

IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for December 2018 and Forecasts for February 2019

1. INTRODUCTION

This bulletin reviews the December 2018 climate conditions over the Greater Horn of Africa (GHA) region and highlights the February 2019 rainfall and temperature forecasts together with the socio-economic impacts associated with both the observed and the forecasted climate conditions.

There are six sections in this bulletin. The major highlights from both the observed and expected climate conditions are outlined in section2. Section 3 discusses the climate patterns that prevailed in the month of December 2018, while the dominant weather systems are discussed in section 4. In

section 5, the February 2019 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from February 2019 climate forecasts are outlined in section 6.

For referencing within this bulletin, the GHA is generally divided into three sub-sectors: The equatorial sector lying approximately between 5°N and 5°S latitude, with the northern and southern sectors occupying the rest of the northern and southern part of the region respectively.

2. HIGHLIGHTS

Rainfall was concentrated in the southern sector and southern part of the equatorial sector of the GHA. Most of these areas recorded near normal or above normal rainfall. Much of the rest of the GHA recorded near normal rainfall during the month of December 2018 (Figure 2 and 3).

Maximum temperature warmer than the mean was recorded in southeast part of the northern sector, and eastern parts of the equatorial and southern sector of the GHA. Several parts of the equatorial sector, south-central part of the northern sector, and eastern part of the southern sector of the GHA recorded minimum temperature warmer than the climatological mean. The western part of the northern sector, and a few areas in southeast part of the northern sector and west of the southern sector of the GHA recorded minimum and maximum temperature that was cooler than the climatological mean in the month of December 2018.

The general rainfall condition in the southern sector of GHA resulted in improvement of water and pasture conditions leading to good crop, and livestock productivity. The eastern part of the equatorial sector reported continued dry conditions following depressed rainfall conditions in the October to December 2018 season.

By December 2018, the Oceanic Nino Index (ONI), a primary index used to monitor the El Nino-Southern Oscillation (ENSO) had apositive signal (Figure 7a). The Indian Ocean

Dipole (IOD) indicated a positive phase (Figure 7b). The ONI and IOD are forecasted to persist in positive but neutral phases over much of the initial months of 2019.

In the month of February 2019, rainfall is expected to be concentrated over much of southern sector and southern part of the equatorial sector of the GHA (Figure 8a).

3. CLIMATE PATTERNS IN DECEMBER 2018

The rainfall amounts (Figure 1) and performance as compared to the climatological mean (1981-2010) using percentage of long term average (Figure 2) and Standardized Precipitation Index (SPI) (Figure 3) for December 2018 are provided in this section. The minimum (Figure 4b) and maximum (Figure 4b) temperature anomalies relative to Long term mean (1981-2010) are also given.

Rainfall performance



Figure 1: Spatial distribution of rainfall during the month of December 2018(Data Source : Blended CHIRPS)

South Sudan, Ethiopia and Somalia:southwest Ethiopia, southern part of South Sudan, and southern Somalia recorded rainfall between10mm to 50mm. Most of South Sudan, Ethiopia and Somalia areas recorded near normal rainfall conditions.

Kenya and Uganda: southern Uganda, and southern Kenya recorded between 50mm and 200mm of rainfall. The northern part of Uganda and northern part of Kenya recorded less than 50mm of rainfall. The rainfall was mainly near normal or above normal over much of these areas.

Rwanda Burundi and Tanzania: Most of these areas recorded 100mm and 300mm. northwestern Kenya, and central Tanzania recorded less than 10mm of rainfall. most of these areas experienced above normal or near normal rainfall condition.

Much of the rest of the GHA recorded less than 10mm of rainfall that resulted to generally dry or

near normal rainfall conditions, except for northern and southeastern Ethiopia where below normal rainfall condition was recorded.



Figure 2: Percentage of average rainfall for December 2018 (Data Source: Blended CHIRPS)



Figure 3: Standardized Precipitation Index for December 2018 (Data Source: Blended CHIRPS)

Temperature Conditions

Sudan Eritrea, and South Sudan: most of these areas recorded maximum and minimum temperatures cooler than the climatological mean, however northwest Sudan and southern South Sudan recorded minimum temperature warmer than the climatological mean.

Ethiopia and Somalia: Much of Somalia extending to eastern Ethiopia and in northern part of Ethiopia maximum temperatures cooler than the climatological mean was recorded. The central Ethiopia and northeast Somalia recorded minimum temperatures cooler than the long-term mean. Much of the rest of these areas recorded maximum and minimum temperatures that was warmer than the climatological mean.

Djibouti, Kenya and Tanzania: Most of these areas recorded maximum and minimum temperature warmer than the climatological mean.

Uganda, Rwanda and Burundi: Northern Uganda and much of Burundi recorded maximum temperature warmer than the climatological mean. Much of the rest of these areas recorded maximum temperatures that was warmer than or near the climatological mean.

Much of the rest of the GHArecorded maximum and minimum temperature that was warmer than or near the climatological mean.



Figure 4a: Maximum temperature anomalies for December 2018 from LTM, 1981-2010 (Data Source: Data Source: provided by the NOAA CPC DAILY)



Figure 4b: Minimum temperature anomalies for December 2018 from LTM, 1981-2010 (Data Source: Data Source: provided by the NOAA CPC DAILY)

Vegetation Condition Indicators

The Normalized Difference Vegetation Index (NDVI) anomaly for December 2018 (Figure 9) indicates that:

South Sudan, and Kenya: much of South Sudan, and eastern part of Kenya showed signs of deterioration of vegetative conditions as compared to the climatological mean. However some areas in northeast and southeast Kenya showed signs of improvement in vegetative conditions.

Ethiopia, Somalia and Tanzania: several parts of Tanzania, and western and central parts of Ethiopia showed signs of improvement in vegetative conditions as compared with the climatological mean. southern Ethiopia, several parts of southern Somalia, and in eastern part of Tanzania showed signals of deterioration in vegetative condition as compared to the long term average.



Figure 5: Normalized Difference Vegetation Index (NDVI) for December 2018 (Data Source: USGS-NASA)

Much of the rest of the GHA region indicated little or no change in vegetative conditions as compared to the climatological average for the month of December 2018. (Figure 9).

4. STATUS OF THE CLIMATE SYSYEMS

Sea Surface Temperature (SST) The anomaly during the period of December 2018 showed that equatorial Pacific Ocean was dominated by warmer than the average SST (Figure 6), this situation currently presents a positive, Oceanic Nino Index (ONI) (Figure 7).Models forecasting El Niño Southern Oscillation ENSO event show a an increased likelihood of a weak El Niño phase toward the beginning of the year 2019. Near average to cooler than average SST conditions dominated eastern equatorial Indian Ocean (Figure 6), while in the western equatorial Indian Ocean SST warmer than

average was recorded. This pattern has presented a positive phase of the Indian Ocean Dipole (IOD) (Figure 8). Models show a likelihood of a persistent positive IOD in the beginning months of 2019.



Figure 6: Sea Surface Temperature anomalies for the period of December 2018 (Source: NOAA/ESRL/PSD)



Figure 7: The Indian Ocean Dipole (IOD) during 2018 and analogue years.



Figure 8: The Oceanic Nino Index (ONI) during 2018 and analogue years.

5. CLIMATE OUTLOOK FOR FEBRUARY 2019

The climate outlook for temperature and precipitation for the month of February 2019 are generated from the GHA region customized Weather Research and Forecasting (WRF) model.

The February 2019 rainfall forecast

During the month of February 2019, rainfall will be concentrated over Tanzania, Burundi Rwanda, southern part of Uganda, and southwest part of Kenya. Central and southwest Ethiopia, southern South Sudan, northern Uganda, and central and south-central Kenya are expected to record little amounts of rainfall (Figure 9a). Southwest part of Tanzania is forecasted to record high rainfall amounts exceeding 500mm. Much of the areas covering Sudan, South Sudan, Eritrea, Djibouti, northern Kenya, northwest and eastern Ethiopia, and much of Somalia are expected to record small amount of rainfall or remain generally dry.



Figure 9a: Forecast of rainfall total for February 2019 (WRF).



February 2019 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over northern parts of Sudan, western and central Ethiopian highlands, north-western Somalia, southwest Uganda, western and central Kenya, and over much of Rwanda, and Burundi. Much of the rest of the GHA is likely to record average temperatures warmer than 22°C(Figure 9b).

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed climate conditions are provided below.

Impacts of observed climate conditions during Dcember 2018

During the month of December 2018, some places in eastern parts of the equatorial sector experienced dry conditions associated with depressed OND 2018 rainfall season causing prospects of poor crop, water and livestock performance.

Potential impacts for February 2019 climate outlook

In the month of February 2019, the forecasted climate is likely to result to improved water availability, improved crop and pasture conditions leading to good prospects for crop and livestock performance especially in southern sector of the GHA.

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