Ten Day Climate Bulletin
N° 04
Dekad 1st to 10th February, 2010

HIGHLIGHT: The highest cumulative rainfall amounts were recorded over southern parts of central Africa and northern parts of southern Africa countries. The highest mean maximum temperature was recorded at Ndele in Central Africa Republic while the lowest mean minimum temperature was recorded at Alger in Algeria.

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 1022hPa with a W-E axis weakened by 4hPa and shift southwest compared to the past dekad. Its centre was located at about 25°N/30°W extending a ridge over North Atlantic Ocean.
- **Libyan high pressure**: of about 1022hPa centred at about 25°N/22°E, extended a ridge over north Niger, Chad and Sudan.

- **Saharan Thermal Low:** Pressure at 1008 hPa centred at about 08°N/20°E, maintained its intensity and shifted eastwards compared to the past dekad. Its trough was extended over south Nigeria, north Cameroon and south Chad.

- **St. Helena high:** Pressure of 1022 hPa with a SW-NE axis weakened by 4 hPa and shifted northeast compared to the previous dekad. Its mean position was at 26°S/23°W, extending a ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1020 hPa with a W-E axis weakened significantly by 5hPa compared to the past dekad and shifted eastwards. Its mean position was located at 30°S/90°E with an extended ridge over Indian Ocean.

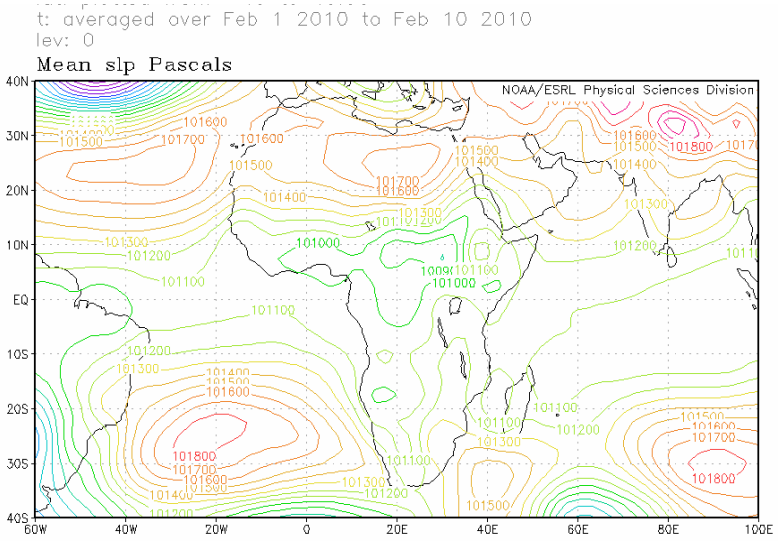

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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

Between the third dekad of January (blue line) and the first dekad (black) of February, 2010 in (Figure 2), the ITD moved southwards particularly over the eastern part of the Gulf of Guinea countries where the maximum displacement of about 100km was observed (Figure2)

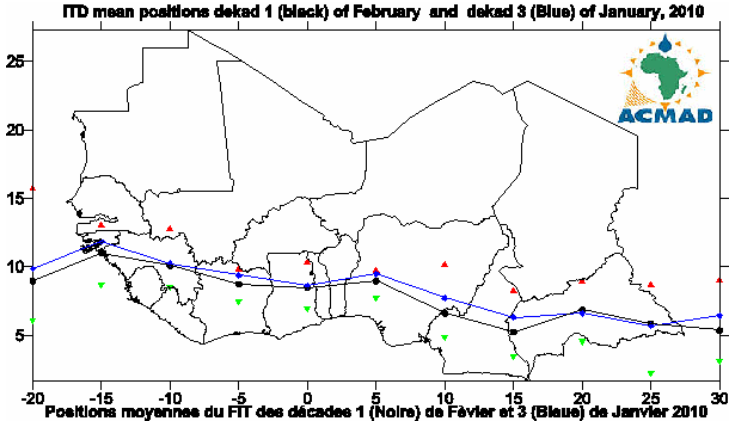

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was moderate over Liberia and south Côte d'Ivoire, Ghana, Togo and Nigeria during the dekad.

1.2.2 Thermal Index (TI)

In the first dekad of February, 2010, the thermal index (TI) regime at 300hPa in (figure 3), had the threshold value of 243°K associated with conditional instability that triggers heavy rains with floods in areas with high relative humidity covering extreme southeastern Sahel, extreme eastern Gulf of Guinea countries, central Africa, major part of GHA countries and northern part of southern Africa countries with highest TI value of 244°K over southern part of Central Africa and northern part of southern Africa countries that was associated with heavy rains and floods over the areas characterized by high relative humidity in Figure 4.

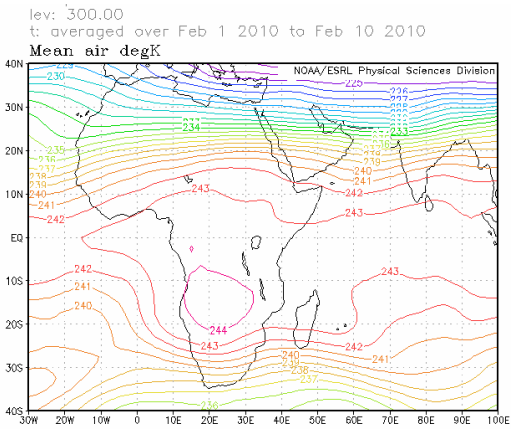

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

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

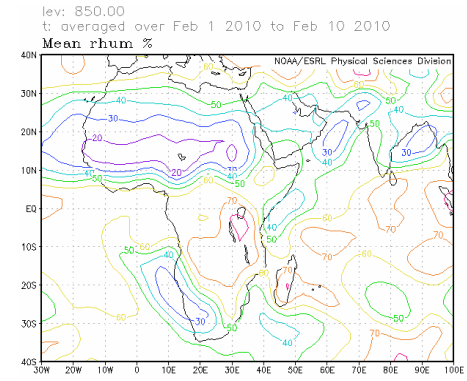

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 Northern Africa, Central Africa and GHA while over Southern Africa countries observed slight decreases in rainfall distribution. In detail:

- **North Africa countries:** had increase in rainfall distribution but decrease in amounts ranging between 10mm to 50mm over Morocco, Algeria and Tunisia with localized peaks of bout 75mm.
- **The Sahel:** continued to experience dry and dusty conditions under the influence of the Harmattan.
- **Gulf of Guinea countries:** experienced localized rainfall with amounts ranging from 10mm to 50mm over southern Cote d'Ivoire, Ghana, Nigeria and Cameroon.
- **Central Africa countries:** had rainfall distribution increase with amounts ranging between 10mm to 200mm intensifying to about 250mm over northeast Angola.
- **GHA countries:** experienced slight increase in rainfall distribution with amounts ranging from 10mm to 100mm intensifying with a localized peak of about 200mm over south Tanzania and central Ethiopia.
- **Southern Africa countries:** had significant rainfall decrease with amounts ranging from 10mm to 75mm with maximum ranging from 100mm to 200mm over the northern part intensifying to 250mm over Zambia, Malawi, Mozambique and Madagascar.

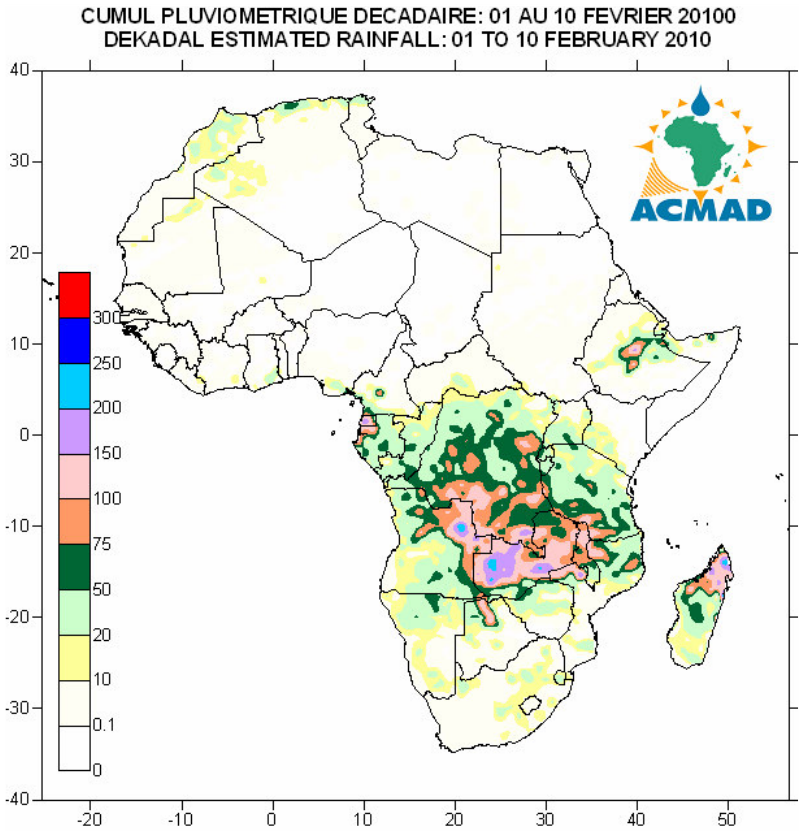

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows maximum cumulative rainfall recorded (above 100mm) over Southern and Central African countries. The highest mean maximum temperature of 37,4°C at Ndele in central Africa Republic while the lowest mean minimum temperature of 7.8°C was recorded at Alger in Algeria.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	6	2	33,9	27,4
2	Accra	11	1	33,7	26,6
3	Agadez	0	0	31,9	15,1
4	Alger (Dar El Beida)	22	4	17,8	7,8
5	Antananarivo	24	4	26,3	17,9
6	Antsiranana	10	3	32,0	23,7
7	Bamako-Senou	0	0	36,9	22,2
8	Bangui	0	0	35,0	23,1
9	Banjul	0	0	35,5	18,6
10	Beira	22	2	32,3	25,5
11	Bobo Dioulasso	0	0	36,4	22,8
12	Brazzaville	136	3	31,4	23,7
13	Bujumbura	0	0	31,3	21,9
14	Bulawayo	1	1	32,2	17,5
15	Casablanca	14	5	19,4	13,1
16	Cotonou	0	0	33,1	27,3
17	Dakar-Yoff	0	0	27,6	20,0
18	Dar-es-Salaam	17	3	33,3	25,3
19	Djibouti	15	1	-	-
20	Dodoma	3	1	30,3	19,2
21	Douala	33	3	32,8	25,2
22	Durban	13	3	29,5	22,2
23	Francistown	0	0	34,1	20,5
24	Ghanzi	1	1	33,4	19,9
25	Harare	1	1	26,4	17,3
26	Johannesbourg	48	5	26,6	15,3
27	Khartoum	0	0	30,4	17,7
28	Kigali	0	0	29,7	18,3
29	Kigoma	13	3	29,5	21,5
30	Kinshasa	0	0	32,2	21,8
31	Le Caire	0	0	20,2	11,1
32	Le Cap	1	1	24,7	16,9
33	Libreville	134	5	30,7	23,8
34	Lomé	0	0	35,3	26,6
35	Lusaka	78	3	26,1	19,6
36	Manzini	23	2	-	19,9
37	Maputo	21	3	32,1	22,6
38	Maseru	2	2	-	14,5
39	Maun	81	2	33,6	20,7
40	Mbeya	179	5	24,2	15,1
41	Moroni	0	0	32,1	25,4
42	Nairobi	0	0	27,5	14,5
43	Nampula	117	3	31,2	22,3
44	Ndele (RCA)	0	0	37,4	21,5
45	N'Djamena	0	0	34,9	17,6
46	Niamey-Aéroport	0	0	35,8	18,5
47	Nouakchott	0	0	34,6	20,3
48	Ouagadougou	0	0	36,1	19,2
49	Plaisance	193	9	30,8	24,3
50	Port Elisabeth	0	0	27,7	19,3
51	Pretoria	20	2	29,3	18,1
52	Sal	0	0	29,6	-
53	Seretse Khama- Aéro	0	0	32,4	-
54	Seychelles	149	10	30,3	25,2
55	Tamanrasset	0	0	24,1	8,1
56	Toalagnaro	30	8	27,9	23,0
57	Tombouctou	0	0	35,0	17,1
58	Tripoli	0	0	20,0	8,7
59	Tunis	41	6	16,1	8,7
60	Windhoek	2	1	31,4	15,8
61	Zinder	0	0	32,2	16,6

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

Data Source: ACMAD / GTS

3. OUTLOOK FOR DEKAD (21st – 28th FEBRUARY, 2010)

3.1 RAINFALL

The ITD will be expected to move slightly southward while the dry and dusty conditions will continue with intensified Harmattan over the Sahel and northern sector of the Gulf of Guinea countries with rainfall intensification over central Africa, southern parts of GHA and southern Africa countries. In detail**:**

- **North Africa countries:** will experience some decrease in rainfall amounts ranging from 10mm to 50mm with isolated peaks of about 75mm.

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

- **Gulf of Guinea countries:** will experience slight rainfall increase observing amounts ranging from 10mm to 75mm with localized peaks of about 100mm over the coastal zone.

- **Central Africa countries:** will experience rainfall increase with amounts ranging from 10mm to 100mm intensifying over southern parts observing amounts ranging from about 150mm to 250mm.

- **GHA countries:** will have rainfall increase over parts characterized by high relative humidity (>70%) intensifying over southern parts observing amounts ranging from 10mm to 100mm with isolated peaks of 150 and above.

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

3.2 TEMPERATURE

The forecast in Figure 7, shows high temperature in the Gulf of Guinea, northern central Africa, northern 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 eastern central Africa, southwest parts of GHA and northeastern part of southern Africa countries while significant soil moisture change deficits will dominate western part of central Africa countries and Madagascar.

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 prevailing Harmattan dust will result in increased cases of meningitis and other ailments over the Sahel and parts of the Gulf of Guinea countries and limited 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.

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**.**

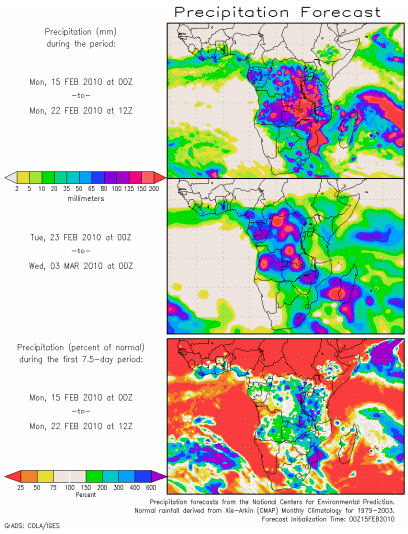

Figure 6 : Precipitation forecast, Source : COLA

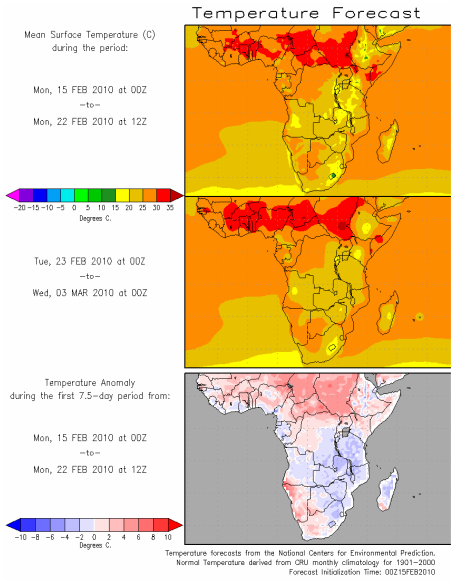

Figure 7 : Temperature forecast Source : COLA

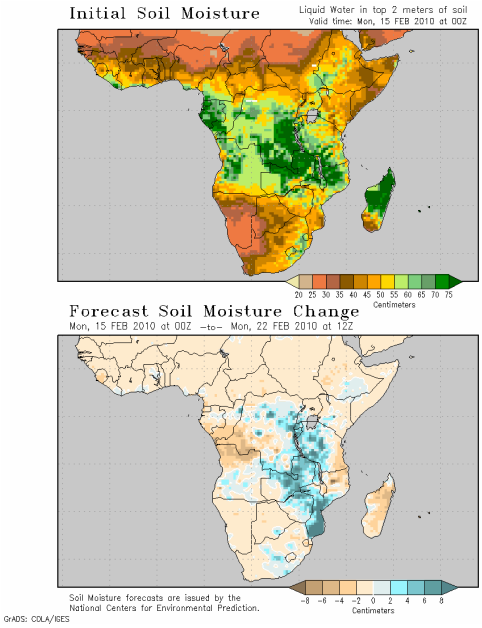

Figure 8 : Soil moisture forecast, Source: COLA

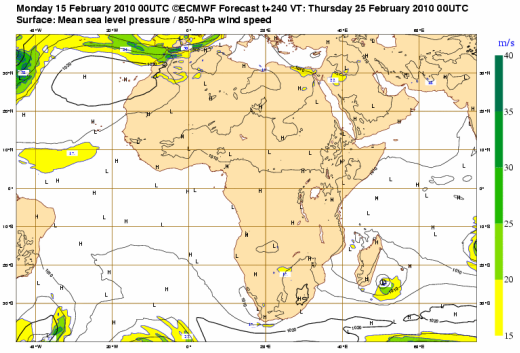

Figure 9 : Mean Sea Level pressure forecast Source: ECMWF