IGAD Climate Prediction and Applications Centre Monthly Bulletin, September 2016

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. INTRODUCTION

In this bulletin, the climate conditions recorded over the GHA region in the month of September 2016 is reviewed and the rainfall and temperature predicted for November 2016 period is also provided. Highlights on the socio-economic impacts associated with both the observed and the predicted conditions are also given.

This bulletin has three main components, these are: the climatic conditions observed during the month of September 2016 over GHA, the climate predicted for November 2016 period, and the impacts associated with both the observed climate conditions and the climate prediction. There are six sections in this bulletin. Section 1 is the introduction followed by section 2 where the major highlights from both the observed and expected climate conditions are outlined. Section 3 provides the climate patterns that prevailed in the month of September 2016 and under section 4 the dominant weather systems are discussed. Section 5 contains the climate outlook for the month of November 2016, and finally the socio-economic impacts associated with the observed climatic conditions in September 2016 and those expected from the climate predicted for November are presented the final section.

2. HIGHLIGHTS

Rainfall activities were mainly observed over much of western and central parts of the northern sector, as well as over the western part of the equatorial sector during the month of September 2016. The rainfall performance was near average to below average for most of these areas except for parts of north eastern and central northern sector of the Greater Horn of Africa (GHA).

The observed rainfall conditions over parts of the Greater Horn of Africa during the month of September 2016 resulted in deteriorated water and pasture conditions leading to migration of pastoralist. However some areas especially in the northern sector experienced improved crop, pasture and foliage conditions, and replenishment of water resources, flooding and associated impacts, and increase in water related diseases.

During the month of November 2016, rainfall is likely to be concentrated in the equatorial sectors as well as southern parts of the northern sector of the GHA. However most of these places are likely to receive near normal to below normal rainfall except for a few areas around northern parts of central northern sector as well as eastern parts of the equatorial sector of the GHA. Much of the GHA region is likely to record above average mean temperature in the month of October except for a few areas in north eastern and eastern northern sector.

3. CLIMATE PATTERNS IN SEPTEMBER 2016

The climatological summary for the rainfall in terms of amount, percentage of average, and standardized precipitation index for September 2016 Rainfall performance as Compared to the Long-Term Mean over the GHA are provided in this section.

RAINFALL AMOUNTS AND PERFORMANCE DURING SEPTEMBER 2016

Rainfall amounts in September 2016

During the month of September 2016, rainfall amount of over 100mm and was recorded southern part of Sudan, south western Eritrea, over much of South Sudan, western and central Ethiopia, over much of Uganda, western Kenya, western Rwanda, northern Burundi, and northern coast of Tanzania. The rest of the GHA region recorded less than 100mm of rainfall with few areas recording between 11mm and 50mm of rainfall (Figure 1).

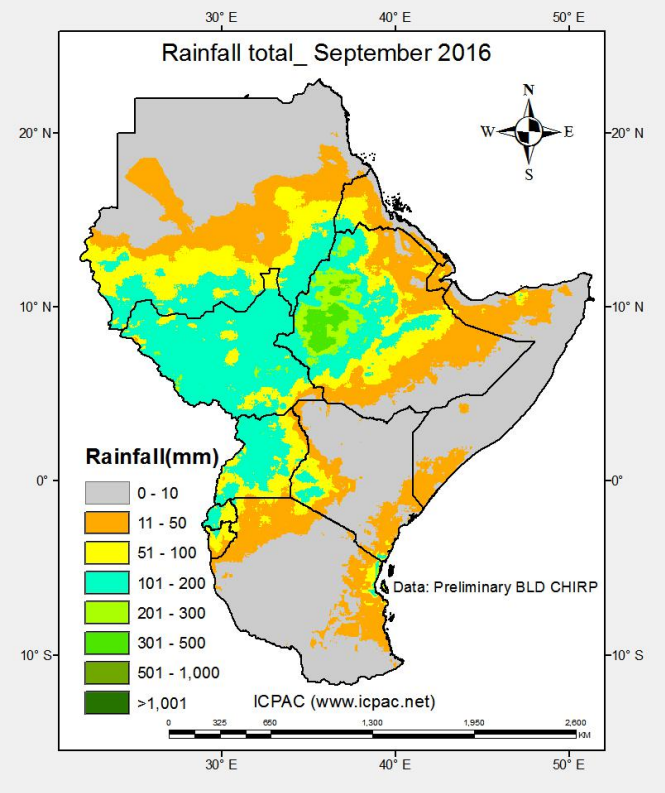

Figure 1: Spatial distribution of rainfall during the month of September 2016

Rainfall performance as compared to the Long Term Mean

Figure 2 shows the September 2016 rainfall performance as Compared to the Long-Term Average for the northern, equatorial and southern sectors of GHA. Most stations within the northern sector observed rainfall amount that were near the long term average, except for a few stations in the Ethiopian highland which recorded rainfall amounts greater than the long term average. Most in western equatorial sector recorded rainfall amounts greater than the long term average while the stations that are in eastern equatorial sector recorded rainfall amounts that are less than the long term average. Much of the southern sector are yet to start receiving rainfall hence most of the stations recorded less than the average rainfall amounts for the month of September (Figure 2a, 2b and 2c).

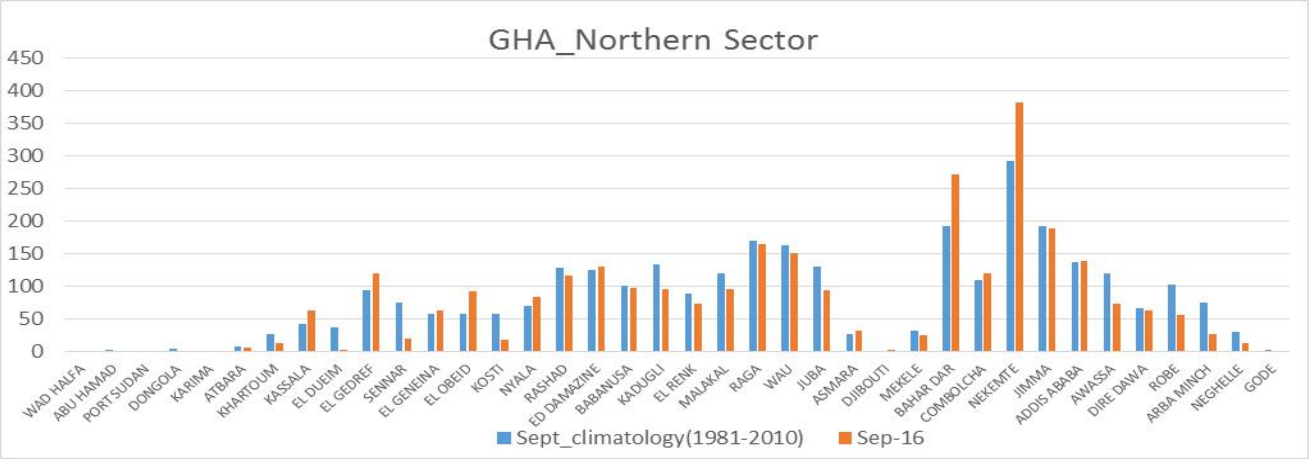

Figure 2a: September 2016 Rainfall performance as Compared to the Long-Term Mean over GHA northern sector

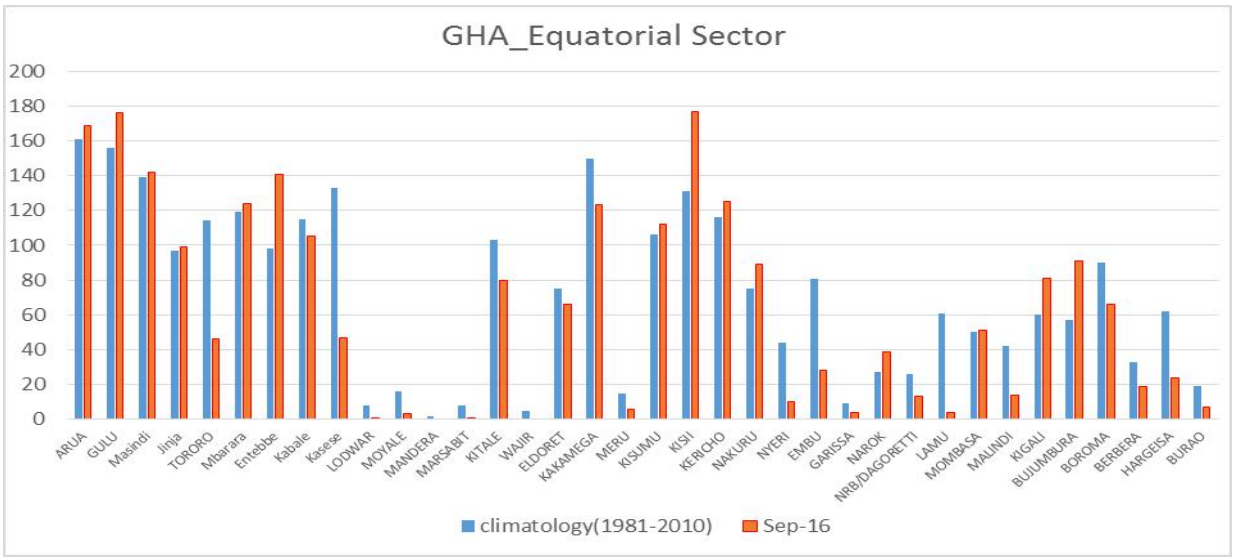

Figure 2b: September 2016 Rainfall performance as Compared to the Long-Term Mean over GHA Equatorial sector

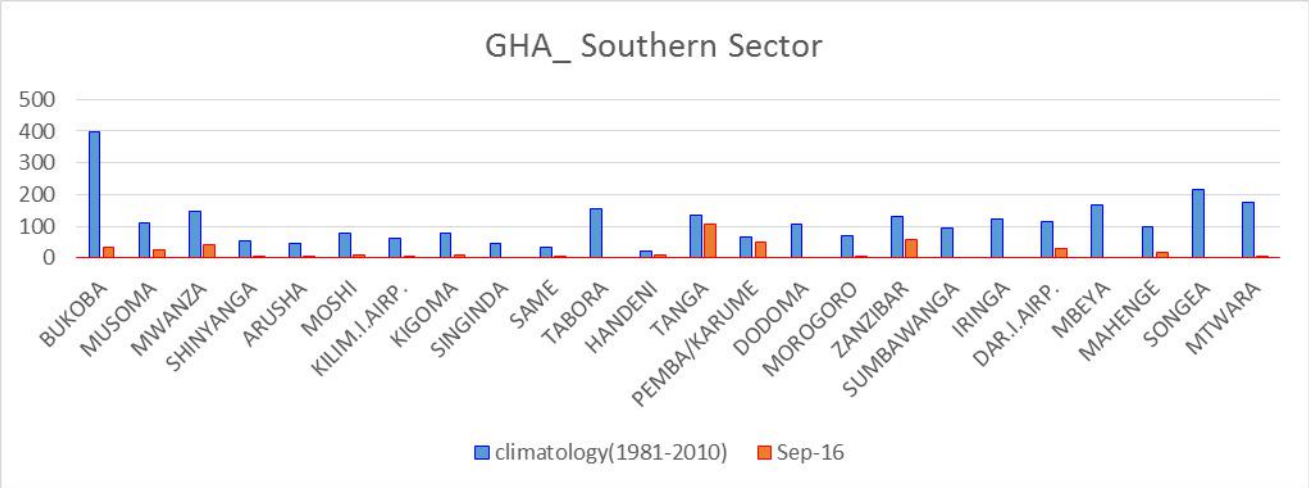

Figure 2c: September 2016 Rainfall performance as Compared to the Long-Term Mean over GHA Southern sector

Rainfall severity in the month of September 2016

Figure 3 shows the percent of average of the September 2016 rainfall and Figure 4 shows the standardized precipitation index (SPI) for the same month.

In the month of September 2016 much of the Greater Horn of Africa (GHA) region indicated near normal or below normal rainfall conditions resulting to near normal to severely dry rainfall conditions. However a few areas mostly in the northern sector, recorded rainfall amounts of between 125% and more than 175% of the long term mean rainfall. This translated into moderately wet to severely wet conditions. These areas include, east of Sudan, western of Eritrea, much of Djibouti, and western parts of Ethiopia. Areas around central and southern parts of Sudan, north eastern parts of South Sudan. Southern and eastern parts of Ethiopia, northern and southern Somalia, southern part of Uganda, central, northern and eastern Kenya, and much of Tanzania recorded rainfall amounts of less than 25% of the long term mean, an indication of moderately dry to extremely dry rainfall conditions. The rest of the GHA region recorded between 25% and 125% of the long term average precipitation for month of September (Figure 2), which translated into near normal rainfall conditions.

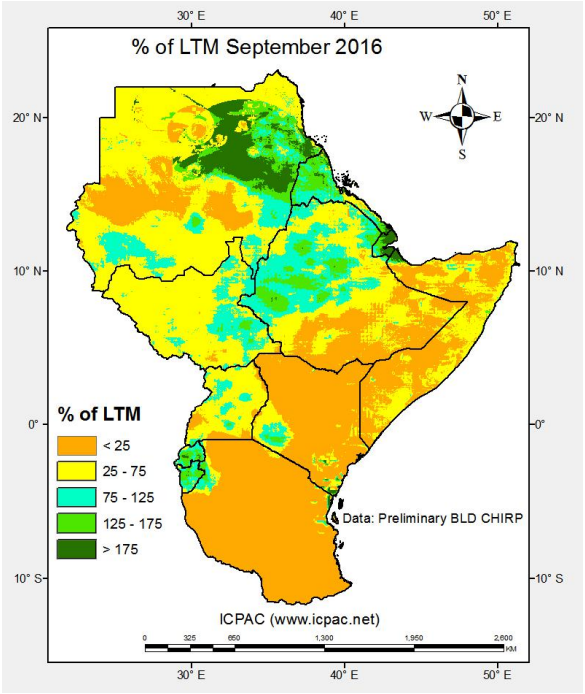

Figure 3: Percentage of average rainfall for September 2016

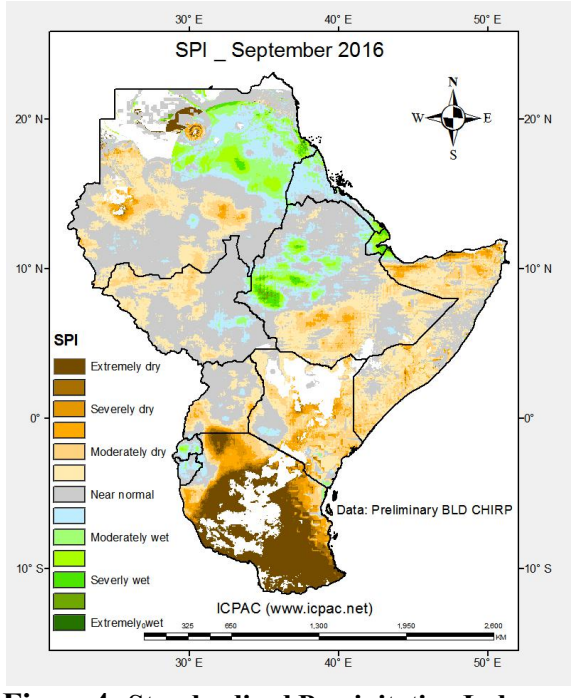

Figure4: Standardized Precipitation Index for September 2016

TEMPERATURE ANOMALIES

During the month of September 2016, warmer than average maximum temperatures prevailed over much of the Greater Horn of Africa region except for a few areas around eastern Sudan, western part of Eritrea, eastern and central Kenya, and central and eastern part of Tanzania that recorded less than average maximum temperature (Figure 5a). North eastern part Sudan, and eastern and southern margin of central Ethiopia, south western and south eastern Uganda, and northern part of Tanzania recorded positive maximum temperatures anomalies exceeding 2°C .

During the month of September 2016 above average minimum temperature were experienced in most parts of the Greater Horn of Africa, except for a few parts in central and southern Tanzania and isolated part in eastern Kenya. Northern part of Sudan and central part in southern part of Sudan extending to northern South Sudan, southern part of Ethiopia, southern and mid northern Uganda, northern Rwanda, southern Kenya extending to northern Tanzania, and western Tanzania recorded positive minimum temperature anomalies exceeding 2°C. (Figure 5b).

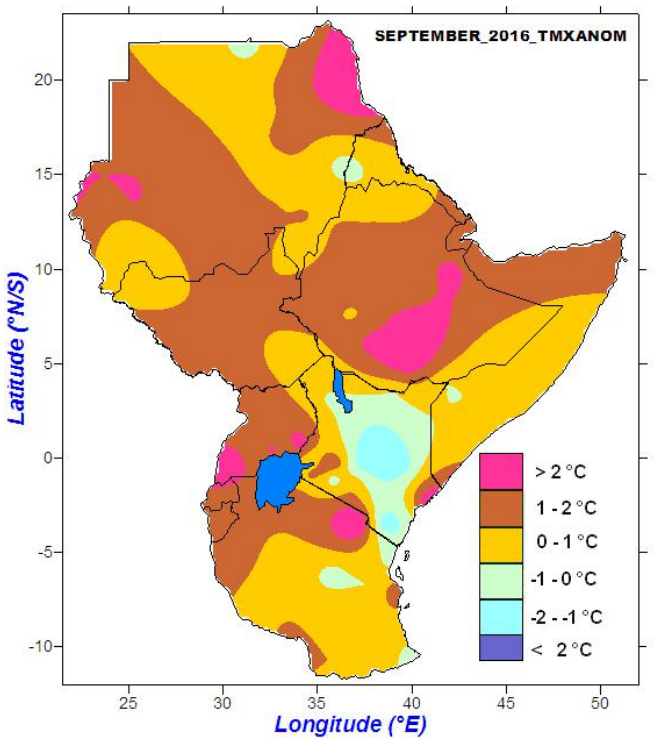

Figure 5a: Maximum temperature anomalies for September 2016

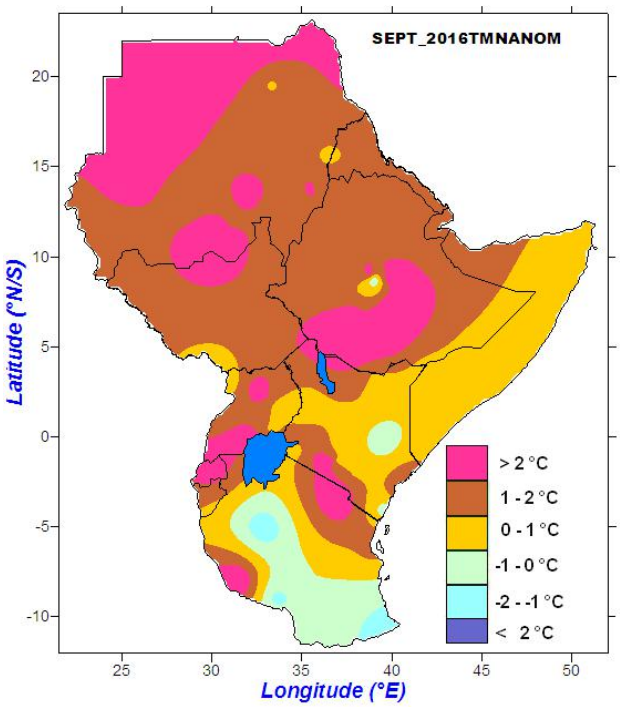

Figure 5b: Minimum temperature anomalies for September 2016

4. STATUS OF THE CLIMATE SYSTEMS

During the period between mid-September and mid-October 2016, near average to cooler than average sea surface temperature (SSTs) is observed over central and eastern equatorial Pacific Ocean (Niño 1+2, Niño 3, Niño 3.4 and western part of Niño 4), This represents a typical pattern of a neutral ENSO conditions evolving to a la Niña conditions. Average to warmer than average sea surface temperatures (SSTs) is observed over eastern equatorial Indian Ocean and cooler than average SST is observed over western and central equatorial Indian Ocean (Figure 6). This pattern represents a negative phase of the Indian Ocean Dipole (IOD) (Figure 7).

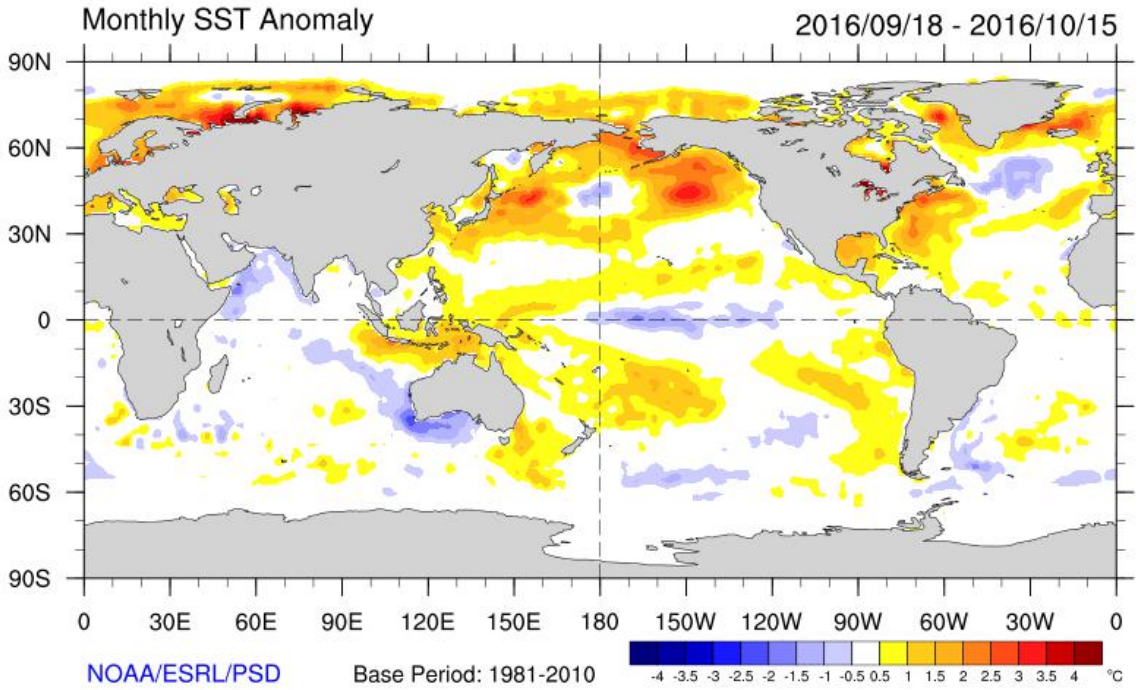

Figure 6: Sea Surface Temperature anomalies for the period 18 September to 15 October 2016 (Courtesy of NOAA/ESRL/PSD)

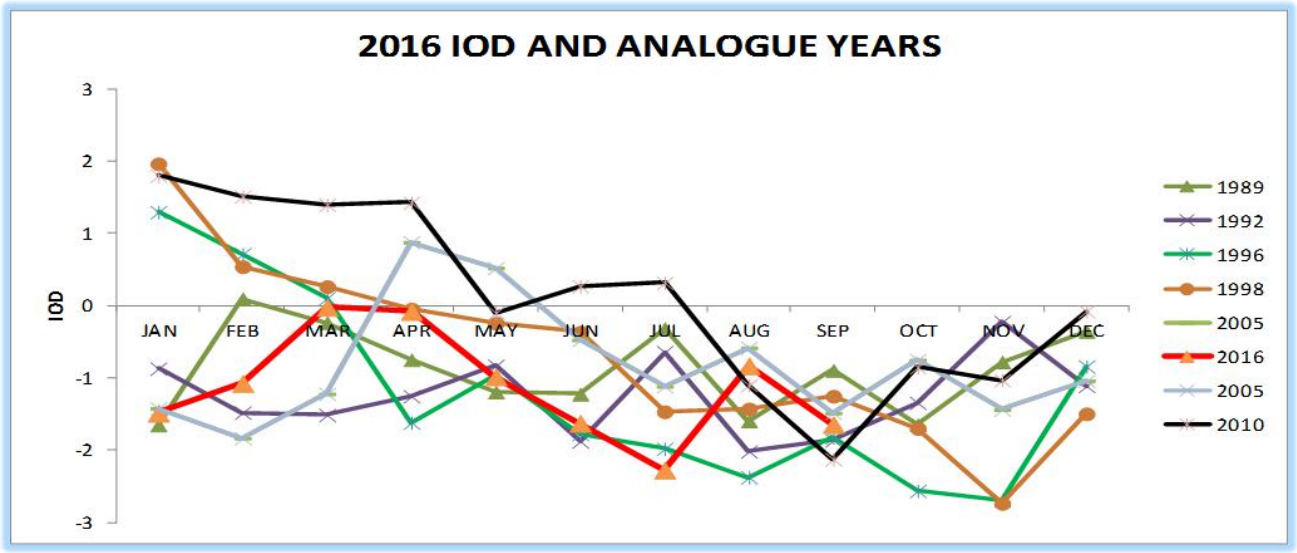

Figure 7: Indian Ocean Dipole (IOD) for 2016 and Analogue Years

5. CLIMATE OUTLOOK FOR OCTOBER 2016

The rainfall forecast for November

The rainfall outlook for GHA region is given in Figure 8a below. There is high chance of experiencing above average rainfall condition in eastern and southern part of Sudan extending to northern and north eastern South Sudan; over northern and north eastern Ethiopia; in western and central Eritrea; in parts of Djibouti extending to northern part of Somalia; over central and eastern part of Kenya extending to southern part of Somalia; and over eastern and coastal Tanzania. The rest of the GHA region are likely to receive near average to below average rainfall conditions in the month of November 2016 (Figure 8a).

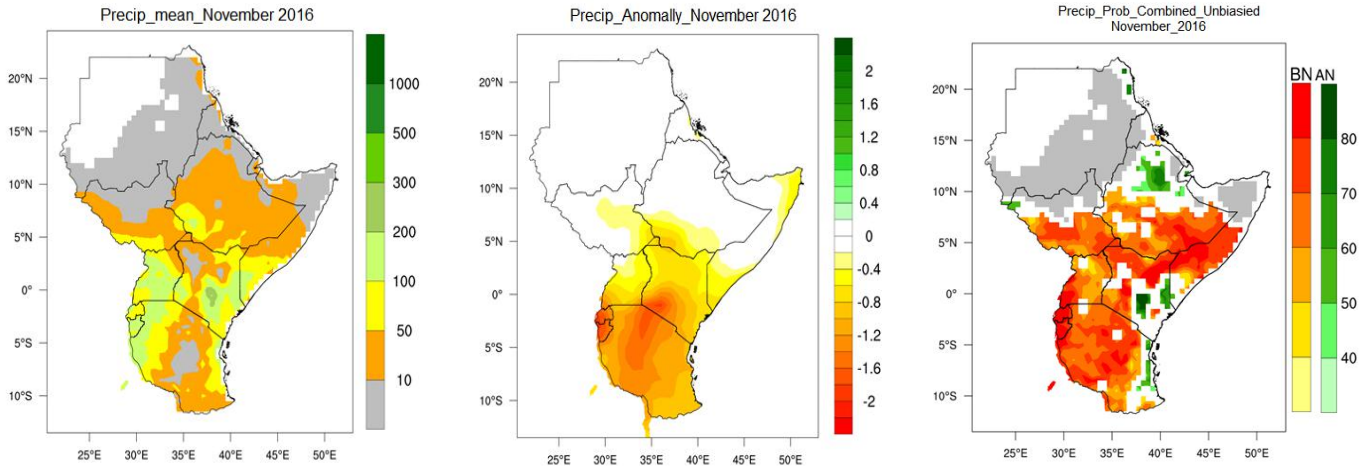

Figure 8a: Rainfall Outlook for November 2016

Temperature Outlook for November 2016

The temperature forecast for GHA region is given in Figure 8b indicates that much of the GHA region is likely to receive above average mean temperature, however a few areas such as western Sudan, central and southern Eritrea, central and north eastern Ethiopia, western tip of Somalia, and over central part of Kenya have a more chance of recording cooler than the average mean temperature during the month of November 2016.

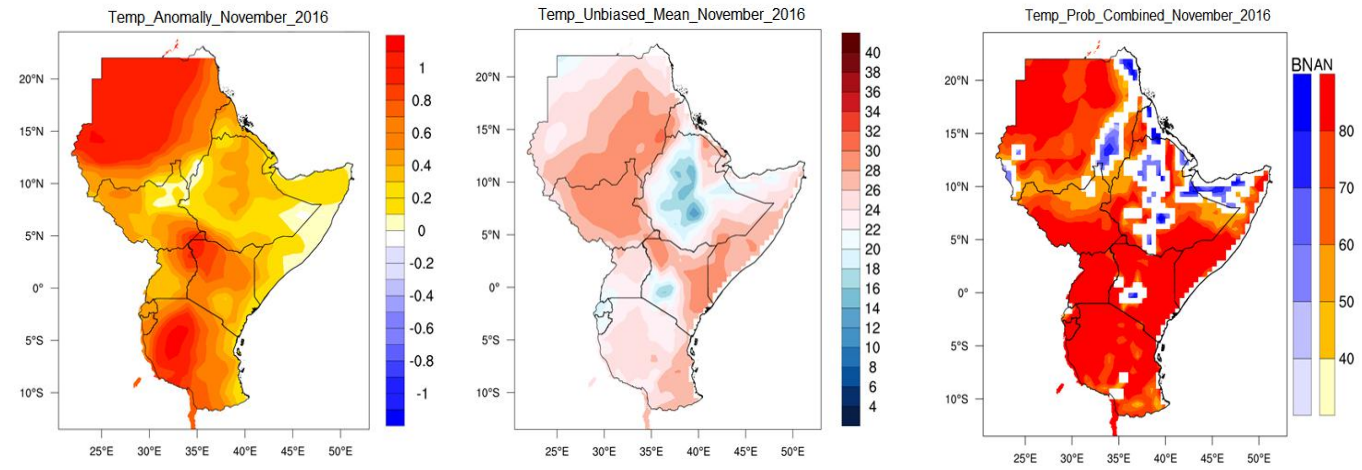

Figure 8b: Mean temperature outlook for November 2016.

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

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

Vegetation condition indicators and associated impacts

The Normalized Difference Vegetation Index (NDVI) anomaly for September 2016 indicates that vegetative conditions improved in southern part of Sudan, south western Eritrea, north eastern Ethiopia, northern and eastern parts of South Sudan, north western and central Kenya as well as parts of central and eastern and south eastern Tanzania. Deteriorated vegetative conditions was observed in the southern and south eastern parts of Sudan, northern part of Ethiopia, over central, south eastern and eastern parts of South Sudan, over much of Uganda, western part of Kenya, southern part of Somalia, eastern part of Rwanda and northern part of Tanzania. The rest of the GHA region indicated little or no change in vegetative conditions (Figure 9).

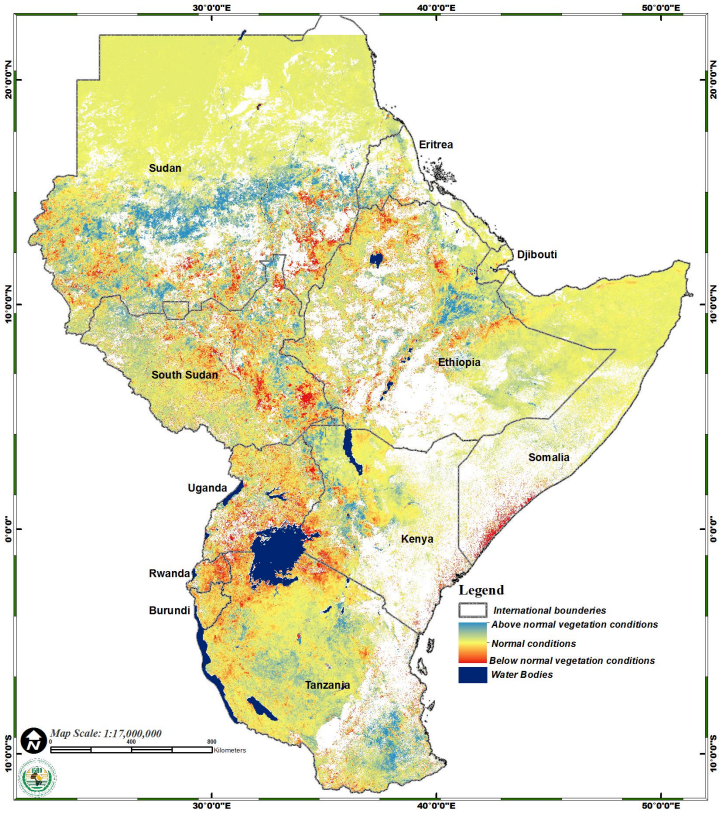

Figure 9: Normalized Difference Vegetation Index (NDVI) of September 2016 over the Greater Horn of Africa

Impacts of observed climate conditions during September 2016

The socio-economic impacts associated with the observed rainfall over much of the Greater Horn of Africa during the month of September 2016 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 stress and increased prevalence of water related diseases.
- Prospects of reduced performance in crop conditions and water resource availability
- Deterioration in pasture conditions, leading to migration of pastoralists.

Potential impacts for November 2016 climate outlook

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

- Improvement in pasture and crop conditions leading to good prospects for crop and livestock performance;
- Improvement in water resources and replenishment of reservoirs;
- Increased Prevalence 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;
- Deterioration of pasture and water resources leading to water related crop and livestock stress.
- Existence of water related diseases.