



Southern Sudan



Agronomy Update

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HIGHLIGHT:

- Excessive rainfall causes flash floods in Jonglei, Lakes, CES and Bhar El Ghazal and rains may intensify in August
- Crops at maturity stage in the Green Belt Zone and at vegetative stage in other Zones
- Vegetation improved greatly in CES, Lakes, western parts of Jonglei and Upper Nile State while northern, western and eastern parts of the country had decreased vegetation

INTRODUCTION

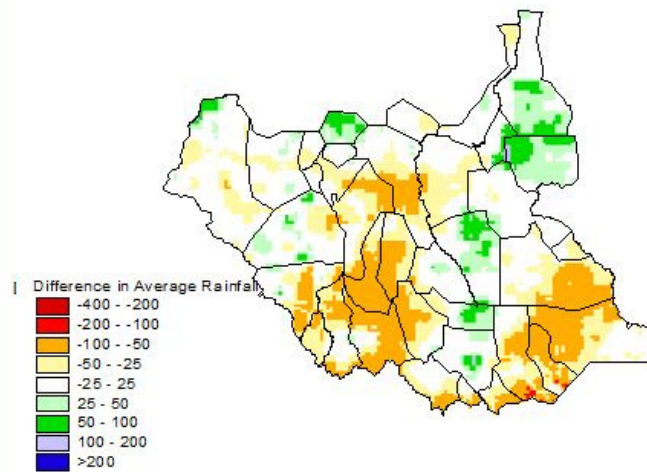
The Agro-meteorology bulletin is a report produced monthly to report the agricultural season in Southern Sudan. The emphasis of the report is mainly on rainfall performance and its implication on crops and rangeland. The impact of agricultural season has huge implications on food security situation of households that basically depend on agriculture.

RAINFALL PERFORMANCE IN SOUTHERN SUDAN

High or low precipitation has significant effect on agriculture. All crops need at least some water to survive; therefore rain (being the most common source of water) is important to agriculture. While a regular rainfall pattern is usually vital for crop development, too much or too little rainfall can be harmful, even devastating to crops. Drought can kill crops if it's severe, while overly wet weather can

cause harmful fungus to flourish and affecting crops. Different crops need varying amounts of rainfall to survive. In areas with excessive rainfall, soil nutrients diminish and erosion increases. Animals have adaptation and survival strategies for the wetter regimes. The previous dry season (2009) led to low production causing food shortages in the current season (hunger period), as the crops have yet to mature. Excessive rain during short periods of time can cause flash floods. Areas across western and eastern southern Sudan observed rainfall exceeding 75 mm in the first two dekads of July and these includes Jonglei, Lakes and Bhar el Ghazal regions of southern Sudan. This has led to reports of flooding, fatalities and property damage during the second dekad and into the third dekad of July. Reports also indicated isolated flooding in Awerial County in the Lakes State and in the Jonglei State with localized negative effects on crops. Based on the satellite rainfall images, significant cumulative rainfall was experienced over the following regions in southern

Figure 1: Difference in Average Rainfall July dekad 3 (21-31)



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Produced by Food Security and Technical Secretariat (FSTS), Southern Sudan Center for Census, Statistics and Evaluation (SSCCSE) in collaboration with Government of Southern Sudan Institutions
 1. Ministry of Agriculture and Forestry. 2. Ministry of Animal Resources and Fisheries 3. Ministry of Health. 4. Southern Sudan Relief and Rehabilitation Commission

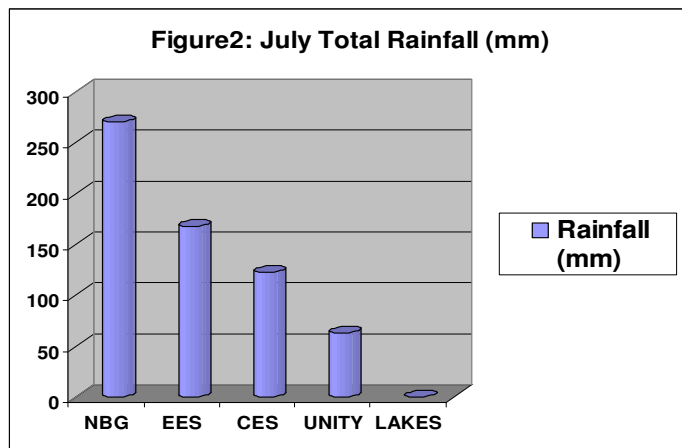
A joint effort of the Government of Southern Sudan with United Nations Organizations and International Non-Governmental Organizations



SIFSIA is a programme funded by the European Commission to build capacity in food security in Southern Sudan

Sudan; Jonglei, Lakes, the Greater Bhar el Ghazal, Upper Nile and CES. The imagery indicates that these areas received rainfall amounts above normal by 150mm, therefore increasing the chances of flood occurrence (see Figure 1). There is a possibility that the excessive rains may reduce crop yield as most crops are at flowering and maturity stage varying with planting and may not require excess rain at this time. EES (Kapoeta) had most of its area experiencing rainfall amount below the average by 60mm. In this situation the rangeland performance in EES are likely to be affected as pasture may be reduced. In contrast with average, most areas in southern Sudan have received normal to below normal rainfall. The Greater Bhar el Ghazal (Wau & Aweil), Jonglei (Bor & Bieh), Lakes (Yirol), Upper Nile states (Sobat, Latjor & Renk) and CES (Yei, Juba & Terekeka) have received above normal rainfall hence increased chances of floods occurrences.

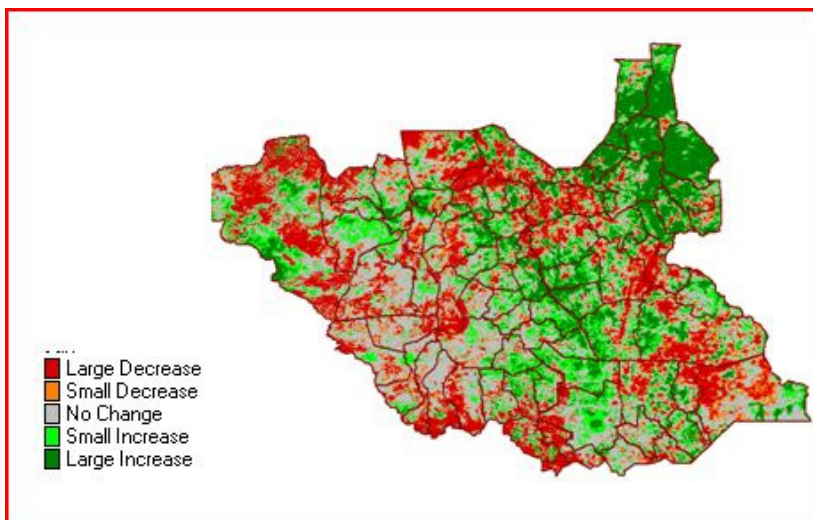
For the last 31 days of July 2010, with reference to data collected from the Automatic Weather Stations, rainfall



performance was analyzed in selected States. Comparing the rainfall performance for the five states, NBG received the highest amount of rainfall (270mm) followed by EES (168mm), CES (122mm), Unity (63mm) and lastly Lakes states with less than 1mm. In contrast with last month i.e. June rainfall, some areas like NBG, EES and CES have received more total rainfall in July while Unity and Lakes had less rainfall. These dramatic changes have implications on the crop performance, yield and pasture condition. Excessive rainfall at flowering stage may affect crop yield due to the raindrop effect that shades off the plant flowers while scarce/erratic rainfall

may affect germination and pollen fertilization. Therefore the impact will vary with the stage of the plant.

Figure3. NDVI Difference for the Period (21-31) July 2010.



Satellite Imagery: The satellite imagery Normalized Difference Vegetation Index (NDVI) is used to obtain an overall picture of the progress of the agricultural season.

NDVI has the potential to evaluate the vegetation condition, which is related to seasonal variation in climatic conditions. Extreme climatic events such as drought and abundant moisture can have a significant impact on vegetation development and can be identified by utilizing vegetation indices. Most of southern Sudan regions had vegetation improvement with many areas having medium to large vegetation increase except for EES that had sparse vegetation

especially in areas of greater Kapoeta which received rainfall amounts less than (60mm) in the month of July. Rainfall and vegetation performance reflects also pasture conditions. However with reference to the difference in the average NDVI images, most parts of southern Sudan had vegetation decrease in the last dekad of July (see red colours, Figure 3) including northern, western and eastern parts of the country. Only few areas had no change and vegetation improvement. These include CES, Lakes, western parts of Jonglei and Upper Nile State. This can be attributed to the difference in the rainfall amount received causing difference in the vegetation

performance. However improved rainfall in the last decade of July is likely to improve on vegetation performance.

SUMMARY OF AGRICULTURE SEASON BY STATE

Eastern Equatoria State: Generally, there has been rainfall improvement in the state although the pattern is poor. In the month of July, EES received rainfall amount of (168mm) compared to (87mm) in June. Vegetation also improved as well but in some parts only. However, the mixed trends continue in the state where some areas received more rainfall than others and also causing the differences in vegetation performance. Crops in Magwi and Kapoeta south are at maturity stage while crops in Kapoeta north and east are at vegetative stage while in some parts of Kapoeta east the season is yet to start. The state has much of its area covered with crops at vegetative stage. Mixed trends of rainfall is likely to cause impact on crop performance as areas south of Torit, Ikotos, Budi have received rainfall below normal by (100mm) and is likely to affect the vegetative growth of the crops as this area has most of its crops at vegetative stage hence effecting the yields. There is poor vegetation growth despite the rains, as most areas still have sparse vegetative growth especially Kapoeta east. Areas to the west and south west of the state have light to medium vegetation. Impacts of the rainfall on vegetation are also likely to affect the rangeland and crop performance. The situation is to be monitored and updates will be made accordingly.

Warrap State: Although erratic rains started in mid-May, and the June-September rainfall was established in June, rainfall performance is still poor. The seasonal forecast projects a higher chance of above normal to normal rainfall in the state. There is also a mixed trend of rainfall whereby some areas such as north Abyei have received rainfall above normal by 50-100mm (see Figure 1) hence susceptible to flooding while the south and the central areas have received rainfall below normal by (25-50mm) and only very few areas have received normal rainfall. Except for Tonj south, the WRSI/crop maturity stage satellite images indicates that most of the crops in the state are in the vegetative stage and are likely to be affected by the rainfall patterns described above as crops need sufficient moisture for growth.

Central Equatoria State: In the month of July, the state received rainfall amount of (122mm) compared to (81mm) in June (Figure 2). This remarkable improvement in rainfall amounts also has negative impacts in some areas especially low lying areas in Juba and Terekeka County where rainfall of about 50-100mm above normal was received and these areas are prone to flooding which may destroy crops which are at flowering and maturity stage. Juba County has crops at vegetative stage as well as crops are at maturity stage in Kajo-Keji, Yei, Lainya and southern parts of Juba. Harvesting may be affected by excessive rains especially in Juba County if the rainfall intensifies as crops may not mature normally with too much water. Though the amounts of rainfall intensified, compared to average, the state received normal rainfall in July and crops are expected to perform normally except for few areas mentioned above.

Upper Nile State: Satellite images indicate areas at the border of Latjor and Sobat to have received 100-200mm above normal (see Figure 1) hence the possibility of incidence of floods occurrence. Floods are expected to intensify in the month of August since rainfall outlook projected by FEWSNet indicates normal to above normal rainfall. With reference to the WRSI/Crop condition satellite images, the crop maturity map indicates the southern part of the state with the crops at vegetative state except for the northern part of Renk and Shilluk kingdom where in some areas the season is yet to start. Monitoring will be done and updated accordingly about the situation.

Northern Bahr el Ghazal State: Despite the delays in the rainfall at the beginning of the season, dramatic increase in the total amount of rainfall received in July has been noted. NBG received rainfall amount of (270mm) in July compared to the total amount of (104 mm) in June. Rains are likely to intensify in the month of August since the forecast is still indicating normal to above normal rainfall expected which raises the possibility of floods in low

lying areas. WRSI/crop maturity satellite images indicate generally crops at vegetative stage. Though a lot of rainfall has been received in the state compared to the July average rainfall, the images indicate normal to above normal rainfall hence crops are also expected to perform normal except for some few areas that received below but near to normal rainfall.

Western Bahr el Ghazal State: Most areas received normal rainfall though there are some areas with below and above normal rainfall. Wau received rainfall above normal by (50-100mm) causing flooding of farmland in some areas. WRSI satellite images indicate crops at vegetative stage except for southern parts of Wau and Raga. Crops are expected to perform normally since most areas have normal rainfall except for the few like in southern part of Wau too much rain may affect the crops at maturity stage due to floods effect. Rainfall has brought about improved vegetation most of the areas in the state have medium to heavy vegetation. This is obviously impacting also the rangeland performance.

Jonglei State: Excessive rainfall in the state has been a threat to agriculture and food security in some parts like Akobo, Bor, Pibor and Bieh hence causing floods in farmlands and damaging crops and livestock. 54% of areas have been planted with varieties of crops that are at vegetative, flowering and fruiting stage. The variation is caused by the difference in planting time by the farmers. However some places like Pochalla are reported to be replanting sorghum, maize and G/nuts mainly due to army worm outbreak. Weeding still continues as per weeds infestation. Crops are affected by water logging effects of the floods. This is a serious concern as far as food security and agriculture is concerned since the reports from the state indicate high chance of the crops not likely survive. Sudan tribune reported that the ongoing floods are a similar repetition of floods of 2008 Nile River overflows that affected Baidit Payam in Bor County.

Unity State: Dramatic changes in the rainfall amounts have been noted in this state since May (22mm), June (102mm) and then (63mm) in July. This is seriously impacting on vegetation (also rangeland performance) and crop performance. Unlike last

month where most areas had received normal to above normal rainfall amounts which increased towards the north, most parts have below normal rainfall by 50mm in the month of July especially central part of the state (see: Figure 1) covering Mayendit, Leer and Koch. This will affect the vegetative growth of the crops as most crops are at vegetative stage. Vegetation growth ranges from light to medium. If rainfall does not improve crops are likely to be affected and vegetation is likely to deteriorate as well. June- September forecast by (SMA) indicates that there is a 40% chance of rainfall being above normal and 35% chance of rainfall being normal while there is a 25% chance of rainfall being below normal in the state. Higher chances are that rainfall is likely to improve.

Lakes State: Reduction in the total rainfall amount has been noted in this state, most areas have received rainfall below normal except for Yirol which has normal to above normal. The WRSI satellite image indicates most crops at vegetative stage apart from the western parts of Wulu, south Cuibet and Rumbek with crops at maturity stage. Generally the western parts of the state have below normal rainfall in the month of July by 50mm this may not affect much the crops since they are at maturity stage in this area. However the eastern parts of the state have normal to above normal rainfall with some parts of Yirol having 50-100mm of rainfall above normal causing floods incidences. Crops in low lying areas have been affected by floods in Yirol. However the SMA projected higher chance of a normal to below normal rainfall in this state. The situation is to be monitored.

Western Equatoria State: As the first season comes to an end, crops are at maturity stage. Most parts have rainfall below normal except for some parts of north of Tambura and central part of Yambio that had normal to above normal. This may not cause serious impact on the crops since most crops are at maturity and may not need excessive rainfall.