



## **SPECIFIC SECTOR VERIFICATION AND REPORTS ON THE USE COF41 AND RECOMMENDATIONS FOR USE OF COF 42 CLIMATE OUTLOOK PRODUCTS AND SERVICES**

### **1. Introduction**

Climate related hazards are common in the Greater Horn of Africa (GHA) region. Disasters associated with these hazards inflict socio-economic miseries and economic losses in all countries of the region and these often retard socio-economic development.

Climate change will lead to changes in frequency, magnitude, and severity of extreme weather and climate events such as drought, floods, sea level rise, and storm surges. These would threaten sustainable development efforts including human health, livelihoods and investments, natural ecosystems, economic prosperity and social wellbeing among others.

It is evident that for sustainable development in GHA, there is need for robust strategies that incorporate climate smart socio-economic systems. Disaster risk reduction and climate change adaptation are therefore key priorities in building resilient communities.

At the Summit on the Horn of Africa Crisis in Nairobi, Kenya on 9th September 2011, the Heads of States and Government of the East African Community (EAC), the Inter-Governmental Authority on Development (IGAD) and The Republic of South Sudan, called on the IGAD secretariat to develop the Regional Disaster Resilience and Sustainability Strategy Framework to reduce the impact of disasters in the region.

In this regard, the IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI) was established to harmonize regional and national resilient building efforts.

Since 1997, an innovative process known as the regional climate outlook forum (RCOF) has been running in many parts of the world within the framework of the World Meteorological Organization (WMO) in collaboration with National Meteorological and Hydrological Services (NMHSs), regional / international climate centres, among many other partners.

RCOFs are aimed at providing consensus early warning seasonal climate information to support the Regional Disaster Resilience and Sustainability Strategy Frameworks. To date 42 RCOFs have so far been successfully conducted for the Greater Horn of Africa by the IGAD Climate Prediction and Applications Centre (ICPAC) in collaboration with partners.

The Forty Second Greater Horn of Africa Climate Outlook Forum (GHACOF42) took place at Hotel Lemigo, in Kigali, The Republic of Rwanda from 22 to 23 February 2016, and was organized by ICPAC in collaboration with WMO, NMHSs of ICPAC member countries, UNDP, World Bank, and other partners. It was held within the framework of



the Intergovernmental Authority on Development (IGAD) regional strategy for mainstreaming climate information into key socio-economic sectors for disaster risk reduction and sustainable development.

Due to the severe impacts left by the 2015 El Niño event on several socio-economic sectors in the GHA region together with the increasing challenges posed by climate change, and the need to strengthen early warning systems for early action, GHACOF42 focused on the theme *"2015 El Niño impacts and lessons learned in the Greater Horn of Africa"*

**The objectives of GHACOF42 were:**

- To document the impacts and lessons learned from the 2015 El Niño across sectors;
- To develop consensus regional climate outlook for the March to May 2016 rainfall season, and;
- To formulate mitigation strategies to the implications of forecasted seasonal rainfall on the critical climate sensitive sectors of the region.

The forum also provided a regional interaction platform for the region's climate scientists from the ten member states of ICPAC's National Meteorological and Hydrological Services (NMHSs), Universities, research institutions, and regional and international organizations engaged in climate modeling, prediction and applications for the region, policy makers, and research scientists as well as users of climate information from various sectors across ICPAC member states. In addition, lessons/experiences from the use of the products provided in the last regional climate outlook forum (GHACOF41) were reviewed.

Several users' specific workshops were also organized alongside GHACOF 42 in collaboration with various partner organizations. These included: Agriculture and Food Security; Water resources; Disaster Risk Management; and Livestock sector.

**2. DISCUSSION GUIDE for Sector Working Group:**

**INSTRUCTION:**

In this session, experts from different sectors will gather in their respective SWG to discuss the implication and Mitigation Strategy for the Consensus Outlook by answering the following questions:

1. What is the likely implication of the current forecast in your sector? (Hazard and risk analysis)
2. Which are the socio-economic vulnerability factors that might exacerbate the situation? (Vulnerability analysis)
3. What are you going to do to mitigate the likely impact of the climate forecast (Mitigation strategy)



Actions were to:

- Prepare a consolidated report for your respective sector
- Select a representative to make presentation on behalf of your sector during plenary

Reference materials availed to the sectors:

- Forecast for MAM (Both in terms of probability and rainfall amount)
- LTM for MAM
- Analogue years
- Topographical maps
- Hazard maps (Flood and drought) overlaid with forecast
- Population exposure maps (for flood and drought)

## **DRM (HAZARD, RISK AND VULNERABILITY ANALYSIS)**

### **Zones I:**

Areas in zone I will experience dry conditions, which is normal for the period. The forecast therefore will have little significance.

Zones II & IV:

**Areas in these two zones are predicted to have increased likelihood of near normal to below normal rainfall.**

***Near normal rainfall:*** There should be no major concerns over hazards and disaster risks. However, individuals, communities and authorities are advised to focus on usual preparedness against risk factors that prevail during March – May season.

***Below normal rainfall:*** Need to put in place preparedness and mitigation measures for likely impacts from hazards which include;

- Dry spells and associated effects on agriculture, livestock, water and health.
- Fluctuation of temperatures leading to very high temperatures especially in parts of Sudan, South Sudan, Somalia, Djibouti, Kenya.
- Shortage of water for agricultural production, livestock, human consumption, energy production and other purposes.
- Disease outbreak especially in livestock associated with dry conditions.
- Likely conflict over natural resources like pasture, water and grazing land.
- Drought conditions especially in parts of Ethiopia, Sudan and Somalia that are already suffering effects of prolonged dry spell and drought from previous season.
- Possibility of famine in parts of Sudan and Ethiopia that are currently suffering drought, if the dry conditions persist.
- Displacement and migration of populations in search of food, water and pasture.



### **Zone III:**

Areas in this zone have increased probability for near normal to above normal rainfall.

**Near normal rainfall:** Low risk of hazards manifesting into disasters. However preparedness for usual scenarios associated with normal rainfall need to be considered e.g. disease outbreaks, occasional flooding and other isolated incidents.

**Above normal rainfall:** Individuals, communities and authorities should put in place preparedness and mitigation measures including early warning and early action strategies, and update / develop disaster response plans for hazards that include:

- Flooding especially areas in flood plains, low lying areas, river & lake banks and swamps. Flash flooding is also likely especially in urban areas with poor drainage systems.
- Disease outbreaks that including epidemics like cholera, malaria, dysentery, etc.
- Water logging affecting crops.
- Destruction of infrastructure e.g. roads, bridges, etc.
- Wind storms that may affect buildings and other infrastructure
- Hailstones which cause damage to crops and vegetation
- Landslides and mudslides especially in hilly and mountainous areas in Eastern and Western Uganda, Rwanda, Western Kenya.
- Lightening in most prone areas of Rwanda and Uganda.
- Population displacement if the flooding and landslides happen on a large scale.

Besides the hazards, above normal rainfall has benefits to the countries in the region which include; filling up of water reservoirs, increased water for agricultural and energy production.

### **Socio-economic vulnerabilities that may exacerbate the likelihood of drought or floods.**

- Poverty amongst the vulnerable population.
- Dependency on rain-fed agriculture (when rains fails, productivity fails too).
- Settlement in risky areas e.g. mountainous areas for landslides and flood plains.
- Environmental degradation which has left a lot of areas exposed to natural hazards.
- Population pressure which causes people to settle / utilise fragile eco-systems.
- Lack of alternative livelihood options / diversification / dependency on single options
- Poor infrastructure and poor physical planning.
- Poor access to social services e.g. health facilities.
- Gender and social inequalities.
- Weak institutional capacities for coordination, early warning & early action etc.



### **Mitigation strategies to reduce potential impact.**

- Down scale the regional forecast by national meteorological agencies.
- Develop / improve early warning systems to provide timely information and alerts.
- Develop / update preparedness and contingency plans based on probable scenarios.
- Encourage and promote user interface at country level between Met / climate people and user sectors and practitioners to better interpret the forecast.
- Develop policies and strategies for disaster risk management as a long-term measure.
- Document lessons learnt and utilize them for better preparedness.
- Conduct / update hazard, risk&vulnerability assessments and mapping to identify hot spots.
- Promote community based disaster risk management to build resilience of communities.

## **AGRICULTURE AND FOOD SECURITY**

### **Zones I:**

There are no agricultural activities taking place in this zone.

### **Zones II**

Expected hazards and risks:

- Depressed rainfall is expected in some agricultural areas of northern sector covering northern half of Ethiopia, southern Eritrea, parts of Djibouti, north of South Sudan and northern part Somalia;
- Current vulnerability: high food insecurity due to consecutive below normal rainfall seasons (since June 2015) that led to below normal crop harvests, poor pastures and water deficits and animal deaths in some areas.

### **Impacts of forecast (MAM):**

- Ethiopia: Belg production in Amhara, eastern and western Haraghe is likely to be affected leading to a third poor consecutive crop production season. Afar Region and Sitii zone of Somali region are likely to have below normal pasture and water therefore affecting livestock production. Recovery of livestock from previous below normal consecutive seasons is likely to be delayed.
- Somalia: The expected depressed (Gu) rainfall in northern Somalia region (Somaliland) could aggravate the already drought conditions affecting water and pasture and livestock production and productivity;
- Northern South Sudan and southern part of Sudan: The main rainfall season is expected from June, hence the forecasted depressed rainfall during MAM 2016



season is not expected to have any major impacts on crops and livestock production.

### **Zones III:**

- The expected normal to above normal rains presents good prospects for improved agricultural performance within both crop and agro-pastoral areas;
- However, there is risk of flooding, landslides, water logging, escalation of fungal and bacterial crop diseases in some areas;
- Flooding in Wabi Shabelle and Juba in Somalia, Jonglei, Lakes State and parts of Juba in South Sudan; Mwanza area in Tanzania and lake region of Kenya may occur;
- Landslides in Burundi, western Rwanda, south-west & western Uganda and Mt Elgon area in both Uganda and Kenya may occur;
- Post-harvest losses could occur in the Lakes region of Tanzania where harvesting is expected to begin;
- The forecast presents good opportunities for performance of plantation crops such as sugar cane, bananas, coffee and tea, as well as agro-forestry across growing areas in zone III.

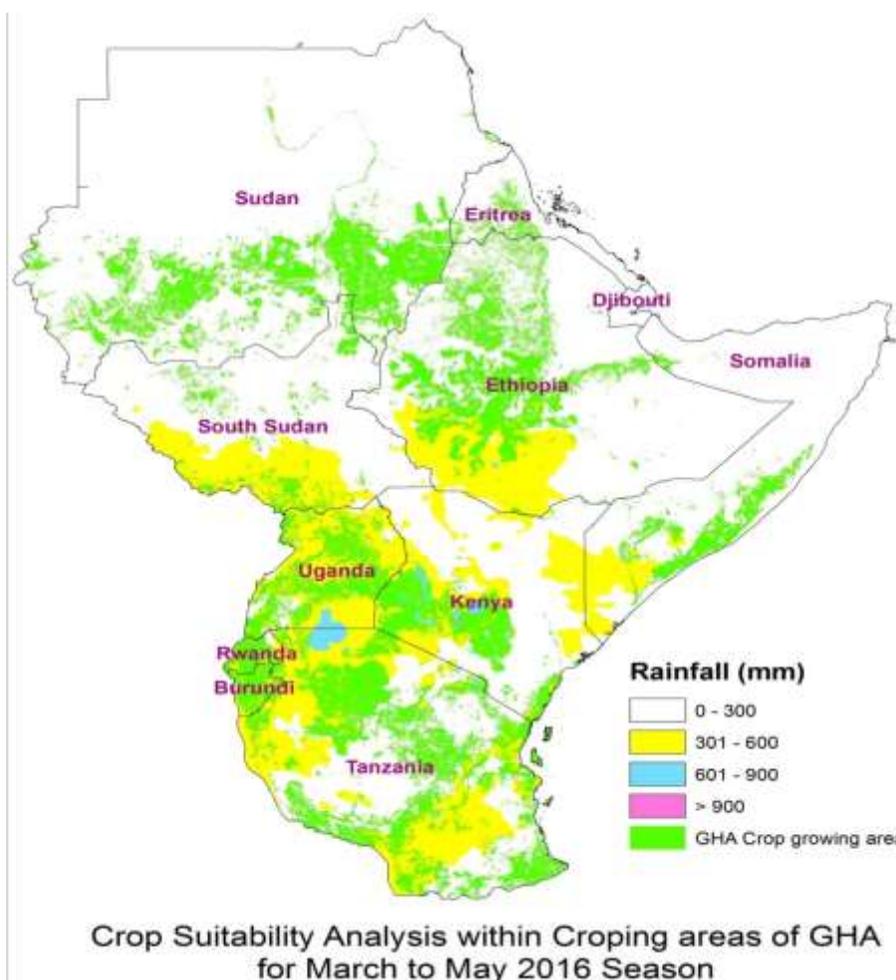
### **Zone IV**

- Tanzania: In the uni-modal areas, the crops are maturing, hence there will be no negative impact as these areas benefited from the above normal El Nino 2015 rains. In the bi-modal areas, the expected below normal rains could affect the planting of crops underway in February/March 2016;
- Somalia: The expected below normal rains may affect planting of crops in the Juba land and part of south-western agricultural areas; flooding may also destroy the planted crops.
- Kenya: The long rains season for maize and wheat in the central and southern rift could be affected if these areas receive below normal rains.

### **Mitigation strategy**

- Farmers should be motivated to take advantage of a prospective good season so as to maximise food production through increasing acreages, planting high yielding crops and varieties and observing proper agronomy;
- Encourage immediate/timely dissemination of appropriate climate information and associated agro-advisories to users in all areas
- Encourage crop diversification including planting of short season/early maturing varieties in marginal areas e.g. pulses (beans and green grams) as well as moisture-stress resilient cereals like sorghum, pearl millet, etc;
- Put in place soil and water conservation structures within regions where normal and below normal rainfall are expected;
- Early planting to take advantage of the available moisture;

- For areas expecting enhanced rains, early detection and control of fungal and bacterial diseases, flood mitigation e.g. river embankment, rehabilitation of irrigation schemes, etc are highly recommended;
- Application of good agricultural/agronomical practices including the introduction of new crops with higher production returns;
- Water harvesting and storage for future use;
- Encourage people to engage in multiple social-economic business including value addition of agricultural products;
- Encourage afforestation and re-afforestation in the marginal agricultural areas;



The above map shows that most agricultural areas (green zones) stretching from the green belt of South Sudan through southern half of Ethiopia, western and central highlands of Kenya, most of Uganda, Rwanda; the lake region as well as southern highlands of Tanzania and south western parts of Somalia are likely to receive at least 300mm of rainfall (yellow and blue zones) which is suitable for maize crop production. Most other agricultural areas in the northern and southern sectors fall under the JJA and



### Zone III

The basins that fall within this zone (Lakes Victoria, Kyoga and Albert, Tana, Juba Shebele and Ewaso Ngiro) are expected to have normal to above normal river flows leading to good water supply for municipal, irrigation and hydropower uses but also high potential for flooding in the downstream of the catchments.

### Zone IV:

The rest of the basins which are in this forecast zone are expected to have water scarcity which may affect water supply to cities as well as hydro-power and food production

### Mitigation strategy

For basins which are forecasted to have normal to above normal rainfall it is necessary to

- Create awareness among the communities on the benefits and risks associated with this forecast such abundant water and risks of flooding and diseases.
- Construction/rehabilitation of water storage/conservation structures to take advantage of the enhanced runoff.

For basins which are forecasted to have normal to below normal rainfall it is necessary to

- Create awareness among the communities so as to conserve water
- Have supplementary water supply from ground water
- Institute efficient water use eg water rationing /conservation

**Table 1: Implications and mitigation measures for different basins under different forecast categories in the water sector**

Basin/Sub basin	Forecast	Implication	Mitigation measures
Lake Rukwa	Normal to below normal	Normal conditions are expected	Create awareness among the communities
North East (Pangani, Wami/Ruvu	Normal to below normal	Hydro-power and food production to be affected negatively Water shortage in major cities	Efficient water use eg water rationing /conservation
Rufiji	Normal to below normal	Normal conditions are expected	Create awareness among the communities
Lake Tanganyika	Normal to below normal	Normal conditions are expected	Create awareness among the communities
Ruvuma -	Normal to below normal	Normal conditions are expected	Create awareness among the communities
Athi	Normal to below normal	Negative impact on water supply for major cities	Efficient water use Supplementary water supply from ground water
Tana	Normal to above normal	Good hydro power production Good water supply for agriculture/irrigation High potential for flooding Increased sediment load	Enhanced water conservation measures Raise awareness on flooding potential



Ewaso Ngiro	Normal to above normal	Good water supply for agriculture/irrigation Good potential for ground water recharge High potential for flooding	Enhanced water conservation measures Raise awareness on flooding potential
East-Lake Victoria	Normal to above normal	Good water supply for agriculture/irrigation Good hydro power production High potential for flooding Increased water quality problems	Enhanced water conservation measures Raise awareness on flooding potential
Rift Valley Lakes	Normal to above normal	Good water supply for agriculture/irrigation Good hydro power production High potential for flooding Increased lake water levels	Enhanced water conservation measures Raise awareness on flooding potential
East-Lake Victoria	Normal to above normal	Good water supply for agriculture/irrigation/hydro power High potential for flooding Increased lake water levels Water quality to be affected negatively	Enhanced water conservation measures Raise awareness on flooding potential
West-South Lake Victoria	Normal to above normal	Good water supply for agriculture/irrigation/hydro power High potential for flooding Increased lake water levels Water quality to be affected negatively	Enhanced water conservation measures Raise awareness on flooding potential
Lake Albert	Normal to above normal	Good water supply for agriculture/irrigation High potential for flooding Increased lake water levels	Enhanced water conservation measures Raise awareness on flooding potential
Lake Kyoga	Normal to above normal	Good water supply for agriculture/irrigation High potential for flooding Increased lake water levels	Enhanced water conservation measures Raise awareness on flooding potential
Juba-Shebele	Normal to above normal	Good water availability for all sectors High potential for flooding	Enhanced water conservation measures Raise awareness on flooding potential
Dharor and Nugal	Normal to above normal	Good water availability for all sectors in areas of above normal rains Ground water recharge in areas of above normal rains High potential for flash floods	Enhanced water conservation measures Raise awareness on flooding potential
Awash	Normal to below normal And normal to above normal	Good water availability for all sectors in areas of above normal rains Ground water recharge in areas of above normal rains Potential for water shortage in lower reaches	Enhanced water conservation measures
Upper & Lower Blue Nile	Normal	Normal conditions are expected	Create awareness among the communities
Upper & Lower Blue Nile	Normal	Normal conditions are expected	Create awareness among the communities
White Nile	Normal	Normal conditions are expected	Create awareness among the communities



## LIVESTOCK SECTOR

### Zones I & V:

#### Ethiopia

- Areas affected: Afar, Tigray, NE Amhara Somali, Pastoral zones of Oromia, highland mixed agriculture areas
- there will be likely shortages of water and pasture
- This will be the third failed season a situation that has and will continue to increase vulnerability of people if the zone receives below normal rains
- If below normal rainfall is received
- Ethiopia yellow zone-belg which are not very reliable. If normal there is hope for pasture regeneration

#### Ongoing efforts to address the crisis

- Destocking
- Livestock movement under the government for genetic resource conservation for restocking when situation improves
- Financial assistance for fattening for export by some NGOs
- Growing of fodder by government
- Preventive vaccination at no cost

#### Sudan

- Kordofan and Dafur is dry
- Eastern Sudan bordering Eritrea is dry also
- Seasonal migration has started early hampering the scheduled vaccination programme
- Livestock movement to the south towards South Sudan. But the north of south sudan is dry. Livestock herds crowding at the border.
- Pastoralist have moved in Eldinder and Elradom national park increasing the incidences of diseases
- Harvested water is running out
- Water tracking already happening
- Supplemental feeding of livestock with livestock feed from Gezira irrigation schemes

#### Djibouti

- Stressed area ,
- If below normal situation will worsen

South Sudan – Situation same as yellow areas of Sudan

### Zones II & VI:

- Tanzania. Southern Kenya and southern Somalia



- Situation not as bad as the northern yellow sector
- If rains fail (BN) then situation may begin to deteriorate
- Close monitoring of the rainfall performance is recommended

#### **Zones III & IV:**

- Increase of vectors expected especially in areas that had high rains during the last season
- Uganda ; high cases of trypanosomiasis, fear of human cases ( Karamoja, NE Uganda, Ethiopia, )
- RVF scare; Vaccination across the countries within this zone especially in endemic zones and surveillance in non endemic zone
- Risk of TAD due to movements
- Increase risk of zoonoses
- Positive effects;
- Increase in pasture and water availability
- Produce and conserve fodder especially with a forecast of likely la Niña later in the year
- Use of cane tops for feed (in Ethiopia from Sugar factories)

#### **General recommendations**

- Don't fall for generalizations. Use the downscaled country maps to augment this regional map. there is a pressing need for more observatories especially rainfall stations to be able to monitor the season's performance adequately.

#### **Comments and discussions**

Mr. Samuel Akeru asked;

- (1) How the experienced/ongoing off season rainfall will affect the onset of the MAM 2016 rains?
- (2) How have the groups used the analogue years in discussion and to inform their proposed short term and long term mitigation plans

Dr. Seif indicated some crops that require five to six months of rainfall may not be suitable under depressed rainfall conditions that have become frequent in some areas. He then asked if it is still realistic that we continue relying on same crops?

Mr. Kongoti observed that not all the five WMO GFCS pillars (sectors) were covered in the presentations. He indicated that the energy sector was not included. He further indicated that sectors need to have advocacy strategies regionally that can be undertaken and pass them to national and local levels.

Mr. Kabongo informed that gully formation is becoming a big issue that is related to heavy rains in sloppy or hilly areas.



Mr. Patrick Luganda suggested that there is need to have regional concern for areas that have had a lot of drought that lead to migration and conflict.

Dr. Philip Omondi suggested that ICPAC and SWALIM need to work together to maximize data in Portland and Somalia in general.

Mr. Atheru responded that user of the forecast needed a year (analogue) to compare that forecast with so as to understand the evolution of the season. The analogue year is a year in the past that has close patterns of rainfall to the year whose forecast in being given. The analogue year is determined based on the oceanic and atmospheric patterns for both current and historical years. A year with patterns closest to the current year is chosen. He also responded that crops need not be changed because of sort variations in climate. He advised that agricultural people need to work closely with climate scientist to determine which crops will grow well under prevailing climatic conditions. With regard to the energy sector being part of the WMO GFCS, Mr. Atheru indicated that energy sector working group might be included in future GHACOFs.

Dr. Evelyne Komutunga added that different crops have different water requirements and these are used to determine which crop to grow where? In addition, she indicated that the way people choose which crops to grow is also rooted in their cultural values.

Caroline Kirungu added that the use of analogue year requires initial conditions such as the conditions that prevailed in particular locations before the start of the season.

***The End***