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

Ten Day Climate Bulletin

N° 09 Year 2009

Dekad of 21 to 31 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 Zambia and parts of Tanzania.

1. GENERAL SITUATION:

1.1 SURFACE

- **Azores high:** Pressure of 1033hPa was located at about 46°N with extending a ridge over Atlantic Ocean.

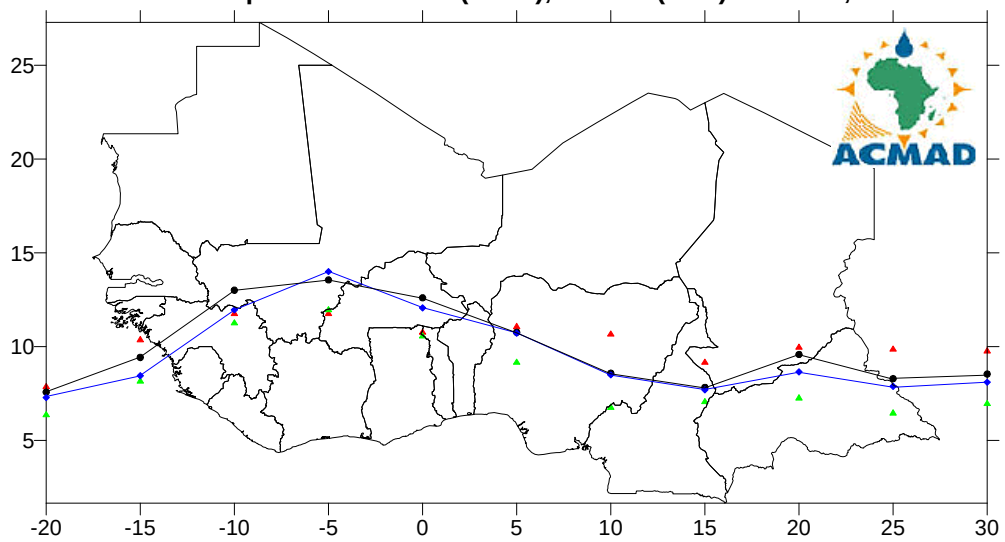
- **St. Helena high:** Pressure of 1023hPa weakened significantly by 7hPa and shifted northeast at 38°S/09°W with an extended ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1027hPa weakened by 3hPa compared to the past dekad and shifted southwest. It's mean position at 39°S/65°E with extended ridge over the Indian Ocean.

- **Tthermal low:** Pressure at 1005hPa deepened slightly by 1hPa compared to the past dekad and shifted southeast at 12°N/03°E with an extended trough over south Mali, Burkina Faso, north Ghana, north Togo, north Benin, northwest Nigeria, north Cameroon and south Chad.

- **Inter-Tropical Discontinuity (ITD):** Between the second dekad and third dekad of March, 2009, the ITD had a northward displacement over western Gulf of Guinea countries and the Sahel countries, Mali, Burkina Faso and Chad. It's mean position was observed at 7.6°N and 9.5 °N over longitude 20°W and 15°W respectively; at 13.0°N and 13.6°N over southwest and south Mali respectively; at 12.6°N over east Burkina Faso; at 10.8°N and 8.6 °N over west and southeast Nigeria respectively; at 7.8°N over extreme east Cameroon; at 9.6°N over south Chad; 8.3°N and 8.5°N over extreme southwest and south Sudan respectively.

ITD mean position dekad 3 (black), dekad 2(blue) of March, 2009



Position moyenne du FIT décade 3 ème décade (noire) et 2 ème (bleue) de Mars 2009

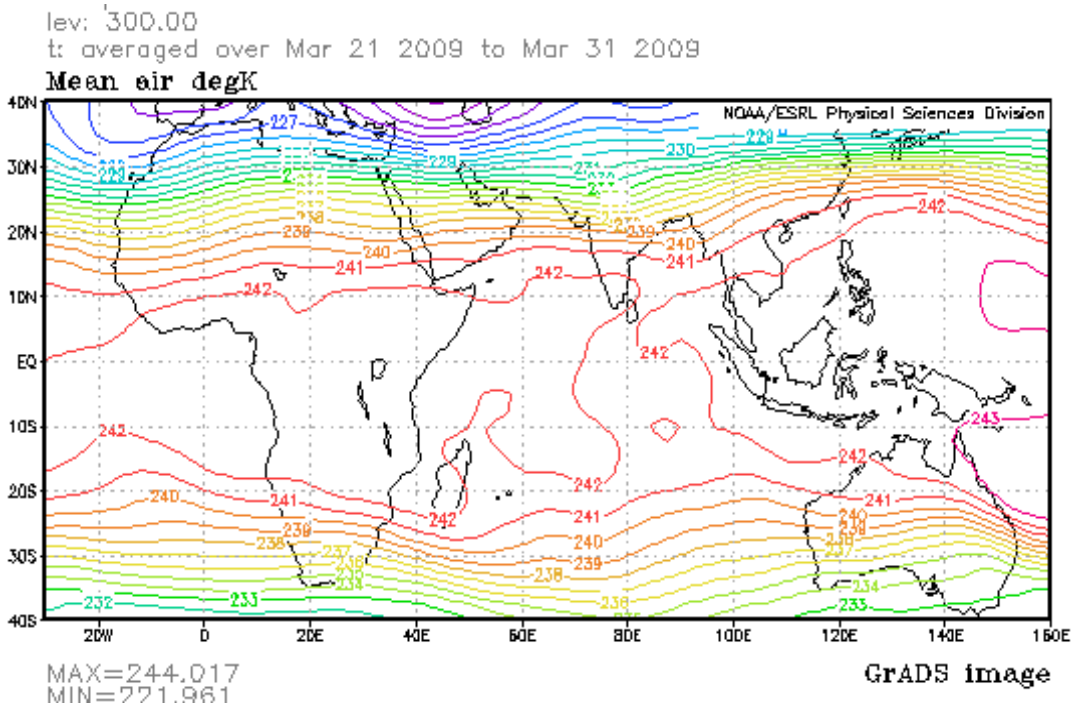
The red and green triangles represent the max. and min. displacements of the ITD respectively

Direction Générale ACMAD, BP 13184, 85 Avenue des Ministères, Niamey - Niger
Tél. (227) 20 73 49 92, Fax : (227) 20 72 36 27, E-mail : dgacmad@acmad.ne, Web : http://www.acmad.org

1.2 TROPOSPHERE

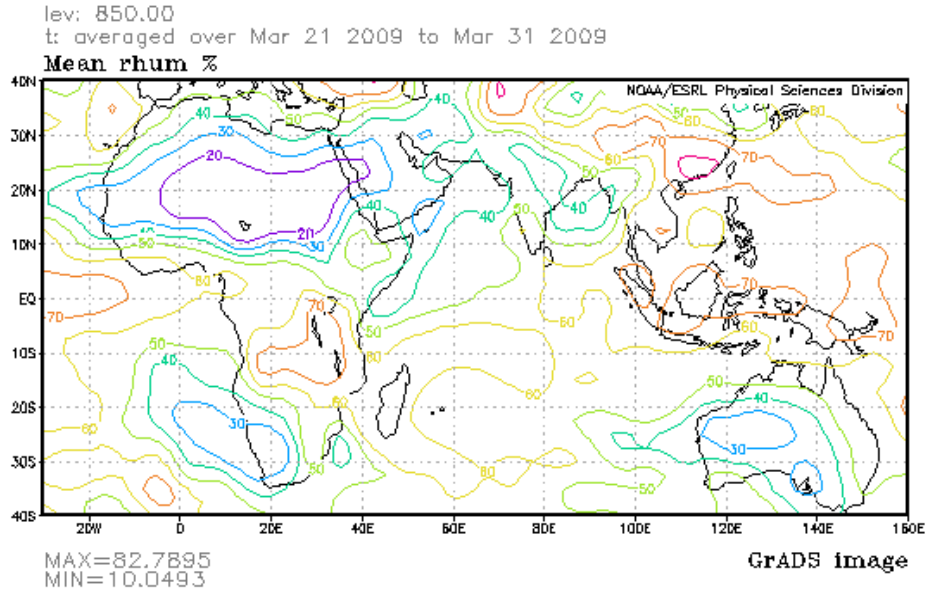
- **Monsoon:** Monsoon influx at 925hPa level was weak (1 to 5m/s) over Cameroon and moderate (5.5 to 11.5m/s) over Ghana, Togo and south Nigeria.

- **Thermal Index (TI):** In third dekad of March, 2009, the thermal index (TI) regime at 300hPa, map shown below, had TI regime value of 242°K over the tropical Africa zone 10°N extending to about 20°S covering part of Gulf of Guinea countries, central Africa countries, GHA countries and northern parts of southern Africa countries resulting in heavy rainfall over some parts characterized by high relative humidity as observed below.



(Data Source: NOAA/NCEP)

- **Relative Humidity (RH):** The 850hPa map below shows high RH (>70%) in the third dekad of March, 2009 over parts of central Africa countries and southwestern parts of GHA countries. The Sahara, the Sahel countries, extreme northern part of Gulf of Guinea countries and 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 third dekad of March, 2009 shows rainfall activities increase over the northern Africa, the Sahel countries, Gulf of Guinea countries, and GHA countries, slight decrease over central Africa countries while southern Africa countries experienced significant rainfall decrease. In summary:

- **North Africa countries:** experienced significant spatial and intensity of rainfall increase recording amounts ranging from 10mm to 100mm over north Morocco, north and west Algeria and Tunisia.

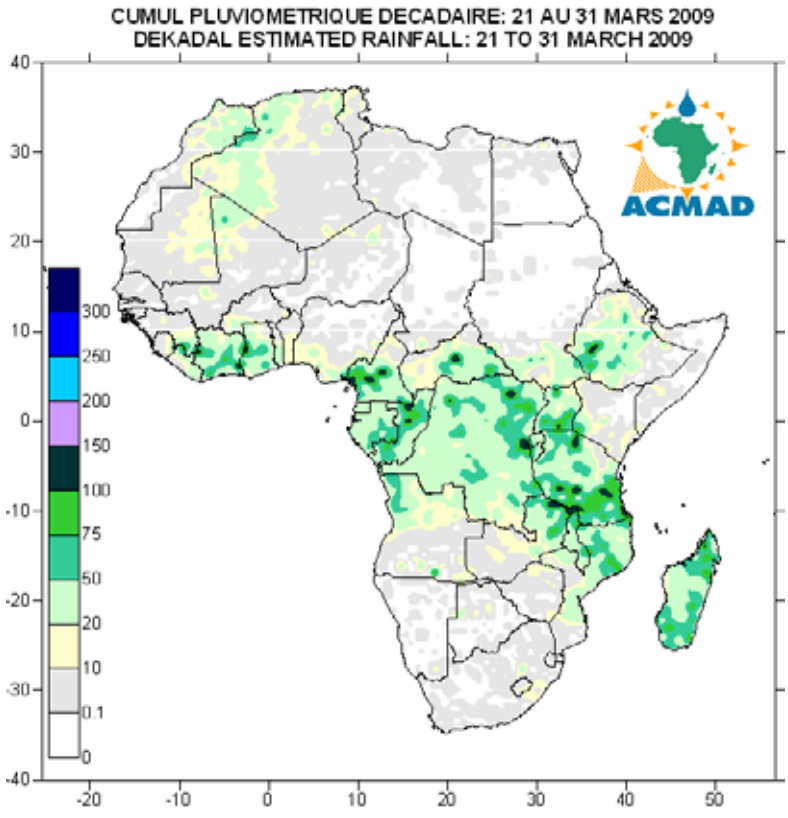
- **The Sahel:** had spatial and intensity of rainfall increase recording amounts ranging from 10 to 75mm over south Burkina Faso, south Chad, north Mali and northeast Mauritania.

- **Gulf of Guinea countries:** experienced spatial and intensity of rainfall increase recording amounts ranging from 10mm to 100mm with peaks ranging above 100mm to 150mm over Côte d'Ivoire, Ghana, southeast Nigeria and Cameroon.

- **Central Africa countries:** had spatial rainfall decrease in the southern part while northern part had an increase recording amounts ranging from 10mm to 100mm with peaks ranging above 100mm to 150mm over Democratic Republic of Congo, Central African Republic and Congo.

- **GHA countries:** experienced significant spatial rainfall increase recording amounts ranging from 10mm to 100mm with peaks ranging above 100mm to 150mm over Ethiopia, Great Lakes countries, and Tanzania.

- **Southern Africa countries:** experienced significant spatial and intensity of rainfall decrease recording amounts ranging from 10mm to 100mm with maximum over north Zambia, Malawi, north Mozambique and Madagascar.



(Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heavy rainfall recorded over Toalagnaro and Antsiranana in Madagascar, Mbeya in Tanzania. The lowest temperature of 5.4°C was recorded at Alger (Dar-El-Bieida) in Algeria while the highest temperature of 41.7°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	0	0	32,1	25,9
2	Abuja	0	0	37,7	25,9
3	Agadez	0	0	37,1	22,6
4	Alger(Dar El Beida)	19	4	19,8	5,4
5	Antananarivo	52	5	27,4	17,4
6	Antsiranana	103	6	31,5	22,3
7	Bamako-Senou	1	1	38,5	26,7
8	Bangui	4	1	34,6	22,9
9	Banjul	0	0	32,2	18,8
10	Beira	49	3	30,0	22,8
11	Bilma	0	0	36,9	18,0
12	Bobo Dioulasso	21	1	37,9	25,6
13	Brazzaville	0	0	34,2	23,3
14	Cotonou	24	1	32,1	27,4
15	Dakar-Yoff	0	0	23,5	18,4
16	Dar-es-Salaam	42	6	32,0	23,5
17	Douala	40	3	32,6	24,4
18	Durban	8	2	27,5	19,7
19	Entebbe	65	6	26,3	19,3
20	Francistown	0	0	28,6	12,3
21	Johannesbourg	0	0	24,9	12,7
22	Khartoum	0	0	38,4	22,3
23	Kigali	0	0	27,2	16,2
24	Kigoma	37	5	29,4	20,3
25	Kinshasa	18	3	33,8	22,5
26	Le Caire	0	0	23,1	13,0
27	Le Cap	0	0	23,6	15,6
28	Libreville	9	2	31,4	24,4
29	Lilongwe	41	2	-	-
30	Lomé	27	1	33,2	26,3
31	Lusaka	0	0	25,9	14,7
32	Manzini	0	0	28,8	17,1
33	Maputo	1	1	31,3	20,9
34	Maseru	3	2	25,8	11,7
35	Maun	0	0	31,1	17,1
36	Mbeya	134	6	24,2	12,7
37	Nairobi	13	2	28,4	15,1
38	Nampula	58	3	29,6	21,5
39	N'Djamena	0	0	40,6	23,3
40	Niamey-Aéroport	0	0	41,7	27,1
41	Nouakchott	1	1	28,8	17,9
42	Ouagadougou	0	0	41,0	27,9
43	Plaisance	47	9	30,0	23,3
44	Sal	0	0	24,2	19,2
45	Seretse-Khama Airport	0	0	29,0	14,5
46	Seychelles	33	4	32,0	26,4
47	Tamanrasset	0	0	28,8	15,5
48	Toalagnaro	154	9	29,8	23,6
49	Tombouctou	0	0	40,7	26,3
50	Tripoli	0	0	25,5	10,1
51	Tunis	9	3	20,8	10,5
52	Windhoek	0	0	28,8	13,9
53	Zinder	0	0	38,8	23,9

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

3.OUTLOOK FOR DEKAD (11th – 20th 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 significant decrease over 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 increasing temperatures with rainfall increase recording amounts ranging from 10 to 75mm over southern and western parts of the Sahel countries and significant reduction of the Harmattan winds and associated dust episodes.

- **Gulf of Guinea countries:** will experience spatial rainfall increase recording rainfall amounts ranging from 10mm to 200mm with isolated peaks of about 250mm

- **Central Africa countries:** will experience slight 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 Zambia, Mozambique, 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 with 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 Gulf of Guinea countries.

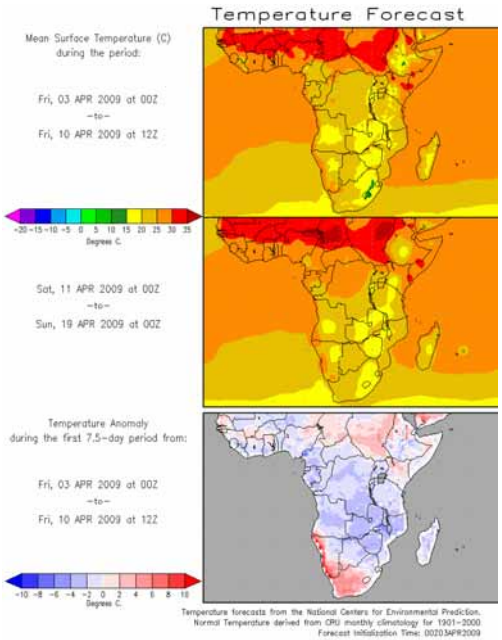
3.4 IMPACTS

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 of 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.

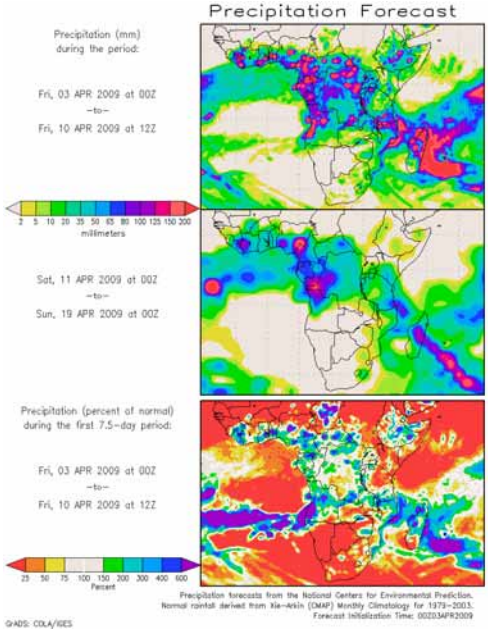
Agriculture and food security: The applications of climate information in agricultural production are of crucial importance. We often emphasize on the importance of well documented onset dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop yield assessments in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

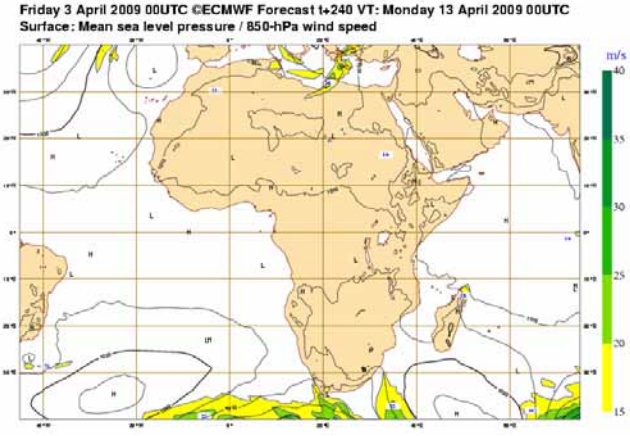
African Natural Ecosystems: There is a need to invest in the rehabilitation of our presently degraded rainfall catchments areas within our natural ecosystems through enhanced national conservation programmes such as national tree planting, afforestation and soil conservation during rainy seasons to minimize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



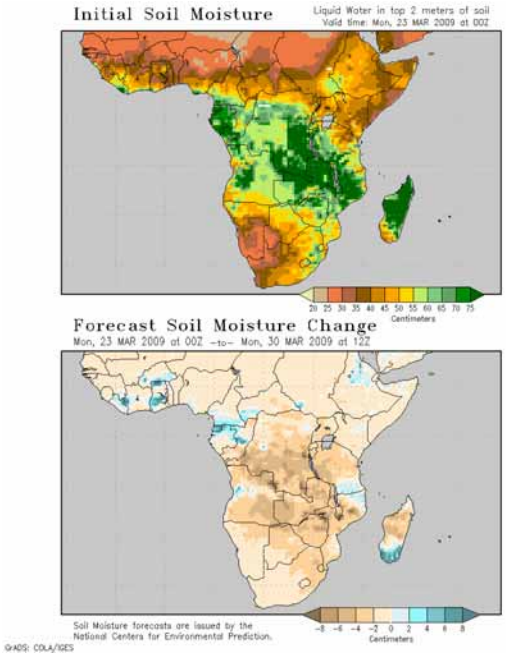
Source : COLA



Source : COLA



Source : ECMWF



Source: COLA