

IGAD Climate Prediction and Applications Centre Monthly Bulletin, December 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 -5° and 5° 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 condition over the Greater Horn of Africa (GHA) region for the month of December 2016 is reviewed and the rainfall and temperature outlook for February 2017 period is also provided. Highlights on the socio-economic impacts associated with both the observed and the predicted conditions are also given.

Generally in December 2016, several parts of the equatorial sector remained dry due to the prevailing La Niña conditions and negative Indian Ocean Dipole (IOD). Good rains however have been received in minor areas in the southern equatorial sector. The mean surface temperature observed was extremely high in several parts of the region. Dry conditions have prevailed in several parts of the equatorial sector with reported negative consequences for both crops and livestock.

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 December 2016 and under section 4 the status of climate systems in December are discussed. Section 5 contains the climate outlook for the month of January 2017, and finally the socio-economic impacts associated with the observed climatic conditions in December 2016 and those expected from the predicted climate February are presented the final section.

2. HIGHLIGHTS

Rainfall activities were mainly observed over southern sector with areas around southern and eastern parts of the equatorial sector, as well as south-central part of the northern sector also recording some rainfall during the month of December 2016. The rainfall performance in most of these areas was however below the average indicating moderately dry to extremely dry conditions.

The delayed onset and depressed rainfall over equatorial and southern sector of the GHA region during the month of December 2016 resulted in persistence in deterioration of water and pasture conditions leading to migration of pastoralists, and poor prospect of crop and livestock production., water stress, and effect on hydroelectricity production.

During the month of February 2016, rainfall is likely to be concentrated in the southern sector as well as southern parts of equatorial sector of the GHA region.

3. CLIMATE PATTERNS IN DECEMBER 2016

The rainfall amounts, rainfall performance as compared to the Long Term Mean, rainfall performance compared to the Long-Term Mean, its severity index, percentage of long term average and

standardized precipitation index for December 2016 are provided in this section. The minimum and maximum temperature anomalies are also given.

RAINFALL AMOUNTS AND PERFORMANCE DURING DECEMBER 2016

Rainfall amounts in December 2016

During the month of December 2016, rainfall amount of between 10 to 50mm was recorded; central Uganda; western and south western parts of Ethiopia; western and central parts of Kenya; and northern coast of Tanzania. Much of northern Sudan, extreme west and southern Eritrea, north eastern part of Ethiopia, north eastern part of Somalia and isolated parts in central Somalia, north western and eastern parts of Kenya, and much of central and south western Tanzania recorded less than 10mm of rainfall. The rest of the GHA recorded between 10mm and 50mm of rainfall (Figure 1).



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

Rainfall severity in the month of December 2016

Figure 2 shows the amount of rainfall received expressed as percentage of long term average for December while Figure 3 shows the standardized precipitation index (SPI) for the same month.

In the month of December 2016 rainfall amounts less than 75% of the long term average was recorded in central and southern parts of part of Ethiopia, southern part of South Sudan, over much of Uganda, Rwanda and Kenya, central and southern parts of Somalia, northern Burundi, and over much of Tanzania with exception of the western part. Less than 25% of the long term average rainfall amount was recorded in south western Ethiopia, eastern Uganda extending to north western and western Kenya, and in isolated parts of eastern Kenya, central Somalia, and southern Tanzania. These areas corresponded to moderately dry to severely dry rainfall conditions. A few isolated areas in western and north eastern South Sudan, extending into western Ethiopia, north eastern tip of Somalia, as well north eastern part of Kenya extending to southern Ethiopia recorded rainfall amounts greater than 125% of their long term average December rainfall. This translated into moderately wet conditions to severely wet rainfall conditions.

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region received between 75% and 125% of long term average rainfall for the month of December which translated to near normal or generally dry rainfall conditions.

Figure 2: Percentage of average rainfall for December 2016



Figure 3: Standardized Precipitation Index for December 2016

TEMPERATURE CONDITIONS

During the month of December 2016, average maximum temperatures greater than 35°C was recorded in southern and south eastern parts of Sudan extending to much of South Sudan; over a few places in central Eritrea, northern and western margins of Ethiopia, northern Uganda, north western and eastern parts of Kenya, and in southern Tanzania. Average maximum temperature less than 20°C was observed in north western Sudan, in the Ethiopian highlands, around the Rift Valley highlands of Kenya, western Rwanda, western Burundi, and over the western margin of Tanzania (Figure 4a). While the rest of the Greater Horn of Africa (GHA) recorded average maximum temperature of between 25°C and 35°C.

Average minimum temperature below 15°C was observed north western Sudan, over the Ethiopian highlands, over central and western Kenya highlands, western Rwanda, western Burundi, and over south western Tanzania, during the month of December 2016. Average Minimum temperature of between 25°C and 30°C was recorded in central and western South Sudan. The rest of the GHA recorded average minimum temperatures of between 15°C and 25°C during the month of December 2016 (Figure 4b).







Figure 4b: Minimum temperature anomalies for December 2016

4. STATUS OF THE CLIMATE SYSTEMS

During the period running through December 11th 2016 and January 1st 2017, 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) (Figure 5). However this situation currently presents a weak la Niña conditions tending towards a neutral ENSO. Average to warmer than average sea surface temperatures (SSTs) is observed over the equatorial Indian Ocean (Figure 5). This pattern represents a neutral phase of the Indian Ocean Dipole IOD (Figure 6) and this pattern is more similar to recent years such as 1989, 1992, 2005 and 2010.



Figure 5: Sea Surface Temperature anomalies for the period 11 December 2017 to 07 January 2017 (Courtesy of NOAA/ESRL/PSD)



Figure 6: The Indian Ocean Dipole (IOD) during 2016 and analogue years.

CLIMATE OUTLOOK FOR FEBRUARY 2017

The rainfall forecast for February

The rainfall outlook for February over the GHA region is given in Figure 7a below. Rainfall is likely to be experienced majorly in the southern sector and southern part of the equatorial sector of the Greater Horn of Africa (GHA). These include southern part of Uganda, southern part of Kenya, and over much of Rwanda, Burundi and Tanzania. Much of the northern sector and northern part of the equatorial sector is likely to remain generally dry receiving less than 10mm of rainfall during the month of February 2017.



Rainfall Forecast (mm): February 2017

Figure 7a: Rainfall Outlook for February 2017

Temperature Outlook for February 2017

The temperature forecast for GHA region for February 2017 is given in Figure 8b and it indicates that more than 24°C is likely to be observed in the southern part of Sudan extending to much of South Sudan and eastern margins of Ethiopia; over western and southern Eritrea; north eastern and south eastern Ethiopia; north western and northern Uganda; north western and eastern Kenya; central and southern Somalia; and over eastern and southern Tanzania. Average temperature less than 18 °C is likely to be observed in northern and north eastern Sudan; over central Eritrea; over central and highlands of Ethiopia; northern Somalia; central highlands of Kenya; over western Rwanda and Burundi; and over south western Tanzania. The rest of the GHA is likely to record average temperature of between 18°C and 22°C in the month of February 2017.



Mean Temperature Forecast (C): February 2017

5. 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 December 2016 indicated that vegetative conditions deteriorated over much of the southern and equatorial sector of the Greater Horn of Africa (GHA). These areas include south eastern South Sudan extending to south western Ethiopia; over much of Uganda, Kenya, southern Somalia, Tanzania, Rwanda; and parts of southern Rwanda. Improved vegetative conditions observed in south eastern Sudan, north eastern South Sudan, eastern margin of central Ethiopia, as well as in parts of central and north eastern Kenya. The rest of the Greater Horn of Africa indicated little or no change in vegetative conditions. (Figure 8).

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Figure 8: Normalized Difference Vegetation Index (NDVI) of December 2016 over the Greater Horn of Africa

Impacts of observed climate conditions during December 2016

The socio-economic impacts associated with the observed rainfall over much of the Greater Horn of Africa during the month of December 2016 were as follows: In regions that experienced wet conditions

- Improved pasture and foliage conditions;
- Replenishment of water reservoirs;
- Increase of water related diseases;

In regions that experienced dry conditions the impacts were:

- Increased water stress
- Increased prevalence of water related diseases.
- Food insecurity and increase in food prices
- Loss of livestock and livestock prices
- Human wildlife conflict due to scramble for water and food resources
- Prospects of reduced performance in crop conditions and water resource availability
- Deterioration in pasture conditions, leading to migration of pastoralists.
- Delayed onset in some areas leading to delayed farming

Potential impacts for February 2017 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;
- Continued deterioration of pasture and water resources leading to water related crop and livestock stress.
- Existence of water related diseases.