

Summary:

- ❖ Rainfall predictions for June was above normal according to the IGAD Climate Prediction and Application Center (ICPAC) and the national rainfall prediction that issued by Sudan Meteorological Authority (SMA) for June-September 2021.
- ❖ Rainy season was commenced early in the southern parts of the country with considerable rainfall amounts during early-May 2021.
- ❖ Rainfall amounts were moderate to heavy over Sudan during June 2021.
- ❖ Rainfall amounts during June were above normal east and west of the country.
- ❖ Favorable growing season conditions are confined across the country.

ITCZ Movement:

The position of the ITCZ was below the normal position for the first dekad of June although it has moved further north compared to the previous dekad (third dekad of May). Which notified less than average rains during this dekad. This restricted the favorite conditions for the onset of the growing season over the southern parts of the country (**Figure 1**).

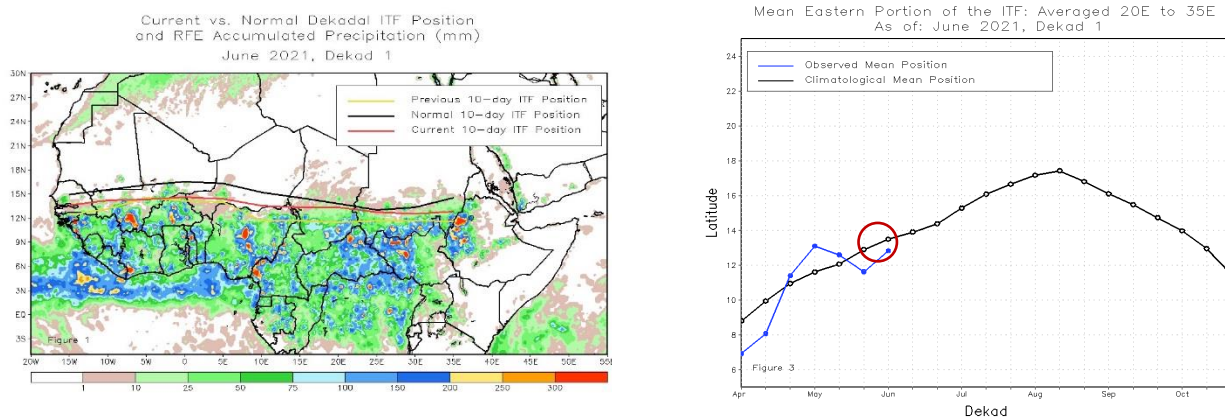


Figure 1: ITCZ position during the first dekad of June compared to the previous dekad and the long-term average position.

Significant progress in the ITCZ position during the second dekad of June this spurred the progress of the rain belt northward with higher than average rainfall amounts. During this dekad ITCZ was above to its previous and normal position to allow the release of the features of the growing season northerly towards the centrals (**Figure 2**).

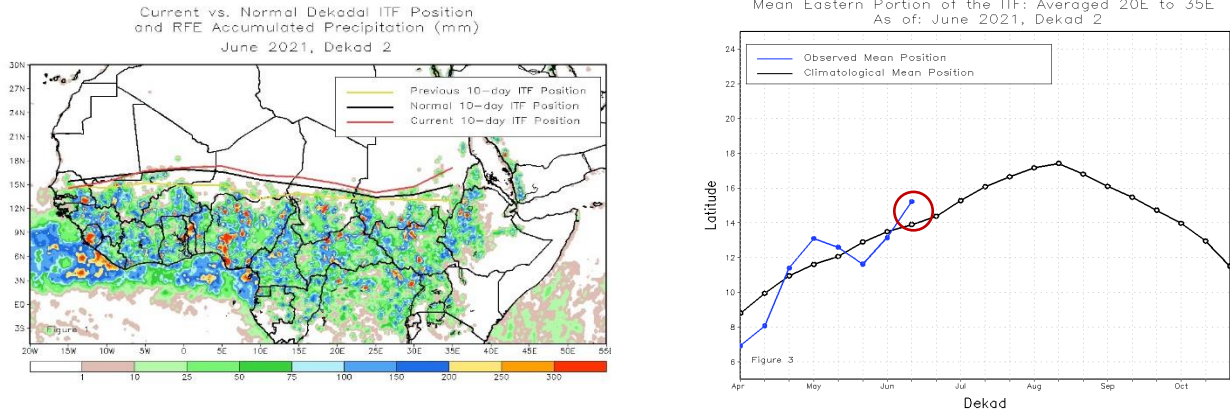


Figure 2: ITCZ position during the first dekad of June compared with the previous dekad and the long-term average position.

During the third dekad of June, slight movement of the ITCZ northerly remaining to the north of its normal and previous position, which implies the continuation of rainfall over the southern and central parts of the country. (**Figure 3**).

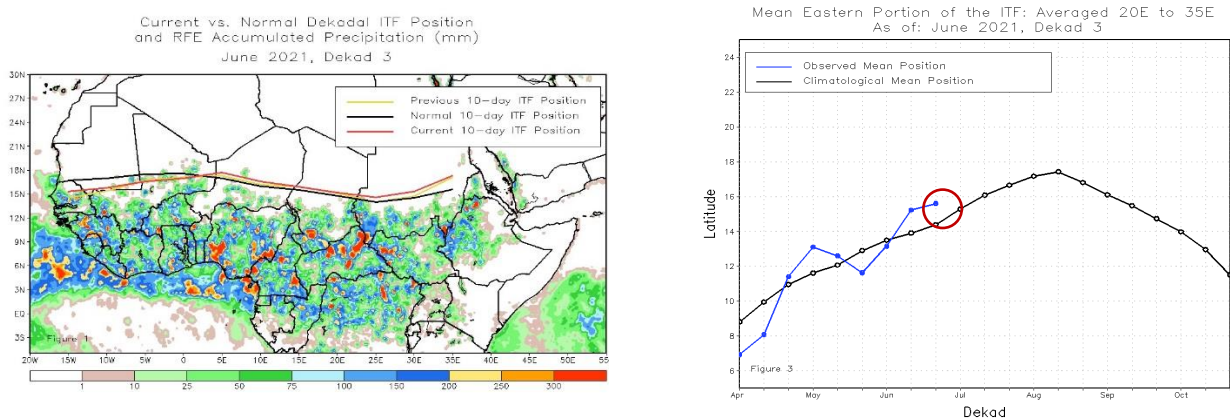


Figure 3: ITCZ position during the first dekad of June compared with the previous dekad and the long-term position.

2021 Rainfall:

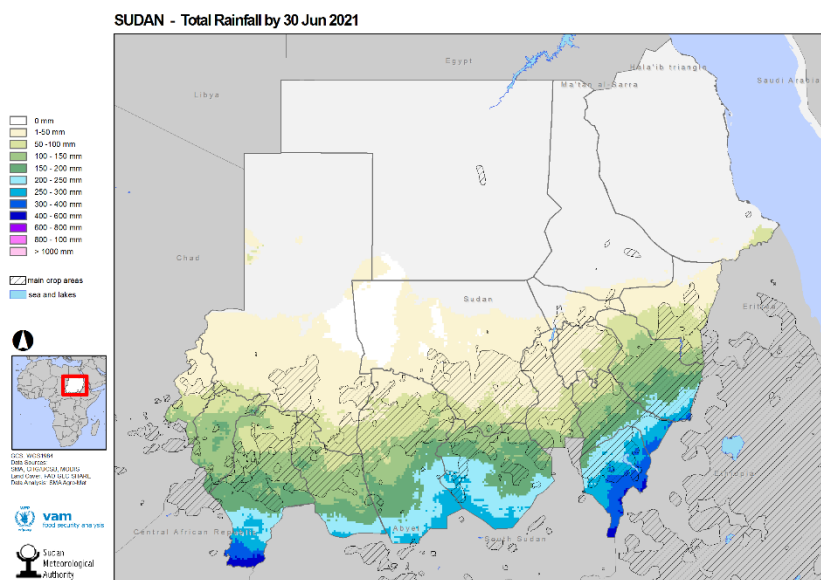
The following is the analysis of season 2021 rainfall by the end of June, situation in terms of rainfall amounts and rainfall amounts as percentage from averages.

Total Rainfall Amounts

During 2021 considerable rainfall amounts noticed over most of the southern parts of Sudan during April, May and June. Highest rainfall amounts observed in Blue Nile state, south of Darfur state, in the southern parts of Gedarif state, south-eastern parts of Sennar state and south of Kordofan Region (more than 200 mm) (**Figure 4**).

Moderate rainfall amounts ranges from 50 mm to 100 mm observed in north and central parts of Gedarif state, east and southern parts of El Gazira state, southern parts of White Nile state, most southern parts in North Kordofan, northern parts of South and West Kordofan states, most southern parts of North Darfur state, most parts in South and East Darfur states and the southern parts in West Darfur state (**Figure 4**).

Low rainfall amounts (less than 50 mm) registered in Kassala, Khartoum state, western and central parts in El Gazira state, most of North Kordofan state, most northern parts of West Kordofan state, various parts of North Darfur state and northern parts of West Darfur state (**Figure 4**).



- Heavy rainfall in the most southerly part of South Darfur and Blue Nile states exceeded 300 mm by late June and exceeded 200 mm northerly and south of Kordofan region.
- Moderate rainfall scattered north of the southern states with rainfall amounts exceeded 100 mm in April, May and June.
- Less than 50 mm registered in Kassala and Khartoum states, parts of El Gazira state northern White Nile state, southern parts of North Kordofan state, northern parts of West Kordofan state, southern parts of North Darfur state and northern parts of West Darfur state.

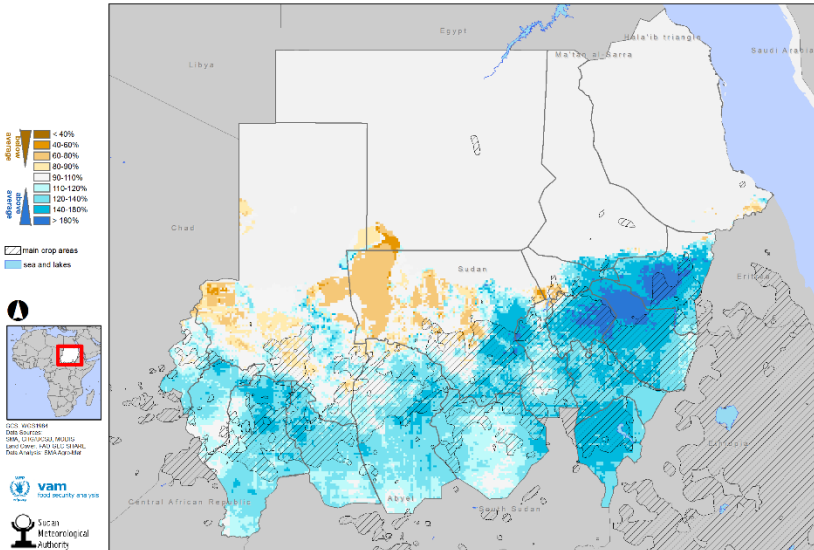
Figure 4: Total rainfall over Sudan by June 2021. **Source:** Sudan Agromet Information System (SAMIS).

Total Rainfall as Percentage of Average

Rainfall as Percentage of Average is derived to assess the rainfall performance against the long-term average as shown in (**Figure 5**). By late June, high percentage of rainfall amount from the average shown across the southern states (110 – 140%) and over the eastern parts of the country especially over Kassala and Gadaref states (120 – 180% or more).

Low percentages from averages rainfall amounts (60 – 90%) registered El Gazira, White Nile states, south of Khartoum state, over most of Kassala state, North Kordofan state and over scattered areas in North Darfur state (**Figure 5**).

SUDAN - Total Rainfall (percent of average) by 30 Jun 2021



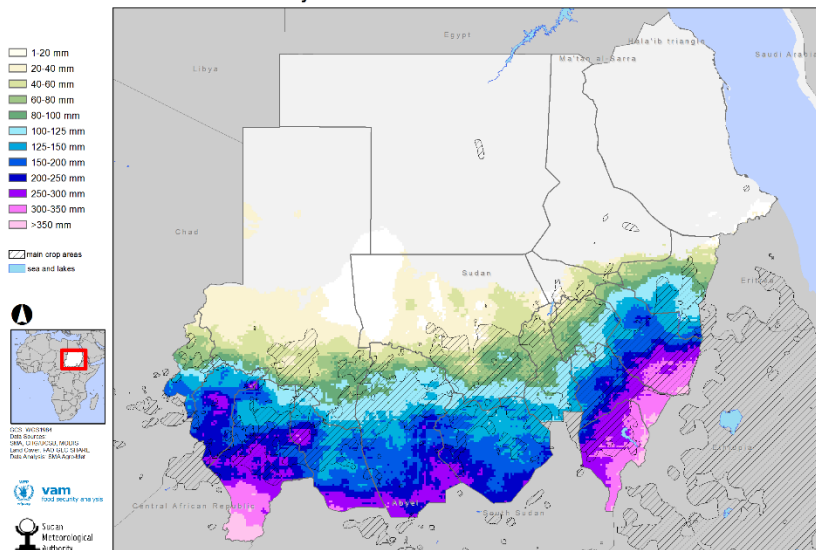
- By late June, above normal total rainfall registered across the southern and the eastern parts of the country especially over Kassala and Gedarif states.
- Below average total rainfall amounts shown south of Khartoum state, over most of North Kordofan state and over scattered areas in North Darfur state.

Figure 5: Total rainfall percentage from average by June 2021 over Sudan. **Source:** Sudan Agromet Information System (SAMIS).

June Rainfall Amounts

The country witnessed varying amounts of rain during June, ranging from 300 mm or more in Blue Nile State and the southern parts of Gedarif State, Sinnar and South Darfur State, then medium amounts of rains recorded in large parts of the southern states (**Figure 6**), where it was also monitored south of Kassala and southeast of El Gazira State. It gradually decreases towards the north, so that the White Nile State and the southeast of Khartoum State recorded the lowest levels of rain in the country during June, as well as North Kordofan, North Darfur, and northern Kassala and El Gazira states (**Figure 6**).

SUDAN - Rainfall in the 30 days to 30 Jun 2021



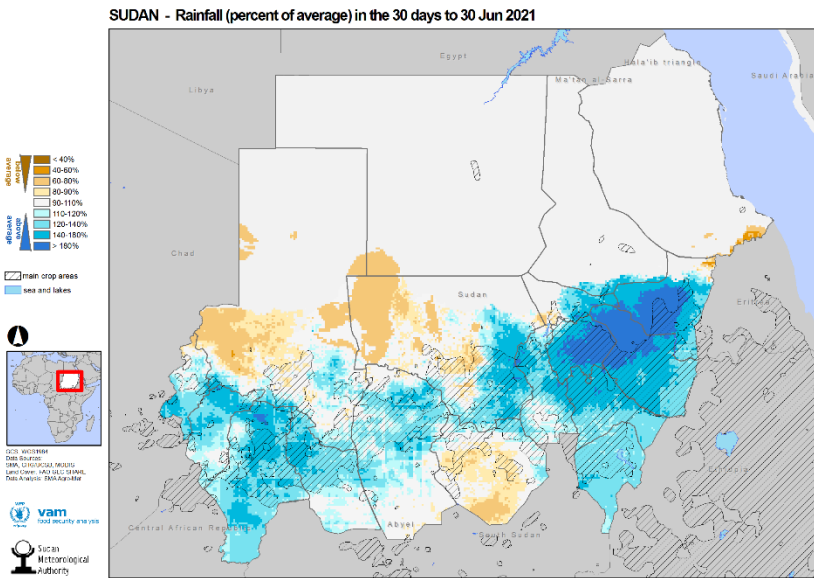
- Heavy rainfall during June 2021 registered in Blue Nile and South Darfur states, southern parts of Gedarif and Sinnar states and south of Kordofan region.
- Moderate rainfall occurred north of the southern states, south of Kassala state, parts of South Darfur state and across West Kordofan, East and Center Darfur states.
- Low rainfall amounts registered north of Kassala and El Gazira state, White Nile state, south east of Khartoum state. North

Figure 6: June 2021 rainfall amounts over Sudan. **Source:** Sudan Agromet Information System (SAMIS).

June Rainfall as Percentage of Average

Figure 7 shows the performance of June rainfall amounts as a percentage from the long-term average. High percentage of rainfall amount from the average shown across the eastern parts of the country, south of Darfur region and east and west of Kordofan region.

Low percentages of average rainfall amounts registered in parts of most parts of North Kordofan state, South Kordofan state and the southern parts of North Darfur state (**Figure 7**).



- High rainfall percentage of average occurred in Kassala, Gedarf, Sinnar, Blue Nile states and over South Darfur and small areas east of North Kordofan state and north of West Kordofan state and in South and West Darfur states.
- Low rainfall percentage of average amounts occurred in most parts of North Darfur, North Kordofan and South Kordofan states.

Figure 7: June 2021 rainfall as percentage over Sudan. **Source:** Sudan Agromet Information System (SAMIS).

June Dekadal Rainfall & Percentage of Average

Drier than average condition in dek1 June over North and West Kordofan states, White Nile state, Kassala, El Gazira state and south of Khatoum states as no rains recorded during this dekad (**Figure 8a, 8b**). High rainfall amounts registered in Blue Nile and south of El Gedarf states, South Kordofan and Darfur states to give wetter than average conditions announcing the start of growing season there.

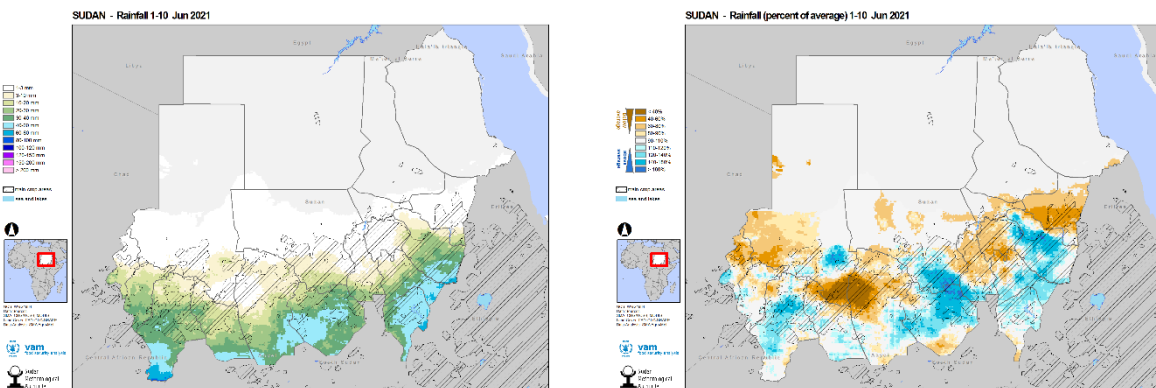


Figure 8(a, b): June1 2021 rainfall & percentage of average. **Source:** Sudan Agromet Information System (SAMIS)

Mid-June characterized by above than average rainfall over the country with dekadal rainfall not exceeding 100 mm, but good spatial distribution of rainfall noticed except small area in South Kordofan state (**Figure 9**).

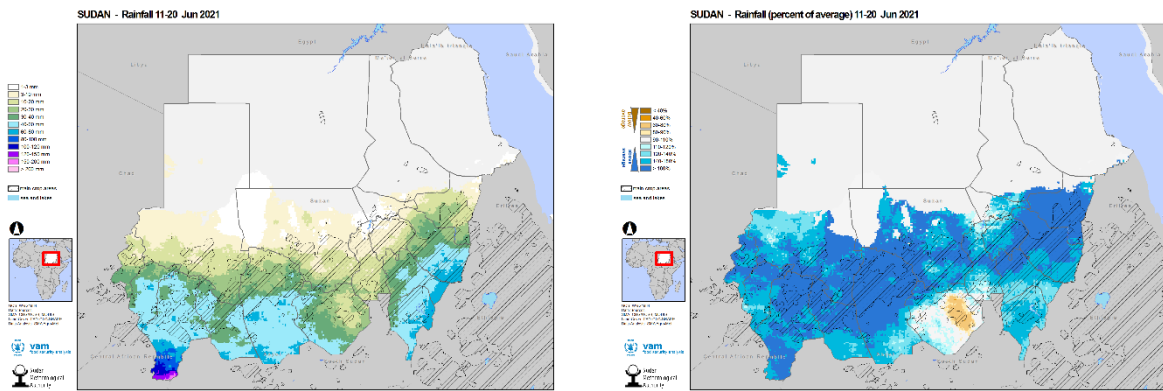


Figure 9: June2 2021 rainfall & percentage of average. *Source:* Sudan Agromet Information System (SAMIS)

Sharply drier than average conditions prevailed across Kordofan region and North Darfur state during late-June unlike the eastern parts of the country and south and west of Darfur region where appreciable rains received during this dekad (**Figure 10**).

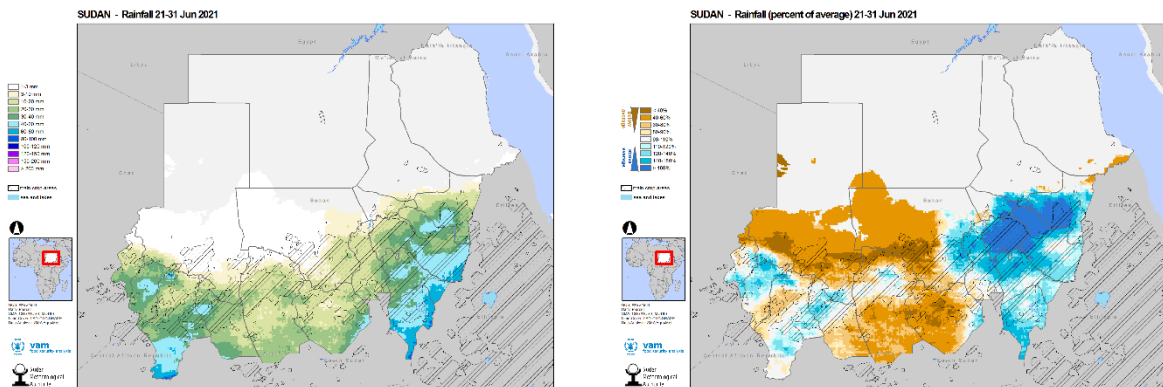


Figure 10: June3 2021 rainfall & percentage of average. *Source:* Sudan Agromet Information System (SAMIS)

Start of Season 2021

(**Figure 11**) shows the start of the growing season relative to average dates and dates of onset in Sudan. Corresponding to the wetter than average season so far, earlier than normal start of season noticed across the southern parts of the country and timely in central Darfur and El Gedarif states (**Figure 11**). Early May was the onset date south of the country. In June, there was an opportunity to advance north to start the agricultural season in the east and west of the country, except for North Kordofan and North Darfur states (**Figure 11**).

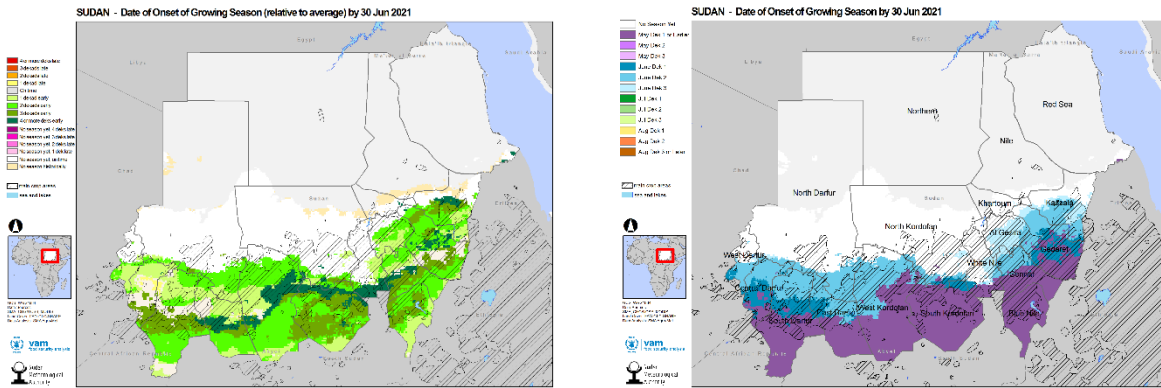


Figure 11: Start of growing season relative to averages and dates. *Source:* Sudan Agromet Information System (SAMIS)

Normalized Difference Vegetation Index (NDVI)

Third Dekad of June 2021

Normalized Different Vegetation Index (NDVI) is widely used index to assess the crops development during the rainy season.

The third dekad of June brought some vegetation development as a result of the previous dekad good rainfall. Dense vegetation conditions noticed in the southern parts of Blue Nile and South Darfur states. Slight progress in vegetation cover observed south of Kordofan region and east Darfur state. There is a chance for this situation to be improved across the eastern parts of the country as late June rainfall was significant and high rainfall amounts are expected all over the country (Figure 12).

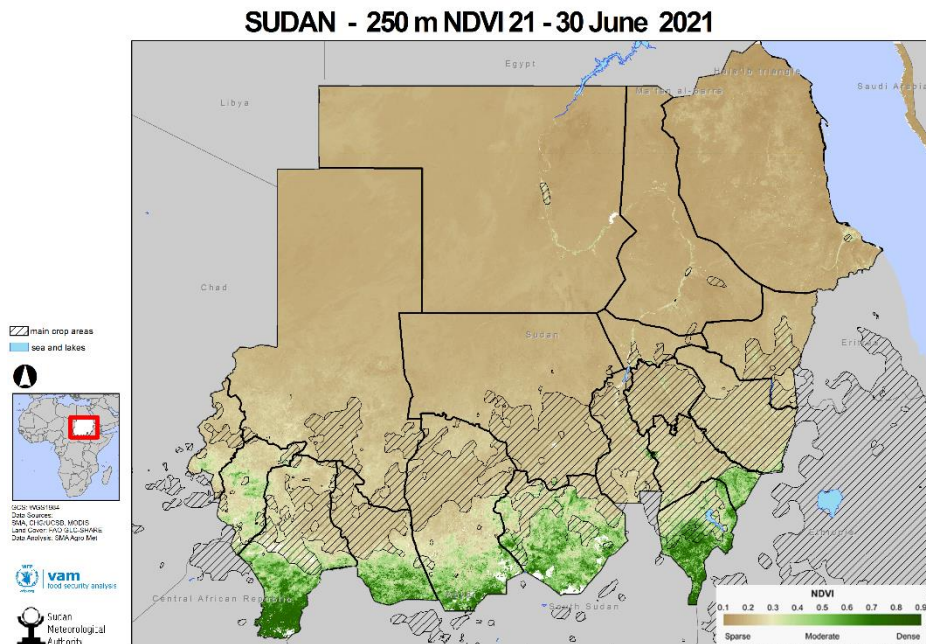


Figure 12: Vegetation development situation over Sudan during the third dekad of June 2021. *Source:* USGS/EROS.

NDVI As Percent of Average June 2021

Normalized Different Vegetation Index (**NDVI**) percent of median is used to assess the crops progress compared to the median. By the end of June vegetation patterns are extremely variable, with areas of below and above average vegetation development close to each other. Blue Nile, Southern Darfur and Kordufan and south of North Darfur had significant vegetation development. Scattered areas in El Gedarif, Sinnar, West Kordufan and East& Center Darfur states has the worst situation observed as compared to median (**Figure 13**).

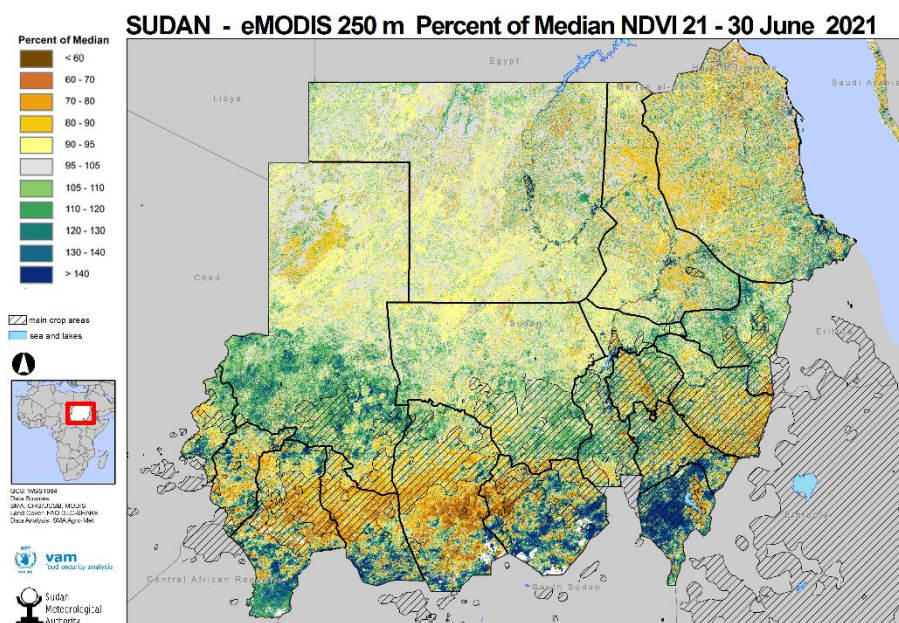


Figure 13: NDVI Percent of Median over Sudan during the third dekad of June 2021. *Source:* USGS/EROS.

Greater Horn of Africa Climate Outlook forum (GHACOF 58)

The Fifty Eight Greater Horn of Africa Climate Outlook Forum (GHACOF58) was convened on 18 May 2021 by the IGAD Climate Prediction and Applications Centre (ICPAC) in collaboration with the National Meteorological and Hydrological Services (NMHSs) of IGAD Member States, World Meteorological Organization (WMO) and other partners to share and document climate impacts across the region and to formulate responses to the regional climate outlook for the JJAS 2020 rainfall season over the GHA.

Figures 14 & 15 show the rainfall and mean temperature predictions over the region for the June-September 2021. **Tables 1** show the prediction over each Zone for both rainfall predictions.

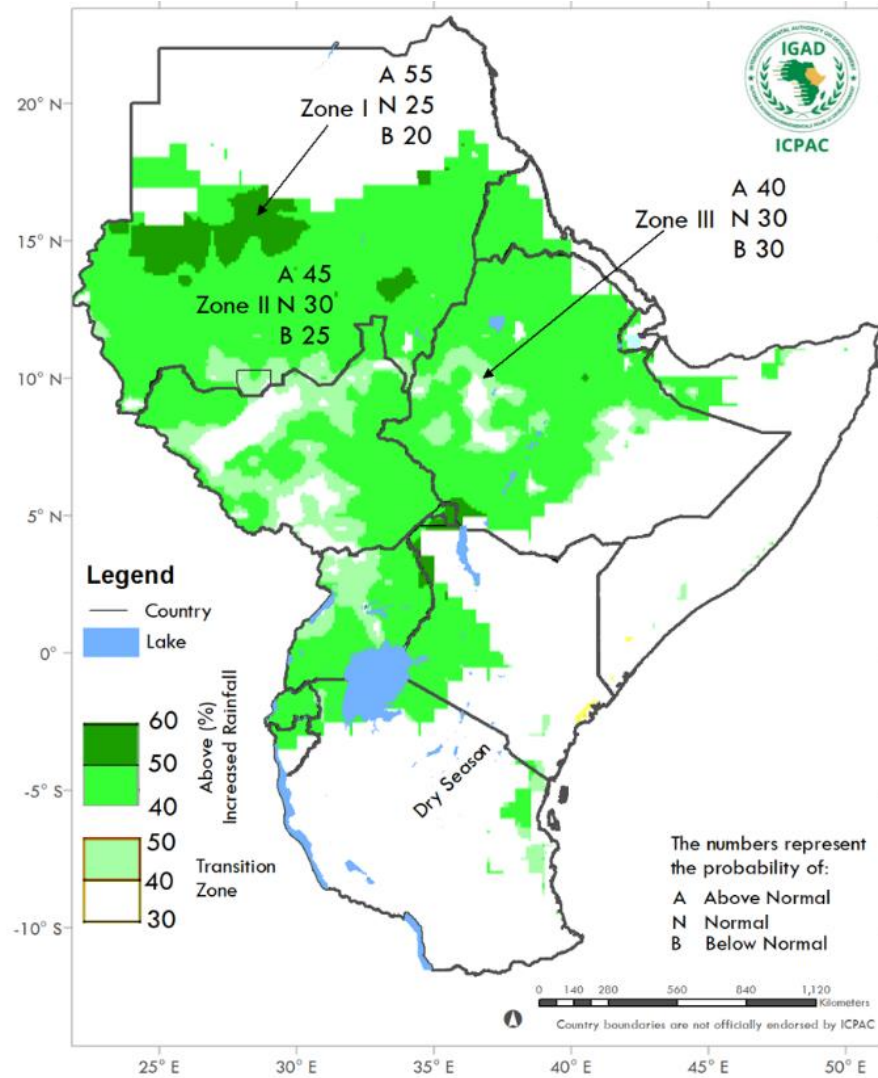


Figure 14: Greater Horn of Africa Objective rainfall Outlook for the June to September 2021 rainfall season.

Table 1: Rainfall prediction probabilities over the four zones during the June-September 2020.

Zone I	In this Zone (all green shading) the above normal rainfall category has the highest probability. The probability varies with location and can be read from the legend. For regions where the probability is highest (55%, dark green) the probabilities for all three categories are provided.
Zone II	In this Zone (all green shading) the above normal rainfall category has the highest probability. The probability varies with location and can be read from the legend. For regions where the probability is highest (40%, light green) the probabilities for all three categories are provided.

Temperature Probabilistic Forecast for July-September 2021

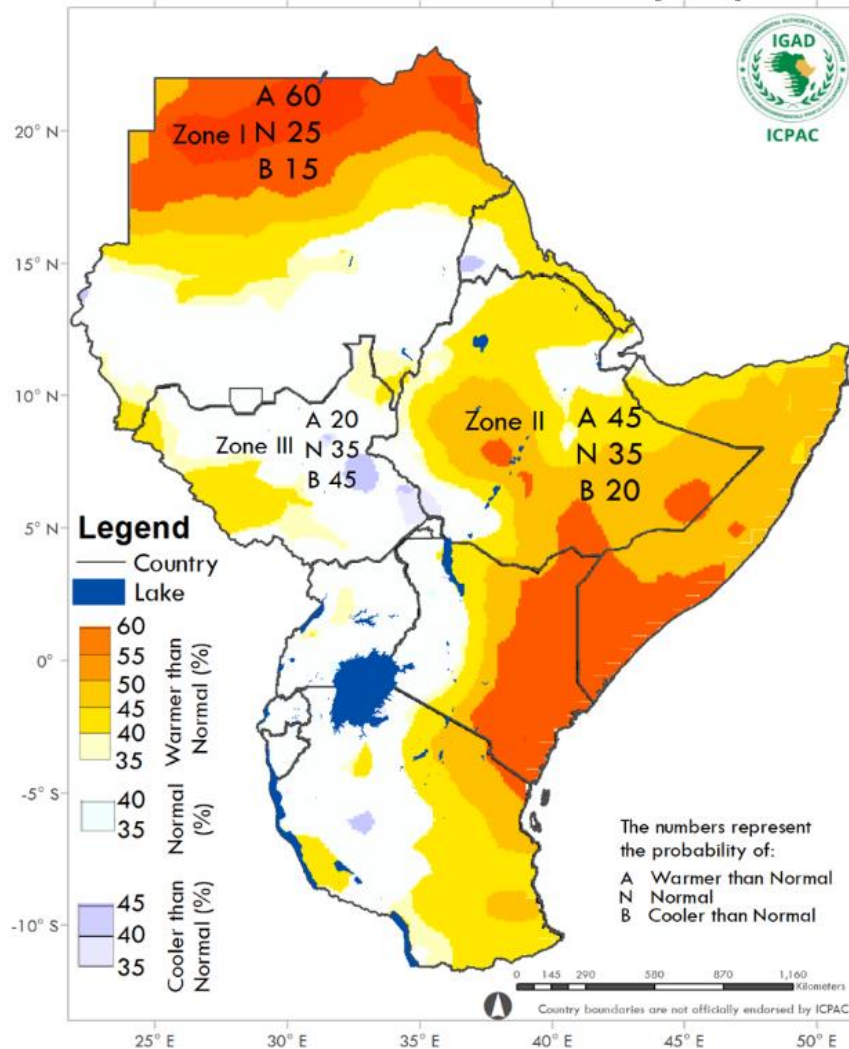


Figure 6: GHA Mean Surface Temperature Outlook for June to September 2021.

Note: The boundaries between zones should be considered as transition areas. White shading areas in Figures 1 and 2 indicate regions where the predicted probabilities for the above-, near- and below-normal categories are approximately equal at 33% (i.e. no single category is favoured over the other two).

Sudan Rainfall Prediction for June-September 2021 Season

Sudan Meteorological Authority (SMA) issued its seasonal forecasts for the period June-September 2021 in late-May. It has been distributed publicly to enable the decision-makers and farmers to set up their plans and actions to make use of the promising rainy season. The predictions are on the same line with the ICPAC predictions, above normal rainfall is forecasted over the whole country during the prediction period (June-September 2021), **Figure 16**.

The monthly rainfall predictions show above normal rainfall is expected all over the country. Updates will provide new information to the users to plan or intervene accordingly.

SMA adopted various distribution mechanisms to ensure the better dissemination of the seasonal forecast for the decision makers as well as the farmers, pastoralist, investors and ordinary people. Also, the seasonal rainfall forecast supports the NGOs and UN Agencies to setup their intervention and action plans during the season.

SMA rainfall prediction over Sudan for the season June-September 2021.

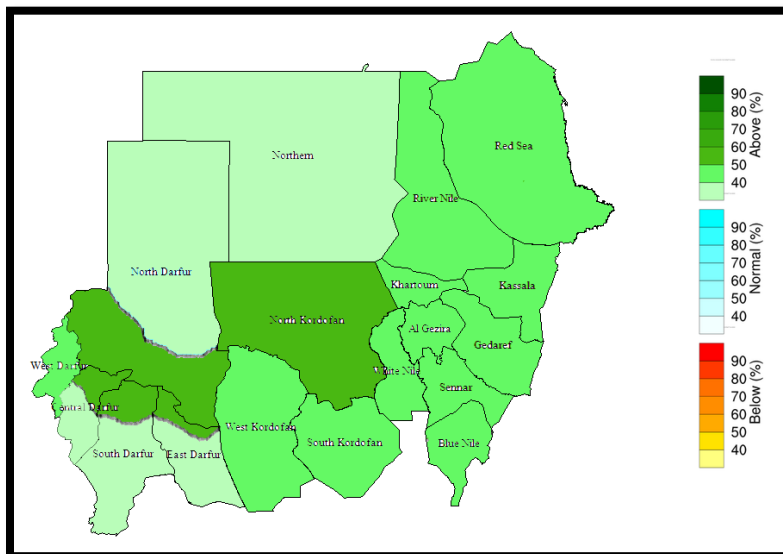


Figure 76: SMA rainfall prediction over Sudan for the season June-September 2021.

Although there are considerable amounts of rainfall occurred during June, the sowing of the crops still confined in most parts of the country. July rainfall expected to be normal to above normal all over the country. This will allow the favorable growing conditions to take place over the central areas of the country.

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Sudan Meteorological Authority

Sudan AgroMet Bulletin



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