



Highlights

- Widespread flooding¹ was reported across the country, affecting over 835 000 people, with the overall impact on crop and livestock production deemed as significant. Some states, particularly Warrap, Northern Bahr el Ghazal (NBeG) and Jonglei were the most affected in terms of loss of production.
- FAO assessments show that about 65 107 hectares of land planted with cereals has been damaged with an estimated loss of 37 624 tonnes² of grain in the flood-affected areas.
- In most of the affected locations, the floods arrived when the crops were either in late maturity stage or at the time of harvesting (matured crops), which minimized the pre-harvest losses at the field. However, the loss of cereals during the post-harvest period is high due to the prevailing wet conditions and poor storage facilities.
- Jonglei experienced heavy flooding in 2019 and 2020, especially in Twic East and some parts of Bor South, the floodwaters never receded and therefore minimal agricultural activities took place during the current season.
- An estimated 795 558 livestock have perished due to flooding this year in eight states. This includes cattle, goats and sheep, and an unknown number of poultry, dogs and donkeys.
- Flood buffer zones have significantly decreased the level of interstate cattle raiding in Wunlit triangle (Unity, Warrap and Lakes), as well as in Jonglei.
- On the other hand, as water recedes, soil moisture conditions will improve and offer the opportunity for flood recession farming, which enhances agricultural production, specifically for vegetables, and as a result, would improve the nutrition status of the farming households. In addition, there are opportunities for fishing if the necessary fishing kits are provided to the communities in the flood-affected areas.

Background

Flooding occurs annually in the flood-prone states of Jonglei, Lakes, Warrap, NBeG, Unity, Upper Nile and others in Greater Equatoria (Central Equatoria and Eastern Equatoria). The extent of flood damage varies from area to area and from year to year. In 2021, serious to mild flood damages were reported in parts of Jonglei, Warrap, Upper Nile, Northern Bahr el Ghazal, Unity, Lakes and Central Equatoria States. Similarly, the impact on crops, livestock and natural resources (pastureland) varies depending on the timing of floods - the growth stages of crops, seasonal livestock movement and time of harvesting crops³.

Over the past three years, the volume of water that caused flooding has increased, with the highest flooding reported in 2019. Excessive rains, overflow of rivers, or a combination of both normally causes flooding – with some of the rivers flowing in from areas as far as neighbouring countries.

This report is the result of a rapid assessment conducted by FAO, Ministry of Agriculture and Food Security (MAFS) and State Ministries of Agriculture (MoAs) between 20 and 30 October 2021. The team includes trained Agricultural Task Force members, County Crop Monitoring Committees (CCMCs), livestock data collectors and FAO's Agricultural Extension Assistants.

1 Flooding is full coverage or submerging of land with a large amount of water.

2 This estimate represents gross crop production loss.

3 The impact of flood damage on young seedlings is more serious compared to mature crops, which are more tolerant.

Sources of flood waters and time of occurrence

Table 1 below provides a summary of the main states affected by flooding, the timing of floods, and the sources of the flood waters.

| State | Source of flood water | Time of flooding (June – Nov 2021) |
|-------------------------|---|--|
| Jonglei | Overflow of Nile, Sobat, Akobo, Khorflus, Ater and Nyading rivers | August - October 2021 |
| Warrap | 1st flooding by heavy rainfall | Mid-April 2021 |
| | 2nd flooding overflow of rivers | September 2021 |
| Northern Bahr el Ghazal | Rainfall and overflow of rivers | July - August 2021 |
| Central Equatoria | Overflow of River Nile and excess rainfall | Third week of September 2021 |
| Unity | Overflow of River Nile | <ul style="list-style-type: none"> • June - September 2021 • October - November 2021 |
| Upper Nile | Overflow of river Nile | October 2021 |
| Lakes | Overflow of Nile and Gel Rivers; excess rains | <ul style="list-style-type: none"> • Mid-August - November 2021 • Mid-September - October 2021 |

Table 1 – Sources of flood waters and time of occurrence (2021)

Flood impact on cereal crops

The overall impact of floods on cereals has been significant this year. An estimated 65 177 hectares of cereal area were affected during the cropping season, causing the loss of about 37 624 tonnes of cereal production. Warrap was the most affected State with about 21 126 tonnes of cereal loss, followed by Northern Bahr el Ghazal's 7 764 tonnes, and Jonglei with 6 681 tonnes of cereal loss. Other states including Lakes, Upper Nile, Unity and Central Equatoria were affected but to a lower extent (Table 1).

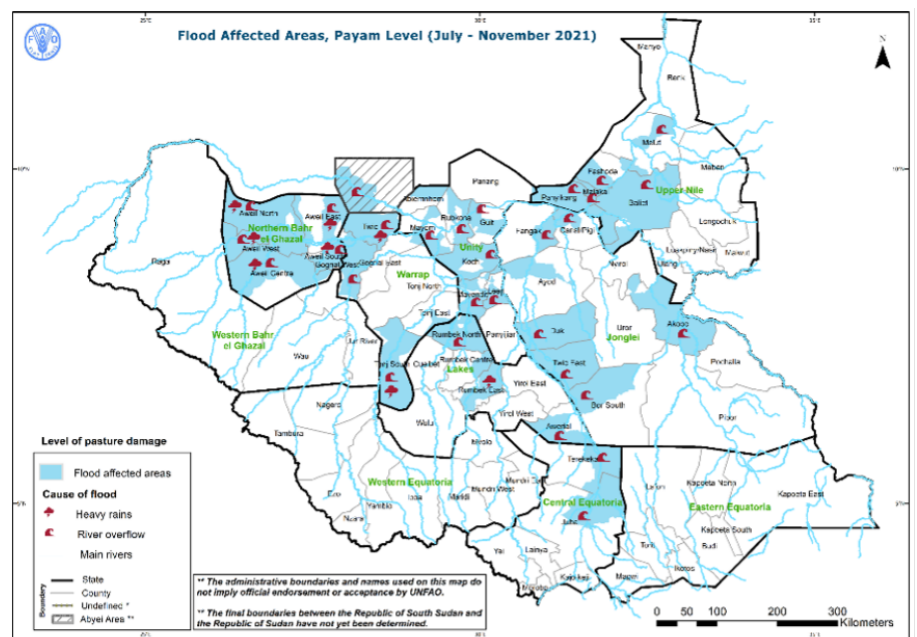


Figure 1: Flood Affected Areas

| NAME OF STATE and (# of Counties) | Expected production as in 2021 (tons) | Cereal area damaged (ha) | Estimated cereal production loss in 2021 (tons) |
|-----------------------------------|---------------------------------------|--------------------------|---|
| Lakes (3) | 45 290 | 1 133 | 637 |
| Upper Nile (5) | 6 691 | 1 493 | 506 |
| Northern Bahr el Ghazal (5) | 148 658 | 17 691 | 7 764 |
| Warrap (4) | 133 601 | 28 491 | 21 126 |
| Central Equatoria (2) | 41 621 | 1 620 | 773 |
| Jonglei (8) | 24 317 | 14 513 | 6 681 |
| Unity (6) | 10 916 | 236 | 137 |
| Eastern Equatoria | | | |
| Grand Total | 411 093 | 65 177 | 37 624 |

Table 2 – Estimated loss of cereal production due to flood damage - 2021 (calculation based on CFSAM 2020 data)

Note: There are no reports of significant flood impact on crops in Eastern Equatoria in 2021

Flood impact on livestock

Livestock losses occurred in the assessed states with variations in numbers by species. An estimated 795 558⁴ heads of cattle, goats, sheep and an unknown number of poultry died because of drowning, lack of livestock feed and diseases. Of the livestock losses, small ruminants recorded the highest losses. However, the number of livestock loss this year due to flooding is less than that of the previous years because most of livestock had already moved to higher grounds, especially in Pibor, Bor South, Twic East and Duk counties in Jonglei State, whereas livestock from Panyijiar County in Unity State moved to Yirol County in Lakes State. Pibor, Akobo, Nyirol and Uror counties in Jonglei State have not been significantly affected by floods as in the previous years. On a positive note, floods have decreased the interstate cattle raiding, especially in the Wunlit triangle region (Lakes, Unity and Warrap states), as well as in Jonglei State. Fish have also increased thus helped households to cope, and supplement the diets of the livestock keeping populations who were caught or stranded in flooded areas.

| States | No. of Counties affected | Total livestock (cattle, goats, sheep) affected | Total livestock (cattle, goats, sheep) death | % livestock death to affected |
|--------------|--------------------------|---|--|-------------------------------|
| Jonglei | 8 | 2,354,850 | 251,325 | 10.67% |
| NBEG | 5 | 846,130 | 12,789 | 1.51% |
| Lakes | 5 | 740,668 | 7,431 | 1.00% |
| Warrap | 6 | 1,689,564 | 25,368 | 1.50% |
| Upper Nil | 6 | 1,893,408 | 143,210 | 7.56% |
| Unity | 7 | 2,589,634 | 354,725 | 13.70% |
| WBEB | 3 | 33,460 | 356 | 1.06% |
| EES | 5 | 27,823 | 354 | 1.27% |
| Total | 45 | 10,175,537 | 795,558 | 7.82% |

Table 3 – Estimated number of livestock deaths due to floods – 2021

Note: Livestock numbers are estimated heads of livestock affected by the floods.

⁴ This represents about 0.6 percent of the livestock population in South Sudan.

Recommendations

In addition to the emergency food assistance by the responsible agencies and NGOs, the following agricultural interventions are required to improve food security of the vulnerable households in the affected areas.

Short term interventions:

- a. Crop and livestock assessments and/or surveys to be conducted to assess the impact of floods and other disasters in the affected areas;
- b. Urgent provision of fishing kits to exploit the abundance of fish in flooded areas and contribute to the improvement of the food and nutrition security situation of the affected population;
- c. Provision of various types of vegetable seeds, cow peas and other planting materials (e.g. sweet potato cuttings) to take advantage of receding flood waters;
- d. Provision of veterinary services in the areas heavily affected by floods;
- e. Provision of boats to aid in transportation of supplies and human movement;
- f. Provision of small ruminants to female headed households to rebuild their livestock assets; and
- g. Provide technical support to coordination meetings and logistical support to the offices of the State Director General of Agriculture, Livestock and Fisheries in the affected states and counties so that they can provide advisory services to the affected populations.

Medium term interventions:

- a. Cash voucher interventions to support access to agricultural inputs as well as nutritious foods;
- b. Support multiplication and distribution of planting materials of vegetables, roots and tubers, such as sweet potatoes and cassava cuttings;
- c. In coordination with local departments of Agriculture, undertake livestock destocking to minimize livestock losses and distribute the meat to severely affected families to improve their nutritional status; and
- d. Support local authorities in the implementation of contingency plans and strategies related to land and water management as part of their flood mitigation measures.

ANNEXES

Jonglei

Seven out of the 11 counties of Jonglei were affected by floods caused by overflow of rivers, namely the Nile, Akobo, Sobat and Agwi rivers. Last year's flood waters, which had not subsided in time for this year's flooding, exacerbated the situation this year. The seasonal rainfall for 2021 in Jonglei State generally started in the fourth week of May and established in June, which is considered late. The amount of rainfall reported was average, with dry spells of about two weeks in mid-June, until the first week of July, after which the rainfall intensified in July and August. Part of Jonglei State is in the lowlands along the Nile basin, making it one of the most flood prone areas in the country also due to the heavy clay soil present in the area.

In 2021, the total cereal planted areas affected by floods in the seven counties was estimated at 14 513 hectares, while the production loss was estimated at 6 681 tonnes.

In Twic County and the areas of Jalle and Baidid in Bor County, water from the previous floods of 2019 and 2020 never receded and no planting took place in these areas. However, higher grounds were extensively utilized by the communities.

Upper Nile

Six out of 12 counties were assessed to determine the impact of floods in 2021 in the State. A total loss of 506 tonnes of cereals production was estimated out of the total damaged area of 1 493 hectares due to floods. The most affected counties are Melut and Maban, with cereal production losses of 256 and 250 tonnes, respectively.

Unity

In Unity State, six counties were assessed to determine the impact of flooding on crops. These include Rubkona, Guit, Mayendit Mayom, Koch and Leer counties. The damaged cereal area in these six counties is about 235 hectares while the loss of production for the six counties is estimated at 137 tonnes, which comparatively, is not significant. The floods arrived when the maize crop was at maturity stage, and therefore, the damage was minimal, but displacement of communities was serious and post-harvest losses are likely to be high due to poor post-harvest handling and storage facilities.

Warrap

Four out of the six counties of Warrap have been affected by floods including Gogrial West, Twic, Gogrial East and Tonj South. The flood damage caused an estimated loss of 21 126 tonnes of cereals, thus putting the flood affected areas of Warrap at 15.8 percent less production compared to the expected production without flood damage in the four counties.

The first flooding that occurred in July was caused by heavy rainfall and covered Gogrial, Twic and Tonj counties. It caused serious damage on groundnuts, late planted sorghum, and other crops including sesame which were below knee height. During the first flooding, the lowland areas of Tonj South were the most affected as majority of the farmers planted late in June and July. Hence, the crops were totally immersed and did not recover in most of these areas.

The second flooding for Gogrial and Twic Counties occurred in September causing significant damage on early planted sorghum. Crops were affected at pre-harvest maturity stage. Only few farmers managed to harvest submerged sorghum but with greater post-harvest loss due to too much moisture content, while for Tonj South, the second flood came in October as Tonj River water level inundates.

In Abyei, the rain started in May, followed by dry spells up to June/July. Therefore, the impact on crops was due to dry spells rather than waterlogging. Harvesting of crops started in September and continued up to October. As a result, the effect of flooding was minimal in Abyei, except in a few areas close to Kiir River, which were flooded in September because of river overflow.

Lakes

Three out of eight counties were affected by floods, namely Rumbek North, Awerial and Rumbek East. The floods were caused by a combination of river overflow (Nile and Gel rivers) and heavy rainfall. The first flood occurred from August to November, while the second one occurred from mid-September to October 2021. Since the floods occurred at maturity and harvesting stages, most of the crops escaped the serious effects of the floods and damage was low. The total cereal area affected by floods in Rumbek North, Awerial and Rumbek East is estimated at 783, 200 and 150 hectares respectively, while the losses of cereal production are estimated at about 405, 110 and 122 tonnes respectively.

Regarding livestock, in Awerial and Rumbek counties, the floods covered most of the low land areas, thus depriving cattle of pasture, and forcing cattle to move to higher areas where farms are located and pasture is available. In Rumbek North, the majority of the county was flooded and all cattle moved to the higher grounds of Rumbek Centre.

Northern Bahr El Ghazal (NBeG)

All the five counties of NBeG State were assessed to determine the extent of flood damage during the season. Most affected were Aweil South and Aweil West counties. Rainfall and overflow of rivers were the causes of flooding in the State, which occurred from July to September. In Aweil South, in addition to the heavy rainfall of July, that caused flooding, the second flooding appeared in early September due to overflow of Kueng River. As a result, 5 out of 8 Payams, especially those located in the low-lying areas were affected causing major loss of crops. In Aweil West, heavy rainfall caused flooding in mid-June in all the nine Payams, followed by overflow of Lol River that started in early July and continued until the flood impact assessment was conducted in November. The most affected areas are lowlands, followed by midlands, while the highlands were not affected due to their better drainage.

This year, an estimated 17 691 hectares of cereal area was affected due to floods in the five counties of NBeG, resulting in 7 764 tonnes of cereal production loss.

Western Bahr El Ghazal (WBeG)

There were no reports of serious damage on crops caused by flooding in WBeG during the current cropping season. However, localized floods caused the death of about 105 animals, mostly in Jur River County.

Central Equatoria

The occurrence of floods in the State was minimal during the 2021 season, with only two counties affected, namely Terekeka and Juba, because of river overflow in September. Two payams in Juba County, Gondokoro and Mangala were affected, while the situation in the other Payams was minimal. In Terekeka the most affected areas were Nyori, Terekeka, Muni, Mangalla North, Jemeiza and Tombek.

Rainfall over most of Central Equatoria State started in May and intensified in June, resulting in seasonal accumulation of rainwater, as well as overflow of the Nile River. The combination of the heavy rainfall and overflow of rivers resulted in serious flooding along the riverbanks of the Nile, which is higher than the previous year, especially in Juba and Terekeka counties of Central Equatoria State. This year's flooding started in the third week of September causing damage to crops at different stages of development. Few areas such as Managla in Juba and Nyori Payam in Terekeka counties had residual water from last year, which added more water to this year's floods. The total cereal area affected in Juba and Terekeka counties was 988 and 632 hectares respectively, while the cereal production loss was estimated at 542 and 231 tonnes respectively.

Regarding livestock, floods have impacted livestock in several ways, including increased disease outbreaks and shortage of feed. There were increased cases of diseases such as pneumonia, food rot, anthrax, black quarter, trypanosomiasis, hemorrhage septicemia, RVF, and zoonotic diseases. In the flood affected areas, pastures are also affected as most of the grazing and shrub lands were submerged in water forcing the livestock to move to higher grounds where competition for pasture is high between the livestock owned by the displaced and the host communities. Although there were some cases of livestock death in Juba and Terekeka counties, the number was insignificant.

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