



## IGAD Climate Prediction and Applications Centre Monthly Bulletin, September 2015

*For referencing within this bulletin, the Greater Horn of Africa (GHA) is generally subdivided into three sub-regions: The equatorial sector lying approximately between  $-5^{\circ}$  and  $5^{\circ}$  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 of the Greater Horn of Africa (GHA) during the month of August 2015;
- During October to December 2015 rainfall period several areas within the equatorial sector are likely to receive above normal rainfall, while the southern sector has high probability for near normal to above normal rainfall.
- The observed rainfall activities over the GHA during the month of August 2015 resulted in improved crop, pasture and foliage conditions and improvement in water resources over some parts of northern sectors. However, it also led to increased incidence of water related diseases.

### 2. INTRODUCTION

In this bulletin, the climatic conditions observed over the GHA region in the month of August 2015 is reviewed and the climate outlook for October 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 August 2015 are discussed under section 4, while the dominant weather systems are discussed in the section that follows. The climate outlook over the GHA for the season of October to December 2015 is presented in section 6 followed by the socio-economic impacts associated with the observed climatic conditions in August 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 August 2015 over GHA, the climate outlook for October-December (OND) 2015 rainfall period, and the impacts associated with both the observed climate conditions and the climate outlook.

Rainfall activities were mainly observed over south western and central parts of the northern sector; as well western parts of the equatorial sector of the GHA region during the month of August 2015. The observed rainfall conditions over parts of the Greater Horn of Africa during August resulted in improved crop, pasture and foliage conditions, replenishment of water resources, and reported cases of flooding leading to disruption of livelihood.

The climate outlook for October to December 2015 rainfall season indicates an increased likelihood of above normal rainfall over much of the equatorial sector, high probability for near to above normal rainfall over the southern sector and increased likelihood for near to below normal rainfall over parts of the northern sector of the GHA (Figure 8).

#### 4. CLIMATE PATTERNS IN AUGUST 2015

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

##### 4.1 Rainfall amounts and performance during August 2015

During the month of August 2015, western, central and northern parts of Ethiopia; northern parts of South Sudan; southern parts of Sudan; parts of central and south eastern Uganda; as well as parts of western Kenya received between 100mm to above 200mm of rainfall (Figure 1), with south western and south eastern parts of Sudan, western and northern parts of Ethiopia; as well as north eastern and north western South Sudan receiving more than 200mm of rainfall. Northern parts of Sudan; most parts of Djibouti; most parts of Somalia Kenya; Rwanda; Burundi; Tanzania; and south western parts of Uganda received less than 50mm of rainfall, while the rest of the GHA indicated rainfall amounts of between 50mm -10mm (Figure 1).

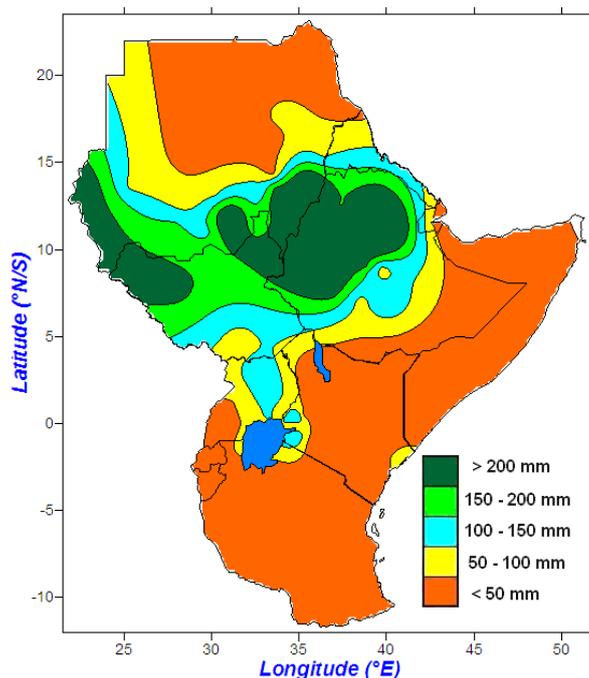
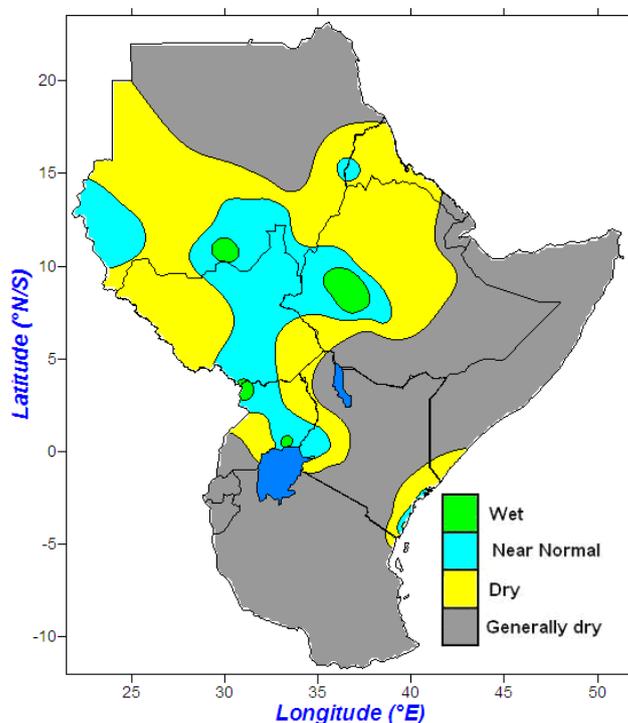


Figure 1: Spatial distribution of rainfall during the month of Aug 2015

##### 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 August 2015, most parts of the GHA region observed dry to generally dry conditions apart from south western and south eastern parts of Sudan; north eastern and south western parts of South Sudan; western parts of Ethiopia; western and coastal parts of Kenya; and north western and south eastern parts of Uganda which received near-normal to wet conditions.



**Figure 2: Rainfall severity index for the month of September 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 June 2015. Near normal to above normal rainfall conditions was observed over southern and central parts of the northern sector (Figure 3a) while near normal to below normal rainfall was observed over the western parts of the northern sector (Figure 3b and 3c).

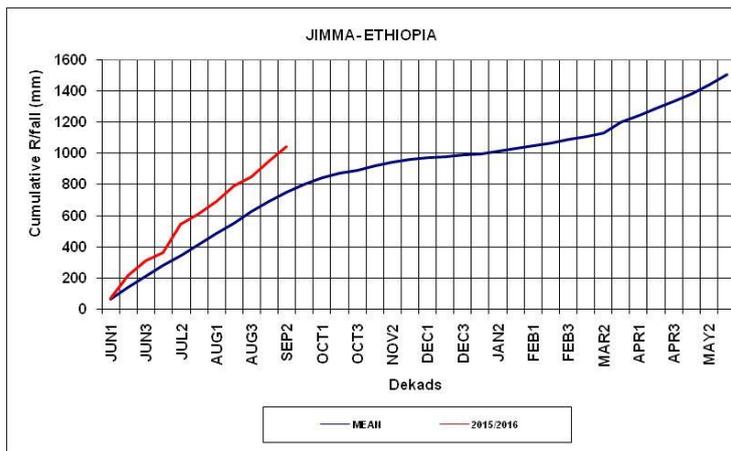


Figure 3a: Cumulative rainfall series for Jimma

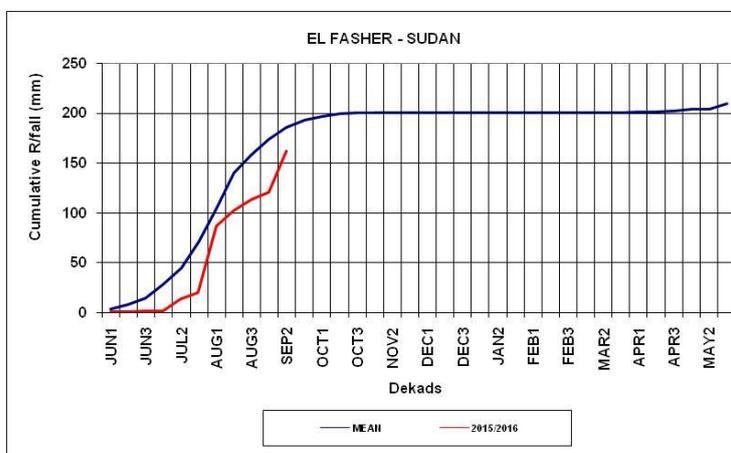


Figure 3b: Cumulative rainfall series for EL-Fasher

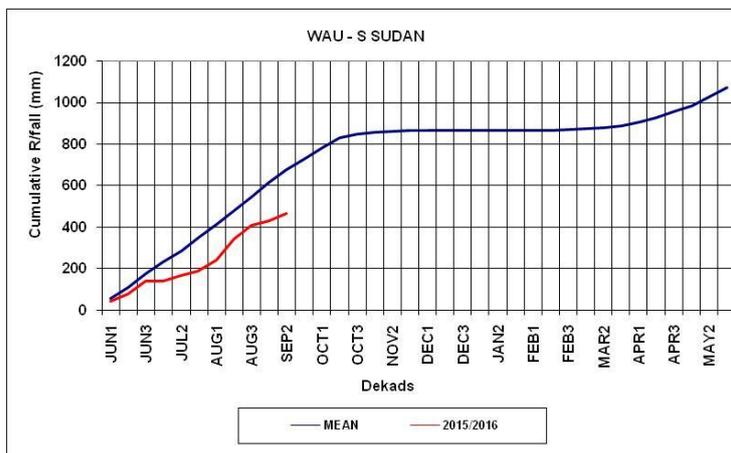


Figure 3c: Cumulative rainfall series for Wau

### 4.3 Rainfall anomalies

#### 4.3.1 Rainfall anomalies during June to August 2015 period

During June to August 2015 period south western and south eastern parts of Sudan; central and southern parts of Kenya; south western and south eastern parts of Uganda; as well as northern Tanzania received between 125% to more than 175 % of long term average rainfall of the period (Figure 4). Most parts Somalia; eastern and western parts of Ethiopia; northern parts of Sudan; northern Eritrea; and southern parts of Tanzania received less than 25% of long term mean rainfall. The rest of the region received between 75%-125% or between 25% -75% of the long-term rainfall (Figure 4) for the three-month long-term mean rainfall during the June-August 2015 period.

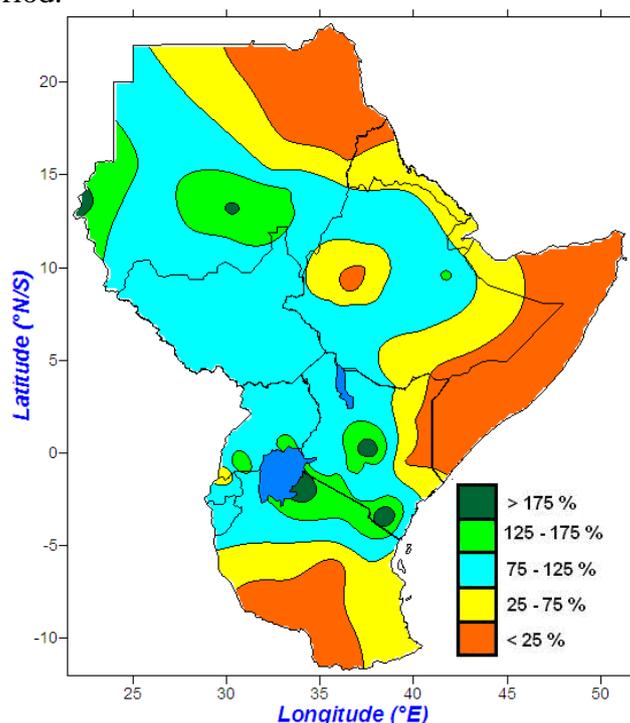


Figure 4: Spatial pattern of rainfall anomalies for June to August 2015 period

### 4.4 Temperature anomalies

#### 4.4.1 Maximum temperature anomalies

During the month of August 2015, warmer than average maximum temperatures prevailed over most parts of the Greater Horn of Africa (GHA) region (Figure 5a) except for isolated regions of western and eastern Uganda as well southern parts of Tanzania which recorded less than average maximum temperatures, with southern Tanzania recording negative maximum temperature anomalies below 2°C. Positive maximum temperature anomalies exceeding 2°C were recorded over northern and southern parts of Sudan; parts of eastern Ethiopia; eastern and southern Kenya; northern parts of South Sudan; northern and southern parts of Uganda; as well as western parts of Tanzania (Figure 5a).

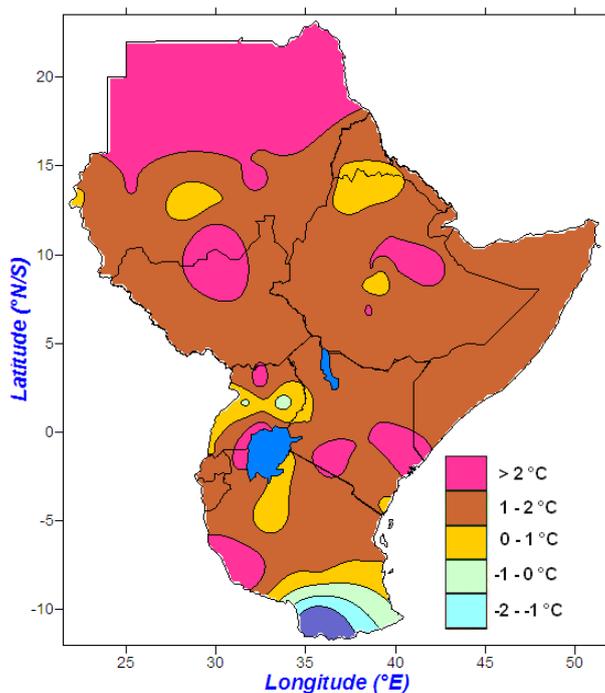


Figure 5a: Maximum temperature anomalies for August 2015

#### 4.4.2 Minimum temperature anomalies

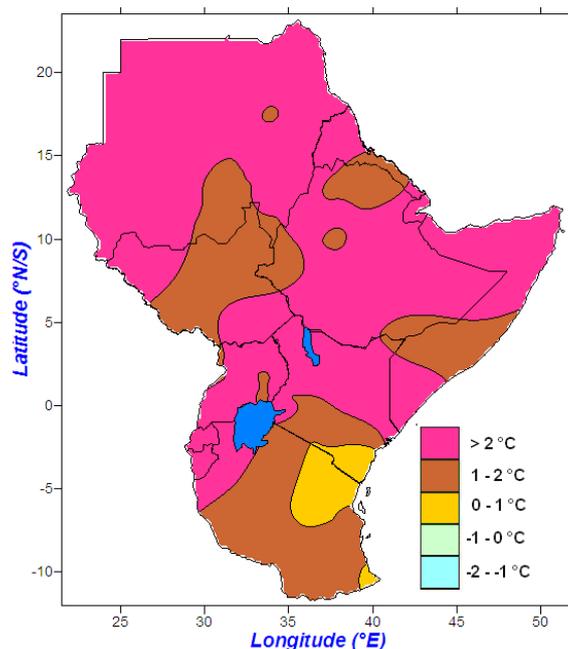


Figure 5b: Minimum temperature anomalies for the month of August 2015

During August 2015, most parts of the GHA received warmer than average minimum temperatures (Figure 5b). Positive minimum temperature anomalies exceeding 2°C were observed over most parts of Sudan; Rwanda; Burundi; most parts of Uganda; Ethiopia; northern and southern parts of Somalia; north western Tanzania; south eastern and north western South Sudan; as well as most parts of northern Kenya (Figure 5b) during the month of August 2015.

### 5. STATUS OF THE CLIMATE SYSTEMS

During the period of mid August to mid September 2015 above average sea surface temperatures (SSTs) were observed over much of equatorial Indian Ocean while the eastern equatorial Indian Ocean indicated neutral to cooler than average SSTs (Fig.6) resulting a positive Indian Ocean dipole index (Figure.7a). Warmer than average SSTs were also observed over eastern and central equatorial Pacific Ocean (Figure. 6) an indication of positive ONI Index over Niño 3.4 index region (Figure 7b)

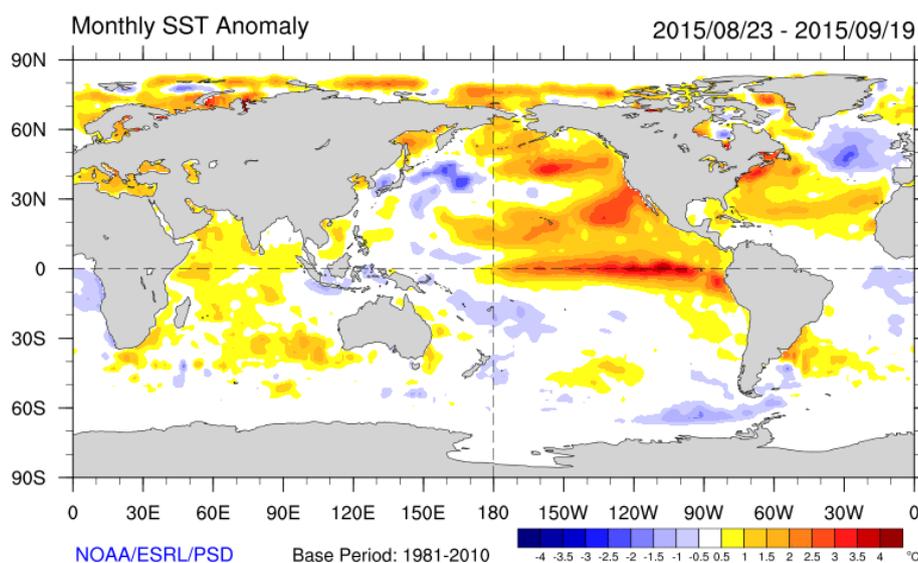


Figure 6: Sea Surface Temperature anomalies for the period 07 June to 04 July 2015 (Courtesy of NOAA)

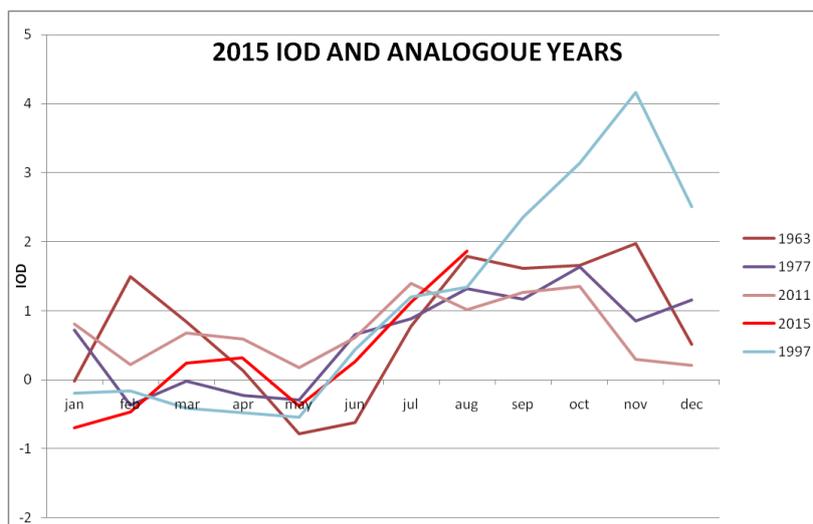


Figure 7a: Indian Ocean Dipole (IOD) for 2015 and Analogue Years

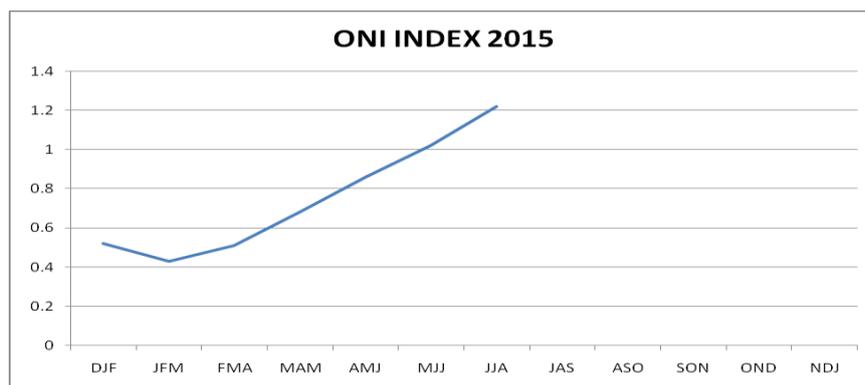


Figure 7b: ONI index for 2015

### 6.0 CLIMATE OUTLOOK FOR OCTOBER TO DECEMBER 2015

The rainfall outlook for October to December 2015 period indicates a high likelihood of above normal rainfall over Uganda; Kenya; Rwanda; Burundi; western and southern Ethiopia; southern parts of South Sudan; central and southern Somalia; and northern Tanzania (Figure 8). Near normal to below normal rainfall is likely to be experienced northern parts of South Sudan; southern parts of Sudan; northern and eastern parts of Ethiopia; parts of Djibouti; and northern parts of Somalia, while near normal to above normal rainfall is likely to be experienced over central and southern Tanzania. The rest of the region is likely to remain generally dry (Figure 8)

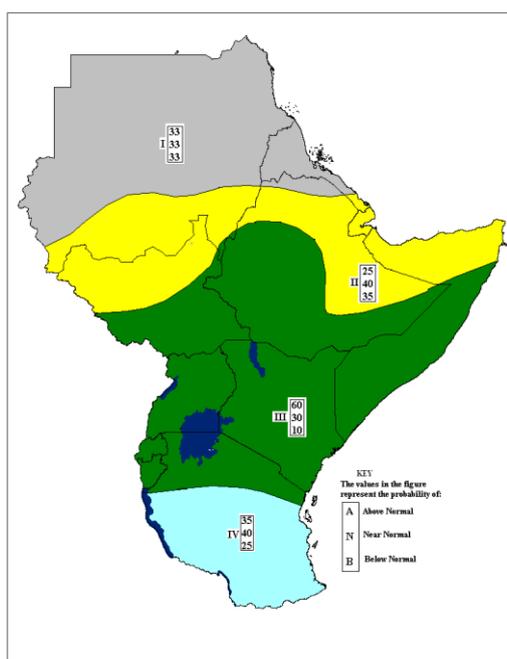


Figure 8: Climate Outlook for October to December 2015 rainfall

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

- Zone I** These areas are usually dry during October to December rainfall season
- Zone II:** Increased likelihood of near normal to below normal rainfall
- Zone III:** Increased likelihood of above normal to near normal rainfall
- zone IV:** Increased likelihood of near normal to above normal rainfall

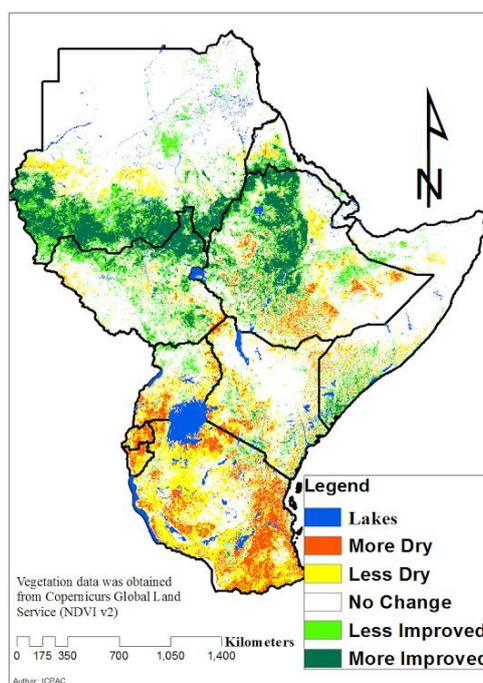
The numbers for each zone indicate the probabilities of rainfall in each of the three categories, above-, near-, and below-normal. The top number indicates the probability of rainfall occurring in the above-normal category; the middle number is for near-normal and the bottom number for below-normal category.

## 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 August 2015 and July 2015 indicates an improved vegetation conditions over southern parts of Sudan Central and western Ethiopia; northern and western parts of South Sudan; and southern parts of Somalia. Much of Tanzania; Burundi; Rwanda; western parts of Kenya; south eastern Ethiopia; and southern Uganda indicated deteriorated vegetative conditions, while the rest of the region indicated little or no change in vegetation conditions (Figure 9)



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

### 7.2 Impacts of observed climate conditions during August 2015

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

- Improved crop, pasture and foliage conditions;
- Replenishment of water reservoirs;
- Localised flooding leading to disruption of livelihood activities;
- Incidence of water related diseases;

In regions that experienced dry conditions the impacts were:

- Poor pasture condition and water availability leading to reduced livestock productivity;
- Poor crop performance.

### 7.3 Potential impacts for October - 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 availability through replenishment of reservoirs;
- High risk of flooding and landslides with associated impacts within risk-prone areas which may lead to disruption of livelihood and destruction of property;
- Outbreaks of water related diseases.
- Extended wet season may disrupt crop harvesting

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 which may lead to food shortages in the coming months;
- 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 lead to significant water and pasture scarcity, crop and livestock losses.