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For referencing within this bulletin, the Greater Horn of Africa (GHA) is generally subdivided into three sub-regions: The equatorial sector lying approximately between -5^o and 5^o latitude, with the northern and southern sectors occupying the rest of the north and southern parts of the region respectively

1. HIGHLIGHTS/ ACTUALITES

- Rainfall activities were mainly observed over western and central parts of the northern sector as well as western parts of the equatorial sector of the Greater Horn of Africa (GHA) during the month of July 2015;
- During September to December 2015rainfall southern parts of the northern sector, most parts of the equatorial sector as well as northern parts of the southern sector are likely to receive near normal to above normal rainfall;
- The socio-economic impacts associated with the observed rainfall over the GHA during the month of July 2015 resulted in improved crop, pasture and foliage conditions, increase in water related diseases; and improvement in water resources over some parts of northern sectors. Eastern parts of the northern sector were associated with water stress for pasture and crop production.

2. INTRODUCTION

In this bulletin, the climatic conditions observed over the GHA region in the month of July 2015 is reviewed and the climate outlook for September to December 2015 rainfall is also provided. Highlights on the socio-economic impacts associated with both the observed conditions and the outlook is also provided.

There are seven sections in this bulletin. In section 1, the major highlights from both the observed and expected climate conditions are outlined. Section 3 provides an overall summary. The climate patterns that prevailed in the month of April 2015 are discussed under section 4, while the dominant weather systems are discussed in the section that follows. The seasonal climate outlook over the GHA for the September to December 2015 rainfall season is presented in section 6 followed by the socio-economic impacts associated with the observed climatic conditions in July 2015 and those expected from the climate outlook in the final section.

3. SUMMARY

This bulletin has three main components, these are: the climatic conditions observed during the month of July 2015 over GHA, the climate outlook for September to December 2015rainfall period, and the impacts associated with both the observed climate conditions and the climate outlook.

Rainfall activities were mainly observed over western and central parts of the northern sector; as well as western parts of the equatorial sector of the GHA region during the month of July 2015. The observed rainfall conditions over parts of the Greater Horn of Africa during July resulted in improved crop, pasture and foliage conditions, replenishment of water resources, and water deficit leading to poor pasture and crop performance were observed over eastern parts of the northern sector.

The climate outlook for the September to December 2015 rainfall season indicates an increased likelihood of near normal to above normal rainfall over southern parts of South Sudan, southern parts of Ethiopia; southern parts of Somalia; most parts of Kenya, Uganda, Burundi; Rwanda; and northern parts of Tanzania. The rest of the region is likely to experience near normal to below normal conditions or generally dry conditions during September to December 2015 rainfall season (Figure 8).

4. CLIMATE PATTERNS IN JULY 2015

The climatological summary for the rainfall amounts and rainfall severity indices over the GHA in the month of June 2015 are provided in this section. The rainfall severity indices are derived only for those areas in the GHA region where the month of June is not a generally dry month.

4.1 Rainfall amounts and performance during July 2015

During the month of July 2015, western parts of Ethiopia, south eastern and south western Sudan; parts of eastern and south western South Sudan; parts of north western and south eastern Uganda as well as western parts of Kenya received rainfall amounts of between 100mm to above 200mm (Figure 1), with western parts of Ethiopia; eastern parts of South Sudan, and northern western Uganda receiving more than 200mm of rainfall. South western parts of Eritrea; north eastern parts of South Sudan; western and coastal parts of Kenya; central and eastern parts of Uganda; and southern parts of Sudan recorded rainfall amounts of between 50mm to 100 mm (Figure 1). While the rest of the GHA indicated less than 50 mm of rainfall.

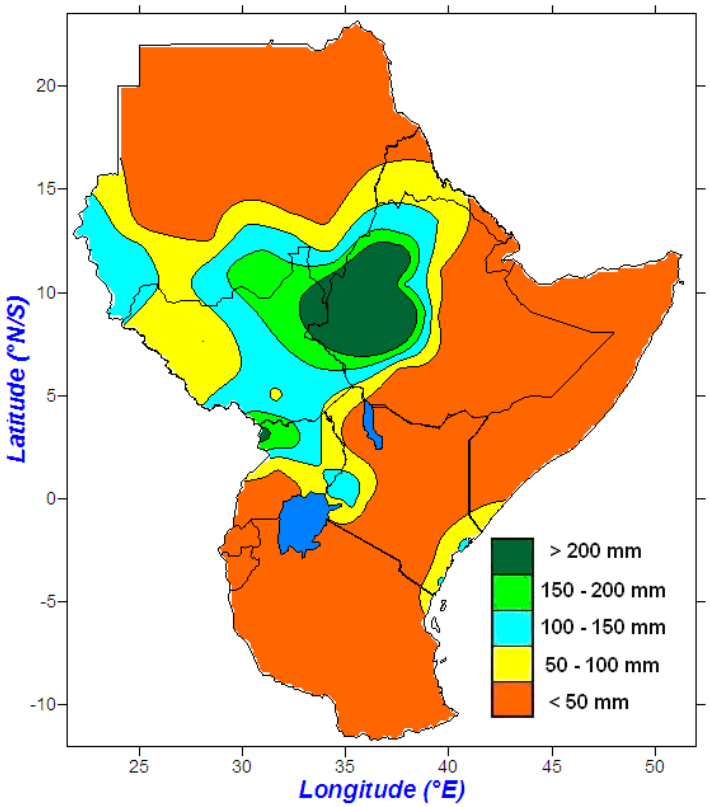

Figure 1: Spatial distribution of rainfall during the month of July 2015

4.2 Climate severity

Rainfall severity indices are derived by considering all observations which are less than 25% (first quartile) of the ranked historical records to be dry while those which are more than 75% (third quartile) are considered wet.

During July 2015, near-normal to wet conditions are observed in western parts of Ethiopia; south western and south eastern Sudan; north eastern and south western South Sudan; north eastern and south western Uganda; as well as western and coastal parts of Kenya (Figure 2). Near normal to dry rainfall conditions are experienced over most parts of Eritrea; western and coastal parts of Kenya; western and eastern Uganda; parts of central and northern Ethiopia; as well as southern parts of Sudan. The rest of the GHA indicates generally dry conditions. (Figure 2)

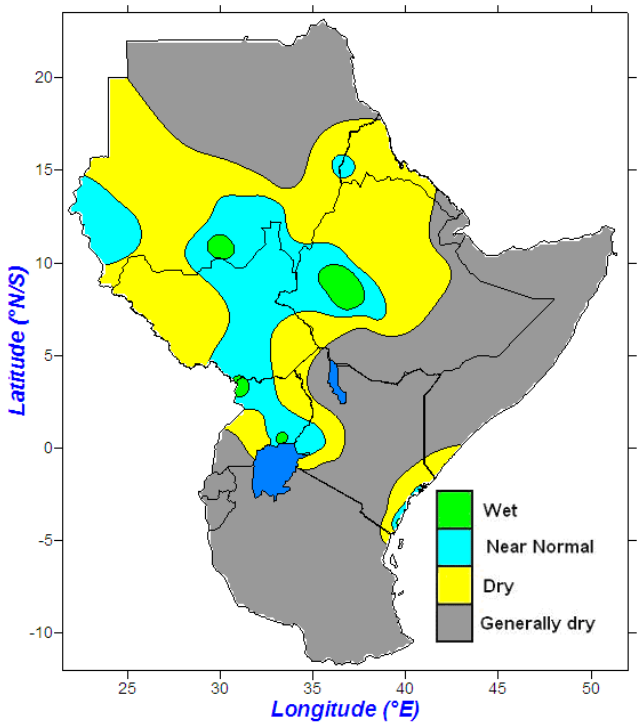

Figure 2: Rainfall severity index for the month of July 2015

4.2.1 Cumulative climate stress severity monitoring

The extent of climate-related impacts on any particular system depends on the severity and duration of the climate stress. Direct and indirect severe impacts on health and food security, water resources and livestock, among other socio-economic sectors emanates from cumulative climate stress severity. The indices used to monitor cumulative rainfall severity over GHA are presented in the next section.

4.2.2 Cumulative rainfall performance from January 2015

The cumulative dekadal rainfall was used to evaluate the rain water stress over GHA region. Figure 3 shows the cumulative dekadal rainfall performance since January 2015. Near normal to above normal rainfall was observed over south western parts of northern sector as well as

western parts of equatorial sector (Figure 3a, and 3b). While near normal to dry conditions were experienced over eastern parts of the northern sector (Figure 3c).

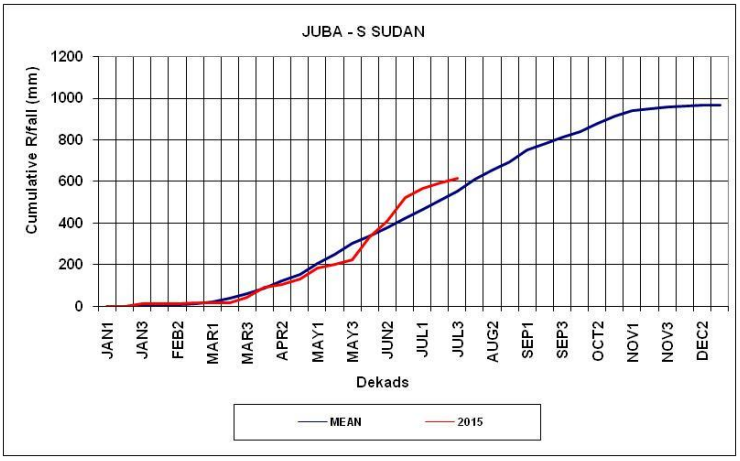

Figure 3a: Cumulative rainfall series for Juba

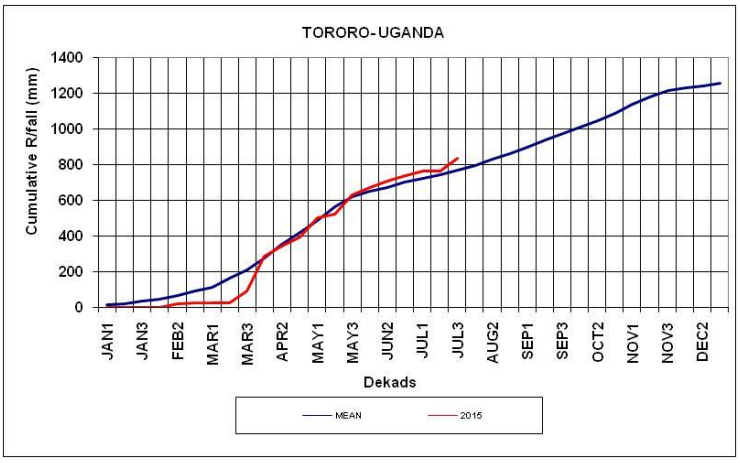

Figure 3b: Cumulative rainfall series Tororo

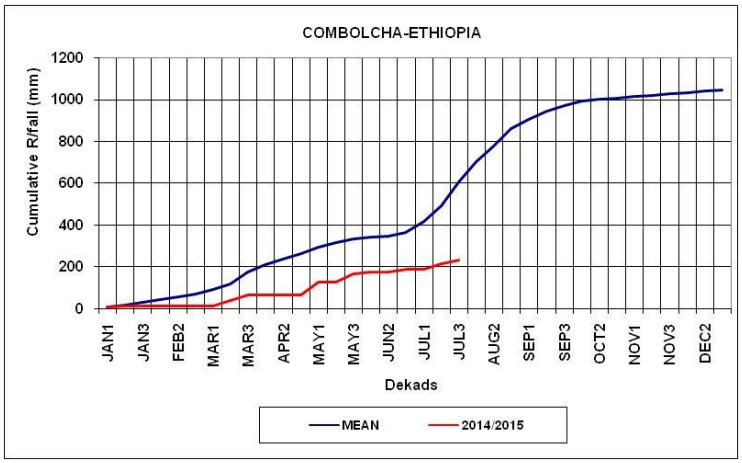

Figure 3c: Cumulative rainfall series for Combolcha

4.3 Rainfall anomalies

4.3.1 Rainfall anomalies during May to July 2015 period

During May to July 2015 period parts of Djibouti; northern tip of Somalia; southern Eritrea; south western Ethiopia southern Kenya and north eastern Tanzania recorded rainfall amount of between 75% to more than 175% of the long term average rainfall of the period. South western and southern part of Sudan; western parts of Ethiopia; most parts of Uganda; northern Tanzania; western, southern, and coastal Kenya; northern parts of Somalia; central and southern parts of Eritrea; as well as western and southern parts of South Sudan recorded between 75% to 125% of long-term average rainfall (Figure 4). Northern parts of Sudan; parts of central and southern Somalia; parts of eastern Kenya and south western parts of Tanzania recorded rainfall amounts of less than 25% of long term rainfall average, while the rest of the region received between 25% to 75% of long term mean rainfall (Figure 4) for the three-month long-term mean rainfall during the May-Junly2015 period.

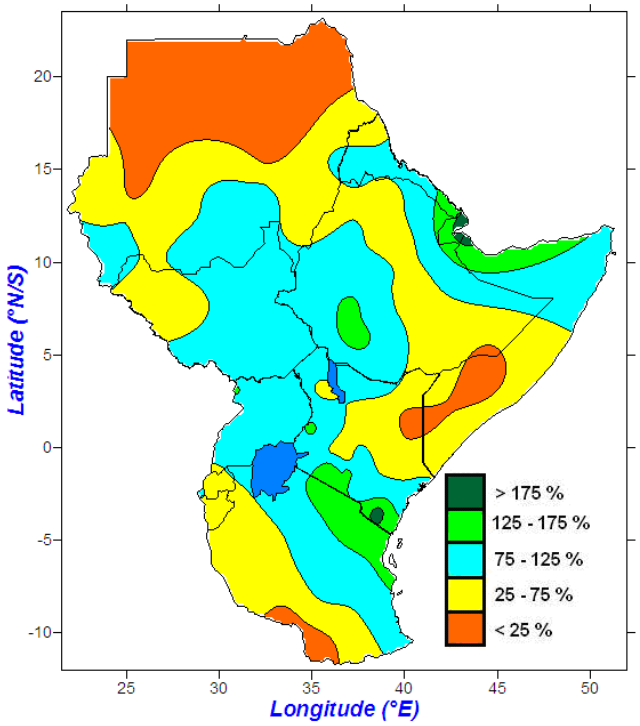

Figure 4: Spatial pattern of rainfall anomalies for May to July 2015 period

4.4 Temperature anomalies

4.4.1 Maximum temperature anomalies

During the month of July 2015 warmer than average maximum temperatures prevailed over most parts of the Greater Horn of Africa (GHA) region (Figure 5a). Positive maximum temperature anomalies exceeding 2°C were recorded over South Sudan; Rwanda; Burundi; western and southern parts of Tanzania; northern Ethiopia; northern Eritrea; western Kenya; southern Parts of Sudan; and most parts of Uganda (Figure 5a).

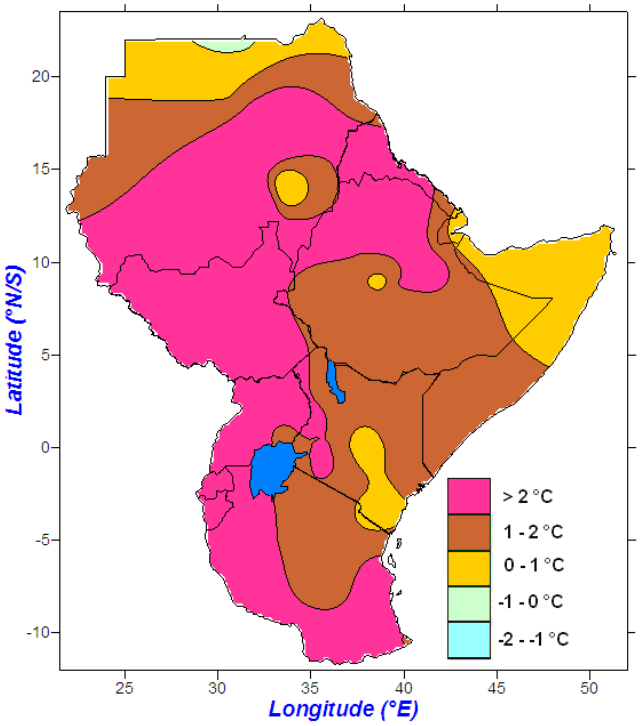

Figure 5a: Maximum temperature anomalies for July 2015

4.4.2 Minimum temperature anomalies

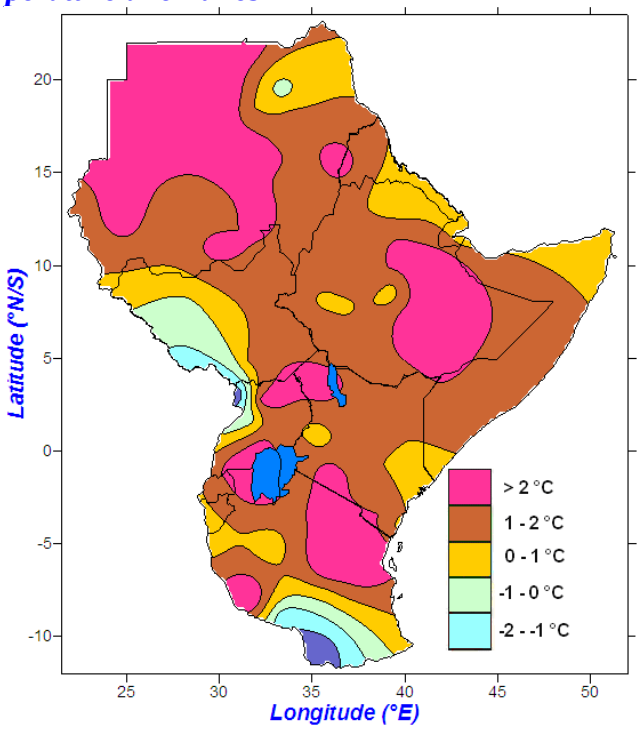

Figure 5b: Minimum temperature anomalies for the month of July 2015

During July 2015, most parts of the GHA received warmer than average minimum temperature anomaly except for south western South Sudan, north western Uganda, and south western

Tanzania (Figure 5b). Positive minimum temperature anomalies exceeding 2°C were observed over north western Sudan; eastern Ethiopia; south western Uganda; parts of north western; north eastern and western Tanzania; as well as north western and southern Kenya(Figure 5b). Negative minimum temperature anomalies exceeding 2°C were observed over north eastern Uganda and south western Tanzania during the month of July 2015.

5. STATUS OF THE CLIMATE SYSTEMS

During the period of mid July to mid August 2015 above average sea surface temperatures (SSTs) were observed over the equatorial Indian Ocean. The eastern equatorial Indian Ocean indicated neutral to warmer than average SSTs, and western equatorial Indian Ocean also indicated neutral to warmer than average SSTs (Fig.6) resulting in moderate and positive Indian Ocean dipole index (Figure.7a). Warmer than average SSTs were observed over eastern equatorial Pacific Ocean (Figure. 6) an indication of positive ONI Index (Figure 7b).

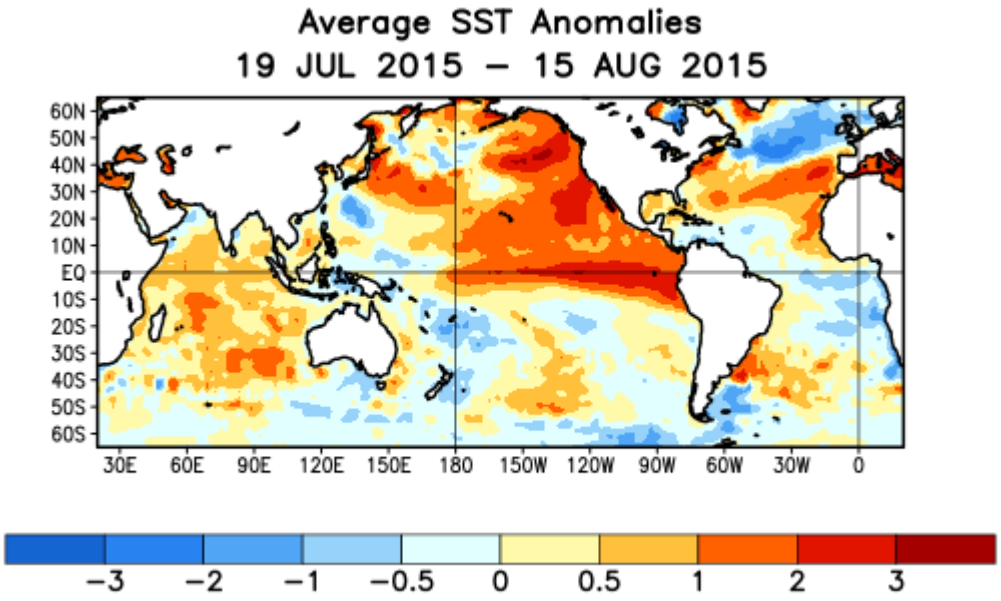

Figure 6: Sea Surface Temperature anomalies for the period 07 June to 04July 2015 (Courtesy of NOAA)

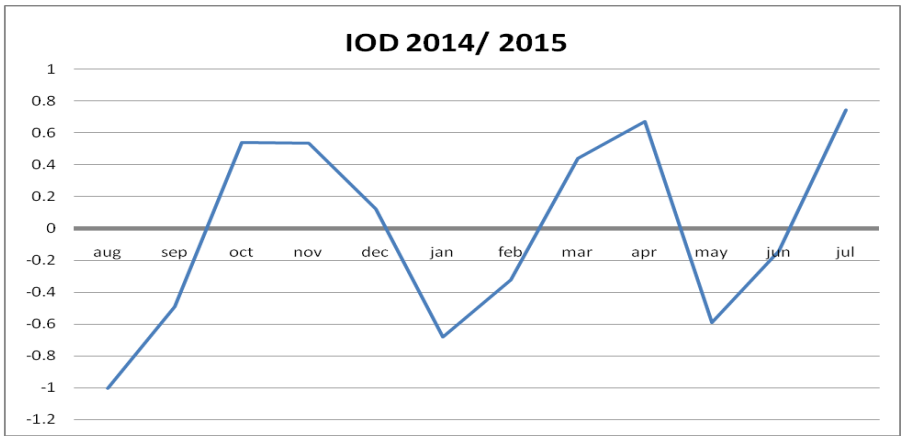

Figure 7a: Indian Ocean Dipole (IOD) for 2015 and Analogue Years

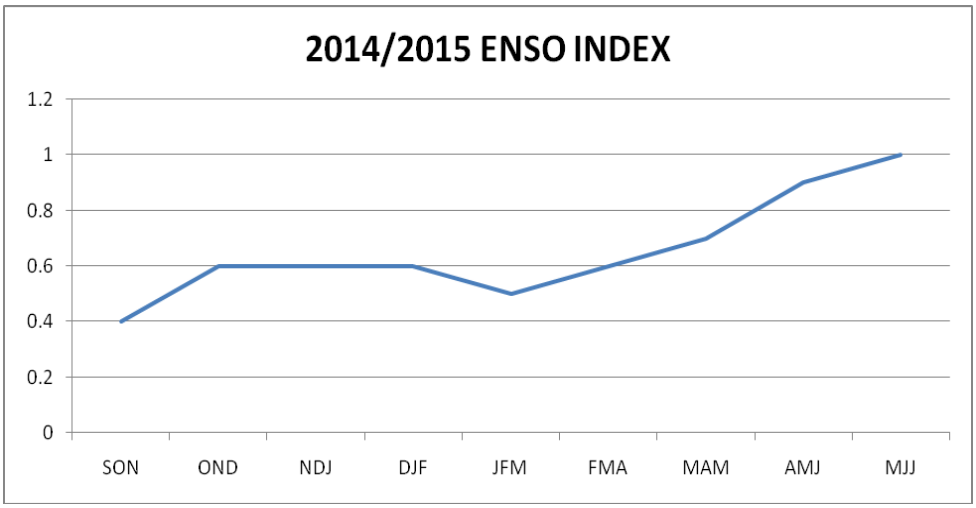

Figure 7b: ENSO index for 2014/2015

6.0 CLIMATE OUTLOOK FOR JUNE TO AUGUST 2015

6.1 The Climate Outlook Forum

The Forty First Greater Horn of Africa Climate Outlook Forum (GHACOF41) was convened from 24-25 August 2015 at Kunduchi Beach Hotel, Dar Es Salaam, Tanzania by the IGAD Climate Prediction and Applications Centre (ICPAC) in collaboration with the World Meteorological Organization (WMO), and partners to formulate a consensus regional climate outlook for the September to December 2015 rainfall season over the GHA region. The GHA region comprises Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania and Uganda.

The Forum was an interactive event that brought together climate information user experts from critical socio-economic sectors, governmental and non-governmental organisations, decision-makers, climate scientists, civil society stakeholders among others. It reviewed the implications of the key factors expected to influence the evolution of the regional climate during the SOND 2015 rainfall season include the Sea Surface Temperature (SST) anomalies over the tropical Oceans and their implications on rainfall bearing mechanisms including (i) the phase and strength of Indian Ocean Dipole mode (IOD) which is currently positive (ii) likely impacts of the current El Niño event over equatorial eastern Pacific ocean that is predicted to persist during the rest of 2015 and early months of 2016; (iii) SST anomalies over the Atlantic Ocean The influence of these ocean processes will be modulated by regional circulation processes, topography and large inland water bodies.

Users of climate information who participated in GHACOF 41 were drawn from various sectors including agriculture and food security, disaster risk management, water resources, health, media and as well as non-governmental organisations and development partners. The participants provided sector specific assessment of the usefulness of the previous regional consensus climate outlook and formulated sector specific mitigation strategies based on the consensus regional climate outlook for the September to December 2015 rainfall season.

6.2 Rainfall Outlook for September and December 2015

The rainfall outlook for various zones within the GHA region is given in figure 8 below.

Zone I & VI: These areas are usually dry during September to December season

Zone II: Increased likelihood near normal to below normal rainfall

Zone III: Increased likelihood of above normal to near normal rainfall

zone IV&V: Increased likelihood of near normal to above normal rainfall

Note:
The numbers for each zone indicate the probabilities of rainfall in each of the three categories, above-, near-, and below-normal. The top number indicates the probability of rainfall occurring in the above-normal category; the middle number is for near-normal and the bottom number for below-normal category. For example, in zone III, there is 45% probability of rainfall occurring in the above-normal category; 35% probability of rainfall occurring in the near-normal category; and 20% probability of rainfall occurring in the below-normal category. It is emphasised that boundaries between zones should be considered as transition areas.

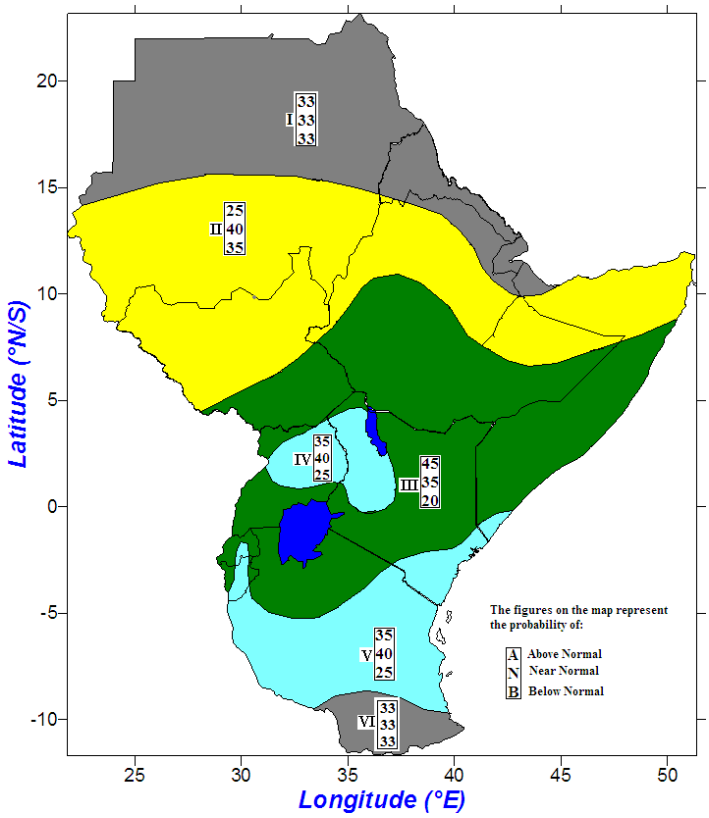

Figure 8: Greater Horn of Africa Consensus Climate Outlook for September to December 2015 rainfall season

7.0 IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed rainfall conditions and those from the climate outlook are provided below.

7.1 Vegetation condition indicators and associated impacts

The difference of the Normalized Difference Vegetation Index (NDVI) between July 2015 and June 2015 indicates an improved vegetation conditions over southern parts of Sudan; western Ethiopia; northern parts of South Sudan; and northern parts of Somalia. Eastern and southern parts of Ethiopia; southern parts of Somalia; central, southern and coastal Kenya; most parts of Tanzania; southern parts of Uganda; eastern parts of Rwanda; and eastern Burundi indicated deteriorated vegetative conditions while the rest of the region indicated no change in vegetation conditions (Figure 9)

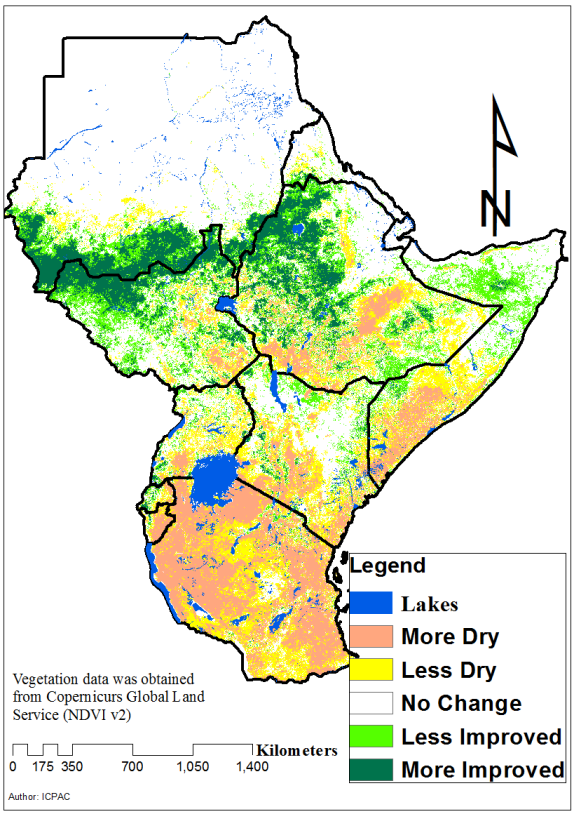

Figure 9: Vegetation difference between July and June 2015 over the Greater Horn of Africa

7.2 Impacts of observed climate conditions during July 2015

The socio-economic impacts associated with the observed rainfall over much of the Greater Horn of Africa during the month of July 2015 were as follows:

- Improved crop, pasture and foliage conditions;
- Replenishment of water reservoirs;
- Localised flooding leading to destruction of property, displacement of people, and disruption of livelihood;
- Increase of water related diseases;

In regions that experienced dry conditions the impacts were:

- Poor pasture and water availability leading to reduced livestock productivity;
- The water and food scarcity.
- Increased water related diseases;
- Poor crop performance.
- Delay in commencement of planting season

7.3 Potential impacts for September to December 2015 climate outlook

The areas expected to receive normal to above normal rainfall are likely to have the following impacts:

- Good prospects for crop and livestock performance;
- Improvement in water resources and replenishment of reservoirs;
- Flooding that may lead to disruption of livelihood of people, and destruction of property;
- Outbreaks of water related diseases.

The areas expected to receive near normal to below normal rainfall are likely to have the following impacts:

- Poor prospects for crop and pasture performance;
- Risk of water scarcity;
- Outbreaks of water related diseases;
- If the dry conditions occur within the agricultural areas, this could lead to water stress conditions and may cause significant water and pasture scarcity, crop and livestock losses.