



## South Sudan Crop Watch Updates from 1<sup>st</sup> Dekad of August to 3<sup>rd</sup> Dekad of September 2017

**Disclaimer:** The authors would like to acknowledge the technical difficulties in conducting this analysis within a highly complex context. This second Crop Watch for 2017 production season provides an understanding of the status of food crop production in South Sudan. The information and views set out in this working paper are those of the authors and do not necessarily reflect the official opinion of FAO nor the Government offices.

### Highlights

- Continued insecurity has resulted in displacement of farmers in Greater Equatoria, Unity and Upper Nile; resulting in a large area of agricultural land left uncultivated. Similarly, intercommunal violence in pockets of former states of Warrap and WBeG have impacted the amount of cultivated land. In these areas, farmers who have managed to stay in their villages were only able to cultivate land around homesteads and have avoided far fields due to insecurity. In some cases, farmers may not be able to harvest their crops due ongoing conflict.
- Following the recovery of crops in July, from the dry spells of May and June, the intensity of rainfall over the vast majority of cropping areas increased in August and September. The rainfall has shown improvement in both amount and distribution. The August to September rainfall has been vital for the good performance of crops over most of the cropping areas in the country.
- While the normal to above normal rainfall benefited the growth of crops, the excess rains have caused waterlogging and flooding of crop fields leading to difficulty in weeding. Flooding related damage to crops has been observed in many areas of former Northern Bahr el Ghazal (NBeG), Jonglei, Eastern Equatoria and Warrap states.
- In general, the benefits of high rainfall in August and September outweighs its negative effect in terms of crop production, compared to last year where most cropping areas were affected by prolonged dry spells.
- Harvesting of first season crop in bimodal areas of the Greater Equatoria was completed in August, and planting of the second season crops was accomplished by September 2017. However, the amount of cultivated area was very low due to displacement of the farming population, which may result in low production of crops during the cropping year.
- The cropping season is characterized by heavy infestation of crop weeds, diseases and insect pests, including *Striga* (parasitic weed on sorghum and maize) in most areas and presence of relatively new pests particularly Fall Armyworm (FAW) in some areas. Common diseases were sorghum smut and groundnut leaf spot.
- Despite the relatively favourable rainfall for crop production, the expected domestic production in 2017 will still fall short of meeting consumption requirements, and the projected national food gap will remain high for 2018. Figures on planted area and yields of crops will be made available at end of the year when most of the harvesting is completed.

## 1. Introduction

This is the second crop watch report that describes the overall situation of rainfall and the performance of crops in South Sudan for the period of August to September 2017. The contents of the report are based on crop harvest assessments carried out in the field by:

- the South Sudan National Crop Monitoring Taskforce members from Food and Agriculture Organization of the United Nations (FAO), Ministry of Agriculture and Food Security (MAFS), National Bureau of Statistics (NBS) and some of the states;
- County Crop Monitoring Committees (CCMCs) drawn from agriculture staff located at county level currently operational in 38 counties.

The report has also utilized remote-sensing products, including Normalized Difference Vegetation Index (NDVI), the Vegetation Health Index (VHI) and the FAO Agricultural Stress Index (ASI<sup>1</sup>) as well as satellite-based rainfall estimates and data from the network of local rain gauges in the country. The report summarizes rainfall and crop performance in bi-modal and uni-modal areas of South Sudan during the months of August and September 2017. However, the performance of crops may change rapidly over the coming weeks depending on the rainfall situation, particularly for the bi-modal areas and some areas expecting harvests for long-maturing sorghum up to the end of December. Lack of long-term series of rainfall data, as well as lack of access to many conflict-affected field locations are among the principle challenges in the production of this report.

## 2. Crop performance in Greater Equatoria Region

Crop production in the Greater Equatoria region is severely constrained by insecurity and displacement of the population. In most counties this year, farmers have been cultivating only around homesteads and minimized the cultivation of land in the far fields due to insecurity.

**In the former Central Equatoria state** crop production is severely constrained by insecurity that has resulted in displacement of the farming population. The rainfall situation starting from the second dekad of August up to the end of September 2017 was normal to above normal in general, during which time the NDVI figures have also shown an improved vegetation condition (Annex 1). The total area cultivated by farmers in the former Central Equatoria state (CES) has decreased significantly due to the reduction in number of farmers due to displacement. In the former Juba County, some payams such as Ganji, Bungu and Wonduruba are almost completely abandoned. However, farming is going on in Mogerri, Jobur Mangala Center, Lobonok, Lokilri and Lirya Payams. Very limited land was cultivated in Nyarkenyi and Gondokoro Payams compared to last year. The area cultivated to groundnuts has been increasing at the expense of sorghum, and hence better production of groundnuts compared to last year is expected. Moreover, sorghum was affected by *Striga* (parasitic weed) resulting in yield reduction.

The agricultural activities in other parts of Central Equatoria, including Lainya, Yei, Morobo and Kajo Keji have also been seriously hampered by the insecurity and displacement of farmers. Reportedly, almost three quarters of farmers are displaced.

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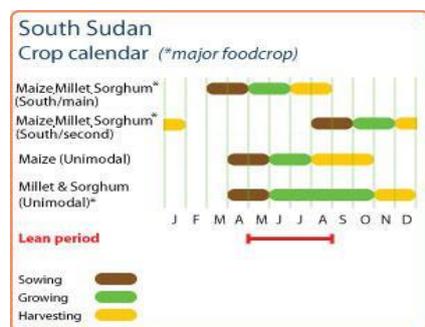
<sup>1</sup> The FAO ASI aims at detecting cropping areas with a high likelihood of water stress (drought). Based on the VHI, it assesses the severity (intensity, duration and spatial extent) of dry periods and calculates the percentage of arable land affected by drought at pixels level. For ASI on South Sudan, please visit <http://www.fao.org/giews/earthobservation/country/index.jsp?lang=en&code=SSD#>

The rainfall around the former Juba County started in late May and there was a two-week dry spell in June in the eastern side of the county. In Lainya and Yei, where the majority of the population left the area due to insecurity, the remaining farmers, who are confined to the towns, have cultivated only small plots of land around homesteads, totally avoiding their far fields due to insecurity. The rainfall situation however, has been very favourable for crop growth throughout the season. The first harvest of maize crop was completed and planting of the second season crops had been completed by end September.

**In most areas of former Eastern Equatoria state (EES)** the seasonal rainfall has improved significantly with heavy rains in August and September. This has benefited farmers and better yields (production per unit area) are expected compared to last year. In most areas, this year farmers have been cultivating only around homesteads and have minimized the cultivation of land in the far fields due to insecurity. Hence, the overall production is expected to remain low because of the decrease in cultivated areas.

Rainfall performances improved in almost all areas in Kapoeta region, including Kapoeta South, Kapoeta North and Kapoeta East, though the amount and distribution varied during the second and third dekads of September. The overall rainfall condition and performance of crops was normal to above normal in August and September, however despite these conditions the overall production is expected to be lower than last year in Greater Kapoeta Region.

**In former Western Equatoria state (WES)**, harvesting of the first season crops, especially maize and sorghum, was completed as per the usual cropping calendar, see figure 1. Yield of the first season



**Figure 1. South Sudan Crop Calendar**

maize is better compared to same time last year. Groundnut yield has slightly dropped in Yambio and Tambura because of the short dry spells, which prevailed between May to early June. The excessive rains in the subsequent months of July and August might have negatively affected the performance of groundnuts. In addition, during the first cropping season, the impact of Fall Armyworm on crops ranges from mild to serious in some pockets of Western Equatoria.

During the months of August and September, the performance of rainfall in former WES appeared to be good, with no reports of dry spells (Annex 1). Planting of second season crops started immediately after harvesting of the preceding crops (Figure 1). The second season maize crop was at flowering stage, while those planted earlier were at maturing stage. Rice is expected to be harvested around the second week of November in Ezo, Tambura, Nzara and Yambio. The area planted with maize in the second season has increased compared to the first season. However, the area cultivated to groundnuts in the second season is lower than the first season. The overall production and yields of the second season crops in 2017 are expected to be higher than the first season because of the good rains and better security situation that allowed farmers to cultivate more land.

### 3. Crop performance in Greater Bahr el-Ghazal Region

The Greater Bahr el Ghazal Region, which covers former Western Bahr el Ghazal (WBeG), Warrap, Lakes and NBeG states, experiences a unimodal rainfall pattern allowing farmers to produce only once in a year. The 2017 rainfall in most of the areas of the region was normal with few areas experiencing dry spells that affected germination and the performance of emerging crops. The Normalized Difference Vegetation Index (NDVI) charts for Greater Bahr el Ghazal Region is shown in Annex-2.

Despite late start of rains, dry spells (between May and July), excessive rains (during August and September), crop pests and labour outmigration in former NBeG, this year's crop production is expected to be better than last year. Overall, the expected harvest is likely to remain insufficient to meet annual cereal requirements for the Greater Bahr el Ghazal region.

**In former NBeG state**, the flooding and inundation of crop fields and villages in some parts former Aweil North, Aweil West and Aweil East counties seriously damaged crops. The situation in Aweil North and Aweil West was serious with most of the lowland areas affected by flooding and waterlogging. In Aweil North, high amount of rainfall was recorded in Gokmachar station for August (407.6 mm) and September (484.8 mm). Contrary to the other three former counties, the rainfall amount in Aweil Centre was insufficient to create floods required for the growing rice crop in the Aweil Rice Scheme. Furthermore, the amount of rainfall in the smallholder farming areas of Aweil Centre was inadequate at the beginning of the season and planted crops were damaged due to prolonged dry spells. Some farmers in these areas have even missed the opportunity of replanting due to the delayed return of the rain after the planting window was over in July.

In NBeG, a total of 5,750 hectares of land was cleared and ploughed for smallholder farmers in all the former five counties during the current cropping season. This was accomplished with the support of BRACE II Project of WFP and FAO, and has increased the amount of land cultivated by farmers during the cropping season.

On the other hand, since 2015 the economic crisis caused out-migration of 50,000 to 60,000 returnees back to Sudan. This negatively impacted the availability of labour force for agriculture in the area. The amount of land cultivated is generally estimated to be lower than last year. However, despite the decrease in cropped area and the negative effect of excessive rainfall in low land areas, the overall production level of main crops is expected to be higher than last year though lower than average. Despite its negative impact, the high rainfall situation of August and September has contributed to the good performance of crops in the majority of the farming areas in NBeG.

There were heavy infestations of crops by pests, diseases and weeds in most of the assessed areas in NBeG. Common diseases include head smut on sorghum and leaf spot on groundnuts, both of which are fungal diseases. The most commonly occurring pests, among others include grasshopper, sorghum midge, stem borers, sorghum cinch bug and *Striga* (parasitic weed). The impact of *Striga* on sorghum crop has been serious and increasing over time. According to the crop harvest assessment team deployed to NBeG in September 2017, from 85 - 90% of the visited sorghum farms of smallholder farmers were infested by *Striga*. The extent of damage ranges from mild to severe.

Harvesting of short cycle sorghum and groundnuts has been ongoing in September and continues into October. In general, this year's production of main crops (sorghum and groundnuts) in NBeG is expected to be higher than last year, despite the dry spells in the early season and excessive rainfall

in August and September. At county level, the preliminary assessment results show that better production is expected in Aweil South, Aweil West, Aweil East and Aweil North, while lower production is expected in Aweil Centre compared to last year.

**In former Warrap**, the amount of rainfall was average and evenly distributed over most of the cropping areas compared to normal and that of last year, resulting in favourable growing conditions for crops. However, the situation in Abyei Administrative Area was not suitable for crops in that there was a dry spell around July, which has caused damage on crops. Although harvesting started in Abyei, the production expected this year is lower than last year due to the effect of moisture stress. There are also reports of bird attacks on the short cycle sorghum variety of Wad Ahmed. While sorghum is the major crop grown in Abyei, it is usually attacked by *Striga* infestations. Due to this, farmers are gradually shifting to sesame production, which also gives higher economic benefits than sorghum.

Generally, there has been an increase in the area planted due to the use of tractors and oxen ploughs, and additional areas cultivated with the support provided through a joint programme of WFP/FAO named BRACE II, working with Food For Assets (FFA) and Cash For Assets (CFA) interventions. The project supported the cultivation of 7,638 hectares in Gogrial West, Gogrial East, Tonj East, Tonj North, Tonj South and Twic through FFA and CFA, with farmers receiving training to increase their yields and provision of inputs.

In the **former Western Bahr el Ghazal State**, not all areas are able to cultivate this year due to ongoing conflict in Bagari region and Raja. However, in areas where cultivation has taken place the yields are expected to be average and in some areas production will be better than last year. Overall, the seasonal rainfall pattern has been good both in terms of amount and distribution. Similar to last year, those areas affected by active conflict like the Greater Bagari, in former Wau county, have cultivated much less land, if any, during the current agriculture season. In areas where normal cultivation has taken place, harvesting of groundnuts and sesame is ongoing and the production level is expected to be better than last year mainly due to good rainfall. However, in some areas with active conflict, farmers are unable to harvest their crops due to the conflict. The medium and long cycle sorghum varieties grown in the area are still in the field and harvesting is expected between December and January. There were no reports of flooding and dry spells except the short break of rainfall in July for up to ten days. Minimal pest infestation was observed and the level of damage by Fall Armyworm on maize crop at the beginning of the season was mild. Maize is a minor crop grown around homesteads for green cob consumption.

**In the former Lakes State**, late onset of rains was reported in Rumbek North and Cueibet, and the effective rains started in May, but was insufficient. Yirol West and Wulu Counties had normal start of rains in April, with average amount in Wulu and below average amount in Yirol West, compared to long term average. Across the state, dry spells of 3-4 weeks occurred in June that affected maize performance negatively in Amok (Rumbek North) and early sorghum in Yirol West (Abang), Cueibet (Achol Malek) and Wulu (Wulu Gedim) Counties. Maize was the most affected crop by the dry spell compared to sorghum and groundnuts. Wilting of maize crops during early stage of growth occurred in Rumbek North. Farmers who practiced dry planting in Cueibet, Yirol West and Wulu Counties have reported failure of germination due to the delay of effective rains. Areas that are prone to floods such as Yirol West and Rumbek North were not affected this year due to lower amount of rainfall. However, the intensified rains of August and September have caused waterlogging in some parts of Yirol West, Rumbek North and Wulu Counties. In general, the performance of crops and the expected production in the 2017 cropping season in Lakes is lower than last year. The NDVI and rainfall anomalies for Lakes are shown in Annex 2.

Cultivation is mostly confined around homesteads, and farmers routinely use the same area year after year, without applying fertility maintenance practices. Planting started late in April in most locations due to delay in rainfall. Dry-planted crops in April in Rumbek North, Wulu and Cueibet Counties sustained some damages. These include maize in Rumbek North and groundnuts in Cueibet and Wulu.

The average planted area per household has decreased this year due to delay in rainfall coupled with intercommunal conflicts in Rumbek North and Cueibet. Regarding pests, an outbreak of Fall Armyworm was reported in Rumbek North, which caused average damage on maize, and no control measures were taken. Average level damage was reported on sorghum due to *Striga* over most of the sorghum growing areas, especially where the crop was continuously cultivated without rotation and no fertility maintenance practices taken. Other pests including stem borers, sorghum Cinch bug, monkeys, local birds, and grasshoppers have also been reported with mild to average damage. Figure-2 shows the NDVI anomaly map of South Sudan in August and September 2017.

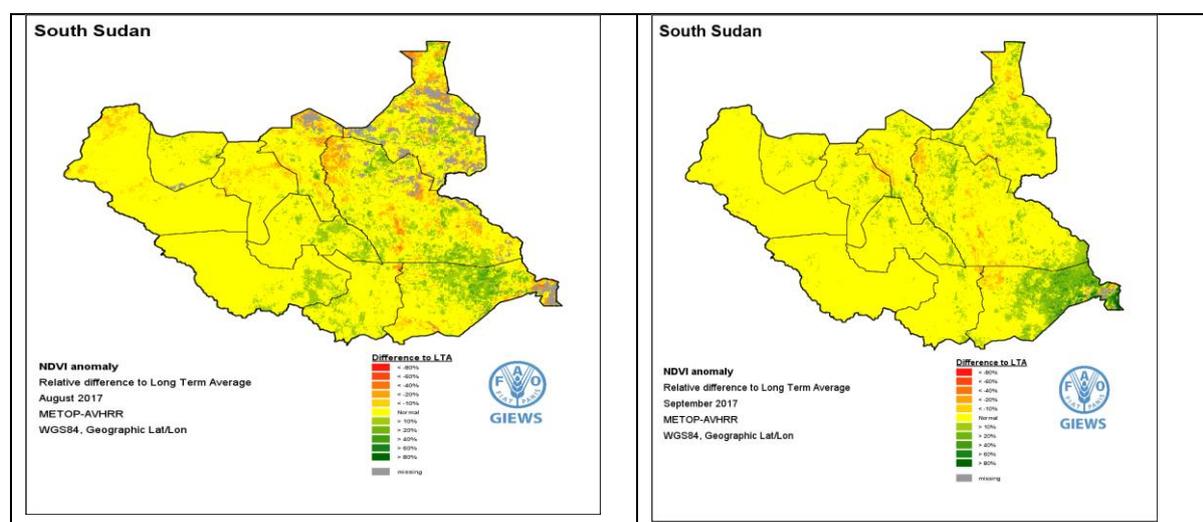


Figure 2. NDVI anomaly map of South Sudan (August and September 2017)

#### 4. Crop performance in Greater Upper Nile Region

In former **Unity**, the performance of the rains was good in August and September across the state (Annex 3). However, some pocket areas including Guit experienced late rains and dry spell at the beginning of the season, which affected the performance of growing crops. In Rubkona, Mayom and Koch the area cultivated to crops has increased due to overall decreased in hostilities in these areas compared to the previous year, although there are flare ups but at reduced scale.

Harvesting of maize has been going on well from the end of September and production is expected to be better than last year, because of the increased cultivated area and reduced conflict. Long maturing sorghum is at booting and flowering stages and harvesting is expected from end of November up to December and January. Although presence of Fall Armyworm and stalk borers was reported, the damage caused by these pests was reportedly mild.

In the former **Upper Nile** state: the rainfall performance throughout Renk and Maban was good in August (Annex 3) but there were dry spells in southern parts of Renk in September. These areas include Jelhag and Faluj for a period of two weeks but with no serious effect on the crops. However, there has been extensive flooding in a number of areas that include Bunj town, Gismalla, Hai Khartoum, Ndoro,

Old Guffa and Khor Gerret of Maban County. However, the Domiji area, where most farmers planted maize, was not affected by floods and farmers were able to harvest their crop in September.

In Renk, harvesting of sesame was going on and the expected yield is estimated between 350 and 500 kilograms kg per hectare, which is better than last year. Sorghum is doing well and area planted to this crop has increased compared to last year. Hence, the overall production of crops is expected to be better than last year because of the good distribution of rainfall in the current season. No major pests and diseases were reported from the area so far.

In the former **Jonglei** state the yields of crops during the 2017 cropping season are expected to be better than last year. The performance of the crops was mixed from area to area, with Eastern and Southern parts of Jonglei including Twic East, Bor South, Duk, and the central parts of the state affected by the dry spells, resulting in varying impacts of maize and sorghum crops ranging from wilting to complete drying (see Figure 2 for NDVI anomalies). Replanting in Bor South was constrained by a combination of climatic extremes starting with dry spells between June and July followed by heavy rainfall and flooding in August and September. Maize was the worst affected crop. The area planted by farmers was small since farmers are cultivating around their homesteads and fear to cultivate far fields due to insecurity. Flooding also occurred in the lowland areas of Pibor, Gumruk and Pochalla between August and September, but occurred after most of the crops were already matured.

## **5. Conclusion and food security implications**

Situation in green belt areas remain extremely concerning. The rainfall situation has been favourable in most areas. Unfortunately, due to the ongoing conflict in the majority of the high producing two-season areas, a large number of farming households have been displaced - as a result most of the productive lands have been left unutilized.

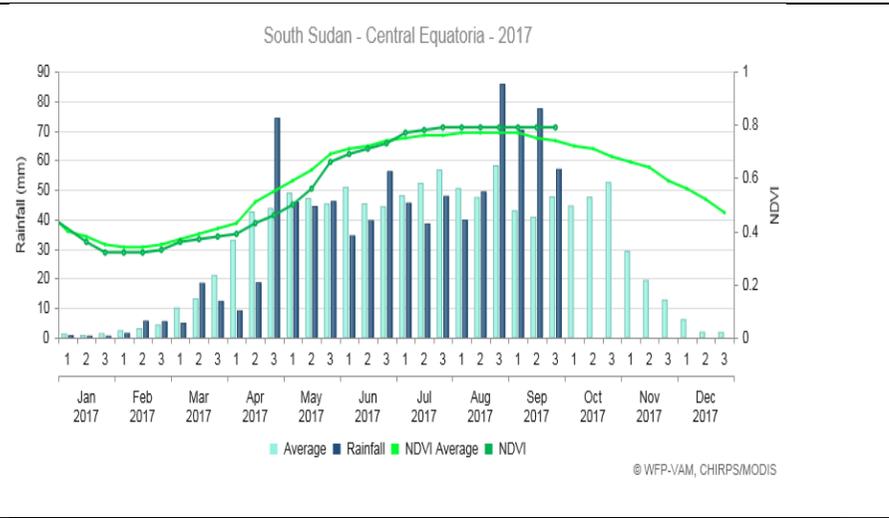
The infestation of FAW and its impact is not yet fully quantified. However, farming households in the infested areas had very little, if any, preventive measures in place. Overall, a 20 to 30 per cent production loss is anticipated in the affected areas. This will have a serious implication on these subsistence farmers, especially those in maize growing areas, in which their limited production may deplete much earlier than normal. This may lead to support to these farmers in terms of food for filling some of the gaps and provision of seeds and tools for their next cycle of production.

While the season has been mixed, with delayed start of rainfall and some dry spells, the rainfall season has been normal to above normal over most of the cropping areas and has created a favourable condition to growing crops. However, localized flooding in lowland areas has displaced households and reduced their production, necessitating the need for support and recovery interventions.

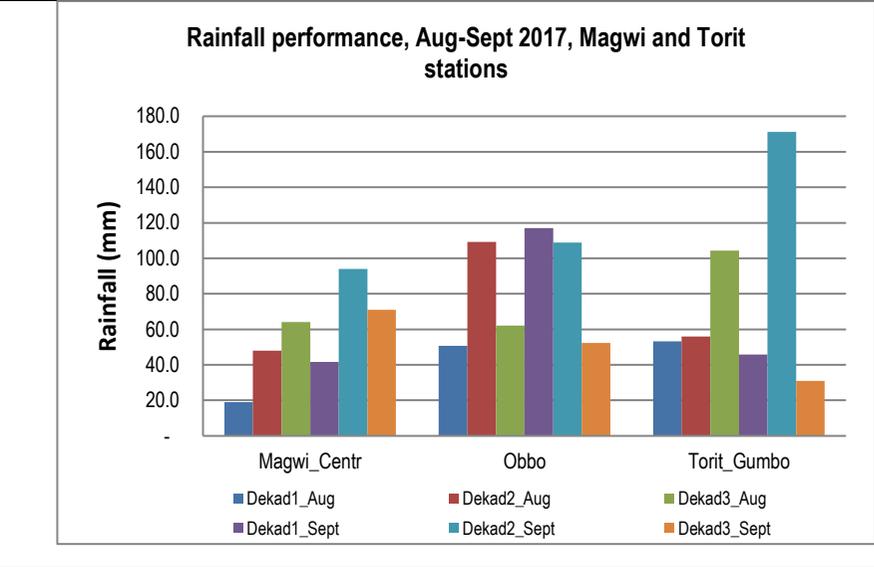
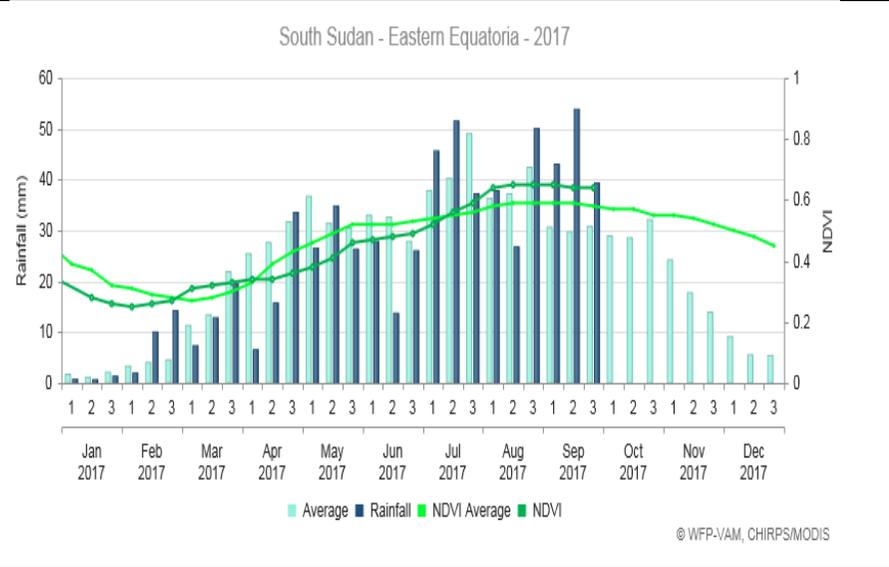
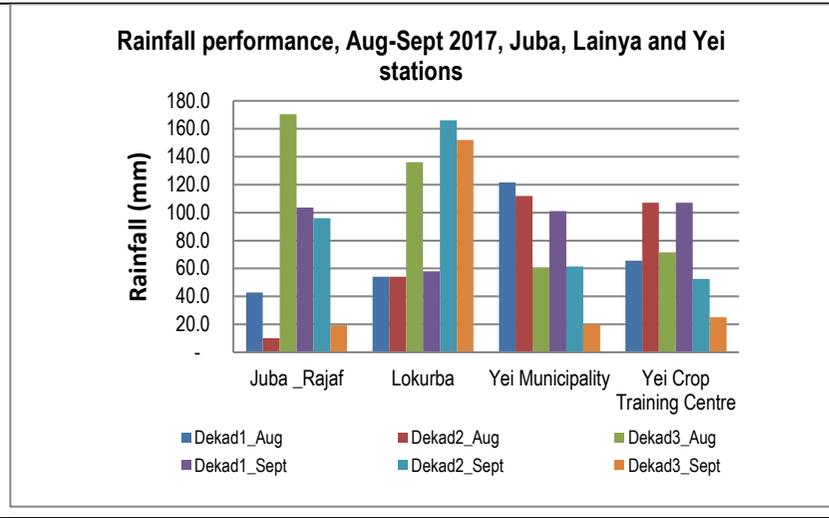
A final report on the 2017 crop production will be produced and most likely released in early 2018. The report will form part of the Crop and Food Security Assessment Mission (CFSAM) that will be produced jointly between MAFS, NBS, FAO and WFP.

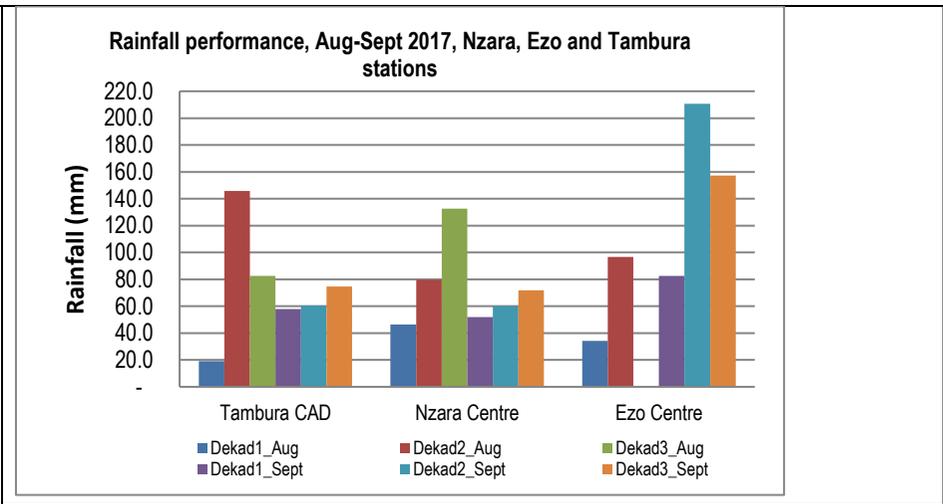
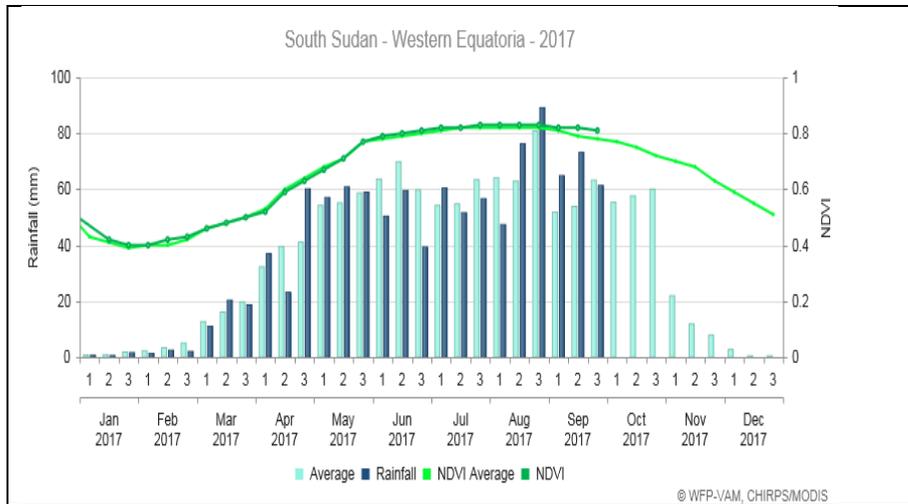
**Annex-1. Rainfall and NDVI – Greater Equatoria (2017)**

**Satellite Rainfall Estimates and NDVI Anomalies (2017)**

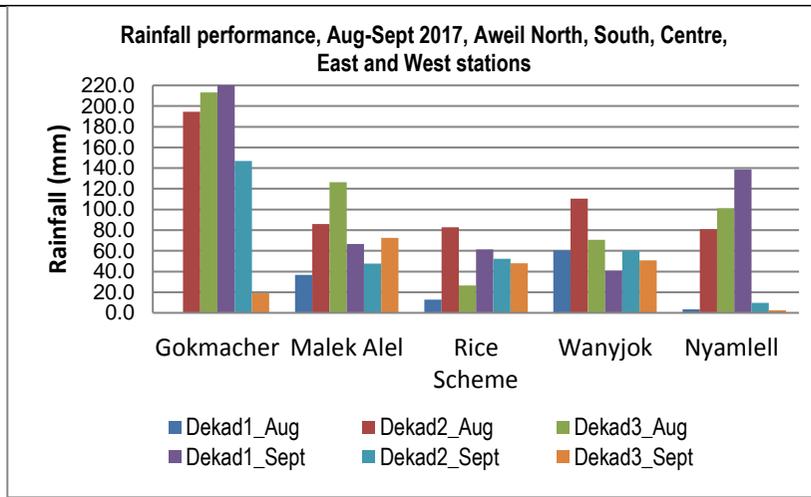
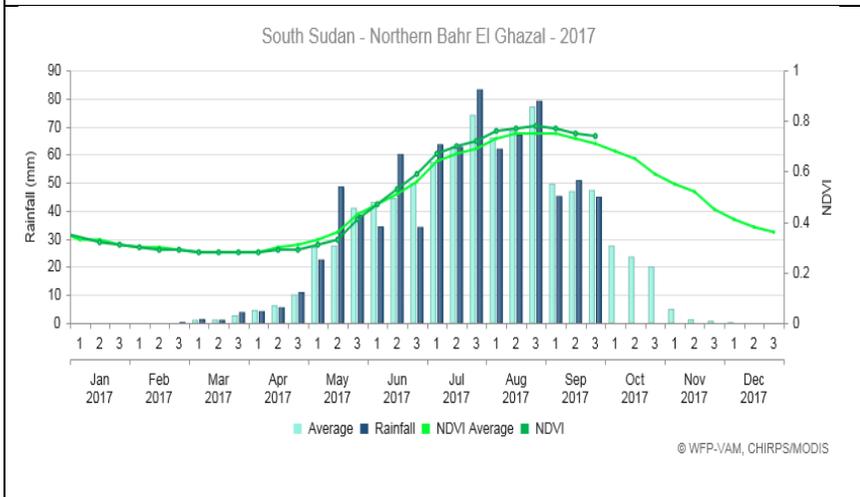
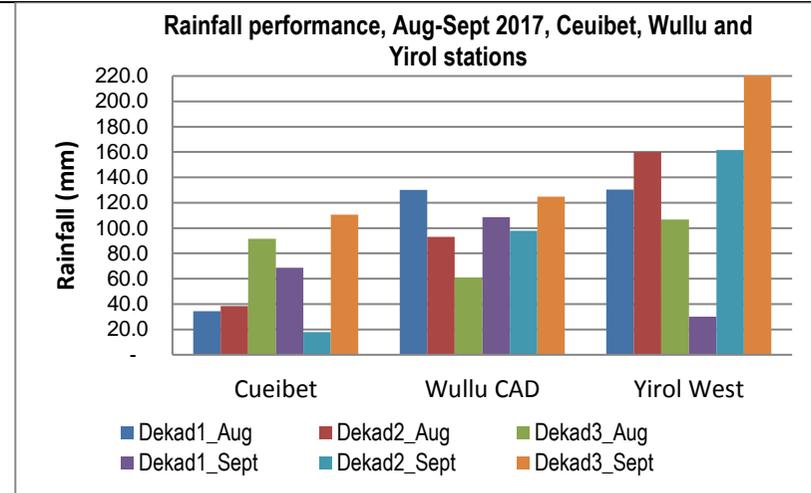


**Rainfall performance recorded in local stations, August-September 2017**

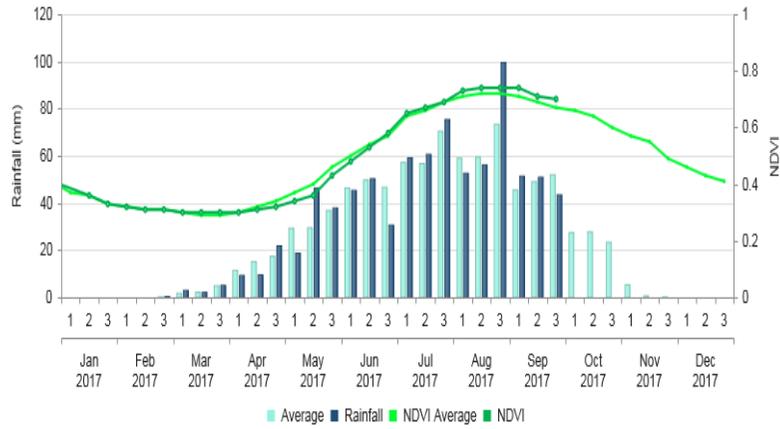




**Annex-2. Rainfall and NDVI – Greater Bahr el Gazal (2017)**

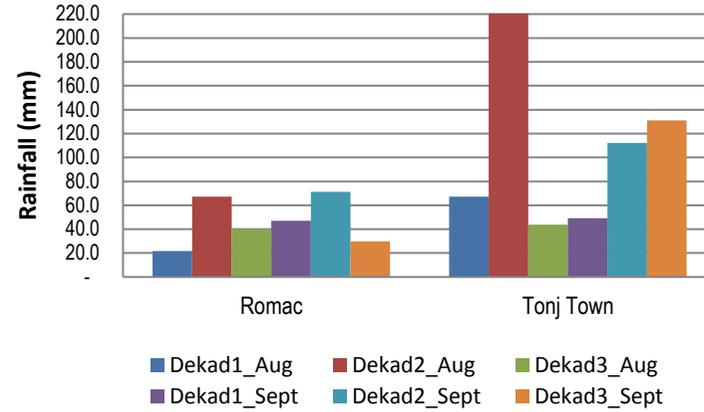


South Sudan - Warrap - 2017

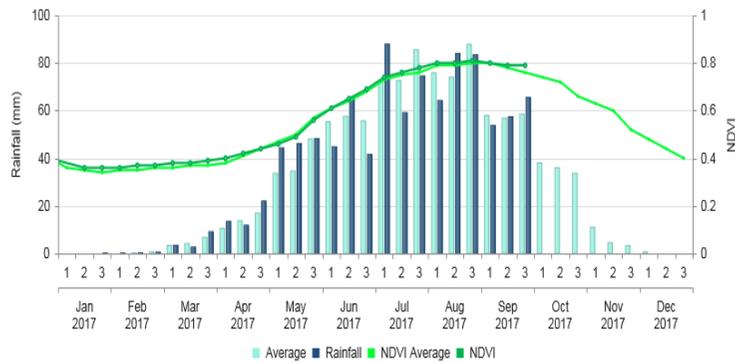


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Rainfall performance, Aug-Sept 2017, Tonj East and South stations

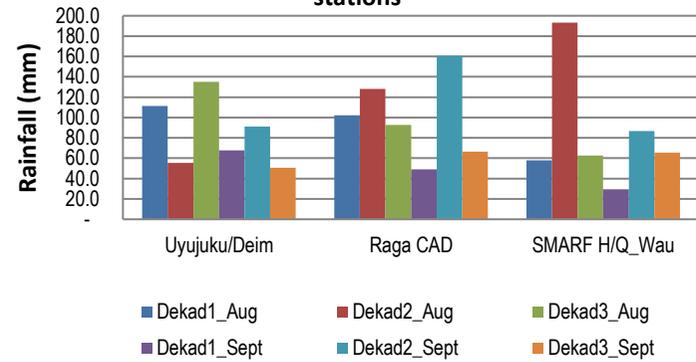


South Sudan - Western Bahr El Ghazal - 2017

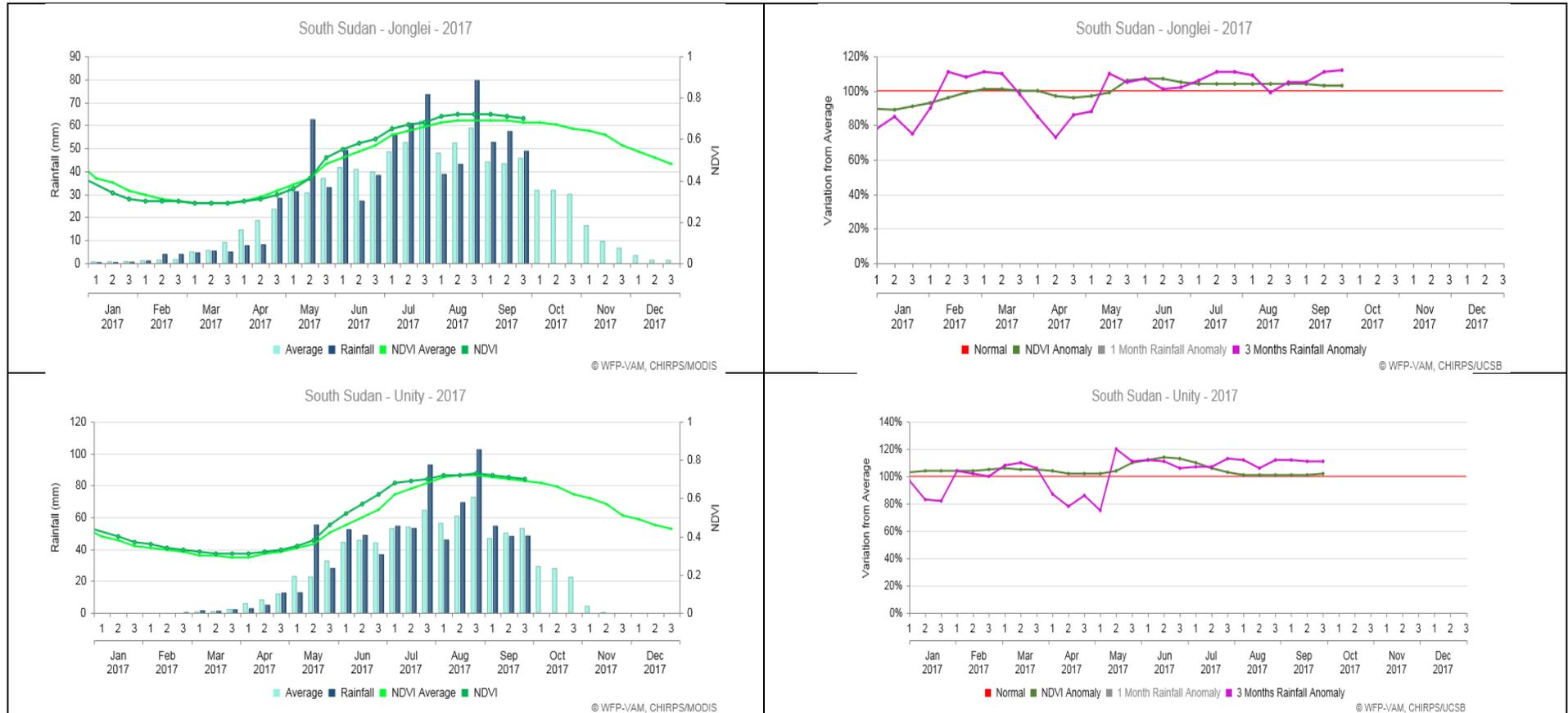


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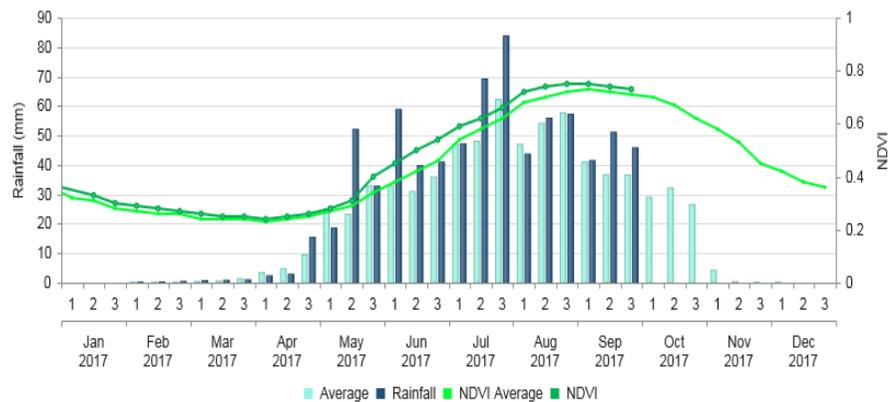
Rainfall performance, Aug-Sept 2017, Raga and Wau stations



### Annex-3. Rainfall and NDVI – Greater Upper Nile (2017)

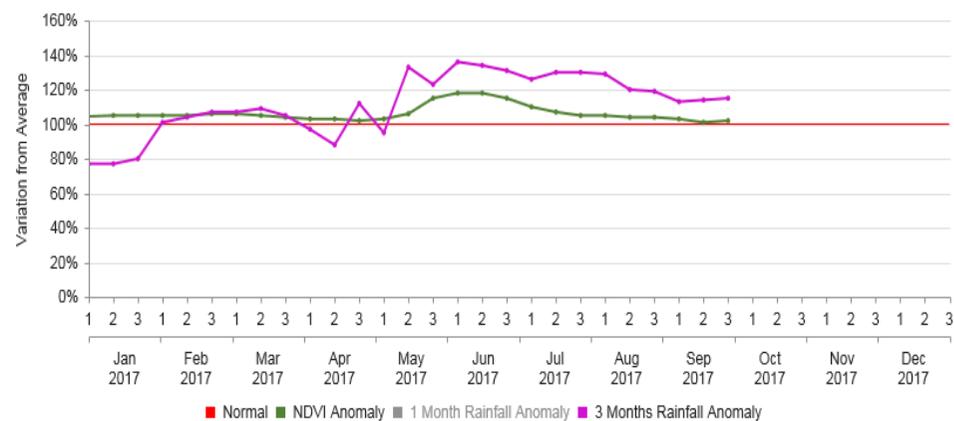


South Sudan - Upper Nile - 2017



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