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

Ten Day Climate Bulletin
N° 02
Dekad 11th to 20th January, 2010

HIGHLIGHT: The highest cumulative rainfall amounts were recorded over central and southern Africa countries. The highest mean maximum temperature was recorded at Ndelé in Central African Republic while the lowest mean minimum temperature was recorded at Tamanrasset in Algeria.

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 1024hPa with a W-E axis strengthened by 2hPa and shift northeast compared to the past dekad. Its centre was located at about 30°N/15°W extending a ridge over North Atlantic Ocean.

- **Saharan Thermal Low:** Pressure at 1011 hPa centred at about 09°N/09°E, extended trough over north Benin and south Nigeria.

- **St. Helena high:** Pressure of 1025 hPa with an NW-SE axis strengthened significantly by 5 hPa and shifted southwest compared to the past dekad. Its mean position was at 33°S/07°W, extending a ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1024 hPa with a W-E axis strengthened by 4hPa compared to the previous dekad and shifted southwest. Its mean position was located at 35°S/90°E with an extended ridge over Indian Ocean.

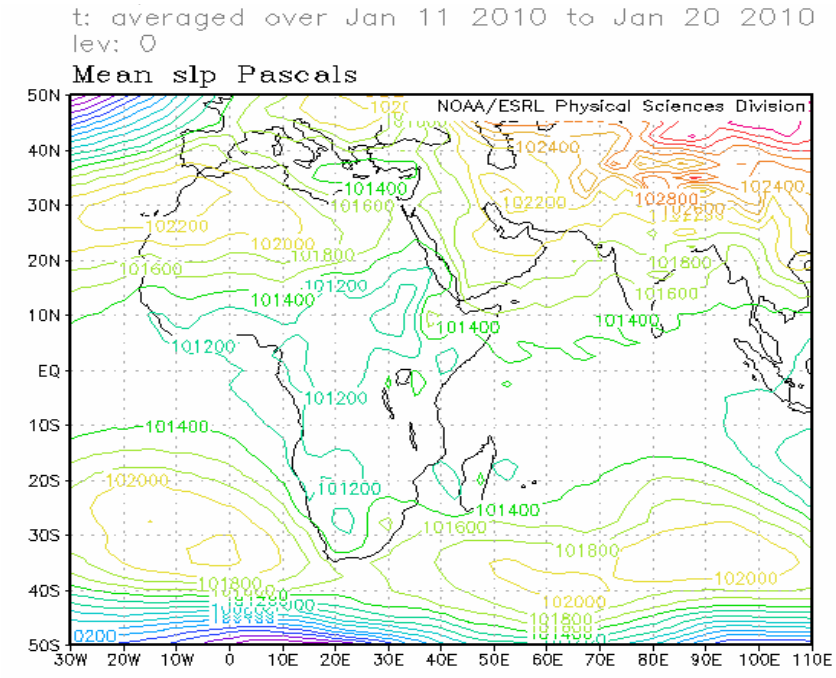

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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- **Inter-Tropical Discontinuity (ITD):** Between the first dekad (blue line) and the second dekad (black) of January, 2010 in (Figure 2), the ITD had a slight fluctuations over the western and central part of Gulf of Guinea countries but moved northwards over its eastern part (Figure2).

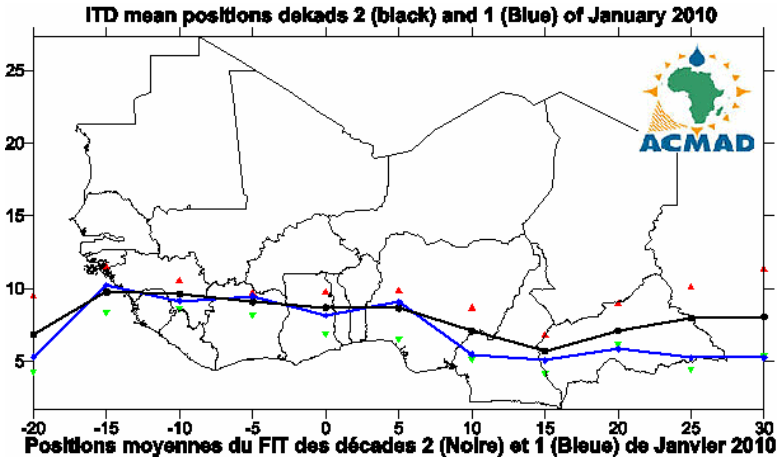

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was weak over Liberia and southwest Cameroon during the dekad.

1.2.2 Thermal Index (TI)

In the second dekad of January, 2010, the thermal index (TI) regime at 300hPa in (figure 3), had isotherm value of 242°K covering extreme southeastern Sahel, southern part of Gulf of Guinea countries; Central Africa, GHA countries and parts of Southern Africa countries. The maximum threshold value of 243°K covered extreme southern part of central Africa/northern part of southern Africa countries and was associated with heavy rains and floods over the areas characterized by high relative humidity in Figure 4.

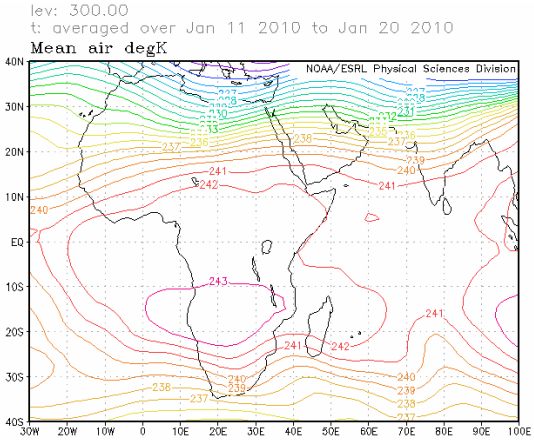

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the second dekad of January, 2010 over western, extreme 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%).

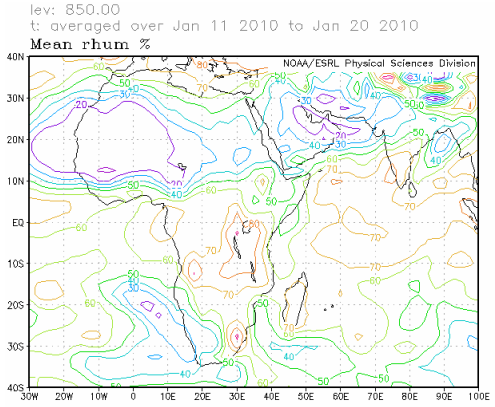

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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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 while the rest of the continent observed insignificant decreases in rainfall pattern. In detail:

- **North Africa countries:** had increase in rainfall distribution amounts ranging between 10mm to 100mm were northern Morocco and Tunisia with localized peaks ranging from about 200mm.
- **The Sahel:** continued to experience dry and dusty conditions under the influence of the Harmattan.
- **Gulf of Guinea countries:** There was insignificant change in rainfall distribution and amounts except over south-eastern Nigeria/Cameroon where observed amounts ranged from 10mm to 50mm.
- **Central Africa countries:** observed decrease in rainfall distribution and amounts ranging between 10mm to 75mm intensifying to about 100mm and above with heaviest rainfall amounts above 200mm over South Democratic Republic of Congo and eastern Angola.
- **GHA countries:** experienced significant decrease in rainfall distribution and amounts ranging from 10mm to 75mm with a localized peak of about 200mm over southern Somalia/Ethiopia.
- **Southern Africa countries:** had rainfall distribution decrease with amounts ranging from 10mm to 100mm and peaks ranging between 100mm to 250mm over northern part of southern Africa countries and Madagascar.

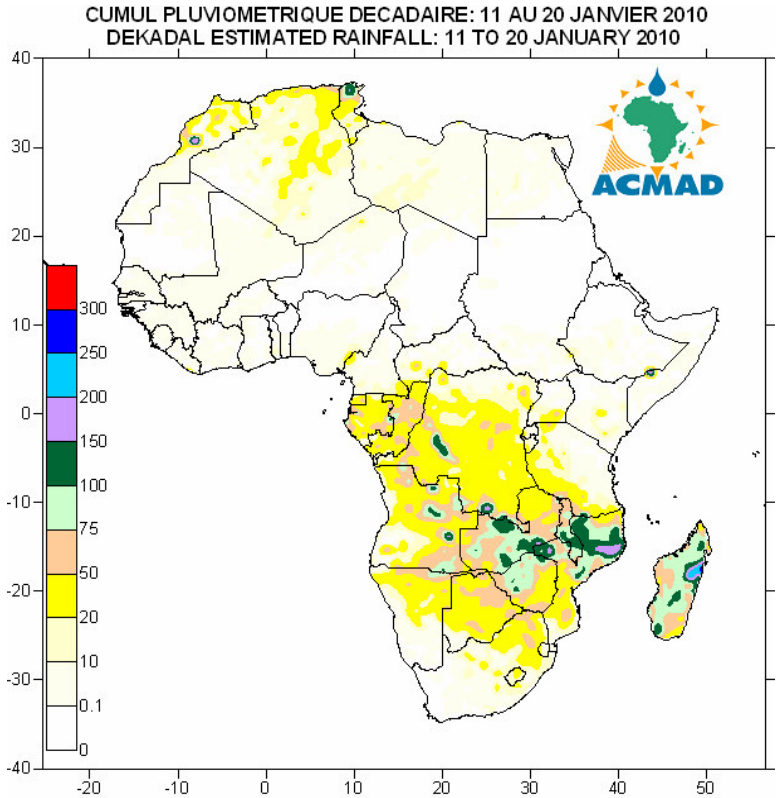

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

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2.2 OBSERVED DATA

The Table below shows maximum cumulative rainfall recorded (above 100mm) over Central and Southern Africa countries. The highest mean maximum temperature of 35,6°C in Ndelé en Central African Republic while the lowest mean minimum temperature of 6.0°C was recorded at Tamanrasset in Algeria.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	1	1	32,3	25,9
2	Abuja	0	0	34,5	20,0
3	Accra	22	1	32,4	25,1
4	Agadez	0	0	31,5	13,8
5	Alger (Dar El Beida)	29	5	17,4	7,7
6	Antananarivo	123	7	25,1	17,6
7	Antsiranana	104	4	31,0	23,1
8	Bamako-Senou	0	0	34,5	17,7
9	Bangui	11	1	32,9	22,1
10	Banjul	0	0	35,0	16,5
11	Beira	0	0	32,4	25,1
12	Bilma	0	0	28,6	-
13	Bobo Dioulasso	0	0	35,0	20,3
14	Brazzaville	4	2	31,4	23,2
15	Bulawayo	35	2	33,1	17,4
16	Casablanca	7	4	20,5	13,2
17	Cotonou	0	0	32,3	25,7
18	Dakar-Yoff	0	0	30,0	18,8
19	Dar-es-Salaam	4	1	32,3	25,5
20	Dodoma	1	2	29,4	19,0
21	Douala	17	1	32,8	24,7
22	Durban	13	4	27,7	21,5
23	Francistown	12	2	33,4	20,1
24	Ghanzi	137	6	31,6	19,7
25	Harare	1	1	29,6	17,1
26	Johannesbourg	80	9	24,9	15,5
27	Khartoum	0	0	33,5	-
28	Kigali	0	0	27,1	16,2
29	Kinshasa	0	0	31,4	22,5
30	Kigoma	34	1	28,2	20,6
31	Le Caire	2	1	21,4	13,2
32	Le Cap	0	0	22,4	16,2
33	Libreville	149	5	29,6	23,9
34	Lomé	0	0	34,0	25,6
35	Lusaka	154	3	30,0	17,9
36	Manzini	9	3	-	19,4
37	Maputo	17	3	31,5	23,3
38	Maseru	52	6	-	14,8
39	Maun	22	4	32,2	21,1
40	Mbeya	26	2	25,3	15,3
41	Nairobi	0	0	24,7	13,9
42	Nampula	153	8	31,8	22,7
43	Ndele (RCA)	0	0	35,6	16,0
44	N'Djamena	0	0	33,8	15,8
45	Niamey-Aéroport	0	0	34,6	16,9
46	Nouakchott	0	0	33,5	18,5
47	Ouagadougou	0	0	35,4	16,8
48	Plaisance	35	7	30,2	23,9
49	Port Elisabeth	10	2	25,6	16,8
50	Pretoria	9	2	28,7	18,8
51	Sal	0	0	27,0	-
52	Seretse Khama- Aéro	10	1	30,8	-
53	Seychelles	98	6	30,4	25,4
54	Tamanrasset	0	0	24,4	6,0
55	Toalagnaro	9	4	28,8	23,2
56	Tombouctou	0	0	32,3	14,9
57	Tripoli	35	4	18,0	8,8
58	Tunis	26	8	15,7	9,6
59	Windhoek	69	9	28,1	17,1
60	Zinder	0	0	0,9	15,2

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

Data Source: ACMAD / GTS

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

3.1 RAINFALL

The ITD will be expected to be quasi-stationary after the maximum southward displacement and intensified harmattan. Dry and dusty conditions will persist over the Sahel, Gulf of Guinea and northern central Africa countries with rainfall intensification over southern parts of central Africa, extreme southern parts of GHA, northern and eastern parts of southern Africa countries. In detail**:**

- **North Africa countries:** will experience some increase in rainfall amounts ranging from 10mm to 150mm with maxima peaks of 200mm and above.

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

- **Gulf of Guinea countries:** will continue to experience rainfall deficits recording amounts ranging from 10mm to 50mm with localized peaks of about 75 mm over the coastal zone.

- **Central Africa countries:** will experience significant rainfall decrease over northern parts with amounts ranging from 10mm to 75mm intensifying over southern parts with amounts ranging from about 100mm to 200mm.

- **GHA countries:** will have rainfall decrease over northern sector intensifying over extreme southern parts amounts ranging from 10mm to 100mm.

- **Southern Africa countries:** will get rainfall increase over northern and eastern parts recording amounts ranging from 10mm to 150mm with peaks of about 200mm 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 70% 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 southern Africa countries while central Africa and southern parts of GHA countries will experience soil moisture change decrease.

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. The parts of 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 over the Sahel and Gulf of Guinea countries and 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 seasonal rainfall onset, performance and duration including suitable planting dates and 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

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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), 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 drying wetlands. We have to rehabilitate our presently degraded rainfall catchment areas and forests 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 to sustainable development and the achievement of the United Nations millennium development goals (MDGs). The countries have to invest in environmental conservation now for better tomorrow**.**

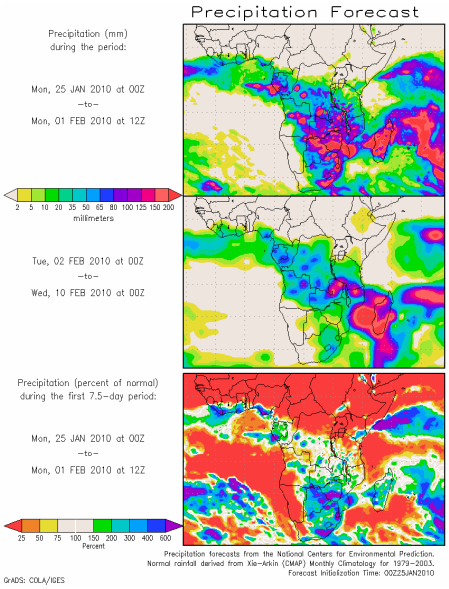

Figure 6 : Precipitation forecast, Source : COLA

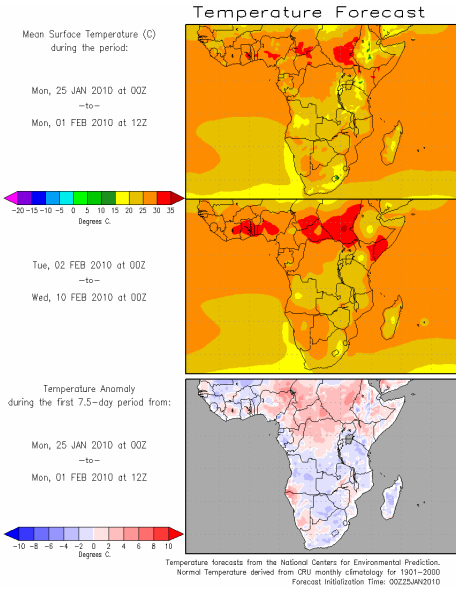

Figure 7 : Temperature forecast Source : COLA

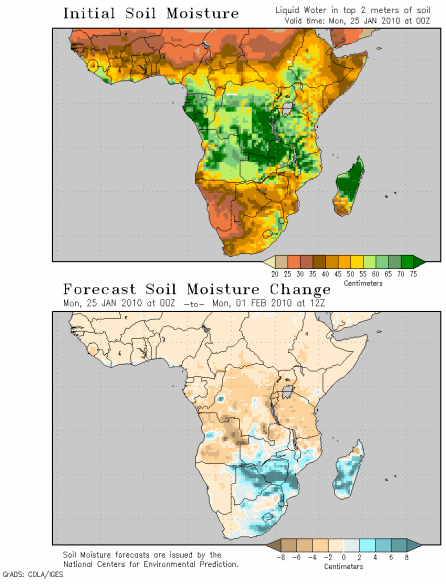

Figure 8 : Soil moisture forecast, Source: COLA

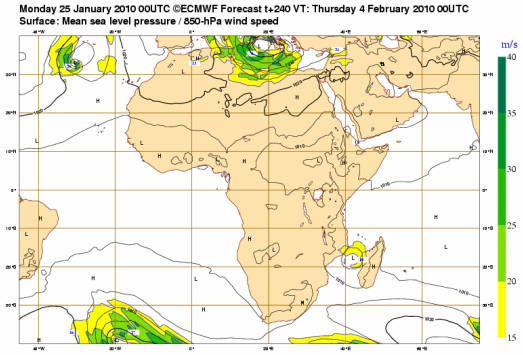

Figure 9 : Mean Sea Level pressure forecast Source : ECMWF

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