REPORT OF

THE SIXTY FIRST GREATER HORN OF AFRICA CLIMATE OUTLOOK FORUM (GHACOF 61) FOR THE JUNE TO SEPTEMBER (JJAS) 2022 SEASON

Hybrid 17-19 May 2022

THEME: " Anticipatory Action for Climate Resilience”

Addis Ababa, Ethiopia, 2022

Table of Contents

PREFACE

The sixty first Greater Horn of Africa Climate Outlook Forum (GHACOF61) was organized both virtually and in person on 17-19 May 2022. The main objectives of the forum were to review the feedback the performance and impacts of the previous rainfall season including the users' feedback, provide the regional consolidated climate outlook for June to September (JJAS) 2022 rainfall season and assess implications of the forecast in key socio-economic sectors over the region. The forum brought together climate scientists, researchers, decision-makers and users from key socio-economic sectors, governmental and non-governmental organizations, development partners and the civil society among other stakeholders. GHACOF61 was preceded by sectors specific workshops that focused on co-production of climate services, feedback on the use of the previous forecast and impacts of the following season, lessons learned and mitigation measures, and co-production of climate services. This was in addition to week-long climate prediction development workshop which was held from 7 to 11 May 2022 to co-develop regional and national climate forecasts.

The GHACOF61 was organized by the IGAD Climate Prediction and Applications Centre (ICPAC) in collaboration with the National Meteorological and Hydrological Services (NMHSs) of ICPAC's participating member countries and supported by partners. The forum was held within the framework of the IGAD regional strategy for mainstreaming climate information in key socio-economic sectors for disaster risk reduction and sustainable development. The theme of GHACOF61 was ***"*Anticipatory Action for Climate Resilience*".***

The three days-event was attracted 698 participants, 115 of whom attended in person at the **Best Western Plus** hotel in Addis Ababa.

ICPAC would continue to organize GHACOFs as one of the most effective ways to strengthen the dialogue between climate scientists and the users of climate services, proactively innovate and improve efforts to deliver better services to intermediary and end-users in the coming seasons.

Guleid Artan (PhD)

ICPAC Director

EXECUTIVE SUMMARY

Due to the COVID-19 pandemic, the IGAD Climate Prediction and Applications Centre (ICPAC) held the sixty first Greater Horn of Africa Climate Outlook Forum (GHACOF61) using a hybrid format don both in person and using zoom platform. The GHACOF61 issued the June to September (JJAS) 2022 climate outlook for the region and formulated mitigation and response strategies as a consequence of the JJAS 2022 seasonal climate outlook. It also reviewed the March-May (MAM) 2022 seasonal rainfall performance and impacts on the different socio-economic sectors. The forum was supported by the ClimSA and CONFER Projects funded by the European Union.

The forum was held within the framework of the IGAD regional strategy for mainstreaming climate information into key socio-economic sectors for resilience and sustainable development. It brought together representatives from National Meteorological and Hydrological Services (NMHSs), global climate centers, regional partners and decision-makers and users from key socio-economic sectors. The agriculture, water, livestock and disaster risk management sectors were held in person. All the sectorial sessions were held two days before the main event to formulate responses to the regional climate outlook for the JJAS 2022 rainfall season over the GHA region. The sectors involved during the sectoral sessions were Agriculture and Food Security, Disaster Risk Management (DRM), Water Resources Management and Energy, Livestock, Health, Environment and Forestry, Media, and the Conflict Early Warning and Response Mechanism (CEWARN). Climate Change experts also had a parallel workshop on day one but later joined the various sectors on the second day.

The objective seasonal forecast was developed during the PreCOF61 climate capacity building workshop held from 17-19 May 2022. The consolidated objective climate outlook generally indicates increased chances for wetter conditions (above average rainfall) over most parts of the region mainly over Djibouti, Eritrea, much of the northern two-thirds of Ethiopia, South Sudan, Sudan, western Kenya, and most parts of Uganda during June to September 2022. Probabilities for wetter conditions are particularly enhanced (> 60%) over western Kenya and neighboring Uganda, central and northern Ethiopia, and parts of Sudan. On the other hand, isolated areas over the rangelands of eastern Ethiopia and coastal areas of Kenya and southern Somalia are likely to experience drier than average (below-normal) rainfall conditions.

The forum provided a structured means for users, researchers, and climate services providers to interact at the regional level to ensure that user needs for the seasonal prediction are met. The forum attracted 703 participants, and out of this, 515 were male and 188 were female.

1. SETTING THE STAGE AND OFFICIAL OPENING CEREMONY

Speech by Mr. Fetene Teshome, Director General of Ethiopian Meteorological Institute

Mr. Fetene Teshome, Director General of Ethiopian Meteorological Institute welcomed all participant to Addis Ababa and to the workshop. He started his speech by pointing out that climate shocks have been and are projected to increase under climate change and may be an indication of more irregular onset and cessation of a rainy season, prolonged dry spells and too much rain at times. With these changes, he noted that there will be need for development and implementation of appropriate methods to address weather and climate variability to assist economic sectors to build their adaptive capacity. To meet these needs, Mr. Fetene stated that the Ethiopian Meteorological Institute is working towards making producing actionable climate information.

He also added that the Government of Ethiopia is supporting the Ethiopian Meteorological Institute (EMI) to reach the grass root community, empowering Regional Meteorological Services Center, installing latest observing and communication systems, capacitating national, regional and local staffs, and creating conducive environment through COFs. He notes that at the sub national level, the Government is continuing to create a system that enable sharing of best experiences in seasonal climate forecasting, communication and disseminations to the end users.

He also pointed out the collaboration efforts that EMI has done with partners, donor organizations, and ICPAC which include capacity building of researchers in forecasting, verification, climate modeling among others. He emphasized that this is the time for all to come together and collaborate to improve climate services. He summed up his speech by appreciating every participant for their invaluable contributions during the conference and encouraged future contributions towards eradicating poverty and reducing disaster risks and vulnerabilities in Ethiopia.

Speech by Mr. Atheru on behalf of ICPAC director Dr. Guleid Artan

Mr. Atheru welcomed everyone to ghacof61 on behalf of the director and ICPAC as an institution. He noted that the region has experienced multiple shocks since 2019 without time to recover and MAM 2022 is likely to a fourth consecutive failed rainy season. He added that Africa is warming faster than the global average, and the regional climate continues to change. He emphasized that timely, accessible, and user-friendly climate information must be at the forefront of building resilient communities.

He informed the participants that ICPAC is taking the lead in issuing early warning information to the region with co-production of climate information with users as a central part of its mission. He further said

that ICPAC organize regional Climate Outlook Forum three times a year to provide seasonal forecasts for the periods of March–May (MAM), June-September (JJAS) and October-December (OND). These seasonal forecasts are updated every month.

Mr. Atheru noted that the forums have made an enormous contribution to the improvement of climate information for disaster risk management in our region and there is need for Climate Smart Development in all sectors.

Finally, he promised that ICPAC will continue to innovate in the organization of the forums to strengthen the dialogue between climate scientists and the users. He thanked the European Union and the World Bank for financial support extended to ICPAC that has facilitated organisation of this forum and wished everyone good deliberations during the forum.

Speech by Mr. Mukabana on behalf of the WMO's regional director

Mr. Mukabana the deputy director general read the WMO's director speech. He gave the background and evolution of RCOFs and noted that the forums have been around for about 20 years starting in 1997 and has since expanded rapidly and all over the world. He pointed out that although the RCOF process has remained unchanged, the delivery of consensus-based, user-relevant climate outlook products is in real time through regional cooperation and partnership. Although RCOFs were first created out of a desire to manage the impacts of seasonal to inter-annual climate variability, WMO has stated that the RCOF concept also has the potential to be extended to develop the capacity to adapt to climate change. Similarly, he noted that the end-users that will benefit from the RCOFs contribute to its organization and to the breadth of the sessions, thus ensuring the applicability to meeting end-user requirements.

He added that RCOFs provide support to policy and decision-making as interest in climate services continues to grow. With the drought conditions in parts of east Africa, enacting a climate policy that could address adaptation and resilience to key economic sectors, to communities and the biodiversity in the region to cope with drought and other extreme climate events will be a key message.

Other issues that he mentioned include how scientific consensus are built in RCOFs, capacity building and the role of networking in RCOFs, production of usable and operational regional climate outlook with skill, and demonstration of value, and sustainability of the RCOFs and NCOFs.

Lastly, Mr. Mukabana affirmed that WMO strongly supports the RCOFs process and the NCOFs as contributing to the socio-economic development of the Greater Horn of Africa (GHA) through availing of science-for-service weather water and climate information that helps in adopting to adverse impacts of climate change and building adaptation and resilience to the extremes.

Speech by H.E. Ambassador Asfaw Dingamo, State Minister for Ministry of Water and Energy.

Amb. Asfaw welcomed all to ghacof 61 and thanked the organizers for choosing Addis Ababa as the preferred venue for the event. He noted that ghacof61 comes at a time when drought has ravaged parts of the region especially south eastern Ethiopia, eastern Kenya, and Somalia. He also added that in the recent past, intensity and frequency of droughts and floods has increased and destabilized lives of millions of people.

With June to September being a major rainy season for the northern Greater Horn of Africa countries, he stated that there is need for clear and concise message on whether La Niña-led flood or Elnino led drought will be affecting the region as it is essential for the policy makers, planners and disaster risk managers.

Amb. Asfaw recognized the aspirations of ICPAC in developing reliable, proactive and timely climate information as well as web-based dissemination scheme for the region. He also applauded the role of the pre-forum capacity-buildings that precedes GHACOF and stated the need to expand systems that allow production of user-tailored climate information both at national and regional level. He called upon member states and international communities to extend their supports in order to sustain and strengthen excellent services and works of ICPAC in the future. On behalf of the Government of Federal Democratic Republic of Ethiopia and on behalf of IGAD, he expressed his appreciation to institutions that have continued to support ICPAC to help in continuation of the Greater Horn of African Climate Outlook Fora. Lastly, he withed the participants a successful deliberation and declared the Sixty first Greater Horn of Africa Climate Outlook Forum under the theme “Anticipatory Action for Climate Resilience” officially opened.

1.1 Introduction

The organization of Regional Climate Outlook Forums (RCOFs) was initiated in 1996 in Victoria Falls, Zimbabwe, by the WMO’s Climate Information and Prediction Services (CLIPS) project in collaboration with NMHSs. RCOFs gained momentum as a regional response to the major 1997–1998 El Niño event. The IGAD Climate Prediction and Applications Centre (ICPAC), formerly known as Drought Monitoring Centre (DMC), organized the first RCOF in Nairobi, Kenya, for the March to May (MAM) 1998 rainfall season in February 1998.

The sixty first Greater Horn of Africa Climate Outlook Forum (GHACOF61) was organized by 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 June to September

2022 rainfall season over the GHA region. June to September (JJAS) is an important rainfall season for the northern parts of the Greater Horn of Africa (GHA) region.

This report presents summarizes the activities and discussions the sixty first Greater Horn of Africa (GHA) Climate Outlook Forum (GHACOF61), which was held both in person at Best Western Plus hotel in Addis Ababa and virtually on 19 May 2022.

1.2 Objective of the forum

The main objective of the forum was to provide the regional climate outlook for the June to September (JJAS) rainfall season, analyze the potential impacts of the expected climate conditions on different socio-economic sectors, and formulate appropriate mitigation measures as well as advisories. Assessment of the performance and impacts of the preceding seasonal climate was also undertaken. Experiences and lessons learned in using the forecast together with good practices were highlighted in the sectoral reports. The challenges encountered during the season were also reported.

1.3 Participants for the forum

The hybrid forum was composed of climate scientists from the National Meteorological and Hydrological Services (NMHSs) of ICPAC member countries, universities, research institutions, regional and international organizations engaged in climate modelling, prediction and applications for the region. Others were from socio-economic sectors such as agriculture and food security, health, water resources, energy, disaster risk reduction, civil society, and conflict early warning response, among other users. Various regional and international Governmental and Non-Governmental organizations and the donor community are also participated in the forum. Not all participants gave their details in the registration forms, of those that did, the number and percentages are broken down per sector in Table 1. A total of 703 participants from the various sectors had been registered online. Out of this, 515 were male and 188 were female. In terms of sectors, the meteorology and climate services comprised of 260 (i.e., 36.9%) of the total participants who listed their sector.

Table 1: Number of registered participants according to their sectors

No	Sector	Number of registers
1	Agriculture and Food Security	111
2	Conflict / Law enforcement and Security	13

3	Disasters Risk Reduction	48
4	Education / Academia and Research	23
5	Environment and Climate Change	83
6	Health	19
7	Humanitarian Assistance	15
8	Livestock	23
9	Media / Communication and Information Technology	39
10	Meteorology and Climate Services	260
11	Migration and Social Protection	3
12	Water and Energy	37
13	Coordination of different sectors	9
13	Other	20
14	Total	703

1.4 Methodology

Presentations and plenary discussions were some of the main modes used during the online forum. On 17 May 2022 sectors organized a working session to review and discuss the climate products needed by each sector and on the 18 May 202, the sectors review the impact of the MAM 2022 season, share lesson and good practices, discuss the outlook of JJAS 2022, and generate advisories to mitigate the climate. On the 19th May, the sectors gave consolidated presentations on the impacts and advisories discussed in the previous days.

2. FEEDBACK ON MAM 2022 SEASONAL CLIMATE PERFORMANCE AND IMPACTS

This session was mainly dedicated to showing the meeting participants the performance of the previous season and to showcase some of the impacts observed during the season with regards to the observed rainfall and temperature from the six sectors including Agriculture and food security, Disaster Risk

Management, Environment and Forestry, Water resources and Energy, Livestock and Rangelands, and Health and Nutrition.

2.1 Agriculture and Food Security

Some of the positive impacts reported by the sector during the MAM 2022 rainfall season included; good crop production, adequate rainfall during April were conducive for long maturing crops such as maize and sorghum in Ethiopia, distribution of seeds to small-scale farmers, and early planting of climbing beans in Burundi. On the contrary, the prolonged dry spell observed during February and March was suitable for; suppressing the breeding and spread of the dessert locusts, land preparation, and harvesting and storing irrigation crops. There were also some negative impacts identified which included; incidences of waterlogging in cultivated prone areas, landslides, soil erosion and flooding in Rwanda, Tanzania, Burundi and Uganda; heavy rains and wet conditions could lead to crop failure (mostly beans) and the emergence of some crop pests (e.g., FAW) in Rwanda; high likelihood of increased weeds, problematic in areas where farmers still use traditional weeding methods in Rwanda; disruption of feeder roads affecting access to markets in Rwanda and S. Sudan; depressed rainfall in small areas in the western part of Western Equatoria State has affected maize crop at germination stage in S. Sudan; and scarcity of agro inputs such as fertilizers may affect food crop production in Tanzania.

The mitigation measures employed during MAM 2022 season included; building of composites to increase soil fertility in Burundi; Kenya is in the process of wavering import duty on Maize and wheat for four months; risk transfer through buying insurance for crops in Rwanda; advisories were issued in Uganda on where to channel food assistance; distribution of drought tolerant seeds was done in Ethiopia; and timely communication of weather information for decision making. It was noted that late onset of the seasonal rainfall and prolonged dry spells have negatively affected agricultural development in Ethiopia and Somalia.

2.2 Disaster Risk Management

During the March – May 2022 rainfall season, there were only four disasters which were reported. Drought, which was reported in Kenya, Ethiopia, Somalia and Uganda, was the main disaster reported followed by COVID-19, floods and landslides (mostly in Uganda). It was also reported that the last couple of months have recorded the lowest number of COVID-19 cases and that there are currently 36,002 active cases in the IGAD region. Cumulatively, a total of 19.3 million people have been affected by drought, 253,280 people have been displaced by flood, drought and conflict. In general, a total of 4.3 billion USD is needed for humanitarian response in the IGAD region. In most countries, two measures

were taken including communication of early warning information in Kenya, Ethiopia, Somalia, South Sudan and Uganda while declaration of state of emergency was done in Ethiopia, Kenya, South Sudan and Somalia. It was noted that Ethiopia was leading with the number of people who have been fully vaccinated against COVID-19 followed by Uganda. Some of the key lessons learnt included; the importance of a multi-agency approach towards response to disasters, the importance of cash transfers to the affected families, it is important to host family programs which assists affected communities in Uganda.

2.3 Environment and Forestry

The positive impacts observed during the MAM 2022 season in the environment and forestry sector included; improved forage production and water for wildlife and livestock in areas that received above average rainfall in S. Sudan, Sudan, Kenya, Uganda and Tanzania; increased vegetation cover in the forests resulting from planting and natural regeneration in Burundi, Ethiopia, Kenya, S. Sudan, Sudan and Tanzania; increased demand for tree seedlings resulted in enhanced income for tree seedling farmers in Burundi and Kenya; decreased number of forest fires in S. Sudan, Sudan and Tanzania; increased honey production in S. Sudan and Tanzania; increased reforestation of the mangroves in Djibouti, Kenya and Sudan; reduced infection of forest pests and diseases in Sudan; and reduced wildlife deaths, especially herbivores in Kenya.

There were also negative impacts which were reported during the same period and these included; decreased forage and water availability for both wildlife and livestock resulting from drought has led to death in livestock and wildlife as well as resource-based conflicts between human and wildlife in Ethiopia, Kenya, S. Sudan and Uganda; impact on tree planting activities due to ongoing conflicts in Ethiopia and S. Sudan; increased forest degradation due increase in the use of fuelwood and charcoal for indoor heating in Kenya and Djibouti; flooding and soil erosion on steep slopes leading to landslides in Burundi, Ethiopia, Kenya, S. Sudan and Uganda; destruction of beehives as a result of heavy rains in Tanzania; decrease in growth rate and natural regeneration in areas with low rainfall in Ethiopia, Kenya and Sudan; proliferation of invasive species in Djibouti; and destruction of flowering trees and impact on tree seeds quality by hailstorms in Burundi.

The observed changes in the MAM seasonal rainfall included, delayed onset of rains in Kenya, S. Sudan and Tanzania, challenges in the predictability of the MAM season resulting into poor planning for tree planting in Kenya; decreased rainfall amount and erratic rainfall patterns in Burundi, Ethiopia, Kenya, S. Sudan and Sudan; and increase in temperature and aridity in Kenya, Tanzania, Uganda and Ethiopia. The implementation of climate services and advisories resulted into; improved planning of reforestation

activities in Kenya, S. Sudan, Sudan, Tanzania and Uganda; adoption of alternative tree planting techniques such as the use of fertilizers and hydrogels in Uganda; employing the use of accelerated rate of tree planting activities to take advantage of current rainy season in Kenya and Uganda; mobilization of financial resources to ensure the available tree seedlings are planted before the rains subside in Burundi and Kenya; tree planting along river banks to reduce siltation and soil erosion in Burundi and Tanzania; raising awareness at local levels on the importance of the restoration of degraded lands in Djibouti and Burundi; provision of water in L. Nakuru for wildlife in Kenya; and increased surveillance of human-wildlife conflict hotspots in Kenya and S. Sudan.

2.4 Water Resources and Energy

The positive impacts identified in the water resources and energy sector during the MAM 2022 rainfall season were as follows; a good opportunity for water harvesting and enhanced hydropower generation for the catchment areas that received above average rainfall in Burundi, Ethiopia, Sudan, Rwanda; increased recharge of water resources in Burundi, Djibouti, Ethiopia, Kenya, Somalia, Sudan Rwanda, and Uganda; reduction in flooding incidences due to declining trends in water levels in the three large lakes in Uganda; increased river flows and inflows to Dams/Lakes in April in Kenya; and receding of flood waters in Unity State and deployment of machinery for repair of dykes in S. Sudan. There were also negative impacts reported during the MAM 2022 rainfall season and these included; riverine, flash floods and landslides in Burundi, Ethiopia (Omo), Kenya, Tanzania, Rwanda and Uganda (Rwenzori); over-exploitation of ground water in Djibouti and destruction of water infrastructure in Kenya (Rift Valley); deterioration of water quality for domestic use in Djibouti, and Kenya (Eastern); water shortage due to drought in Ethiopia, Kenya and Somalia; reduction of water levels in rivers and reservoirs in Ethiopia, Kenya, Tanzania and Sudan; and increased temperature and high evaporation rate in Ethiopia, Somalia and Sudan. Some of the mitigation measures taken to curb the negative impacts included; water tracking and creating community awareness in Somalia and Ethiopia; rehabilitation of water infrastructure in Kenya; and construction of flood management infrastructure in Rwanda.

It was noted that changes in the MAM rainfall season have occurred and they include; increased water levels in L. Tanganyika (776.32m on 14.04.2022) in Burundi; increased drought and drought intensity in the south and south eastern Ethiopia; severe water shortage especially and increased temperatures have accelerated drying of water pans and dams in south eastern and north eastern parts of Kenya; reduced inflows to reservoirs which could impact hydropower production in the Masinga dam in Kenya; in recent years most parts have experienced late onset and short rainfall duration in Kenya, Somalia and Uganda; and prolonged rainfall events with relatively less rainfall intensity in Rwanda.

Climate services and advisories were used to raise awareness and support the communities to harvest rain water, guided the scheduling of hydropower plants for conservation and management in Kenya, guided the conservation activities for dams in Sudan, and mobilization of funds and machinery for rehabilitation of dykes and reclamation of roads in flood affected areas in S. Sudan.

2.5 Livestock and Rangelands

The positive impacts of MAM 2022 rainfall season in the livestock and rangelands sector included; enough rain in most areas for pasture regeneration; some of the drought affected areas received some rains (Somali region and Borena zone) in Sudan; and good pasture in S. Sudan and ready market for animal products (milk and ghee) as well as livestock market. The negative impacts were related to shortage in feeds and drinking water as well as livestock/livestock products prices. Shortage of water and feeds was mainly experienced in sixteen out of the twenty-three ASAL counties; in Ethiopia the shortage was experienced in most parts of the Somali region, Harrege zone of Oromia region and south Omo zone of SNNP region; in Somalia, the shortage was experienced in Hawd pastoral of central and Hiran, Addun, Bay Bakool and Baidoa. Low livestock/livestock prices were mainly experienced in Djibouti where livestock prices were 10-30% below the five-year average, high milk prices, diminished household income, reduced purchasing power limiting household food access.

There were also reported cases of livestock disease outbreaks at watering points due to overcrowding. The region also lost a substantial percentage of livestock; over 3 million in Kenya, resulted into 15 billion birr loses in Ethiopia; and impacted close to 9 million livestock. On average, most house holds have lost 10-15% of their livestock assets. Both in-country and cross-border migration has been witnessed due to conflicts. In addition, there were reported cases of human-human and human-wildlife conflicts. Some of the identified long-term observed changes in the MAM seasonal rainfall are in the form of late onset and short rainfall seasons, higher than normal temperatures, extreme flash floods and longer than usual dry spells. The climate services and information were used to create awareness on water harvesting, advice on timely vaccination against transboundary diseases and adopt national production and professional sale of fodder (especially in Djibouti and Ethiopia).

2.6 Health and Nutrition

The positive impacts of MAM rainfall season on the health sector included; low Malaria incidence and rainfall experienced in some places was convenient for agricultural activities and hence food security in Kenya; there was no marked change in incidence of most other climate sensitive diseases conditions in

Kenya; there was improved food security, nutrition and sanitation status due to good rain and availability of water in Burundi; no malaria case reported during MAM 2022 in Somalia; and power supply and distribution ensured throughout the season in Ethiopia which was good for health facilities.

The negative impacts reported included; limited water for domestic use and livestock in most parts of the drought-stricken areas of Somalia and Kenya; food security compromised in the north-west, northern and north-eastern parts of Kenya and Somalia; increase in under nutrition especially among the children, pregnant women and the aged in both Kenya and Somalia; malnutrition increased in various regions with varying magnitude in Oromia, SNNP and Somali Regions, Amhara and Afar in Ethiopia; malaria case build up in five zones and 3 regions (3 in SNNP, 1 in South West and 1 in Amhara), Benishangul-Gumuz and Gambella Regions in Ethiopia; malaria cases increased leading to outbreak in some areas in Burundi, S. Sudan and Sudan; there was also reported outbreak of Human influenza type "A" in the major cities of Somalia; more than 50% of the districts got upsurges in malaria and some districts like Namutumba and Kibuku reached epidemic levels in Uganda; some cases of Acute Watery Diarrheal in some areas in Burundi and Somalia; and reported cases of Hepatitis E Virus [HEV] cases in Bentiu IDP camp in S. Sudan.

The following were some of the response measures taken during the MAM 2022 rainfall season; water tracking in most drought hit regions and areas with anticipated shortage of water supply in Kenya, Somalia, Ethiopia and Sudan; focus was given to the underlying causes of health issues such as food shortage and food prices; food distribution for the people living in north west, northern and north eastern parts of Kenya and rural areas in Somalia and Kenya; availing of animal feed and water to animals to improve dairy products; enhance the effective utilization of vector control and monitor stock outs of health commodities in Ethiopia, Somalia and S. Sudan; enhanced surveillance in areas with history of outbreaks for malaria diseases in S. Sudan, Sudan and Ethiopia; early detection of cases and treatment in Burundi and Somalia; distribution of long-lasting insecticidal nets (LLINs) distribution campaign in Burundi and S. Sudan; stocking up on malaria prevention (LLINs), diagnostics (RDTs), medicines (ACTs); and health education and hygiene promotion for prevention in Ethiopia in Somalia and Burundi.

2.7 Plenary Discussion

One of the participants inquired whether livestock prices were low because of over supply or poor body conditions and whether it is best for farmers to hold back and not sell until prices increase or rather sell before the dry conditions sets in and affect the animals. It was clarified that livestock prices low because of the poor body conditions of the animals so they fetch less on the market and that below a certain body condition even buyers are unwilling to buy such animals.

For Kenya prices of Meat have increased with over 20% since January centrally to the expectations that most livestock farmers would have disposed off their livestock because of the effect of draught thereby bringing costs down but this is not the scenario on the ground. How can this be explained? It was noted that livestock market is complex. Sellers prefer animals with good body conditions because of quality meat. As a buyer you look at the quality of meat before you buy it if it is bony nobody will buy.
Is the implication that traders are buying animals at reduced prices (or maybe not buying animals in bad condition) and selling at higher than usual prices (perhaps due to other inflationary pressures)?
I thought Government policies towards cushioning livestock farmers in our region is buying of the livestock by Government and the livestock would sill find itself to the market hence increasing the supply leading to price reduction. Am not sure the boniest livestock will find their way into the market but for sure a big percentage will. There could be other variables that include unscrupulous businessmen holding the livestock in some high holding grounds waiting for market to appreciate and this may lead to artificial shortage.

3. JUNE – SEPTEMBER 2022 SEASONAL FORECAST

The focus of the first part of the discussions in the session was to understand the status of global climate drivers; and their expected impact on the JJAS season. The second part of the session was to discuss the forecast for the JJAS 2022 season with associated intra-seasonal characteristics.

Dr. Stefan Lines presented on the current State of the Global climate system for the June-September (JJAS) season. He stated that the year 2021 was seventh warmest on record and last decade has been the warmest on record. He explained the connection of the major drivers such as the Indian Ocean Dipole, El Nino Southern oscillation with the JJAS rainfall season. The IOD is currently neutral, and expected to become negative through JJAS however the connection between IOD and JJAS rainfall is weak. The La Niña conditions are present, but tropical Pacific SSTs are expected to warm, and models predict a sustained La Niña or transition to neutral ENSO over JJAS. The negative Nino Index suggests increased JJAS rainfall.

He emphasized that in addition to interannual variability, the Pacific Decadal Oscillation affects the decadal variability. Currently the PDO is in negative phase and hence wetter than normal conditions expected over the northern parts of GHA. In concluding remarks, he mentioned the concern for a drier than usual October-December season based on the current ENSO/IOD predictions.

Dr. Hussen Endris presented on the JJAS 2022 forecast. He showed that over some parts of the region the JJAS contributes over 80% of the total annual rainfall, with parts of Ethiopia receiving an average of 1000mm. The years 2018 and 2021 were chosen as the analogue years based on the sea surface temperature patterns. The forecast indicated wetter than normal conditions in most parts of the GHA region, while drier than normal conditions expected in isolated areas over coast of Kenya and Somalia. Much of South Sudan, western Ethiopia and Southern areas of Sudan are expected to experience an early start of the JJAS season. Higher probabilities of receiving 500 mm seasonal rainfall totals, expected over eastern South Sudan, southern parts of Sudan, and northern Uganda.

Warmer than average temperatures are indicated over northern parts of Sudan and eastern parts of the region, while near average to cooler temperatures are indicated over much of Ethiopia, Eritrea, Djibouti, South Sudan, Southern Sudan, Uganda, western Kenya.

4. SECTOR IMPACTS AND MANAGEMENT STRATEGIES

This session covered the implications of the JJAS 2022 climate outlook, anticipated impacts and key management strategies in different sectors. Below are key highlights from the different sectors.

4.1 Agriculture and Food Security

Expected positive sectoral impacts

Conducive climate conditions for harvesting. There will be limited crop losses because the dry season will coincide with the harvesting period specifically in Burundi, Rwanda and Tanzania. Increased access to markets and price of commodities: Room to construct and rehabilitate feeder roads in Rwanda while good and passable feeder roads will facilitate agricultural marketing in Tanzania and Burundi.

Expected negative sectoral impacts

Excess moisture, flash floods, landslides, soil erosion and water logging could likely affect crop productivity in Northern Ethiopia, Uganda, South Sudan and Sudan.

Most parts of the region are likely to face weed infestation and increased crop diseases due to increased moisture. Member states will likely face increased competition for resources such as land and labour (Sudan), post-harvest losses due to enhanced rainfall (Uganda and South Sudan), low crop production due to reduced rainfall (Somalia) and damage to feeder roads will affect mobility (South Sudan).

Key advisories

Rehabilitate the drainage structures to deal with water logging[1], improve rehabilitation and maintenance of irrigation infrastructure, promote water harvesting technologies, increase availability of certified seeds[2], grow fast maturing varieties and increase pest surveillance[3] and employ good agronomic practices such as weeding and mulching, terracing.

[1] Ethiopia, Uganda and Somalia
[2] Ethiopia, Sudan and South Sudan
[3] Uganda

There is need to also strengthen national food storage in Tanzania, Uganda and South Sudan, implement national food security strategy at household level and strengthen the agro-input system in Tanzania.

4.2 Disaster Risk Management

Expected positive sectoral impacts

There is a likelihood of pasture regeneration and water supply in Somalia and Uganda, good crop and livestock prospects in Uganda, Kenya and South Sudan and improved in food supply leading to better food security in Uganda.

Expected negative sectoral impacts

Floods riverine and flash floods are expected in the lowland areas of Uganda, Ethiopia, Kenya, Sudan and South Sudan. Similarly, rising water levels on L. Victoria and along the Nile to cause flooding in the adjacent areas (Uganda, South Sudan and Sudan)

Persistent drought and its impacts is likely to intensify in Kenya, Somalia and Ethiopia. This in addition to resource-based conflict in Somalia and displacements in Sudan, South Sudan and Uganda.

Water-borne disease and increased incidences of malaria are likely in Kenya, Uganda and South Sudan. Lightning strikes in Kenya and Uganda

Key Advisories

- Effective dissemination of early warning information and alerts through community engagement and sensitization, outreach programs etc.
- Continued humanitarian assistance to the drought affected areas until next season.
- Increase human/animal disease surveillance.
- Provide temporary shelters and identify safer higher ground (floods).
- Capacity building on response measures.
- Organized/coordinated migration (displacement)
- Activate coordinating mechanism at national and sub-national level
- WASH interventions in areas where floods are expected
- Installation of lightning arresters.
- Review/activate contingency planning

4.3 Environment and Forestry

Expected positive sectoral impacts

Improved forests and trees regeneration, higher growth rates and tree and forest cover area in Ethiopia, Kenya, South Sudan, Sudan and Uganda, in addition to better seedlings production and enhanced survival of planted seedlings in afforestation and reforestation programmes in Burindi, Ethiopia, Kenya, South Sudan, Sudan and Uganda

Reduction in resources-based conflict, wildfire incidences in forests in Ethiopia, Kenya, South Sudan, Sudan and Uganda,

Expected negative sectoral impacts

Increased incidences of floods, landslides and land degradation including soil erosion in Djibouti, Ethiopia, Kenya, South Sudan, Sudan and Uganda.

Destruction of infrastructure such as roads in forests and protected areas limiting tourist activities and timber availability on the market in Ethiopia, Kenya, South Sudan, Sudan and Uganda

Decreased forage and water for wildlife/livestock in areas with forecasted low rainfall and areas currently experiencing drought and not concerned by the coming season leading to resources-based conflicts.

Increased wildfires incidences in Burundi, Kenya and Tanzania

Key Advisories

- Soil and water conservation measures and proper farming practices
- Supply adequate seedlings for community tree planting programmes
- Provide of fodder and water for wildlife in protected areas
- Mobilize resources to put in place remedies against the current drought
- Fire management practices
- Work with the community and local leaders to enforce, minimize and reduce encroachment on the forests

4.4 Water Resources and Energy

Expected positive sectoral impacts

There is a likelihood of good water availability and moderate inflows into the lakes and reservoirs in part of South Sudan, Sudan and good hydro-power production in Ethiopia, parts of Kenya and Sudan.

Expected negative sectoral impacts

There is a likelihood of reduced hydropower production in Kenya and Tanzania, reduced water supply in South Sudan. In addition, South Sudan is likely to experience conflict over water while Sudan, Uganda, South Sudan may experience floods.

Key Advisories

- Equatorial countries (Somalia, Kenya, Uganda and Tanzania) that are currently experiencing low-flows, and JJAS season is not their main rainfall season, are advised to conserve and efficiently use the available water resources to last the until the next rainfall season (OND 2022).
- Rehabilitation and desilting of irrigation canals and water storage infrastructures to efficiently convey and store water is important.
- Continuous awareness raising on water conservation during drought and flood risks for flood-prone areas.
- Riparian countries are encouraged to share information on high/low river flows or extreme rainfall with their downstream transboundary neighbours to reduce negative impacts and avert disasters

4.5 Livestock and Rangelands

Expected positive sectoral impacts

Easing of the drought will lead to regeneration of pasture and water recharge in Djibouti and South Sudan while improved livestock body conditions in Sudan and Somalia as well as meat and milk production are likely to increase marketability of goods in Ethiopia.

Increased forage and water availability with minimal resource-based conflict is expected.

Expected negative sectoral impacts

Despite the heavy rains due to prevailing weak body condition, high mortality is expected especially in goats in Djibouti. There will also be increased risk of floods and landslides in South Sudan and upsurge in stress related diseases associated with intensified rains following after a dry season spell in Ethiopia.

Cross-border and intra-county migration is likely to increase conflict over pasture and water in Kenya, Sudan and Somalia. This is in addition to increased incidences of livestock diseases; poor livestock body conditions and associated increased livestock mortality in Kenya South Sudan and Sudan

Key Advisories

- Encourage the private sector to scale up commercial fodder production business and invest in the feed and fodder supply value chain.
- Close monitoring and institutionalisation of contingency plans in areas expected to have depressed rainfall performanceand flooding during the upcoming rainy season for early action planning
- Flood monitoring in South Sudan and Afar region (Awash River) to be given priority even as we monitor drought in the rest of the regions
- Activation and enforcement of existing MOUs that will facilitate the harmonised vaccination and disease surveillance campaigns as well as supply of veterinary drugs are availed in the cross-border areas. CIP PPR vaccination between Ethiopia and Sudan.
- Community peace committees to be activated
- Use of technologies such as cloud seeding can help where funds and atmospheric conditions are favourable.

4.6 Health and Nutrition

Expected positive sectoral impacts

Improvement in nutrition due to good food production in most parts of Uganda.

Expected negative sectoral impacts

Upsurges of vector borne diseases such as malaria are expected in Uganda, Ethiopia, Kenya, Sudan while arboviral diseases (Dengue and Chikungunya) may occur in Ethiopia. In addition, there is a high risk of Cholera outbreak in Uganda and Ethiopia, and a likelihood of respiratory infections in Ethiopia and Kenya.

Likelihood of landslides in Uganda and contamination of domestic water sources in Kenya due to excess surface water runoff hence water borne infections. Further, depressed food supply in Kenya may lead to malnutrition and scarcity of water for domestic use

Key Advisories

- Enhanced malaria surveillance, availing testing and treatment supplies and promoting use of mosquito nets in the communities with high malaria transmission
- procurement of more Artemisinin-based Therapies (ACTS) and malaria Rapid Diagnosis Tests(mRDTs), Enhanced Social and behavior change communication (SBCC) and awareness activities on the malaria Upsurges.
- Enhanced community awareness and possible cholera vaccinations in highly prone communities.
- Environmental control/manage larval sources/emptying water pools in discarded materials, construction sites, etc.
- Food ration supplies to households to mitigate food shortages and food supplement for the children and the elderly.
- Provision of water for domestic use and animals through water trucking/bowsers

4.7 Conflict and Security (CEWARN)

Expected positive sectoral impacts

Community families, especially women are finding alternative means of livelihood by engaging in other activities especially stone quarrying and artisanal mining.

There will be an increase in inter communal interactions and settlements into previously unoccupied and fertile areas hence agricultural diversification.

Increased cross border peace dialogues and the relative relaxation in raids will lead to increased cross border trade.

Expected negative sectoral impacts

Conflicts maybe suppressed along the South Sudan corridors during early weeks of onset except for reprisal attacks and other political and inter-communal conflicts. On the other hand, Northern Kenya will continue experiencing conflicts due to the sustained conditions in both the Kenya-Ethiopia part of the corridor- high altitude areas of Marsabit being the epicenter.

Cooler than usual conditions along the Kenya-Uganda corridor to sustain conflicts around preserved resource areas and there is a likelihood of a spike in incidents along the South Sudan corridor around the weeks of the dry spell onset in July.

Key Advisories

- Package the outlook and forecast indicators and their effects on water, pasture and food security to be more focused to conflict implications.
- Disseminate the products to national level conflict early warning units.
- Narrow the gap between early warning and response.
- Train national and sub national early warning units on the nexus of weather variability with conflicts.
- Work more closely with FSNWG-food security is another driver of conflicts in the Karamoja region.

5. PRESENTATIONS BY REGIONAL AND INTERNATIONAL PARTNERS

This session focuses on different presentation by national, regional, and international partners on the status of climate products and services. Two presentations were delivered during the session: (1) Updates on ENACTS and Introduction to AICCRA, and (2) WMO Meteorological Infrastructure.

Dr Tufa Dinku presented on Updates on Enhancing National Climate Services (ENACTS) and Introduction to ACT today and AICCRA. He mentioned that ENACTS) has three pillars; i) Enhance access, promote use and improve data availability. Different tools are available for each of the pillars; with CDT, ADT and PyCPT being utilized as the tools to improve data availability, the Data Library for enhancing access and SecExp being used to promote use. ADT is currently being utilized in Ethiopia, Kenya, Rwanda, Zambia and Ghana.

Adapting Agriculture to climate Today for Tomorrow Focuses on SDG 2, works with EMI to provide forecasts, the agriculture research institute on tailoring the climate products, and the Ministry of agriculture on dissemination of climate information. The program has introduced some innovation such as index insurance, forecast based financing, NextGen seamless climate forecast system

Accelerating Impacts of the CGIAR Climate Research for Africa (AICCRA) works to make climate information services and climate smart agriculture more accessible to millions of smallholder farmers across Africa. Implemented in the following six countries, Ethiopia, Kenya, Ghana, Mali, Senegal, and Zambia. The project runs up to 2023.

Dr. Abubakr Salih Babiker from the WMO regional office presented on WMO Meteorological infrastructure, data policy and funding. He started his presentation by highlighting some of the main purposes of WMO including (1) facilitate worldwide cooperation in the establishment of networks of stations for the making of meteorological, hydrological and other geophysical observations related to meteorology, available to members; (2) promote the establishment and maintenance of systems for the rapid exchange of meteorological and related information; and (3) promote standardization of meteorological and related observations and to ensure the uniform publication of observations and statistics. He also highlighted the main functions of the World Weather Watch (WWW) such as Global Observation System (GOS) for surface and space observation, Global Telecommunication System (GTS), and Global Data Processing and Forecasting System (GDPFS). He noted that the main function of GTS is to facilities and arrangements for the rapid collection, exchange and distribution of observations and processed information within the framework of the World Weather Watch. On the other hand, WIGOS is inheriting the Global Observing System (GOS) which was mostly focused on weather prediction and

climate, and covers data and application on the overall Earth System including Weather, Climate, Ocean and Marine, Air Quality, & Environment.

Dr. Abubakr also pointed-out that in many areas of the world, especially in Africa, the exchange of surface-based observations has been stagnant or declining since 1995 (e.g., 50% decrease in Africa between 2015-2020). In contrary, model resolutions have increased significantly.

Finally, he higlighted about WMO's New Unified Data Policy for international exchange of earth system data. The unified data policy aims to strengthen the world's weather and climate services and cncompasses all WMO-relevant Earth system data: weather, climate, hydrology, ocean, atmospheric composition, cryosphere etc.

6. RELEASE OF FORUM STATEMENT AND CLOSING OF THE FORUM

During the closing of the session, Mr. Fetene Teshome director general of Ethiopian Meteorological Institute and Permanent Representative (PR) of Ethiopia with World Meteorological Organization (WMO), was invited to officially release the statement and thereafter officially close the meeting. Mr. Fetene Teshome congratulated ICPAC for successful organization of GHACOF61. He also thanked and appreciated presenter and participants for active participation in the forum. In his closing remark, Mr. Fetene, noted that the JJAS rainfall season is crucial for countries in northern sector of GHA such as Sudan, South Sudan, Ethiopia, Eritrea and Djibouti which the season accounts more than 70% of annual rainfall. The climate outlook indicates strong chances of wetter than normal conditions in most parts of the GHA region, and drier than normal conditions in isolated areas over coast of Kenya and Somalia. Warmer than average temperatures are indicated over northern parts of Sudan and eastern parts of the region, while near average to cooler temperatures are indicated over much of Ethiopia, Eritrea, Djibouti, South Sudan, Southern Sudan, Uganda, western Kenya. He urges all actors in the region, member states, national and local governments, resilience activists in the region as well as communities at grass root level to take serious precautions and actions based on JJAS 2022 seasonal outlook and maximize the opportunity of expected rain in some parts of region.

The statement for the GHACOF61 is provided in **Annex I**.

ANNEXES

Annex I: Statement for the GHACOF61

Statement from the 61st Greater Horn of Africa Climate Outlook Forum (GHACOF61) 17-19 May 2022; Addis Ababa, Ethiopia

1. Consolidated Objective Climate Outlook for June to September 2022 Rainfall Season

June to September (JJAS) constitutes an important rainfall season, particularly in the northern parts of the Greater Horn of Africa (GHA) where the JJAS rainfall contributes to more than half of the annual rainfall totals. Based on the World Meteorological Organization (WMO) recommendation, ICPAC implemented the objective seasonal forecast procedure to generate seasonal climate forecasts over the Greater Horn of Africa (GHA). Consequently, May 2022 initialized forecasts from 7 Global Producing Centres (GPCs) were processed using two approaches to produce the JJAS seasonal climate outlook over GHA. The indicates **increased chances for wetter conditions (above average rainfall) over most parts of the region** during June to September 2022 (Figure 1). Accordingly, Djibouti, Eritrea, much of the northern two-thirds of Ethiopia, South Sudan, Sudan, western Kenya, and most parts of Uganda are likely to experience a wetter than average season. Probabilities for wetter conditions are particularly enhanced (> 60%) over western Kenya and neighbouring Uganda, central and northern Ethiopia, and parts of Sudan. On the other hand, isolated areas over the rangelands of eastern Ethiopia and coastal areas of Kenya and southern Somalia are likely to experience drier than average (below-normal) rainfall conditions.

The consolidated objective temperature forecast from the same 7 Global Producing Centres (GPCs) indicates an increased likelihood of warmer than average (above normal) surface temperatures over northern Sudan and most parts of eastern Tanzania, eastern Kenya, southeastern Ethiopia, and southern and central Somalia. On the other hand, most of the southern parts of Sudan, eastern South Sudan, Eritrea, and north-eastern Ethiopia have higher chances of experiencing cooler than average (below-normal) temperature conditions during the JJAS 2022 season.

The predicted start of the June to September 2022 season (Figure 3) and Standardized Precipitation Index (Figure 4) are provided below. Consistent with the predicted rainfall, analysis of daily predicted rainfall from 5 GPCs (ECMWF, Météo-France, CMSS-Italy, DWD-Germany, ECCC-Canada) further indicates an average to early onset over northern Uganda, western Kenya, most parts of South Sudan, large parts of Ethiopia, parts of Eritrea, eastern Sudan, coastal Kenya, and southern Somalia. Moderate chances for delayed onset are predicted over western Sudan and parts of northern Somalia.

Standardized Precipitation Index (SPI) analysis of observed and predicted precipitation from 4 -15 months period ending on 30 September 2022 indicates moderately wet conditions in the northern regions, particularly over Ethiopia and Sudan. On the other hand, long-term rainfall deficits are expected to continue in many parts of the equatorial and southern regions (Figure 4).

The World Meteorological Organisation (WMO) and the major global climate centres have noted that Sea Surface Temperatures (SSTs) over the equatorial Pacific Ocean have reflected La Niña conditions over the past few months. The NOAA Climate Prediction Centre further indicated that La Niña is favoured to continue through the summer, but with odds decreasing to 58% chance in August-October. The JJAS

rainfall interannual variability is associated with the SST conditions in the eastern equatorial Pacific, where above-average rainfall tends to occur during La Niña. In contrast, dry conditions prevail during the El Niño years. Furthermore, an increased chance for the development of a negative phase of the Indian Ocean Dipole (IOD) is predicted through the coming season and beyond. The phase of the IOD is known to impact rainfall variability during the short rains season, with the predicted negative IOD corresponding to increased chances of suppressed rainfall in OND. The influence of these ocean processes will interact with regional circulation patterns, especially monsoonal winds, Tropical Easterly Jet, and the Somalia Low-level Jet. 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. While sporadic heavy rainfall is most probable over much of the monsoonal region, extended dry spells and below normal rainfall may occur in areas with an increased likelihood of near normal to above normal rainfall and vice versa. ICPAC will provide regional updates on a regular basis while the National Meteorological and Hydrological Services (NMHSs) will provide detailed national and sub-national climate updates.

2. The Climate Outlook Forum

The 61st Greater Horn of Africa Climate Outlook Forum (GHACOF 61) was convened from 17th to 19th May 2022 by the IGAD Climate Prediction and Applications Centre (ICPAC) in collaboration with the National Meteorological and Hydrological Services (NMHSs) of IGAD Member States, World Meteorological Organization (WMO), and other partners to document and share the climate impacts across the region and formulate responses to the climate outlook for the June to September 2022 rainfall season over the GHA region. The GHA region comprises of 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, SSTs over Atlantic and Indian Oceans, and IOD and considered their impacts on the GHA during June to September 2022 rainfall season. Climate information users from 8 sectors (disaster risk management, agriculture and food security, livestock, health, environment, media, conflict, water resources), NGOs, and development partners actively participated in the formulation of mitigation strategies of the potential impacts of the objective climate forecast in their respective domains.

3. Methodology

Guidance and valuable forecast information were drawn from a wide range of sources, including the World Meteorological Organisation's Global Producing Centres (WMO GPCs) and National Meteorological and Hydrological Services. These inputs were combined using deterministic and probabilistic modelling techniques to obtain the regional consolidated objective rainfall forecast for the June to September 2022 season. The objective seasonal forecast was developed during the PreCOF61 one-week climate capacity building workshop held from 11th to 15st May 2022. During this workshop, regional scientists and national forecasters from 7 IGAD Member States used ICPAC's FCDO-funded High-Performance Computing (HPC) cluster, through remote connection, and co-developed regional and national-level climate outlooks. GHACOF 61 was preceded by sectoral co-production meetings from 17th – 18th May 2022.

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 JJAS season. These factors were assessed using dynamical and statistical models. The regional consolidated objective forecast is produced from outputs of 7 global state-of-the-art seasonal prediction systems. 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 third of the recorded rainfall amounts centred around the climatological median; 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 June to September 2022 for various zones within the GHA region are given in Figure 1 and Figure 2, respectively.

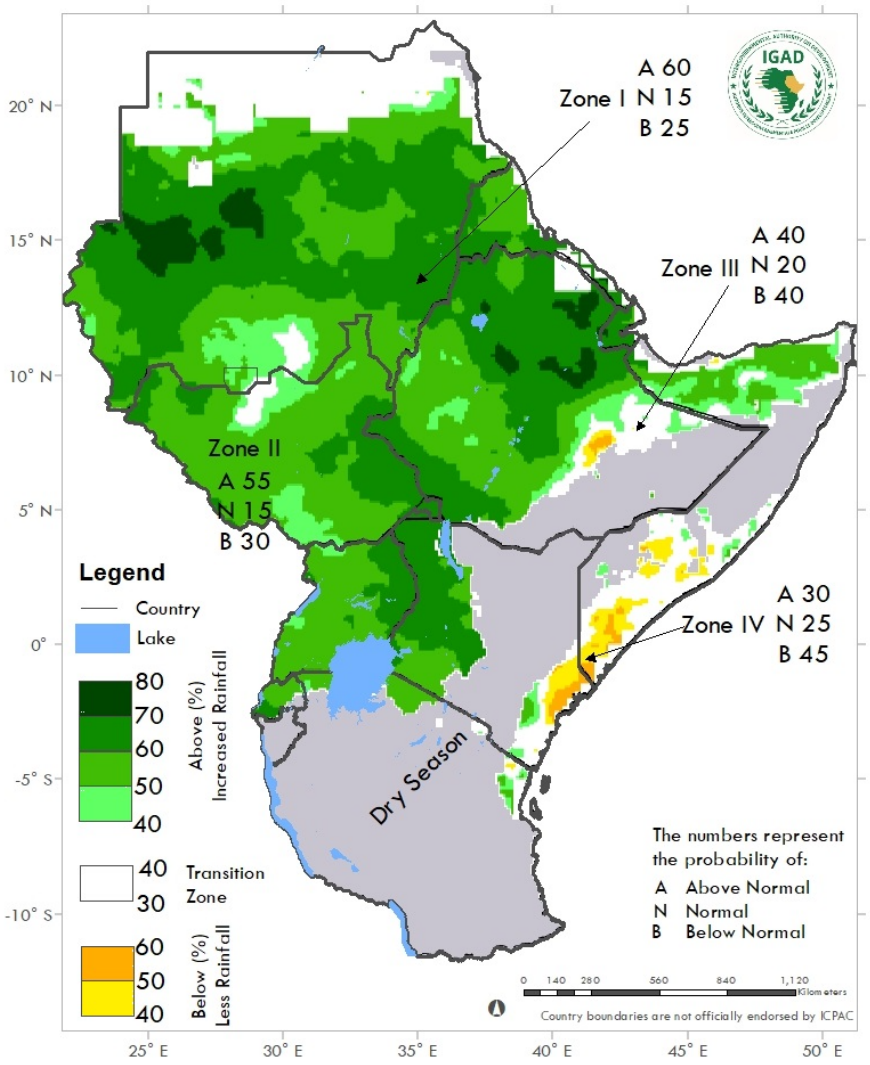


Figure 1: Probability forecast of rainfall for June to September 2022.

4. Rainfall Outlook for June to September 2022

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

Zone I: In this Zone (dark green shading), the above normal rainfall (wetter) category has the highest probability. The probability varies with location and can be read from the legend. For the most widespread dark green shade (60%), the probabilities for all three categories are provided.

Zone II: In this Zone (all bright green shading), the above normal rainfall (wetter) category also has the highest probability. The probability varies with location and can be read from the legend. For the most widespread green shade (55%), the probabilities for all three categories are provided. The difference between Zones I & II is the increasing probability for the wetter than average category in Zone I.

Zone III: In this Zone (white), the above normal rainfall (wetter) category has equal probability as the below normal (drier) rainfall. The probability for the normal category is provided.

Zone IV: In this Zone (orange), the below normal rainfall (drier) category has the highest probability. The probability varies with location and can be read from the legend. For the most widespread orange shade (45%), the probabilities for all three categories are provided.

5. Temperature Outlook for June to September 2022

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

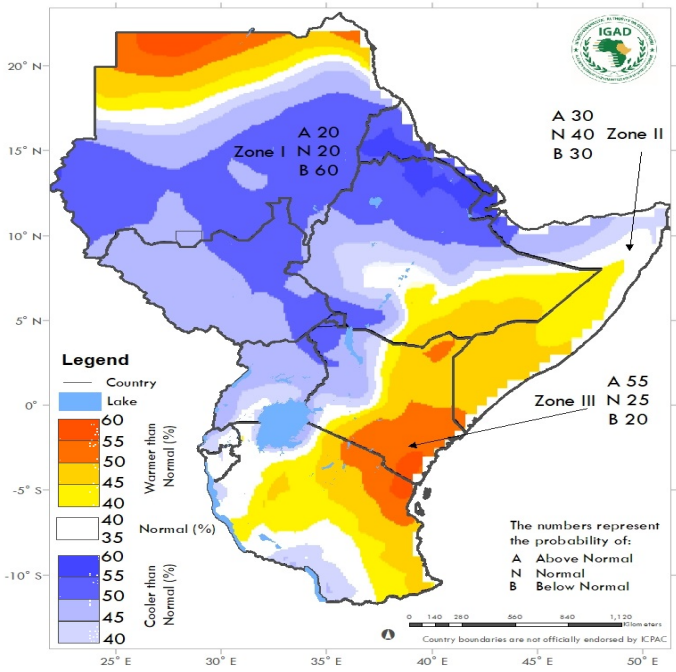


Figure 2: Probability forecast of mean surface temperatures for June to September 2022.

Zone I: Enhanced likelihood for above normal mean temperature (i.e., warmer)

Zones II: Increased likelihood for near normal mean temperature

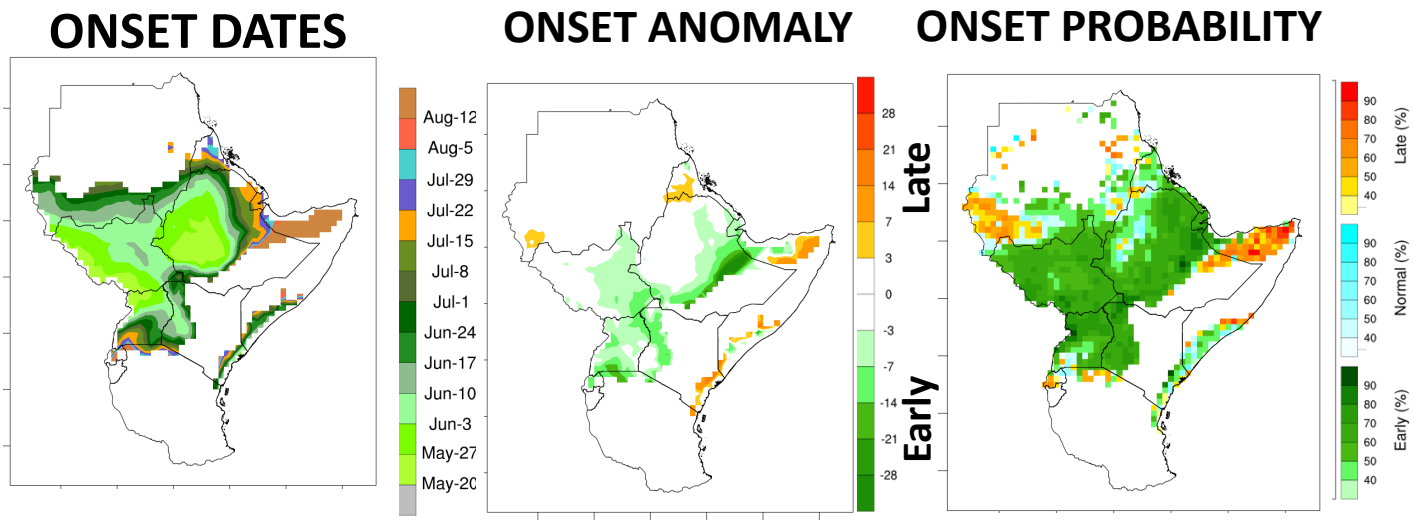
Zones III: Increased likelihood for below normal mean temperature (i.e., cooler)

Note: The numbers for each zone indicate the probabilities of rainfall in each of the three categories, above-, near, and below-normal. The top number (A) indicates the probability of rainfall occurring in 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 60% probability of rainfall occurring in the above-normal category; 15% probability of rainfall occurring in the near-normal category; and 25% probability of rainfall occurring in the below-normal category. It is emphasised that boundaries between zones should be considered as transition areas.

6. Probability forecasts of the start of JJAS 2022 season and the expected average onset dates

The average start dates of June to September 2022 season and their probability outlook are provided in Figure 3. The forecast was processed using daily rainfall forecasts from 5 Global Climate Models (ECMWF, Météo-France, CMCC-Italy, DWD-Germany, ECCC-Canada) obtained from the C3S Climate Data Store.

Figure 3: Forecast of the start of June to September 2022 season.



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

The intensity and duration of droughts are indicated in the 4, 9, and 15-months SPI ending on 30 of September 2022 in Figure 4 below.

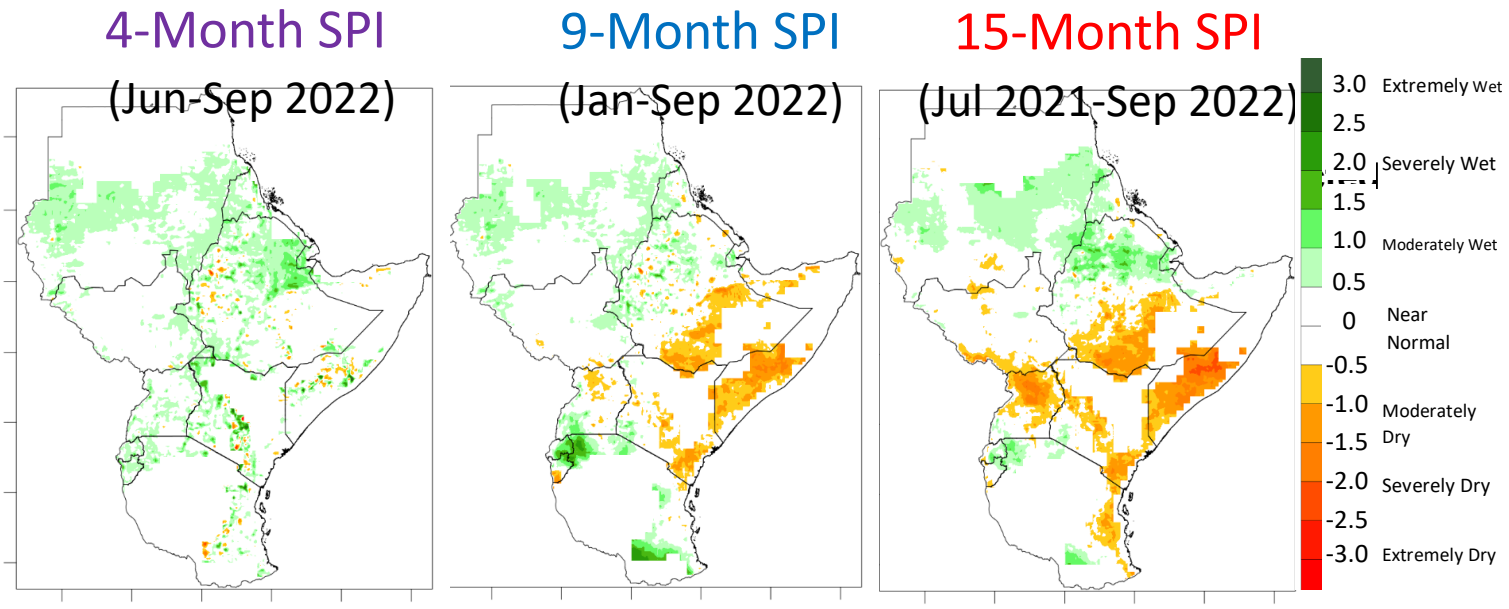


Figure 4: Standardized Precipitation Index (SPI) forecast

GHACOF 61 was organized jointly by IGAD's 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 and the AICCRA-East Africa project funded by the World Bank. Contributors to the regional climate outlook included representatives of NMHSs from GHA countries (Institut Géographique du Burundi, Météorologie 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).