Ten Day Climate Bulletin
N° 18
Dekad 21st to 30th June, 2010

HIGHLIGHT: Cumulated rainfall indicated intense rainfall distribution over NW Ethiopia stretching into South Sudan, northern parts of Congo, Cameroun and East Nigeria. In the Gulf of Guinea countries most intense rainfall was reported over Cote d'Ivoire, Guinea and countries bordering Senegal. Other parts of the continent remained dry except the southern fringes of Sahel where rainfall season showed indications of onset, as rainfall was reported generally in most places.

1. GENERAL SITUATION

Subsection 1.1 provides the strengths of the surface pressure systems and ITD displacement, while subsection 1.2 on Troposhere, gives a brief on monsoon, thermal index regimes and relative humidity.

1.1 SURFACE

- **Azores high:** pressure of 1028 hPa with SW-NE axis, weakened by 2 hPa and shifted southwest compared to the previous dekad. Its mean position was about 34°N/37°W with an extended ridge over north Atlantic Ocean.

- **Saharan thermal low :** pressure of 1004 hPa deepened by 2 hPa and shifted eastwards compared to the past dekad. Its mean position was about 15°N/17°E with an extended trough over south Algeria, central Mali, north Niger and central Chad.

- **St. Helena high:** pressure of 1029 hPa with E-W axis, weekened slightly by 1 hPa and shifted northwest compared to the previous dekad. Its mean position was about 24°S/25W, extending a ridge over south Atlantic Ocean.

- **A continental high pressure** of 1026 hPa with N-S axis, weekened by 2 hPa and shifted northeast compared to the past dekad. Its mean position was about 27°S/28°E with an extended ridge over east of Southern Africa countries.

- **Mascarene high:** pressure of 1034 hPa with W-E axis, strengthened by 3 hPa and shifted southeast compared to the past dekad. Its mean position was about 33°S/95°E with an extended ridge over Idian Ocean. An anticyclonic cell pressure of 1027 hPa with W-E axis was observed about 35°S/45°E south of Madagascar.

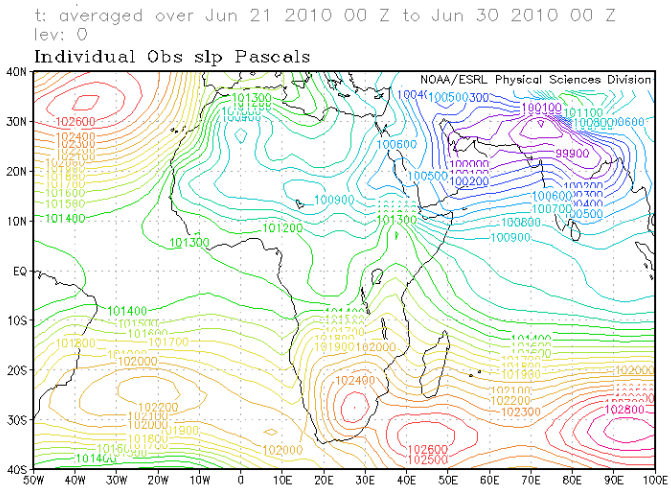

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter-Tropical Discontinuity (ITD)**
  Between the second dekad (blue line) and the third dekad of June (black line), 2010, the ITD continued its northward migration over west and east Sahel, but was quasi stationnary over its central parts (Figure2).

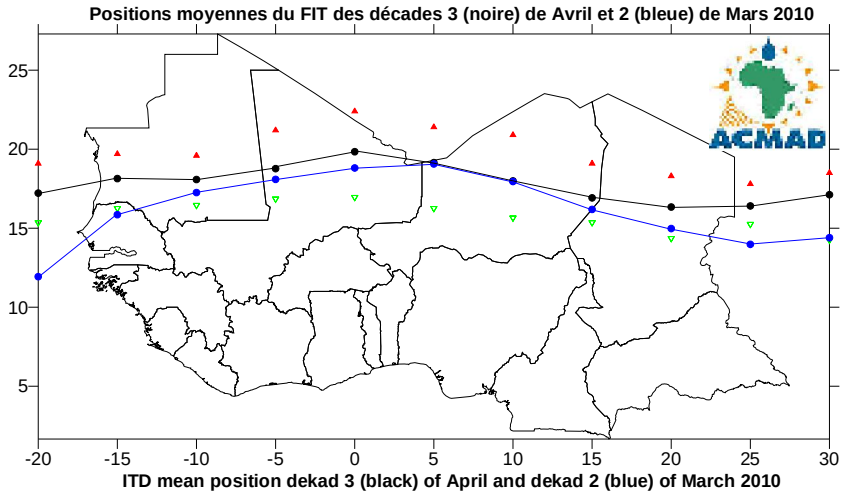

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was weak (1 to 5 m/s) over Sierra Leone and moderate (5.5 to 12.5 m/s) over Guinea Bissau, Liberia, Côte d'Ivoire, Burkina Faso, south Ghana and Togo, Nigeria, south Niger and Chad during the dekad.

1.2.2 Thermal lndex (TI)

In the third dekad of June, 2010, thermal index (TI) regime at 300hPa in (Figure 3) had TI regime value of 243°K stretching over most of the Sahel through northern parts of Gulf of Guinea countries and extreme northern part of GHA countries. Similar value of 243°K persisted as isolated pockets over southern part of Central Africa countries and off the Somali coast. With the attendant high relative humidity can be linked to occurrence of heavy rainfall with floods over the areas as shown in Figure 4.

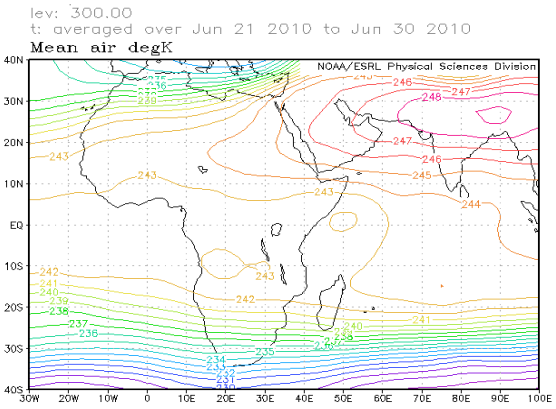

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the third dekad of June, 2010 over most part Gulf of Guinea countries, extreme western part of central Africa, most part of GHA and extreme northeastern part of Southern Africa countries including central part of Madagascar. However, most of northern part of Africa north of 15°N as well as western part of Southern Africa countries experienced the lowest RH (< 40%).

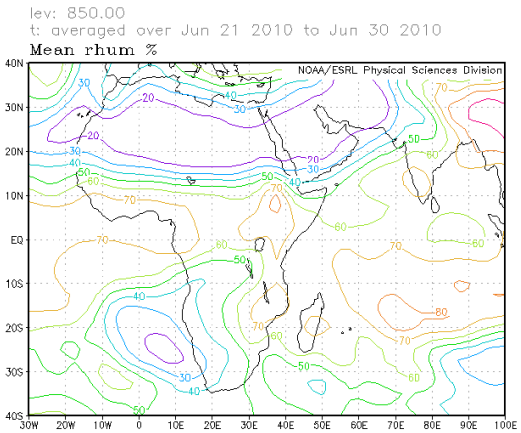

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

2. RAINFALL AND TEMPERATURE SITUATION

Subsection 2.1 provides a summary on estimated rainfall amounts and distribution while subsection 2.2 provides a table showing stations' observed rainfall, number of rainy days, mean maximum and mean minimum temperatures.

2.1 RAINFALL

The rainfall estimate based on satellite and rain gauge observations in Figure 5, shows increase in rainfall distribution and amounts over the Sahel and parts of GHA countries while North Africa and southern parts of Central Africa countries experienced decrease in rainfall distribution. Southern Africa remained cold and dry. In detail:

- **North Africa countries:** had decrease in rainfall distribution, observing localized amounts ranging from 10mm to 50mm over northern Morocco and Algeria.

- **The Sahel:** had slight spatial increase in estimated rainfall distribution, observing between 10mm to 100mm with the highest amounts of about 150mm over south Mali.

- **Gulf of Guinea countries:** experienced rainfall amounts ranging between 10mm to 100mm intensifying to amounts ranging from 100mm to 200mm over south Côte d'Ivoire, east Nigeria and Cameroon.

- **Central Africa countries:** continue to observed slight decreased in rainfall distribution; observing between 10mm to 100mm. High rainfall amounts ranging from 100mm to 200mm was reported over Democratic republic of Congo and Congo.

- **GHA countries:** experienced increase in both rainfall distribution and amount. The estimated amounts ranged from 10mm to 100mm intensifying to about 200mm over west Ethiopia.

- **Southern Africa countries:** continues to experience rainfall deficit. However, some localized amounts of estimated rainfall ranging from 10 to 75mm were observed over southern part of South Africa with maximum of about 150mm over central Madagascar.

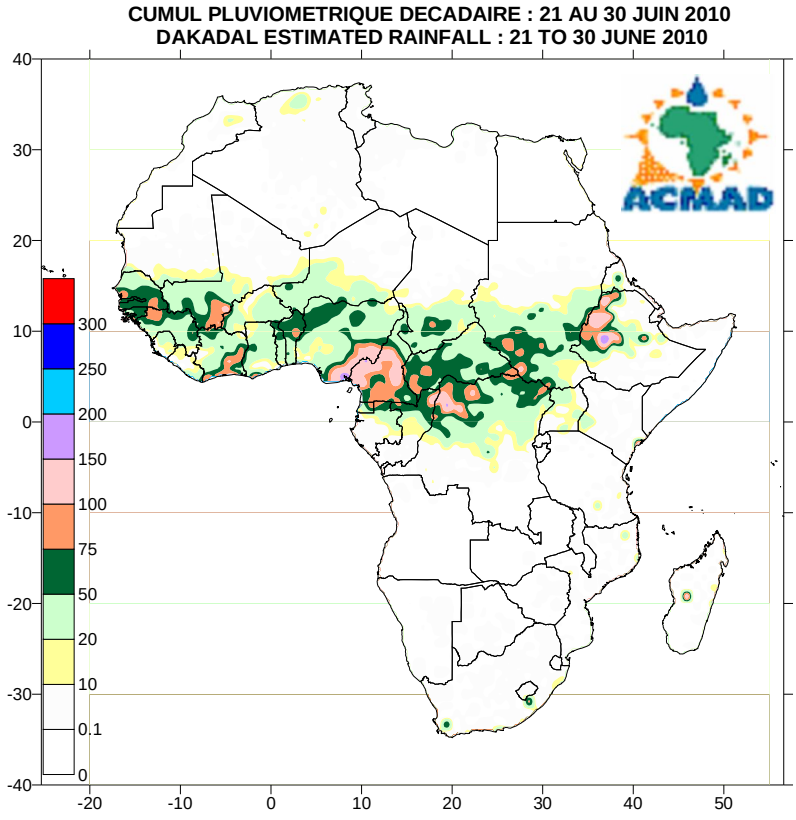

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCE

2.2 OBSERVED DATA

The Table below shows that moderate rainfall amounts were observed over Gulf of Guinea countries (GGC) and south Sahel countries (SC). The highest mean maximum temperature of 45.9°C was recorded at Bilma in Niger while the lowest mean minimum temperature of 2.5°C was recorded at Ghanzi in Botswana.

	STATIONS	Rainfall (mm)	Number of rainy days	Mean maximum temperature (°C)	Mean minimum temperature (°C)
PAN	Casablanca	0	0	23,8	19,6
	Alger (Dar El Beida)	0	0	28,4	14,6
	Tamanrasset	2	1	37,9	25,6
	Tunis	0	0	27,9	18,7
	Tripoli	0	0	31,8	18,7
	Le Caire	0	0	35,1	24,6
PS	Nouakchott	0	0	35,3	24,8
	Dakar-Yoff	50	2	30,9	25,7
	Tombouctou	0	0	41,0	25,9
	Bamako-Sénou	25	3	34,3	23,6
	Ouagadougou	38	3	34,0	25,8
	Bilma	0	0	45,9	27,4
	Agadez	3	1	42,5	29,1
	Niamey-Aéroport	33	3	37,8	26,2
	Zinder	26	4	38,2	26,5
	N'Djamena	20	1	37,1	26,5
PGG	Abidjan	133	7	30,1	26,1
	Accra	64	3	29,1	24,0
	Conakry	5	1	30,5	-
	Lomé	11	2	30,9	25,3
	Cotonou	20	5	29,9	25,6
PAC	Libreville	2	1	27,3	23,4
	Douala	66	2	-	-
	Bangui	0	0	30,5	-
	Brazzaville	0	0	31,4	20,4
PCA	Nairobi	0	0	23,3	11,3
	Kigoma	0	0	30,8	16,9
	Dodoma	0	0	27,6	15,2
	Dar-es-Salaam	1	1	30,2	20,4
	Mtwara	2	1	29,1	20,5
PAA	Nampula	0	0	26,4	17,7
	Lusaka	0	0	22,2	8,8
	Beira	9	1	25,5	17,2
	Harare	0	0	19,6	8,4
	Bulawayo	0	0	23,6	7,3
	Ghanzi	0	0	23,2	2,5
	Francistown	0	0	22,3	9,6
	Seretse Kama Intl Airport	0	0	21,8	-
	Windhoek	0	0	24,0	7,2
	Johannesbourg	0	0	18,1	4,6
	Pretoria	0	0	20,1	3,7
	Le Cap	14	3	18,7	7,3
	Port Elisabeth	0	0	21,8	8,6
	Durban	6	1	-	12,5
	Maun	0	0	25,3	9,6
	Mbeya	0	0	22,0	8,8
	Manzini	0	0	-	10,3
	Maputo	0	0	27,1	13,8
POI	Seychelles	5	4	29,5	25,4
	Antsiranana	1	1	29,8	20,7
	Antananarivo	0	0	21,8	13,1
	Toalagnaro	10	4	24,1	18,4
	Plaisance	10	4	26,3	20,6

Data Source: ACMAD / GTS

NOTE: **0** means no rain;
- means no temperature data available

NAC= Northern Africa Countries ; **SC**=Sahel Countries; **GGC**=Gulf of Guinea Countries; **CAC**=Central Africa Countries; **GHAC**=Greater Horn of Africa Countries; **SAC**=Southern Africa Countries; **IOC**=Indian Ocean Countries.

3. OUTLOOK FOR DEKAD (11th – 20th JULY, 2010)

3.1 RAINFALL

The ITD will continue its move northward movement causing rainfall increase in the Sahelean countries with intensification over the Gulf of Guinea, north central Africa and north GHA countries. In detail**:**

- **North Africa countries:** will remain mainly dry during most parts of period, but with localized rainfall amounts ranging from 10mm to 20mm in the south and parts of northwestern coast.

- **The Sahel:** will experience rainfall increase both in intensity and spread especially in the south with amounts ranging from 50mm to 120mm.

- **Gulf of Guinea countries:** will continue experiencing rainfall amounts ranging from 80mm to 150mm. More intense rainfall will be experienced along the coastal belt of Sierra Leone , Liberia and Guinea where it may reach over 150mm.

- **Central Africa countries:** during the period under consideration rainfall will show a decline in the southern parts with some areas being dry. This dry condition is expectd to change as we move northwards where rainfall of ranging between 20 - 80mm will be realised over Central African Republic and northern parts of Cameroon.

- **GHA countries:** will have rainfall decrease in all parts, except over West Kenya, Uganda, South Sudan and the western highland areas of Ethiopia. In these areas the amounts expected will range between 20mm to 60mm increasing to about 100mm in northwest of Ethiopia.

- **Southern Africa countries:** will continue to experience dry conditions in the western parts. Some rainfall increase is expected over the Cape coast stretching over the coastal areas into Mozambique. These parts will see rainfall amounts of about 5 -50mm. High rainfall is expected over the eastern coast of Madagascar

3.1 TEMPERATURE

The forecast in Figure 7 shows temperature in the Gulf of Guinea will be 20 – 25°C, the Sahel 25 - 30°C in the south while in the north it will be above 35°C. Central Africa is expected to record temperatures between 20°-25° except over west of the Democratic Republic of Congo where between 25 and 30°C are expected to be recorded. GHA countries will realise a cooler period of 15 - 20°C over southern Tanzania, Western highlands of Kenya, eastern Uganda and N.W Ethipia. Eastern sectors of GHA will be reporting temperatures between 25 and 30°C. The lowest temperatures ranging from 5- 10°C will be realised in the southern areas of southern Africa, but as we move northwards these areas will notice warmer conditions of 15 - 20°C.

3.2 SOIL MOISTURE

The outlook on soil moisture changes, Fig.8 indicate that moisture will increase over the Sahel and Gulf of Guinea countries with indication of continued depletion over southern parts of Central Africa. Soil moisture drying conditions will continue over the GHA region except in the northwestern areas of Ethiopia where an increase is expected as a consequence of continued rainfall. Low soil moisture is expected to continue over the Southern Africa region except over the Cape region where some limited recharge may take place.

3.4 IMPACTS

Health: The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy period. The temperatures in the range of 18°C to 32°C with high rainfall and relative humidity (>60%) favour the survival of the vector and development of the parasite in the vector resulting in high incidences of malaria even in low prevalence areas. The Gulf of Guinea, Southern Sahel, central Africa, and parts of GHA countries with high humidity of over 60% , sufficient rainfall and conducive temperatures will support survival of malaria and it is therefore advised that plans be put in place to combat likely outbreaks. Chances of out break of malaria are low in southern African countries and the East African highlnds of Tanzania, Kenya and Ethiopia due to current prevailing low temperatures.

Agriculture and food security: The integration of climate prediction products and information into agricultural production and food security is of crucial importance. We emphasize on the importance of suitable planting dates, seasonal rainfall onset, rainfall amounts and length of the season including monitoring of the

phenological stages of crops for crop yield assessments in the countries. It is imperative to carry out cost benefit analysis on applications of appropriate planting dates and suitable seed variety in order to take full advantage of limited soil moisture availability in a shortened crop growing season. The drought-tolerant crops can be grown in zones where the prevailing soil moisture is the major climate constraint on crop yield. The crop varieties that are higher yielding, more drought resistant, earlier maturing, disease and pest tolerant are recommended in these moisture constrained zones for communities' sustained food security and adaptation. There is also a need to invest in higher yielding crops during rain season in the Sahel as the rains are expected to continue performing well during the growing period.

African Ecosystems: While noting that forests serve as rainfall catchment areas, the destruction of forests has been blamed for the declining water levels in the African lakes, rivers and the drying wetlands. We have to rehabilitate our presently degraded rainfall catchment areas and natural ecosystems through enhanced national policies and environmental reclamation strategies. Good practices in ecosystems rehabilitation and management include national tree planting during rainy season and soil conservation to minimize soil loss during rainy seasons due to heavy runoff**.** Farmers in the Sahelian region which is expected to receive enhanced rainfall are advised to employ strategic measures to avert soil erosion and retain water in their fields through micro water conservation practices.

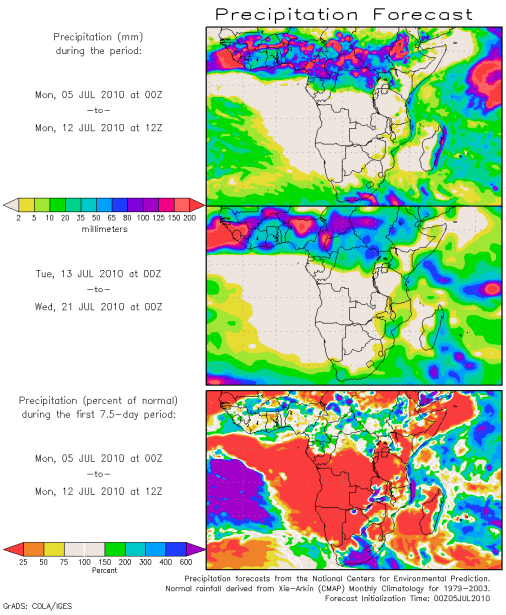

Figure 6 : Precipitation forecast, Source : COLA

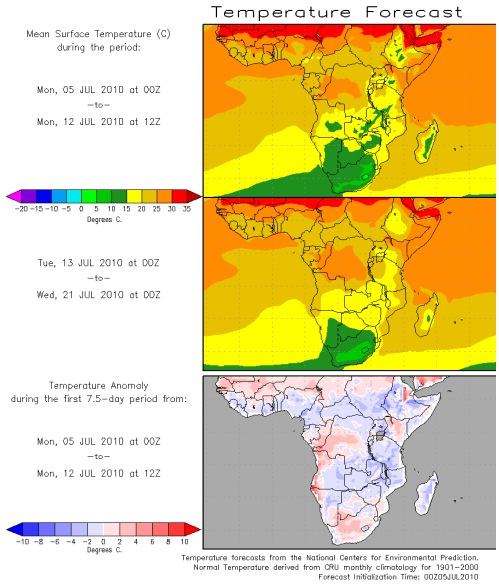

Figure 7 : Temperature forecast Source : COLA

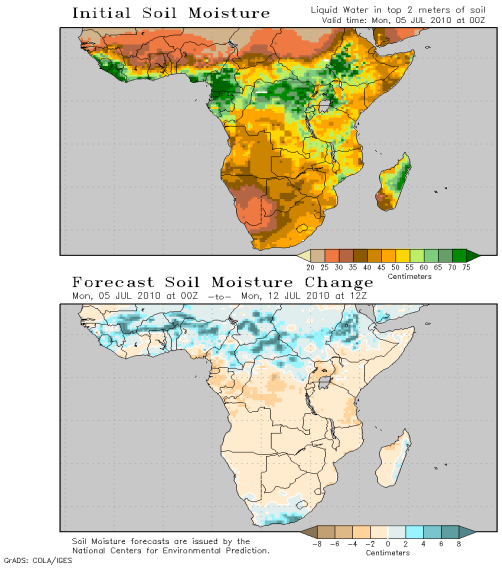

Figure 8 : Soil moisture forecast, Source: COLA

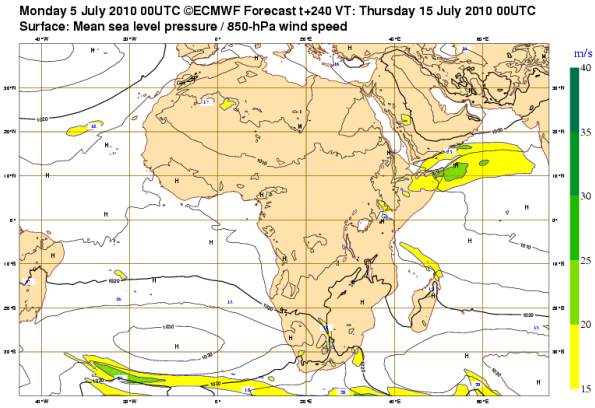

Figure 9: Mean Sea Level pressure forecast
Source: ECMWF