



STATEMENT FROM THE FIFTY NINTH GREATER HORN OF AFRICA CLIMATE OUTLOOK FORUM (GHACOF59): 24-26 August 2021; ICPAC, NAIROBI METROPOLITAN AREA, KENYA

INTERNET-BASED LIVE FORUM

Consolidated Objective Climate Outlook for October to December 2021 Rainfall Season.

October to December (OND) constitutes an important rainfall season, particularly in the equatorial parts of the Greater Horn of Africa (GHA), where the OND rainfall contributes 20-70% of the annual total rainfall. Analysis of global climate model predictions from 9 Global Producing Centres (GPCs) customized for GHA indicates increased chances for drier conditions during October to December 2021 over much of the region. Specifically, there are raised chances of a drier than average season over Tanzania, Burundi, Rwanda, Kenya, southern, central and north-western Somalia, southern and south-eastern Ethiopia, and the Red Sea coast of northern Eritrea. Probabilities are especially enhanced for below average rainfall over the cross-border areas of Kenya and Somalia. Near-average to below average rainfall conditions are indicated over northeastern Somalia. Except for few areas where drier than average rainfall conditions are favoured, equal probabilities for the below, normal, and above average categories are indicated over much of South Sudan and southern parts of Sudan as well as western and northern Uganda.

Compared to the usual chances, the predicted probabilities of total seasonal rainfall exceeding 200 mm and 300 mm are enhanced over South Sudan, northwestern Uganda and southwestern Ethiopia. In contrast, predicted probabilities for exceeding 200 and 300 mm are lower than usual over most other regions and notably so over eastern Kenya and southern Tanzania. Consistent with enhanced probabilities for below average rainfall, the start of the season is expected to be delayed by up to two weeks, especially over eastern Kenya and southern Somalia.

The consolidated objective temperature forecast from 9 Global Producing Centres (GPCs) indicates an increased likelihood of warmer than average surface temperatures across GHA. Probabilities of warmer than average temperatures are most enhanced from eastern Kenya to Somalia, eastern parts of Ethiopia, and eastern Sudan.

A Standardized Precipitation Index (SPI) analyses of observed and predicted precipitation for 3, 6, and 12 months indicates long-term rainfall deficits in many parts of equatorial and southern regions. Notably, past observed deficits as well as forecasts to 31 December 2021 indicate a 12-month SPI representative of moderate to severe multi-season drought conditions in the region, particularly over Uganda, southwestern Ethiopia, eastern Kenya, southern Somalia, and Tanzania. Owing in part to the excessive rainfall experienced in the northern parts of GHA in summer, increased moisture surpluses are indicated north of about 10N latitude.

The World Meteorological Organisation (WMO) and the major global climate centres have noted that Sea Surface Temperatures (SSTs) over the equatorial central Pacific Ocean are likely to cool over the coming months. Global models further indicate that the Indian Ocean Dipole (IOD), which is known to have significant effects during the short

(October to December - OND) rains is also expected to persist at negative IOD levels through the majority of OND 2021. This season's configuration of the ENSO and IOD is expected to interact with regional circulation patterns in a way that typically depresses seasonal rainfall in the region. Their effects also are modulated by topography and large inland water bodies. Updates on the ENSO condition will be provided regularly by WMO and the major climate centres.

The outlook is relevant for seasonal timescales and covers relatively large areas. Local and month-to-month variations might occur as the season progresses. Spells of heavy rain and above normal rainfall may occur in areas with an increased likelihood of below normal seasonal totals and vice versa. ICPAC will provide regional updates on regular basis while the National Meteorological and Hydrological Services (NMHSs) will provide detailed national and sub national climate updates.

The Climate Outlook Forum

The Fifty-ninth Greater Horn of Africa Climate Outlook Forum (GHACOF59) was convened from 24th to 26th August 2021 by the IGAD Climate Prediction and Applications Centre (ICPAC) in collaboration with the GHA National Meteorological and Hydrological Services (NMHSs), World Meteorological Organization (WMO) and other partners to document and share the climate impacts across the region and to formulate responses to the regional climate outlook for the October to December 2021 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 the El Niño Southern Oscillation (ENSO) conditions, IOD, and SSTs over the Pacific and Indian Oceans, and considered their impacts on the GHA during October to December 2021 rainfall season. Climate information users from sectors such as disaster risk management, agriculture and food security, livestock, health, environment, media, conflict, and water resources as well as non-governmental organisations and development partners actively participated in the formulation of management strategies for the potential impacts of the objective climate forecast in their respective sectors.

Methodology

Guidance and valuable information on factors expected to influence the upcoming season were drawn from a wide range of sources. Predictions from dynamical seasonal climate models, including those of the World Meteorological Organisation's Global Producing Centres (WMO GPCs-LRF) formed the primary forecast inputs.

The objective seasonal forecast was developed during the PreCOF59 climate capacity building workshop held from 16th to 20th August 2021. During the workshop, experts examined the prevailing and predicted SSTs over the Pacific, Indian and Atlantic Oceans as well as other global, regional and local climate factors that affect the rainfall evolution during OND season. These factors were assessed using dynamical and statistical models. The regional consolidated objective forecast is produced by recalibrating outputs from 9 global state-of-the-art seasonal prediction systems (WMO GPCs-LRF and other models). Regional scientists and national forecasters from 10 ICPAC Member States used ICPAC's FCDO-funded High-Performance Computing (HPC) cluster through remote connection to co-develop regional and national-level climate outlooks. Climate prediction products were used by sectoral experts and climate providers to co-assess expected impacts, draft mitigation strategies, and co-produce advisories. The sectoral meetings were held from 24th – 25th August 2021 preceding the GHACOF59.

The current capability of seasonal to inter-annual climate forecasting allows for the prediction of departures from mean conditions on a regional domain, with consideration of scales of processes that contribute to regional and sub-regional climatic conditions. Forecast probability distributions are established objectively to indicate the likelihood of above-, near-, or below-normal rainfall for each zone. Above-normal rainfall is defined as within the wettest third of recorded rainfall amounts in each zone; near-normal is defined as the middle third of the recorded rainfall amounts; below-normal rainfall is defined as occurring within the driest third of the rainfall amounts. Climatology

here refers to weather conditions, averaged over a 30-year period (1991-2020). Probability distributions for temperature are also established.

The rainfall and temperature outlooks for October to December 2021 for various zones within the GHA region are given in Figure 1 and Figure 2, respectively. Figure 3 provides Standardized Precipitation Index for 3-, 6, and 12-month time scale.

Rainfall Outlook for October to December 2021

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

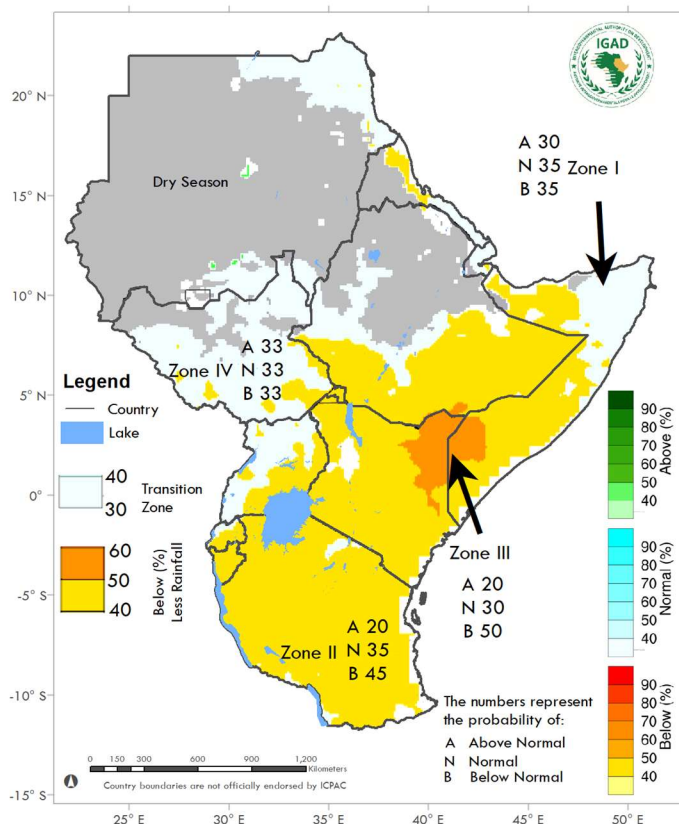


Figure 1: Rainfall outlook for October to December 2021

- Zone I:** In this Zone (light blue) probabilities for the near normal and below normal rainfall categories are equal at 35%, and slightly greater than for the above normal category.
- Zone II:** In this Zone (all yellow) the below normal rainfall (drier) category has the highest probability (45%). The probabilities of the near normal and above normal categories are 35% and 20% respectively.
- Zone III:** In this Zone (orange), the below normal rainfall (drier) category has the highest probability (50%). The probabilities for the other categories are provided.
- Zone IV:** In this Zone (light blue) the probabilities for the below, normal, and above are equal.

Temperature Outlook for October to December 2021

The temperature outlook for various zones within the GHA region is given in Figure 2 below.

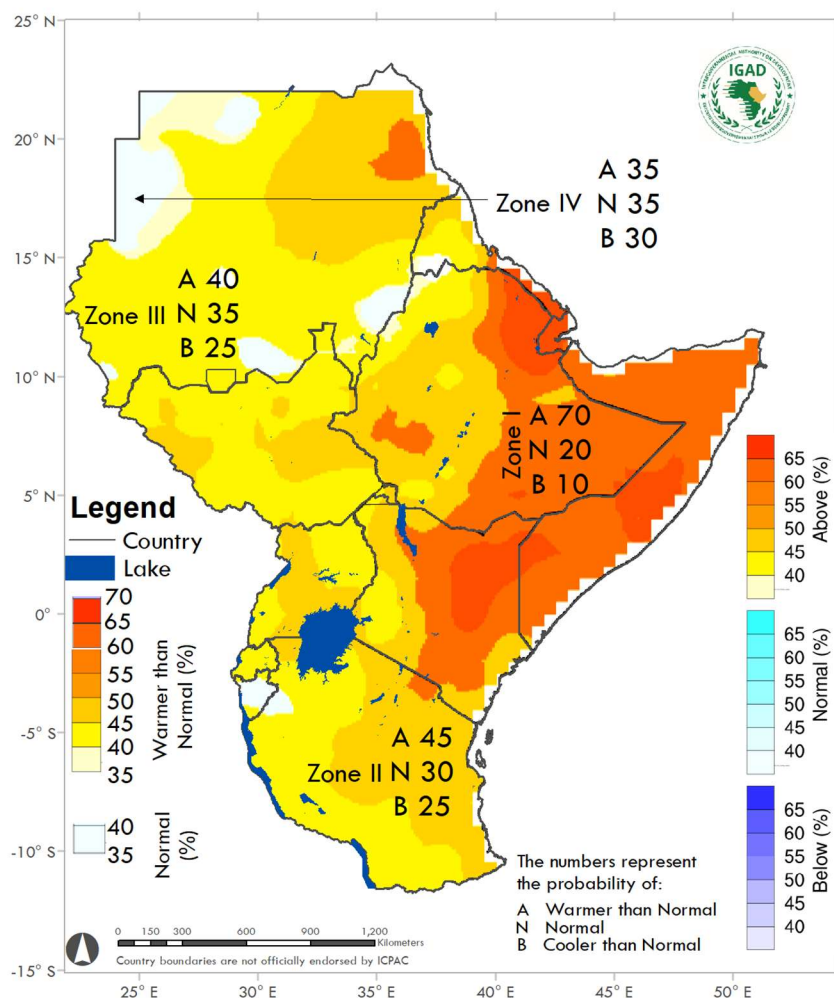


Figure 2: Temperature outlook for October to December 2021

- Zone I:** In this Zone the above normal mean temperature (i.e., warmer) category is most likely at 70% (the probabilities of the other categories are also provided).
- Zones II:** In this Zone also the above normal mean temperature category has the highest probability (at 45%).
- Zones III:** In this Zone also the above normal mean temperature category has the highest probability (at 40%).
- Zones IV:** In this Zone probabilities for the near normal and above normal mean temperature categories are equal at 35%, and slightly greater than for the below normal category.

Note: The numbers for each zone indicate the probabilities of rainfall/temperature in each of the three categories, above-, near-, and below-normal. The top number (A) indicates the probability of the above-normal category; the middle number (N) is for near-normal and the bottom number (B) for below-normal category. For

example, in Zone I in Figure 1, there is 30% probability of rainfall occurring in the above-normal category; 35% probability of rainfall occurring in the near-normal category; and 35% probability of rainfall occurring in the below-normal category. It is emphasised that boundaries between zones should be considered as transition areas.

Precipitation-based Drought Outlook based on Standardized Precipitation Index (SPI)

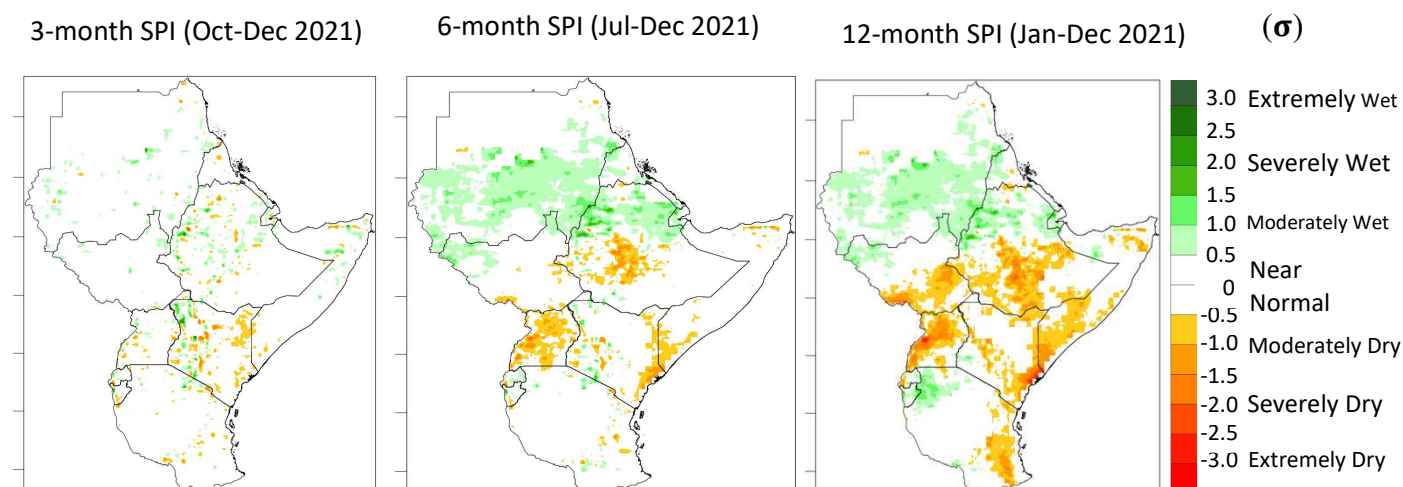


Figure 3: Standardized Precipitation Index

Contributors

GHACOF 59 was organized jointly by the IGAD Climate Prediction and Applications Centre (ICPAC) and National Meteorological and Hydrological Services (NMHSs) of the Greater Horn of Africa (GHA). The forum was supported by the ClimSA and CONFER Projects funded by the European Union as well as DRESS-EA project funded by Adaptation Fund through OSS. Contributors to the regional climate outlook included representatives of NMHSs from GHA countries (Insitut Geographique du Burundi; Meteorologie Nationale de Djibouti; National Meteorological Agency of Ethiopia; Kenya Meteorological Service; Rwanda Meteorological Agency; South Sudan Meteorological Service; Sudan Meteorological Authority; Somalia Meteorological Authority and Uganda National Meteorological Authority) and climate scientists as well as other experts from national, regional and international institutions and organizations: ICPAC; Met Office, UK; and WMO Global Producing Centres (GPCs).