



Pibor County Flood Assessment Brief

Pibor County, Jonglei State, South Sudan, December 2019

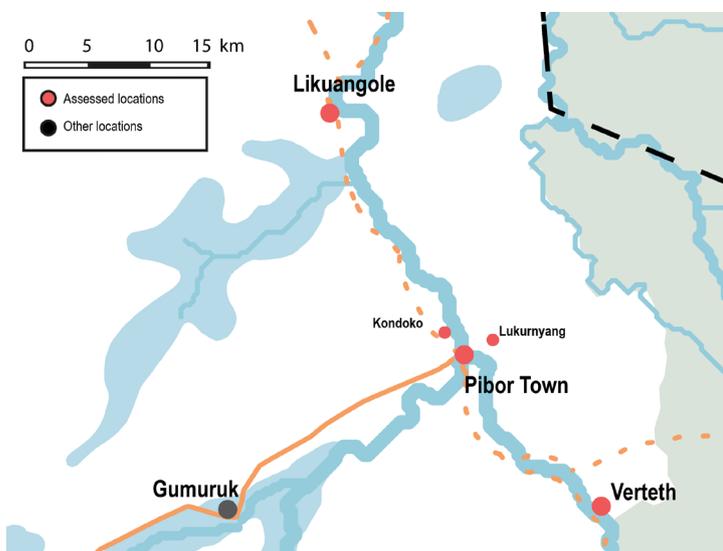
Introduction

A national flooding emergency was declared by the Government of South Sudan in October 2019, with six counties in Jonglei state being severely affected¹ and Pibor county was one of the heaviest affected according to the Office for the Coordination of Humanitarian Affairs (OCHA)². The flooding had initially cut off access to humanitarian services for much of the population, and continues to present operational challenges for partners to deliver aid to affected populations.

Pibor county is particularly vulnerable due to the accumulation of shocks (acute food insecurity, inter-communal violence, drought and disease outbreaks) over the past years, lack of water and sanitation infrastructure, persistently high prevalence of global acute malnutrition (GAM), and seasonal lack of access to services during the rainy season³. These shocks have contributed to the poor food security and nutrition situation observed prior to the October flooding, with 154,000 people estimated (65% of the population) in IPC Phase 3 'Crisis' or worse for food insecurity in August 2019⁴, and the most recent nutrition surveys⁵ reporting GAM prevalences well above World Health Organisation (WHO) recommended emergency thresholds⁶.

REACH conducts ad hoc rapid assessments to monitor shocks in areas of concern identified by the Needs Analysis Working Group (NAWG), partners and the Integrated Needs Tracking (INT) System⁷. In order to fill information gaps related to the flooding in Pibor, the World Food Programme and REACH conducted a joint assessment between 26 November and 06 December 2019 to assess the needs in flood-affected areas of Pibor county, Jonglei state. The primary objective was to assess the food security and nutrition situation in flood-affected areas, population dynamics, access to services and other priority needs, in accessible flood-affected areas. The assessment team visited areas within Pibor

Map 1: Assessed locations, Pibor county (lowlands)



Key Findings

- Prior to flooding, the August 2019 IPC Workshop classified Pibor county as Phase 4 'Emergency' for food insecurity, and Phase 4 'Critical' for acute malnutrition. Pibor county was projected to be Phase 3 'Crisis' for the September to December 2019 period [post-harvest], and projected Phase 4 'Emergency' for the January to April 2020 [lean season] period for food insecurity⁴. **Assessment results suggest the effects of flooding will likely exacerbate needs in the coming dry season due to limited food availability and accessibility, lost livestock and assets, market fluctuations, increased morbidity, and an extended period of limited access to services due to flood waters.**

- Flooding disrupted normal cattle migration, forcing cattle to nearby high ground locations. Whole households have reportedly migrated with their cattle, an extreme coping strategy previously used during times of severe food insecurity. These populations are likely unable to access services that are available at population centres. **The scope of needs and likely caseloads remains a key information gap, due to the reported high level of movement and continued inability to access many of these locations.**

- **Food availability and accessibility was limited in assessed areas due to destroyed crops, lost livestock and livelihoods assets, disrupted access to markets and other traditional coping mechanisms, and large increases in market food prices.** Food consumption patterns likely reflected the reduced availability and accessibility of food. More than two-thirds of assessed households had food consumption scores (FCS)⁸ of 'poor' or 'borderline' (66%), indicating low quality of diet, with households relying on limited cereals, meat, fish, and limited vegetables. Nearly all assessed households had household hunger scale (HHS)⁹ scores of 'moderate' (99%), indicating moderate quantity of food consumed, with many households reporting consuming only 1-2 meals per day, and sometimes going entire days without food.

- The health environment was of concern with high child morbidity, increasing trends of diarrhoea and acute respiratory infections, and operational challenges impeding partners ability to provide services. The prevalence of child morbidity was high, with more than one-third (38%) of children under-5 years reportedly sick in the two weeks prior to data collection. Fever (suspected malaria) was the most common symptom reported (32%), followed by cough (17%), and diarrhoea (16%).

- The water, sanitation and hygiene (WASH) situation is concerning in Pibor town due to contaminated water sources, likely due to flooding, and lack of functional latrines. **Open defecation is prevalent, and an increase in diarrhoeal diseases has been noted in health facility admissions data.** The majority of water points (76%) in Pibor town tested positive for contamination by the WHO WASH team¹⁰, with several points remaining flooded at the time of data collection.

- Flood waters were a major operational constraint for actors and may remain so through January. Constrains include the limited mobility to reach affected populations, receding flood waters changing river paths and dynamics, lack of information on yet to be identified displaced populations, and increased reports of intra-communal violence and security incidents.

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town, as well as areas outside the town including Likuangole centre, Verteth centre, Kondoko and Lukurnyang settlements (see Map 1).

Pre-existing vulnerabilities and effects of the flooding

Prior to the current flooding situation, Pibor had a number of pre-existing vulnerabilities due to being in the South-eastern semi-arid pastoral livelihood zone and re-occurring shocks, including climatic and inter-communal violence, degrading the food security, livelihoods, and nutrition of the population over the past several years. The August 2019 IPC Workshop classified Pibor as Phase 4 'Emergency' for Acute Food Security, and projected an improvement to Phase 3 'Stressed' in the September to December 2019 period, and a further deterioration to Phase 4 'Emergency' in January to April 2020⁴. However, these projections were made based on assumptions prior to the flooding. The most recent severe flooding started in the beginning of October 2019, with rainfall far exceeding long-term averages up to November (see Figure 3). The effects of the October 2019 flooding on population and cattle movements, food availability and accessibility, and access to humanitarian services have broken these assumptions, making it likely that the food security, nutrition and health status of the population in Pibor will deteriorate further in the coming months.

Cattle and population movement dynamics

The flooding caused both internal displacement of populations, and disruption of cattle migration patterns. Two main migration patterns were observed depending on cattle ownership. For HHs with cattle,

Methodology

A mixed methods approach was utilised with household surveys, focus group discussions, key informant interviews, participatory mapping, and transect walks¹¹. Sites were purposively selected based on accessibility, early participatory mapping of flood affected-areas, and key informant reporting. Likuangole, Verteth, Pibor town, and Gumuruk payams were identified, however Gumuruk was not accessed by the assessment team due to logistical challenges. Survey teams moved house-to-house, exhaustively interviewing all households and measuring all children as time allowed in the field, and findings are indicative of the assessed locations. Approximately half of interviewed households were randomly selected for food security questions. All age-eligible children and pregnant and lactating women (PLW) were assessed by MUAC¹², with height being used as a proxy for age determination¹³, and women self-reporting PLW status. Focus groups were organised by local authorities and conducted for both men and women separately. In total, 198 households were interviewed for food security, 434 children under 5 years and 424 PLW were assessed for MUAC, 10 focus group discussions, and 8 key informants interviewed. PLAN International, VSF-Germany, UNICEF, JAM, and other organisations contributed to data collection and logistics.

Table 1: Number of assessed households and individuals by location

Pibor Town	Households	Children	PLW*
Hai Jakor	39	29	28
Hait Mathar A	55	55	51
Hai Mathar B	70	70	79
Market Area	59	64	49
Pibor Center	112	62	41
Outside Pibor Town	Households	Children	PLW*
Kondoko	75	59	67
Lukurnyang	44	61	45
Likuangole	29	22	27
Verteth	33	15	30

*Pregnant and lactating women (PLW)

Figure 1: Seasonal calendar, Pibor county

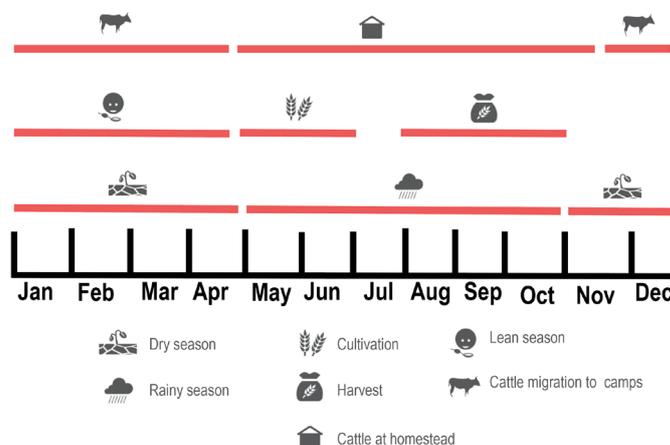
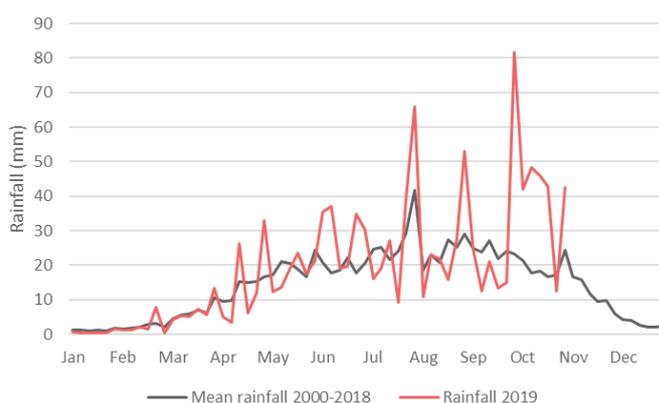


Figure 2: GAM and SAM in Pibor County, 2016 - 2018⁵

Month / Year	Period	GAM (95% CI)	SAM (95% CI)
October 2016	Post-harvest	26.4% (21.6 - 31.8)	6.6% (4.4 - 9.6)
October 2017	Post-harvest	26.8% (22.8 - 31.2)	8% (6 - 10.6)
May 2018	Pre-harvest	20.7% (17 - 25)	4.9% (3.1 - 7.4)
October 2018	Post-harvest	20.8% (17.3 - 24.8)	4.3% (3.0 - 6.3)

Figure 3: Rainfall data for Long term (2000-2018) and 2019, Pibor County¹⁴



most household members including women, children and elderly, migrated with livestock to temporary cattle camps in high ground locations. For HHs without cattle or dependent on agriculture, they remained in population centres or moved to high ground locations within those centres, such as in Pibor, Likuangole and Verteth payams. HHs remaining in population centres have reportedly retained some level of access to services, with health services, emergency food distributions, and non-food items (NFIs) available in these locations since the flooding.

Cattle keepers in the Pibor area would normally travel to Kong Kong and Jom dry season grazing areas in December, however many cattle have reportedly been forced to instead migrate towards high ground pasture northwest of Pibor town in the area of Longalath. Similarly in Likuangole, cattle have been forced towards Kongor instead of normal seasonal pastures, while cattle in Verteth and Gumuruk have reportedly settled on nearby high ground, unable to migrate (see Map 2). While some FGD participants reported that people in temporary cattle camps were relying on meat from dead animals and limited milk supply (reduced due to lack of pasture), the assessment team was unable to access these camps to confirm. Food availability and accessibility remains a concern given the lack of information on the condition of HHs in these camps. Dry season migration will likely be delayed due to high flood waters, or as HHs remain closer to home as they have access to water. Some FGD participants from Longalath reported they may seek alternate routes to access pasture in order to start to move cattle to dry season grounds earlier, however this may cause additional tensions over limited resources along these routes.

Impact on Food security and Livelihoods

FGD participants reported limited food availability in October 2019, with markets either not functioning or being inaccessible, and losses of household food stocks and cattle from the flooding. FGD participants and key informants reported that the food stocks were very limited at the time of the assessment. While some HHs had reportedly harvested crops prior to flooding, some HHs were unable to harvest due to late rains causing failed crops, according to FGD participants and KIs in Likuangole centre and Lukurnyang.

Markets were flooded in October, reducing or ceasing market functionality and also cutting off physical access to the markets. At the time of data collection however, markets in Likuangole and Pibor town were semi-functional again. While the market in Pibor town remained flooded, vendors had set up shops in another part of town, with vendors relying on limited stocks from prior to flooding and expensive commercial flights to maintain their supply chains. These supply bottle necks resulted in doubling or tripling of food prices compared to before the flooding. For example, the price of one can of maize flour would normally sell for 100 South Sudanese Pounds (SSP) before the floods, has risen to 250 SSP; and 1kg of beans which was 400 SSP before the floods, was now 800 SSP at the time of data collection.

The low availability and access have exacerbated food consumption gaps for flood-affected populations. A moderate quantity of food

Map 2: Assessed locations, normal and alternate cattle migration routes, Pibor county

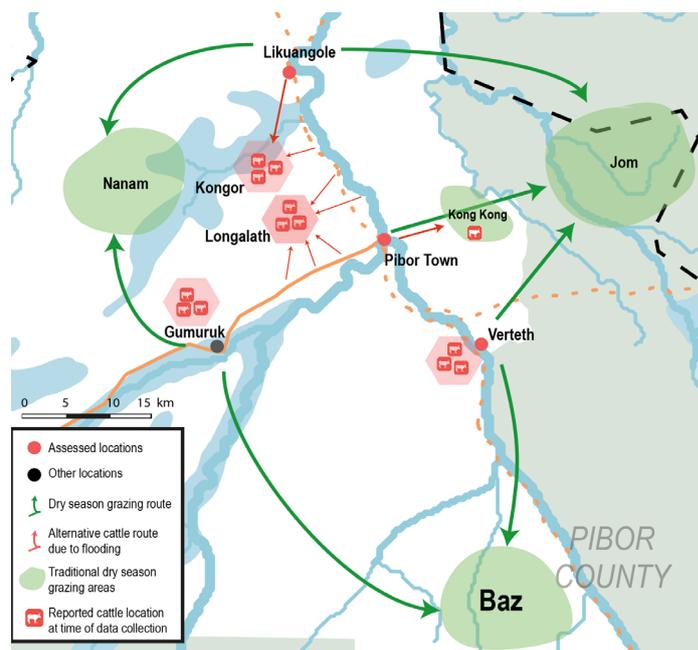


Figure 4: % of households by food consumption scores (n=148)

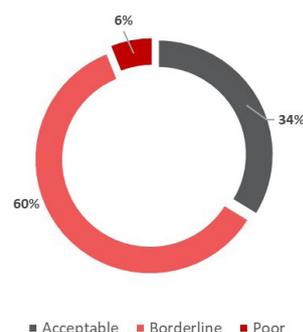
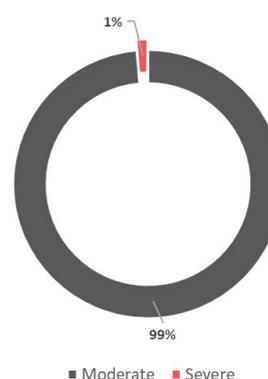


Figure 5: % of households by household hunger scale (n=198)



consumed was observed, with nearly all households classified with HHS scores of 'moderate' or worse, and most households reportedly only eating 1-2 meals per day, as opposed to the normal 2-3 meals per day consumed this time last year. Limited dietary diversity was observed, with two-thirds of households classified with food consumption scores (FCS) of 'borderline' or worse. Poor dietary diversity is likely driven by reduced access to cereals and staple foods, however access to seasonal fishing and meat have somewhat buoyed up the quality of food for some households. While access to fishing and other wild foods (fruits and leaves) will likely

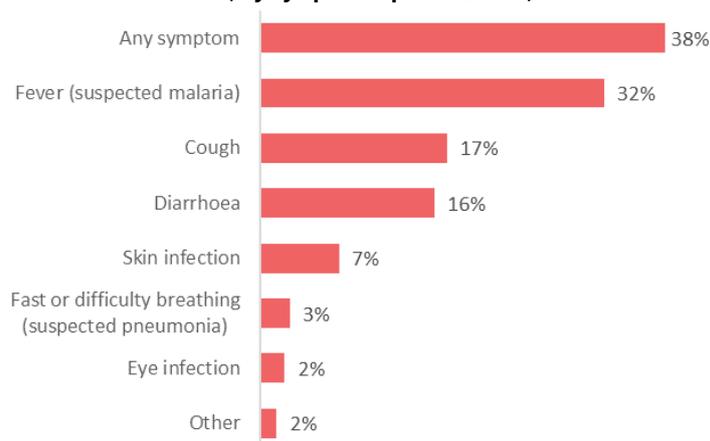
continue until March, dietary diversity may decrease as the ability of households to trade livestock for cereals is reduced, and the availability of meat and milk decreases due to livestock losses and reduced access to herds as they move to dry season grazing areas.

Coping strategies for accessing food or resources to buy food have been limited due to the flooding. Normally households would supplement income to purchase food in the market during this period by selling and producing charcoal, grass cutting, collecting wild foods or utilising other natural resources. However, flood waters were still high at the time of the assessment, limiting both access to natural resources and to markets where they could be sold. Livelihoods assets lost during flooding such as axes and other tools have also limited these activities. Cattle markets, such as in Bor or Juba, could also not be accessed to sell livestock due to restricted movement, further decreasing households' ability to cope with the current situation. Normally, HHs in Pibor split during cattle migration with young men moving to cattle camps to protect herds. Moving entire HHs, including women, children and elderly, is a livelihood coping strategy commonly observed in this context in response to severe food insecurity, allowing access to meat and milk. For HHs with cattle, escaping flood waters and protecting herds were immediate reasons for migration with livestock to temporary cattle camps during the flooding, however HH members also remained in these camps as a coping strategy due to lack of access to food. As flood waters recede, access to natural resources and markets will increase, however it is unclear whether households will choose to follow their cattle to dry season grazing grounds, or stay near population centres in order to access humanitarian assistance.

Impact on Water, Sanitation and Hygiene (WASH)

The WASH environment was poor in assessed locations in terms of unavailability of safe water and lack of sanitation facilities. The flooding submerged all but a handful of water points and latrines in Pibor town and surrounding communities, likely contributing to contamination of those water sources, according to key informants. Three quarters (76%) of water points tested by the World Health Organisation (WHO) in previous weeks tested positive for some level of contamination¹⁰. Access to safe drinking water has been a major concern in Pibor county even prior to the flooding due to lack of infrastructure outside population centres, and a low water table, which is unavailable in the dry season. Outside of Pibor town, there are limited functioning handpumps, with some HHs reportedly using untreated river water because it is their only source or because of long queues at existing handpumps, as reported by key informants in Likuangle. The lack of latrines in population centres has exacerbated poor sanitation, as some of the few available latrines available are still flooded, and the displaced population is congested in a smaller area, which increases the risk of faecal contamination. The poor WASH environment has likely contributed to the increase in diarrhoeal cases observed, which may further increase in the coming months as flood waters recede and water sources become scarcer.

Figure 6: % of children 6-59 months who were sick in the two weeks prior to data collection, by symptom reported (n = 1,024)



Impact on Health and Nutrition

The flooding had immediate effects on the health and nutritional status of the population, with limited access to services, with loss of life reported¹⁵, high levels of morbidity and malnutrition, and major operational challenges for partners to provide services. The number of health consultations has remained relatively steady since October¹⁶, likely due to a combination of limited access to flood-affected populations, and increased morbidity. The proportion of illnesses attributable to diarrhoea and acute respiratory infections (ARI) has steadily increased¹⁶, likely due to the onset of the cold season, coupled with unhygienic conditions due to flooding and increased exposure for households without shelter. In assessed areas, more than one-third (38%) of children under 5 years of age were reported sick in the two weeks prior to data collection, with the most common symptoms reported as fever (32%), cough (17%), and diarrhoea (16%). Of the 20 health facility sites in Pibor county, 14 were reported to be partially or severely affected by the flooding, according to health cluster partners¹⁴.

Action Against Hunger (AAH-USA) and Joint Aid Mission (JAM) conducted a mass MUAC screening, covering Likuangle centre and Pibor town at the end of October, recording a proxy GAM by MUAC¹⁷ of 8.9%, and proxy SAM of 3.2%, which indicated a severe situation¹⁵. Since then, the situation appears to have improved. As part of this assessment, a MUAC screening was conducted in Pibor town, Kondoko, Lukurniyang and very limited samples in Likuangle and Verteth due to short time on the ground, and found a proxy, weighted GAM of 3.2% for children under 5 years.

However, the MUAC screening reinforced the notion that HHs may have moved to cattle camps, as children over 2 years of age were under-represented in the sample, suggesting they may not have been in the assessed areas. Of children identified as malnourished by MUAC, only approximately one-third (34%, or 8 of 23 children) were reportedly in a therapeutic feeding program (OTP or TSFP), indicating low program coverage at the time of assessment. The proxy GAM for PLW in the assessed locations was moderate at 16%, supporting that the nutrition situation was poor but not severe in these assessed areas.

Of particular concern is the risk of human disease outbreaks in Pibor county due to diminished service access and increased exposure of populations.

In April 2019, a measles outbreak was reported, which lasted until August¹⁶. Outbreaks such as these are related to challenges in implementing immunisation activities accessing very mobile and hard to reach populations in Pibor county. These normal challenges have been exacerbated by the flooding, and caused the bi-annual National Immunisation Day (NID) campaign, usually conducted in November, to be delayed until accessibility improves. This delay in preventive services and seasonal challenges in immunisation campaigns, coupled with the poor public health situation due to flooding (contaminated water sources, open defecation, congested populations lacking shelter) may further increase the risk of an outbreak occurring, further impacting morbidity and malnutrition in the coming months.

Likely Situation Evolution for January to April 2020

In the coming dry season from January to April 2020, Pibor county was projected to face Phase 4 'Emergency' conditions for food insecurity, and Phase 4 'Critical' for acute malnutrition, according to the IPC Analysis Workshop in August 2019. **These projections were made under assumptions of food and livelihoods availability and accessibility that likely no longer hold true.** With flooding having had widespread effects on food availability and accessibility, loss of cattle and other livelihood assets, and increased morbidity, it is likely that households will face even greater needs than originally projected for this period. A number of key issues that may affect humanitarian needs in the coming months and should be monitored include:

- **Condition of populations in cattle camps** – At the time of assessment, there remained information gaps on the condition of populations in cattle camps, given flood waters were still cutting off access to humanitarian food, health, and nutrition services. While these populations reportedly had access to cattle for meat, milk production is reportedly diminished due to lack of grazing land and livestock diseases. It is important to further assess the situation in the coming one to two months when accessibility improves.
- **Population movement dynamics** – Two potential movement patterns could be expected; (A) households with cattle remaining may have household members follow livestock to dry season cattle camps as a coping strategy, which may increase access to milk but may reduce their access to humanitarian services; (B) households may split, sending some household members to cattle camps and others to population centres in order to access food or other humanitarian services. Whether individual households have lost a lot of livestock or have access to other coping strategies may affect their decision making.
- **Cattle movement dynamics** – As flood waters recede and cattle start moving towards dry season grazing areas, alternate routes may be used to more quickly move towards dry season grazing grounds, as reported by some FGD participants. This

may increase tensions between communities, as they share limited water sources and grazing areas along these routes.

- **Market dynamics** – Given the reported loss of household crops, some households will be dependent on markets for access to staple foods sooner in the dry season than normal. Additionally, prices may remain high due to increased demand and diminished supply, as traders will likely not be able to restock goods from Juba by the Gumuruk road until possibly January or February.
- **Increasing morbidity and risk of disease outbreaks** – With flood waters receding, morbidity of malaria and diarrhoea will likely increase due to more breeding grounds for vector borne diseases, and an increase in the concentration of contaminated water sources. Most likely there will also be a seasonal increase in respiratory infections (ARI), compounded by increased exposure of households with damaged shelters. The bi-annual NID campaign scheduled for November is delayed until accessibility improves, which may further increase the risk of disease outbreaks.
- **Increase in security incidents** - There have been several incidents of insecurity including cattle raiding, age-set fighting¹⁸, and other security incidents. If the situation deteriorates, the frequency of these incidents may increase.

Conclusion

Pibor county has faced an accumulation of shocks over the past several years including intra-communal conflict, climatic shocks such as flooding and drought, both human and livestock disease outbreaks, which have eroded household resilience. For these reasons, Pibor county was already an area of concern coming into the January to April dry season, and was projected to be Phase 4 for both IPC Acute Food Insecurity and Acute Malnutrition. **The flooding has changed the underlying assumptions made for these projections and has likely further exacerbated needs, diminished assets and impacted the health and nutritional status of the population.** Households have coped with the situation through migrating to cattle camps, or utilising limited natural resources in the area, however only a portion of the population can currently access humanitarian assistance. Floods continue to present major operational challenges for partners, the most notable being access to populations in cattle camps, but also the potential for an increase in criminality now and in the dry season. The condition of populations in cattle camps, cattle movement patterns, market dynamics, and the risk for disease outbreaks are all key factors to monitor in the coming months.

Footnotes

1 Voice of America South Sudan. South Sudan President Declares State of Emergency for Flood Victims. 31 October 2019.

2 Flooding Update #4, RC South Sudan. 29 November 2019.

3 REACH. Pibor County Food Security and Livelihoods Brief: Pibor County, Jonglei State, South Sudan. April 2018.

4 IPC Analysis Workshop, South Sudan, August 2019

5 South Sudan SMART Survey Matrix 2019.

6 WHO guidance recommends an emergency threshold for the prevalence of global acute malnutrition by weight-for-height of 15%. From WHO The management of nutrition in major emergencies. 2000.

7 The Integrated Needs Tracking (INT) system is an information management system for comparing the needs across multiple-sectors to help decision makers prioritise their response. More information can be found in [here](#).

8 Food consumption score (FCS) is an indicator of the general quantity and quality of foods being consumed in a household, based on how many days any household members have consumed 9 distinct food groups within a 7 day recall period. Households are categorized into categories of severity based on their responses. FCS is often used as a proxy for quality of food consumed. Standard FCS thresholds are <21 for 'poor', 21-<=35 for 'borderline' and 35+ for 'acceptable'. More information on FCS can be found [here](#).

9 Household hunger scale (HHS) measures the perceived hunger by asking the frequency a household has experienced three common experiences associated with hunger in the past 30 days (no food in the house, slept hungry, gone whole day and night without food). HHS is often used as a proxy for quantity of food consumed. Thresholds and categories used for analysis are those used for IPC AFI in South Sudan. More information on HHS can be found [here](#).

10 Pibor Health Cluster meeting minutes. 04 December 2019.

11 A transect walk is an observational walk through the community with key informants.

12 Mid-upper arm circumference (MUAC) is one anthropometric measure used to determine the nutritional status of a child, where the circumference around the mid-point of the left arm is measured. If MUAC is <11.5cm, the child is considered SAM, and if between 11.5 to <12.5cm then the child is classified with moderate acute malnutrition (MAM). For PLW, SAM was classified as having a MUAC of less than 21cm, and MAM as less than 23cm.

13 Height can be used as a rapid proxy for age-determination. Children under 6 months (<65cm) and children older than 5 years (>110cm) were not measured for MUAC. Children were estimated to be under 2 years of age (65 to <87cm) or over 2 years of age (87 to <110cm).

14 [CliMis Rainfall data](#).

15 Assessment Report on the Impact of Flood on Human Activity, Pibor County, Boma State. 31 October 2019. VSF-Germany Programs Department.

16 Integrated Disease Surveillance and Response (IDSR). Epidemiological Bulletin Week 47, 2019 (18 – 24 November). WHO and Ministry of Health South Sudan.

17 Global acute malnutrition (GAM) is the proportion or prevalence of acute malnutrition in a population, including both severe acute malnutrition (SAM) and moderate acute malnutrition (MAM). The term proxy GAM is used because the results are not a true estimate of the prevalence of acute malnutrition in the population. This is because MUAC is more sensitive to malnutrition in children under 2 years of age.

18 In Murle culture, people belong to their age-set groups depending on when they were born. Age set groups have been known to have clashed between each other in the Pibor context. *Gumruk - Manythor - Manyat Protection Assessment Factsheet, Jonglei State - South Sudan. Danish Refugee Council. 07-03-2019*

About REACH

REACH is a leading humanitarian information provider that uses primary data collection and in-depth analysis as tools to enhance the capacity of aid actors to make evidence-based decisions in emergency, recovery and development settings.

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