African Centre of Meteorological Application for Development
Centre Africain pour les Applications de la Météorologie au Développement

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Dekad of 01 to 10 June, 2009

HIGHLIGHT: The heaviest rainfall mounts were observed over northern Congo, southern part of Côte d'Ivoire. The areas with high TI regime value of 242°K and above characterized by high relative humidity (>60%) will continue experience heavy rainfall.

1. GENERAL SITUATION:

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

1.1 SURFACE

- **Azores high:** Pressure of 1024hPa weakened significantly by 5hPa and shifted southwest compared to the past dekad. Its mean position was located at about 30°N/28°W, extending a ridge over north Morocco.

- **St. Helena high:** Pressure of 1027hPa strengthened by 1hPa and shifted northeast at 30°S/06°E with an extended ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1028hPa weakened by 3hPa compared to the past dekad and shifted northeast. Its mean position was located at 35°S/61°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1005hPa maintained it intensity and shift to about 1 degree to the north compared to the previous dekad. Its mean position was located at 16°N/04°E with an extended trough over southeast Mauritania, central Mali, Niger and Chad.

- **Inter -Tropical Discontinuity (ITD):** Between the third dekad of May (blue line) and the first dekad of June (black line), 2009, the ITD (Figure 1) had moved slightly northwards over the Sahel. Compare to the ITD position of the first dekad of June 2009 (pink line), the 2009 ITD was located north over western Sahel and south over eastern Sahel.. Its mean position was observed at 13.8°N over longitude 20°W; at 15.9°N over north Senegal; at 16.8°N over south Mauritania; 17.0°N over central Mali; at 16.1°N and 14.6°N over west and central-east Niger respectively; at 14.3°N and 13.5°N over west and east Chad respectively; at 12.9°N and 14.0°N over west and central Sudan respectively.

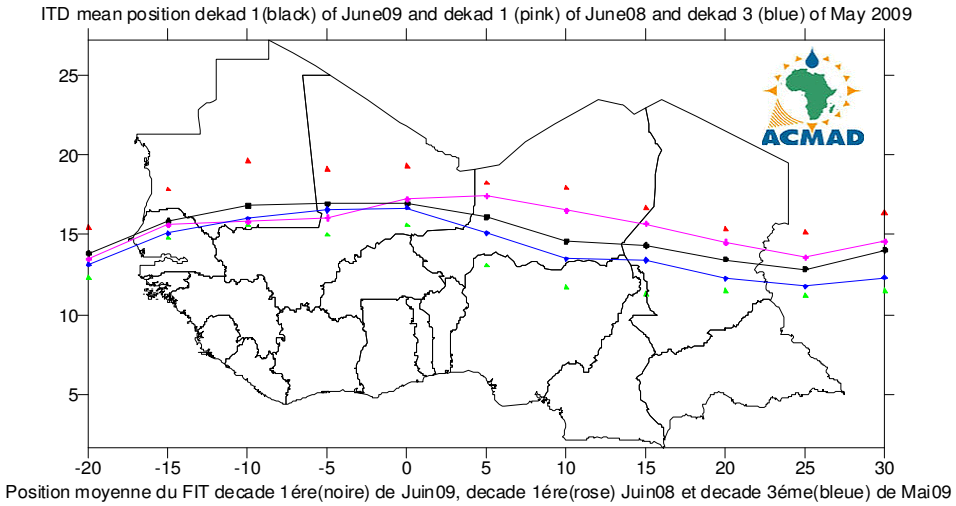


Figure 1 : The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

• **Monsoon:** Monsoon influx at 925hPa level was weak (1 to 5m/s) over Liberia and moderate (5.5 to 11.5m/s) over Guinea Bissau, Guinea Conakry, Sierra Leone, east Burkina Faso, Togo, Benin, Nigeria and south Chad.

• African Easterly Jet (AEJ): The intensity of AEJ at 700hPa level was about 18m/s weakened by 1m/s compare to the past dekad. The jet axis was located at about 07°N, stretching from extreme southwest Côte d'Ivoire, central Liberia up to 25°W in the Atlantic Ocean.

• **Thermal Index (TI):** In the first dekad of June, 2009, the thermal index (TI) regime at 300hPa in (figure 2), had TI regime value of 242°K within tropical belt about 10°N and 10°S covering Gulf of Guinea, central Africa, GHA and extreme southern part of the Sahel countries resulting in heavy rainfall over areas characterized by high relative humidity as observed in Figure 3. The highest thermal index regime of 243°K and above characterized by heavy rainfall with floods was located over extreme northeastern part of GHA countries, India and Asia.

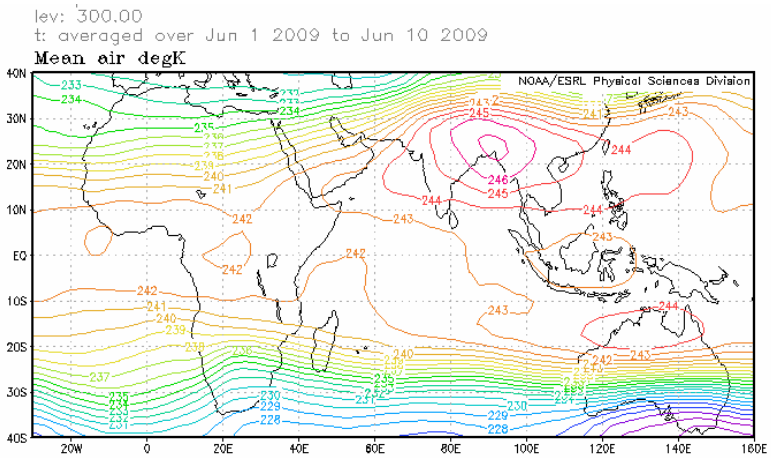


Figure 2: Air temperature at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

• **Relative Humidity (RH):** The 850hPa (Figure 3) shows high RH (>70%) in the first dekad of June, 2009 over GHA countries, Ethiopia/Sudan and over the Gulf of Guinea. The Sahara, most part the Sahel countries and northern part of Southern Africa countries experienced dry conditions characterized by the lowest RH (<40%).

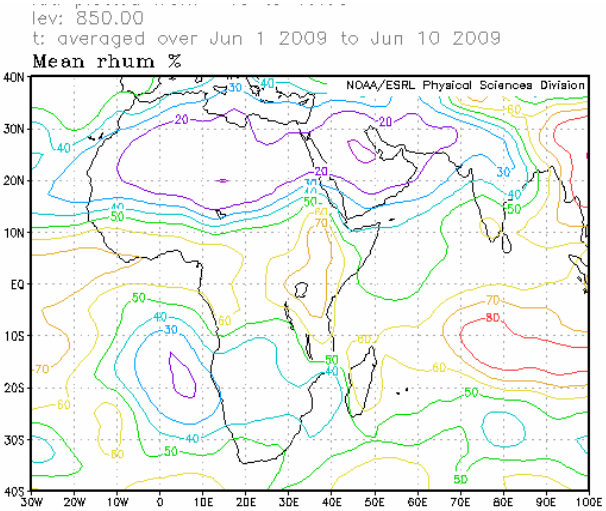


Figure 3: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD)

2. RAINFALL AND TEMPERATURE SITUATION

Subsection 2.1 provides a summary on estimated rainfall amounts and distribution and the subsection 2.2 gives stations observed data on rainfall, mean maximum and mean minimum temperatures including number of rainy days.

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge in Figure 4 below shows rainfall distribution and amounts decrease over Central Africa and GHA countries while the Sahel, Gulf of Guinea and Southern Africa countries experienced rainfall increase in distribution and amounts. In detail:

- **North Africa countries:** experienced localised light rainfall recording ranging from 10mm to 50mm over east Algeria/west Libya.

- **The Sahel:** had slight increase in rainfall distribution, but decreased amounts ranging from 10mm to 50 mm with maximum rainfall amounts ranging from about 75mm to 100mm over south Mali, Burkina Faso and south Chad.

- **Gulf of Guinea countries:** experienced increase in rainfall distribution and amounts ranging from 10mm to 100mm with peaks ranging from about 150mm to 250mm over south Cameroon, central Nigeria, south Côte d'Ivoire, south Guinea, Sierra Leone and Liberia.

- **Central Africa countries:** had decrease in rainfall distribution recording amounts ranging from 10mm to 100mm intensifying to about 150mm over north Congo, Central Democratic Republic of Congo and southeast Central African Republic with heaviest rainfall peaks ranging between 150mm to 300mm over Central African Republic.

- **GHA countries:** experienced decrease in rainfall distribution recording amounts ranging from 10mm to 100mm over south Sudan, west Ethiopia, west Kenya and south Somalia.

- **Southern Africa countries:** experienced increase in rainfall spatial distribution and amounts ranging from 10mm to 100mm over Zambia, north South Africa intensifying over east Botswana in the range of about 150mm to 200mm.

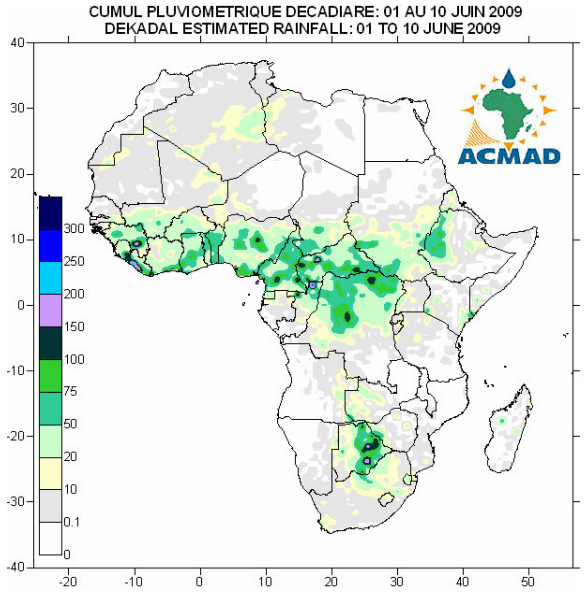


Figure 4: Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest rainfall recorded over Abidjan in Côte d'Ivoire and Seretsé Khama in Botswana. The lowest temperature of 5.8°C was recorded at Seretsé Khama in Botswana while the highest temperature of 43.7°C was recorded at Bilma in Niger.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	220	9	32,1	25,8
2	Abuja	7	1	32,6	23,4
3	Accra	3	1	32,0	25,6
4	Agadez	0	0	43,5	27,9
5	Alger(Dar El Beida)	0	0	28,2	14,9
6	Antananarivo	0	0	24,3	13,0
7	Antsiranana	5	2	31,0	22,1
8	Bamako-Senou	31	3	37,6	25,1
9	Bangui	27	3	32,5	22,5
10	Banjul	0	0	33,8	22,7
11	Beira	2	2	28,9	17,1
12	Bilma	0	0	43,7	20,3
13	Bissau	0	0	34,6	-
14	Bobo Dioulasso	46	4	35,1	24,9
15	Brazzaville	0	0	28,6	21,6
16	Casablanca	0	0	23,1	18,2
17	Conakry	0	0	31,6	-
18	Cotonou	95	4	31,2	26,2
19	Dakar-Yoff	0	0	28,0	22,6
20	Dar-es-Salaam	2	1	30,9	21,0
21	Djibouti	0	0	39,7	-
22	Douala	80	4	31,1	24,3
23	Durban	9	2	23,9	12,5
24	Entebbe	1	1	26,5	20,6
25	Francistown	50	3	24,3	6,7
26	Harare	0	0	22,7	11,0
27	Johannesbourg	2	2	17,5	7,8
28	Khartoum	0	0	42,8	28,9
29	Kigali	0	0	27,8	-
30	Kigoma	0	0	29,6	18,6
31	Kinshasa	0	0	28,7	-
32	Le Caire	0	0	36,1	23,0
33	Le Cap	24	3	18,0	12,3
34	Libreville	17	1	29,6	24,5
35	Lilongwe	0	0	-	9,9
36	Lomé	30	2	32,4	25,9
37	Lusaka	0	0	26,8	10,4
38	Manzini	46	2	-	11,8
39	Maputo	14	3	26,7	16,2
40	Maun	59	3	26,8	11,0
41	Mbeya	0	0	24,0	8,0
42	Nairobi	32	3	24,2	14,2
43	Nampula	0	0	29,2	17,3
44	N'Djamena	13	1	41,4	25,5
45	Niamey-Aéroport	4	3	40,1	28,1
46	Nouakchott	0	0	35,4	22,6
47	Ouagadougou	1	1	37,7	27,7
48	Plaisance	8	7	27,3	20,9
49	Sal	0	0	26,0	20,9
50	Seretse Khama Intl Aéro	105	3	-	5,8
51	Seychelles	16	5	31,2	27,1
52	Tamanrasset	0	0	35,7	23,3
53	Toalagnaro	18	2	26,8	19,3
54	Tombouctou	2	1	42,9	28,9
55	Tripoli	0	0	36,4	22,0
56	Tunis	0	0	30,4	19,4
57	Windhoek	0	0	22,8	8,5
58	Zinder	0	0	41,1	26,5
59	Ndele (RCA)	35	5	34,0	20,6

NOTE: **0** means no rain;
- means no temperature data available Data Source: ACMAD / GTS

3.OUTLOOK FOR DEKAD (21st – 30th JUNE, 2009)

3.1 RAINFALL

The ITD will move northwards maintaining moisture influx and rainfall increase over Gulf of Guinea countries, southern part of the Sahel, northern parts of central Africa. There will be rainfall decrease over southern parts of GHA countries with significant decrease over southern Africa countries (Figure 5). In summary**:**

- **North Africa countries:** will experience rainfall decrease amounts ranging from 10mm to 75mm.
- **The Sahel:** will continue to experience increasing temperatures with rainfall increase recording amounts ranging from 10mm to 100mm with highest amounts over southern parts of the Sahel countries.
- **Gulf of Guinea countries:** will experience rainfall increase recording amounts ranging from 10mm to 150mm with isolated peaks ranging from about 200mm to 300mm.
- **Central Africa countries:** will experience slight rainfall increase over northern parts recording amounts ranging from 10mm to 100mm with peaks ranging from about 150mm to 250mm.
- **GHA countries:** will record rainfall increase over northern parts with amounts ranging from 10mm to 100mm with peaks of about 150mm to 200mm.
- **Southern Africa countries:** expected rainfall decrease amounts ranging from 10mm to 100mm.

3.2 TEMPERATURE

The forecast in Figure 6, shows that the mean surface temperature will increase over northern part of Gulf of Guinea countries, the Sahel, northern parts of central Africa and northern parts of GHA countries. The highest forecast temperatures range from 25°C to 35°C in orange and red colours respectively with more than 60% of the Continent recording 20°C and above.

3.3 SOIL MOISTURE

The outlook on soil moisture change, maps shown in Figure 7 include the initial soil moisture and the forecast changes over the next 7 days. The soil moisture change and precipitation relationship is discernable on the maps below. The areas forecast to have highest soil moisture change include Gulf of Guinea countries, southern part of the Sahel, northern parts of central and southern Africa and northern GHA countries.

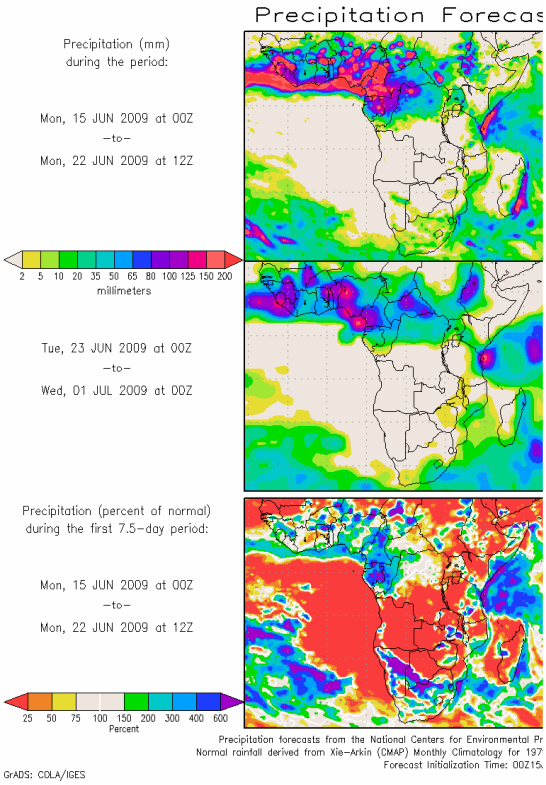
3.4 IMPACTS

Health: The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy periods. The temperatures in the range of 18°C to 32°C with high rainfall and relative high 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 parts of Gulf of Guinea, the Sahel, central Africa, northern parts of GHA countries and Madagascar with high humidity/rainfall coupled with the prevailing conducive temperatures will support the survival of parasite resulting in higher incidences of climate related diseases including malaria. The health authorities and Agencies need to continue the health care and humanitarian services to protect lives of the vulnerable communities.

Agriculture and food security: The integration of climate information and prediction products in agricultural production is of crucial importance. We often emphasize on the importance of well documented onset dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop yield assessments in our countries. It is imperative to carry out cost benefit analysis on determination and applications of appropriate planting dates 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 a good rainy season by taking advantage of seasonal climate consensus forecast, for example those issued by regional climate outlook fora (RCOF), the GHACOF, PRESAO, PRESAC, and SARCOF for Greater Horn of Africa (GHA), West Africa, central Africa, and southern Africa countries respectively.

African Ecosystems: Call for rehabilitation of our presently degraded rainfall catchments areas and forests through enhanced national policies and conservation programmes such as national tree planting,

afforestation and soil conservation during rainy seasons to minimize soil loss due to heavy runoff. Enhanced national strategies for adaptation to Climate Change are of highest priority for States' sustainable development.



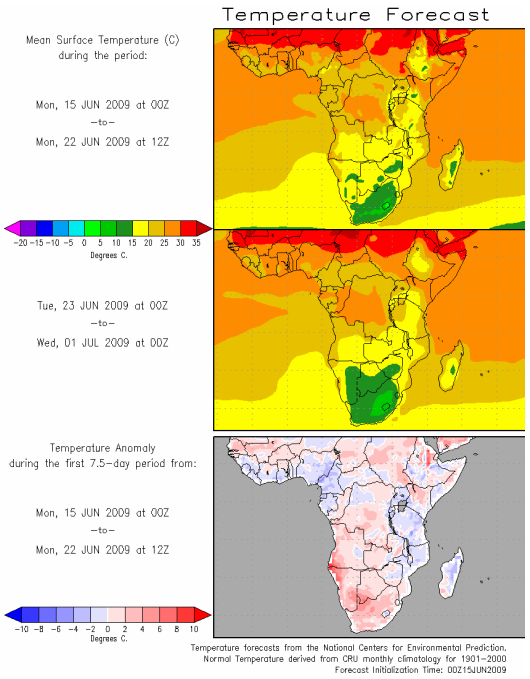


Figure 6 : Temperature forecast Source : COLA

Figure 5: Precipitation forecast, Source : COLA

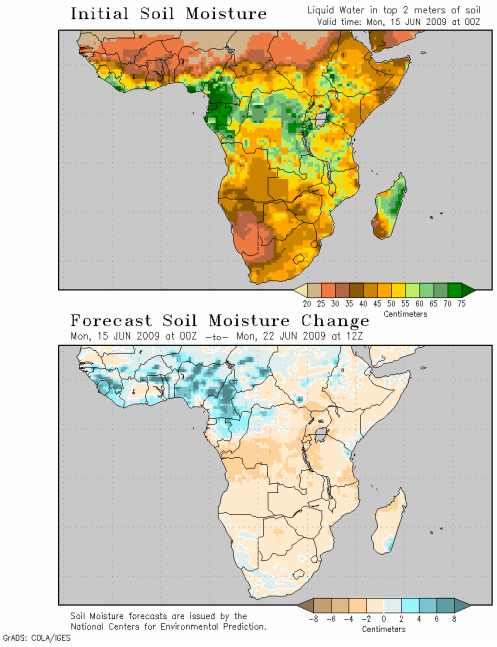


Figure 7 : Soil moisture forecast, Source: COLA

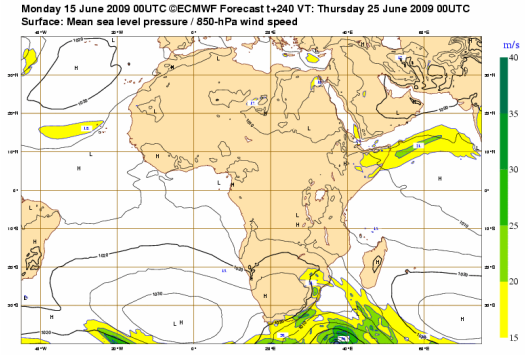


Figure 8 : Mean sea Level pressure forecast

Source : ECMWF