

Sudan Agromet Dekadal Bulletin

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Highlights

- The ITCZ moved markedly northwards in contrast with previous dekads, being now around 16°N.
- Abundant and well above average rainfall over Eastern Sudan. In Western Sudan rainfall was low in particular in West Kordofan and South Darfur. Unseasonal rainfall registered in Central-North Sudan due to the ITCZ movement.
- Cumulative rainfall is on or above normal in S and SW Sudan but below average conditions prevail in W Kordofan-S Darfur and S Kordofan-Upper Nile.
- Vegetation development under way and on average in Southern and Central states, up to the borders of Blue Nile-Sennar, South and West Kordofan and South Darfur. Conditions in Upper Nile and NE Jonglei are reflecting the below normal rainfall relative to the average season.

Rainfall Analysis – Seasonal Progress

Rainfall in Sudan and its seasonal distribution is mostly the result of the northwards movement of moist air masses, source of the rainfall. The Intertropical Convergence Zone (ITCZ) marks the northernmost extent of these humid air masses, where they meet with drier and warmer air. The rains follow some distance south of this border between air masses, so that tracking this ITCZ through the season provides a quick evaluation of the seasonal movement of the rains

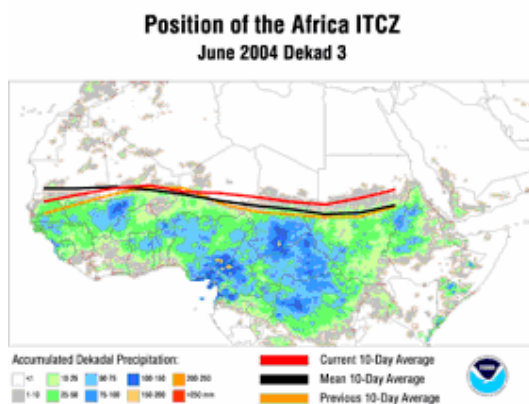


Fig 1a – Position of ITCZ over Africa in June Dek 3 2004 (red) compared to previous dekad (orange) and average position (black). Background is a rainfall map (Source : CPC-FEWS Net)

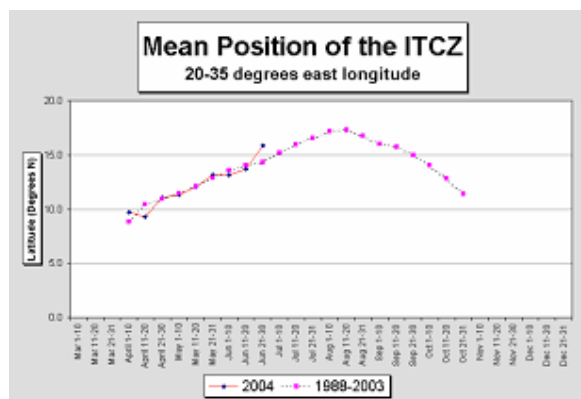


Fig 1b – Current latitude of the ITCZ position compared to the 15 year average. (Source : CPC-FEWS Net)

Note (fig 1a) how the ITCZ position marks the border between the (significantly) rainy and non-rainy rainfall areas. The way this position changes along the season can be described by the time series of its mean latitude (fig 1b). We can see :

- The ITCZ has been progressing northwards in line with the 15 year average until mid June.
- However, this dekad the ITCZ made a remarkable advance northwards as can be clearly seen from the map and plot in Fig 1. The current position is about 16°N, well north of the average. Consequences on the rainfall pattern are described in the next sections.

Rainfall Analysis - Dekadal Amounts and Frequency

10 day rainfall amounts produced by SAMIS at SMA/SEWS are based on a combination of METEOSAT satellite and synoptic gauge data. Rainfall climatology is similarly derived from a combination of historical data from the two sources.

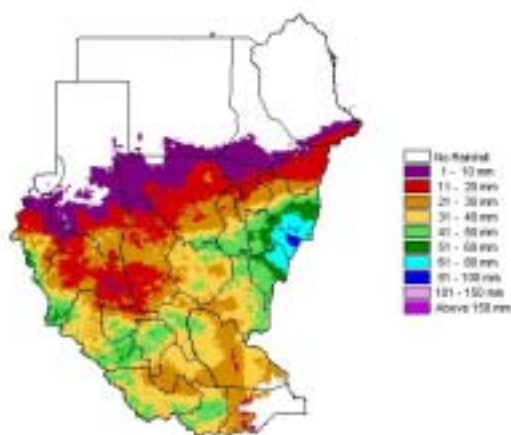


Fig 2a – Rainfall amounts (mm) 21-30 June 2004

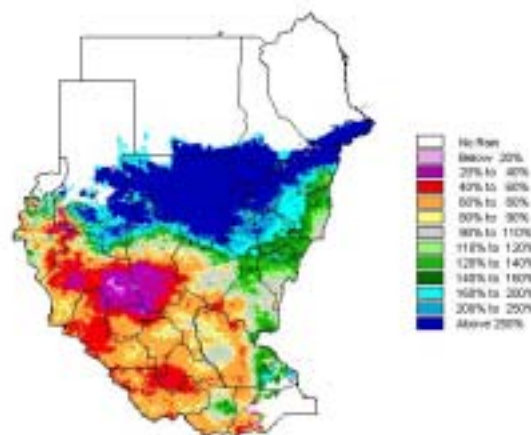


Fig 2b – Same but in relative terms : as % of long term average

In this dekad, rainy areas made a remarkable progress northwards due to the strong ITCZ movement described in the previous section. Over all Eastern Sudan rainfall amounts were much larger than in the previous dekad. Areas with heavier rainfall (over 60-80 mm) were found mostly along the eastern border of the country (Gedaref, Sennar and Blue Nile States) with point values of 103.1mm reported at Damazine. In Western Sudan, in particular West Kordofan and South Darfur, rainfall amounts were below 20-30mm. Central-North Sudan (from N Kordofan to Kassala) registered low rainfall, but very little if any is usually reported at this time of the year.

In relative terms, Eastern Sudan registered significantly more than the average rainfall, in contrast with Western and Southern Sudan where amounts were markedly below the average. Central-North Sudan registered very much above average rainfall, though average amounts are usually very small.

Rainfall Analysis - Cumulative Amounts

Cumulative amounts are obtained by summing the dekadal estimates starting from Dekad 1 of March until present.

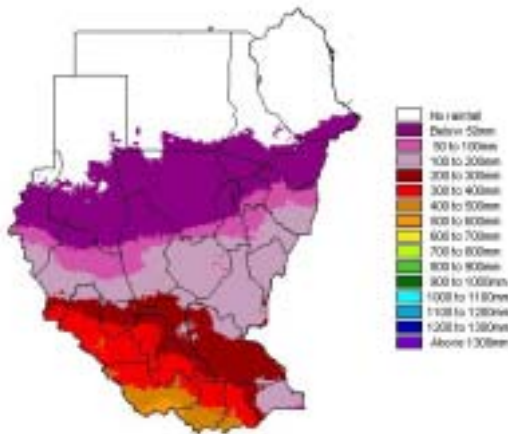


Fig 3a – Cumulative rainfall (Mar Dek1 – Current Dek)

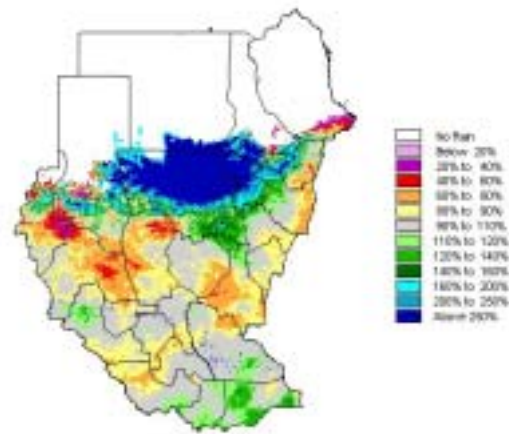


Fig 3b – Same but in relative terms : % of long term average

The cumulative rainfall amounts (Fig 3a) display the usual organisation in latitude bands (as the rainfall moves north following the ITCZ). Currently, values approach 500mm in southernmost Sudan and less than 50mm up to 16°N.

The situation relative to the average (Fig 3b) improved from last dekad in the East of Sudan (Upper Nile to Kassala), due to good rains in this area. In contrast, some worsening is noticeable in S Darfur – W Kordofan borders, but it is still early in the season for this to be of significance.

Compared to the average scenario (Fig 3b), values are on or above normal in most of Southern and Southwestern Sudan. Slightly below average conditions remain in the Upper Nile-South Kordofan border and S Darfur-W Kordofan border. It is however fairly early in the season – the situation should be monitored but can be quickly reversed in the next dekads. In Central-North Sudan the unseasonal rains show up as areas of exceptionally above average rainfall.

Vegetation Analysis

Vegetation information is based on the NDVI, a satellite index related to vegetation amount and vigour. NDVI data is sourced from the Africa Data Dissemination Service and processed at SMA.

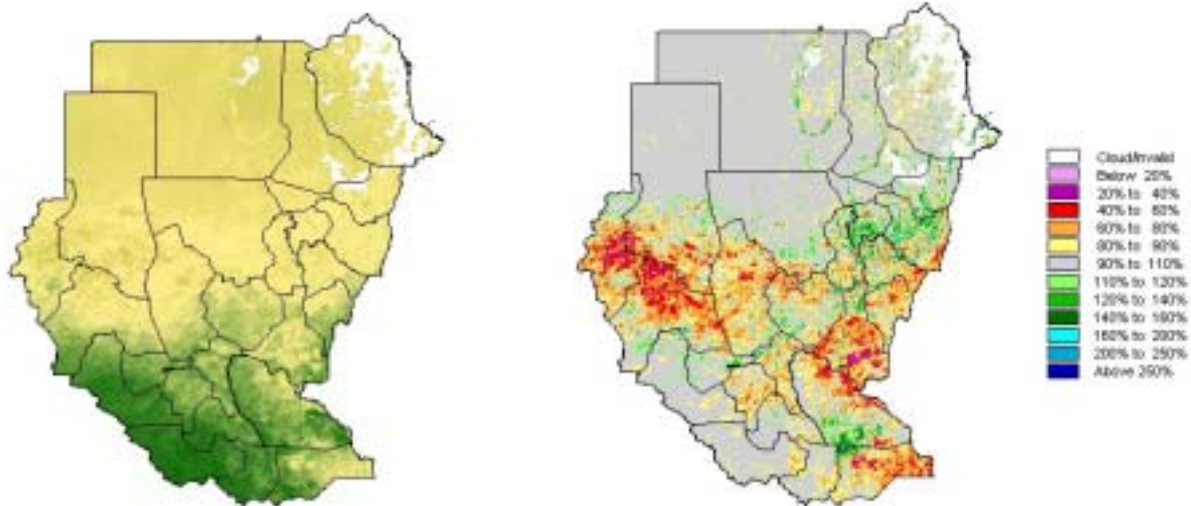


Fig 4a – NDVI 21-30 June 2004. Darker shades for denser vegetation, lightest shade for soil. (Source : ADDS).

Fig 4b – Same in relative terms : % of long term average (ADDS)

The NDVI for this dekad (Fig 4a) continues the trend of vegetation advancing northwards following the progress of the rains. Currently, new season vegetation development is registered in the central states, up to the borders of Blue Nile - Sennar, South and West Kordofan and South Darfur.

In Southern Sudan, vegetation conditions are mostly on average (Fig 4b), with a pocket of well above average vegetation development over the E Equatoria-Jonglei border, in broad agreement with an area of above average rainfall (Fig 4b). Conditions in Upper Nile and NE Jonglei are reflecting the below normal rainfall relative to the average.

Markedly lower than average conditions in West Sudan (West and South Darfur in particular) are not yet considered significant – typically, vegetation development starts in early July, so this most likely reflects only small scale fluctuations of dry season values (which tend to be fairly small). However this should be monitored in case the situation persists.

One can also see (Fig 4b) that vegetation development seems above average over Eastern Sudan (Sinnar, Gezira, Gedaref). This is not due to new vegetation development – last season was very productive in these areas and there is probably more vegetation material remaining than usual, coupled to the average amounts being quite low for this time of the season. The next two dekads should clarify the situation.

Acknowledgements

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