IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, July 2017

1. INTRODUCTION

This bulletin reviews the climate condition over the Greater Horn of Africa (GHA) region for the month of July 2017, and also highlights the rainfall and temperature outlook for the month of September 2017, together with the socio-economic impacts associated with both the observed and the predicted conditions.

In the month of July rainfall is mainly expected in the northern sector as well as in the western part of the equatorial sector of the GHA. In July 2017, the Oceanic Nino Index (ONI) signal showed a neutral state but tending to positive index, with positive but weak Indian Ocean Dipole (IOD) index as at the end of July 2017. The ONI is expected to persist in a neutral phase in the coming few months.

For referencing within this bulletin, the 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.

2. HIGHLIGHTS

Rainfall performance was generally in normal in most part of the GHA region, except in areas northeast, south and west of Sudan; west and south of Ethiopia; eastern South Sudan; west, central and southwest of Uganda, western Kenya, and in a few areas central and south Somalia, and north western Tanzania which recorded above the normal rainfall. Places in central part of central and western parts of Sudan; much of Eritrea, Djibouti, Rwanda, and Burundi; in parts of north eastern Ethiopia, northern Somalia, central and eastern Kenya, south-western Uganda, and in north eastern and eastern Tanzania recorded below normal rainfall during the month of July 2017

The rainfall condition in the GHA region during the month of July 2017 continue to bring with it a relief in some of the areas especially in the northern sector and north-western equatorial sector of the GHA. However a few places especially in the western, parts of the equatorial sector as well as eastern parts of the northern sector are experiencing impacts of depressed rainfall conditions that has led to deterioration of water and pasture conditions, poor prospect of crop and livestock production, and general water stress.

September 2017 forecast indicates that, rainfall is likely to be concentrated in over western and central parts of the northern sector of the GHA region (Figure 7a).

3. CLIMATE PATTERNS IN JULY 2017

The rainfall amounts and rainfall performance as compared to the Long Term Mean (1981-2010) using percentage of long term average and Standardized Precipitation Index (SPI) for July 2017 are provided in this section. The minimum and maximum temperature anomalies (2008-2016) are also given.

RAINFALL AMOUNTS AND PERFORMANCE DURING JULY 2017

Rainfall amounts in July 2017

During the month of July 2017, areas covering southern parts of Sudan, south-western Eritrea, much of South Sudan, western and central Ethiopia, much of Uganda except for the south-western part, in western and coastal Kenya, in southern Somalia, and north-eastern Tanzania recorded rainfall amount less than 50mm. Places in the western parts of Ethiopia, and a few isolated parts southern Sudan, northern South Sudan, eastern Uganda and western Kenya recorded rainfall amounts greater than 200mm.

Rainfall amounts less than 10mm was experienced over much of northern part of Sudan, coastal Eritrea, eastern Djibouti, eastern and southern Ethiopia, much of north and central Somalia, in south-western Uganda, over much of Rwanda, Burundi, Tanzania, and in north-eastern, eastern and central parts Kenya during the month of July 2017 (Figure 1).

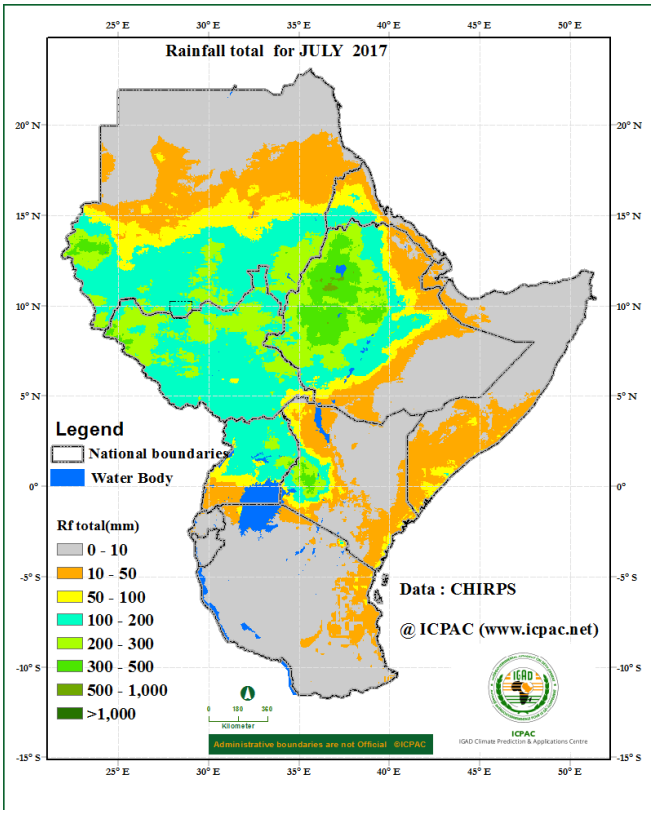

Figure 1: Spatial distribution of rainfall during the month of July 2017*(Data Source : CHG CHIRPS)*

Rainfall severity in the month of July 2017

Figure 2 shows the amount of rainfall received expressed as percentage of long term average (1981-2010) for the month of July while Figure 3 shows the SPI for the same month.

In the month of July 2017 several areas in the GHA region recorded rainfall amounts of between 75% and 125%. Parts of Northeaster, southern and western Sudan; a few places in western and southern Ethiopia, central and southern Somalia and in eastern South Sudan; and in parts of eastern, central and western Uganda and western Kenya recorded rainfall of about 125% of the long term average (Figure 2). Much of these areas corresponded to moderately wet to severely wet rainfall conditions (Figure 3). Rainfall less than 75% of the long term average was experienced in central and western Sudan; in much of Eritrea, Djibouti, north-eastern Ethiopia, Rwanda and Burundi; and in parts of north-western Somalia, south-western Uganda, central and eastern Kenya, and in eastern Tanzania. Much of these areas were associated with moderately dry to severely dry rainfall conditions (Figure 3). Much of the

rest of the Greater Horn of Africa region received between 75% and 125% of long term average rainfall for the month of July which translated to near average rainfall conditions for most of these places. Several areas covering east of Sudan, much of Eritrea, Djibouti, north-western Somalia, northern Ethiopia, eastern Kenya and eastern Tanzania showed poor performance of rainfall as compared to the month of July 2017.

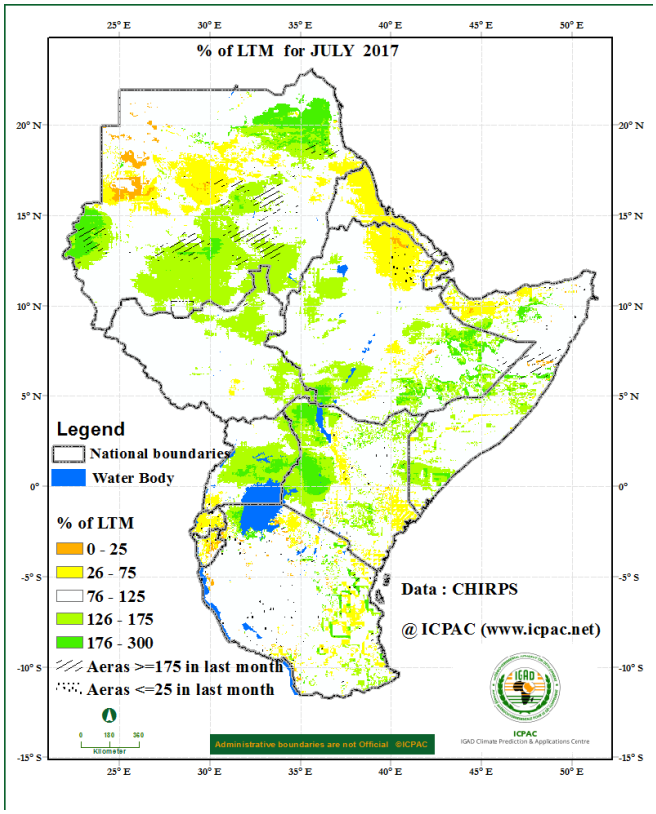

Figure 2: Percentage of average rainfall for July 2017*(Data Source: CHIRPS)*

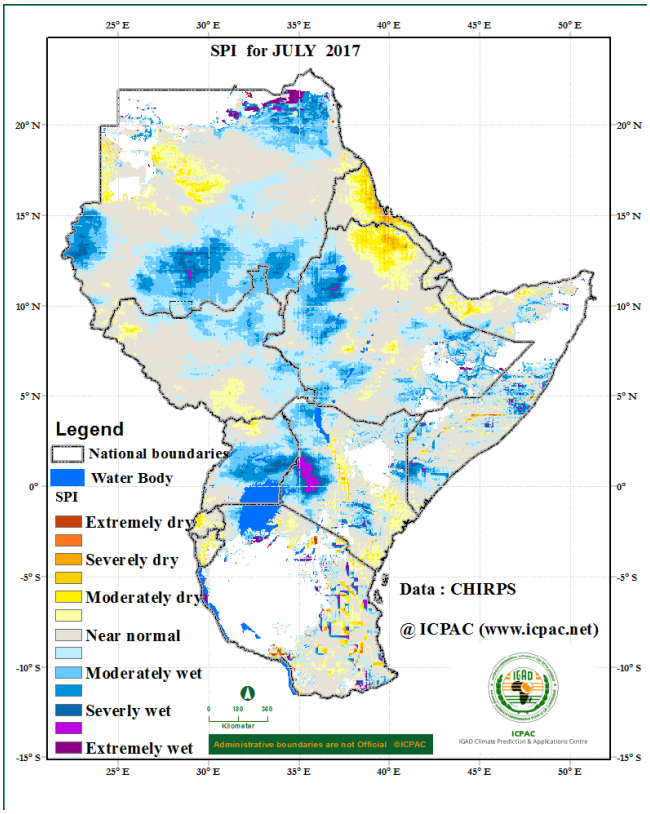

Figure 3: Standardized Precipitation Index for July 2017*(Data Source: CHIRPS)*

TEMPERATURE CONDITIONS

During the month of July 2017, warmer than the average maximum temperatures conditions was mainly experienced over much of South Sudan, southern and central Sudan, south-western Eritrea eastern and western parts of Kenya, and in north-western, central and southern Tanzania; and in parts of north-eastern Ethiopia and several isolated areas of Ethiopia; and in northern and southern parts of Somalia, eastern Rwanda, eastern Burundi (Figure 4a). Much of the rest of the GHA recorded near average maximum temperature.

Much of the Sudan except for some western part, northern and central South Sudan, western Eritrea, north-eastern and southern parts of Ethiopia, southern Uganda, north-eastern, western and central parts of Kenya; much of Burundi; and in north-western, western and southern Tanzania recorded above the average minimum temperature conditions in the month of July 2017. The rest of the GHA recorded near the average conditions for the minimum temperature (Figure 4b).

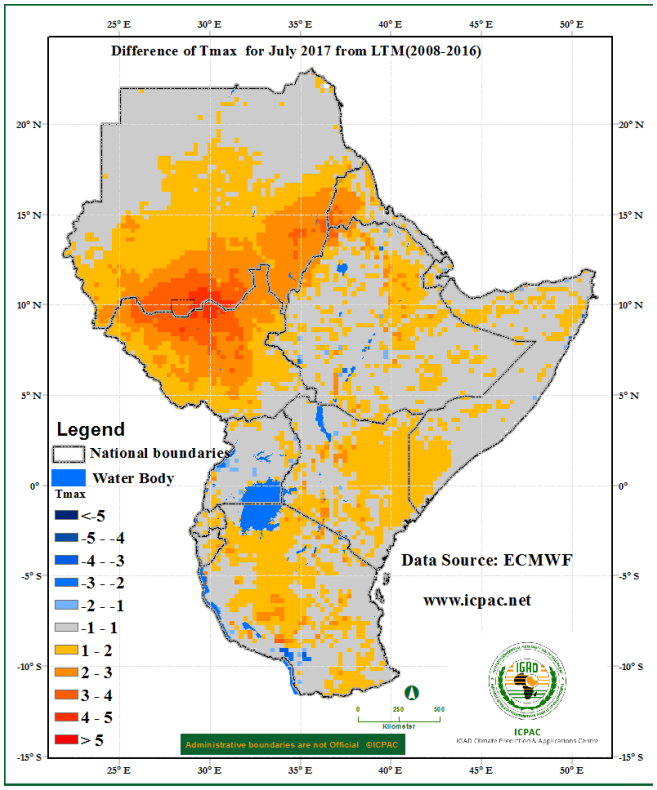

Figure 4a: Maximum temperature anomalies for July 2017 (From LTM 2008-2016 (*Data Source: ECMWF)*

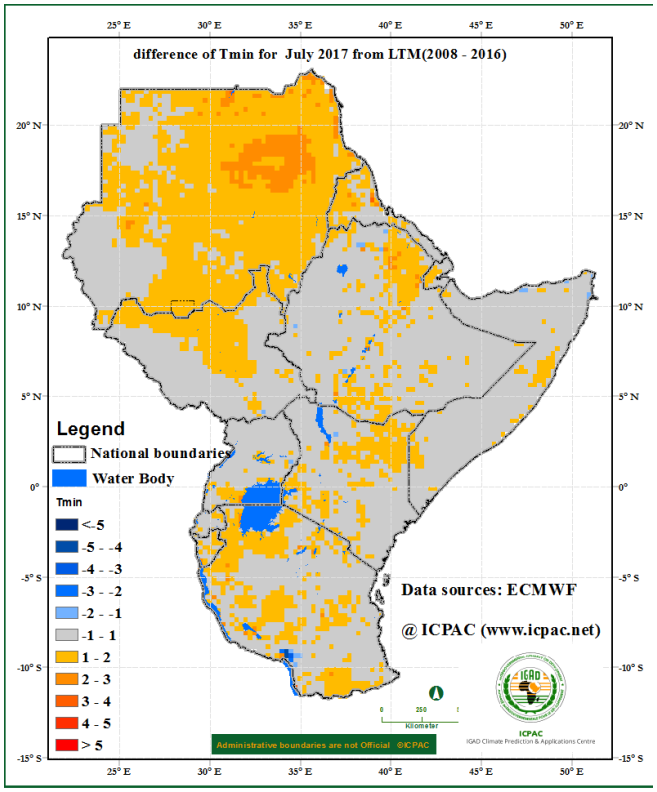

Figure 4b: Minimum temperature anomalies for July 2017 From LTM 2008-2016 *(Data Source: ECMWF)*

4. STATUS OF THE CLIMATE SYSTEMS

The Sea Surface Temperature (SST) anomaly during the period 30 July – August 28, 2017 showed that over central equatorial Pacific Ocean stretching towards the eastern equatorial Pacific region (Niño 4 to Niño 1&2 areas) near average with pockets of cooler than average SST anomaly was in existence, the area stretching from central towards western equatorial Pacific Ocean observed warmer than the average SST (Figure 5), however this situation still currently presents a neutral ENSO phase (Figure 6b). Near average to cooler than average SST conditions dominated eastern side of equatorial Indian Ocean (Figure 5) with much of the central to western equatorial Indian Ocean experiencing near average SST with margins of warmer than average sea surface. This pattern has presented a weak but positive phase of the IOD (Figure 6) similar to recent years such as 1982, 1991 and 2003.

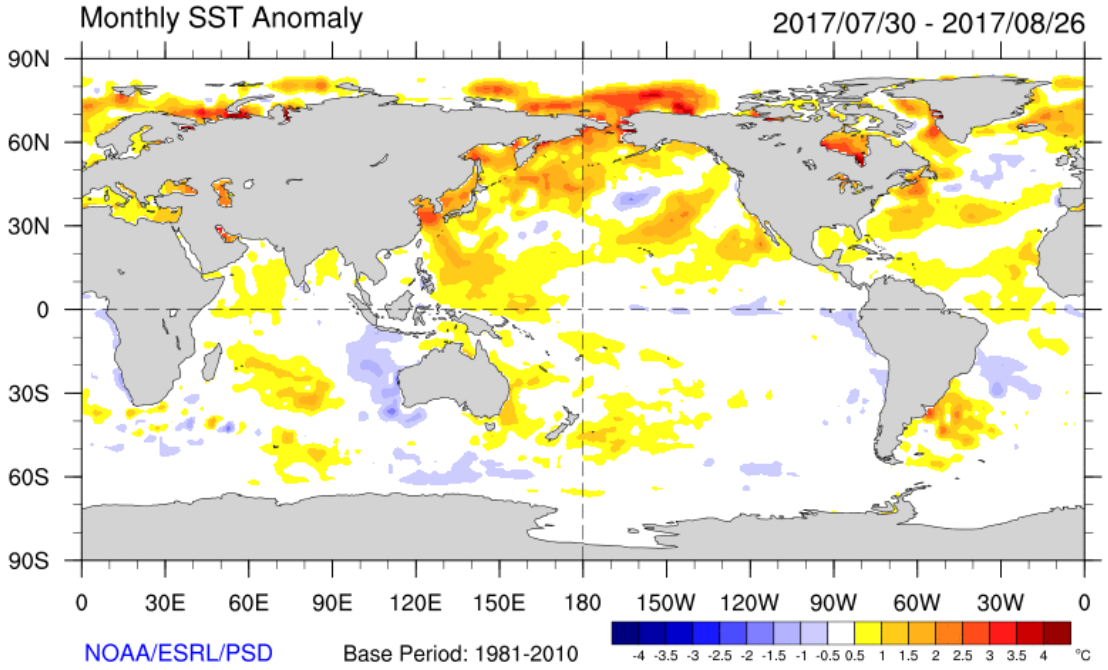

Figure 5: Sea Surface Temperature anomalies for the period 30 July to 26 August 2017 (*Source: NOAA/ESRL/PSD***)**

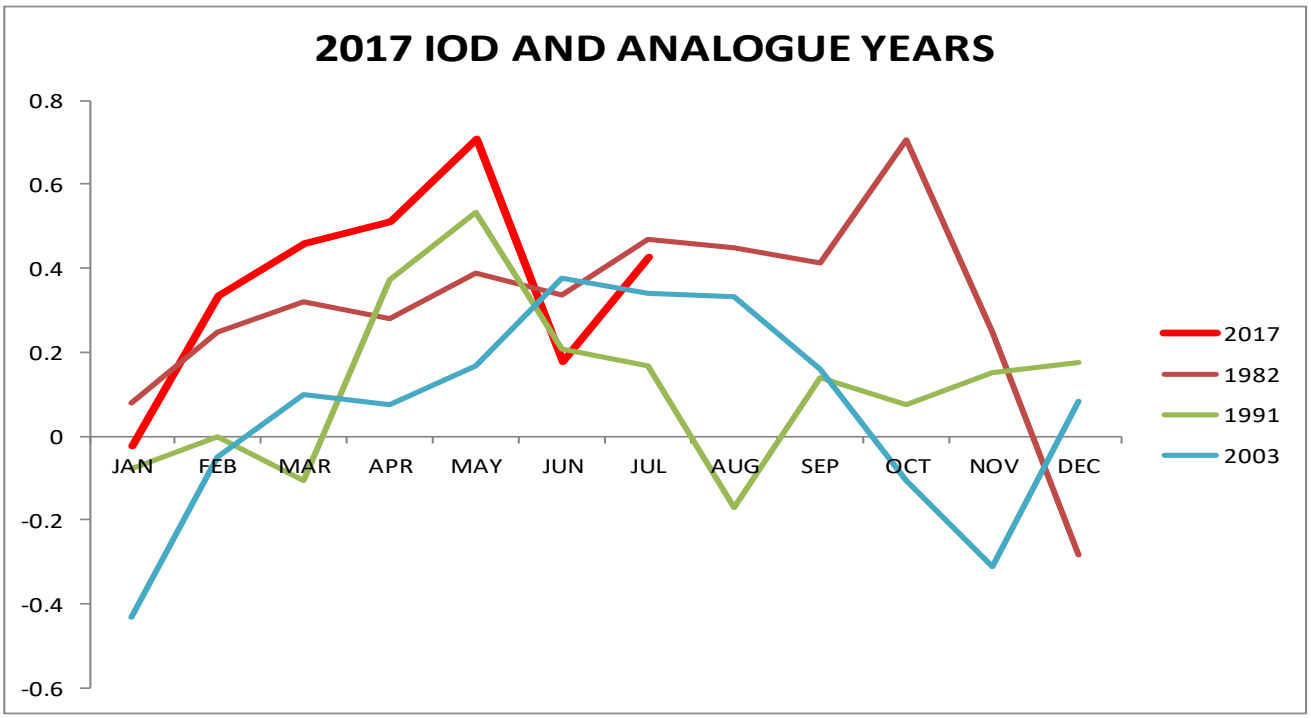

Figure 6a: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.

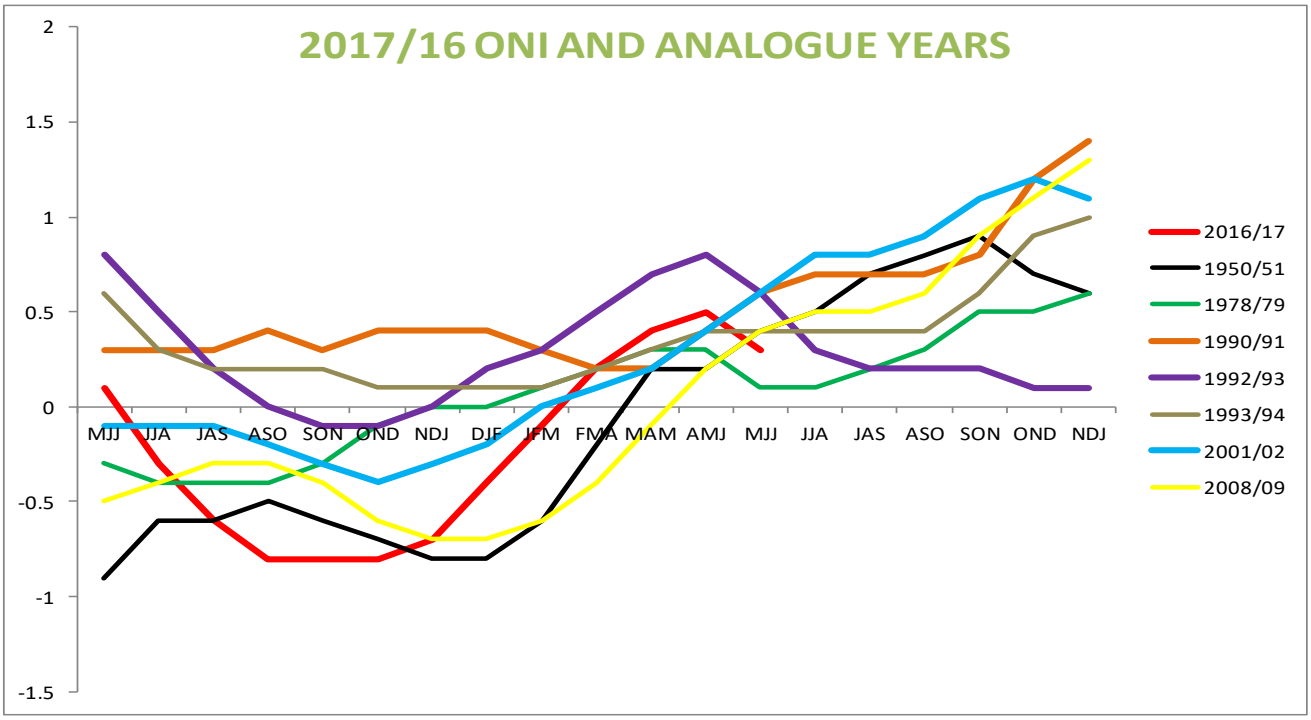

Figure 6b: The Oceanic Nino Index (ONI) during 2016/17 and analogue years.

5. CLIMATE OUTLOOK FOR SEPTEMBER 2017

The climate outlook for temperature and precipitation for the month of September 2017 are generated through a statistical downscaling of Ensemble GCM.

The rainfall forecast for September 2017

The forecast for the month of September 2017, indicates likelihood of high amount of rainfall (>100mm) over the southern part of Sudan; over much of South Sudan; around south-western Eritrea; in western to central parts of Ethiopia; several parts of Uganda; and in western Kenya (Figure 7a). Areas around southern parts of Sudan, much of western, northeast and southern areas of South Sudan, central Eritrea, much of Djibouti, northern and central Ethiopia, central to southern Somalia, north-eastern, eastern and south-central parts of Kenya, and in much of north-eastern, central, western and southern Tanzania have higher chances of recording below the average rainfall, with the rest of the GHA region having better chances of near average to above average rainfall conditions (Figure 7c).

Temperature Outlook for September 2017

Average temperature of more than 22^{o}C is likely to be observed in much of Sudan, south Sudan, Somalia, Djibouti, Eritrea, eastern Ethiopia, in much of Uganda, in north and eastern parts of Kenya, and in northwest and eastern and southern parts of Tanzania. Average temperature less than 22 ^{o}C is likely to be observed in central and western Ethiopia, in south-western Uganda, Rwanda, Burundi, western Kenya, and in south-western and north-eastern Tanzania in the month of September 2017. Much of the GHA region has higher chances of recording warmer than the average mean temperature for the month of September 2017, except for the south-eastern parts of Sudan, much of Eritrea, north-eastern, central and south-central parts of Ethiopia, eastern Djibouti, in central and north central Kenya, in western Rwanda northern; in central parts of Somalia, and in north-eastern and south-western parts

of Kenya which are likely to record average to cooler than the average mean temperature in the month of September 2017.

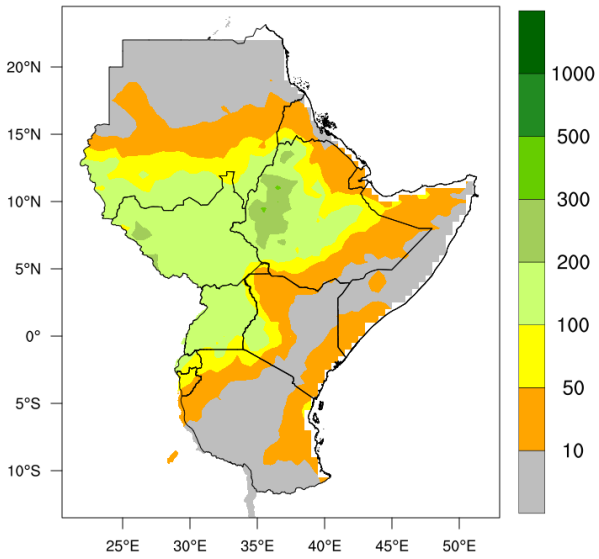

Figure 7a: Rainfall total forecast for September 2017

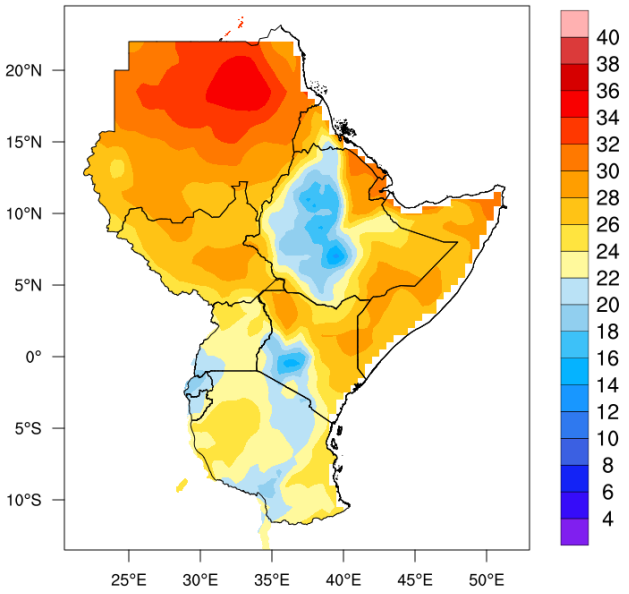

Figure 7b: Mean temperature forecast for September 2017.

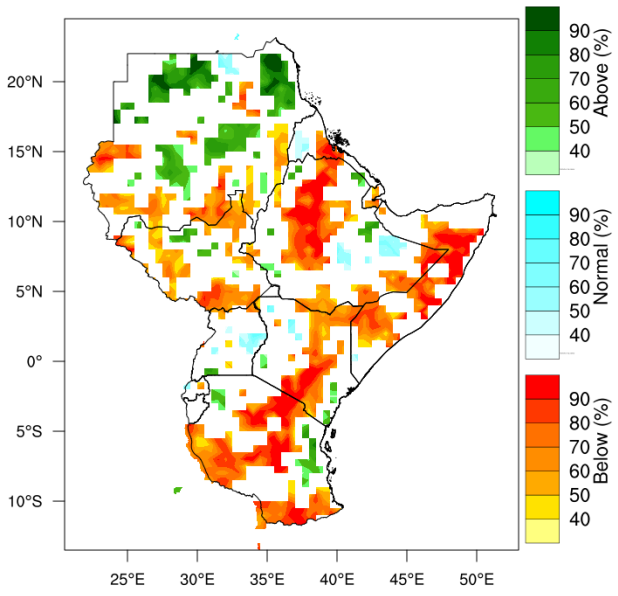

Figure 7c: Rainfall terciles probability forecast for September 2017

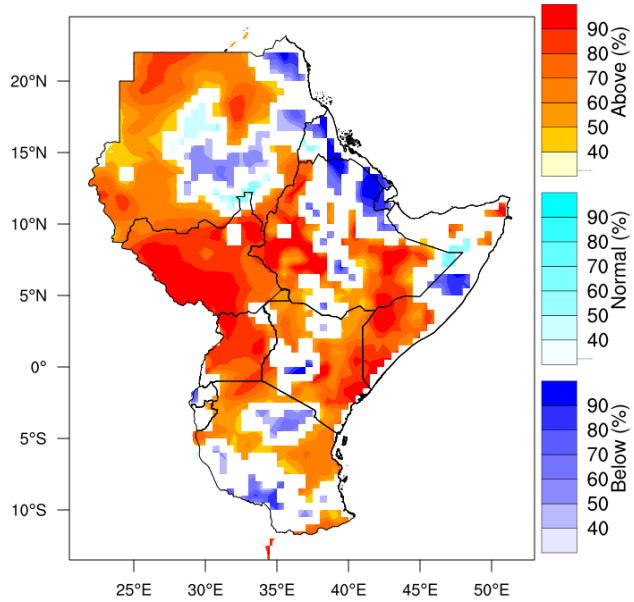

Figure 7d: Mean temperature terciles probability forecast for September 2017.

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 July 2017 indicated that vegetative conditions showed deterioration as compared to the long term average in western and southern margins of central Ethiopia, southern Uganda, southeastern Somalia, southern and eastern Uganda, western, central and coastal parts of Kenya, in parts of Rwanda, and in northwestern Tanzania. Improvement in vegetative conditions as compared with the long term average was observed in southern parts of Sudan, northern and western South Sudan, northeastern Ethiopia, northern Uganda, in northwestern and central parts of Kenya, and eastern and southern Tanzania. The rest of the Greater Horn of Africa indicated little or no change in vegetative conditions. (Figure 8).

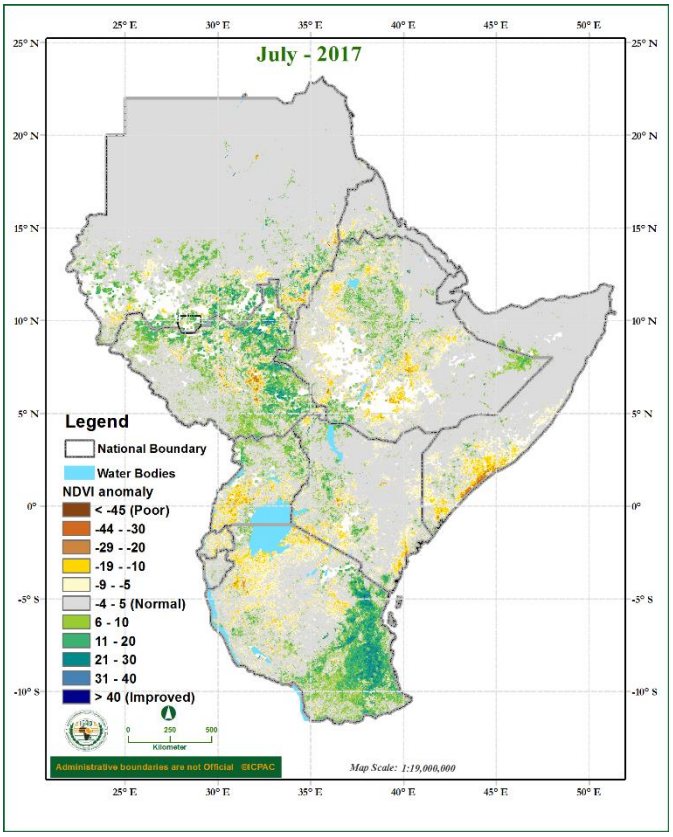

Figure 8: Normalized Difference Vegetation Index (NDVI) of July 2017 over the Greater Horn of Africa *(Data Source: USGS-NASA*)

Impacts of observed climate conditions during July 2017

During the month of July 2017 several places in the Greater Horn of Africa still continued to experience depressed rainfall related impact that has led to continued water stress, poor pasture and crop performance, reported in some areas round the equatorial and southern part of northern sector of the GHA; there is reported cases of climate related diseases and also high temperature related heat stress especially in some areas west of the northern sector of the GHA.

However some areas in the northern sector have reported improved pasture and water conditions, and receiving a substantial amounts of rainfall with good and healthy crops which have acted as a relief from the previously dry conditions, some incidences of flooding were reported in few isolated areas over the northern sector of GHA during the month of July 2017.

Potential impacts for September 2017 climate outlook

The probable impacts from the September 2017 climate forecast show much of the south-western, south-central and south-eastern parts of the northern sector, as well as western and central parts of the equatorial sector of the GHA likely to have improved water, crop and pasture conditions leading to good prospects for crop and livestock performance. However some parts especially in eastern and southern parts of the equatorial sector are likely to receive little or rainfall which are likely to result into a continued deterioration of water and pasture resources leading to water related crop and livestock stress and poor prospects for crop and livestock performance.

For more information contact
ICPAC P.O. Box 10304, 00100 Nairobi,
KENYA;
Tel: +254-020-3514426
E-mail: director@icpac.net

Website: www.icpac.net