

# Sudan AgroMeteorological Bulletin

SUDAN METEOROLOGICAL AUTHORITY

11-20 SEPTEMBER 2005



## Highlights

- In seasonal terms (Fig 1b ), Since first July the ITCZ has been consistently further north than usual , but in the pervious fourdekades it turned south .Now around 15°N.
- Areas with heavier rainfall were found in lower south DarFur, West Equatoria and (West- North) Bahr EL Ghazal with point value of 93.7mm reported at Wau .
- In relative terms, most southern parts registered above average rainfall, in particular, Jonglei, Lakes, East, West Equatoria, and parts of upper Nile. In West Kordofan, South Darfur and Kassala rainfall was above average as well.
- Below average cumulative rainfall is seen in South Gedaref and Sennar as well as in Upper Bahr El Ghazal, and lower South Darfur.
- In relative terms, vegetation conditions are mostly above average generally across the country particularly in Blue Nile- Upper Nile regions, West Equatoria , Bahr EL Jabel and Lakes. Below average conditions can be seen in small patches, particularly in Kassala, Gedaref and upper of White Nile..

## 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

**Current vs Mean Position of the Africa ITCZ**  
As analyzed by the NOAA Climate Prediction Center  
September 2005 Dekad 2

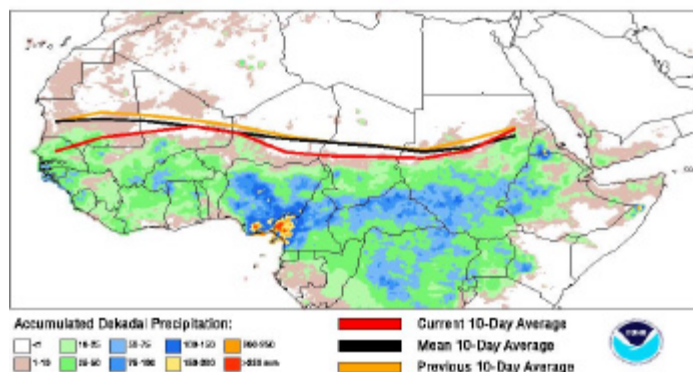


Fig 1a – Position of ITCZ over Africa in September Dek 2 2005 (red) compared to previous dekad (orange) and average position (black). Background is a rainfall map (Source : CPC-FEWS Net)

**Mean Position of the ITCZ**  
20-35 degrees east longitude

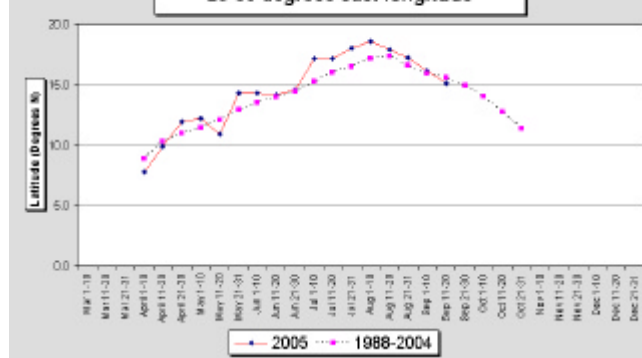


Fig 1b – Current latitude of the ITCZ position compared to the 15 year average. (Source : CPC-FEWS Net)

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 :

- During this dekad the ITCZ over Sudan was south of the previous and average position except in Eastern (see Fig 1a) .
- In seasonal terms (Fig 1b), since first July the ITCZ has been consistently further north than usual but in the previous four dekads were below the average.

## Rainfall Analysis – 10 Day Amounts

10 day rainfall amounts produced by SAMIS at SMA 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.

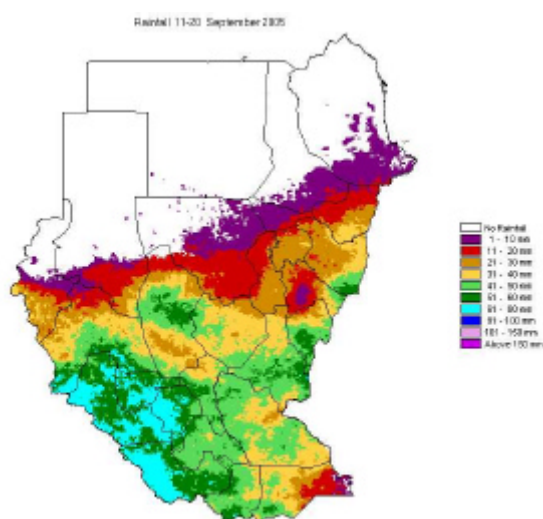


Fig 2a – Rainfall amounts (mm) 11– 20 September 2005

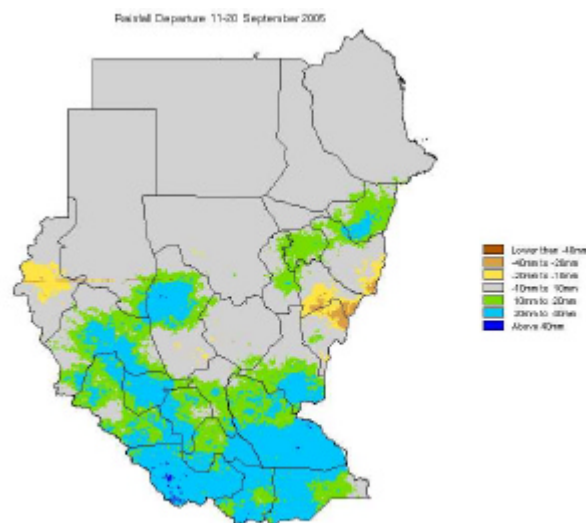


Fig 2b – Same as a difference from the average : yellows/ browns for rainfall deficit, greens/blues for rainfall surplus

In this dekad the rainfall amounts were generally lower than the previous dekad. Areas with heavier rainfall (over 60-90 mm) were found in lower south Darfur, West Equatoria and (West- North) Bahr EL Ghazal with point value of 93.7mm reported at Wau.

In contrast, lower rainfalls occurred in East Equatoria, , North Kordofan, North, West Darfur, Sennar, El Gezira states and in particular northern White Nile.

In relative terms, most southern parts registered above average rainfall, in particular, Jonglei, Lakes, East, West Equatoria, and parts of upper Nile. In West Kordofan, South Darfur and Kassala rainfall was above average as well. In contrast, in the Sennar and Upper of Blue Nile were below the average.

In general, conditions for crop development are suitable across the country but Eastern Gedaref will need decent rainfalls next dekad.

## Rainfall Analysis – Cumulative Amounts

Cumulative amounts are obtained by summing the dekadal estimates starting from Dekad 1 of March until present. The climatological cumulative are likewise derived by summing the dekadal climatological estimates over the same period of time.

The cumulative rainfall amounts (Fig 3a) display the usual organization in latitude bands (as the rainfall moves north following the ITCZ). Currently, values are exceeding 1200 mm in the Yei region (West Equatoria) and less than 50 mm up to 20°N.

In relative terms, significant above average departures (Fig 3b) are evident in most of Southern Sudan and in Greater Darfur as well as in the East, over Kassala, parts of Khartoum, Gezira, and southern Red Sea states.

Below average cumulative rainfall is seen in South Gedaref and Sennar as well as in Upper Bahr EL Ghazal, and lower South Darfur. In these latter regions these deficits are not considered significant because they happen above crop water requirements.

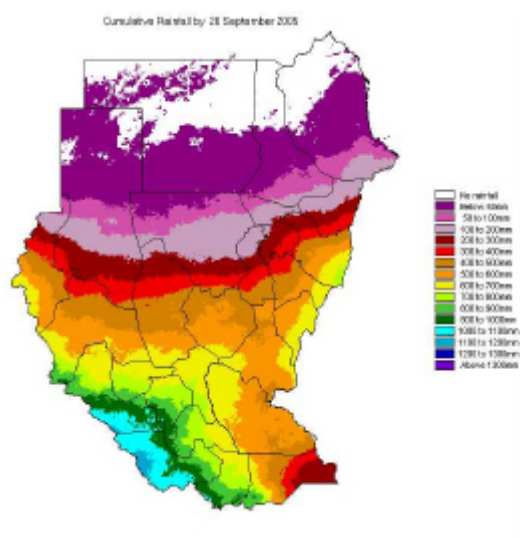


Fig 3a – Cumulative rainfall (Mar Dek1 – Current Dek)

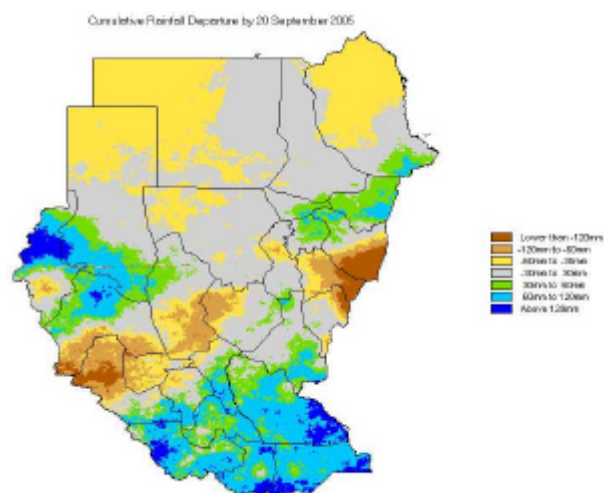


Fig 3b – Same as a difference from the average : yellows/ browns for rainfall deficit, greens/blues for rainfall surplus

## Vegetation Analysis

The NDVI (Fig 4a) continues the trend of vegetation advancing northwards following the progress of the rains. Currently, season vegetation development is registered up to Kassala, El Gezira, White Nile, most of North Kordofan and lower half of North Darfur.

In relative terms, vegetation conditions are mostly above average across the country, particularly in Blue Nile-Upper Nile regions, West Equatoria, Bahr El Jebel and Lakes, but also in small patches spread across the country.

Below average conditions can be seen in small patches, particularly in upper White Nile, parts of Kassala and Gedaref . Elsewhere there are small patches of lightly below average conditions of little significance.

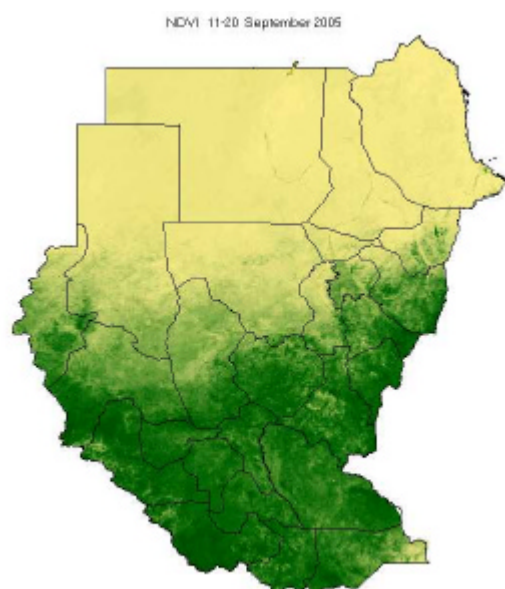


Fig 4a – NDVI 11 – 20 September 2005. Darker shades for denser vegetation, lightest shade for soil.

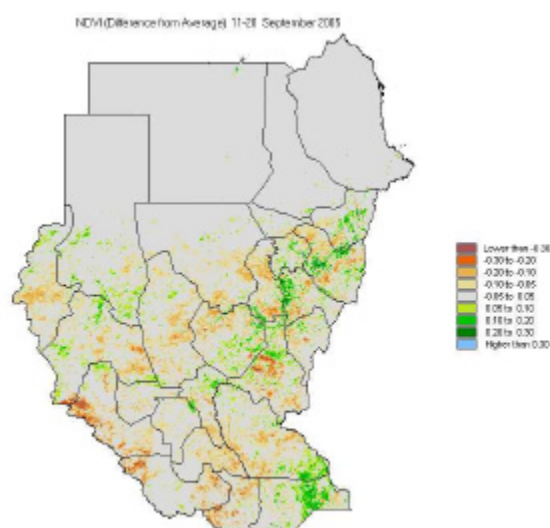


Fig 4b – NDVI difference from average at second of September 2005. Yellows/reds for below average vegetation development, greens/blues for above average

## **ACKNOWLEDGEMENTS**

This Bulletin is issued twice a month (after the first and second 10 day periods of the month) and complements/updates a larger monthly Bulletin prepared in cooperation with the Sudan Early Warning System and originates from a 2002 capacity building initiative of the World Food Programme (WFP) to improve the range and quality of the monitoring information available to the institutions involved in humanitarian assistance in Sudan.

This initiative led to the installation at the Sudan Meteorological Authority of a system to process meteorological station and satellite data into a range of rainfall, vegetation and crop related information products. This system – SAMIS (Satellite based Agro-Meteorological Information System) – developed by the TAMSAT group (Univ of Reading, UK), has been fully operational at SMA since 2003.

SMA expects to develop further the range and quality of the products available over the course of the next seasons.

SMA would like to thank the major providers of the satellite data, TAMSAT group, University of Reading , UK (METEOSAT) and FAO/ARTEMIS (SPOT-VGT).

Mr. A. M. Abel Gadir, Director General  
Sudan Meteorological Authority  
PO Box 574  
Khartoum  
Sudan  
Tel. +249 11 778836/7  
Fax. +249 11 771693

SAMIS Team at SMA :  
Mr. Musa Abd El Bagi  
Mrs Hanan Mohammed  
Mrs Badria Abdelrahman  
Mr Ahmed AbdelKarim  
  
su\_samis@yahoo.com