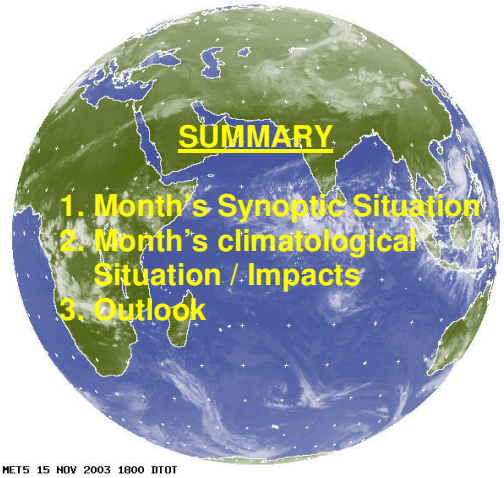
AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT
CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

CLIMATE WATCH AFRICA BULLETIN

N° 08
AUGUST 2009



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HIGHLIGHTS: Heavy rainfall amounts were experienced over the southern parts of the Sahel, northern parts of central Africa countries and northern sector of Greater Horn of Africa (GHA) countries with the highest over Senegal, Gambia, Guinea Conakry, Guinea Bissau, Sierra Leone and Cameroon.

1. SITUATION DURING THE MONTH OF AUGUST, 2009

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

1.1 Centres of Anticyclone

The Figure1 shows surface pressure systems as described below:

The Azores high pressure at 1024hPa maintained its strength compared to the previous month and shifted northeast at about 35°N/40°W.

The St Helena high pressure at 1024hPa weakened slightly by 2hPa compared to the past month and shifted northwest at 25°S/08°W extending a ridge over western Gulf of Guinea.

The Saharan thermal lows of 1008hPa maintained their intensities compared to the past month, but covered limited areas in eastern Niger/western Chad and northern Mali/southern Algeria.

The Mascarene high pressure at 1028hPa strengthened slightly by 2hPa and shifted southeast at 35°S/65°E with an extended ridge over eastern Africa.

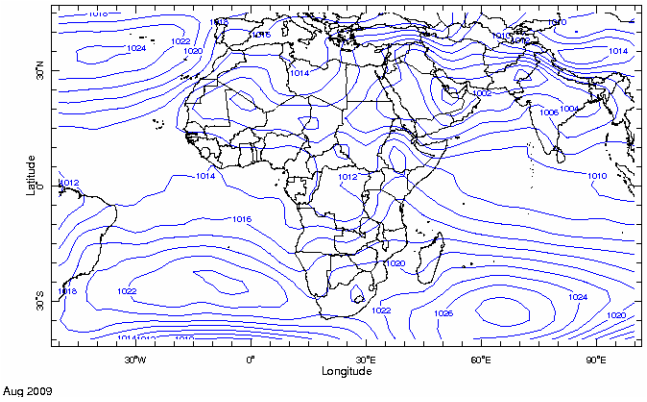

Figure 1 : Mean surface pressure during the Month of August, 2009

(Source : IRI/NOAA/NCEP)

1.2 Low level wind anomaly flow at 850hPa

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

Strong westerly wind anomalies were observed from equatorial Atlantic ocean up to western part of Gulf of Guinea countries and over north Cameroon.

Over western Zambia and eastern Angola strong continental southerly anomalies prevailed turning to north-easterly anomalies over western and off coast Angola, while over northern Democratic Republic of Congo and central Congo strong continental north-easterly wind anomalies were observed.

Over Somalia and Ethiopia strong moist easterly anomalies from north Indian ocean prevailed turning to southerly winds over Djibouti and Eritrea.

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

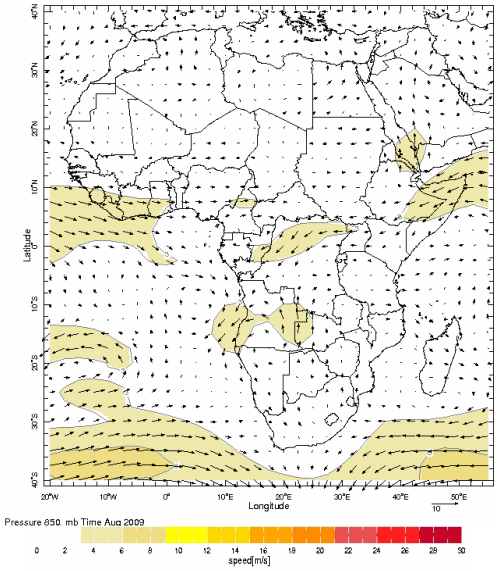

Figure 2 : August 2009, Wind Anomalies at 850hPa
(Source : IRI/NOAA/NCEP)

1.3 Mid and upper troposphere winds

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At the 700hPa (Figure 3), a wind core associated with the African Easterly Jet (AEJ) compared to the previous month shift northwards at about 17°N over costal Mauritania and strengthened by 1m/s to about 12m/s.

The Figure 4 shows, the Tropical Easterly Jet (TEJ) at 150hPa core value of 28 m/s observed over south India/Indian Ocean at about 11°N weakened by 2m/s compared to the past month with an extended effect up to the eastern Sahel. A secondary core value of 18m/s was observed over western Gulf of Guinea countries.

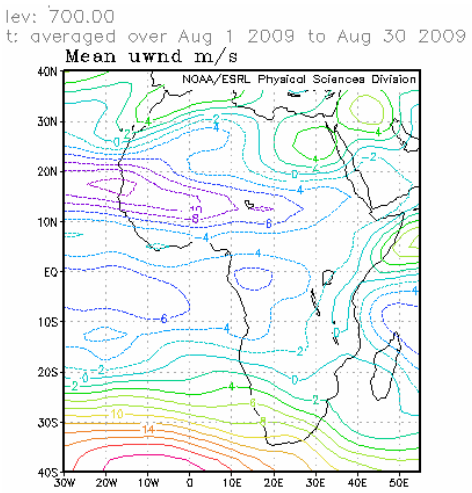

Figure 3 : U - Winds velocity at 700hPa
(Source : NOAA/NCEP)

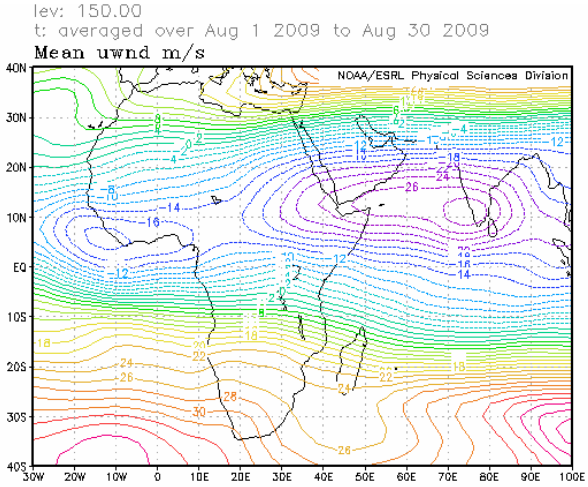

Figure 4 : U - Winds velocity at 150hPa
(Source : NOAA/NCEP)

1.4 Thermal index

In the month of August, 2009, the Thermal Index (TI) regime at 300hPa, Figure 5, had a near-threshold value of 242°K isotherm over Africa covering the Sahel, most of Gulf of Guinea countries, extreme northern parts of central Africa and northern parts of GHA countries with the threshold value of 243°K covering the western Sahel maintaining the highest conditional instability associated with heaviest rainfall over Senegal, south Mauritania, Gambia and Mali. The highest TI regime with epicenter of 249°K over north India that maintained the highest conditional instability associated with heavy rainfall with floods. The low TI regime value less or equal to 241°K was associated with suppressed convection over rest Africa.

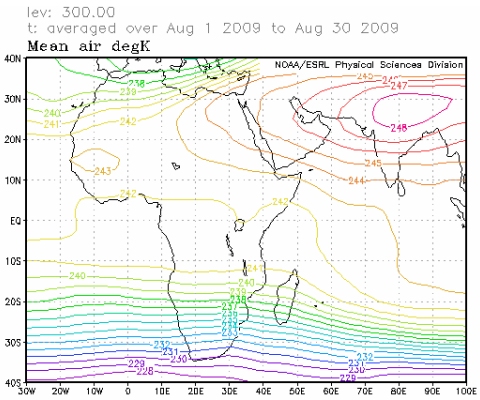

Figure 5: Thermal Regime at 300hpa
(Source : NOAA/NCEP)

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

A neutral to warming conditions prevailed in most of the Pacific Ocean except in the southern and northern parts where some cooling conditions prevailed. Neutral to warming conditions were observed in most of the Atlantic Ocean except in the equatorial east, central-north and extreme south western where some cooling conditions were observed. Neutral to warming condition were observed in most of the Indian Ocean except the cooling conditions observed in its southern part. Over the Mozambique Channel cooling were observed.

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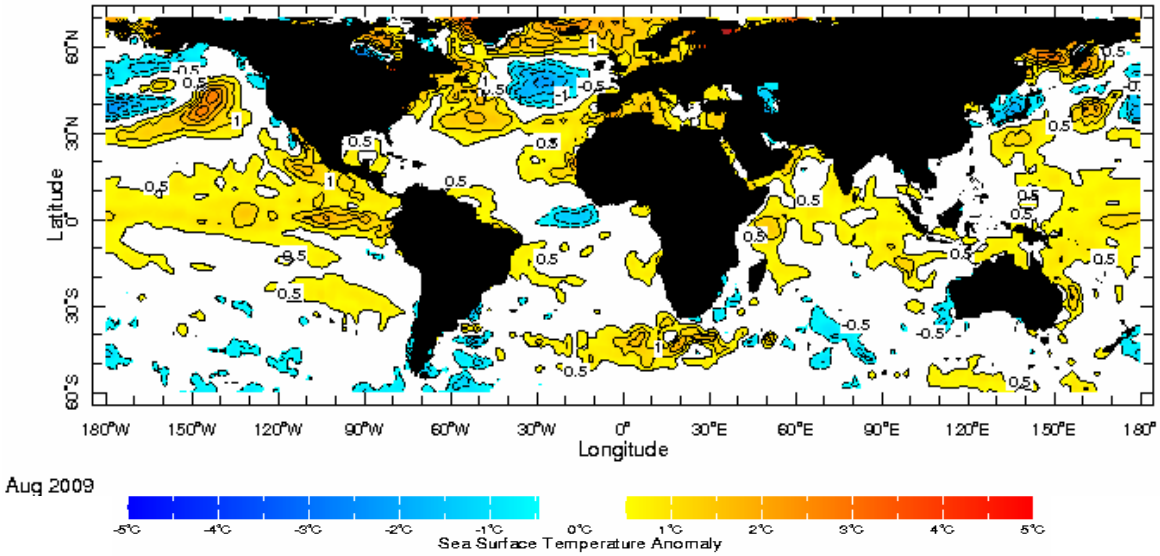

Figure 6: Sea Surface Temperature Anomalies (Source: IRI)

2. CLIMATOLOGICAL SITUATION AND IMPACTS DURING THE MONTH OF AUGUST, 2009

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

2.1 Rainfall

Compared to the last month, the estimated rainfall for August 2009 in Figure 7, shows slight spatial increase in rainfall distribution and amounts over the Sahel, Central Africa and Greater Horn of Africa (GHA) countries while northern and southern Africa and Gulf of Guinea countries coastal zone observed no significant change in rainfall amounts and distribution. In detail**:**

- **North Africa:** had non significant change in spatial rainfall distribution observing rainfall amounts ranging from 10mm to 80mm over extreme northern Morocco, Algeria and Tunisia.

- **The Sahel**: had spatial significant rainfall distribution and amounts increase observing amounts ranging from 10mm to 250mm with maximum rainfall amounts ranging between 250mm to 400mm over southern Chad, Burkina Faso, southern Mali intensifying to about 700mm over Senegal and the Gambia.

- **Gulf of Guinea**: countries observed decrease in rainfall distribution over its southern part while significant amounts increase ranging from 10mm to 250mm was observed over northern part with maximum amounts ranging from about 250mm to 500mm over Nigeria, Cameroon, Benin, Togo, Cote d'Ivoire intensifying to about 600mm over Guinea Conakry, Guinea Bissau and Sierra Leone.

- **Central Africa**: countries had slight increase in rainfall distribution and amounts ranging from 10mm to 250mm with peaks of about 250mm to 400mm over Central Africa Republic, Congo and northern Democratic Republic of Congo.

- **GHA**: northern countries experienced spatial rainfall distribution increase observing amounts ranging from 10mm to 250mm with peaks of about 250mm to 400mm over southwestern Sudan and northern Ethiopia/Eritrea.

- **Southern Africa:** countries experienced no significant change in rainfall pattern compared to the past month. However, some rainfall amounts ranging from 10 to 80mm were observed over the Cape and eastern South Africa with localized peaks of about 200mm over southwest Namibia and south Madagascar.

Compared to the reference period 1979-2000, the August, 2009, rainfall anomalies, Figure 8 shows significant rainfall deficits over most of Gulf of Guinea countries, GHA countries, northern part of central Africa countries, extreme southwestern part of the Sahel, southeastern part of Madagascar and extreme southeastern South Africa. However, excessive rainfall was observed over Senegal, the Gambia, southeast Mauritania/Mali, central Cameroon and northwestern Democratic Republic of Congo.

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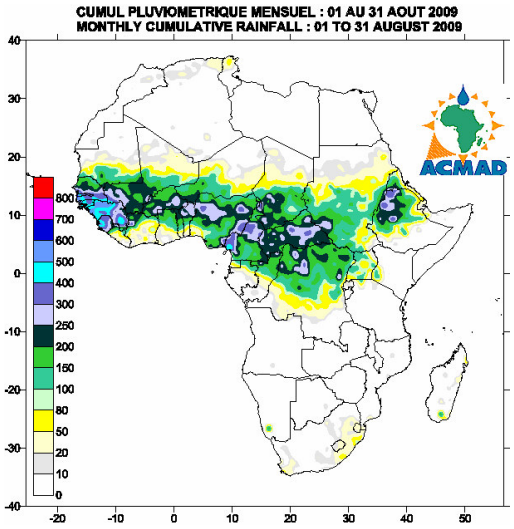

Figure 7: Monthly cumulative rainfall (Data Source: NOAA/NCEP)

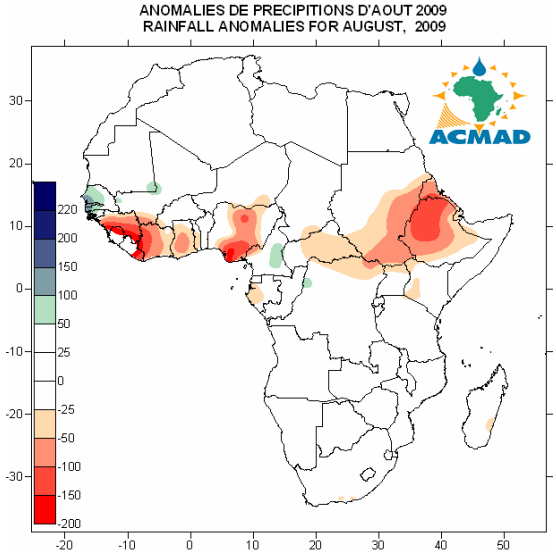

Figure 8: Monthly Precipitations Anomalies (Data Source: NOAA/NCEP)

2.2 Surface Temperature Anomalies

In August 2009, the temperature anomalies (Figure 9) compared to 1971-2000 base period, in most of African countries were generally normal (1°C to –1°C). However, positive temperature anomalies (>1.5°C) were observed over Niger, northern Chad, northeastern Sudan, western Egypt, eastern Mali, northwestern Mauritania, northwestern South Africa, Northern Madagascar with epicenter of highest temperature anomalies (>2.5°C) over Libya, Algeria and Tunisia .

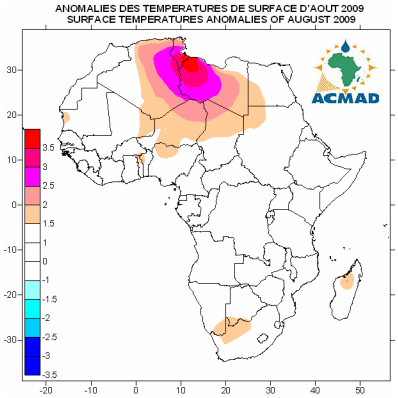

Figure 9 : Monthly Temperatures Anomalies (Data Source: NOAA/NCEP)

3. OUTLOOK

The subsections provide the expected SSTs and ENSO characteristics and evolution of events based on Figures 10 and 11 respectively with rainfall outlook in September.

3.1 Forecast Sea Surface Temperature (SST)

The figure 10 shows the forecast Sea Surface Temperature Anomalies from August 2009 SST for the period August-September-October.

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Pacific Ocean: Neutral to warming conditions will continue over most of Pacific ocean except in the southern and extreme north-eastern parts where cooling will prevail.

Atlantic Ocean: A neutral to warming condition is expected over most of Atlantic Ocean except the north-eastern part of the ocean.

Indian Ocean: Neutral to warming condition are expected over most of the Indian Ocean while a cooling condition will prevailed over its south-eastern part.

Over Mozambique Channel, neutral condition will persist.

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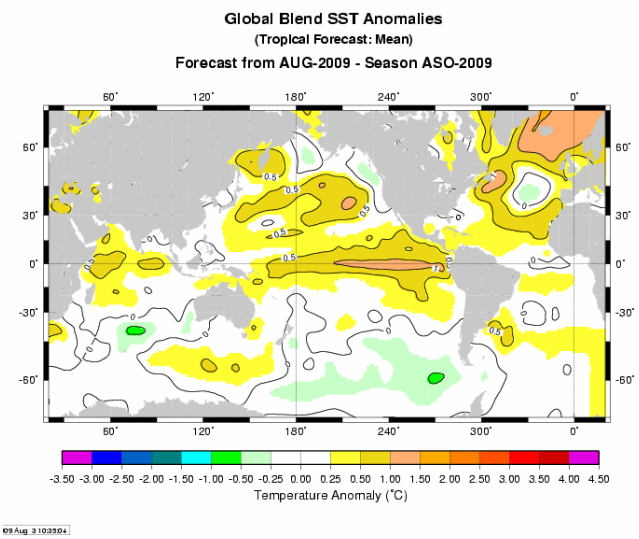

Figure 10 : Forecast Sea Surface Temperatures Anomalies (source IRI)

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) shown on Figure 11 that, current forecasts and observations indicate that maintenance of weak to moderate El Nino conditions (SST anomaly in the 0.6 to 1.6 range) is the most likely scenario through 2009, with probability of at least weak El Nino approximately about 80 to 85% for the ASO to NDJ seasons. A return to neutral conditions is believed no more than 20% likely during these seasons.

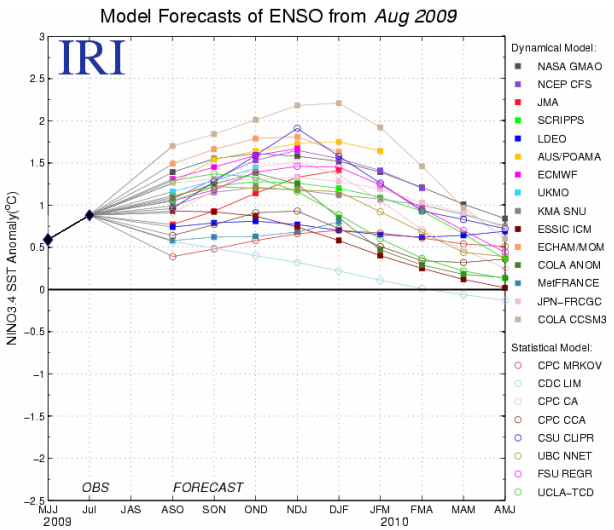

Figure 11 : Multi-model ENSO Forecast
(source IRI)

3.3 Rainfall

The moisture influx due to prevailing wind will maintain heavy rainfall over extreme southern part of the Sahel and northern part of the Gulf of Guinea countries while northern part of central Africa countries will experience slight rainfall reduction, but with an increase over northern sector of GHA countries. In detail

- **North Africa countries:** will experience rainfall increase, amounts ranging from 10mm to 100mm.

- **The Sahel:** will continue to experience increasing temperatures with slight rainfall decrease recording amounts ranging from 10mm to 150mm with highest amounts about 200mm over southern part of the Sahel countries.

- **Gulf of Guinea countries:** will experience slight rainfall decrease recording amounts ranging from 10mm to 200mm with peaks ranging from about 250mm to 500mm.

- **Central Africa countries:** will have slight rainfall decrease recording amounts ranging from 10mm to 200mm with peaks of about 250mm to 400mm.

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• **GHA countries:** will record rainfall increase over northern parts with amounts ranging from 10mm to 200mm with peaks of about 250mm to about 400mm.

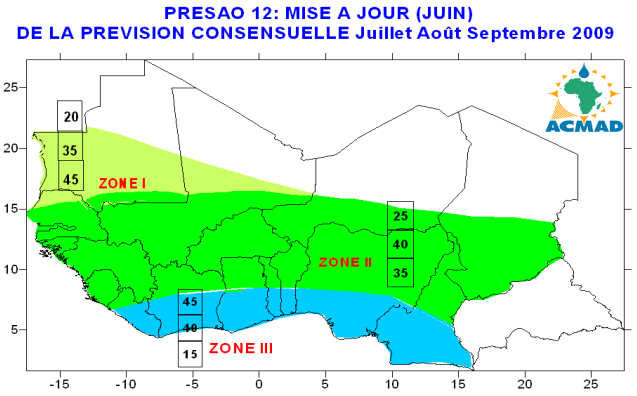
• **Southern Africa countries:** expected to have some rainfall deficits amounts ranging from 10 to 80mm with localized rainfall peaks of about 100mm.

3.4 Result of PRESAO12:seasonal rainfall forecast for July-August-September 2009

i) Over zone III which covers the southern part of Gulf of Guinea countries (from Cote d'Ivoire to Cameroon), a high probability of rainfall higher than normal (Probability of 0,45)

ii) Over the zone II, which corresponds to the Central Sahel and including Sierra Leone, Guinea Conakry, Guinea Bissau, southern Senegal, the Gambia, southern Mali, Burkina Faso, Niger, Chad, North Gulf of Guinea, the probability of rain near normal (p = 0.40) with a tendency to below normal (p = 0.35) is forecast.

iii) Finally over zone I, which includes the south-west of Mauritania, northern Senegal, probability of rainfall below normal (p = 0.45) is forecast.



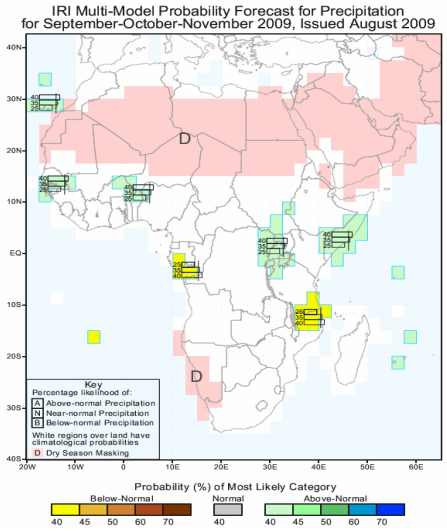
ADVICE:

THE POTENTIAL OF ADVERSE IMPACTS IN THE REGIONS ARE CLEAR FROM THE FORECAST PROBABILITIES. ORGANISATIONS PROVIDING EARLY WARNING AND INTERVENTION SERVICES NEED, MORE THAN EVER, TO MAINTAIN CLOSE AND PERMANENT COORDINATION.

3.5 Seasonal Rainfall forecast for September-October- November 2009

The IRI seasonal rainfall forecast issued on August for the period of September-October-November 2009 show:

- excessive rainfall over Senegal, the Gambia, western Mali, south-western Niger, east Burkina Faso, north Benin, Togo, northwest Nigeria, Great Lakes countries and extreme east GHA countries.
- Below normal rainfall is expected over southern Gabon, southern Congo, southern Tanzania and northern Mozambique.



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