

Sudan Seasonal Monitor



Sudan Meteorological Authority
Federal Ministry of Agriculture and Forestry



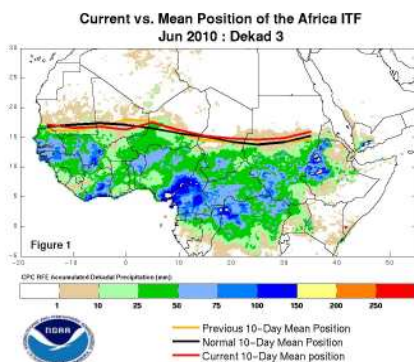
Issue 4

July 2010

Summary:-

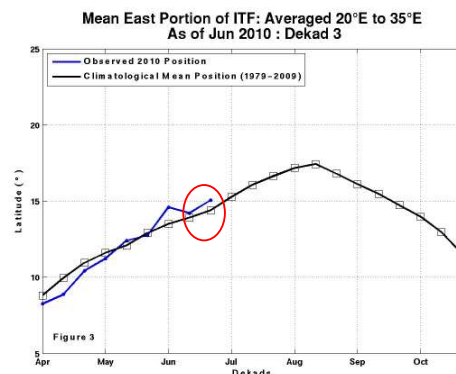
- During June 2010 the rainfall belt gradually advanced its position northward, bringing favourable conditions to agriculture in central parts of the country. Sowing and planting conditions could be started by mid and late June in central Sudan. See Page (1) Fig (1.1 and 1.2) and page (2) Fig (2.1, 2.2, 2.3 and 2.4).
- Suitable planting and early crop development conditions have been spread northwards in late June, but delays have happened particularly in areas of Eastern parts of the country and in South Kordufan States. See Page (3) Fig (3).
- June is very humid throughout Western and Northern Bahr El Gazal, Western and central Equatoria, Warab, southern parts of Upper Nile, Blue Nile and southern parts of Sinnar state with above average rainfall amounts, although There are some pockets of dryness through southern parts of Jonglei state, northern parts of Sinnar and Gadarif states and throughout of East Equatoria state. See Page. (4) Fig. (4)
- Vegetation has significantly developed to average levels in the areas of Unity state, South Kordufan state, southern Darfur and Western Darfur states, while below average development was shown in Jonglei, Upper Nile, southern parts of western Bahr El Ghazal state and southern parts of southern Darfur state. See text for further detail. See Page 4. Fig (5.1 and 5.2).
- Forecasts for July-August-September rainfall from different sources (SMA, IRI and ECMWF) have become more consistent. SMA updated its seasonal forecast for the rainfall of July-August-September (JAS) 2010, see Page (6).Fig (6). According to this forecast, JAS rainfall is expected to be above average to average throughout different climatic zones of the country, with a somewhat lower chance of above average rainfall in the southwest region.

Seasonal Progress:-



1.1

Fig (1.1) – Position of the ITCZ over Africa in June Dekad3-2010(red) compared to its average position (black) and to its position during same period in 2009. (Source: Climate Prediction Centre (CPC)).



1.2

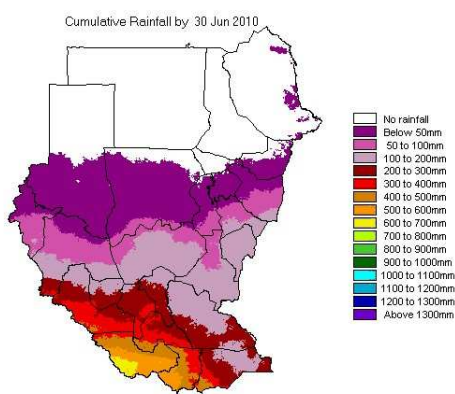
Fig (1.2) – Average position of the ITCZ over Sudan along the current season compared to a 20-years average (1988-2010). (Source: CPC),Note: the position in mid June (circled)

Rainfall in Sudan mostly results from a northwards movement of humid air masses from March to August and their southwards retreat from September to November. At their northernmost reach, these humid air masses meet with drier and relatively warmer air to form the Inter Tropical Convergence Zone (ITCZ). Since the rains follow south of the ITCZ, tracking the ITCZ through the season provides a quick evaluation of the seasonal progress of the rainy season and of its quality.

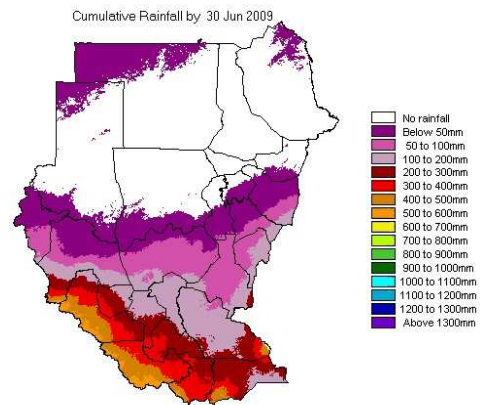
Fig (1.1 and 1.2) shows a map with the latest ITCZ position. The current position of the ITCZ is north to its average position and north to its position of the previous decade.

June Rainfall in Sudan

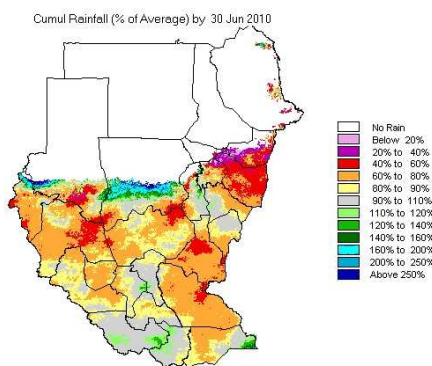
During June 2010 the rainfall belt gradually advanced its position northward, compared to both May 2010 rainfall and June 2009 rainfall belts a significant improvement in rainfall amounts and distribution was experienced almost through all the country. A higher amount (more than 700 mm) was registered in Western Equatoria state which improved the situation caused by May dryness. See Fig (2.1,2.2,2.3 and 2.4).



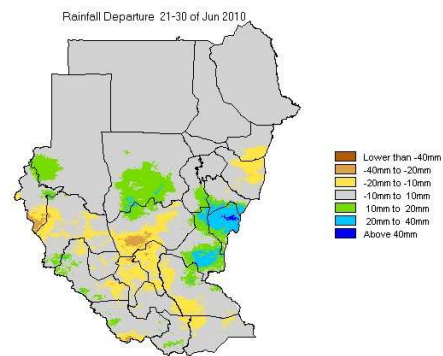
2.1



2.2



2.3



2.4

Fig 2.1 – Cumulative Rainfall amounts by 30 June 2010.

Fig 2.2 – Cumulative Rainfall amounts by 30 June 2009.

Fig 2.3 – Cumulative Rainfall (% of average) by Jun 2010.

Fig 2.4 – Rainfall departure 21- 30 of June 2010.

During early June, significant rainfall amounts was registered in Southern and Central parts of the country specifically Upper Nile state and Equatoria states in the South , Blue Nile and White Nile states (Abu Naama and Kosti,) in the centre, the rainfall extended to the north with little amounts in South Kordufan, Blue Nile, Gedarif, Kassala and Gezira.

In mid-June Central parts continue to have considerable amounts of rainfall especially in Damazine district and Sennar state, with below average amounts observed in juba, El Rank and Malakal.

Late June the rainfall was spreaded to the northern parts, but below average rainfall amounts was registered in southern part of the country, South Kordufan and Kassala. Parts of Eastern Region (New Halfa and Kassala) experienced below average rainfall amounts during late June. See Fig (2.3).

In term of total rainfall amounts, June showed a wide distribution of the rainfall over central Sudan, with above average amounts in Central Equatoria, Western Equatoria, Upper Nile, Blue Nile, North Kordofan, Sennar and Gazera state. Although Eastern parts of the country received below average rainfall amounts. See Fig (2.3).

Late June good rainfall will support the agriculture situation in Central Sudan to start sowing and re sowing the crops (Sorghum & Millet).

Start of Growing Season

A better evaluation of the effect of rainfall on crops can be made by comparing rainfall to a measure of the water demand imposed on crops by the environmental conditions (i.e. temperature, humidity, solar insulations and wind levels).

It could be detected when rainfall is enough to meet the estimated water demands of planting and early crop development – the start of the growing season is taken as the date when these demands are met for at least two dekads periods. Fig (3), displays the dates on which the growing season started across southern Sudan.

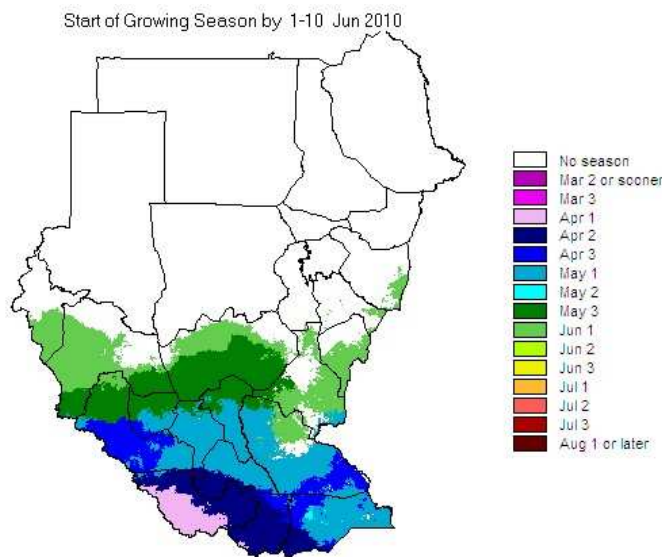
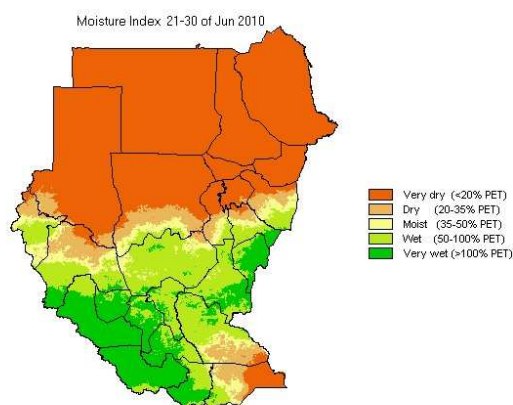


Fig (3) – Dates of Start of Growing Season until early June 2010. Each color represents a different 10 day period of a given month (1 = 1 to 10, 2 = 11 to 20, 3 = 21 to 30 or 31).

Fig(3) shows that across Southern Sudan and most of central parts suitable conditions for planting and early crop development took place in early June. In late June, there was northwards progress of the rainfall and this was reflected in the occurrence of planting conditions across remaining areas of Southern Sudan and in parts of South Kordufan, South Darfur.

Moisture Index:-



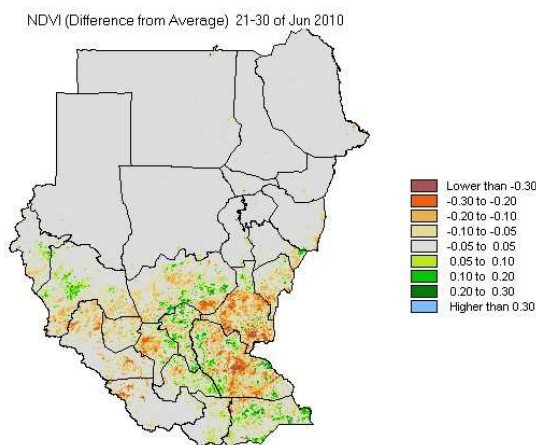
Fig(4)- Moisture Index for the period 21-30 of June 2010.

June is very humid throughout Western and Northern Bahr El Gazal, Western and central Equatoria, Warab, southern parts of Upper Nile, Blue Nile and southern parts of Sinnar state with above average rainfall amounts, although There are some pockets of dryness through southern parts of Jonglei state, northern parts of Sinnar and Gadarif states and throughout of East Equatoria state. See Page. (4) Fig. (4)

Vegetation Status:-

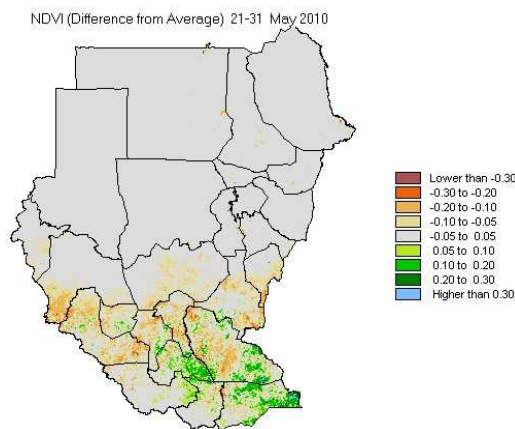
Vegetation condition and development are assessed by means of the NDVI (Normalized Difference Vegetation Index) – this is a satellite derived parameter which responds (almost) uniquely to vegetation and is available on a global scale every ten days.

The wetness and good amounts of rainfall during June led to above average vegetation development, mid April to mid May worst situations are maintained by June good rainfall, as a consequence, this led to significant change in vegetation conditions, when compared with average situation (Fig 5.1). , which results in on average vegetation development in Unity, South Kordufan, South and western Darfur. In June, the most noticeable below average vegetation development regions are below average development in Jonglei, Upper Nile, southern parts of western Bahr El Ghazal state and southern parts of southern Darfur state. See Fig (5.1).



5.1

Fig 5.1 – NDVI difference from average in late June 2010.



5.2

Fig 5.2 – NDVI difference from average in late May 2010.

Yellows and reds represent below average vegetation development, greens and blues represent above average vegetation development.

Note: - below average development in Jonglei, Upper Nile, southern parts of western Bahr El Ghazal state and southern parts of southern Darfur state. See text for further detail.

Seasonal Perspectives

El Niño (and La Niña) events are disruptions of the ocean-atmosphere system in the Intertropical Pacific which can cause large scale changes in wind circulation and sea surface temperature, and lead to a variety of impacts on rainfall and temperature distribution across the globe.

During June - August season there is an approximately 62% probability of maintaining neutral conditions, and that is predicted to be the most likely situation through the second half of 2010 and into early 2011. The likelihood of returning to El Niño conditions is now very low while the chances of La Niña conditions are about normal.

Note that El Niño – La Niña effects on the climate of Sudan are not known in detail but are judged to be weaker than in other areas such as Southern Africa and Kenya-Tanzania.

Rainfall Outlook:-

There are a variety of methodologies and models that use tropical east Pacific sea surface temperatures (SSTs) patterns as input to predict/forecast long term (1 to 6 month) changes to rainfall and temperature regimes over wide areas of the globe.

SMA uses seasonal forecast information produced by IGAD Climate Prediction and Application Centre (ICPAC) and information publicly available on the Web from three main sources: International Research Institute IRI in USA, Climate Prediction Centre (CPC) from NASA in USA and the European Centre for Weather Forecasts ECMWF in Europe.

June – September 2010 Rainfall Forecasts

July-August-September (JAS) is the crucial period for most crops in Sudan, in particular for the northern regions. Forecasts for JAS rainfall have been prepared in May and June by a variety of sources. Forecasts made at such long time ranges can provide only general guidance and it is possible to find conflicting information.

SMA updated its seasonal forecast for the rainfall for June-July-August-September (JAS) 2010 (Fig 6).

According to this forecast, JAS rainfall is expected to be on average to above average in eastern region, with probabilities of 45-30%, the western region is expected to be above average to average with probabilities of 40-35%. In Southern Sudan rainfall expected to be above average to average with probabilities of (40%-35%) with a somewhat Lower chance of above average rainfall in the southwest regions.

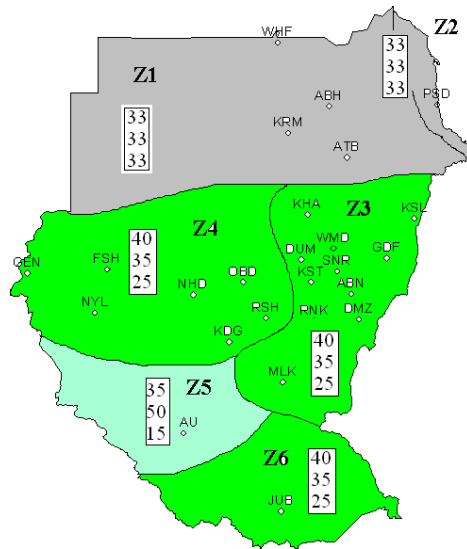


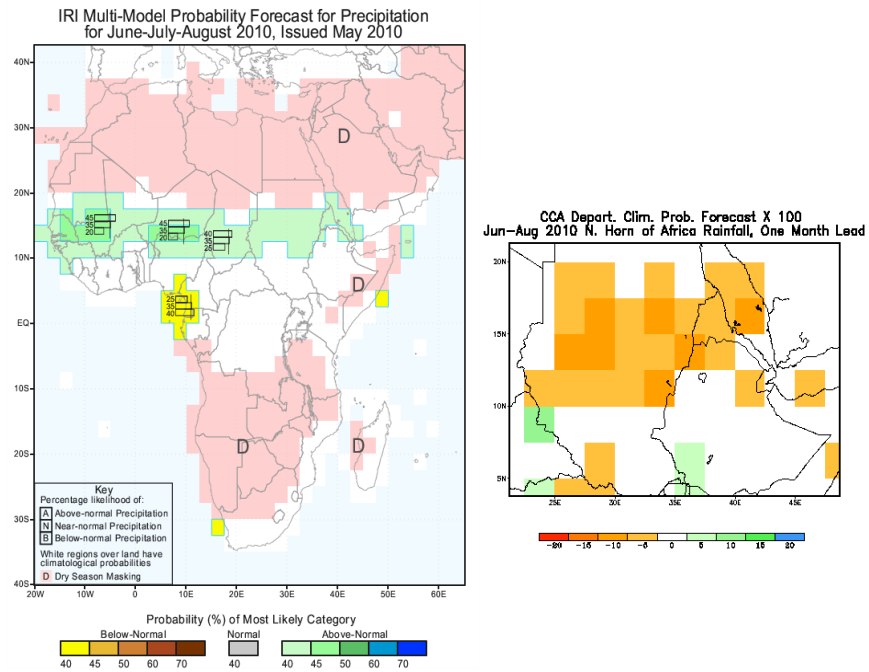
Fig (6) – SMA forecasts of July - September rainfall, 2010). Boxes indicate likelihood of above (top), on (middle) and below (bottom) average conditions. Zones represent homogeneous climatic rainfall

June- July -August-September 2010 Rainfall Forecasts from other sources:-

IRI and ECMWF forecast (Fig7a, 7c) outlook shows above normal to normal rainfall, mainly across the centre of Sudan and dry season in the north regions with probabilities of 45 -35% and 80 – 90%. CPC shows more moderate outlook and forecast normal to below normal across the central Sudan. See Fig (7b).

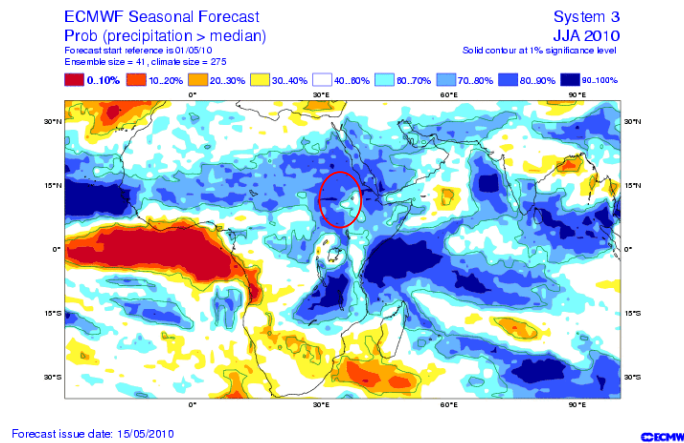
IRI and ECMWF are in consensus with SMA forecasting above normal to normal condition a cross the central Sudan, however, this is in contrast with CPC forecast of normal to below normal rainfall across the central Sudan.

In any case, actual crop-related quality of the rainfall season is influenced by a range of other factors such as the timing and distribution of rainfall amounts through the season, on which these forecasts do not provide information.



7.1

7.2



7.3

Fig 7.1 – Probabilistic forecast for June-July-August (JJA) 2010 rainfall for Africa. Boxes indicate likelihood of above (top), on (middle) and below (bottom) average conditions. Green to blue indicate areas of increasingly more likely above average conditions (source: IRI).

Fig 7.2 – Forecast for June-July-August (JJA) 2010 rainfall for Africa. Colours indicate departure from climatology (usual scenario), oranges and yellows for below average conditions, blues and green for above average (source CPC).

Fig 7.3 – Forecast for June-July-August (JJA) 2010 rainfall for Africa. Probability of exceeding median rainfall (usual scenario). Yellow to red for less rainfall than usual, greens and blues for more rainfall than usual. (source : ECMWF)

