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

Ten Day Climate Bulletin

N° 08 Year 2009

Dekad of 11 to 20 March, 2009

HIGHLIGHT: The areas with high TI regime of 242°K characterized by high relative humidity recorded heavy rainfall with the highest over Democratic Republic of Congo, north Zimbabwe and northeast Madagascar.

1. GENERAL SITUATION:

1.1 SURFACE

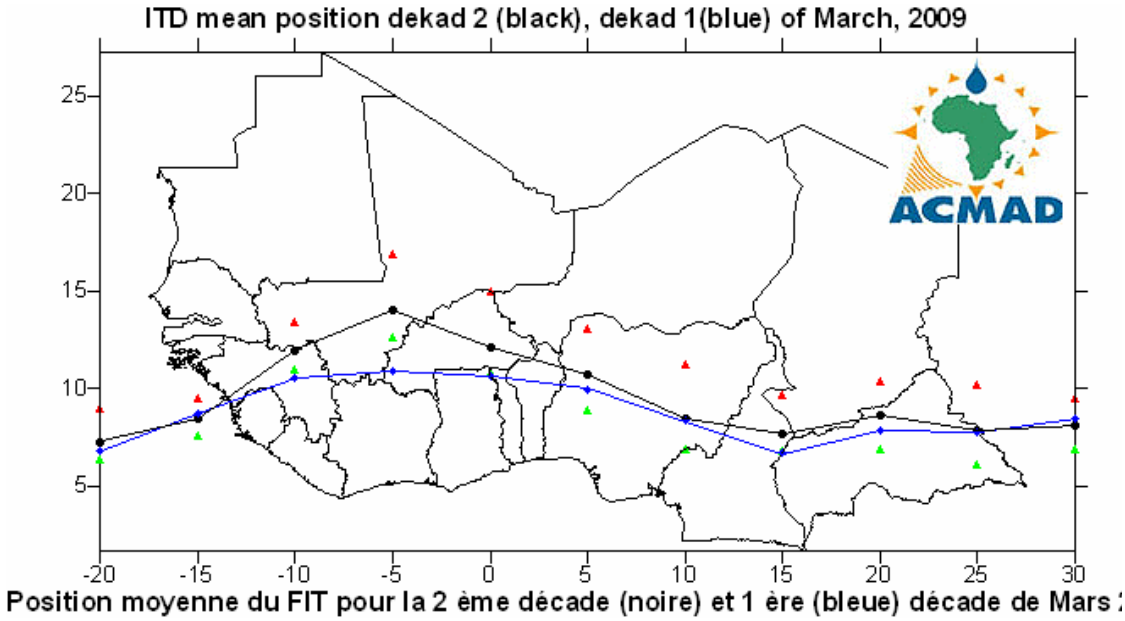
• **Azores high:** Pressure of 1033hPa was located north of 50°N with extending a ridge over north Morocco and Algeria.

• **St. Helena high:** Pressure of 1030hPa strengthened by 4hPa and shifted southwest at 40°S/10°W with an extended ridge over South Atlantic Ocean.

• **Mascarene high:** Pressure of 1030hPa weakened slightly by 1hPa compared to the past dekad and shifted northeast. It's mean position at 38°S/71°E with extended ridge over the Indian Ocean.

• **Thermal low:** Pressure at 1006hPa deepened slightly by 1hPa compared to the past dekad and shifted north at 14°N/01°E with an extended trough over south Mali, Burkina Faso, southwest Niger, north Ghana, north Nigeria and south Chad.

• **Inter-Tropical Discontinuity (ITD):** Between the first and the second dekad of March, 2009, the ITD continued its northwards migration over Gulf of Guinea countries and south of some Sahel countries such as Burkina Faso and Mali. It's mean position was observed at 7.3°N and 8.5°N over longitude 20°W and 15°W respectively; at 12.0°N over extreme north Guinea; at 14.0°N over south Mali; at 12.1°N over east Burkina Faso; at 10.7 and 8.5°N over west and southeast Nigeria respectively; at 7.7°N over extreme east Cameroon; at 8.7°N and 7.9°N over west and southeast of Central African Republic and at 8.1°N over extreme south Sudan.

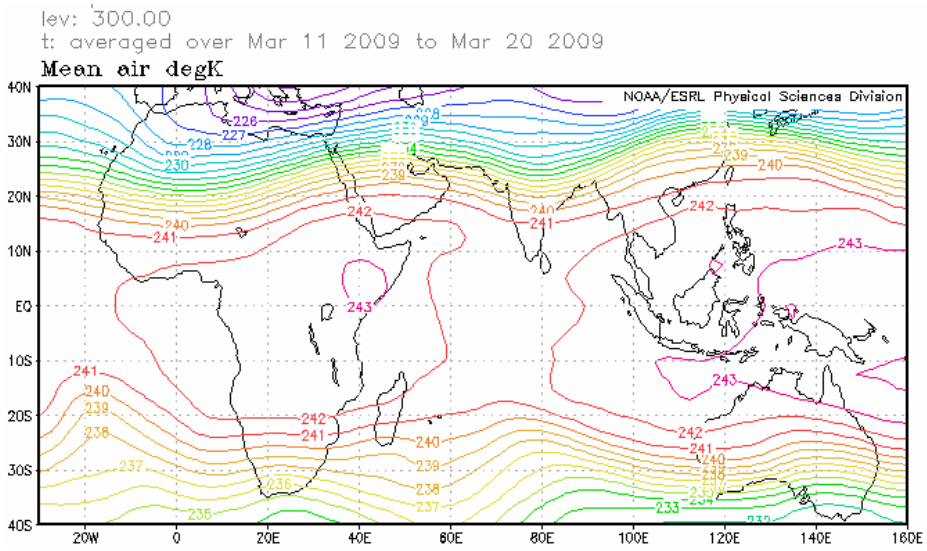


The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

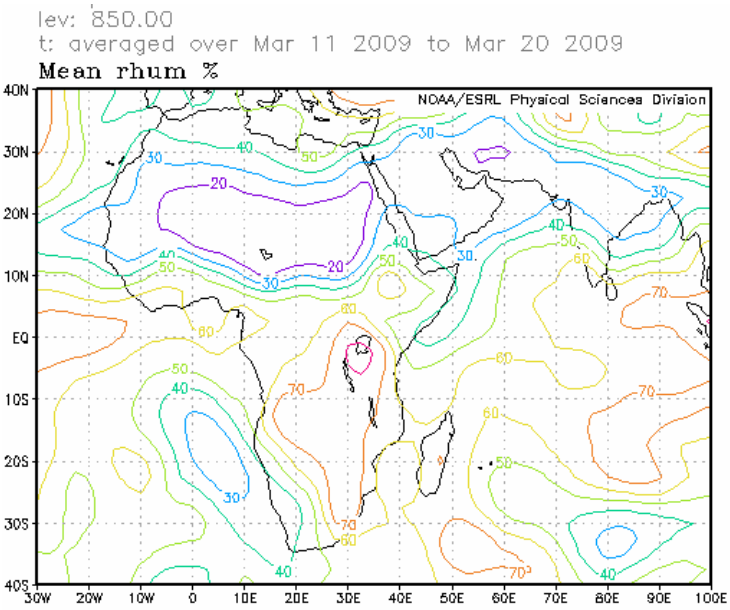
- **Monsoon:** Monsoon influx at 925hPa level was weak (1 to 5m/s) over Cameroon and moderate (5.5 to 11.5m/s) over Liberia, east Côte d'Ivoire, Ghana and Togo.

- **Thermal Index (TI):** In second dekad of March, 2009, the thermal index (TI) regime at 300hPa, map shown below, had TI regime value of 242°K over southern part of Gulf of Guinea countries, central Africa countries, GHA countries and northern parts of southern Africa countries associated with heavy rainfall that intensified into floods over areas covered by TI regime threshold value of 243°K also characterized by high relative humidity as observed below. The TI regime maximum value of 243°K and above, was located over Kenya, Tanzania and part of Great Lakes countries, south eastern Asia and northeastern Australia.



(Data Source: NOAA/NCEP)

- **Relative Humidity (RH):** The 850hPa map below shows high RH (>70%) in the second dekad of March, 2009 over western part of Gulf of Guinea, parts of central Africa countries, southwestern parts of GHA and eastern part of southern Africa countries. The Sahara, the Sahel countries, and extreme northern part of Gulf of Guinea countries, the western part of Southern Africa countries experienced dry conditions characterized by the lowest RH (<40%).



(Data Source: NOAA/NCEP)

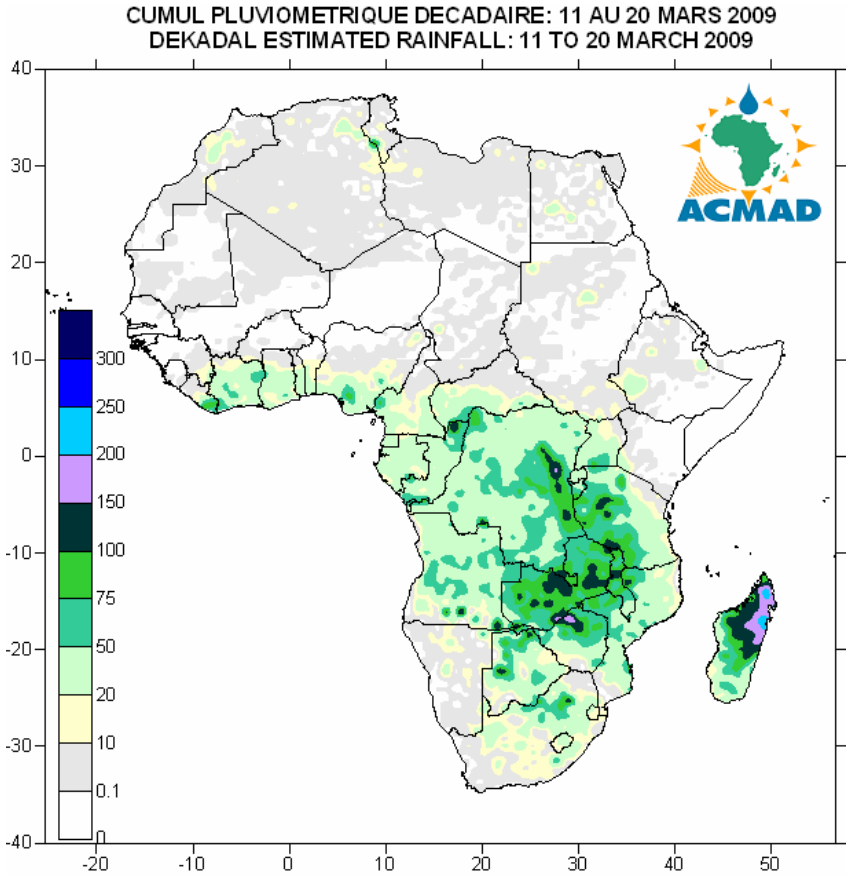
2. RAINFALL AND TEMPERATURE SITUATION

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge on the map below for the second dekad of March, 2009 shows rainfall activities increase over the Gulf of Guinea countries, Central Africa countries and GHA countries, while northern Africa countries and Southern Africa countries experienced spatial rainfall decrease.

In summary:

- **North Africa countries:** experienced slight spatial rainfall decrease recording amounts ranging from 10mm to 50mm with localized rainfall amounts ranging from 50 to 100mm over southern Tunisia/Algeria.
- **The Sahel:** countries were dominated by the effects of Harmattan winds with dust episodes.
- **Gulf of Guinea countries :** spatial rainfall increase with decrease intensity recording amounts ranging from 10mm to 75mm with maximum of about 75mm to 100mm.
- **Central Africa countries:** had slight spatial rainfall increase recording amounts ranging from 10mm to 100mm with localized peaks ranging 100mm to 200mm over Democratic Republic of Congo and Congo.
- **GHA countries:** experienced slight spatial rainfall increase recording amounts ranging from 10mm to 100mm with maximum ranging from 100 to 150mm over Tanzania.
- **Southern Africa countries:** experienced significant spatial rainfall decrease recording rainfall amounts ranging from 10mm to 15$00mm with heaviest amounts ranging 100mm to 200mm intensifying to about 250mm over Madagascar.



(Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heavy rainfall recorded over Antananarivo in Madagascar, Brazzaville in Congo and Plaisance in Mauritius. The lowest temperature of 5.4°C was recorded at Alger (Dar-El-Bieida) in Algeria while the highest temperature of 40°C was recorded at Niamey in Niger.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	42	4	31,3	25,5
2	Abuja	0	0	36,3	25,4
3	Accra	0	0	32,7	25,5
4	Agadez	0	0	36,1	20,7
5	Alger(Dar El Beida)	18	3	19,3	5,4
6	Antananarivo	118	6	27,0	17,8
7	Antsiranana	32	1	31,5	21,8
8	Bamako-Senou	0	0	37,8	25,6
9	Bangui	63	3	34,7	23,0
10	Banjul	0	0	27,8	17,3
11	Beira	89	5	30,1	24,1
12	Bilma	0	0	34,6	15,7
13	Bobo Dioulasso	0	0	36,6	25,1
14	Brazzaville	108	3	32,0	22,4
15	Bujumbura	7	1	-	-
16	Cotonou	15	2	31,7	26,6
17	Dakar-Yoff	0	0	23,1	17,9
18	Dar-es-Salaam	33	2	33,2	24,2
19	Douala	29	5	32,8	25,0
20	Durban	13	4	25,7	20,0
21	Entebbe	35	3	26,7	19,9
22	Francistown	3	1	27,7	17,6
23	Johannesbourg	81	3	22,3	13,5
24	Khartoum	0	0	37,9	21,3
25	Kigali	11	1	25,8	16,3
26	Kigoma	21	5	28,7	20,1
27	Kinshasa	17	2	32,1	22,0
28	Le Caire	0	0	22,3	12,4
29	Le Cap	0	0	23,7	15,8
30	Libreville	49	5	30,0	24,0
31	Lilongwe	21	2	-	17,2
32	Lomé	45	3	33,1	26,0
33	Lusaka	72	5	26,2	18,3
34	Manzini	17	3	26,2	18,0
35	Maputo	39	2	29,8	21,3
36	Maseru	8	4	24,3	12,6
37	Maun	27	3	30,8	18,8
38	Mbeya	91	8	24,0	14,5
39	Nairobi	1	1	28,8	15,4
40	Nampula	20	2	31,7	21,9
41	N'Djamena	0	0	39,4	22,9
42	Niamey-Aéroport	0	0	40,0	25,5
43	Nouakchott	0	0	24,6	17,3
44	Ouagadougou	0	0	38,7	28,4
45	Plaisance	167	8	29,6	23,5
46	Sal	0	0	24,9	18,9
47	Seretse-Khama Airport	98	7	25,9	16,9
48	Seychelles	19	6	32,2	25,6
49	Tamanrasset	0	0	26,9	12,9
50	Toalagnaro	31	3	31,0	24,0
51	Tombouctou	0	0	39,6	24,3
52	Tripoli	0	0	21,4	8,4
53	Tunis	0	0	18,9	8,9
54	Windhoek	0	0	28,7	14,2
55	Zinder	0	0	37,1	21,8

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

3.OUTLOOK FOR DEKAD (01st – 10th APRIL, 2009)

3.1 RAINFALL

The ITD will migrate northward leading to an increase in rainfall over Gulf of Guinea countries. The rainfall will also increase over central Africa, parts of GHA with a decrease over northern parts of southern Africa countries. In summary:

- **North Africa countries:** expected to experience rainfall increase with amounts ranging from 10mm to 100mm.
- **The Sahel:** will continue to experience increased temperatures characterized with a reduction in the Harmattan conditions.
- **Gulf of Guinea countries:** will experience spatial rainfall increase recording rainfall amounts ranging from 10mm to 150mm with isolated peaks of about 200mm
- **Central Africa countries:** will experience spatial rainfall increase recording amounts ranging from 10mm to 200mm with peaks of about 250mm and above.
- **GHA countries:** will record spatial rainfall increase with amounts ranging from 10mm to 150mm with peaks of about 200mm to 250mm.
- **Southern Africa countries:** will experience spatial rainfall decrease recording amounts ranging from 10mm to 100mm with peaks of about 150mm and above over Zambia, Zimbabwe, Malawi and Madagascar.

3.2 TEMPERATURE

The forecast map below shows that the mean surface temperature will increase over northern part of Gulf of Guinea countries, southern part of the Sahel, parts of central Africa and GHA countries including parts of Namibia. The highest forecast temperatures range from 25°C to 35°C in orange and red colours respectively cover more than 75% of the Continent recording 20°C and above.

3.3 SOIL MOISTURE

The outlook on soil moisture change, map shown below includes 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 increase include parts of north Mozambique, southeast Tanzania and Gulf of Guinea countries.

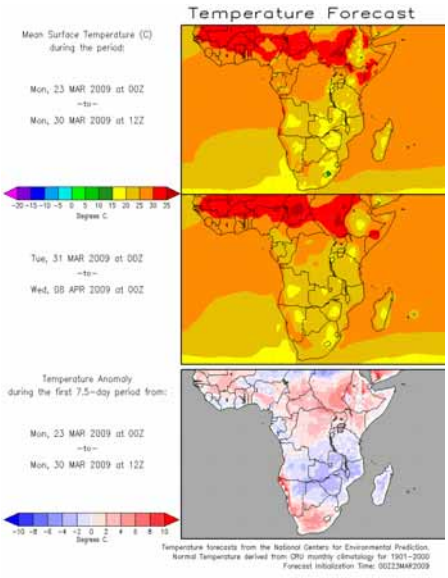
3.4 IMPACTS

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 (high humidity) 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 Gulf of Guinea, central Africa, GHA and parts of southern Africa countries and Madagascar with high humidity/rainfall coupled with the prevailing conducive temperatures support the survival of parasite resulting in higher incidences of vector borne diseases including malaria. The health authorities and Agencies need to continue the health care and humanitarian services to protect lives of the vulnerable communities.

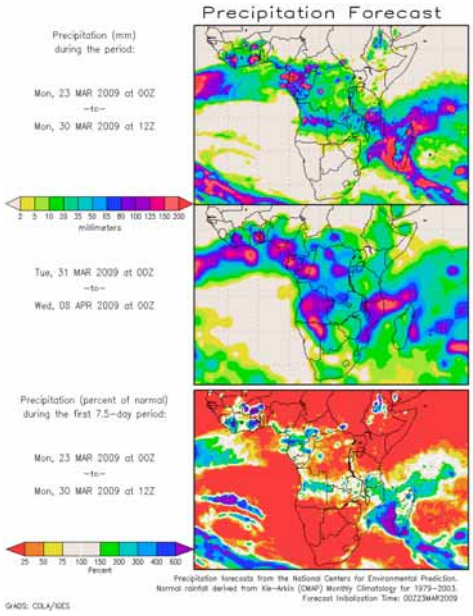
Agriculture and food security: The applications of climate information in agricultural production are of crucial importance. We often emphasize on the importance of well documented onset dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop yield assessments in our countries. However, it is also important 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 PRESAO, PRESAC, GHACOF and SARCOF for West Africa, central Africa, Greater Horn of Africa and southern Africa countries respectively.

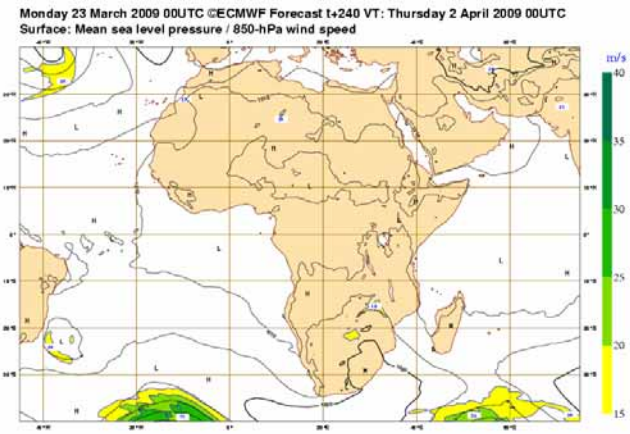
African Natural Ecosystems: There is a need to invest in the rehabilitation of our presently degraded rainfall catchments areas within our natural ecosystems through enhanced national conservation programmes such as national tree planting, afforestation and soil conservation during rainy seasons to minimize soil loss due to heavy runoff. Enhanced national strategies for adaptation to Climate Change are of high priority.



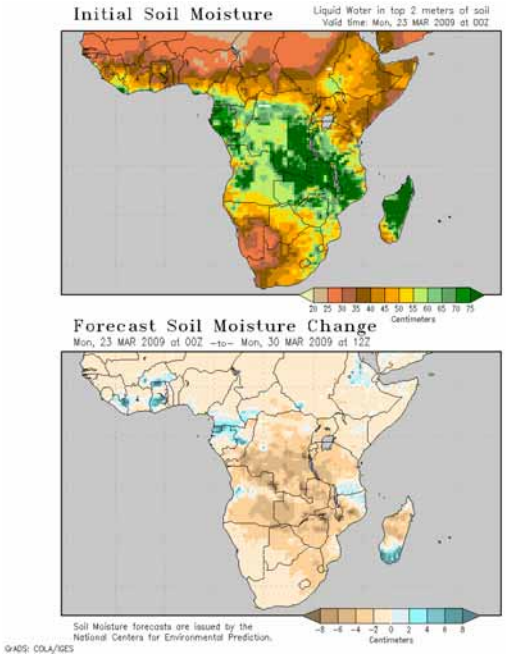
Source : COLA



Source : COLA



Source: ECMWF



Source: COLA