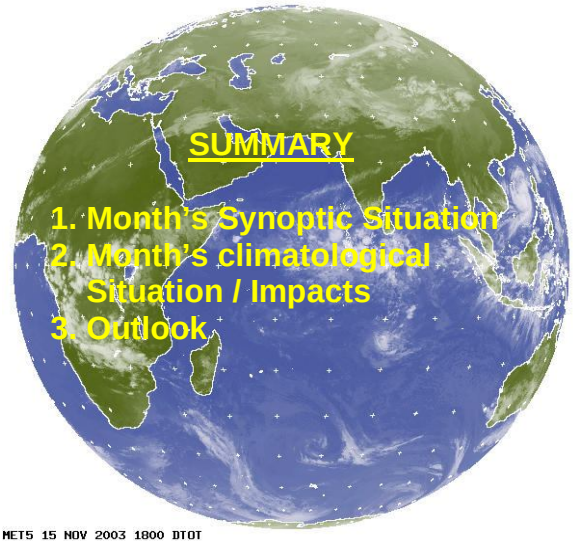
AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT
CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

CLIMATE WATCH AFRICA BULLETIN

N° 10
OCTOBER 2010



SUMMARY

5, Avenue des Ministères BP : 13184 Niamey- Niger
Tel: (227) 20 73 49 92 -- Fax: (227) 20 72 36 27 -- email: dgacmad@acmad.ne -- Web: http//www.acmad.org

HIGHLIGHTS: Excessive rainfall was observed over extreme western part of the Sahel, part of GHA and extreme western part of central Africa countries while deficits of rainfall prevailed over most of central African, GHA and southern Africa countries. High temperatures anomalies were observed over northeastern and southern parts of Africa.

1. SYNOPTIC SITUATION DURING THE MONTH OF OCTOBER 2010

This section provides the strengths of the surface pressure systems; the 850hPa general circulation anomalies; upper troposphere thermal regimes; relative humidity; sea surface temperature (SST) and El Nino/Southern Oscillation (ENSO).

1.1 Centres of Surface Pressure Systems

The Figure 1 shows surface pressure systems as described below:

The Azores high: A high pressure of 1018hPa weakened slightly by 2hPa and shifted southwest. Its centre was located at about 34°N/37°W, extending a ridge over north Atlantic ocean.

The St Helena high pressure at 1020hPa weakened significantly by 6hPa and shifted southeast compared to the past month. Its center was located at about 32°S/05°E over south Atlantic Ocean.

The Saharan thermal low at 1008hPa maintained its intensity as compared to the previous month. It had two cells centred at about 18°N/32°E over central Sudan and 15°N/12°E over western Chad.

The Mascarene high pressure of 1024hPa strengthened significantly by 4hPa and shifted southeast compared to the past month. Its mean position was located at about 32°S/85°E with an extended ridge over Madagascar and southern part of GHA countries.

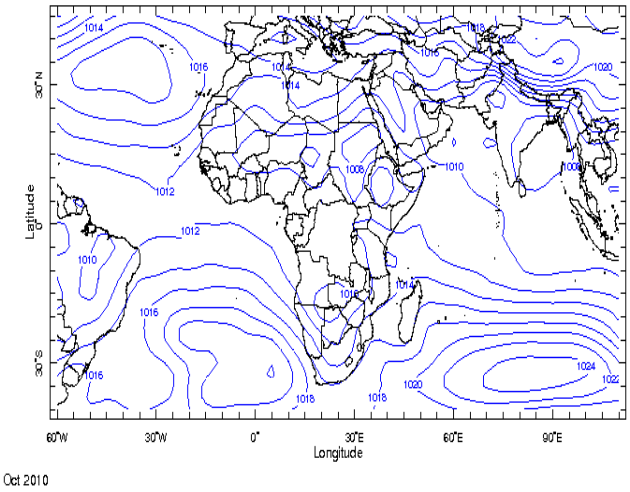


Figure 1 : Mean Surface Pressure during October, 2010

(Source: IRI/NOAA/NCEP)

1.2 The 850hPa wind anomaly

The Figure 2 shows wind anomalies at 850hPa derived from reference period 1971-2000.

Strong westerly wind anomalies from equatorial Atlantic ocean were observed over south-western part of the Gulf of Guinea countries continuing into south-westerly anomalies over north Nigeria, south Niger, central Chad and western Sudan.

Continental westerlies and south-westerlies anomalies were observed over southwest Algeria, north Namibia and south Angola.

Over off coast of Somalia and extreme northeast Libya, southern/south-westrelies wind anomalies prevailed.

The average wind anomaly speed (shaded) was observed at about 08 m/s and above.

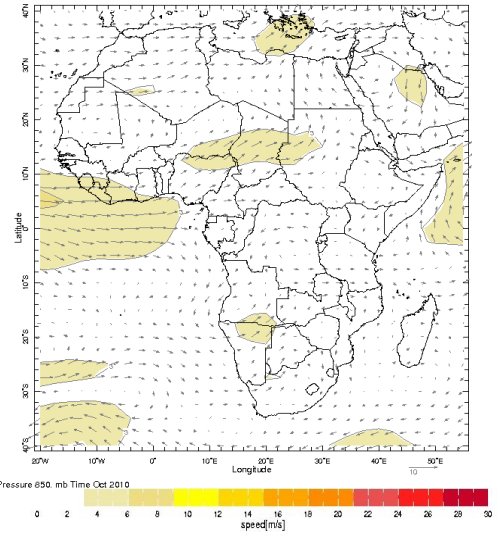


Figure 2 : October 2010, Wind Anomalies at 850hPa
(Source : IRI/NOAA/NCEP)

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1.3 Thermal index

In the month of October, 2010, the Thermal Index (TI) regime at 300hPa, Figure 3, had an isotherm value close to 242°K forming a belt between 12°N and 12°S over southern Sahel, the Gulf of Guinea countries, northern part of Central Africa and GHA countries. The highest TI value of 244°K was located over Asia. These indices were linked to some heavy rainfall with floods over the areas characterized by high relative humidity as shown in Figure 6. The low TI regime values less or equal to 241°K were associated with suppressed convection over the rest of Africa.

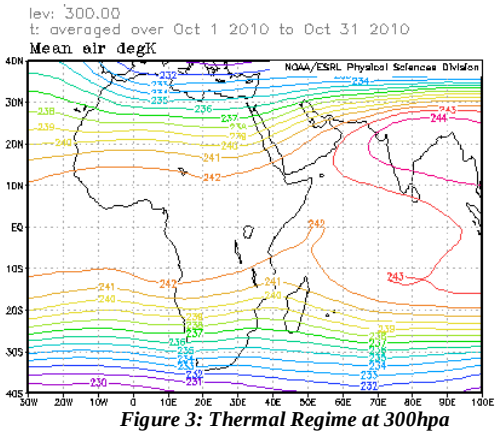

Figure 3: Thermal Regime at 300hpa (Source: NOAA/NCEP)

1.4 Relative Humidity at 850hPa

The 850hPa (Figure 4) shows high RH (>60%) in September 2010, over most part of Gulf of Guinea countries, extreme southwestern part of the Sahel, northern part of Central Africa, western part of GHA countries and northern part Madagascar. The Sahara, northern Sahel and most part of Southern Africa countries experienced dry conditions characterized by the lowest RH (≤ 40%).

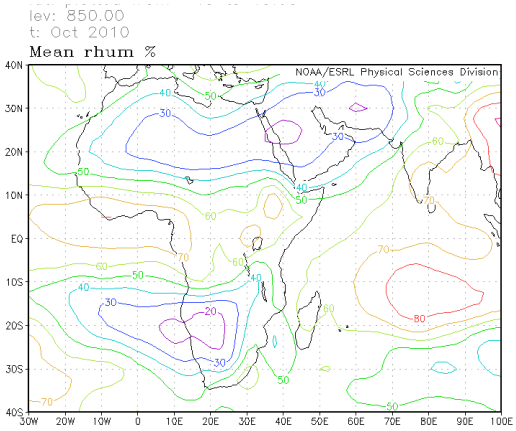

Figure 4:RH at 850 hPa (Source : NOAA/NCEP)

1.5 Sea Surface Temperature (SST) and El Nino/Southern Oscillation (ENSO)

Warming conditions persisted in western, northern and south-western Pacific Ocean while in most of the eastern and equatorial parts cooling conditions were continued. Warming conditions continued in most of the Atlantic Ocean except in south central and some central north parts where cooling conditions prevailed. Neutral to warming conditions persisted in most of the Indian Ocean except over the southern and extreme north-western parts where some cooling conditions were observed.

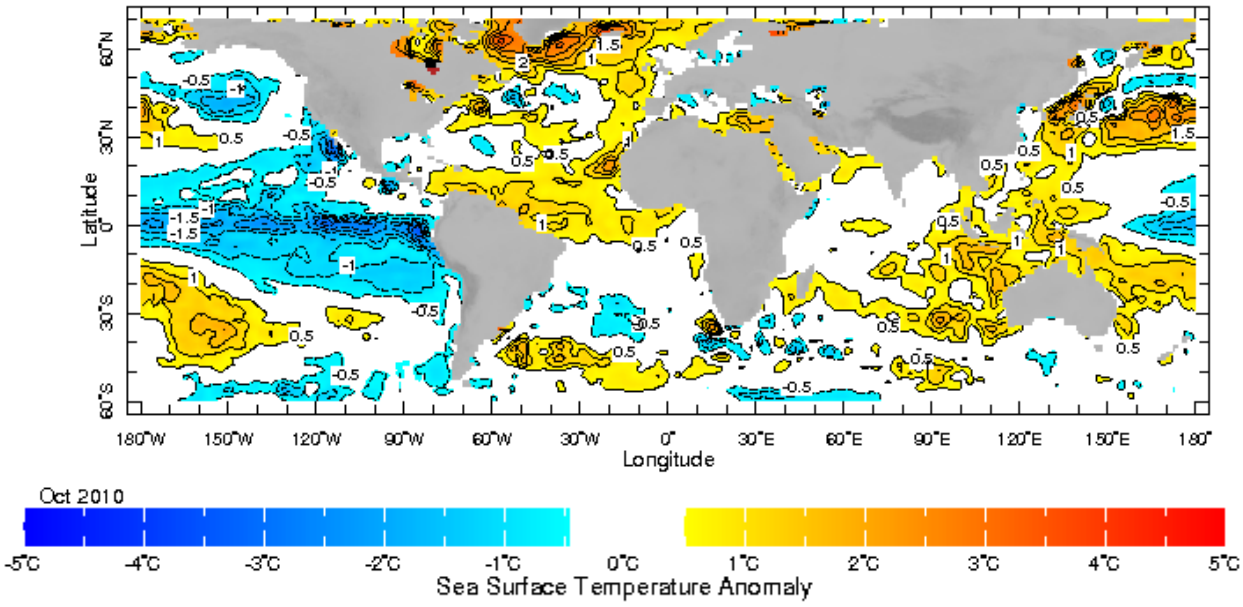

Figure 5: Sea Surface Temperature (Source IRI).

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2. CLIMATOLOGICAL SITUATION AND IMPACTS DURING THE MONTH OF OCTOBER

The section provides the general climatological situation covering two major parameters that are rainfall and temperature.

2.1 Rainfall

The estimated rainfall for October, 2010 in Figure 6, shows continued decrease in rainfall distribution and amounts over the Sahel, Gulf of Guinea countries and GHA countries, while central Africa and Southern Africa had increase in rainfall distribution. In detail**:**

- **North Africa:** had no significant change in rainfall distribution and amount, observing localized amounts ranging of about 20mm to 80mm.
- **The Sahel**: continued to have decrease in rainfall distribution and amount; observing amounts ranging between 20mm to 150mm intensifying to about 200mm over extreme southern part with maximum of about 250mm over western Mauritania.
- **Gulf of Guinea countries:** had decrease in rainfall amount ranging from 20mm to 250mm with maximum ranging from 250mm to 400mm over eastern Nigeria and Cameroon.
- **Central Africa**: had slight spatial rainfall distribution increase as well as the amounts, observing amounts ranging from 20mm to 300mm intensifying to about 400mm over northern Democratic Republic of Congo, Central African Republic and Equatorial Guinea with the highest amounts of about 500mm over Gabon.
- **GHA**: countries had slight rainfall distribution and amounts decrease, observing 20 to 150mm intensifying to about 250mm over Sudan and Ethiopia.
- **Southern Africa:** countries experienced increase in rainfall distribution, observing amounts ranging from 20mm to 150 mm over the region.

October, 2010 rainfall anomalies compared to the reference period 1971-2000, Figure 7 shows excessive rainfall over western Mauritania, eastern part of Gulf of Guinea countries, southwest Côte d'Ivoire, east Liberia, south Chad, north Cameroon, western Central Africa Republic and western Congo, while rainfall deficits was observed over extreme western part of Gulf of Guinea countries, most of Central Africa, GHA and southern Africa countries.

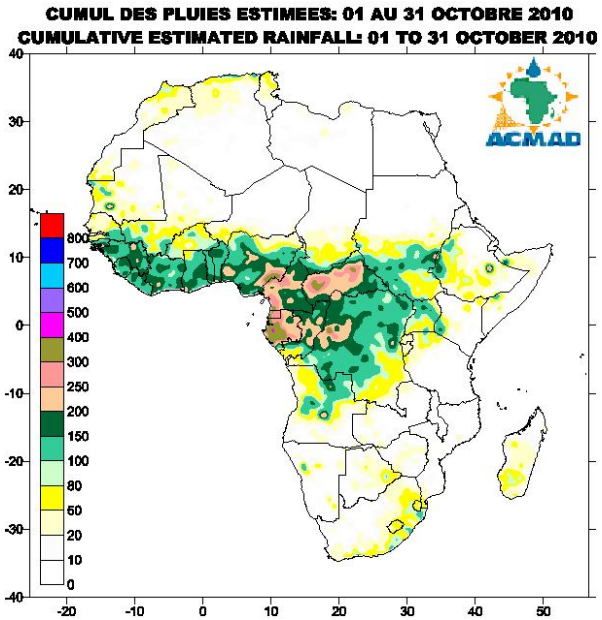

Figure 6: Monthly cumulative rainfall (Data Source: NOAA/NCEP)

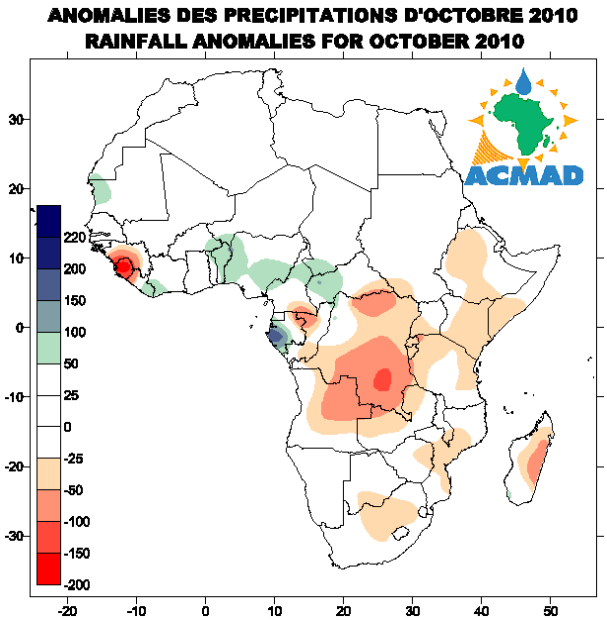

Figure 7: Monthly Precipitations Anomalies (Data Source: NOAA/NCEP)

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2.2 Surface Temperature Anomalies

In October, 2010, the temperature anomalies (Figure 8) compared to 1971-2000 base period, were generally hotter by more than 1.5°C over most of northeastern and southern African countries, with the highest anomalies epicenter (>2.5°C) located over east Niger, north Chad, south Libya, north Sudan, most of Egypt, Zambia, Botswana and north South Africa.

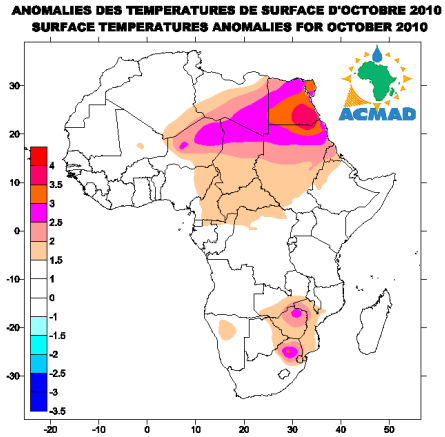

Figure 8 : Monthly Temperatures Anomalies (Data Source: NOAA/NCEP)

3. OUTLOOK

The subsections provide the expected SSTs and ENSO characteristics and evolution of events based on Figures 9 and 10 respectively and expected rainfall outlook.

3.1 Forecast Sea Surface Temperature (SST)

The figure 9 shows the forecast Sea Surface Temperature Anomalies from November for the period of November-December-January 2010.

- **Pacific Ocean:** warming conditions will persist over western and south central parts of the ocean while over most of equatorial and eastern parts cooling will continue to be observed.

- **Atlantic Ocean:** Neutral to warming condition will persist over most of the Ocean except over the south central part where cooling will be observed.

- **Indian Ocean:** Neutral to Warming conditions are expected to persist in most of the Ocean.

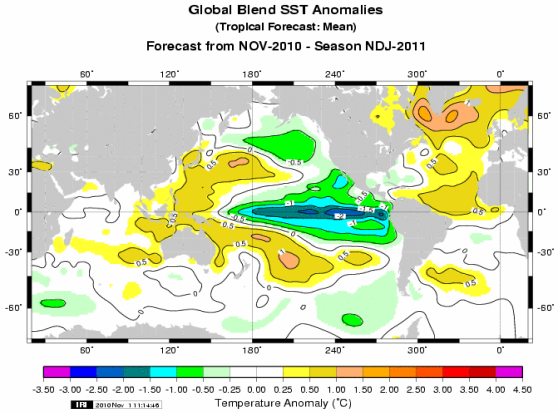

Figure 9 : Forecast Sea Surface Temperatures Anomalies (source IRI)

3.2 El Ni Niño/La Niña

The set of dynamical and statistical model forecasts of ENSO over Nino 3.4 domain (5°N – 5°S, 120°W – 170°W) are shown in Figure 10.

All the set of dynamical and statistical model predictions issued during late September and early October 2010 indicate La Nina conditions during the October-December 2010 season currently in progress. The SST observations in the NINO3.4 region indicate moderate (+) La Nina conditions, with an area-averaged weekly anomaly of -1.5°C, but -1.8°C during the two previous weeks. Current predictions and observations indicate a least 90% of chance for maintaining La Nina conditions from November up to March.

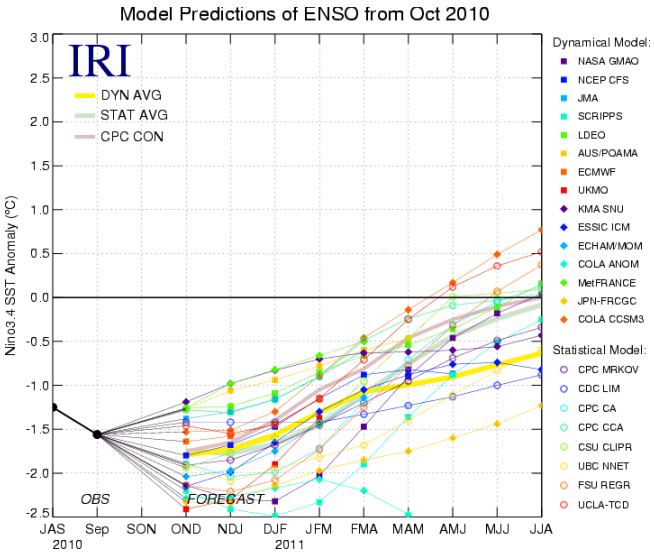

Figure 10 : Multi-model ENSO Forecast (source IRI)

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3.3 Rainfall

The prevailing high relative humidity coupled with high conditional instability manifested by TI regimes at 300hPa will maintain heavy rainfall with highest probability of flooding over southern part of Gulf of Guinea countries, central Africa countries and western part of GHA countries. Over the Sahel and northern part of Gulf of Guinea countries the Harmattan characterised by dry (low relative humidity) and dusty conditions with varying intensity will be observed. In detail:

North Africa countries: will have increase in rainfall activities over the northern part with amounts ranging from 10mm to 150mm.

The Sahel: will experience low to no rainfall due to the influence of Harmattan characterised by dry, low temperatures and dusty conditions. However, the extreme south-western and south-eastern parts could experience some low amounts of rainfall between 10 to 50mm.

Gulf of Guinea countries: will experience rainfall amounts ranging from 20 to 300 mm, while the coastal zone will record increased rainfall with peaks of about 500mm.

Central Africa countries: will continue to experience rainfall activities increase with amounts ranging from 10mm to 500mm intensifying to maxima of above 600mm.

GHA countries: will have slight rainfall increase with amounts ranging from 10mm to 200mm intensifying to amounts ranging between 200mm to 400mm over Great Lakes countries, while the eastern sector of the region will be mainly dry.

Southern Africa countries: will have rainfall activities with light to moderate amounts over the eastern coastal belt and will experience some rainfall amounts ranging from 10mm to 150mm, which may reach a peak of about 250mm.

3.4 IRI seasonal Rainfall outlook for Africa issued in October 2010 for NDJ

The IRI seasonal rainfall forecast issued in October for the period of November-December-January 2010 shows that:

- Above normal to Normal rainfall over extreme west Morocco, some Gulf of Guinea countries like Côte d'Ivoire, Liberia, eastern Guinea Conakry, south Cameroon and most of Southern Africa countries.

- Below normal to Normal rainfall is expected over most of GHA countries and extreme eastern part of central Africa.

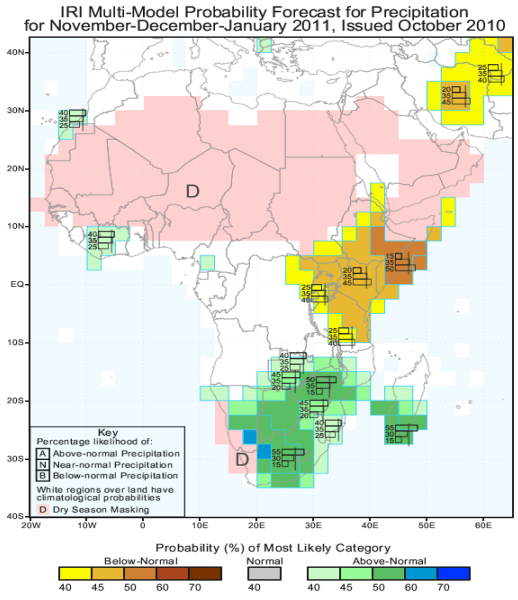

Figure 11: IRI forecast

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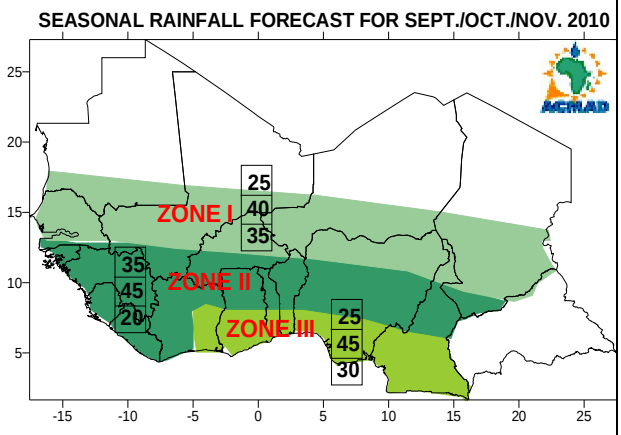
3.5 ACMAD Seasonal Rainfall outlook for west Africa, Chad and Cameroon issued in August 2010 for SON 2010

Zone I North Sahel (South Mauritania, Senegal, South Mali, South Niger, North Burkina Faso and Central Chad) with normal probability of (0.4) and below Normal rainfall probability of (0.35)

Zone II South Sahel and North Gulf of Guinea (Guinea Bissau, Guinea Conakry, South Burkina Faso, Extreme south of Mali, Sierra Leone, Liberia, Ivory Coast, north /Ghana/Togo/Benin, Central Nigeria, north Cameroon and south Chad) with normal rainfall probability of (0.45) and above normal probability of (0.35).

Zone III South of Gulf of Guinea (east Ivory Coast, south Ghana, Togo, Benin, Nigeria and Cameroon with normal rainfall probability of (0.45) and a below normal rainfall probability of (0.30).



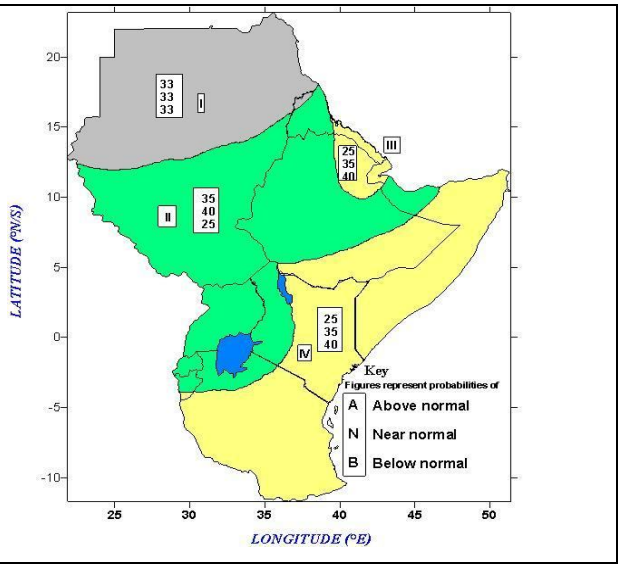
3.6 Greater Horn of Africa Consensus Climate Outlook for the September to December 2010

Zone I: This zone is generally dry during the season and covers northern parts of Sudan and northwestern Eritrea.

Zone II: Increased likelihood of near normal to above normal rainfall over central and southern Sudan, western, central and northern Ethiopia, much of Uganda, Rwanda, Burundi, western Kenya, and Lake Victoria basin of Tanzania.

Zone II: Increased likelihood of below to near normal rainfall over southern Eritrea, northeastern Ethiopia, and Djibouti.

Zone IV: Increased likelihood of below normal to near normal rainfall over much of Kenya, southern and southeastern Ethiopia, much of Somalia, Tanzania and southern Burundi.

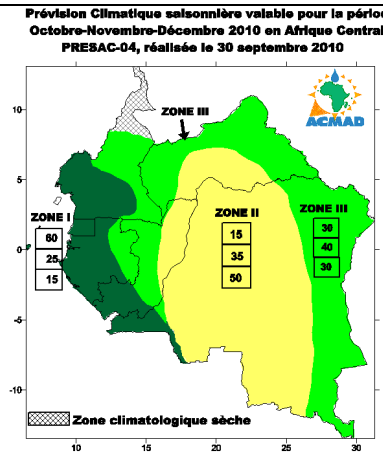


3.7 ACMAD Seasonal Rainfall outlook for central Africa issued in September 2010 for OND 2010

Zone I, covering Equatorial Guinea, Sao Tome et Principe, southern part of Cameroon, most of Gabon and coastal Gabon will experience above normal to normal rainfall.

Zone II, covering north of Congo, central CAR and DRC, will have below normal to normal rainfall.

Zone III, including extreme East of Cameroon, East of Gabon, central d Congo, extreme East, West and North CAR and East DRC will be characterized by normal rainfall.



ADVICE:

- ✓ **The high rainfall variability in the region may cause risks with adverse effects throughout the season, particularly on goods and persons (flooding) on plants (locust invasion) and Public Health (malaria epidemics and other waterborne diseases such as cholera).**

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