Ten Day Climate Bulletin
N° 08
Dekad 11th to 20th March, 2010

HIGHLIGHT: The highest cumulative rainfall was recorded at Libreville in Gabon. The highest mean maximum temperature was recorded at Niamey-Airport in Niger while the lowest mean minimum temperature was recorded at Alger Dar-El Beida in Algeria. The TI regime threshold value of 243°K extending about 15°N and 20°S will continue to trigger heavy rains with floods over areas with relative humidity (>70%).

1. GENERAL SITUATION

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

1.1 SURFACE

- **Azores high pressure**: of 1024 hPa with a S-N axis strengthened by 4 hPa and shifted northeast compared to the past dekad. Its centre was located at about 44°N/01°E extending a ridge over North Atlantic Ocean.

- **Saharan Thermal Low:** Pressure at 1006 hPa centred at about 15°N/32°E, deepened slightly by 1 hPa and shifted northeast compared to the past dekad. Its trough extended over Burkina Faso, southwest Niger, north Nigeria, north Cameroon, south Chad and northwest Sudan.

- **St. Helena high:** Pressure of 1025 hPa with a SE-NW axis maintained its intensity and shifted northeast compared to the previous dekad. Its mean position was at 35°S/03°E, extending a ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1024 hPa with a W-E axis weakened by 4 hPa compared to the past dekad and shifted northwest. Its mean position was located at 32°S/82°E with an extended ridge over Indian Ocean.

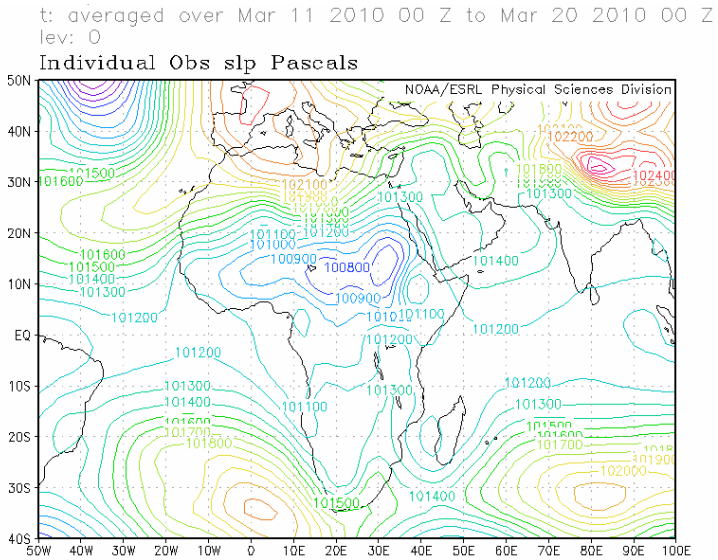

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter-Tropical Discontinuity (ITD)**

Between the first dekad (blue line) and the second dekad (black) of March, 2010, the ITD had a northward migration over the Gulf of Guinea countries except over the central parts where it shifted southwards (Figure2).

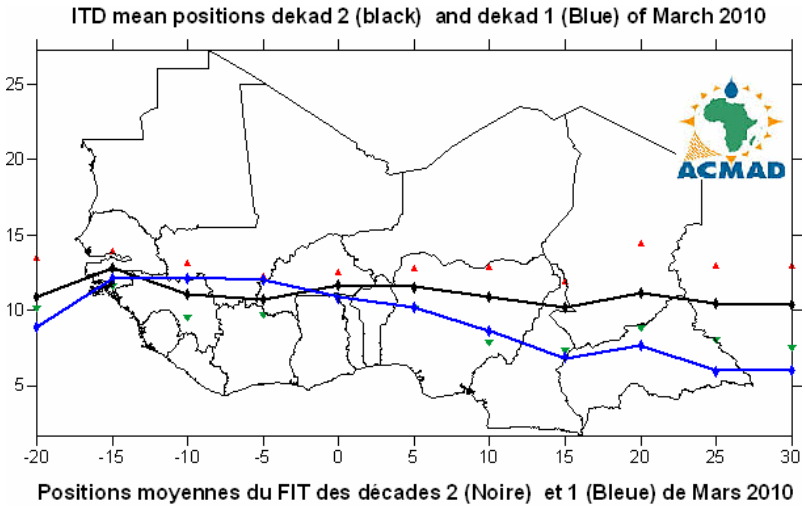

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was moderate (5,5 to 12,5 m/s) over Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Togo and north Benin during the dekad.

1.2.2 Thermal Index (TI)

In the second dekad of March, 2010, the thermal index (TI) regime at 300hPa in (figure 3), had the threshold value of 243°K (for heavy rains with floods) extending about 15°N and 20°S covering extreme southern part of Gulf of Guinea countries, central Africa, major part of GHA countries, northern part of southern Africa countries and northern Madagascar with the highest value of 244°K linked to heavy rainfall with severe floods in areas with high relative humidity shown in Figure 4.

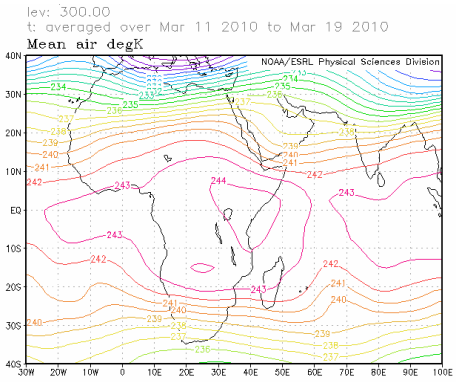

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the second dekad of March, 2010 over southern part of Central Africa, parts of GHA countries and eastern and northern and eastern parts of Southern Africa countries. The Sahara, the Sahel and northern part of Gulf of Guinea countries experienced dry conditions characterized by the lowest RH (40%).

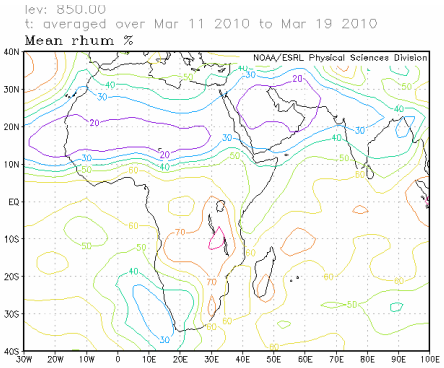

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 in Figure 5 below compared to that of the past dekad shows rainfall distribution increase over Gulf of Guinea countries, Central African countries and GHA countries while it decreased over Northern Africa countries. The Sahel countries continued to be under the influence of the Harmattan. In detail:

- **North Africa countries:** had significant rainfall distribution and amounts decrease observing between 10mm to 50mm over north Morocco, Algeria and Tunisia.

- **The Sahel:** continued to experience dry and dusty conditions under the influence of the Harmattan.

- **Gulf of Guinea countries:** experienced significant increase in rainfall distribution with amounts ranging from 10mm to100mm with localized peaks of about 100mm to 150mm over southeast Côte d'Ivoire/Ghana and Cameroon.

- **Central Africa countries:** observed rainfall distribution and amounts increase, ranging between 10mm to 150mm with maximum ranging from 150 mm to 200mm over Central African Republic intensifying to about 300mm over Gabon and Equatorial Guinea.

- **GHA countries:** experienced slight increase in rainfall distribution, observing amounts ranging from 10mm to 100mm with localized peaks of about 150mm.

- **Southern Africa countries:** had rainfall amounts ranging from 10mm to 100mm with maximum of about 150 mm and above intensifying over the northern part with peaks ranging from about 200mm to 300mm over Madagascar.

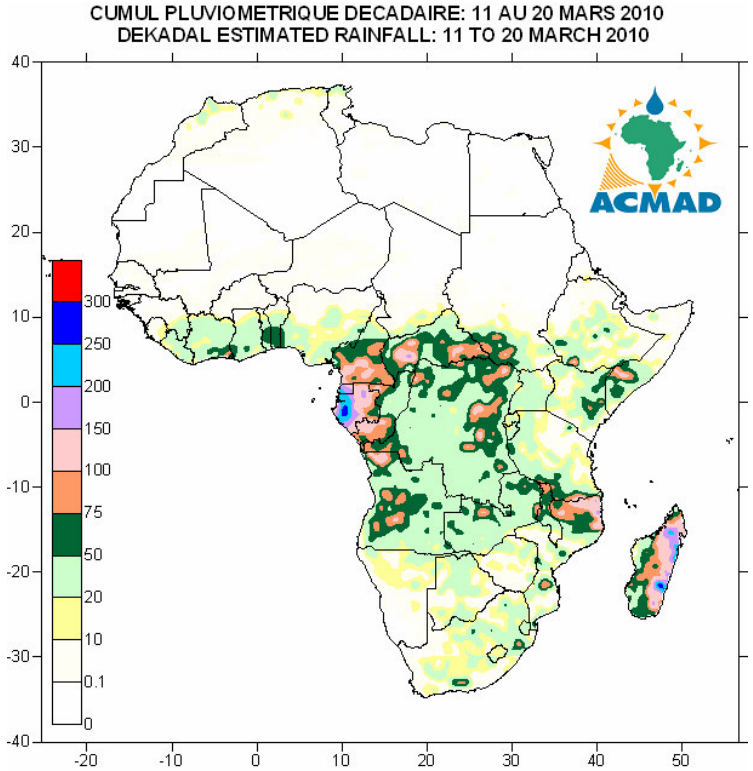

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows the highest cumulative rainfall that was recorded at Libreville in Gabon. The highest mean maximum temperature of 40,9°C recorded at Niamey-Airport in Niger while the lowest mean minimum temperature of 5.8°C was recorded at Alger Dar-El Beida in Algeria.

N°	STATIONS	Précipitations (mm)	Number of rainy days	Température Max mean (°C)	Température Min mean (°C)
1	Abidjan	11	1	32,5	26,1
2	Accra	28	2	33,7	26,2
3	Agadez	0	0	37,6	23,4
4	Alger (Dar El Beida)	17	4	19,8	5,8
5	Antananarivo	83	8	27,2	18,5
6	Antsiranana	49	7	30,8	22,9
7	Bamako-Senou	0	0	38,7	23,8
8	Bangui	12	2	34,8	23,3
9	Banjul	0	0	38,6	20,1
10	Beira	28	3	30,9	24,7
11	Bilma	0	0	37,0	18,2
12	Bissau	0	0	25,8	21,6
13	Bobo Dioulasso	0	0	38,8	27,0
14	Brazzaville	52	4	33,6	23,8
15	Bulawayo	8	3	29,2	17,1
16	Casablanca	10	1	22,2	13,5
17	Conakry	0	0	33,1	25,2
18	Cotonou	7	2	32,7	27,5
19	Dakar-Yoff	0	0	29,0	19,8
20	Dar-es-Salaam	15	1	33,5	25,7
21	Dodoma	0	0	31,4	19,7
22	Douala	49	3	31,5	24,1
23	Durban	6	3	27,4	21,1
24	Entebbe	0	0	27,7	19,9
25	Francistown	0	0	31,8	18,3
26	Ghanzi	31	2	31,9	18,3
27	Harare	186	3	28,1	16,9
28	Johannesbourg	5	1	26,6	14,9
29	Khartoum	0	0	39,7	26,5
30	Kigali	0	0	29,2	16,9
31	Kigoma	22	5	29,3	20,4
32	Kinshasa	0	0	33,6	23,0
33	Le Caire	0	0	26,6	16,3
34	Le Cap	0	0	24,4	15,4
35	Libreville	236	8	31,1	23,3
36	Lomé	68	3	33,2	26,3
37	Lusaka	40	3	29,4	18,0
38	Manzini	28	2	28,5	19,7
39	Maputo	84	3	31,3	23,0
40	Maseru	1	1	25,3	12,6
41	Maun	36	2	-	19,7
42	Mbeya	44	6	25,6	15,7
43	Monrovia	0	0	33,1	24,3
44	Moroni	0	0	32,1	25,3
45	Mtwara	7	4	31,7	-
46	Nairobi	36	4	26,6	14,4
47	Nampula	92	6	31,4	22,5
48	N'Djamena	0	0	40,6	25,7
49	Niamey-Aéroport	0	0	40,9	27,1
50	Nouakchott	0	0	37,2	21,7
51	Ouagadougou	0	0	40,0	26,3
52	Plaisance	109	7	30,7	24,3
53	Port Elisabeth	0	0	25,2	17,0
54	Pretoria	9	3	29,5	17,9
55	Sal	0	0	27,6	21,1
56	Seretse Khama- Aéro	0	0	33,5	20,9
57	Seychelles	110	6	31,4	25,3
58	Tamanrasset	0	0	28,4	14,2
59	Toalagnaro	85	8	28,1	22,6
60	Tombouctou	0	0	37,4	20,6
61	Tripoli	0	0	20,7	8,9
62	Tunis	23	4	17,6	8,6
63	Windhoek	1	1	31,5	16,8
64	Zinder	0	0	39,1	25,3

NOTE: **0** means no rain;

- means no temperature data available

Data Source: ACMAD / GTS

3. OUTLOOK FOR DEKAD (01st – 10th APRIL, 2010)

3.1 RAINFALL

The ITD will be expected to move northward while the dry and dusty conditions will continue under the influence of the Harmattan. The rainfall will intensify over southern part of the Gulf of Guinea, central Africa, major part of GHA and northern parts of southern Africa countries. In detail**:**

- **North Africa countries:** will experience some increase in rainfall amounts ranging from 10mm to 100mm with maximum ranging from 150 to 200mm.

- **The Sahel:** will continue to experience high temperature with dry and dusty conditions under the influence of the Harmattan.

- **Gulf of Guinea countries:** will experience rainfall increase observing amounts ranging from 10mm to 150mm with peaks of about 200mm to 300mm.

- **Central Africa countries:** will experience rainfall increase with amounts ranging from 20mm to 200mm with peaks ranging from about 250mm to 300mm resulting in flooding.

- **GHA countries:** will have rainfall increase with amounts ranging from 10mm to 150mm intensifying over some parts with amounts ranging from about 200mm to 300mm resulting in flooding.

- **Southern Africa countries:** will experience significant rainfall decrease with amounts ranging from 10mm to 100mm with peaks of about 150mm.

3.2 TEMPERATURE

The forecast in Figure 7, shows high temperature in parts of Gulf of Guinea, northern central Africa, parts of GHA and parts of southern Africa countries and the Sahel, with Niger recording the highest temperature. The high temperatures ranging from 20°C to 35°C will cover more than 75% of the Continent.

3.3 SOIL MOISTURE

The outlook on soil moisture change, maps shown in Figure 8 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 high soil moisture change increase include eastern part of central Africa countries, parts of GHA and western parts of southern Africa countries while significant soil moisture change deficits will dominate northeastern part of southern Africa countries.

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. Some parts of the Gulf of Guinea, central Africa, GHA and parts of southern Africa countries with high humidity/rainfall coupled with prevailing conducive temperatures will support the survival of parasite resulting in higher incidences of malaria including other climate related diseases. The Harmattan dust will result in increased cases of meningitis and other dust related ailments over the Sahel and parts of the Gulf of Guinea countries and to a limited extent in parts of central Africa countries. The health authorities and Agencies need to continue the healthcare and humanitarian services to protect lives of the vulnerable communities.

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 performance and duration 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 a good rainy season by taking advantage of seasonal climate consensus forecasts, for example those issued by regional climate outlook forums (RCOFs), the GHACOF, PRESAO, PRESAC, and SARCOF for Greater Horn of Africa (GHA) countries, West Africa countries/Chad/Cameroon, central Africa and southern Africa countries respectively. The GHACOF25 has issued the seasonal climate consensus forecast for March-April-May, (MAM), 2010 for GHA countries.

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**.** Enhanced national strategies and policies for adaptation to Climate Change are of highest priority for States' enhanced economic growth and the achievement of the United Nations millennium development goals (MDGs) for sustainable development. The countries have to invest in environmental conservation now for better tomorrow**.**

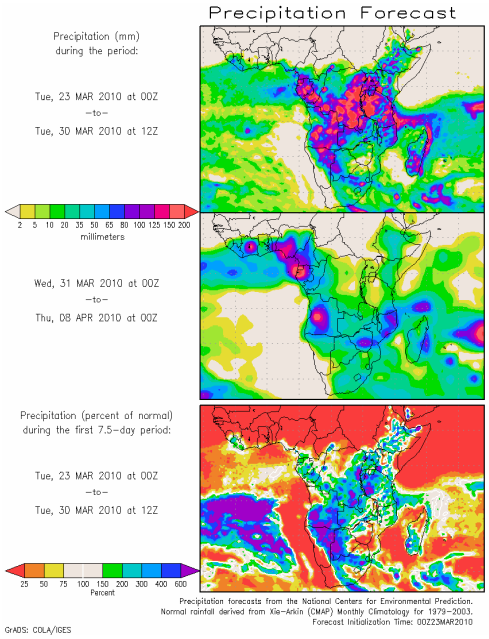

Figure 6 : Precipitation forecast, Source : COLA

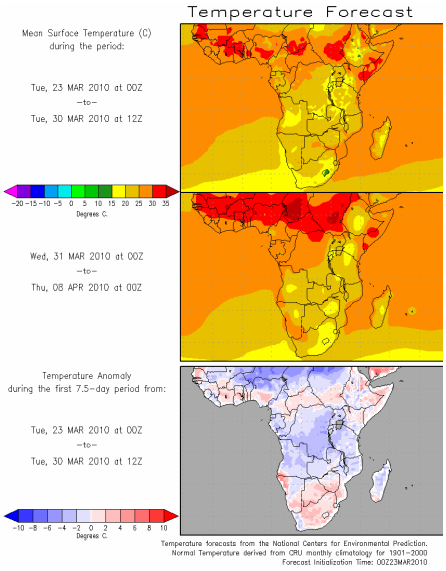

Figure 7 : Temperature forecast Source : COLA

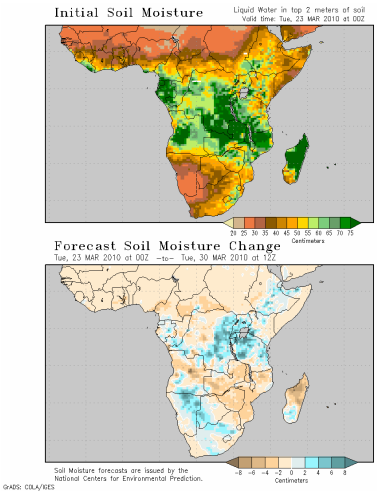

Figure 8 : Soil moisture forecast, Source: COLA

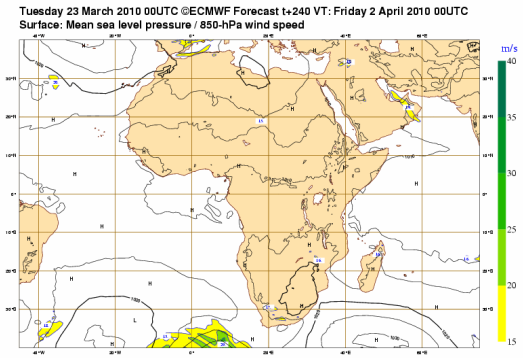

Figure 9 : Mean Sea Level pressure forecast Source: ECMWF