Ten Day Climate Bulletin
N° 06
Dekad 21st to 28th February, 2010

HIGHLIGHT: The highest cumulative rainfall that was recorded at Beira in Mozambique. 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 southern part of Central Africa, parts of GHA countries and eastern and northern parts of Southern Africa countries characterized by high relative humidity are expected to get heavy rainfall associated with floods.

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 1016 hPa with a SW-NE axis maintained its intensity and shifted northeast compared to the past dekad. Its centre was located at about 21°N/30°W extending a ridge over North Atlantic Ocean.

- **Saharan Thermal Low:** Pressure at 1005 hPa centred at about 12°N/18°E, deepened by 2 hPa and shifted eastwards compared to the past dekad. Its trough was extended over south Mali, Burkina Faso, north Ghana, southwest Niger, north Nigeria, north Cameroon and south Chad.

- **St. Helena high:** Pressure of 1026 hPa with a SE-NW axis strengthened by 3 hPa and shifted southeast compared to the previous dekad. Its mean position was at 35°S/04°E, extending a ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1025 hPa with a W-E axis strengthened slightly by 1hPa compared to the past dekad and shifted southwest. Its mean position was located at 37°S/55°E with an extended ridge over Indian Ocean.

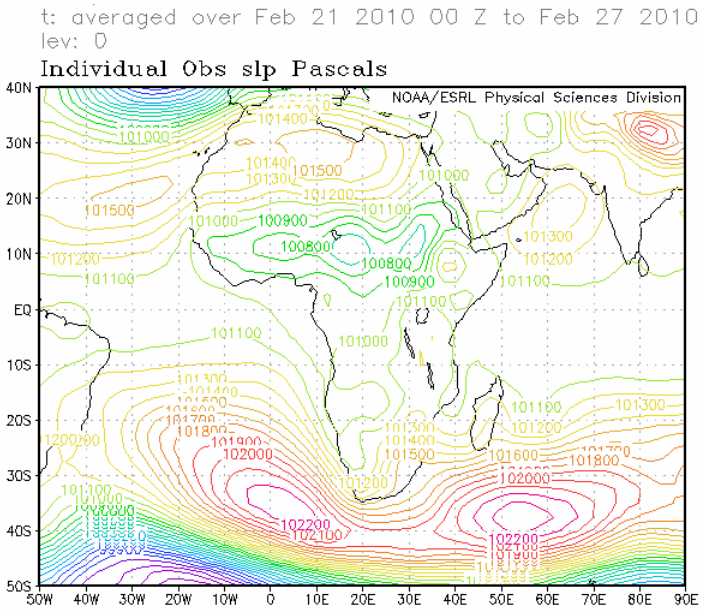

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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

Between the second dekad (blue line) and the third dekad (black) of February, 2010, the ITD had a northward migration over the west and the east parts of the Gulf of Guinea countries while in the central parts the ITD moved slightly southwards (Figure2).

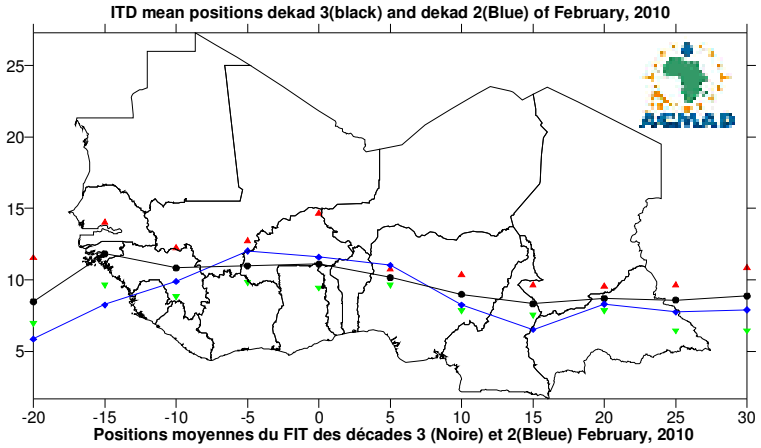

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

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, south Côte d'Ivoire and Ghana, Togo, Benin and Nigeria during the dekad.

1.2.2 Thermal Index (TI)

In the third dekad of February, 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 10°N and 25°S covering central Africa, major part of GHA countries, northern part of southern Africa countries and extreme northern Madagascar. The high value of 244°K and above covered areas with highest rainfall and severe flooding in areas with high relative humidity shown in Figure 4.

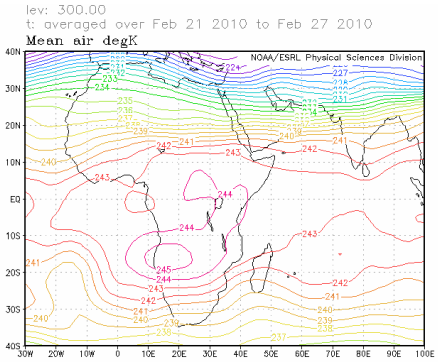

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the third dekad of February, 2010 over southern part of Central Africa, parts of GHA countries and eastern and northern 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%).

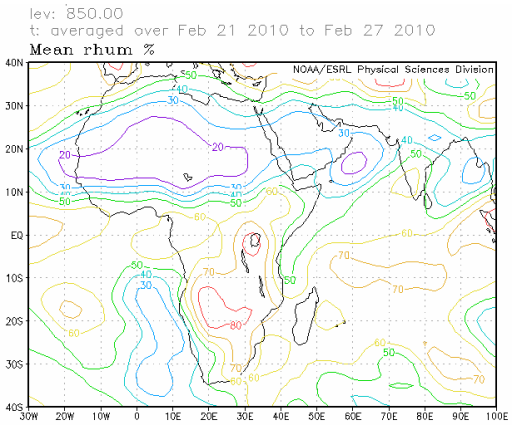

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 Africa and GHA and Southern Africa 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 rainfall distribution and amounts decrease observing between 10mm to 75mm over Morocco and Algeria with localized peaks ranging from about 100mm to 150mm.
- **The Sahel:** continued to experience dry and dusty conditions under the influence of the Harmattan.
- **Gulf of Guinea countries:** experienced slight increase in rainfall distribution with amounts, ranging from 10mm to50mm with localized peaks of about 150mm over southern Cote d'Ivoire, Ghana and eastern Nigeria/Cameroon.
- **Central Africa countries:** had slight rainfall distribution increase with amounts ranging between 10mm to 100mm intensifying to about 250mm over Democratic Republic of Congo.
- **GHA countries:** experienced significant increase in rainfall distribution, observing amounts ranging from 10mm to 150mm intensifying of about 250mm over Great Lakes countries.
- **Southern Africa countries:** had rainfall distribution increase with amounts ranging from 10mm to 150mm intensifying to 250mm over eastern Mozambique.

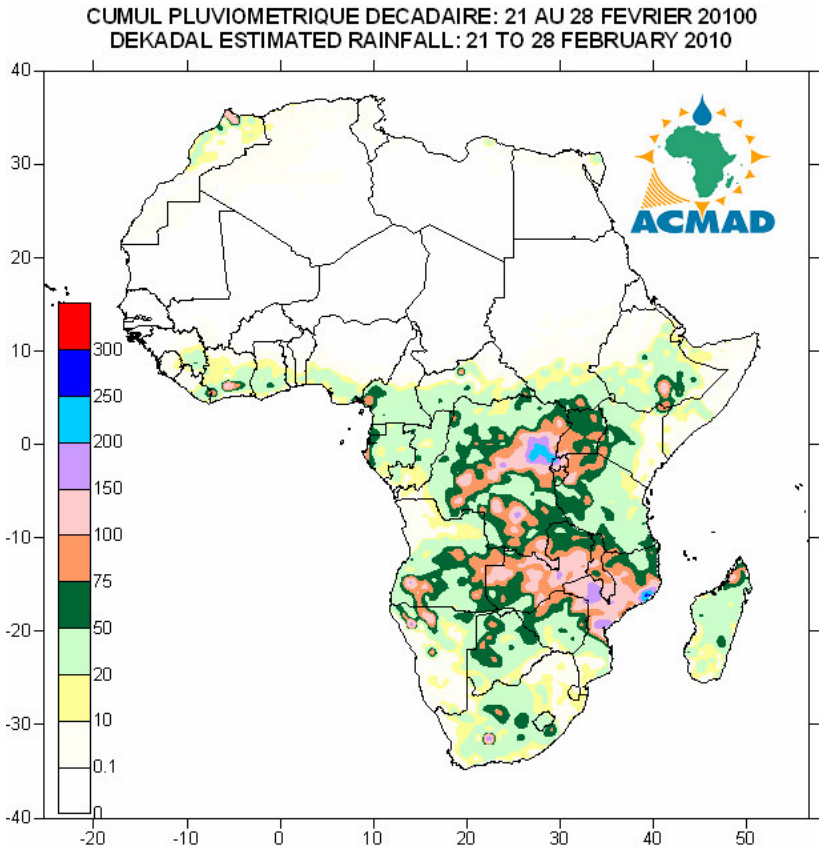

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows the highest cumulative rainfall that was recorded at Beira in Mozambique. The highest mean maximum temperature of 42.1°C recorded at Niamey-Airport in Niger while the lowest mean minimum temperature of 9.9°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	0	0	34,0	27,2
2	Accra	0	0	33,4	26,4
3	Agadez	0	0	38,7	22,1
4	Alger (Dar El Beida)	1	1	23,0	9,9
5	Antananarivo	10	2	28,3	17,5
6	Antsiranana	37	3	31,2	24,2
7	Bamako-Senou	0	0	40,8	23,5
8	Bangui	14	1	33,8	24,1
9	Banjul	0	0	38,4	19,4
10	Beira	108	5	30,2	25,4
11	Bilma	0	0	38,1	14,8
12	Bissau	0	0	36,9	22,8
13	Bobo Dioulasso	0	0	40,2	25,7
14	Brazzaville	4	3	33,6	24,3
15	Bulawayo	11	3	28,2	18,3
16	Casablanca	16	3	21,9	15,2
17	Conakry	0	0	32,1	25,2
18	Cotonou	0	0	33,8	29,1
19	Dakar-Yoff	0	0	28,5	19,6
20	Dar-es-Salaam	63	2	33,7	25,0
21	Dodoma	12	3	28,9	18,9
22	Douala	43	3	33,3	24,6
23	Durban	9	4	28,6	22,7
24	Francistown	51	3	27,3	20,1
25	Ghanzi	88	7	27,4	19,2
26	Harare	82	5	26,3	16,4
27	Johannesbourg	20	3	24,3	14,2
28	Khartoum	0	0	37,2	24,4
29	Kigali	0	0	27,2	17,9
30	Kigoma	4	2	28,6	21,4
31	Kinshasa	0	0	34,6	24,8
32	Le Caire	6	2	22,0	15,1
33	Le Cap	27	2	28,9	18,2
34	Libreville	40	2	31,4	25,0
35	Lilongwe	0	0	25,7	20,2
36	Lomé	0	0	34,4	28,0
37	Lusaka	27	5	27,0	18,9
38	Manzini	17	1	27,0	19,4
39	Maputo	26	2	31,8	23,1
40	Maun	47	4	29,0	20,3
41	Mbeya	22	4	23,7	16,3
42	Monrovia	0	0	33,3	25,2
43	Moroni	0	0	32,8	25,1
44	Nairobi	27	3	26,8	16,3
45	Nampula	28	2	31,7	22,3
46	Ndele (RCA)	45	1	-	21,4
47	N'Djamena	0	0	40,8	22,7
48	Niamey-Aéroport	0	0	42,1	23,8
49	Nouakchott	0	0	36,9	21,0
50	Ouagadougou	0	0	41,9	23,6
51	Plaisance	15	4	30,8	24,6
52	Port Elisabeth	5	5	26,1	18,6
53	Pretoria	43	2	26,7	18,1
54	Sal	0	0	27,6	21,3
55	Seretse Khama- Aéro	7	1	28,3	-
56	Seychelles	82	7	30,9	25,7
57	Tamanrasset	0	0	31,0	13,7
58	Toalagnaro	18	3	30,7	24,3
59	Tombouctou	0	0	40,6	21,6
60	Tripoli	0	0	28,8	11,5
61	Tunis	1	1	23,2	12,2
62	Windhoek	13	2	30,6	16,6
63	Zinder	0	0	39,6	23,4

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

Data Source: ACMAD / GTS

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

3.1 RAINFALL

The ITD will be expected to move significantly 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 100mm with peaks of about 150mm to 200mm over the coastal zone.

- **Central Africa countries:** will experience rainfall increase with amounts ranging from 10mm to 150mm with maximum peaks ranging from about 200mm to 300mm resulting in flooding.

- **GHA countries:** will have rainfall increase with amounts ranging from 10mm to 100mm intensifying over western parts with amounts ranging from about 150mm to 300mm resulting in flooding.

- **Southern Africa countries:** will experience significant rainfall increase over northern parts with amounts ranging from 10mm to 100mm with peaks ranging from 150mm to 300mm resulting in flooding.

3.2 TEMPERATURE

The forecast in Figure 7, shows high temperature in parts of the Sahel with Niger having the highest temperature, Gulf of Guinea, northern central Africa, parts of GHA and parts of southern Africa countries. 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 parts of the Gulf of Guinea, central Africa, parts of GHA and northern parts of southern Africa countries while significant soil moisture change deficits will dominate western part of central Africa, southern part of GHA countries and southern parts 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 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**.**

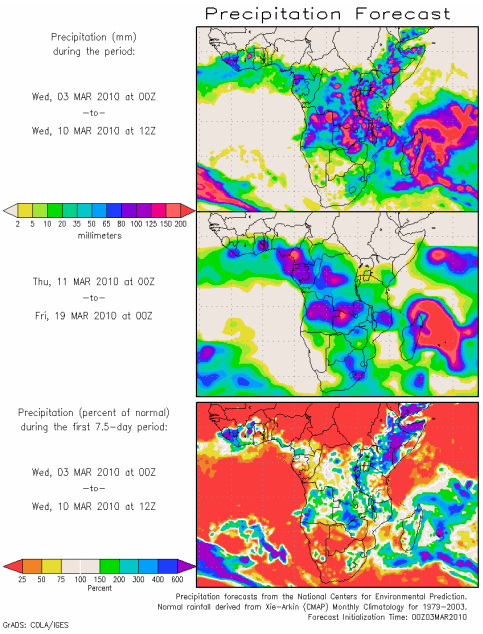

Figure 6 : Precipitation forecast, Source : COLA

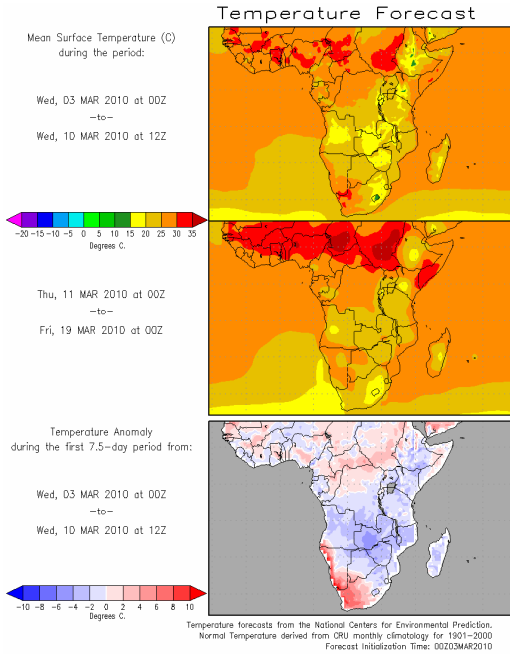

Figure 7 : Temperature forecast Source : COLA

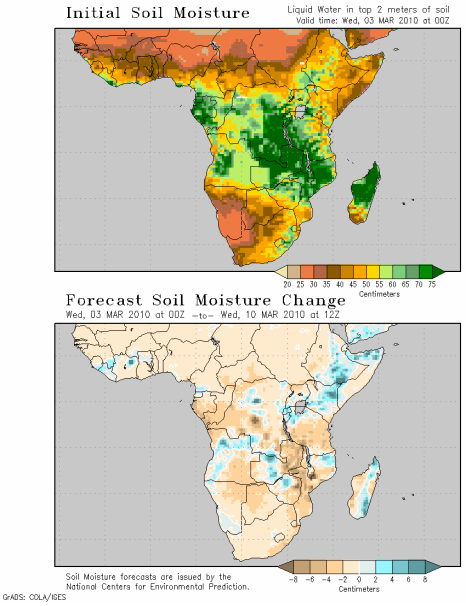

Figure 8 : Soil moisture forecast, Source: COLA

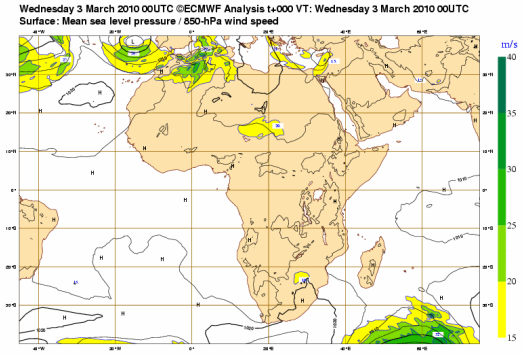

Figure 9 : Mean Sea Level pressure forecast
Source: ECMWF