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

1. HIGHLIGHTS/ ACTUALITES

- Rainfall activities were mainly observed over central and south central parts of the northern sector, western and central parts of the equatorial, as well as northern and eastern parts of the southern sector of the Greater Horn of Africa (GHA) during the month of April 2016;
- During June to September 2016 rainfall period much of the western and central parts of the northern sector and central parts of the equatorial 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 April 2016 resulted in improved crop, pasture and foliage conditions, improvement in water resources, increase in water related diseases, and flooding.

2. INTRODUCTION

In this bulletin, the climatic conditions observed over the GHA region in the month of April 2016 is reviewed and the rainfall and temperature outlook for June to August 2016 rainfall season is also provided. Highlights on the socio-economic impacts associated with both the observed conditions and the outlook is also given.

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 2016 are discussed under section 4, while the dominant weather systems are discussed in the section that follows. The climate outlook over the GHA for June to August 2016 season is presented in section 6. The socio-economic impacts associated with the observed climatic conditions in April 2016 and those expected from the climate outlook in presented the final section.

3. SUMMARY

This bulletin has three main components, these are: the climatic conditions observed during the month of April 2016 over GHA, the climate outlook for June to August 2016 rainfall period, and the impacts associated with both the observed climate conditions and the climate outlook.

Rainfall activities were mainly observed over southern parts of the central and south central parts of the northern sector, western and central parts of the equatorial sector as well as the northern, southern and eastern parts of the southern sector of the GHA region during the month of April 2016. The observed rainfall conditions over parts of

the Greater Horn of Africa during April resulted in improved crop, pasture and foliage conditions, and replenishment of water resources and flooding over a few places.

The climate outlook for the June to September 2016 rainfall season indicates that much of the southern parts of Sudan; much of South Sudan; western, central and northern parts of Ethiopia; northern and eastern parts of Uganda; and north western, central and western parts of Kenya are likely to receive near normal to above normal rainfall. Western and central parts of Uganda, coastal region of Kenya, southern coast of Somalia and northern coast of Tanzania are likely to receive normal to below normal rainfall (Figure 8a). South eastern parts of Sudan; western parts of Ethiopia; and north eastern parts of South Sudan are likely record below average temperatures during the same period, with the rest of the GHA likely to experience near average to above average temperature anomaly during the same period (Figure 8b).

4. CLIMATE PATTERNS IN APRIL 2016

The climatological summary for the rainfall amounts and rainfall severity indices over the GHA in the month of April 2016 are provided in this section. The rainfall severity indices are derived only for those areas in the GHA region where the month of April is not a generally dry month.

4.1 Rainfall amounts and performance during April 2016

During the month of April 2016, northeastern, central and south western Ethiopia Southern parts of South Sudan; much of Uganda, Rwanda and Burundi; northern, western and central parts of Kenya, and northern, eastern and southern parts of Tanzania recorded rainfall amounts of between 100mm to more than 200mm of rainfall (Figures 1). The rest of the region recorded less than 100mm of rainfall.

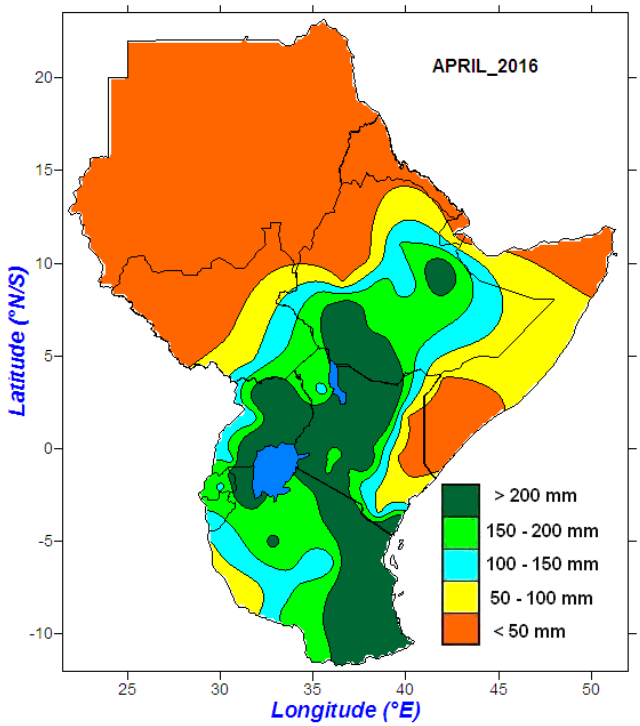

Figure 1: Spatial distribution of rainfall during the month of April 2016

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 the month of April 2016, central to southwestern parts of Ethiopia; southern parts of South Sudan; much of Uganda, Rwanda, Burundi, and Kenya; southern parts of Somalia; and north, western, eastern and south eastern Tanzania, recorded near-normal to wet rainfall conditions (Figure 2). The rest of the GHA recorded dry to generally dry rainfall conditions (Figure 2).

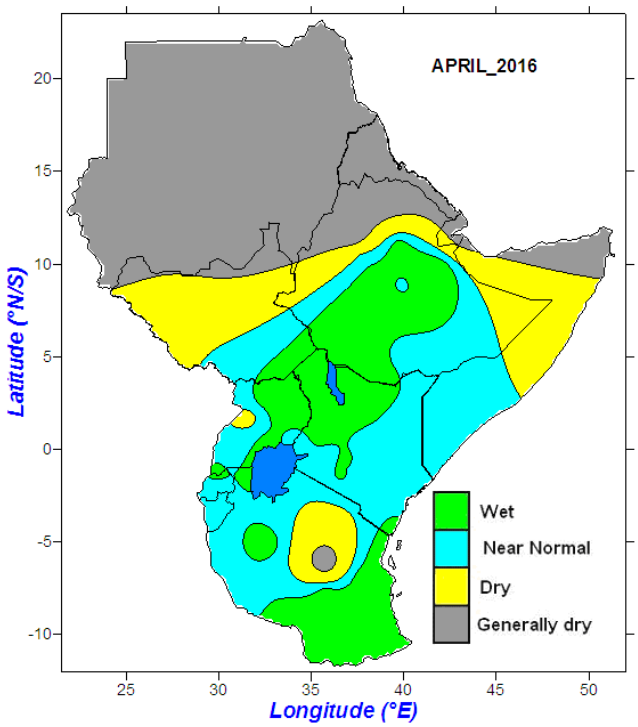

Figure 2: Rainfall severity index for the month of April 2016

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 2016

Figure 3 shows the cumulative dekadal rainfall performance since January 2016. Near normal to above normal rainfall conditions was observed over western and central parts of the equatorial sector and eastern parts of the southern sector (Figure 3a, 3b and 3c).

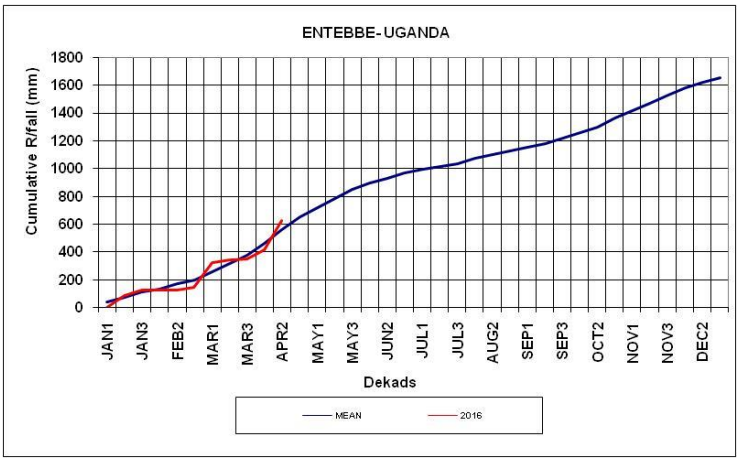

Figure 3a: Cumulative rainfall series for Entebbe

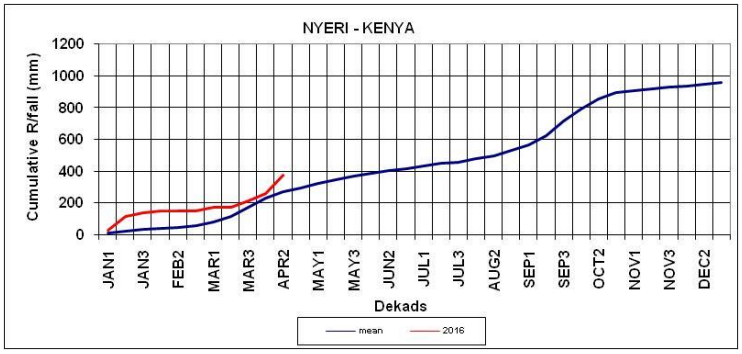

Figure 3b: Cumulative rainfall series for Nyeri

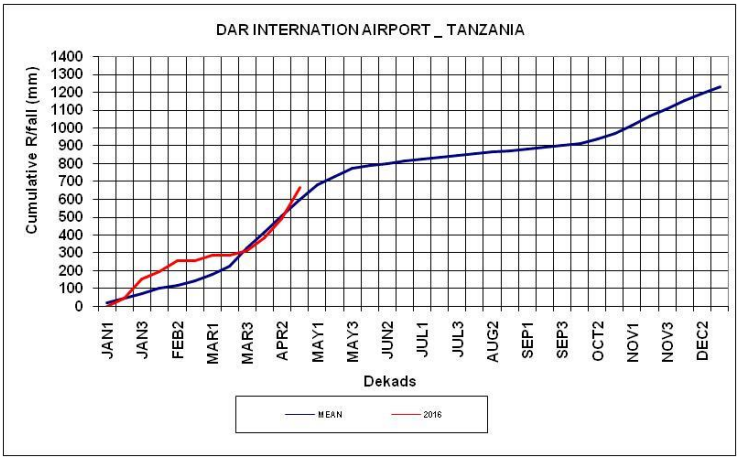

Figure 3c: Cumulative rainfall series for DAR.I.Airport

4.3 Rainfall anomalies

4.3.1 Rainfall anomalies during January to March 2016 period

During January to March 2016 rainfall period, south eastern parts of Sudan; southern parts of South Sudan; northern, central and south western parts of Ethiopia; much of Uganda; west of Kenya; much of Rwanda; much of Burundi; and much of Tanzania recorded between 75% to more than 175% of long term rainfall of the period (Figure 4). Much of Sudan, and western parts of Eritrea, recorded less than 25% of long term average rainfall for the period. The rest of the region recorded between 25% to 75% of long term average rainfall for February to April (Figure 4).

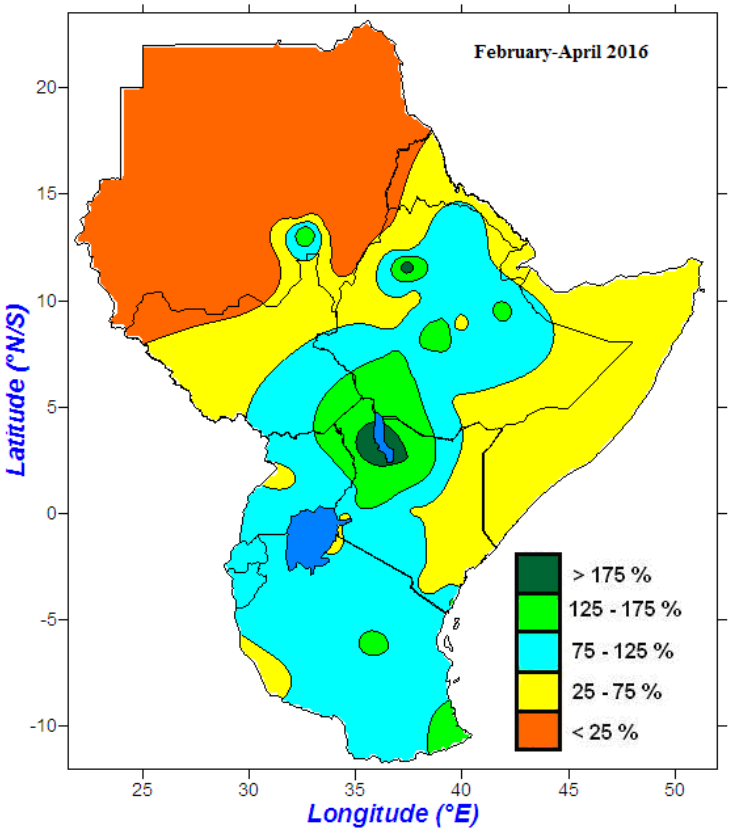

Figure 4: Spatial pattern of rainfall anomalies for February to April 2016 period

4.4 Temperature anomalies

4.4.1 Maximum temperature anomalies

During the month of April 2016 warmer than average maximum temperatures prevailed over most of the Greater Horn of Africa (GHA) region (Figure 5a) except for isolated areas in northern Ethiopia and central Tanzania. Positive maximum temperature anomalies exceeding 2°C were recorded over south central and south eastern Sudan, south western Ethiopia, central and southern Somalia, and eastern Kenya (Figure 5a).

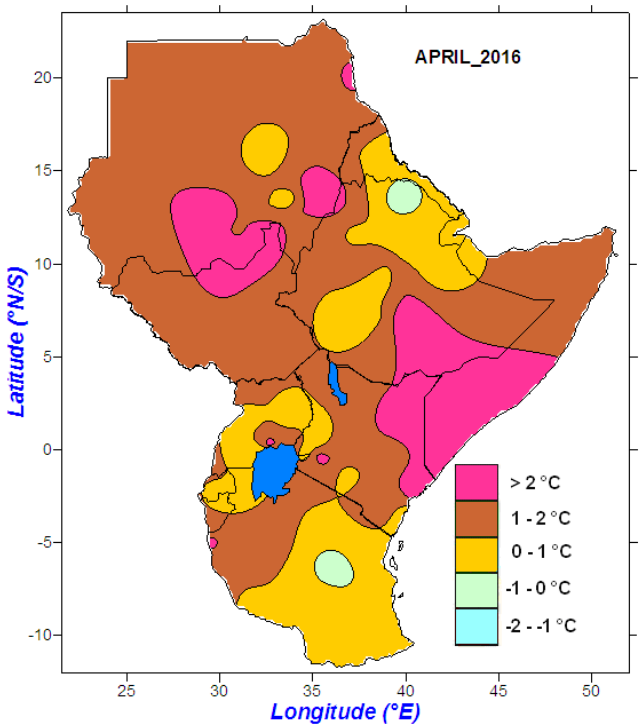

Figure 5a: Maximum temperature anomalies for April 2016

4.4.2 Minimum temperature anomalies

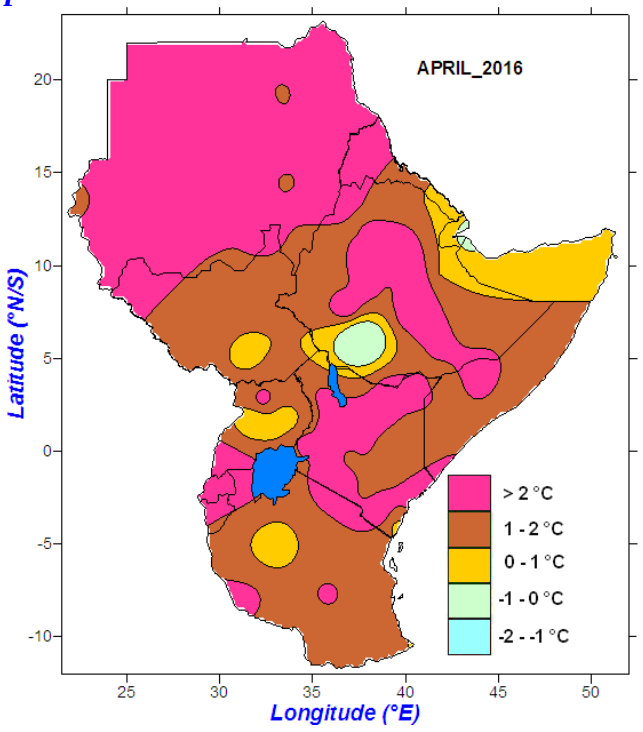

Figure 5b: Minimum temperature anomalies for April 2016

During the month of April 2016, most parts of the GHA recorded warmer than average minimum temperature anomaly except for the southern parts of Ethiopia. Positive minimum temperature anomalies exceeding 2°C was recorded over much of Sudan; western Eritrea; north western parts of South Sudan; central and south western Ethiopia, south western parts of

Uganda, over much of Rwanda, northern parts of Burundi, western, central northern and coastal Kenya, some parts of Somalia, and parts of western and central Tanzania (Figure 5b).

5. STATUS OF THE CLIMATE SYSTEMS

During the period between the end of April and the middle of May 2016 above average sea surface temperatures (SSTs) were observed over equatorial Indian Ocean. The generally warming in the equatorial Indian Ocean results in a neutral Indian Ocean dipole index (Figure.7a). Generally warmer than average SSTs were observed over central and eastern equatorial Pacific Ocean, with cooler than normal region stretching along the central equatorial Pacific Ocean (Figure. 6).

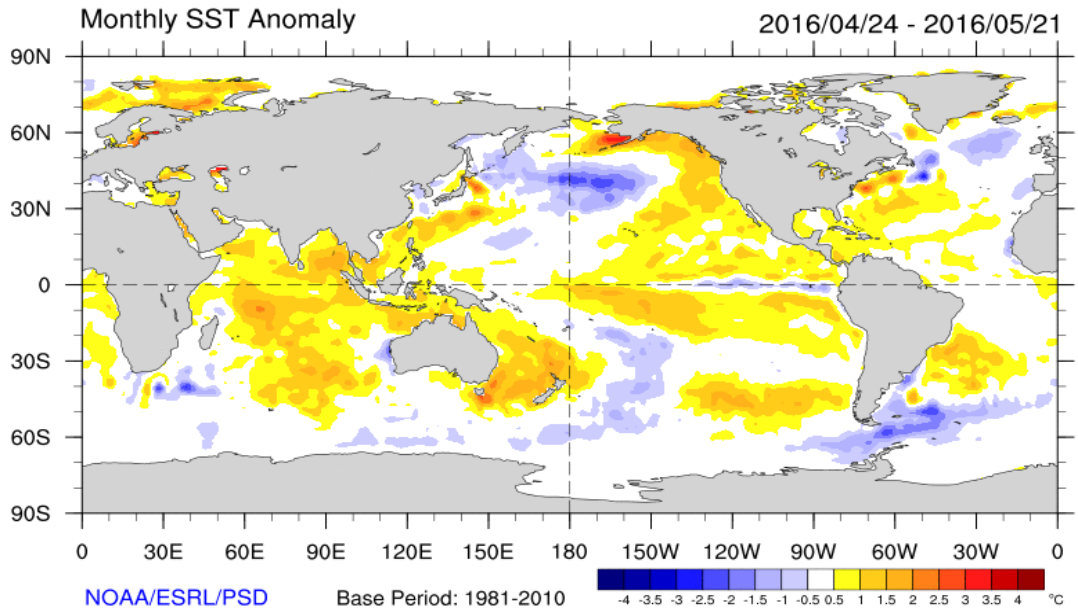

Figure 6: Sea Surface Temperature anomalies for the period 7 February to 05 March 2016 (Courtesy of NOAA)

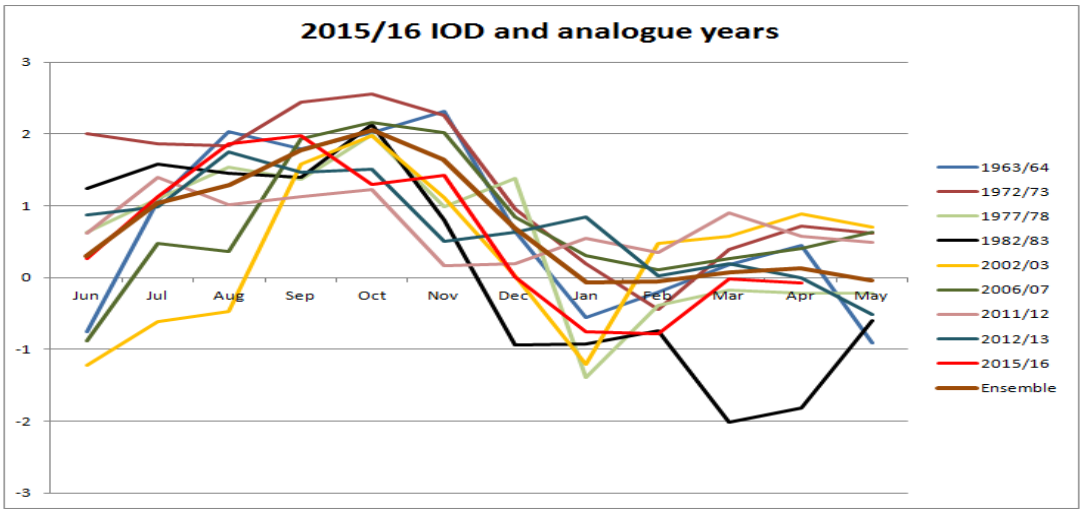

Figure 7a: Indian Ocean Dipole (IOD) for 2015/2016 and Analogue Years

6.0 CLIMATE OUTLOOK FOR JUNE TO SEPTEMBER 2016

6.1 The Climate Outlook Forum

The Forty Third Greater Horn of Africa Climate Outlook Forum (GHACOF43) was convened from 30 to 31 May 2016 at Enashipai Resort, Naivasha, Kenya by the IGAD Climate Prediction and Applications Centre (ICPAC), and partners to formulate a consensus regional climate outlook for the June to September 2016 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 reviewed the state of the global climate system including sea surface temperatures (SSTs) over the Pacific, Atlantic and Indian Oceans, the likelihood for the development of La Niña conditions as well as the likelihood of negative phase of Indian Ocean Dipole (IOD).

6.2 Rainfall Outlook for June to September 2016

The rainfall outlook for various zones within the GHA region is given in Figure 1 below.

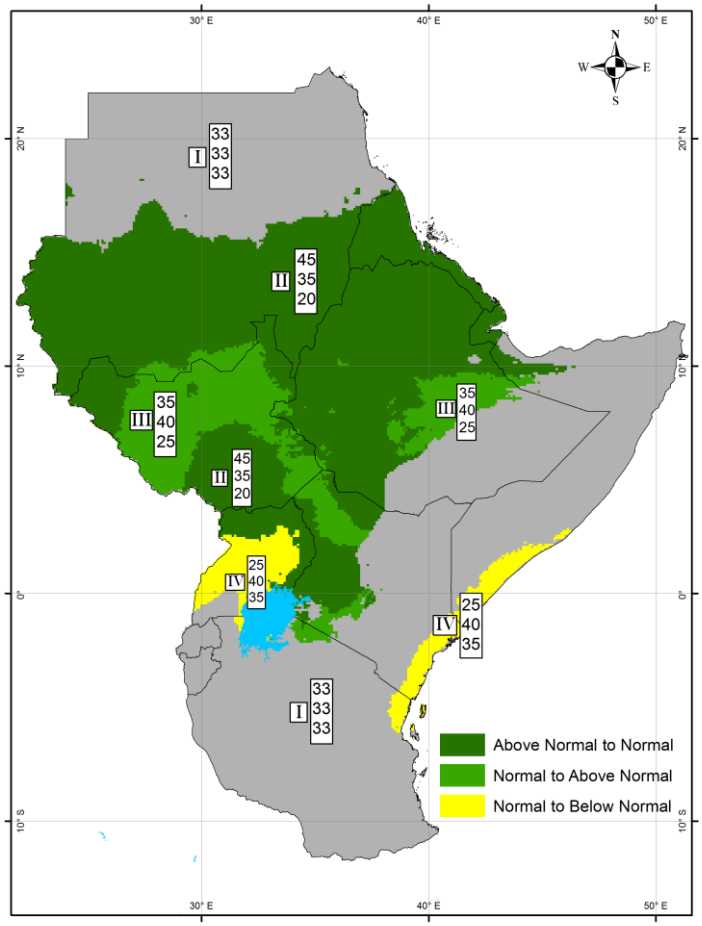

Figure 8a: Greater Horn of Africa Consensus rainfall Outlook for the June to September 2016 rainfall season

Zones I : Usually dry during June to September

Zones II: Increased likelihood of above normal rainfall

Zones III Increased likelihood for near to above normal rainfall

Zones IV: Increased likelihood of near normal to below normal rainfall

6.3 Temperature Outlook for June to September 2016

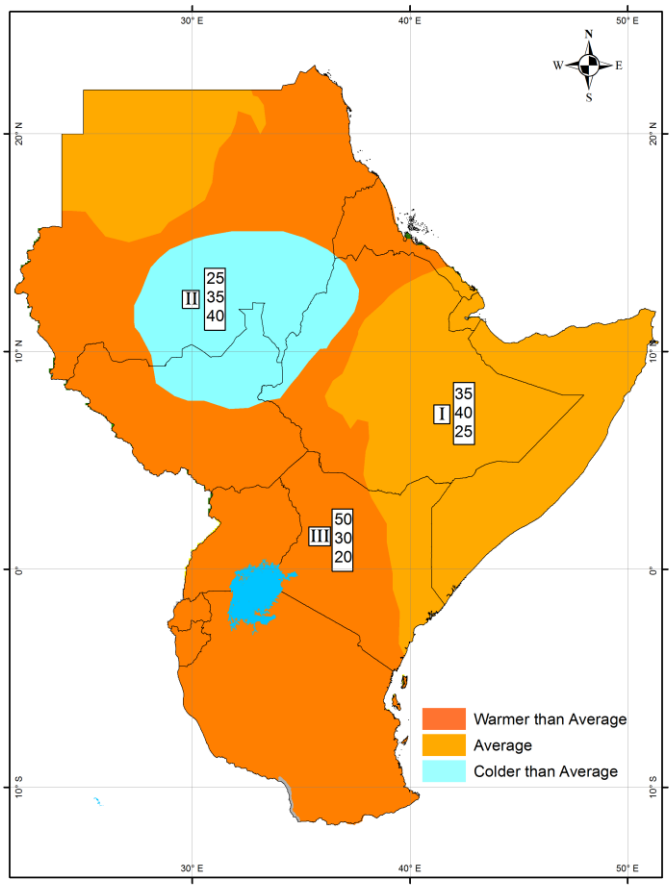

Figure 8b: Greater Horn of Africa Consensus Mean Temperature Outlook for June to September 2016 season

Zone I: Increased likelihood of average to warmer than average mean temperatures.
Zone II: Increased likelihood of colder than average mean temperatures.
Zone III: Increased likelihood of warmer than average mean temperatures.

Note:
The numbers for each zone indicate the probabilities of rainfall and mean temperature in each of the three categories, above-, near-, and below-normal. For example in Zone III, Figure 1, there is a 35% probability of rainfall occurring in the above-normal category; a 40% probability of rainfall occurring in the near-normal category; and a 25% probability of rainfall occurring in the below-normal category. In Zone III, Figure 8b, there is a 50% probability of mean temperature occurring in the above-normal category; a 30% probability of mean temperature occurring in the near-normal category; and a 20% probability of mean temperature occurring in the below-normal category. The boundaries between zones should be considered as transition areas.

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 April and March 2016 indicates improvement in vegetative conditions over southwestern parts of Sudan; western parts of South Sudan; isolated patches over southern Ethiopia; western parts of Uganda; southern parts of Rwanda; over most of Burundi; and western and southern parts of Tanzania (Figure 9). Deteriorated vegetative conditions were observed over few parts of southern and southwestern Sudan; northern and southeastern parts of South Sudan; few places in the western and south western Ethiopia; eastern parts of Uganda; over much of western and central parts of Kenya; around southern coast of Somalia; as well as north eastern parts of Tanzania (Figure 9). The rest of the region indicated little or no change in vegetative conditions (Figure 9).

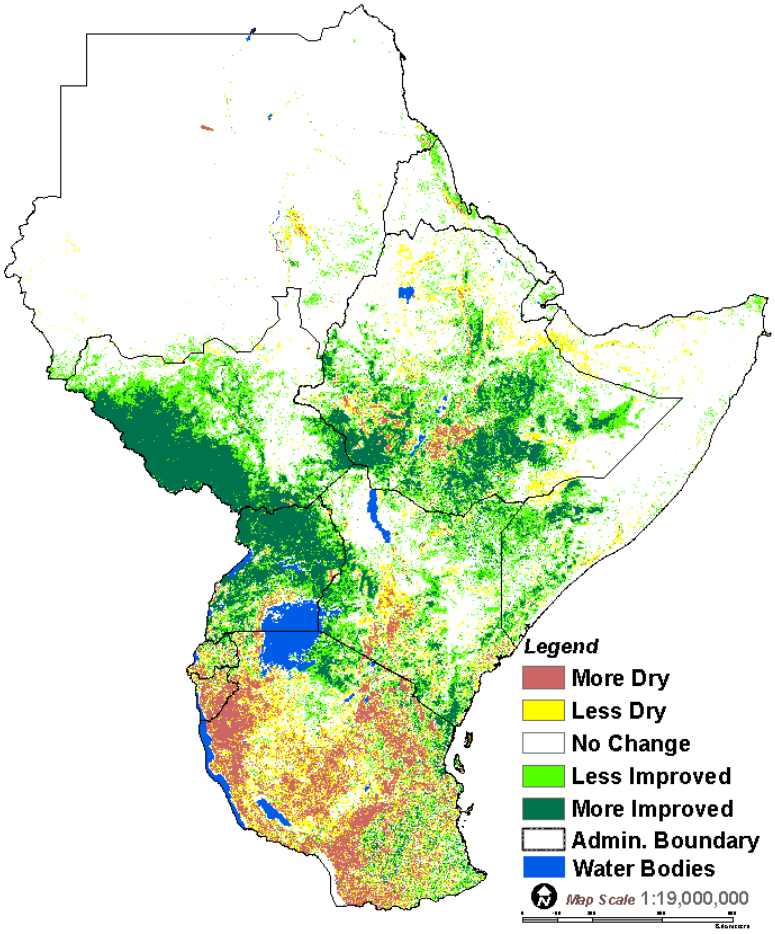

Figure 9: Vegetation difference between April and March 2016 over the Greater Horn of Africa

7.2 Impacts of observed climate conditions during April 2016

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

- Improved crop, pasture and foliage conditions;

- Replenishment of water reservoirs;
- Increase of water related diseases;
- Flooding over selected areas

In regions that experienced dry conditions the impacts were:

- Increased water related diseases;

7.3 Potential impacts for June to August 2016 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;
- Outbreaks of water related diseases.