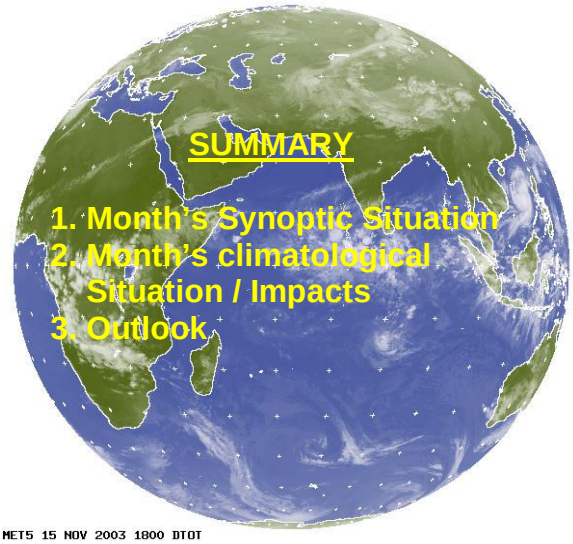
AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT
CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

CLIMATE WATCH AFRICA BULLETIN

N° 06
JUNE 2010



SUMMARY

1. Month's Synoptic Situation
2. Month's climatological Situation / Impacts
3. Outlook

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HIGHLIGHTS: Heavy rainfall was observed over parts of Gulf of Guinea, extreme southern Sahel and Ethiopian highlands of Greater Horn of Africa countries. Whereas, rains were being reported in part of Gulf of Guinea and GHA countries remained lower than the expected amounts for the month.

1. SYNOPTIC SITUATION DURING THE MONTH OF JUNE 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 1024hPa strengthened by 2hPa and shift northwest. Its centre was located over 35°N/32°W over north Atlantic Ocean.

The St Helena high pressure at 1022hPa strengthened slightly by 2hPa and shift northeast 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 filled up slightly by 2hPa compared to the previous month. Its centre was located at about 15°N/15°E with a trough covering a limited area over southeast Niger/ west Chad.

The Mascarene high pressure of 1026hPa strengthened by 2hPa and shifted northeast compared to the past month. Its mean position was located at about 30°S/90°E with an extended ridge over eastern part of Africa.

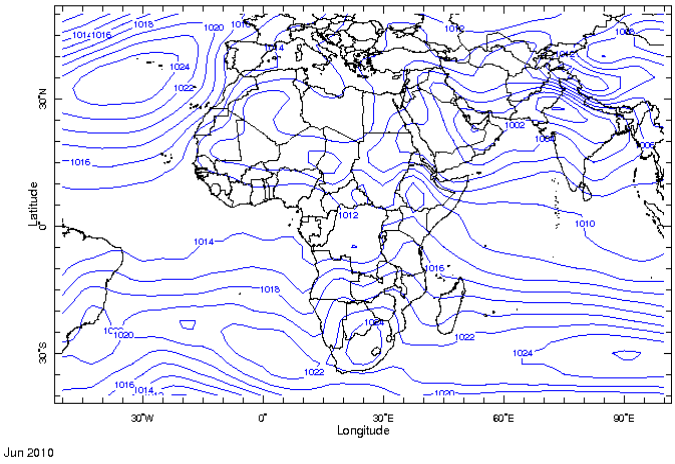

Figure 1 : Mean surface pressure during the Month June, 2010

(Source : NOAA/NCEP)

Continental High Pressure of 1024hPa centered over Southern Africa at about 27°S/25°E.

1.2 The 850hPa wind anomaly

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

Over northern Africa strong westerly/south-westerly wind anomalies prevailed.

Strong westerly wind anomalies were observed over Equatorial northern Atlantic and western part of the Gulf of Guinea.

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

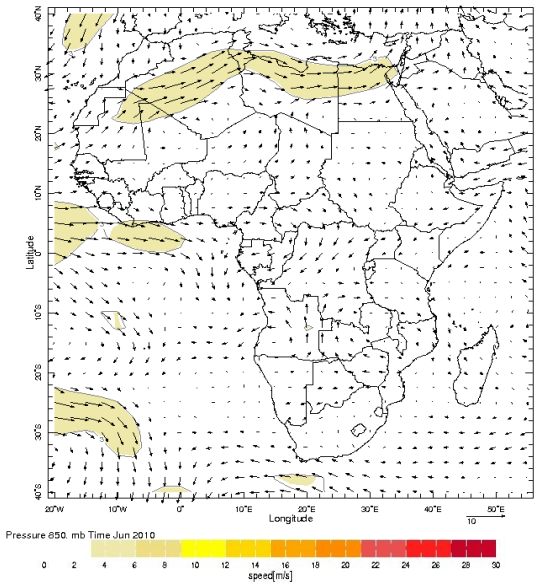

Figure 2 : June 2010, Wind Anomalies at 850hPa
(Source : IRI/NOAA/NCEP)

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1.3 The African Easterly Jet (AEJ) and The Tropical Easterly Jet (TEJ)

AEJ at 700hPa:
During the month of June 2010, the African Easterly Jet (AEJ) had a core value of about 10m/s located at about 10°N, stretching from Atlantic ocean up to 10°E.

TEJ at 150hPa:
The Tropical Easterly Jet (TEJ) had a core value of about 26m/s located at about 08°N over western Indian ocean with extended axis of about 16m/s over eastern and central Africa.

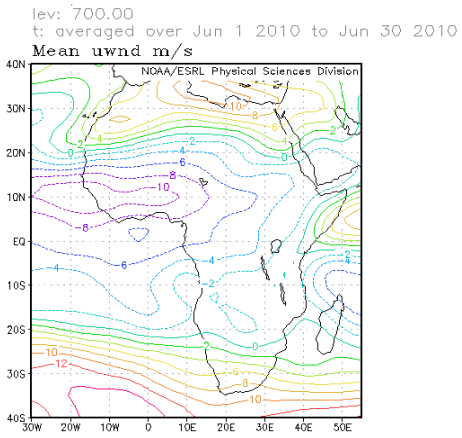

Figure 3: U-Winds at 700hPa
(Source: NOAA/NCEP)

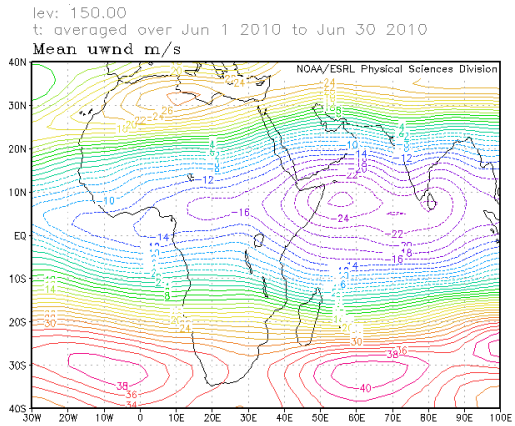

Figure 4: U-Winds at 150hPa
(Source: NOAA/NCEP)

1.4 Thermal index

In the month of June, 2010, the Thermal Index (TI) regime at 300hPa, Figure 3, had an isotherm value close to 242°K forming a belt about 20°N-15°S over Africa; the isotherm value of 243°K covered western part of Gulf of Guinea, eastern part of the Sahel, northern part of GHA countries, while the highest TI value of 247°K located over Asia had an extension over northern part of GHA countries. These indices were linked to the 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 Africa.

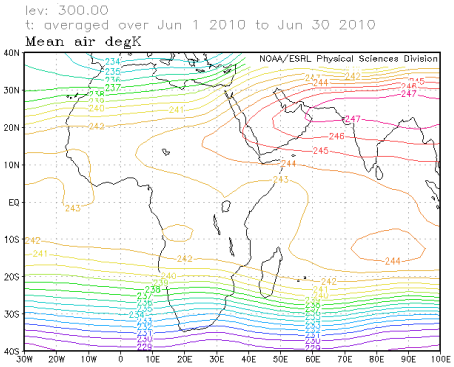

Figure 5: Thermal Regime at 300hpa
(Source: NOAA/NCEP)

1.4 Relative Humidity at 850hPa

The 850hPa (Figure 6) shows high RH (>60%) in June, 2010, over most part of Gulf of Guinea countries, western and eastern parts of Central Africa, GHA countries and northeastern part of Southern Africa countries including central Madagascar. The Sahara, most of the Sahel and western part of Southern Africa countries experienced dry conditions characterized by the lowest RH (40%).

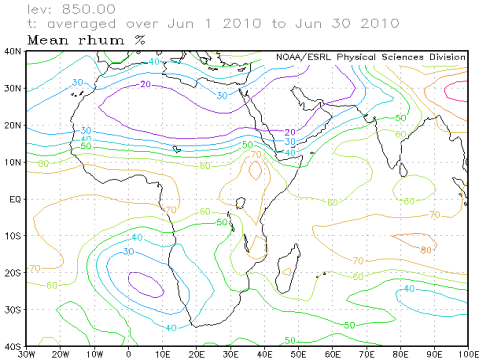

Figure 6:RH at 850 hPa (Source : NOAA/NCEP)

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

Warming conditions persisted in equatorial west and south-western and north-western Pacific Ocean while in most of the eastern part cooling conditions were observed. Warming conditions continued in most of the Atlantic Ocean except in southern parts around coastal areas of Gabon and Congo where cooling conditions prevailed. Warming conditions were observed in most of the Indian Ocean except the extreme south-western part.

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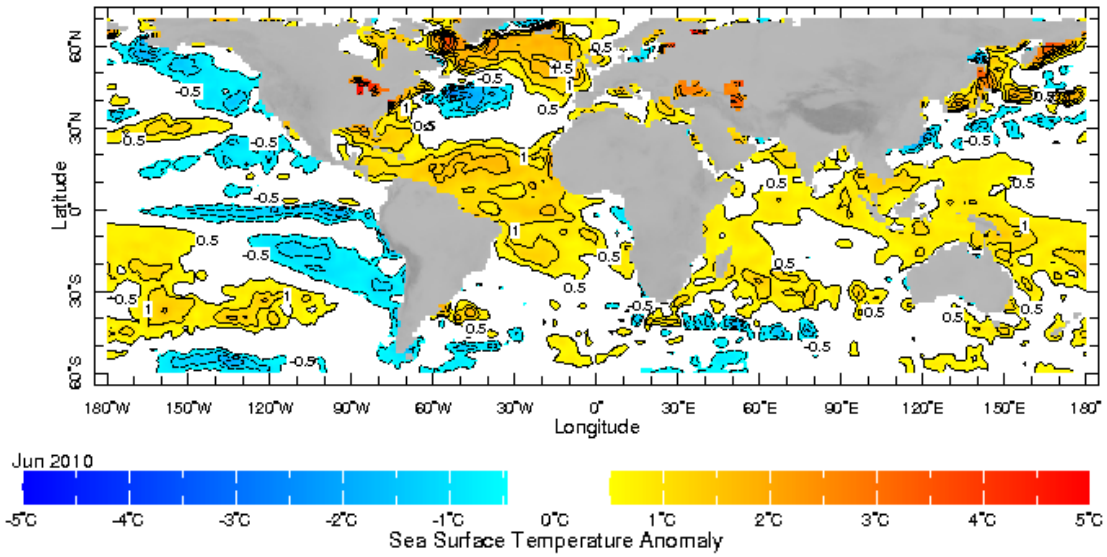

Figure 7: Sea Surface Temperature Anomalies (Source: IRI)

2. CLIMATOLOGICAL SITUATION AND IMPACTS DURING THE MONTH OF JUNE

The section provides the general climatological situation covering two major parameters, t rainfall and temperature.

2.1 Rainfall

The estimated rainfall for June, 2010 in Figure 8, shows some increase in rainfall distribution over the Sahel and Gulf of Guinea countries while Central Africa, GHA and southern Africa countries experienced decrease in rainfall distribution. In detail**:**

- **North Africa:** had no change in rainfall distribution and amounts, observing localized amounts ranging from 10mm over north Tunisia to about 80mm in south Algeria.
- **The Sahel**: had slight rainfall increase both in space and amount, observing amounts ranging between 10mm to 200mm intensifying to about 300mm over south Mali and south Chad.
- **Gulf of Guinea countries:** had increase in rainfall both in in amount and area covered with amounts ranging from 10mm to 300mm intensifying to about 400mm over the southern parts.
- **Central Africa**: had slight rainfall distribution decrease; observing amounts ranging from 10mm to 200mm intensifying to about 300mm over north Democratic Republic of Congo, north Congo and Central Africa Republic.
- **GHA**: countries experienced slight rainfall decrease; observing 10mm to 200mm with peaks between 200mm to 500mm over western Ethiopia.
- **Southern Africa:** countries realised decreased rainfall; observing localized amounts ranging from 10mm to 80 mm over southwestern part of South Africa, Mozambique and Madagascar with some peaks of about 150mm.

June, 2010 rainfall anomalies compared to the reference period 1971-2000, Figure 9 shows rainfall deficits over Guinea Conakry, Sierra Leone, Cameroun, South Chad and some parts of GHA countries, while excessive rainfall was observed over Nigeria, south Benin, Togo, south and northeastern Mali, extreme southern Algeria and western and eastern part of GHA countries.

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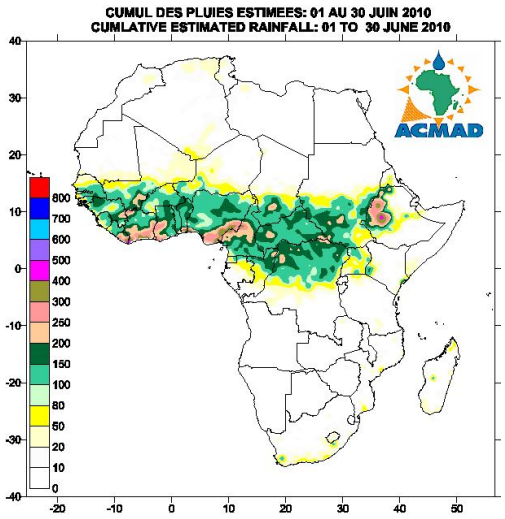

Figure 8: Monthly cumulative rainfall (Data Source: NOAA/NCEP)

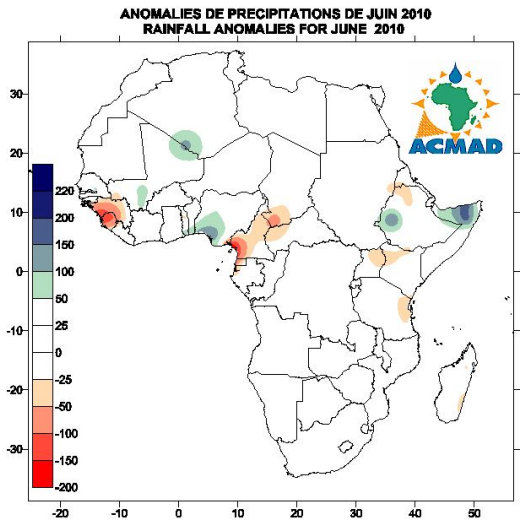

Figure 9: Monthly Precipitations Anomalies (Data Source: NOAA/NCEP)

2.2 Surface Temperature Anomalies

In June, 2010, the temperature anomalies (Figure 10) compared to 1971-2000 base period, were generally hotter by more than 1.5°C in eastern Niger, northern Chad, Libya, Egypt, northern Sudan, northern Madagascar, southwest Nigeria, Togo and Benin with the highest anomalies epicenter (>2°C) over Libya, Egypt and Madagascar. However, negative temperature anomalies (<-1°C) was observed over north-eastern Namibia.

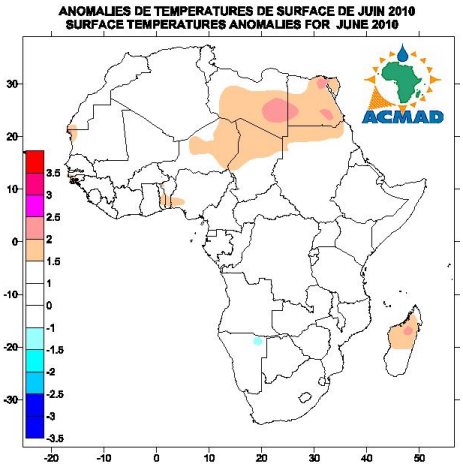

Figure 10 : Monthly Temperatures Anomalies (Data Source: NOAA/NCEP)

3. OUTLOOK

The subsections provide the expected SSTs and ENSO characteristics and evolution of events based on Figures 11 and 12 respectively and expected rainfall outlook.

3.1 Forecast Sea Surface Temperature (SST)

The figure 11 shows the forecast Sea Surface Temperature Anomalies from July for the period of July-August-September 2010.

- **Pacific Ocean:** warming conditions will persist over western, south central and northern parts of the ocean while over extreme southern and eastern parts cooling will be observed.
- **Atlantic Ocean:** A warming condition will persist over most of Atlantic Ocean except the central north and south-western parts where some cooling conditions will persist.
- **Indian Ocean:** warming conditions are expected to persist in most of the Indian Ocean while over south-western part cooling condition will be observed.
- Over the Mozambique Channel warming condition is expected to continue.

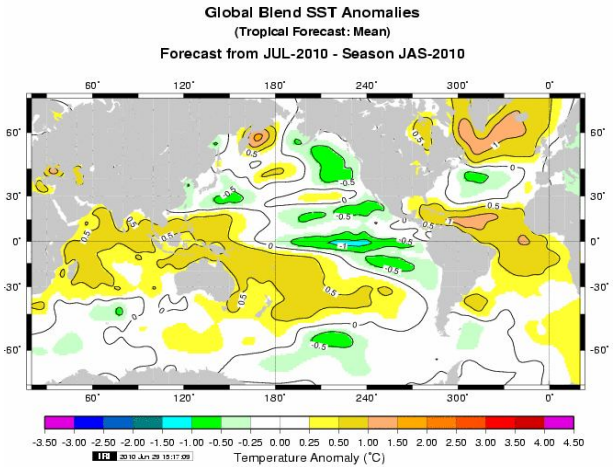

Figure 11 : Forecast Sea Surface Temperatures Anomalies (source IRI)

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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 12.

The SST observations in the NINO3.4 region indicate borderline La Nina conditions, with an area-averaged weekly anomaly of -0.5. Current predictions and observations indicate a probability of about 58% for developing La Nina conditions during the June-August period, increasing to 62% from the August-October period through the end of 2010.

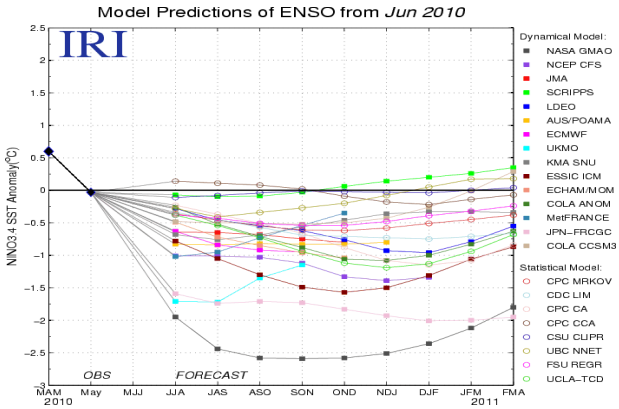

Figure 12 : Multi-model ENSO Forecast (source IRI)

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 Gulf of Guinea countries, southern Sahel, northern part of central Africa countries and northern parts of GHA countries. In detail:

North Africa countries: will not have significant change in rainfall distribution and amounts ranging from 10mm to 100mm over northern Morocco and Algeria.

The Sahel: will continue to experience increase in rainfall amounts and areas covered over the southern part observing 10mm to about 300mm with localised peaks ranging from 300mm to 500mm.

Gulf of Guinea countries: will experience increase in rainfall amounts ranging from 10mm to 400mm with some peaks above 600mm.

Central Africa countries: will experience rainfall distribution decrease with amounts ranging from 10mm to 300mm intensifying to some peaks of about 400mm in the north.

GHA countries: will have rainfall decrease with amounts ranging from 10mm to 400mm intensifying over some parts over north west Ethiopia with amounts ranging from about 400mm to 600mm.

Southern Africa countries: will experience some rainfall activities over the eastern parts; observing some localized amounts ranging from 10mm to 100mm with peaks ranging of about 200mm mainly over Madagascar..

3.4 IRI seasonal Rainfall outlook for Africa issued in June 2010 for JAS 2010

The IRI seasonal rainfall forecast issued in June for the period of June-July-August 2010 confirm ACMAD forecast for July-August-September, and shows that:

- Above normal to Normal rainfall over most of the Sahel and northern part of the Gulf of Guinea countries stretching from Senegal to western Ethiopia and Great Lakes countries.
- Below normal to Normal rainfall is expected over southern part of Gulf of Guinea countries covering Liberia, Côte d'Ivoire and southern Nigeria.

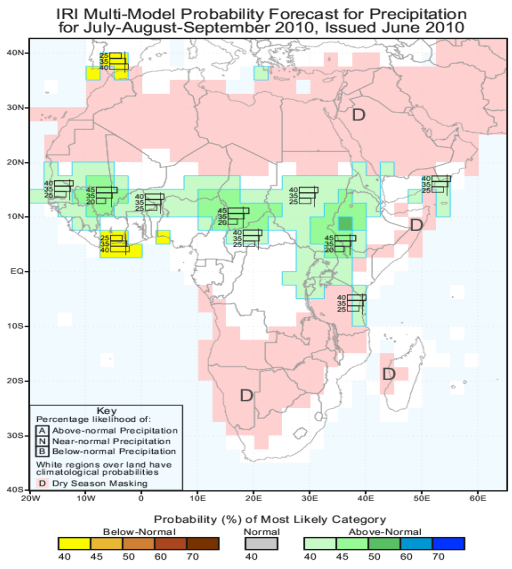

Figure 13: IRI forecast

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3.5 ACMAD seasonal Rainfall outlook for west Africa, Chad and Cameroon issued in June 2010 for JAS 2010

As indicated on the June updated map of predicted probabilities at the regional level, it is expected that (see updated map of PRESAO13) :

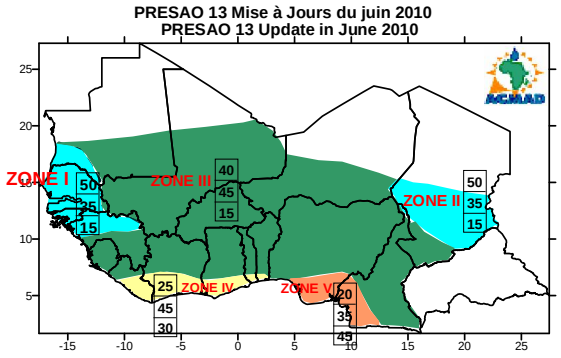
1. The low probability of rainfall deficit (Probability <0.20) still covers a large area which includes the Sahel, the north part of the Gulf of Guinea countries and the North East Cameroon), and a high probability for a deficit in precipitations (>0.30) along the coastal areas of the Gulf of Guinea.

2. The above mentioned vast region is divided into three zones I, II and III.
* zone III, the probability of normal rainfall is the highest (0.45), although the probability of above normal rainfall is also important (0.40)

* Zone I (South-West Mauritania, Senegal, Gambia, Guinea-Bissau and Guinea Conakry North) and zone II (southern Chad) the scenario of excess rainfall dominates (probability of 0.50)

3. Zone IV, the trend to normal precipitations predominates with a probability of 0.45; however the risk of precipitations below normal is a potential scenario (probability of 0.30).

4. Zone V the scenario of rainfall deficit has the highest probability (0.45) but with a significant trend to normal precipitations (0.35).



ADVICE:

- ✓ **Detailed forecasts at the country scale (including rainfall amounts and the onset) are available from National Meteorological Services**
- ✓ **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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