emergency supplies based on the needs expressed by affected populations. Based on FGDs in Bor, Leer and Pibor, these include plastic sheets, empty sand bags, dike building tools like hoes, plastic carpets, food, medicine, fishing nets, dignity kits, mosquito nets, soap, kitchen utensils, and underwear.

Enhance coordination between different levels of government

At present, stakeholders working to support flood-affected communities indicated that they often work directly with entities at the local level, rather than working through coordinated systems that originate at the national level of government. This is often due to the lack of resources and established coordination mechanisms within the government, despite institutional frameworks and coordination mechanisms that have been outlined in the national DRM policy draft. The recent appointment of new government officials and members of parliament since 2020 provides a unique opportunity to strengthen coordination between different levels of government, and to build on existing efforts in disaster risk management, currently led by the Ministry for Humanitarian Affairs and Disaster Management (MHADM).

Enhance coordination amongst stakeholders at national level

Stakeholders, primarily NGOs and UN agencies, are currently taking ad hoc approaches to CBDRM, that are not perceived to be coordinated or complementing each other. As the initiator of the country's disaster risk management policy, the Ministry of Humanitarian Affairs and Disaster Management is well placed to coordinate initiatives between government entities, NGOs and UN agencies, to ensure that efforts are in line with the country's national policy, and lessons learned are shared collectively.

Rehabilitate public and community infrastructure – roads, structures, dikes and drainage systems – to complement community-level initiatives

Several key informants noted that while capacity gaps exist at the community level, they did not have the required resources, skills, materials, and technology to strengthen local infrastructure that are critical for protecting communities during floods. While communities are requesting additional materials, such as sandbags and plastic sheets, as indicated in the FGD data, they are also requesting technical assistance and access to machinery to build more durable dikes. The increasing severity of floods has reduced the potential impact of CBDRM initiatives such as building dikes with locally available materials. In addition to dikes, there is a need to excavate flood water through drainage systems that are connected to rivers, so that flood waters can recede more quickly. Thus, more comprehensive investments in durable and permanent infrastructure are needed, in the form of roads, durable structures, drainage systems, as well as dikes. Key ministries that can partner with stakeholders to engage in these initiatives include the Ministry of Water Resources and Irrigation, Ministry of Roads and Bridges, as well as the Ministry of Land, Infrastructure and Housing.

Learning mechanisms for CBDRM initiatives

Lessons learned from the various CBDRM initiatives that have been implemented over the years should be shared through coordinating mechanisms amongst government stakeholders and partners. Disaster risk management committees, and other community level governance committees, have become a key part of stakeholder's disaster risk informed development programming in South Sudan. The intention is to support community empowerment, agency, and resilience in the face of hazards. However, the success and sustainability of disaster risk management committees in communities established over the years is largely unknown, as stakeholder engagement ceases when funding or the duration of the project cycle ends. As community level committees continue to be integrated into programming in South Sudan, it is imperative that lessons learned from previous experiences are shared comprehensively and consistently with stakeholders through open access knowledge platforms, that allow for activity design to be responsive and dynamic. This will be critical in ensuring the sustainability of existing local governance structures such as boma and payam development committees that have already been established at the local level.

Storage facilities as a part of infrastructure development

Supporting communities in creating storage facilities to protect their assets when flooding occurs is a key component of CBDRM. The findings obtained from key informants indicated that the lack of storage facilities at the local level prevented communities from retaining and maintaining assets when floods occurred, which in turn made them more reliant on distributions of food and non-food items immediately following floods. As the priority was often saving lives, particularly of vulnerable community members that may not be fully mobile during natural disasters, such as the elderly, people with disabilities, or children, communities may prioritize utilizing the minimal time they have to prepare for floods to accompany family and community members to higher ground rather than preserving their assets. The lack of secure and durable storage facilities subsequently means that assets left behind will likely be destroyed, which makes it increasingly difficult for households to cope or rebuild in the aftermath of floods. Creating durable storage options, both at the household and community level, will support in maintaining assets, and thereby also support existing resilience mechanisms such as maintenance of livelihoods, accumulation of long-term food stores, etc. Such types of support will also lessen dependency on humanitarian aid, and allow communities to leverage existing infrastructure to protect assets during disasters.

Supporting disaster and climate risk informed approaches to enhancing community-resilience

The political transitional context of South Sudan, combined with multiple humanitarian crises, have made it difficult for stakeholders to address all government and community needs and initiatives, and created challenges for national policies, frameworks and coordinating mechanisms that seek to implement community-based disaster risk reduction and management mechanisms. Relying on emergency and humanitarian responses to flood impacted communities, year after year, is not a sustainable approach in light of changing and competing global funding priorities, the immense scope of needs, and donor fatigue. As a result, taking a long-term disaster and climate-risk informed development approach, combined with emergency response, will be critical in supporting community and national level resilience in the face of hazards such as floods. Long-term sustainability of interventions, such as CBDRM committees also needs to be considered, especially since such initiatives in recent years have not lasted after stakeholder projects and funding have ended. World Vision has sought to respond to this limitation by integrating livelihood activities and support, with a long-term view to enhancing resilience and decreasing dependency on humanitarian aid. Other stakeholders can consider similar multi-sectoral approaches that address priority needs.

Develop conflict-sensitive approach in CBDRM

The South Sudanese context warrants consideration of a holistic perspective, which includes analysis of conflict dynamics and other factors that may make populations more vulnerable to the impacts of flooding and other natural disasters. Primarily, this would include inter-communal violence, which has spiked in frequency since the signing of the revitalized peace agreement in 2018. A conflict sensitive approach would consider the need for significant interventions and involvement on the part of the government, particularly when addressing the grievances and involvement of youth in this type of violence. Conflict sensitivity in CBDRM would also recognize and plan for the access barriers created by inter-communal violence for aid actors and the government to respond to flood-affected communities, reduce vulnerabilities to revenge attacks during the rainy season, and also the challenges that IDPs face in accessing areas with higher ground that are currently considered to be too insecure for settlement. Furthermore, the competition over scarce shared resources, infrastructure and services, which require sustained peacebuilding and development initiatives, also frame the context in which CBDRM initiatives are being implemented.

Conclusions

This report aimed to validate the FDNA conducted by the World Bank and the Government of South Sudan following the 2020 floods observed in the country, through field-based data collection in select locations. It also sought to explore existing community-based disaster risk management mechanisms, and identify opportunities for further support.

On a research basis the field validation exercise confirmed the overall conclusions drawn by the FDNA in terms of impact of the floods on South Sudan public infrastructure, housing, displacement and livelihoods, However, the report has also highlighted that relying on satellite imagery alone can present inaccuracies in the mapping of flood extents as found in Bor, where less than half of flooded facilities, livelihood areas and settlements were located within the satellite-mapped flood area. However, remote assessments are a valid and useful way to approach large-scale flooding in South Sudan where not only the large number of affected locations but also the remoteness and impassible roads during the rainy seasons render field assessments challenging.

Conversations with affected communities further clarify actionable immediate needs and shine light on unexpected factors such as the long-lasting effects flooding has had on populations beyond the duration of the rainy season and even beyond the following year. Findings further confirmed that flooding does not affect people in isolation of compounding factors such as armed conflict and disease outbreaks. To the contrary, these frequent but nevertheless increasingly severe and unpredictable weather patterns can cause further conflict by destabilizing established geographic and resource distribution systems that had previously kept the peace within and between cattle herding and farming groups.

The findings of this report also highlighted the need for strengthening and better coordinating community-based disaster risk management mechanisms. Key informants emphasized that communities across the country lack the coping mechanisms, resources, skills and resilience capacities to face the increasing intensity, frequency and longevity of floods. Government institutions do not have the capacity to support CBDRM mechanisms at the local level, and partners face resource-based challenges in being able to adequately respond to the immense needs observed across the country. Information gaps continue to exist, which hinders coordinating mechanisms from the national to the local level. Furthermore, women and youth, as well as vulnerable populations, are particularly impacted by floods. In conjunction with a context characterized by inter-communal violence, a conflict and gender sensitive approach to CBDRM is imperative. The recommendations, which build on the findings of this study, purport that early warning systems and coordinating mechanisms should be strengthened, both on the part of government institutions and partner organizations. Integrating lessons learned from CBDRM initiatives attempted by partners will also ensure the sustainability of mechanisms such as CBDRM committees. Supporting communities to strengthen and develop key infrastructure, which they currently lack the resources, skills and materials to do independently, will also lessen the impact of the increasing intensity of floods.

References

ADPC. (2006). Critical Guideline of CBDRM. Retrieved from http://www.adpc.net/V2007/Programs/CBDRM/Publications/Downloads/Publications/guidefull.pdf

Amnesty International. (2018). War Crimes In Leer And Mayendit, South Sudan. Retrieved from https://www.amnesty.org/en/documents/afr65/8801/2018/en/

Coalition for Humanity South Sudan (CH). (2018). Conflict Dynamics in Leer County, South Sudan: Issues, Barriers and Opportunities Towards Conflict Transformation. Retrieved from https://fscluster.org/sites/default/files/documents/conflict_dynamics_in_leer-final_version_.pdf

FEWSNET. (2019). South Sudan Food Security Outlook Update: Further scale up of food assistance required to prevent Crisis (IPC Phase 3) or worse outcomes. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/FEWS%20NET%20South%20Sudan%20Food%20Security%20Outlook_Update_12_2019__final.pdf

Government of South Sudan. (2018). Initial National Communication to The United Nations Framework Convention on Climate Change.

Hallegate, S., Vogt-Schilb, A., Rozenberg, J., Bangalore, M. and Beaudet, C. (2020). From Poverty to Disaster and Back: a Review of the Literature. Economics of Disasters and Climate Chang 4 p, 223-247.

Hallegatte, S., Vogt-Schilb, A., Bangalore, M., and Rozenberg, J. (2017). Unbreakable : Building the Resilience of the Poor in the Face of Natural Disasters. Climate Change and Development. Washington, DC: World Bank.

IDMC. (2021). South Sudan. Retrieved from https://www.internal-displacement.org/countries/south-sudan

IOM DTM. (2020). Pibor UNMISS AA Site Flow Monitoring Summary (7—18 August 2020). Retrieved from https://displacement.iom.int/reports/south-sudan-%E2%80%94-pibor-unmiss-aa-site-flow-monitoring-summary-7%E2%80%9418-august-2020?close=true

IOM DTM. (2020). South Sudan – Mobility Tracking Site Assessment Round 10 Public Dataset, Nov-Dec 2020. Retrieved from https://displacement.iom.int/datasets/south-sudan-%E2%80%94-site-assessment-round-10

IOM DTM. (2020). South Sudan - Village / Neighborhood Assessment – Round, 10 November – December 2020. Retrieved from https://displacement.iom.int/datasets/south-sudan-village-neighborhood-assessment-round-10

IOM DTM. (2019). Displacement Site Flow Monitoring, example: April 2019, p2. Retrieved from https://displacement.iom.int/reports/south-sudan-%E2%80%94-displacement-site-flow-monitoring-april-2019

IPC. (2020). Integrated Food Security Phase Classification data South Sudan: IPC Results October 2020 - July 2021. Retrieved from https://www.ipcinfo.org/ipcinfo-website/alerts-archive/issue-31/en/

IPC. (2020). IPC Consolidated Findings from the IPC Technical Working Group and External Reviews. Oct-Nov 2020. Retrieved from https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/South_Sudan_Combined_IPC_Results_2020Oct_2021July.pdf

Johnson, D.H. (1992). Reconstructing a History of Local Floods in the Upper Nile Region of the Sudan. The International Journal of African Historical Studies 25(3) p. 607-649.

MHADM. (2021). National Disaster Risk Management Policy, South Sudan (Draft).

OCHA. (2021). South Sudan Humanitarian Snapshot (September 2021). Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/south_sudan_humanitarian_snapshot_september_2021.pdf

OCHA. (2020). South Sudan: Flooding Situation Report. Inter-Cluster Coordination Group. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/TC%20YASA%20-%20Sitrep%20%234%20-%2024%20Dec%202020_0.pdf

OCHA. (2019). South Sudan Humanitarian Snapshot, August 2019. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/ss_20190927_humanitarian_snapshot_august.pdf

Rentschler, J. and Salhab, M. (2020). People in Harm's Way : Flood Exposure and Poverty in 189 Countries. Policy Research Working Paper; No. 9447. Retrieved from https://openknowledge.worldbank.org/handle/10986/34655

Southern Sudan Legislative Assembly. (2009). Local Government Act of 2009.

UNICEF. (2021). Children of South Sudan are at 'extremely high risk' of the impacts of the climate crisis – UNICEF. Retrieved from https://www.unicef.org/southsudan/press-releases/children-south-sudan-are-extremely-high-risk-impacts-climate-crisis-unicef

UNMISS. (2021). UNMISS expresses deep concern at ongoing violence in Pibor. Retrieved from https://reliefweb.int/report/south-sudan/unmiss-expresses-deep-concern-ongoing-violence-pibor

World Bank. (u.d.). Gender and Disaster Risk Management – Guidance Notes: Integrating Gender Issues in Community-based Disaster Risk Management. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/F_R_448.pdf

World Bank/GFDRR. (2021). Remote Flood Damage and Needs Assessment. South Sudan Floods 2020.

World Bank. (2020). Disasters, Conflict, and Displacement Intersectional Risks in South Sudan. Retrieved from https://www.gfdrr.org/en/publication/disasters-conflict-and-displacement-intersectional-risks-south-sudan

World Bank. (2020). Poverty and Shared Prospertiy 2020: Reversals of Fortune. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/34496/9781464816024.pdf

Appendix A: Semi-Structured Key Informant Interview

Script (Informed Consent)

IOM is currently conducting a validation exercise of the Remote Flood Damage and Needs Assessment, which was carried out by the World Bank and the Government of South Sudan, on the floods that occurred in South Sudan in 2020. As a part of this validation, we are conducting key informant interviews, with stakeholders such as yourself, to provide in-depth data and analysis on community-based disaster risk management in South Sudan, particularly in relation to floods.

To facilitate accurate documentation of this interview, I would like to request to record our discussion today. Is that okay with you? (If participant declines, take notes instead).

Would you be okay with the final report referencing your name/organization, or would you prefer to be kept anonymous?

Semi-Structured Questionnaire

a) Can you please describe your role so that I understand the perspective you bring to the interview?

b) In the context of the work that your organization/institution does, what is CBDRM, how is it beingimplemented in South Sudan, and can you please provide some examples?

c) What are the CBDRM mechanisms that exist at the local (payam and boma), state and national levels? Can you give some examples of CBDRM initiatives that have been implemented?

d) What are challenges and gaps that have been observed in CBDRM (payam/boma level) in South Sudan?

e) How have communities in South Sudan been impacted by the floods that occurred in 2020? Follow-up questions:

   a. Infrastructure
   b. Settlement and housing
   c. Displacement
   d. Agriculture and livelihoods
   e. Health
   f. Education
   g. Environment and forestry

f) How have the floods impacted vulnerable groups in flood-affected counties? Follow-up questions:

   a. Women
   b. Female-headed households
   c. IDPs
   d. Returnees
   e. People with disabilities
   f. The elderly
   g. Children

g) Are there other risk factors that compound the risks and impacts of floods? How have these risk factors impacted communities', the government's and organizations' abilities to engage in CBDRM? Follow-up questions:

   a. Inter-communal violence
   b. Food insecurity
   c. Outbreak of diseases (COVID-19)
   d. Lack of development and humanitarian crises

e. Displacement

f. Competition over scarce resources, facilities and services

h) What was the response to the 2020 floods amongst aid partners? (i.e. Donors, UN agencies, NGOs)

i) What was the response to the 2020 floods amongst government entities?

j) What capacities existed at the community level to prepare for, or respond to, the risk of floods in 2020? What can be done in the future to help develop this capacity? Are there any early warning initiatives at the community level to prepare for floods?

k) Do you think your agency has the necessary human resources, and do those staff members have the essential competencies and knowledge, to support community-level initiatives that aim to reduce flood/ disaster risks in South Sudan?

l) What are the main challenges to enhancing the capacities of institutions (government, aid organizations, civil society, researchers, policy makers) to address community (payam and boma level) resilience issues to managing flood disasters risks in South Sudan?

m) What are the challenges to mitigating floods in South Sudan? Please provide some recommendations as to how these challenges can be overcome in the future.

n) Please provide some examples of challenges and /or constraints in the areas of coordination of policies, programmes, and frameworks for community-based disaster risk management and resource mobilization for flood management?

o) Do you know of any key success factors and good practices (if available) in developing and implementing CBDRM mechanisms? Please give some examples.

p) Are there any initiatives to develop and institutionalize a system to enhance national and local risk assessments and risk information based on common, open, accessible and regularly updated data on natural, technological and biological hazards, exposure? Who is coordinating and supporting this initiative? Does your organization participate in this, and if so, what is its role?

q) Does your organization/office have any reports, documents, photographs, or datasets on the 2020 floods that would be useful for this project?

Government Stakeholders

a) Is your ministry a part of the National Disaster Risk Management policy, strategy and programme development process? If so, has your ministry included disaster risk reduction in your own ministry's policies and plans?

b) Is your ministry involved in integrating DRR in local level planning, community-based flood management, and/or community-based disaster management? If so, please describe how.

c) What are the priority areas of your ministry and within your sector - considering flood mitigation and overall disaster risk management policy, planning and resource support. Please rank each priority area from 1-5, with 1 being highest priority and 5 the lowest priority.

NGO Stakeholders

1. Does your organization receive resources (financial and human resource), including through the UN expertise available (global and regional), government funding mechanisms, etc., to assist national, sub national and local institutions on DRR?

Research and Academia

a) Do you know of any research being done on CBDRM, or building of resilience at the community level in response to floods?

b) What are current gaps in research?

c) Do you know of any trainings, capacity building and educational initiatives to develop CBDRM skills? If no, what types of initiatives could be introduced?

Appendix B: CBDRM Key Informant Participants

Organization/Office
World Bank
Dutch Embassy
SDC
GIZ
FAO
OCHA
IOM
UNEP
World Vision
Oxfam
UNIDOR
Sudd Institute
Danish Red Cross
Relief and Rehabilitation Commission
Ministry of Forestry and Environment
Ministry of Gender, Child and Social Welfare
Ministry of Land, Housing and Urban Development

Appendix C: DTM Flood Impact FIS Assessment

DTM
IOM DISPLACEMENT TRACKING MATRIX

Appendix C: DTM Flood Impact FIS Assessment

Date: _____

Former* BOMA:

Former* Payam:

* Boma and Payam are defined as survey units based on the former 2011 administrative division and the last Census conducted in South Sudan. They are presented on FIS-VAS maps and lists. There might be differences relative to current existing administrative divisions in South Sudan (new Payam and new Boma). For consistency of data collection and survey coverage, please use **the former administrative units** (Payam and Boma) as reference in the forms, unless the question specifies otherwise ("New Boma").

2021

IOM Facilities, Infrastructure and Service FIFIS-Mapping

	Name	Signature	Date
Data collected by			
Checked by sub-team leader			
Checked by team leader			
Data entered by			
Data entry verification			

A- GENERAL SECTION

5. County:

_____
___

6. Payam:

_____

7. Boma:

_____

8. Alternative boma name:

_____

9. Village / neighborhood name:

_____

10. Is this a facility, a livelihood area or a settlement area? a) Facility ☐ b) Livelihood area ☐ c) Settlement area ☐

[If Facility skip to section B, if Livelihood Area skip to section C, if Settlement Area skip to section D]

B- FACILITIES and INFRASTRUCTURE

10. Facility name: _ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ _

11. What type of facility?

a) Education ☐ b) Healthcare ☐ c) Water points / facilities ☐ d) Religious building ☐
e) Market ☐ f) Transport ☐ g) Administrative / community ☐ h) Connective infrastructure (roads and bridges) ☐
i) Water infrastructure (dikes, culverts and drainage) ☐

[If Education go to question 2.a, if Healthcare 2.b, if Water point / facility 2.c, if Religious building 2.d, if Market 2.e, if Transport 2.f, if Administrative 2.g, if connective infrastructure 2h, if water infrastructure 2i] (Select only 1 option)

11.1 **[Education]** Facility subtype **[select one or several]**:

a) Nursery ☐ b) Primary school ☐ c) Secondary school ☐
d) Vocational school ☐ e) University ☐

11.1.i. Did the facility become a refuge for IDPs fleeing flooding in 2020? a) Yes ☐ b) No ☐

11.1.ii. Was the facility occupied by armed forces during the 2020 floods? a) Yes ☐ b) No ☐

11.2 **[Healthcare]** Facility subtype:

a) PHCU ☐ b) PHCC ☐ c) Hospital ☐

11.2.i. Did the facility become a refuge for IDPs fleeing flooding in 2020? a) Yes ☐ b) No ☐

11.2.ii. Was the facility occupied by armed forces during the 2020 floods? a) Yes ☐ b) No ☐

11.3 **[Water point / facility]** Facility subtype:

a) Stream ☐ b) Borehole ☐ c) Well ☐ d) Water tap ☐ e) Hafir (Water Basin) ☐ f) Spring ☐

11.4 **[Religious building]** Facility subtype:

a) Church ☐ b) Mosque ☐

11.4.i. Did the facility become a refuge for IDPs fleeing flooding in 2020? a) Yes ☐ b) No ☐

11.4.ii. Was the facility occupied by armed forces during the 2020 floods? a) Yes ☐ b) No ☐

11.5 **[Market]** Facility subtype:

a) Daily ☐ b) Periodic (weekly or less often)

11.6 **[Transport]** Facility subtype:

a) Bus station ☐ b) River port ☐ c) ☐ Train station d) Airstrip ☐

11.7 **[Administrative]** Facility subtype:

a) Police station ☐ b) Local administration ☐ c) County or State administration d) Court of justice ☐

e) Women's centre ☐ f) Youth Centre ☐ g) other offices ☐

11.7.i. Did the facility become a refuge for IDPs fleeing flooding in 2020? a) Yes ☐ b) No ☐

11.7.ii. Was the facility occupied by armed forces during the 2020 floods? a) Yes ☐ b) No ☐

11.8 **[Connective infrastructure]** Facility subtype:

a) Road ☐ b) Bridge ☐ **[2.h = a) Road]** Road Type: _____ **[Dropdown of: Primary (largest, between states), Secondary (second largest, between Counties), Tertiary (third largest, between payams), Residential (within boma between settlements), Track (panya road not passable with larger vehicles – small)]**

11.9 **[Water infrastructure]** Facility subtype:

11.9.i. Dyke

11.9.ii. Culvert

11.9.iii. Drainage

12. Building / facility type: a) Permanent ☐ b) Temporary setup ☐
13. Location GPS collect: a) Yes ☐ b) No ☐ **[add kobo field]**Location marked on map: a) Yes ☐ b) No ☐ **[add kobo field]**
14. Map notes:

_____

15. GPS manual (in decimal degrees): Long _____ Lat _____ Alt:_____
16. Is the facility functional? a) Yes ☐ b) No ☐ **[If Yes skip to question 10]**
17. **[If 7 = No, facility not functional]** Please indicate when the facility became dysfunctional: Year:_____ Month:_____
18. **[If 7 = No, facility not functional]** Please tick why the facility isn't functional **[select one or several]**:

a) Conflict ☐
b) 2020 Floods ☐
c) Floods in 2019 and before ☐
d) 2021 Floods ☐
e) Drought ☐
f) Economic reasons ☐
g) Other, specify:_____ ☐

[If 7 = No, facility not functional conclude survey]

19. Who is managing the facility?
a) Government ☐ b) UN/NGO ☐ c) Private individual / company ☐
d) Religious entity ☐ e) Community / self-organized ☐ d) Non state authorities f) Other:_____
20. Did the facility suffer damage during the 2019 floods? a) Yes ☐ b) No ☐
21. Was the facility flooded in 2020? a) Yes ☐ b) No ☐
22. **[If 12 = Yes]** How deep was the water at the lowest point of the facility?
a) less than 25cm ☐ b) 25cm-100cm ☐ c) over 100cm ☐
23. **[If 2.8 = a) Road and 12 = a) Yes, flooded]** Please tick the best description of the flooded road:
    a. Road was passable at reduced speed by motorbike / car / bus / truck ☐
    b. Road was passable only on foot ☐
    c. Road was unpassable ☐
    d. Road was under a lot of water and travelled by boat ☐
24. **[If 2.8 = a) Road and 12 = a) Yes, flooded]** Please indicate between which villages the road was flooded:

a) From (nearest village): _____

b) To (nearest village): _____

c) [Kobo GeoShape of flood extent] Please indicate the section of the road that was flooded on the map

25. **[If 12 = a) Yes, flooded]** How often was the facility flooded in 2020?
    - 25.1 Once
    - 25.2 Twice
    - 25.3 3 times
    - 25.4 More than three times
26. **[If 12 = a) Yes, flooded]** Please indicate how long the flooding lasted (combined if several occasions):
    - a) Up to 1 week
    - b) Over 1 week – 1 month
    - c) Over 1 month – 3 months
    - d) Longer than 3 months
27. Has the facility suffered damage during the 2020 floods? a) Yes ☐ b) No ☐
    - 27.1 **[If 18 = yes]** please indicate the level of damage immediately after the flooding
      - a) No damage (0%)
      - b) Little damage (1%-33%)
      - c) Medium level damage (34%-66%)
      - d) Severe damage (approx. 67%-99%)
    - 27.2 **[If 18 = yes]** please describe the type of damage **[select all that apply]**
      - a) Moisture damage (moist building materials) ☐
      - b) Structural damage (impact of water level or flow velocity [speed]) ☐
      - c) Contamination damage (oil, chemical, latrine waste or biological toxins) ☐
    - 27.3 **[If 18 = yes]** Please indicate how long the damage lasted

      a) up to 1 month ☐ b) over 1 month - 3 months ☐

      c) Over 3 months – 6 months ☐ d) Over six months ☐
    - 27.4 **[If 18 = yes]** please indicate the current status of the facility

      d) Repaired completely ☐ b) Partially repaired ☐ c) No repair work (but still partially functional)
    - 27.5 **[If 18.4. = a) or b)]** Please enter the amount of money that was necessary for the existing repairs of the facility.

      a) SSP ☐:_____ b) USD: ☐_____

      c) Sudanese Pound ☐ : _____ d) Ugandan Shilling ☐ : _____ e) do not know ☐
    - 27.6 **[If 18.c. = a) or b)]** Who conducted the repairs mainly?

      a) Government ☐ b) UN/NGO ☐ c) Private individual / company ☐

      d) Religious entity ☐ e) Community ☐
    - 27.7 **[If 18.4 = a) or b)]** Did the repairs include any measures to make the facility less likely to be damaged by floods again? a) Yes ☐ b) No ☐
    - 27.8 **[If 18.7 = a) Yes]** Please describe what kind of improvements:
      - a) Stronger materials
      - b) Moved somewhere else
      - c) Dykes around facility
      - d) Added drainage
      - e) Other: _____
    - 27.9 **[If 18.7 = a) Yes]** Please add a note on the repairs: _____

C- LIVELIHOOD AREAS

Only larger-scale farming and cattle grazing grounds should be included; ignore ones used by individual families

1. Livelihood area / location name: _ __
2. Is the livelihood area currently in use? a) In-use ☐ b) Abandoned ☐
3. **[If 2 = b) abandoned]** Please indicate
   - 3.1 **Primary** reason for abandonment
     - a) Conflict ☐
     - b) 2020 Floods ☐
     - c) Floods in 2019 and before ☐
     - d) 2021 Floods ☐
     - e) Drought ☐
     - f) Economic reasons ☐
     - g) Other
   - 3.2 Other, specify:_____**Secondary** reason for abandonment
     - a) Conflict ☐
     - b) 2020 Floods ☐
     - c) Floods in 2019 and before ☐
     - d) 2021 Floods ☐
     - e) Drought ☐
     - f) Economic reasons ☐
     - g) Other
   - 3.3 Time of abandonment
     - I. Unknown ☐
     - II. Known ☐ a) year:_____ b) Month:_____
4. Livelihood area/options type:

a) Farm (agriculture) ☐ b) Cattle grazing ground ☐ c) Fishery ☐ d) Industrial compound ☐

[If Farming / agriculture go to 4.1, if industrial compound go to 4.27, else go to 5]

- 4.1 **[If 4 = a) or b)]** Has flooding in 2020 led to disputes over the use of land, as for farming or for grazing?

  _____a) Yes ☐ b) No ☐
- 4.2 **[If 4 = a)]** Agricultural area subtype: **[select all that apply]**

a. Sorghum ☐	i. Sesame ☐
b. Maize ☐	j. Ground nuts ☐
c. Rice ☐	k. Beans ☐
d. Cassava ☐	l. Cowpea beans ☐
e. Finger millet ☐	m. Pulses (lentils, chickpeas, etc.) ☐
f. Pearl millet ☐	n. Cotton ☐
g. Barley ☐	o. Fruit trees (mango, banana, etc.) ☐
h. Wheat ☐	p. Coffee ☐
	q. Other ☐ Specify _____

- 4.3 **[If 4 = a)]** Where does the farmer get their seeds for these crops? **[select all that apply]**

a) Previous Harvest ☐	b) Market ☐	c) Ministry of Agriculture ☐
d) Borrowed ☐	e) UN/FAO/NGO distribution ☐	f) Other, specify: _____ ☐

- 4.4 Was this **[insert answer from Q4]** flooded in 2020? a) Yes ☐ b) No ☐
- 4.5 **[If 4.4 = Yes]** Please indicate the flooded area on the **[insert answer from Q4]** on a map **[polygon on kobo]**
- 4.6 **[If 4.4 = Yes]** Please indicate how long the flooding lasted
  - a) Up to 1 week
  - b) Over 1 week – 1 month

c) Over 1 month – 3 months
d) Longer than 3 months

4.7 **[If 4.4 = Yes]** How deep was the water at the lowest point of the **[insert answer from Q4]**?

a) less than 25cm ☐ b) 25cm-100cm ☐ c) over 100cm ☐

4.8 **[If 4 = a) agriculture and 4.4 = Yes, flooded]** How severe was the impact of the floods?

a) The farmer lost up to a quarter of the expected yields ☐
b) The farmer lost about half of the expected yields ☐
c) The farmer lost about three quarters of the expected yields ☐
d) The farmer was unable to harvest anything due to the floods ☐

4.9 **[If 4 =b) cattle grazing ground and 4.4 = a) yes, flooded]** Have livestock been forcibly displaced to areas other than the usual seasonal grazing grounds during the floods in 2020?

a) Yes ☐ b) No ☐

4.10 **[If 4.9 = a) Yes]** Please provide numbers:

I. Cows: _____
II. Sheep: _____
III. Goats: _____
IV. Other: _____

4.11 **[If 4 =b) grazing ground and 4.4 = a) yes, flooded]** Have you lost livestock (death) due to the floods in 2020?

a) Yes ☐ b) No ☐

4.12 **[If 4.11 = a)]** Please estimate how many:

I. Cows: _____
II. Sheep: _____
III. Goats: _____

4.13 **[If 4= a) Farm and 4.4 = Yes]** Have floods in 2020 impacted on farmer's ability to sell the products they were able to harvest? a) Yes ☐ b) No ☐

4.14 **[If 4.13 = Yes OR 4.9 = a) Yes OR 4.11 = a) Yes]** Can you put a monetary value on the flood-induced financial losses in 2020? a) Yes ☐ b) No

4.15 **[If 4.14 = Yes]** Please choose a currency and indicate how much

a) SSP ☐:_____ b) USD: ☐:_____
c) Sudanese Pound ☐ : _____ d) Ugandan Shilling ☐ : _____

4.16 **[If 4 = a) agriculture and 4.4 = Yes, flooded]** Has the availability of seeds decreased after the 2020 floods?

a) Yes ☐ b) No ☐

4.17 **[If 4.16 = Yes]** Please tick why

a) Lack of harvest to re-use seeds ☐
b) Damage to seed storage facilities ☐
c) Decrease in seed trade due to impassible roads ☐
d) Other issues related to the purchase of seeds, specify: _____ ☐

4.18 **[If 4.4 = Yes]** Have you received support due to the adverse effects of the 2020 floods? a) Yes ☐ b) No ☐

4.19 **[If 4.18 = Yes]** Please indicate by whom:

a) Government ☐ b) UN/NGO ☐ c) Private individual / company ☐
d) Religious entity ☐ e) Community ☐

4.20 **[If 4.18 = Yes]** Please indicate the type of support:

[If 4 = a) agriculture:]

a) Food aid ☐
b) Farming equipment ☐
c) Seeds ☐
d) Fertilizers ☐
e) Land ☐
f) Training ☐
g) Irrigation equipment ☐
h) Money ☐
i) Other:_____ ☐

[If 4 = b) grazing ground]

a) Vaccines ☐
b) Grazing land ☐
c) Fodder ☐
d) Water for livestock ☐
e) Land for livestock ☐
f) Livestock shelter ☐
g) Other:_____ ☐

4.21 **[If 4.4= Yes]** Were your assets damaged by the 2020 floods (farming equipment, animal shelter, seed silo) a) Yes ☐ b) No ☐

4.22 **[If 4.21 = Yes]** Have your assets been restored to pre-flood levels?

a) Yes, completely ☐ b) partially ☐ c) not at all ☐

4.23 **[If 4.22 = a) or b)]** Please enter the amount of money that was necessary for repairs and buying new equipment.

a) SSP ☐:_____ b) USD: ☐_____
c) Sudanese Pound ☐ : _____ d) Ugandan Schilling ☐ : _____ e) do not know ☐

4.24 **[If 4.22 = a) or b)]** Who financed the repairs mainly?

a) Government ☐ b) UN/NGO ☐ c) Private individual / company ☐
d) Religious entity ☐ e) Community ☐ f) Self-financed

4.25 **[If 4.22 = a) or b)]** Did the repairs include any measures making the farm less likely to be damaged by floods again? a) Yes ☐ b) No ☐ c) partially

4.26 **[If 4.25 = a) Yes]** Please add a note describing these repairs:__ __

4.27 **[If industrial compound]** Notes on Industrial compound (describe function / type of activities): _____

4.28 **[If industrial compound]** Was this compound financially affected by the 2020 floods? a) Yes ☐ b) No ☐

4.29 **[If 4.28= Yes]** Please tick all that apply

a) Damaged assets ☐
b) Reduced income ☐
c) Other, specify:_____ ☐

4.30 **[If 4.28= Yes]** How deep was the water at the lowest point of the facility?

a) less than 25cm ☐ b) 25cm-100cm ☐ c) over 100cm ☐

4.31 **[If 4.28= Yes]** Can you put a monetary value on the flood-induced financial loss in 2020? a) Yes ☐ b) No ☐

4.32 **[If 4.31 = Yes]** Please choose a currency and indicate how much

a) SSP ☐:_____ b) USD: ☐_____
c) Sudanese Pound ☐ : _____ d) Ugandan Schilling ☐ : _____

4.33 **[If 4.29 = a) damaged assets]** How long has it taken to restore your assets to pre-flood conditions?

a) up to 1 month ☐ b) over 1 month - 3 months ☐

c) Over 3 months – 6 months ☐ d) Over six months ☐ e) remains damaged ☐

4.34 **[If 4.28 = yes]** please indicate the current status of the facility

a) Repaired completely ☐ b) Partially repaired ☐ c) Not repaired / dysfunctional ☐

4.35 **[If 4.34 = a) or b)]** Please enter the amount of money that was necessary for the existing repairs of the facility.

a) SSP ☐:_____ b) USD: ☐_____

c) Sudanese Pound ☐ : _____ d) Ugandan Shilling ☐ : _____ e) do not know ☐

4.36 **[If 4.34 = a) or b)]** Who financed the repairs mainly?

a) Government ☐ b) UN/NGO ☐ c) Private individual / company (other than owner)☐

d) Religious entity ☐ e) Community ☐ f) private facility owner

4.37 **[If 4.34 = a) or b)]** Did the repairs include any measures to make the facility less likely to be damaged by floods again? a) Yes ☐ b) No ☐

4.38 **[If 4.37 = a) Yes]** Please describe what kind of improvements:

f) Stronger materials
g) Moved somewhere else
h) Dykes around facility
i) Added drainage
j) Other: _____

4.39 **[If 4.37 = a) Yes]** Please add a note describing these repairs:__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __

5. Location GPS collect: a) Yes ☐ b) No ☐ **[add kobo field]**
6. Area/polygon marked on map: a) Yes ☐ b) No ☐ **[add kobo field]**
7. GPS manual (in decimal degrees): Long _____ Lat _____ Alt_____

D- SETTLEMENT AREAS

1. Village / neighborhood / site name:
   _____
2. Settlement type:
   a) Permanent village ☐ b) Seasonal settlement ☐ c) Nomadic settlement (e.g. cattle camps) ☐
   d) Neighborhood ☐ e) IDP site ☐ f) Other temporary site (specify) _____ ☐
3. **[If 2 is (b), seasonal settlement]** During which season is the settlement inhabited?
   a) Rainy season ☐ b) Dry season ☐ b) Other (specify) _____ ☐
4. **[If 2 is (b), seasonal settlement]** Where does the population reside mainly when not in this location?
   a) State _____ **[use list]**
   b) County _____ **[use list]**
   c) Former payam _____ **[use list]**
   d) Former boma _____ **[use list]**
   e) Village / neighborhood name _____ **[use list + other specify option]**
5. **[If 2 is c), nomadic settlement]** Provide details on migration route, duration of stay and frequency in this location:
   Note: __
6. **[If 2 is b) or c)]** Do migration routes change during flooding?
   a) No
   b) Yes, [please add details how these change]: _____
7. Is the settlement currently inhabited? a) Populated ☐ b) Deserted ☐ c) Partially deserted

8. Has this settlement experienced conflict in the past five years? a) Yes ☐ b) No ☐
9. Location GPS collect: a) Yes ☐ b) No ☐ **[add kobo field]**
10. Area/polygon marked on map: a) Yes ☐ b) No ☐ **[add kobo field]**
    Enclose all the built-up area of the village within the polygon
11. GPS manual (in decimal degrees): Long _____ Lat _____ Alt_____
12. Was this settlement flooded in 2020? a) Yes ☐ b) No ☐
13. **[If 12 = a) Yes]** How deep was the water at the lowest point of the settlement?
    a) less than 25cm ☐ b) 25cm-100cm ☐ c) over 100cm ☐
14. Have people fled flooded areas in 2020 and traversed this settlement without staying here? Yes ☐ b) No ☐
15. Have people fled flooded areas in 2020 to stay in this settlement? a) Yes ☐ b) No ☐
16. **[If 15 = Yes]** How many people arrived here in 2020 following flooding approximately? _____
17. **[If 15 = Yes]** Where did most of these IDPs come from?
    a) State _____ **[use list]**
    b) County _____ **[use list]**
    c) Former payam _____ **[use list]**
    d) Former boma _____ **[use list]**
    e) Village / neighborhood name _____ **[use list + other specify option]**
18. **[If 15 = a) Yes]** Are these IDPs still in your settlement? a) Yes, most ☐ b) Yes, some ☐ c) No, none ☐
19. **[If 18 = b) or c)]** When did most return or leave otherwise?
    a) Year:____ b) Month:____ **[Must be between May 2020 and current date]**
20. **[If 15 = a)]** Please describe the relationship between the host community and the 2020 flood IDPs:
    a) Harmonious ☐ b) Mostly fine with rare tensions ☐ c) Tense ☐
    d) Antagonistic (showing or feeling active opposition or hostility) ☐
21. **[If 20 = b), c) or d)]** Please describe the source of the issue:
    a) Tensions over grazing or farm land ☐
    b) Tensions over water ☐
    c) Tensions over food ☐
    d) Communal tensions due to previous conflicts ☐
    e) Other:_____
22. **[If 15 = a) Yes]** Please describe the ways in which this settlement's community was able to support flood IDPs in 2020
    [tick all that apply]
    a) No support ☐
    b) Support with the building of shelters ☐
    c) Sharing shelters ☐
    d) Providing NFIs ☐
    e) Provision of food ☐
    f) Provision of water ☐
    g) Provision of medicine or healthcare ☐
    h) Other:_____ ☐
23. **[If 15 = Yes]** Has this settlement received external aid to support the arrival of flood IDPs? a) Yes ☐ b) No ☐
24. **[If 23 = Yes]** Who provided this support?
    a) Government ☐
    b) UN / NGO ☐
    c) Local community ☐
    d) External communities ☐
25. **[If 12 = Yes, settlement affected by flooding]** Please indicate the flooded area of the settlement on a map **[polygon on kobo]**
26. **[If 12 = Yes]** Please indicate the extent of the flooding
    a) Entire settlement was under water
    b) More than half of the settlement was under water
    c) Less than half of the settlement was under water
27. **[If 12 = Yes]** Please indicate the length of the 2020 flooding (all 2020 instances of flooding combined)
    a) Up to 1 week

b) Over 1 week – 1 month
c) Over 1 month – 3 months
d) Longer than 3 months

28. **[If 12 = Yes]** Have shelters been damaged by the 2020 floods? a) Yes ☐ b) No ☐

29. **[If 28 = Yes]** Please indicate how many shelters have been damaged:

a) All shelters
b) More than half of the shelters
c) Less than half of the shelters

30. **[If 28 = a)]** Please indicate the current status of the shelters
a) Repaired completely ☐ b) Partially repaired ☐ c) Not repaired / dysfunctional

31. **[If 30 = a) or b)]** Please enter an estimate of the amount of money that was necessary for the repairs of one shelter following the 2020 flooding (average).

31.a. Average price per shelter
a) SSP ☐:_____ b) USD: ☐_____
c) Sudanese Pound ☐ : _____ d) Ugandan Shilling ☐ : _____ e) do not know ☐

31.b. Estimate number of damaged shelters: _____

32. **[If 30 = a) or b)]** Who financed the repairs mainly?
a) Government ☐ b) UN/NGO ☐ c) Private individual / company ☐
d) Religious entity ☐ e) Community ☐

33. **[If 30. = a) or b)]** Did the repairs include any measures to make the shelters less likely to be damaged by floods again?
a) Yes ☐ b) No ☐

34. **[If 33 = a) Yes]** Please describe what kind of improvements:
a) Stronger materials
b) Moved somewhere else
c) Dykes around facility
d) Added drainage
e) Other: _____

35. **[If 33 = a) Yes]** Please add a note describing these measures:__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __

[Kobo note: data to be saved in three separate tables to facilitate analysis; please assign corresponding questions (name, type, subtype, GPS) from sections B, C, D the same column name for easy merging if

Appendix D: DTM Boma Flooding Questionnaire

DTM
IOM DISPLACEMENT TRACKING MATRIX

2021

Appendix D: DTM Boma Flooding Questionnaire

BOMA: _____

Payam: _____

IOM Flooding: Boma Mapping Survey

Date: _____/_____/_____ **Form No: _____**

Declaration:

- Your name and organization
- Work for IOM (International Organization for Migration)
- Assessment on available services
- Assistance not guaranteed
- Data valuable to assess return options and to humanitarian partners
- Thankful for time to interviewee

IOM Sub-Team Leader name: _____

RRC Payam Supervisor name: _____

Enumerator name: _____

I. General

Interviewees:

1.1 Name: _____ Position: Boma Chief

1.2 Name: _____ Position: Returnee Representative

1.3 Name: _____ Position: Female Rep.

1.4 Name: _____ Position: Youth Rep.

1.5 Name: _____ Position: IDP representative

1.6 Name: _____ Position: Other (optional)

1.7 State: _____

1.8 County: _____

1.9 Payam: _____

1.10 Boma: _____

a) **Boma centre GPS Latitude :** _____

b) **Boma centre GPS Longitude :** _____

c) **Boma centre GPS Altitude:** _____

1.11 Are there villages that are deserted in this boma? a) Yes ☐ b) No ☐

1.12 **[If 1.9 = yes]** How many villages are deserted? _____ **[write up the names in your notes]**

1.13 **[If 1.9 = yes]** Are any of these villages deserted because of the 2020 floods?

1.14 **[If 1.11 = yes]** Where have most of these populations gone?

a) State: _____

b) County: _____

c) Payam: _____

d) Boma: _____

1.15 Demographics:

a) Estimated number of households: ___
b) Estimated number of adult male (18+ up to 59): ___
c) Estimated number of adult female (18+ up 59): ___
d) Estimated number of elderly male (18+ up to 59): ___
e) Estimated number of elderly female (18+ up 59): ___
f) Estimated number of boys (under 18): ___
g) Estimated number of girls (under 18): ___
h) **[calculate total]** Please check total: ___
i) Estimation of female headed households in the boma: _____

1.16 Has the boma experience conflict in the past 3 to 5 years? a) Yes ☐ b) No ☐

1.17 Has this boma experienced flooding in 2020? a) Yes ☐ b) No ☐ **[If b) No, skip to question 5.1]**

1.18 Please indicate the extent of the flooding:

a) Most of the boma's population was directly affected by the flooding ☐
b) Less than half of the population was directly affected by the flooding ☐
c) Only few inhabitants were affected ☐

1.19 Number of villages in the boma

a) Total: _____
b) Flooded during the 2020 seasonal floods: _____ **[must be equal or smaller than 1.13a)]**

1.20 **[IF 1.1 = Yes]** Please indicate the time periods from when to when parts of the boma were flooded [option to add as many periods of flooding as needed]:

i. a) Starting Month and Year_____ b) End Month and Year:_____
ii. a) Starting Month and Year_____ b) End Month and Year:_____
iii. …

1.21 Is there a local committee or organization that supports the community in cases of natural disasters like floods, fires or draughts? a) Yes ☐ b) No ☐

1.22 **[If 1.15 = Yes]** Does this group also help the community after conflict or during displacement? a) Yes ☐ b) No ☐

1.23 **[If 1.15 = Yes]** Have these organizations been able to give the community early warnings about floods? a) Yes ☐ b) No ☐

1.24 **[If 1.15 = Yes]** Are there any warehouses in the boma used by NGO / UN or government containing pre-positioned emergency food or NFI supplies?

II. Settlement, Housing & Displacement

2.1 Boma Flooding Profile

3.4.1 Approximately, how frequently does the boma experience flooding?

a) Multiple times a year ☐
b) Every year ☐
c) Every second year ☐
d) Every 5 years ☐
e) Every 10 years ☐
f) Rarely (50 or more years) ☐
g) 2020 was the first time ☐

3.4.1 What is the most common type of flooding the boma experiences?

a) River flooding (increased level of water in the river) ☐
b) Flash flooding (heavy and sudden rainfall) ☐
c) Ground water flood (water rises above the ground's surface) ☐

3.4.1 What was the community's response to the 2020 flooding? **[tick all that apply]**

a) Community based response from within the boma ☐
b) Reported to payam / county authority (inc. RRC) ☐
c) Seasonal, planned migration ☐
d) Reliance on humanitarian assistance ☐
e) Support from neighboring boma ☐
f) Forced displacement ☐
g) Other, specify: _____ ☐

3.4.1 Do you believe your boma's population to be more likely to experience flood related shocks compared to other bomas in the country? a) Yes ☐ b) No ☐

3.4.1 **[If 2.1.4 = YES]** What are the reasons you believe the population here is likely to experience flood related shocks? **[tick all that apply]**

a) Nearby river prone to flooding, specify: _____ ☐
b) Nearby lake prone to flooding, specify:_____ ☐
c) The area includes wetlands / swamps that are prone to flooding ☐
d) Low altitude ☐

e) Repeated displacement into more flood prone areas ☐
f) Artificial structures leading to or compounding flooding ☐
g) Damaged dike or similar flood protection ☐
h) Weak dike (non-durable materials) ☐
i) Other, specify: _____ ☐

3.4.1 Do you believe the frequency of flood events has increased over the last ten years?
a) Yes ☐ b) No ☐

3.4.1 How many households in the boma do you estimate were affected (not necessarily displaced) by the floods in 2020? _____

2.2 Displacement

3.4.1 Are there currently IDPs living in your boma? a) Yes ☐ b) No ☐

3.4.1 **[If 3.2.1 = a) Yes]** Please tick the most common reason for their displacement
a) Conflict involving national parties ☐
b) Conflict involving local communities ☐
c) Floods ☐
d) Other natural disasters ☐
e) Other:_____ ☐

3.4.1 Has there been one or more cases of flood-induced displacement in this boma in the past ten years? a) Yes ☐ b) No ☐

3.4.1 **[If 2.2.3 = a) Yes]** Do people usually manage to move before the floods arrive? a) Yes ☐ b)No ☐

3.4.1 **[If 2.2.3 = a) Yes]** How do people usually travel when fleeing?
a) On Foot ☐
b) Bicycle ☐
c) Donkey ☐
d) Car ☐
e) Truck ☐
f) Bus ☐
g) Motorbike ☐
h) Boat ☐
i) Other:_____ ☐

3.4.1 **[If 2.2.3 = a) Yes]** Where do people usually flee to?
a) State _____ **[use list]**
b) County _____ **[use list]**
c) Payam _____ **[use list]**
d) Boma _____ **[use list]**
e) Village / neighborhood name _____ **[use list + other specify option]**

3.4.1 **[If 2.2.3 = a) Yes]** How long do people usually stay away after flooding?
a) It's always very different ☐
b) Usually a few days ☐
c) Usually 1-4 weeks ☐
d) Over a month up to 3 months ☐
e) More than 3 months up to six months ☐
f) Over half a year ☐

3.4.1 **[If 2.2.7 = c) – f)]** What is the most common reason people remain away for such long periods of time?
a) Their home area remains flooded for a long time and cannot be accessed ☐
b) Their shelter and or other assets were washed away and support wasn't available ☐
c) Livelihoods were lost in the flooded home area ☐
d) They prefer to relocate and find new homes / livelihoods ☐
e) Ongoing tensions. IDPs did not feel safe to return ☐
f) Ongoing armed conflict. IDPs did not feel safe to return ☐
g) Other:_____ ☐

3.4.1 Have people fled floods in 2020 *to*, *from* or *within* this boma? a) Yes ☐ b) No ☐

3.4.1 **[If 2.2.9 = Yes]** Please specify:
a) Displacement within the same boma ☐
1. Displaced (ind.) at height of flood:_____

2. Displaced (ind.) now: ____

b) Displacement to this boma from another boma ☐

1. Displaced (ind.) at height of flood:_____
2. Displaced (ind.) now: ____

c) Displacement from this boma to other areas ☐

1. Displaced (ind.) at height of flood:_____
2. Displaced (ind.) now: ____

3.4.1 **[If 2.2.10 = c)]** Where did most people go?

a) Same as 2.2.6
b) Other:
   i. State _____ **[use list]**
   ii. County _____ **[use list]**
   iii. Former payam _____ **[use list]**
   iv. Former boma _____ **[use list]**
   v. Village / neighborhood name ____ **[use list + other specify option]**

3.4.1 **[If 2.2.10 = c)]** How long did most people stay away from the boma after the 2020 flooding?

a) A few days ☐
b) 1-4 weeks ☐
c) Over a month up to 3 months ☐
d) More than 3 months up to six months ☐
e) Over half a year ☐

3.4.1 **[If 2.2.12 = c)-d)]** What was the most common reason people remained away for such long periods of time?

a) Their home area remained flooded for a long time and could not be accessed ☐
b) Their shelter and or other assets were washed away and support wasn't available ☐
c) Livelihoods were lost in the flooded home area ☐
d) They preferred to relocate and find new homes / livelihoods ☐
e) Ongoing tensions. IDPs did not feel safe to return ☐
f) Ongoing armed conflict. IDPs did not feel safe to return ☐
g) Other:_____ ☐

3.4.1 **[If 2.2.10 = c)]** How many of those that fled their homes in 2020 due to floods remain displaced now? _____

3.4.1 **[If 2.2.14 > 0]** What is the most common reason these people have not been able to return home?

a) Their home area remains flooded for a long time and cannot be accessed ☐
b) Their shelter and or other assets were washed away and support wasn't available ☐
c) Livelihoods were lost in the flooded home area ☐
d) They prefer to relocate and find new homes / livelihoods ☐
e) Ongoing tensions. IDPs do not feel safe to return ☐
f) Ongoing armed conflict. IDPs do not feel safe to return ☐
g) Other:_____ ☐

3.4.1 Are there parts of the population that were left behind during the flood related displacement? a) Yes ☐ b) No ☐

3.4.1 **[If 2.2.16 = Yes]** Why were people left behind? **(select all that apply)**

a) Mobility issues, elderly ☐
b) Mobility issues, with disability ☐
c) Mobility issues, other ☐
d) Remained to tend to fields (farmer) ☐
e) Remained to look after assets ☐
f) Insecurity on the road ☐
g) Other, specify:_____ ☐

2.3 Shelter

2.3.1 What is the is the most common type of housing/shelter people have in the boma

a) Tukul (*mud walls with thatched roofing)* ☐ b) Mud walls with iron sheets roofing ☐
c) Brick walls with thatched roofing ☐ d) Brick walls with iron sheets roofing ☐

e) Emergency / improvised shelter / tent ☐ f) Other, specify: _____ ☐

2.3.2 What is the is the status of the majority of housing/shelter in the boma?

a) Most houses are in good condition ☐
b) Most houses have a little damage but can still be lived in ☐
c) Most houses are severely damaged (i.e., no roof / walls missing, etc.) ☐
d) Most people are living in makeshift shelters (former houses completely destroyed) ☐

2.3.3 **[If 2.3.2is c) or d)]** what is the most common reason for the damage?

a) Recent conflict (as of Jan 2020) ☐
b) Non-recent conflict (before Jan 2020) ☐
c) Floods before Jan 2020 ☐
d) 2020 Seasonal flooding ☐
e) Heavy rain ☐
f) Unavailability of maintenance supplies ☐
g) Not enough money ☐
h) Other:_____ ☐

2.3.4 Where do the people in the boma get materials for constructing and repairing houses?

[Select one]

a) Free from surrounding forest / area ☐
b) Boma market ☐
c) Nearest town market ☐
d) Distribution by humanitarian agency ☐
e) Other, specify: _____ ☐

2.3.5 Has flooding in 2020 reduced the availability of shelter materials? a) Yes ☐ b) No ☐

2.3.6 **[If 2.3.5 = a) Yes]** What materials were not available and needed after the flooding?

a) Poles ☐
b) Dried grass ☐
c) rope/string ☐
d) Other: ____ ☐

2.3.7 How many of the 2020 flood-damaged shelters in this boma have been reconstructed at the time of this interview?

a) Not applicable (no damaged shelters) ☐ b) All ☐
c) More than half ☐ d) Less than half ☐

2.4 If electricity is usually available, did the 2020 floods negatively impact its availability?

a) Yes ☐ b) No ☐ c) Not Applicable (no electricity usually) ☐

2.5 Have floods negatively impacted your ability to receive news or communicate over long distances?

a) Yes ☐ b) No ☐

2.6 Has this boma experienced decreased policing or breakdown of community protection mechanisms because of the 2020 floods?

a) Yes ☐ b) No ☐

2.7 Please tick if you know of increased cases of the following in the boma since the 2020 floods

a) People feel unsafe ☐
b) Increase in early pregnancies ☐
c) Increase in child marriages ☐
d) Increase in sexual and gender-based violence ☐
e) Increase in criminality ☐
f) Increase in communal tensions ☐
g) None of the above ☐
h) Other: _____ ☐

2.8 Did women and girls face heightened threats during the collection of wood and water while the area was flooded? a) yes ☐ b) No ☐

2.9 **[If 2.8 = Yes]** Please indicate which threats

a) Sexual and gender based violence ☐
b) Snake bites ☐
c) Other physical violence ☐
d) Criminality ☐
e) Other: _____

2.10 What was the most common response to violence or criminality **before** the 2020 floods?

a) Reported to payam authority / police ☐ b) Report to traditional court ☐
c) Flee the location ☐ d) Compensation ☐ e) Seek protection with relatives ☐
f) Other, specify:_____ ☐

2.11 What has the most common response to violence or criminality been **since** the 2020 floods?

a) Reported to payam authority / police ☐ b) Report to traditional court ☐
c) Flee the location ☐ d) Compensation ☐ e) Seek protection with relatives ☐
f) Other, specify:_____ ☐

2.12 Has the boma experienced communal clashes since the 2020 floods?

a) Yes ☐ b) No ☐

2.13 **[If 2.12 is YES]** What was the community's response?

a) Reported to payam authority / police ☐ b) Retaliation / revenge attacks ☐
c) Temporary migration ☐ d) Negotiation ☐ e) Other, specify: _____ ☐

III. Agriculture & Livelihoods

3.1 What is the most common livelihood group in the boma?

a) Farmers ☐ b) Herders ☐ c) Traders ☐ d) Fishermen ☐
e) Carpenter ☐ f) Blacksmiths ☐ g) Daily laborers ☐ h) Agro-pastoralist (farmer + herder combination
i) Other, specify: ☐

3.2 What is the second most common livelihood group in the boma?

a) Farmers ☐ b) Herders ☐ c) Traders ☐ d) Fishermen ☐
e) Carpenter ☐ f) Blacksmiths ☐ g) Daily laborers ☐ h) Agro-pastoralist (farmer + herder combination: ☐
i) None ☐ j) other: ____

3.3 Who is most active in the livelihood activity described in 3.1? **[select all that apply]**

a) Women ☐
b) Men ☐
c) Girls ☐
d) Boys ☐

3.4 How many people's livelihoods have been negatively affected by floods in 2020?

a) None ☐
b) Few (less than half) ☐
c) About half ☐
d) More than half ☐
e) Everyone ☐

3.5 Have local traders received support after the 2020 flooding?

a) Yes ☐ b) no ☐ c) NA (there are no traders) ☐

3.6 Do the people in this boma practice farming? **[If b) No, skip to question 3.21 livestock]**

a) Yes ☐ b) No ☐

3.7 **[If 3.6 is a) YES]** Has the size of arable land (useful for farming) decreased since 2020 due to flooding?

a) Yes ☐ b) No ☐

3.8 **[If 3.7 is a) YES]** Has land been turned from grazing land into farming land or the other way round? **[select all that apply]**

a) Grazing land has turned into farming land
b) Farming land has turned into grazing land

3.9 What are the sources of water for farming? **[select all that apply]**

a) Rain-fed ☐ b) Irrigated ☐ c) River ☐ d) Other ☐

3.10 What were the main food crops grown in the boma **before** 2019 rainy season? **[select all that apply]**

a) Maize ☐ b) Sorghum ☐ c) Sesame ☐ d) Groundnuts ☐ e) Vegetables ☐ f) Rice ☐
g) Millet ☐ h) Cassava ☐ i) Other, specify: _____ ☐

3.11 What were the main food crops grown in the boma **after** the 2020 rainy season? **[select all that apply]**

a) Maize ☐ b) Sorghum ☐ c) Sesame ☐ d) Groundnuts ☐ e) Vegetables ☐ f) Rice ☐
g) Millet ☐ h) Cassava ☐ i) Other, specify: _____ ☐

3.12 Where do farmers get their seeds for these crops? **[select all that apply]**

a) Previous Harvest ☐ b) Market ☐ c) Ministry of Agriculture ☐
d) Borrowed ☐ e) UN/FAO/NGO distribution ☐ f) Other, specify: _____ ☐

3.13 Has the availability of seeds decreased after the 2020 floods?

a) Yes ☐ b) No ☐

3.14 **[If 3.13 = Yes]** Please tick why

a) Lack of harvest to re-use seeds ☐
b) Damage to seed storage facilities ☐
c) Decrease in seed trade due to impassible roads ☐
d) Other issues related to the purchase of seeds ☐

3.15 Have floods in 2020 impacted on farmers' ability to sell the products they were able to harvest?

a) Yes ☐ b) No ☐ c) Not applicable, farmers generally don't sell their products here

3.16 Have farmers in the boma received support in 2020 to address flood-induced farming needs (ex. seeds, tools etc.)?

a) Yes ☐ b) No ☐

3.17 **[If 3.16 = Yes]** Who was the main provider of support to farmers in the boma? **(select one)**

a) Gov't ☐ b) UN/FAO/NGO ☐ c) Private Business ☐ d) Diaspora ☐ e) Community ☐

3.18 What is the <u>most</u> **needed input** for the production of food crops in the boma? (select one)

a) Land ☐ b) Seeds ☐ c) Fertilizers ☐ d) Labor ☐ e) Training ☐ f) None ☐

3.19 What is <u>the most needed</u> **technology** for the production of food crops in the boma?

a) Tractor ☐ b) Compost fertilizers ☐ c) Ox plough ☐ d) Irrigation equipment ☐
e) Other tools ☐ f) None ☐

3.20 What is <u>the main problem</u> that has affected the production of food crops in the boma in 2020?

a) Crop diseases ☐ b) Conflict ☐ c) Floods ☐ d) Market accessibility ☐
e) Other crop damage (i.e. from insects, livestock, wildlife, etc.) ☐ f) None ☐

3.21 **[If 3.20= c) Floods]** How severe was the impact of the floods?

a) The boma lost up to a quarter of the expected yields ☐
b) The boma lost about half of the expected yields ☐
c) The boma lost about three quarters of the expected yields ☐
d) The boma's farmers were unable to harvest anything due to the floods ☐

3.22 Do the people in the boma own livestock?

a) Yes ☐ b) No ☐ **[If no, go to question 3.36]**

3.23 **[IF 3.22 is YES]** What are the available grazing land types? **[Select all that apply]**

a) Communal grazing land ☐ b) Individual grazing land ☐
c) Leased grazing land ☐ d) Other, specify: _____ ☐

3.24 Is the pasture (grazing land) sufficient for the livestock in the boma?

a) Yes, throughout the year ☐ b) Only during the rainy season ☐
c) No, there is always scarcity ☐ d) Don't know ☐

3.25 **[If 3.7 = Yes]** Has a diminishing grazing land availability influenced relations between communities?
a) Yes ☐ b) No ☐

3.26 [If 3.24 = Yes] In what way?
a) Tensions between different cattle keepers ☐ b) tensions between farmers and cattle keepers ☐ c) Other:_____ ☐

3.27 **[IF 3.25 = YES]** Why has grazing land availability become a source of tension? **[Select all that apply]**
a) Scarcity due to floods ☐ b) communal or political land disputes ☐
c) changing weather patterns (unusually early or late onset of dry / rainy season) ☐
d) other:_____ ☐

3.28 Does this boma have a communal water source for livestock?
a) Yes ☐ b) No ☐ c) Don't know ☐

3.29 Is the water in this boma enough for the livestock?
a) Yes, throughout the year ☐ b) Only during the rainy season ☐
c) No, there is always scarcity ☐ d) Don't know ☐

3.30 Have water sources become less accessible in 2020 due to floods?
a) Yes ☐ b) No ☐ c) Don't know ☐

3.31 Did livestock owners receive support as a result of the floods in 2020?
a) Yes ☐ b) No ☐

3.32 Have livestock owners received livestock vaccines since January 2019? a) Yes ☐ b) No ☐

3.33 **[if 3.32 = Yes]** When did they receive vaccines? **[Select all that apply]**
a) 2019 before rainy season ☐
b) 2019 during or after the rainy season ☐
c) 2020 before the rainy season ☐
d) 2020 during or after the rainy season ☐
e) 2021 before rainy season ☐
f) 2021 during or after the rainy season ☐

3.34 **[IF 3.31 is YES]** Who was the main provider of support to livestock owners in the boma? **[Select one only].**
a) Min. of Agriculture ☐ b) UN/FAO/NGO ☐ c) Private Business ☐ d) Diaspora ☐
e) None ☐

3.35 What was the main problem that affected livestock herders in the boma in 2020?
a) Grazing land availability ☐ b) Livestock diseases ☐ c) Water ☐
d) Lack of market facilities ☐ e) Conflict ☐ f) Drought ☐
g) Raiding ☐ h) Floods ☐ i) Other, specify: _____ ☐

3.36 Have people in this boma lost livestock due to the floods in 2020?
a) Yes ☐ b) No ☐

3.37 **[If 3.36 = Yes]** Please estimate how many:
a) Cows: _____
b) Sheep: _____
c) Goats: _____

3.38 Do people in the boma practice fishing?
a) Yes ☐ b) No ☐ **[If no, go to question number 4.1.1]**

3.39 Are there are any community or pond fisheries (community owned ponds, not rivers)? a) Yes ☐ b)No ☐

3.40 Do the fishermen in the boma sell some of the fish?
a) Yes ☐ b) No ☐

3.41 **[IF 3.40 is YES]** Were fishermen able to sell their fish at a profit after the 2020 floods?
a) Yes ☐ b) No ☐

3.42 What was the main problem that affected fishermen in the boma in 2020? **[select all that apply]**
a) Lack of equipment ☐ b) floods ☐ c) Lack of storage facility ☐ d) lack of market facility ☐
e) Conflict ☐ e) Drought ☐ f) Other, specify _____ ☐

3.43 What other means of income do people in the boma have? **[select all that apply]**
a) Employment ☐ b) Pension ☐ c) Income generating activities ☐
d) Remittances ☐ e) Cash assistance / sale of humanitarian assistance ☐ f)Other (specify) _____ ☐

3.44 Was food very scarce for the boma during and / or after the 2020 floods? ?

a) Yes ☐ b) No ☐ **If no, go to question 5**

3.45 During this food scarcity, what was the most common coping mechanism used by the HHs in this boma?

a) Loans ☐	b) Reduced meals ☐	c) Cash benefits ☐
d) Forest fruits and vegetables ☐	e) Temporary migration ☐	f) Extended family support ☐
g) Food aid ☐	h) Sell / slaughter cattle ☐	i) Other: _____ ☐

3.46 During this food scarcity, what was the second most common coping mechanism used by the HHs in this boma?

b) Loans ☐	b) Reduced meals ☐	c) Cash benefits ☐
d) Forest fruits and vegetables ☐	e) Temporary migration ☐	f) Extended family support ☐
g) Food aid ☐	h) Sell / slaughter cattle ☐	i) None ☐
j) Other: _____ ☐		

3.47 Does the boma have access to a major market (with variety of commodities) for their produce and/or needs?

a) Yes, within the boma ☐ b) Yes, in a different boma ☐ c) No ☐

3.48 **[If 3.47 is YES]** How far is the market in dry season?

a) Up to 30 min ☐ b) Less than an hour ☐ c) 2-3 hours ☐ d) 4-6 hours ☐ e) More than 6 hours ☐

3.49 **[If 3.47 is YES]** How far is the market in the rainy season?

a) Up to 30 min ☐ b) Less than an hour ☐ c) 2-3 hours ☐ d) 4-6 hours ☐ e) More than 6 hours ☐

3.50 **[If 3.47 is YES]** How do you get to the market?

a) Walk ☐ b) Public Transport ☐ c) Bicycle ☐ d) Own Motor Vehicle ☐

e) Other, specify: _____ ☐

3.51 **[If 3.47 is YES]** Did the quantity and variety of available items at the market decrease due to floods in 2020? a) Yes ☐ b) No ☐

3.52 **[If 3.51 is YES]** Which two unavailable items were the most needed?

a) No second one ☐
b) Sorghum flour ☐
c) Maize flour ☐
d) White sorghum (feterita) ☐
e) White sorghum (local) ☐
f) White maize (grain) ☐
g) Wheat flour ☐
h) Rice ☐
i) Cowpea ☐
j) Foul el masri (broad beans) ☐
k) Beans (janjaro) ☐
l) Meat (beef) ☐
m) Sugar ☐
n) Vegetable oil ☐
o) Salt ☐
p) Other: _____ ☐

3.53 Have people been able to borrow or save money during the 2020 floods to meet their needs?

a) Yes ☐ b) No ☐ c) Don't know / no reply ☐

3.54 **[If 3.53 is YES]** Who provided these services? (select all that apply)

a) Banks ☐	b) Microfinance institutions ☐	c) UN / NGO ☐
d) Friends / relatives ☐	e) Community savings / loan group ☐	f) Shops / merchants ☐

g) Money lenders ☐ h) Other, specify: _____ ☐ i) Don't know / no reply ☐

3.55 Has the boma experienced major livelihood shocks in 2020?

a) Yes ☐ b) No ☐

3.56 **[If 3.55 = Yes]** What was the main reason for these livelihood shocks?

a) Drought ☐ b) Floods ☐ b) Livestock diseases ☐ c) Human epidemic ☐

e) Crop diseases ☐ f) Pests ☐ g) Conflict ☐ g) Economic crisis

3.57 What have people done to cope with the negative impacts of the shocks? **[select all that apply]**

a) Waited for assistance ☐ b) Migrated ☐ c) Taken out a loan ☐ d) Sold livestock ☐

e) Other:_____ ☐

3.58 Is there a forest that is used communally for wood collection? a) yes ☐ b) No ☐

IV. Health / WASH & Education

4.1 Health

4.1.1 Number of functioning health facilities in the boma:

a) Before the 2020 floods: _____ b) After the 2020 Floods: _____

4.1.2 How long did most people in the boma walk to reach a health facility **before** the 2020 floods?

a) Up to 30 min ☐ b) Less than an hour ☐ c) 2-3 hours ☐ d) 4-6 hours ☐ e) More than 6 hours

4.1.3 How long did most people in the boma walk to reach a health facility **since the 2020 floods**?

a) Up to 30 min ☐ b) Less than an hour ☐ c) 2-3 hours ☐ d) 4-6 hours ☐ e) More than 6 hours

4.1.4 Do boma residents believe there to have been disease outbreaks linked directly or indirectly to the 2020 flooding?

a) Yes ☐ b) No ☐

4.1.5 **[If 4.1.4 = Yes]** which diseases(s)? **[select all that apply]**

a) Cholera b) Measles ☐ c) Meningitis ☐ d) Malaria upsurge ☐

e) AFP (Acute Flaccid Paralysis) f) Guinea Worm ☐ g) Acute jaundice syndrome (AJS) ☐

h) Relapsing fever ☐ i) Yellow fever ☐ e) Other Specify _____ ☐

4.1.6 **[If 4.1.1 b) < a)]** Has the boma received aid to fill gaps in healthcare services as a result of flooding?

a) Yes ☐ b) No ☐

4.1.7 **[If 4.1.6 = Yes]** Please indicate who provided the aid:

a) Government ☐ b) The community ☐ c) UN / NGO ☐ d) Private sector ☐

4.2 WASH

4.2.1 Where do most people of this boma collect drinking water from? **[select one only]**

a) River ☐ b) Stream ☐ c) Spring ☐

d) Lake/Pond ☐ e) Borehole ☐ f) Tank ☐

g) Tap ☐ h) Well ☐ i) Hafir ☐

4.2.2 Has there been a change in the quality / quantity / accessibility / availability of **drinking water** after the floods in 2020? a) Yes ☐ b) No ☐

4.2.3 **[If 4.2.2 = Yes]** Please tick all that apply

a) Water became murky	☐	b) Waiting time to get water increased	☐
d) Water tastes different	☐	e) Access restricted (ex: flood water in the way or damaged roads)	☐
g) Water is suspected of making people sick	☐	h) Man-made water sources damaged or destroyed	☐
i) Disputes / tensions about water access	☐	k) Water became dirty due to latrine flooding	☐
l) Water became dirty due to dead animal carcasses	☐	m) Other: _____	☐

4.2.4 **[If 4.2.2 = Yes]** Please tick any coping mechanisms people employed in the face of reduced drinking water quality / quantity / accessibility / availability:

a) Reduction in water consumption	☐	b) Longer travel to fetch water	☐
d) Migration closer to water	☐	e) Drinking water of lesser quality	☐
g) More time and energy filtering / boiling water	☐	h) Repairing of damaged water sources	☐
i) relying on government aid for water access	☐	k) Relying on UN / NGO aid for water access	☐
l) other:_____	☐		

4.2.5 Where do most people of this boma collect **non-drinking** water? **[select one only]**

a) River	☐	b) Stream	☐	c) Spring	☐
d) Lake/Pond	☐	e) Borehole	☐	f) Tank	☐
g) Tap	☐	h) Well	☐	i) Hafir	☐

4.2.6 Has there been a change in the quality / quantity / accessibility / availability of non-drinking water after the floods in 2020? a) Yes ☐ b) No ☐

4.2.7 **[If 4.2.6 = Yes]** Please tick all that apply

a) Water became murky (/murkier)	☐	b) Waiting time to get water increased	☐
d) Access restricted (ex: flood water in the way or damaged roads)	☐	e) Water is suspected of making livestock sick	☐
g) Man-made water sources damaged or destroyed	☐	h) Disputes / tensions about water access	☐
i) Water became dirty due to latrine flooding	☐	j) Water became dirty due to dead animal carcasses	☐
k) Other:_____	☐		

4.2.8 Please indicate the change in number: a) Pre 2020 floods _____ b) after the floods _____

4.2.9 **[If 4.2.8 b) > 4.2.8.a)]** Please describe who increased the number of water points and when:

_____

4.2.10 Has the boma received support to improve clean water access in response to the 2020 floods?

a) Yes ☐ b) No ☐

4.2.11 **[If 4.2.10 = Yes]** Please indicate who provided the aid:

a) Government ☐ b) The community ☐ c) UN / NGO ☐ d) Private sector ☐

4.2.12 Does the boma have a water user committee? a) Yes ☐ b) No ☐

4.2.13 Has the boma received additional support in maintaining or repairing boreholes / taps / wells after the 2020 floods? a) Yes ☐ b) No ☐

4.2.14 **[If 4.2.13= Yes]** Please indicate who provided the support

a) Government ☐ b) The community ☐ c) UN / NGO ☐ d) Private sector ☐

4.2.15 What is the most common form of defecation in the boma? **[select one]**
a) Public latrines ☐ b) Household latrines ☐ c) Open air / bush ☐

4.2.16 Did defecation practices change during and immediately after the 2020 floods? a) Yes ☐ b) No ☐

4.2.17 **[If 5.2.16 = YES]** please tick the appropriate boxes

Use of…	No change	Increase	Decrease
Public latrines			
Household latrines			
Open air / bush			

4.3 Education

4.3.1 Are there educational facilities in this boma?
a) Yes ☐ b) No ☐

4.3.2 Have the 2020 floods affected availability of or access to education? a)Yes ☐ b) No ☐

4.3.3 **[If 4.3.2 = Yes]** Please tick all that apply (also if it only applies to a part of the student cohorts or schools)

a) Impassable roads to the schools ☐
b) Increased travel time to school because of road conditions ☐
c) Increased student numbers because of other closing schools ☐
d) School building damage ☐
e) School material damage ☐
f) School latrine damage ☐
g) School water access damage ☐
h) Schools were occupied by IDPs ☐
i) Schools were occupied by armed forces ☐
j) Other, specify: _____ ☐

[End questionnaire for boma that were flooded in 2020, i.e. 1.17 = Yes]

v. Flood Periphery Questionnaire

5.1 Have floods in other bomas hindered your access to areas out of this area? a) Yes ☐ b) No ☐

5.2 **[If 5.1 = a) Yes]** Please tick to which kind of travel destination access was hindered

3.4.1 Primary healthcare
3.4.1 Specialized healthcare
3.4.1 Education
3.4.1 Markets
3.4.1 Humanitarian aid
3.4.1 Family and friends
3.4.1 Livelihood opportunities
3.4.1 Other: _____

5.3 Are there currently IDPs living in this boma? a) Yes ☐ b) No ☐

5.4 **[If 5.3 = a) Yes]** Please provide the main reason for their displacement

a) Conflict involving national parties ☐
b) Conflict involving local communities ☐
c) Floods ☐
d) Other natural disasters ☐
e) Other:_____ ☐

5.5 Has the boma been affected by flooding in the past (if regularly, indicate the last time flooding took place)?

a) Yes, 2019 ☐
b) Yes, within the last 5 years ☐
c) Yes, within the last 10 years ☐
d) Yes, more than 10 years ago ☐

e) No, never to the knowledge of the interviewee(s) ☐

5.6 Have people fled flooded areas in 2020 and travelled through this boma without staying here?
a) Yes ☐ b) No ☐

5.7 Have people fled floods in other areas in 2020 to this boma?
a) Yes ☐ b) No ☐

5.8 **[If 5.7 = Yes]** How many people arrived here in 2020 following flooding approximately? _____

5.9 **[If 5.7 = Yes]** Where did most of these IDPs come from?
a) State: _____ b) County:_____ c) Payam:_____ d) Village or Displacement Site:_____

5.10 **[If 5.7 = Yes]** Did most IDPs reside among the host community or did they remain in a separate IDP settlement?
a) All IDPs stayed in shelters with the host community ☐
b) Most IDPs stayed with the host community but some stayed at a separate IDP settlement ☐
c) Some IDPs stayed with the host community but most stayed in a separate IDP settlement ☐
d) All IDPs stayed in a separate IDP settlement ☐

5.11 **[If 5.7 = Yes]** Are these IDPs still in your boma?
a) Yes, most ☐ b) Yes, some ☐ c) No, none ☐

5.12 **[If 5.11= b) or c)]** When did most return or leave otherwise?
a) Year:____ b) Month:____ **[Must be between May 2020 and current date]**

5.13 Please describe the relationship between n the host community and the 2020 flood IDPs:
a) Harmonious ☐ b) Mostly fine with rare tensions ☐ c) Tense ☐ d) Antagonistic (showing or feeling active opposition or hostility) ☐

5.14 **[If 5.7 = Yes]** Please describe the ways in which this boma's community was able to support flood IDPs in 2020 **[tick all that apply]**
a) No support
b) Support with the building of shelters ☐
c) Sharing shelters ☐ **[Option not available if 5.10 = d)]**
d) Providing NFIs ☐
e) Provision of food ☐
f) Provision of water ☐
g) Provision of medicine or healthcare ☐
h) Other:_____ ☐

5.15 **[If 5.7 = Yes]** Has this boma received external aid to support the arrival of flood IDPs?
a) Yes ☐ b) No ☐

5.16 **[If 5.15 =Yes]** Who provided this support?
a) Government ☐
b) UN / NGO ☐
c) Local community ☐
d) External communities ☐

Appendix E: DTM Flooding FGD Tool

COVID-19 Protocols

In line with COVID-19 protocols, each FGD will be composed of 5-7 participants, to allow for adequate social distancing. Participants will be provided with masks. Furthermore, where possible, FGDs will be conducted in outdoor spaces to allow for adequate airflow.

Participant Selection

1. IDPs - men
2. IDPs – women and girls
3. Host community / returnees – men
4. Host community / returnees – women
5. Elderly and persons with disabilities – women and men

FGDs will be conducted at the boma level. Where possible, participants recruited will reflect gender parity. Participants diverse in age, from 18-65, will be recruited for each FGD. A concerted effort will be made by researchers/enumerators to ensure that youth (18-35) are adequately represented.

Script

Hello, my name is _____ and I work for IOM. We are assisting the World Bank with a study on the experience of communities during floods. The study is a validation exercise of the Remote Flood Damage and Needs Assessment, which was carried out by the World Bank and the Government of South Sudan, on the floods that occurred in South Sudan in 2020. By better understanding your experiences during and after floods, we hope to use this information to help communities better prepare in the future.

Your participation in this study is voluntary, so please let me know if you don't want to answer a question, or if you would like to stop the FGD at any time. If you have any questions about this study at any time, please let me know.

We would also like to record the FGD to assist our colleagues in Juba with writing the report. Do I have your permission to record? (If participant declines, take notes instead).

State:_____ County:_____ Payam:_____

Group:_____ # of participants:_____ Gender:_____

Age Range:_____

General FGD Questions (all groups)

General FGD Questions (all groups)

1. Has this community and local infrastructure been impacted by the floods that occurred in 2020? If so, in what way?

2. Does your boma experience flooding regularly or in exceptional years? Please explain whether floods are expected or always a surprise.

3. Referring to question 2: Has it always been this way, or has the frequency or intensity of floods changed? If it's changed, please describe how and when this happened.

4. What kind of knowledge about floods do people learn from their parents and grandparents in this boma? Do you have any platform or committee to discuss the flood or disaster issue?

5. How does the community make sure they are safe during the floods?

6. Was the boma prepared for the 2020 floods? If any, what measures were put in place in anticipation of the floods to protect lives and livelihoods? Are there any organization to support the flood preparedness (preparedness – not during or after flooding)?

7. What preparations or steps are being taken by you, your household, and your larger community? Are there any initiative from local government to protect yourselves in case floods occur again?

8. How have other shocks like conflict or COVID-19 influenced your ability to cope with floods in 2020?

9. How much external (from aid organizations, private businesses, diaspora or the government) support did the community receive during the 2020 floods? Who did it come from? Was it sufficient and appropriate (did it meet local needs)?

10. What can be done to help the community better cope with floods?

11. You mentioned different ways in which this community has been impacted by the floods in 2020. [For example…] Did these impacts lead to more pressure, tension or competition over shared resources, infrastructure and services? For example, water points, school, health facilities, land, etc. How does the community manage these pressures, tensions and competition to prevent or mitigate conflict?

12. Are there any community-based disaster risk management mechanisms? This would be ways in which your community can leverage local capacities, knowledge and resources to manage the risk and impacts of floods.

Displacement and Shelter

[If instances of flood induced displacement do occurred]

1. Were any family or community shelters partially or fully damaged or washed out during the Flood 2020? Are there raised areas in this boma where temporary shelters were constructed for flood affected people? What are the common practices to ensure that shelters are less affected by the rain / floods?

2. Could you explain the flood displacement patterns in this boma (people coming here, people leaving here, people travelling through here). [Participatory mapping - draw arrows on maps with the most common displacement / migration routes in the area during floods]

3. Did many people have to flee from this area during the 2020 floods or were there people who stayed behind – if so, who stayed behind and why?

4. Have displacement patterns / routes changed over the years- if so, why have they changed? What were the previous displacement routes, and what are the current ones?

5. Was the community able to support arriving IDPs? If yes, what types of support was provided, and who gave this support?

6. Have some people been displaced more than once or returned and soon displaced again? If yes has this been because of floods or other reasons? [If other reasons] How do different displacement drivers impact one another?

Livelihoods

1. What are the most common livelihood activities (by gender and age)/. Were these livelihoods impacted by the 2020 floods? If yes, how were they impacted, and whose livelihoods were impacted?

2. Was the 2020 flood impact on livelihoods different for women and men? If yes, in what way? Please give some examples.

3. How did the 2020 floods impact agriculture in this community? How long did the effects last / have the effects lasted (loss of seeds, waterlogged fields etc.)?

4. Does this community raise livestock or other animals? If so, which ones? How did the 2020 floods impact livestock rearing/keeping? Have you lost livestock or have livestock gotten sick due to reasons related to the floods? [Could include cattle, sheep, goats, donkeys, chickens, etc.] Did the livestock receive vaccinations before and / or after the 2020 floods?

5. Are there any specials support livelihood initiatives/interventions for the IDPs in this Boma

6. What are the primary livelihoods that male and female youth in this community engage in?

7. Have the livelihoods engaged in by youth (male / female) been impacted by floods that this community has experienced? If so, how have they been impacted, and who has been impacted the most?

WASH / Education / Health

1. Did the 2020 floods impact your access to clean water? If so, how?

2. How did the 2020 floods impact defecation practices?

3. In your opinion, have diseases spread during and after the floods due to reasons related to the 2020 floods? Please provide details: Which diseases were observed in your community, and who was impacted the most? Was assistance provided to reduce the spread of the disease(s)? Were there particular groups within the community that were more likely to contract the disease(s)?

4. Did the2020 floods impact access to healthcare? If so, how?

5. Did the 2020 floods impact access to education? If so, how?

Specialized FGD questions

1. Were women and girls impacted differently by the 2020 floods and are there coping mechanism used only by women and girls? Please explain. [Are women and girls affected differently to men and boys? How do women and girls respond or deal with flooding in ways that are different to men and boys?]

2. Are women and girls the group primarily responsible for collecting firewood and water? If yes, have floods impacted their safety during these activities? And if so, how?

3. Did the floods impact their safety during other livelihood activities? If so, how?

4. Are there any programs, policies or strategies that specifically target women for assistance after floods?

5. What can be done to help women and girls better cope with floods? Please give examples.

6. For women and girls that are IDPs, are there any differences in how they experience and cope with floods? If so, what can be done to better support them?

7. Do you think there has been an increased number of early pregnancies and early/forced marriage due to reasons linked to the floods?

8. Has access to maternal healthcare been impacted by the floods? If yes, what have been the consequences?

IDPs (Group 1 and 2)

1. What are the unique needs and experiences that IDPs in this community have when floods occur?

2. Have there been livelihood initiatives / interventions for the IDPs in this boma?

3. For youth IDPs, are there any differences in how they experience and cope with floods? What can be done to better livelihoods practiced by youth?

4. What are the coping mechanisms that IDPs usually rely on during floods?

5. Among IDPs here, are there some groups of people that are more vulnerable than others? Please give some examples of which groups are more vulnerable, and how they have been impacted.

6. How can IDPs be better supported to prepare for floods and cope with them?

7. Are IDPs in this community sharing resources, services, and infrastructure with the host community? If so, which ones?

8. What is the relationship like between IDPs and the host community?

Elderly and Persons with Disabilities (Group 5)

1. Do the elderly and persons with disabilities cope with floods in ways that are different to the rest of the population? If yes, please explain how for both groups individually.

2. Do the elderly and persons with disabilities flee flooding with the first groups to leave the area when displacement occurs? If not, please provide details.

3. Is there an organization that supports either the elderly or persons with disabilities during flooding to meet their special needs?

4. What can be done to support the elderly or persons with disabilities during flooding to meet their special needs?

Flood Periphery – not affected by floods directly (all groups)

1. Have you received and hosted IDPs arriving from flooded areas in 2020?

2. Are you supporting them or are they living separately? Please provide details.

3. If you are supporting them, how are you supporting them. Please give examples.

4. How are relations between IDPs and the host community? Are there ever any tensions regarding available resources? If yes, please give examples.

Appendix F: Selection of payams and limitations

Selection of payams and limitations

As this field validation seeks to inform the programming of activities and investments under ECRP, IOM selected the most flood-affected payams among ECRP target counties[45] based on available FDNA flooding data. As explained further below, the non-ECRP payam, Bor, was also chosen.

Indicator selection and transformation

The preselection underwent a second step whereby IOM identified particularly vulnerable populations based on Multi Sectoral Location Assessment (IOM DTM's Mobility Tracking), Integrated Food Security Phase Classification data (IPC) and Mobility Tracking data on the presence of IDPs and Returnees.

The table below shows the sub-indicators for each dimension as well as the calculation (scored, value or binary) and polarity (negative or positive). All indicators were checked for discrimination quality by looking at the standard deviation.

For the multi-sectoral needs and vulnerabilities dimension, the assessment included three answer options when asking about specific difficulties or vulnerabilities: "Yes", "No" and "Unknown". For all indicators of the multi-sectoral vulnerability analysis, only definitive answers were recorded as a need. "Unknown" and missing answers were coded as non-needs to eliminate any ambiguity to whether a location is experiencing a need. Therefore, high scores in the vulnerability analysis are a certain measure of high need while low scores are not necessarily reflective of a low level of needs and can imply a degree of uncertainty.

Dimension	Sector	(Sub-)Indicator	Calculation	Polarity
Mobility Tracking		Estimated IDP population	value	NEG
		Estimated returnee population	value	NEG
MSLA	Persons with special vulnerabilities	Persons with disabilities or chronic diseases	value	NEG
	SNFI	Shelters in danger of collapse	value	NEG
		Shelters collapsed	value	NEG
	WASH	No water source for drinking	binary	NEG
		Water not fit for human drinking	binary	NEG
		Reported open defecation or evidence of open defecation	binary	NEG
	Food	No access to food	binary	NEG
	Health	No access to health facility	binary	NEG
	Education	Children do not have access to primary education	binary	NEG
	Protection	There are areas women and girls tend to avoid	binary	NEG
		Security incidents are reported	binary	NEG
IPC		IPC Phase (1-5)	scored	NEG

45 *Add ten new counties (see ToR)*

Indicator and dimension normalization

Normalization of each indicator and / or dimension adjusts the distribution and scale of the (sub-) indicators that may reflect different units of measurement and different ranges of variation.

There are three methods for normalization: the z-score method, the min-max method and the ranking method. The ranking method was selected for two reasons. The z-score method transforms normalized values that are below average into negative values, preventing aggregation in later stages. The min-max method is sensitive to outliers. Given that this index consists of multiple indicators and takes a conservative approach in calculating the severity of needs, the approach taken by the Humanitarian User-Group – the ranking method – was chosen. The ranking method sorts each indicator by "worst" to "best" and gives each entry a ranking.

For the Mobility Tracking and MSLA dimensions, the normalized sub-indicators were aggregated and a ranking was created based on the aggregated value. The normalized indicators now have positive polarity.

Correlation and consistency

Correlation tables were created within each dimension with more than one sub-indicator to check that none of the sub-indicators were too highly correlated with each other. A very high correlation implies that an indicator may be confounded by another, making the inclusion of them redundant and giving them a higher weight. The threshold for acceptable correlation was 0.8 in absolute terms.

Cronbach's alpha was used to check the quality of internal consistency. It measures how closely the indicators are related to each other. In early stages of research, it is recommended to achieve a Cronbach's alpha score of at least 0.6 or 0.7 (Nunnally, 1967; Nunnally and Bernstein, 1994). Notably, the score is also a function of the number of items that are compared. In this case, given that the MSLA dimension includes more indicators than any other dimension, it is expected that the alpha will be lower than for the sub-indicators in other dimensions. For the MSLA dimension, the alpha was 0.45.

IOM DTM accessed Leer, Pibor and Bor counties in September and October 2021. Flood and rain related access constraints, insecurity as well as multiple cases of malaria and typhoid among staff delayed certain field visits. IOM visited three out of four bomas in Leer and assessed the third (Rubichiar) from a distance in a neighbouring boma (excluding facility level infrastructure assessments). Six out of eleven bomas were accessed in Pibor. One boma was too insecure to access (Linyerieth), two had no possible road or river access (Kulugur and Thangajon) and two further boma remained too remote without available car access at the time of assessment.

Applying final diversity criteria

As a last step, a selection was made whereby chosen payams would include at least one (partially) urban area and whereby selected payams would not cluster within the same flood area.

Based on these criteria, the current choice of payams is Pibor (Jonglei State), Leer (Unity State), and Bor (Jonglei State). Other payams on the below list will were initially chosen but access challenges made assessments impossible. For example, Wunkur in Pariang proved too insecure to access in the aftermath of the split of two rival military factions of Sudan's People's Liberation Army-in Opposition (SPLA-IO). Similarly, access issues following current floods as well as unanticipated security concerns made a visit to Akotweng in Baliet County impossible.

County	Payam	MSLA severity	IPC severity	IDP/Ret severity	Rationale
Bor South	Bor	High	Middle	High	[urban] Although Bor (Jonglei state, Bor South county) ranks 26 (of the 457 payams under consideration), it ranks first among the urban payams. In general, Bor hosts a high number of IDPs and returnees. While other payams in Bor South (such as Makuach and Kolnyang) host more, the fact that Bor is the only payam within the county to have an urban area could makes it a good case for looking at a larger population being affected by floods (and probably also individuals from other parts of Bor South being displaced to the urban area).
Pibor	Pibor	middle	high	high	[urban] There are flooded areas throughout the payam, with the highest concentration of affected areas in the North-West. In Pibor county, a higher percentage of the population is affected by the floods, compared to other counties.
Pibor	Lekuangole	middle	high	middle	Among all payams in Pibor, Lekuangole is most affected by floods in terms of area. Significant areas in the East and South as well as some areas in the North-West are affected.
Leer	Leer	middle	low	low	Leer payam has higher population figures compared to the rest of the county and is also significantly affected by floods throughout the payam.
Leer	Pileny	low	low	middle	Of all payams, Pileny is the most affected by flood in terms of area. With the exception of some patched in the centre of the payam, all areas are affected.
Baliet	Akotweng	high	middle	low	Akotweng is affected by floods particularly in the centre and in the North. Affected areas by flooding do not seem to follow a pattern. Within Baliet county, it is the most affected payam. Due to potential security concerns Baliet might remain inaccessible during the time of assessment.
Pariang	Wunkur	high	middle	low	Large areas in the south of the payam are affected by floods. The northern area of the payam unaffected by flooding borders Sudan. Within Pariang county, this is the most affected payam.

Limitation

A key limitation of this index is the varying geographic levels of the data underlying each dimension (see table below). Using data based on higher admin levels (county and state) than the index's admin level (payam) inevitably leads to a less payam-specific index. To mitigate this limitation, IOM DTM will work with the World Bank on payam-level flood data in future to create an index that will further automate the prioritization of target locations for flood assessments or other humanitarian programming that ought to be based on the used flood vulnerability criteria.

Dimension	Admin level
Flood data	County-level (2)
Mobility Tracking	Location-level (5)
MSLA	Location-level (5)
IPC	**County-level (2)**

Accessibility and security

Several payams were not chosen despite a high ranking on the established index due to new information on current accessibility and security concerns. IOM deliberated with World Bank counterparts and settled on Bor as the final area of assessment despite not being included in the ECRP list. Bor, which translates to "flooding" in a local language, was one of the hardest hit payams in South Sudan not only in 2020, but during most seasonal flooding, making it an ideal subject for this assessment which not only shines light on the 2020 flood damages to lives, livelihoods and infrastructure but also aims to highlight existing coping mechanisms.