



November 2015  
No. ICPAC/02/284

## IGAD Climate Prediction and Applications Centre Monthly Bulletin, November 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 south-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 October 2015;
- During December 2015 to February 2016 rainfall period most parts of the southern sector and southern parts of the equatorial sector are likely to receive near normal to above normal rainfall, while the northern parts of the equatorial sector are likely to receive near normal to below normal rainfall over the same period;
- The socio-economic impacts associated with the observed rainfall over the GHA during the month of September 2015 resulted in improved crop, pasture and foliage conditions, increase in water related diseases; and improvement in water resources over some parts of equatorial sectors.

### 2. INTRODUCTION

In this bulletin, the climatic conditions observed over the GHA region in the month of October 2015 is reviewed and the climate outlook for 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 October 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 December 2015 is presented in section 6 followed by the socio-economic impacts associated with the observed climatic conditions in October 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 October 2015 over GHA, the climate outlook for December 2015 rainfall period, and the impacts associated with both the observed climate conditions and the climate outlook.

Rainfall activities were mainly observed over western and south-central parts of the northern sector; as well as western and central parts of the equatorial sector of the GHA region during the month of October 2015. The observed rainfall conditions over parts of

the Greater Horn of Africa during October resulted in improved crop, pasture and foliage conditions, replenishment of water resources, and cases of flooding were also reported which led to disruption of livelihood.

The climate outlook for the December 2015 to February 2016 rainfall season indicates an increased likelihood of near normal to above normal rainfall over most parts of the southern sector and southern parts of the equatorial sector. Southern western parts of the northern sector as well as northern parts of the equatorial sector are likely to experience near normal to below normal conditions, with the rest of the GHA region pointing to a general climatology during (Figure 8).

#### 4. CLIMATE PATTERNS IN OCTOBER 2015

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

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

During the month of October 2015, central and southern parts of South Sudan; western and south western Ethiopia; most parts of Uganda; central and western parts of Kenya parts of Rwanda; Burundi and north eastern parts of Tanzania received between 100mm to more than 200mm rainfall (Figure 1), central Uganda and the Lake Victoria peripherals receiving more than 200mm of rainfall. The rest of the GHA region received between 50mm to 100mm or less than 50 mm of rainfall during the month of OCTOBER 2015.

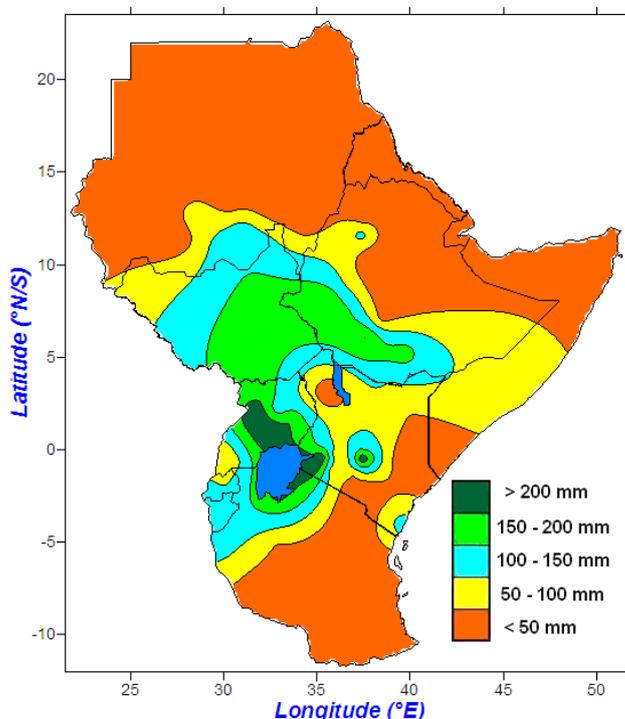
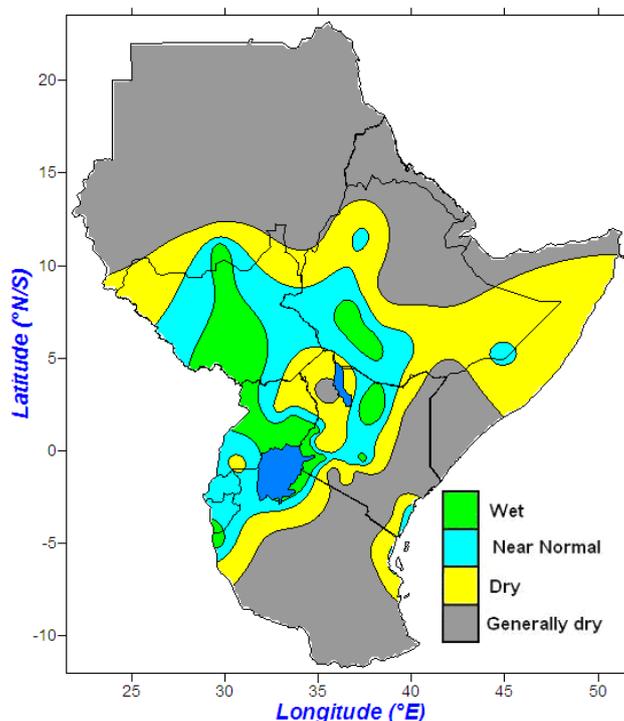


Figure 1: Spatial distribution of rainfall during the month of October 2015

##### 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 October 2015, most of the GHA indicated dry to generally dry rainfall conditions except for most parts of South Sudan; most parts of Uganda; south western Ethiopia; western, central and northern parts of Kenya; north eastern Tanzania; and most parts of Rwanda and Burundi which received near-normal to wet rainfall conditions (Figure 2).



**Figure 2: Rainfall severity index for the month of October 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 June 2015**

The cumulative dekadal rainfall was used to evaluate the rain water stress over GHA region. Figure 3 shows the cumulative rainfall performance since June 2015. Near normal to below normal rainfall was observed over south central parts of northern (Figure 3a). Near normal to above normal conditions were experienced over western parts of the equatorial sector (Figure 3b and 3c).

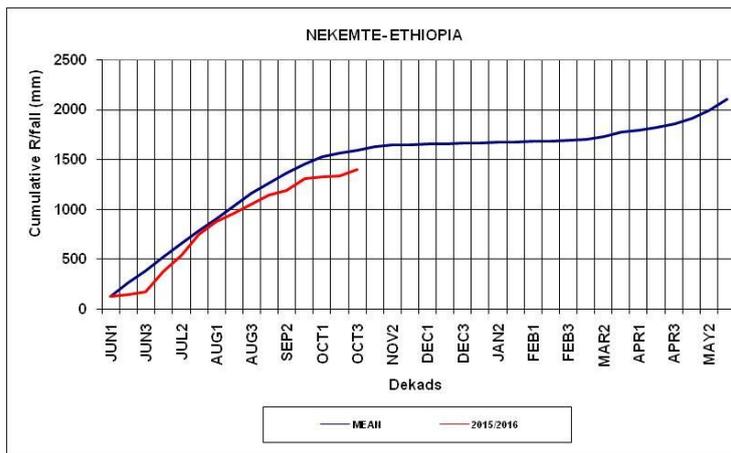


Figure 3a: Cumulative rainfall series for Nekemte

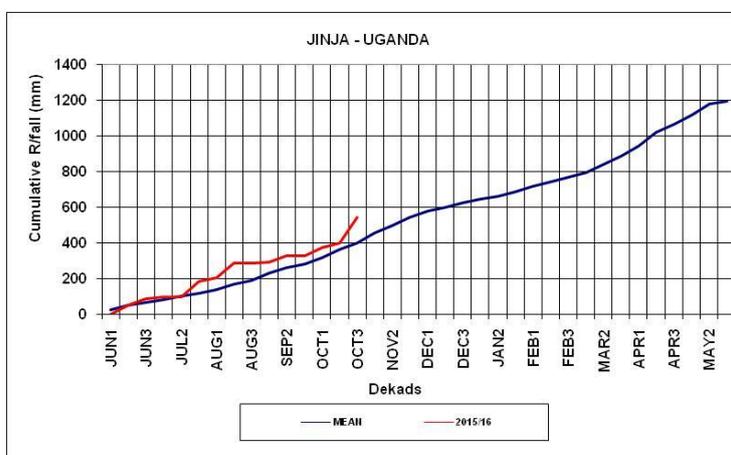


Figure 3b: Cumulative rainfall series Jinja

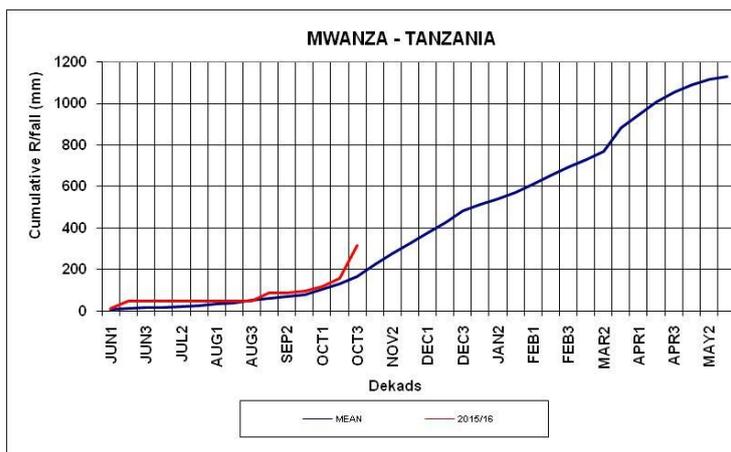


Figure 3c: Cumulative rainfall series for Mwanza

### 4.3 Rainfall anomalies

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

During August to October 2015 rainfall period, southern and eastern parts of Sudan; parts of Eritrea; northern, western and eastern Ethiopia; northern and western South Sudan; southern and western Uganda; most parts of Rwanda and Burundi; central and southern Somalia; western, central and north eastern Kenya; and north western Tanzania received between 125% to more than 175% of long term rainfall of the period (Figure 4), with eastern Sudan; north eastern Kenya; south western Ethiopia; and the regions round lake Victoria receiving more than 175 % of the long term rainfall for the period. Northern Sudan; north western and south eastern parts of Kenya; as well as southern Tanzania; received less than 25% of long term rainfall of the August to October rainfall period (Figure 4).

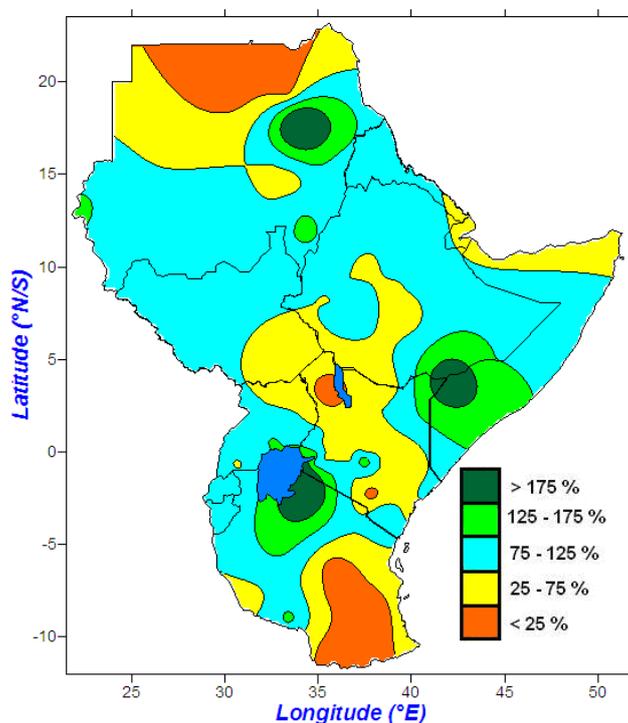
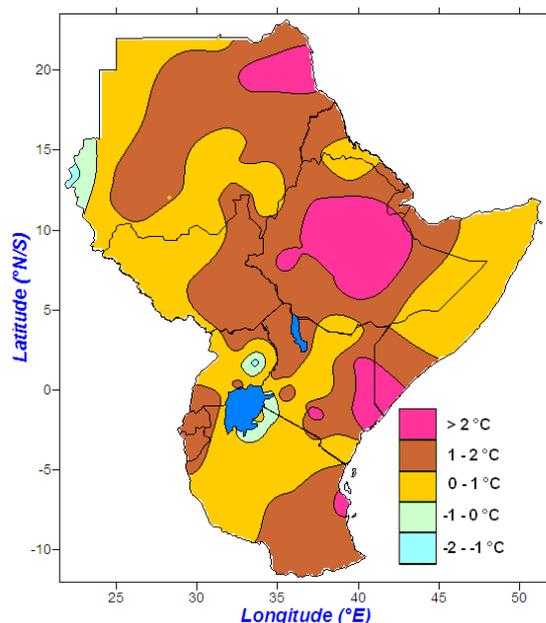


Figure 4: Spatial pattern of rainfall anomalies for August to October 2015 period

### 4.4 Temperature anomalies

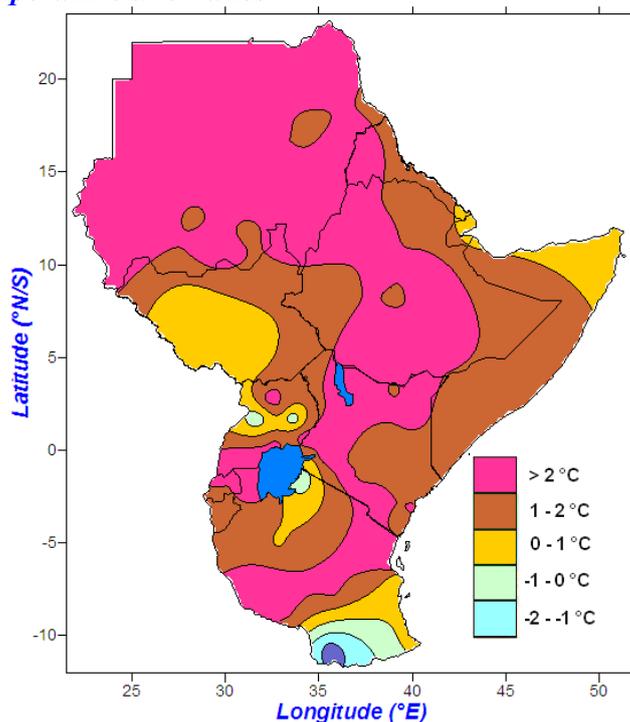
#### 4.4.1 Maximum temperature anomalies

During the month of October 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 Kenya, western Sudan; and north eastern Tanzania which recorded less than average maximum temperatures. Positive maximum temperature anomalies exceeding 2°C were recorded over central Ethiopia; eastern parts of Kenya southern parts of Somalia; north eastern parts of Sudan; and coastal parts of Tanzania (Figure 5a).



**Figure 5a: Maximum temperature anomalies for October 2015**

#### 4.4.2 Minimum temperature anomalies



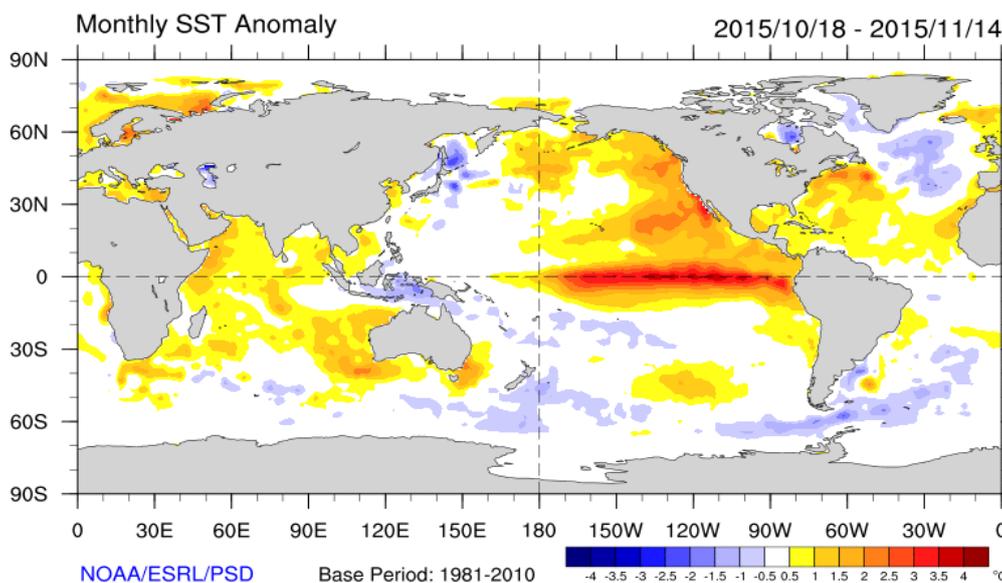
**Figure 5b: Minimum temperature anomalies for the month of October 2015**

During the month of October 2015, most parts of the GHA received warmer than average minimum temperature anomaly except for southern parts of Tanzania which received negative minimum temperature anomalies exceeding  $2^\circ\text{C}$  and also isolated parts of eastern and western Uganda (Figure 5b). Positive minimum temperature anomalies exceeding  $2^\circ\text{C}$  were observed over most parts of Sudan; north eastern, central and southern Ethiopia; northern, western and

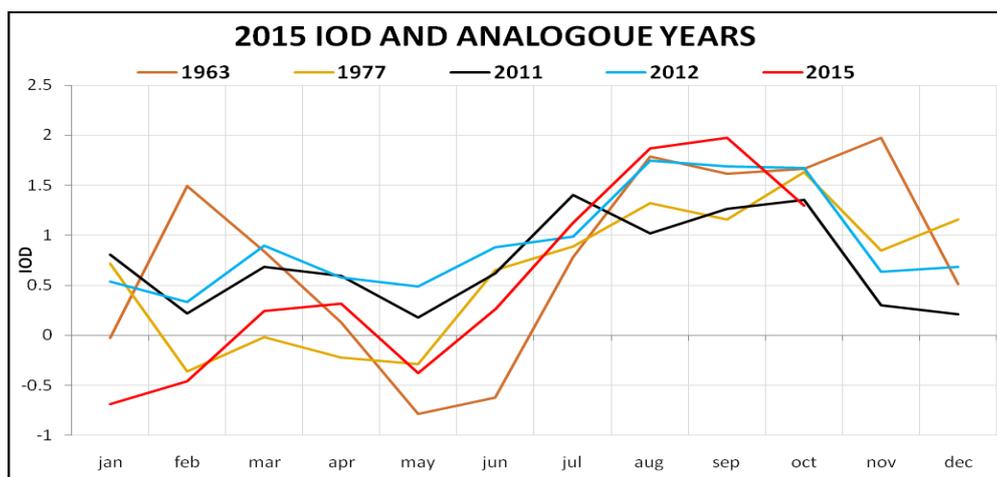
southern parts of Kenya; southern parts of Uganda; northern parts of Burundi; north eastern and central parts of Tanzania (Figure 5b) during the month of October 2015.

### 5. STATUS OF THE CLIMATE SYSTEMS

During the period of mid October to mid November 2015 above average sea surface temperatures (SSTs) were observed over equatorial Indian Ocean. The eastern equatorial Indian Ocean indicated neutral to warmer than average SSTs, while western equatorial Indian Ocean indicated warmer than average SSTs (Fig.6) resulting in a positive Indian Ocean dipole index (Figure.7a). Warmer than average SSTs were observed over eastern equatorial Pacific Ocean (Figure. 6).



**Figure 6: Sea Surface Temperature anomalies for the period 18 October to 14 November 2015 (Courtesy of NOAA)**



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

## 6.0 CLIMATE OUTLOOK FOR DECEMBER 2015

The rainfall outlook for December 2015 to February 2016 period indicates a likelihood of near to above normal rainfall over Zone III represented by western and southern parts of Kenya, southern parts of Uganda, most parts of Tanzania; most parts of Rwanda and Burundi (Figure 8). Near normal to below normal rainfall is likely to occur within Zone II represented by northern and central parts of Uganda; northern and eastern parts of Kenya; southern parts of Somalia; southern parts of South Sudan; and south western parts of Ethiopia. The rest of the region is likely to experience climatologic rainfall conditions (Figure 8).

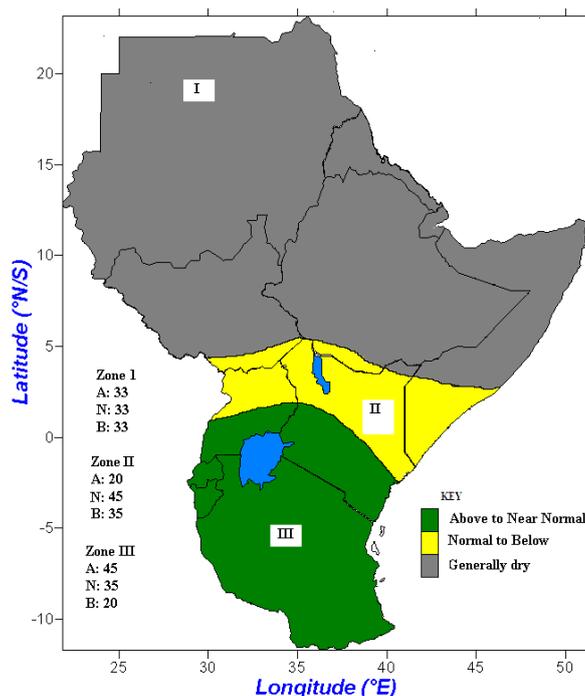


Figure 8: Climate Outlook for December 2015 to February 2016 rainfall season

## 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 October and September 2015 indicates that deteriorated vegetative conditions was observed over southern parts of Sudan; most parts of South Sudan; central and northern parts of Ethiopia; south western parts of Eritrea; north eastern Uganda; parts of western Kenya; south eastern coast of Somalia; and southern parts of Tanzania (Figure 9). Improved vegetative conditions was observed over; south eastern parts of Sudan; southern and eastern parts of Ethiopia; parts of central and southern Somalia; parts of southern Uganda; parts of western, north eastern and coastal Kenya; parts of Rwanda; and north eastern and western parts of Tanzania. The rest of the region indicated little or no change in vegetative conditions (Figure 9).

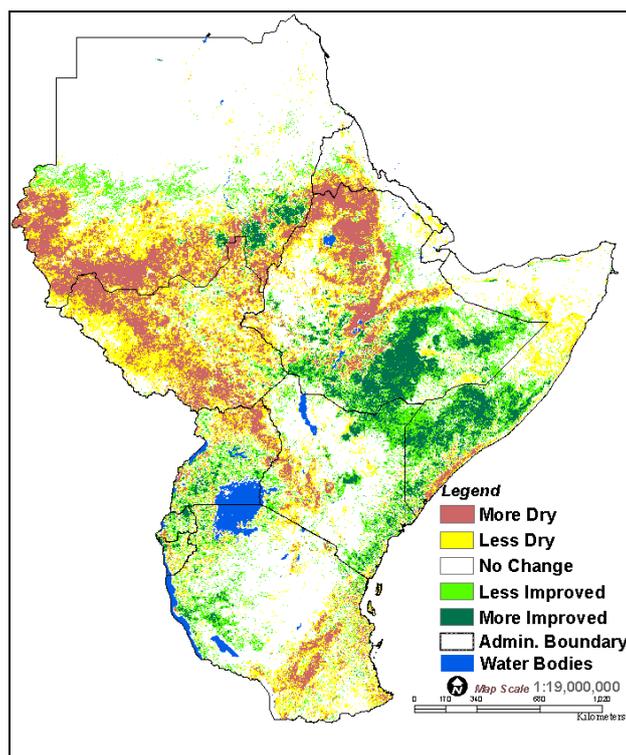


Figure 9: Vegetation difference between October and September 2015 over the Greater Horn of Africa

## 7.2 Impacts of observed climate conditions during October 2015

The socio-economic impacts associated with the observed rainfall over much of the Greater Horn of Africa during the month of October 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;
- Increased water related diseases;
- Poor crop performance.

## 7.3 Potential impacts for 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 and instances of landslides, 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;

- 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.