Ten Day Climate Watch Bulletin
N° 34
Dekad 01 to 10 of December, 2009

HIGHLIGHT : The estimated rainfall maxima appeared over Gabon with the heaviest cumulative rainfall recorded over Antananarivo and Toalagnaro in Madagascar, Johannesburg in South Africa and Beira in Mozambique.

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 1027hPa with an SW-NE axis strengthened slightly by 1 hPa and shifted east compared to the previous dekad. Its mean position was located at about 37°/10°W extending a ridge over North Atlantic Ocean.

- **St. Helena high:** Pressure of 1026 hPa with an NW-SE axis maintained its intensity and shift southeast compared to the past dekad. Its mean position was at 45°S/10°E with an extended ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1025 hPa with a NW-SE axis weakened by 3hPa compared to the previous dekad and shifted southeast. Its mean position was located at 33°S/96°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1009 hPa axis deepened slightly by 1hPa and shifted southwest compared to the previous dekad. Its mean position was located at 08°N/20°E with an extended trough over southwest Chad and south Sudan.

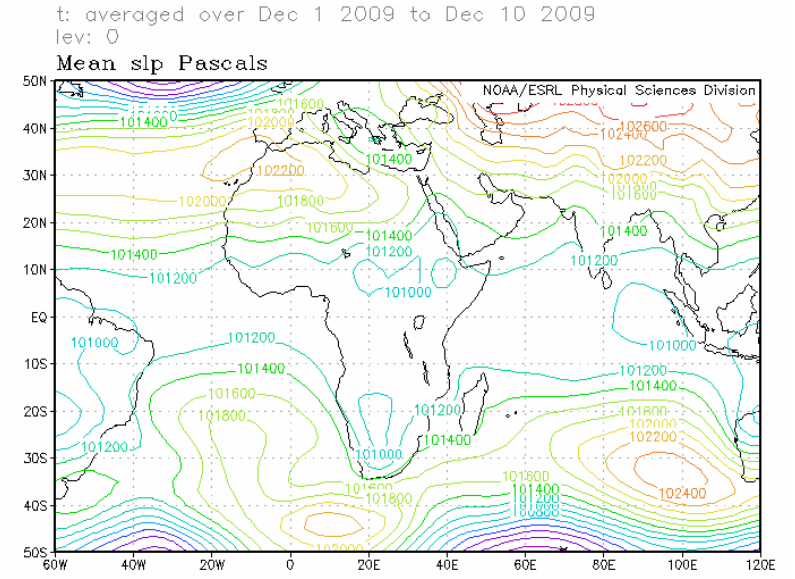

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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- **Inter-Tropical Discontinuity (ITD):** Between the third dekad (blue) of November and first dekad (black) of December, 2009 in (Figure 2), the ITD continued its southward migration over Gulf of Guinea countries. However, over the central part of Gulf of Guinea countries and northern part central Africa the ITD remained quasi-stationary (Figure2).

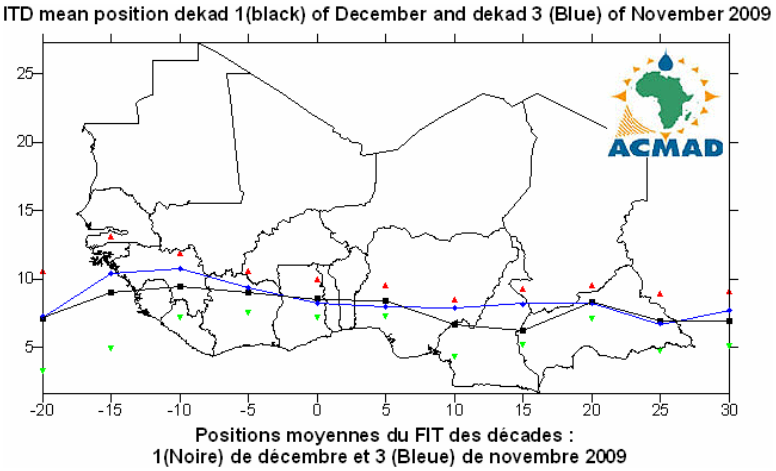

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was not significant during the past dekad.

1.2.2 Thermal Index (TI)

In first dekad of December, 2009, the thermal index (TI) regime at 300hPa in (figure 3), had isotherm value of 242°K covering Gulf of Guinea countries, Central Africa, most of GHA and extreme northern part of Southern Africa countries. The maximum threshold value of 243°K covered western part of central Africa countries and was associated with heavy rains and floods over the area characterized by high relative humidity in Figure 4.

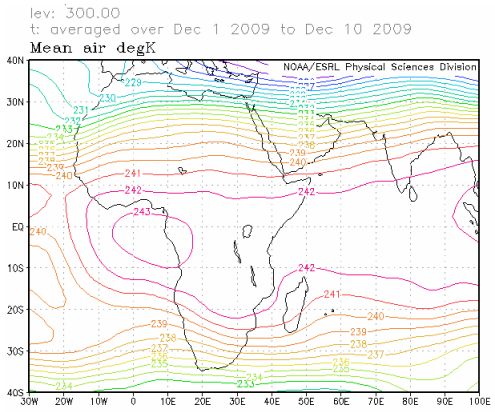

Figure 3: TI at 300hPa
(Source: NOAA/NCEP/ESRL: PSD)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the first dekad of December, 2009 over extreme southern part of Gulf of Guinea countries, extreme western and southern part of central Africa, parts of GHA countries and eastern part of Southern Africa. The Sahara, the Sahel and western part of southern Africa countries experienced dry conditions characterized by the lowest RH (40%).

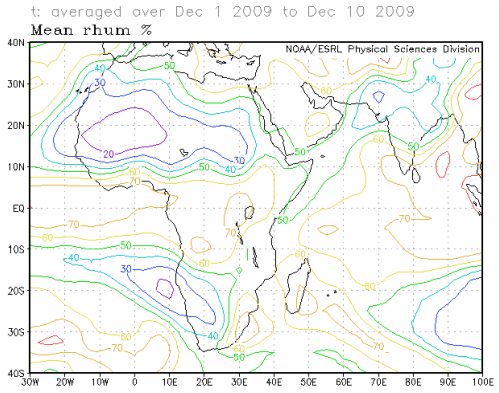

Figure 4 : RH at 850hPa
(Source: NOAA/NCEP/ESRL: PSD)

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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 shows slight rainfall distribution decrease over Central Africa, while rainfall distribution increased slightly over GHA and Southern Africa countries. Over Northern Africa, the Sahel and Gulf of Guinea countries there is no significant change in rainfall distribution and amount. In detail:

- **North Africa countries:** had non significant change in rainfall distribution and amounts observing localized rainfall ranging between 10mm and 50mm.
- **The Sahel:** continued to experience dry and dusty conditions under the influence of the Harmattan.
- **Gulf of Guinea countries:** experienced no significant change in rainfall distribution and amounts with localized amounts ranging from 10mm to 50mm over extreme southern Cote d'Ivoire and Liberia.
- **Central Africa countries:** observed slight rainfall distribution decrease with observing amounts between 10mm to 150mm with peaks ranging from 150mm to 200mm over Democratic Republic of Congo, Angola, but with intensification over Gabon observing amounts ranging from 200mm to 300mm and above.
- **GHA countries:** experienced slight increase in rainfall distribution and amounts observing amounts ranging from 10mm to 100mm with localized peak of about 200mm over southwest Ethiopia and southeast Kenya.
- **Southern Africa countries:** had spatial rainfall distribution increase with amounts ranging from 10mm to 150mm with highest amounts of 200mm over Madagascar and northeast South Africa.

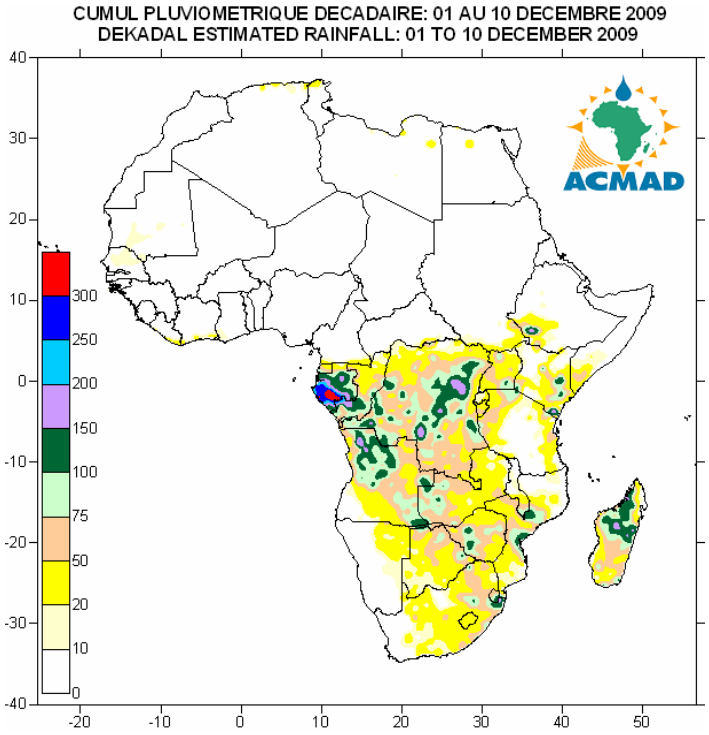

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

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2.2 OBSERVED DATA

The Table below shows heaviest cumulative rainfall recorded over Antananarivo and Toalagnaro in Madagascar, Johannesburg in South Africa and Beira in Mozambique. The highest temperature of 34.8°C was recorded at Abuja in Nigeria while the lowest temperature of 6.2°C was recorded at Alger (Dar El Beida) in Algeria.

N°	STATIONS	Precipitation in (mm)	Number of rainy days	Temperature Max mean (°C)	Temperature Min mean (°C)
1	Abidjan	1	1	32,7	26,0
2	Abuja	0	0	34,8	16,9
3	Addis Abéba	0	0	23,8	9,9
4	Agadez	0	0	29,8	14,3
5	Alger(Dar El Beida)	12	1	19,1	6,2
6	Antananarivo	171	9	27,9	17,6
7	Antsiranana	4	2	32,3	23,7
8	Bamako-Senou	0	0	31,5	16,8
9	Bangui	0	0	33,6	20,0
10	Banjul	0	0	31,5	18,8
11	Beira	138	3	30,5	24,2
12	Bilma	0	0	28,5	8,8
13	Bobo Dioulasso	0	0	34,1	19,1
14	Brazzaville	96	8	30,6	22,6
15	Casablanca	1	1	19,2	10,3
16	Cotonou	0	0	32,4	25,3
17	Dakar-Yoff	0	0	29,7	23,0
18	Dar-es-Salaam	47	4	33,3	24,5
19	Douala	4	3	33,2	24,1
20	Durban	80	9	25,0	19,8
21	Entebbe	0	0	24,9	18,6
22	Francistown	84	3	-	19,2
23	Harare	35	2	-	16,9
24	Johannesbourg	142	6	26,0	14,9
25	Khartoum	0	0	31,9	17,3
26	Kigali	0	0	26,7	16,1
27	Kigoma	38	5	27,3	20,4
28	Kinshasa	0	0	31,8	-
29	Le Caire	0	0	22,0	14,4
30	Le Cap	0	0	21,9	14,5
31	Libreville	70	2	29,4	23,4
32	Lilongwe	0	0	-	18,9
33	Lomé	0	0	34,3	25,3
34	Lusaka	0	0	29,6	18,1
35	Manzini	93	5	-	19,4
36	Maputo	17	4	30,3	23,1
37	Maseru	0	0	-	13,7
38	Maun	39	3	33,8	21,3
39	Mbeya	25	4	26,7	14,3
40	Nairobi	20	5	27,2	15,1
41	Nampula	26	2	36,0	22,7
42	N'Djamena	0	0	34,6	15,7
43	Niamey-Aéroport	0	0	34,2	17,1
44	Nouakchott	0	0	32,0	22,9
45	Ouagadougou	0	0	34,6	17,3
46	Plaisance	7	5	29,4	22,6
47	Sal	0	0	27,3	22,6
48	Seretse Khama- Aéro	30	4	31,5	18,8
49	Seychelles	31	8	31,0	25,2
50	Tamanrasset	0	0	22,4	7,3
51	Toalagnaro	109	7	28,8	22,6
52	Tripoli	1	1	19,3	8,4
53	Tunis	13	4	18,6	10,6
54	Windhoek	0	0	33,0	16,3
55	Zinder	0	0	30,5	15,6

Data source: ACMAD/GTS **NOTE : 0** signifiy : no precipitations and - signifiy : not available or not complete to compute the mean.

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3. OUTLOOK FOR DEKAD (21st – 31st DECEMBER, 2009)

3.1 RAINFALL

The ITD will be expected to have slight southward displacement with slight increase in harmattan intensity. Dry and dusty conditions will persist over the Sahel and parts of the Gulf of Guinea countries, while rainfall will intensify over northwest Africa, southern parts of central Africa and southern parts of GHA, northern and eastern parts of southern Africa countries. In detail**:**

- **North Africa countries:** will experience significant increase in rainfall amounts ranging from 10mm to 100mm with maxima peaks of 150mm and above.
- **The Sahel:** will continue to experience dry and dusty conditions with harmattan.
- **Gulf of Guinea countries:** will continue to experience rainfall deficits recording amounts ranging from 10mm to 50mm.
- **Central Africa countries:** will have rainfall slight increase recording amounts ranging from 10mm to 150mm intensifying over southern parts with peaks ranging from about 200mm and above.
- **GHA countries:** will have rainfall decrease over most parts observing amounts ranging from 10mm to 100mm with maxima peaks of 150mm to 200mm.
- **Southern Africa countries:** will get rainfall amounts increase over northern eastern parts ranging from 10mm to 100mm with peaks of about 150mm to 250mm.

3.2 TEMPERATURE

The forecast in Figure 7, shows high temperature in the Sahel, GHA and 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 include southeastern parts of central Africa countries, extreme southern sector of GHA and northern parts southern Africa countries including northern 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. The parts of central Africa, parts of GHA including 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 resulting in increased cases of meningitis over the Sahel countries and Gulf of Guinea 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 have emphasized on the importance of skilful prediction of seasonal rainfall onset dates and suitable planting dates as well as 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

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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/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 and rivers. 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.

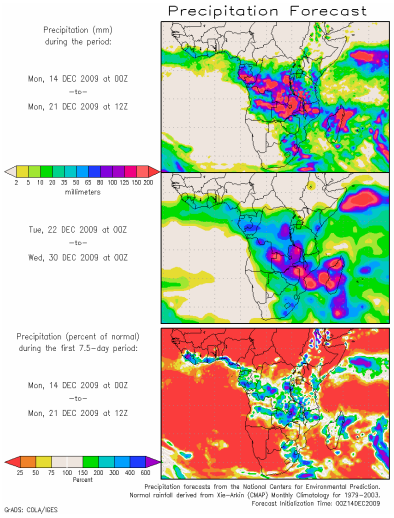

Figure 6 : Precipitation forecast, Source : COLA

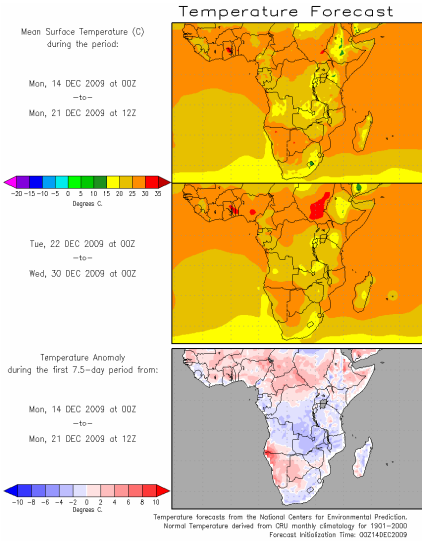

Figure 7 : Temperature forecast Source : COLA

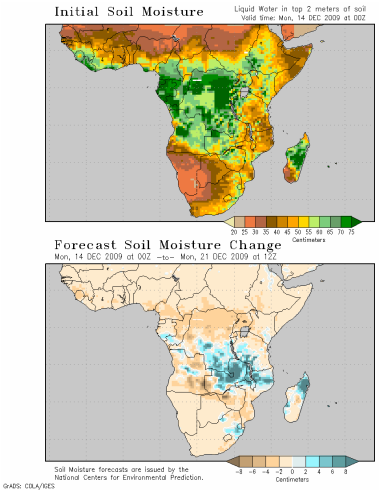

Figure 8 : Soil moisture forecast, Source: COLA

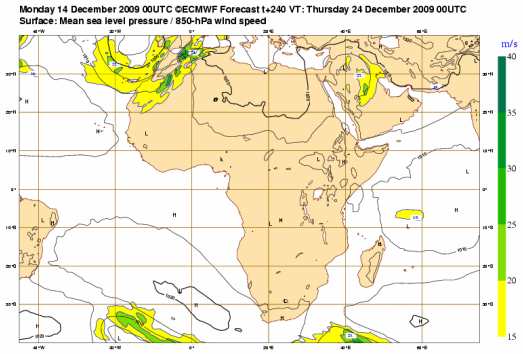

Figure 9 : Mean Sea Level pressure forecast
Source : ECMWF

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