Comité permanent Inter-Etats de Lutte contre la Sècheresse dans le Sahel
Permanent Inter-State Committee For Drought Control in the Sahel

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Special bulletin on the forecasts update of agro-hydro-climatic characteristics for the 2013 campaign in West Africa, Chad and Cameroon

- *A heterogeneous rainy season with average to above normal total rainfall in central Sahel and northern parts of the Guinea Gulf countries, average in the North-west, above normal in the South-east, below normal in the South-west and North-east; and longer to average dry spells during the post flowering period.*

- *A hydrological year with overall average flow*

Introduction

The update of the agro-climatic and hydrological seasonal forecasts of May 2013 consisted in making adjustments on the basis of the current situation and future trends in ocean temperatures, of precipitation forecasts carried out by seasonal forecasting global centers. The considered reference period for water flows and agro-climatic characteristics of the season is the period from 1981 to 2010.

I. *State of the Oceans*

For the week (7 to 13 July 2013), the state of the oceans is described as below (Figure 1):

- The Eastern Equatorial Pacific Ocean (ENSO) continues to have negative sea surface temperatures anomalies, but remains still in the neutral phase, while on the North, the South and the West pacific, warm temperatures continue to be observed.

- On the North Atlantic Ocean, Northern and Southern Equatorial, temperatures above the average are observed.

- On the Guinea Gulf and the Gabon/Congo coasts, the negative temperature anomalies are observed, while in the coasts of Mauritania, Senegal and Guinea, the positive temperature anomalies are maintained;

- On the Eastern and Central Indian Ocean, warm temperatures are observed while on the West, temperatures are still cold;

- Finally, on the Mediterranean Sea, slightly warm temperatures are observed.

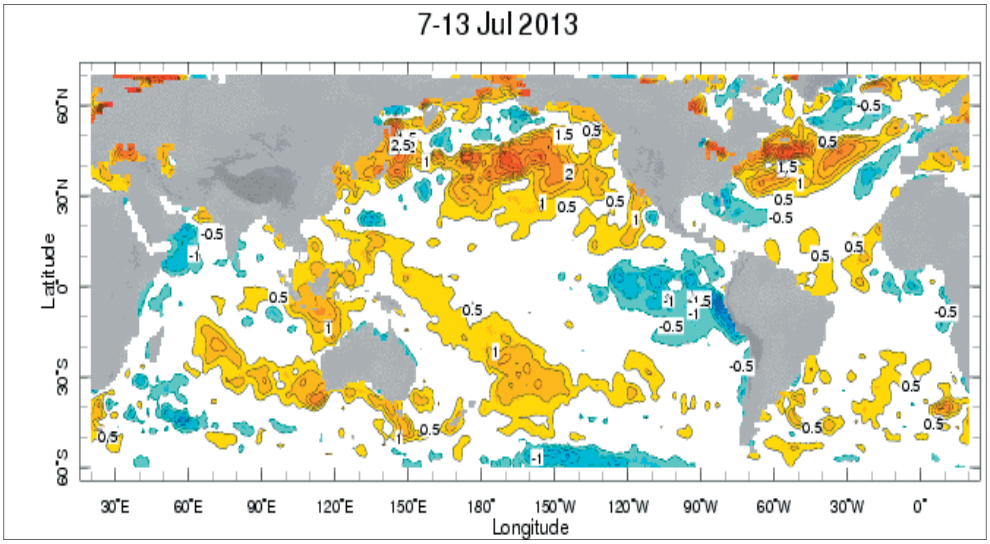

Figure 1: Anomalies of sea surface temperatures: week of July 7 to 13, 2013 (Source: IRI

II. *Seasonal Forcasts 2013*

1) Ocean surface temperatures

 The majority of predictive models indicates that the ENSO will remain neutral until the end of the year. However, the warming observed on the West will persist, while on the center, conditions will be neutral.

 The slight cooling that appeared on the Gulf of Guinea will persist. As for the warming observed on the North Atlantic and the coasts of Mauritania and Senegal, they will persist also, but will experience a slight cooling.

 On the western Indian Ocean, the slight cooling observed will persist, while on the eastern part, the warming conditions will continue.

 Finally, on the Mediterranean Sea, the warming will continue.

2) Update of Seasonal forecasts

a) Seasonal cumulative rainfall

The seasonal forecast update highlighted the differences between the east, centre and west of Sahel. Indeed, in view of the observations of the different ocean basins and the results of seasonal forecast models (IRI, ECMWF, UK-Met-Office, NOAA/NCEP, etc...), the following perspectives emerged, compared to the reference period average, 1981-2010:

 For the Central Sahel (South-west and Centre-South of Niger, Burkina Faso, Central and South Mali) and northern parts of Guinea Gulf coastal countries (extreme north of Côte d'Ivoire, Ghana, Togo, Benin and Nigeria), higher than normal to locally equivalent seasonal cumulative rainfall are very likely;

 For western Mali, southern Mauritania, most of the Senegal and The Gambia, equivalent to normal cumulative rainfall are expected;

 For the extreme south of Senegal, Guinea Conakry, Guinea Bissau, Sierra Leone and the northern half of Liberia, the expected precipitation forecast have the same probability of being lower than or equivalent to the average;

 For central Chad, the extreme south-east of Niger and the extreme north-east of Nigeria, normal to below normal rainfall is expected;

 Finally, for the extreme south of Chad, normal to above normal rainfall are most probable.

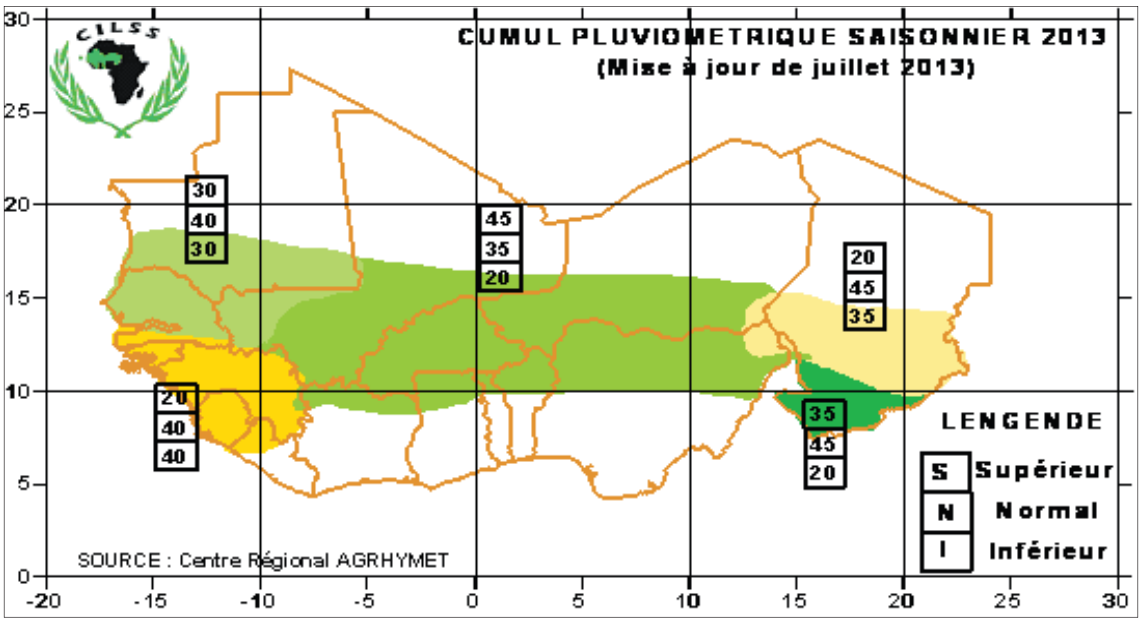

Figure 2: Update of the seasonal cumulative rainfall forecast in West Africa (figures in small rectangles of the top, middle and bottom indicate the probability for the totals being higher, equivalent or lower, respectively, compared to the average of the 1981-2010 period).

b) End dates of the season

The update of the end of the season 2013 dates forecast shows (Figure 3):

 a very high probability of having normal end dates of the season on the north-west of the Sahelian zone, particularly in southern Mauritania, northern Senegal and the extreme north-west of the agropastoral zone of Mali;

 high chances of having a normal to delayed end of the season in the Central Sahel (the south of Niger, northern Burkina Faso and central Mali), the Northern Nigeria, the Central and Southern Senegal, Gambia and the north of Guinea-Bissau;

 a high probability that the end of the season be equivalent to the average on the extreme east of Sahel (the South of Chad), Guinea Conakry, North of Sierra Leone, and northern parts of the coastal Guinea Gulf countries.

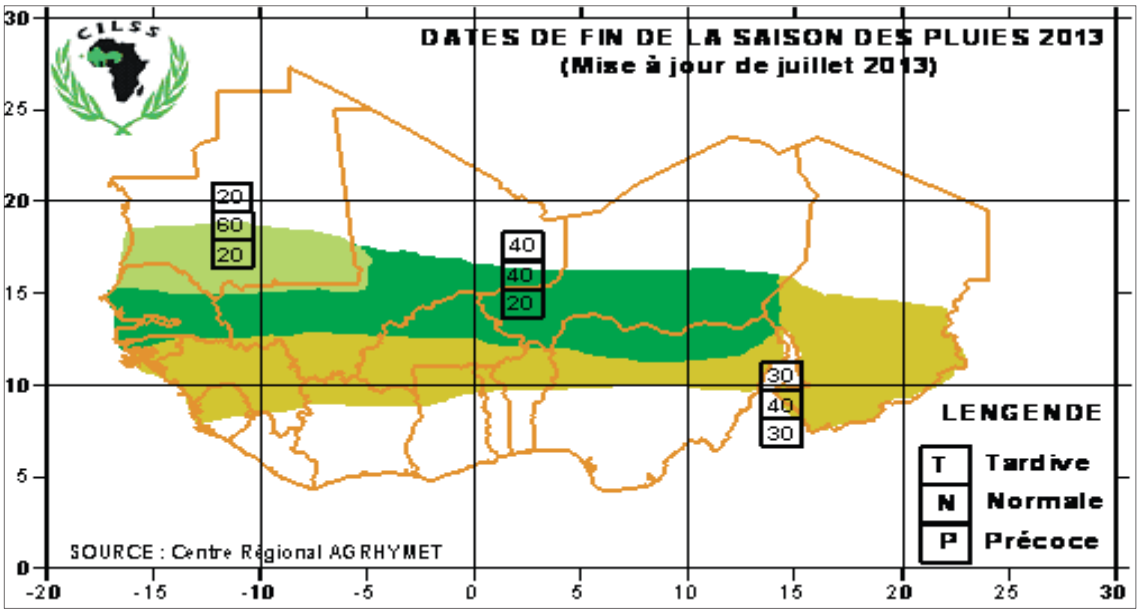

Figure 3: Update of the forecast of the cessation dates of the season in West Africa (figures in small rectangles of the top, middle and bottom indicate the probabilities for the end of the season being delayed, equivalent or early, respectively, compared to the average of the 1981-2010 period).

c) The post-flowering dry spells

For post-flowering dry spells, that is from 50 days after the start date of the season, it is expected that they will tend to be longer to equivalent compared to those usually observed over the reference period and this in all Sahel countries and the northern parts of the Guinea Gulf countries (Figure 4).

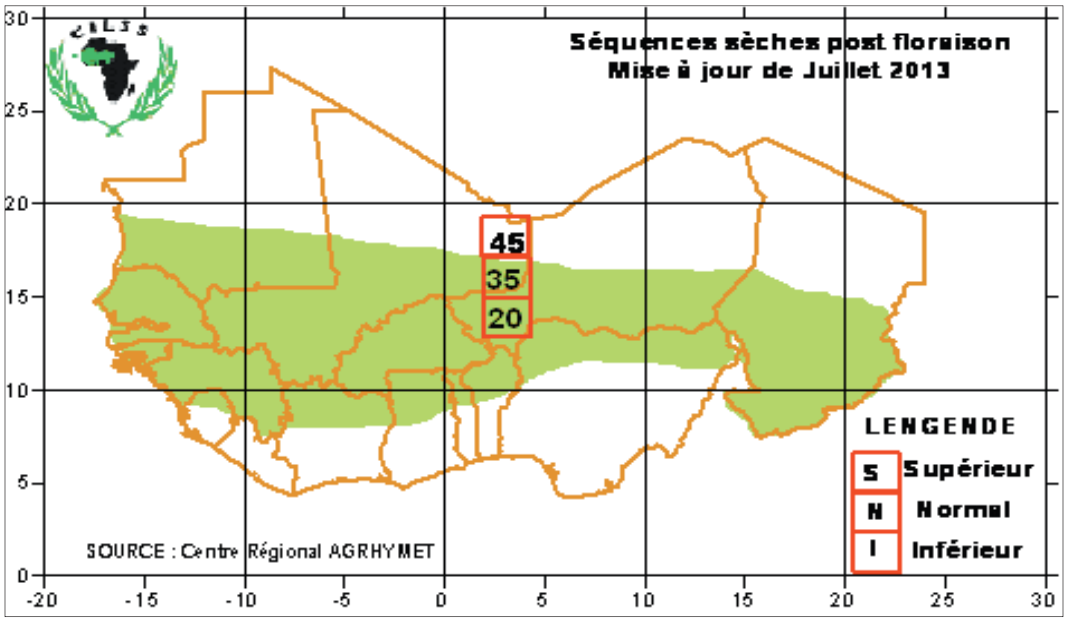

Figure 4: Update of the post-flowering dry spells forecast (within 50 days after the start dates of the season) in West Africa. (Figures in small rectangles of the top, middle and bottom indicate probabilities for the dry spells being longer, equivalent or shorter than the average for the 1981-2010 period.

d) Update of the seasonal flow prediction for the main river basins in West Africa, Chad and Cameroon for the rainy season 2013

The adjustments made to stream flow forecasts of May are as follows:

• Senegal River Basin: average flows are expected. The probabilities of above normal, normal, and below normal discharges are 35%, 45% and 20%, respectively.

• The Gambia River Basin: average flows are expected with a probability of 40%. The probabilities of having flows higher or lower than average are equivalent (30%).

• Volta River Basin: average flows are expected, with a probability of 45%. The probabilities of the higher and lower than average flows are 30% and 25%, respectively.

• Niger River Basin: average flows are expected in the upper and middle parts of the basin, with a probability of 45%. The probabilities of higher and lower than average flows are 35% and 20%, respectively. In the lower part of the basin (Nigerian part), average flows are expected with a probability of 40%. The probabilities of the higher and lower than average flows are 25% and 35%, respectively.

• Lake Chad Basin: average flows are expected globally in the Lake Chad basin with a probability of 45% for the average trend, 35% for higher than the average trend and 20% for lower than the average trend.

• Comoe River Basin: average flows are expected, with a probability of 40%. The probabilities of having flows higher or lower than average are 35% and 25%, respectively.

• Oueme River Basin: average to higher than average flows are in this basin. The probabilities of higher than average, average and lowe than average of 35%, 45% and 20%, respectively.

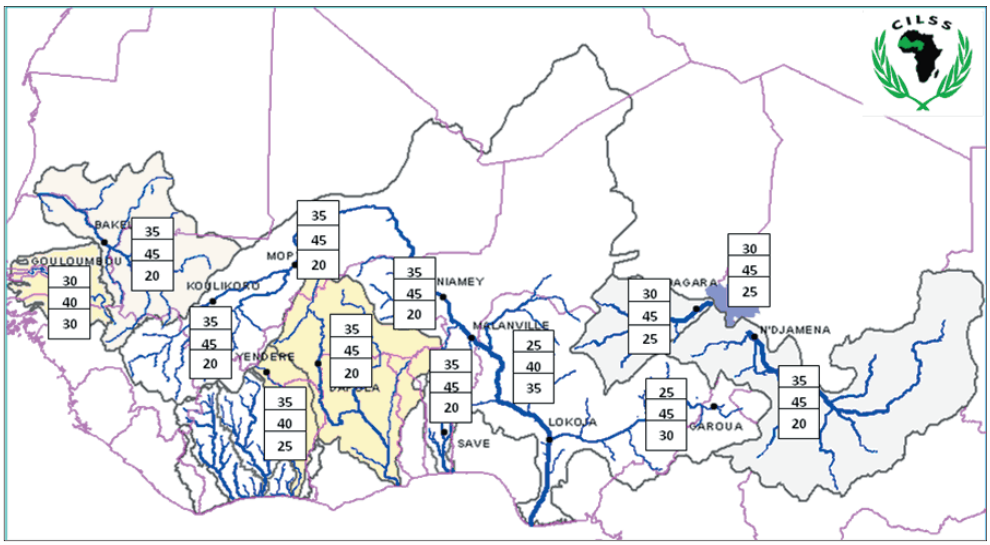

Figure 5: Update of the seasonal flow prediction for the main river basins in West Africa, Chad and Cameroon for the rainy season 2013.

Conclusion

The update (in July) of the the 2013 seasonal forecastof agro-climatic and hydrological characteristics indicates cumulative rainfall and river discharges slightly in decline from those predicted in May. However, the expected hydrological and agro-climatic season is globally average over all river basins of West Africa.

In addition, the state of SST in the equatorial Pacific remains close to neutral conditions, which makes the 2013 rainy season highly dependent on the evolution of the situation in regional ocean basins (North Atlantic, Guinea Gulf, Mediterranean Basin, Indian Ocean). Such a configuration does not favor the realization of a homogeneous agro-hydro-climatic season over space and time.

Thus, it is recommended that actors involved in the management of the rainy season to consider, not only the possible occurrences of important peak flows during the rainy season, but also to anticipate possible severe low flows during the dry season for some water courses.

Also, given the probability of observing (in the crops post-flowering period) dry sequences with a tendency of longer to equivalent compared to the normal, it would be better for farmers to reduce or waive fertilizers inputs after the cereal cops juvenile phase (tillering). Provisions must also be taken to avoid possible damage from borers on harvests. Indeed, if it appears, this caterpillar does more damage in case of prolonged dry spells, particularly during the phase of millet seed set.

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