**ICPAC**
IGAD Climate Prediction
& Applications Centre

# The FIFTY FIRST Greater Horn of Africa Climate Outlook Forum (GHACOF 51) Bulletin

## Summary

***Near normal rainfall is expected over much of the equatorial region, with higher likelihood of suppressed rainfall in the eastern parts of the region. However, increased likelihood of wetter conditions is forecasted over parts of Tanzania, and much of Burundi, Rwanda, Uganda, western Kenya, and southwestern Ethiopia and parts of southern Ethiopia. There is also increased likelihood of warmer than normal mean temperatures over much of the northern and eastern regions, with cooler to near normal temperatures over the western parts of GHA. Regionally downscaled ensemble forecasts indicate earlier than normal start with early withdrawal of the rains over most parts of the equatorial region.***

The regional consensus climate outlook for the MAM 2019 season indicates increased likelihood of near normal rainfall over much of the equatorial region (5°S – 5°N), with higher likelihood of supressed rainfall in the eastern sectors especially over central Somalia, eastern Kenya, and much of northern segments of South Sudan and Ethiopia; Southern Sudan, southern Tanzania, Eritrea and Djibouti. Increased likelihood of wetter conditions is indicated over the bimodal regions of Tanzania, and much of Burundi, Rwanda, Uganda, western Kenya, western Somalia and parts of southern and south-eastern Ethiopia. In the extreme southern Tanzania and coastal areas of Somalia, the consensus indicates supressed rainfall

There is also increased likelihood of warmer than normal mean surface temperatures over much of the northern and eastern regions, while cooler to near normal temperatures are indicated over the western parts of GHA. The central parts of the region is forecasted to be cooler than normal.

Regionally downscaled ensemble forecasts indicate earlier than normal start of the rains over most parts of the equatorial region. However, there is a high chance of earlier than normal withdrawal of the season from south-eastern Ethiopia, central and southern Somalia, and eastern Kenya, south-eastern Uganda, and northern Tanzania.

## 1. Introduction

The March to May (MAM) rainfall is useful in equatorial parts of the region. It coincides with the passage of the Intertropical Convergence Zone (ITCZ) to the northern hemisphere. This bulletin is the culmination of deliberations held during the fifty first Greater Horn of Africa Climate Outlook Forum (GHACOF51) that provided consensus seasonal climate outlook for the next three months for guidance to reduce climate-related risks in support of key socioeconomic sectors and resilience building for sustainable development.

Climate Analogues is used to identify areas that experience statistically similar climatic conditions, but which may be separated temporally and/or spatially. The analogue year to MAM 2019 outlook is MAM 1995.

The main objectives of the GHACOF 51 was to:

a) Review lessons/experiences from the use of the products provided during the previous GHACOF50;
b) Develop consensus regional climate outlook for the March to May 2019 season;
c) Formulate mitigation strategies to the implications of consensus regional climate outlook on the key Socio-economic sectors in the GHA region; and
d) Provide a regional interaction platform for decision makers, climate scientists, research scientists as well as users of climate information.

The forum reviewed the state of the global and regional climate systems and their implications on the March to May seasonal rainfall over the region. The document gives a brief summary of the MAM 2019 outlook and associated impacts on socio-economic sectors.

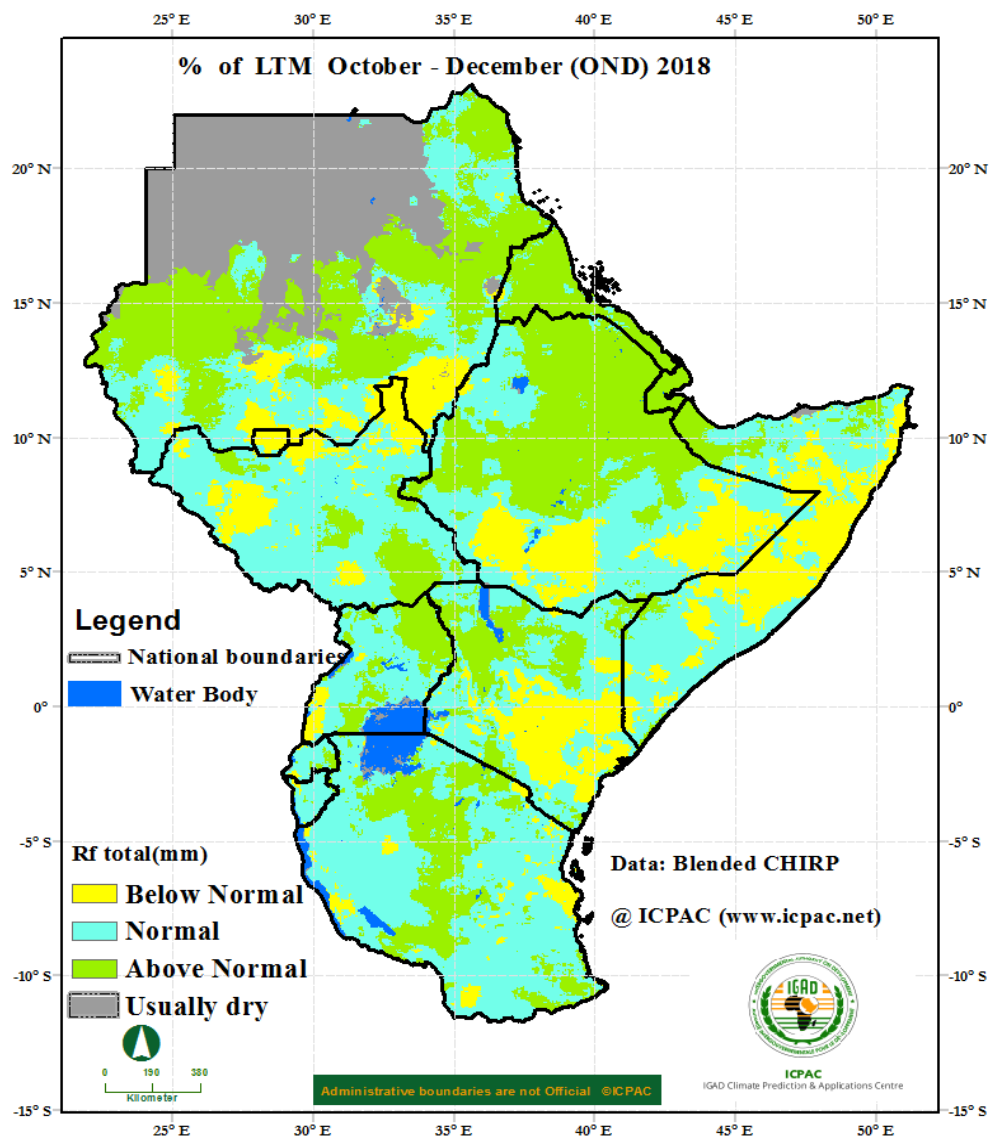## 2. Performance of October – December (OND) 2018 Season



**Figure 1: Performance of October - December (OND) 2018 rainfall (Total/mm)**

This section reviews the total amount of rainfall receive during October to December (OND) 2018 season (Figure 1

The season generally did not perform well contrary to the high expectations given by the forecast. Most parts of the region had the late start and early withdrawal of rains.

The overall assessment showed Hit Rate and Heidke Skill Score 56% and 12% respectively for the OND 2018 season.

Most of the hotspot areas to watch are traditional arid and semi-arid areas in the horn of Africa areas such as Somalia, south-eastern Ethiopia, eastern parts of Kenya and southern districts of Tanzania.

Good rainfall performance with above to near normal was however received as forecasted in the bimodal areas of Tanzania and western segment of the region. Parts of Burundi, Rwanda and Uganda reported flooding with landslides that impacted on several sectors. Most of these areas had poorly distributed OND rains.

***Key messages*** noted are warm Sea Surface Temperatures in the Pacific Ocean did not yield typical El Nino response in the atmosphere.

The Indian Ocean remained weak most the season and therefore did not contribute to the enhanced moisture transport into the region as was expected.

Rainfall observations closely matched the 2001 analogue year, although the SST evolution was significantly different.

Most parts of the region not only had late onset and early withdrawal but also received less than 125% of their long-term mean that was poorly distributed.

## 3. March – May (MAM) 2019 Consensus Climate Outlook
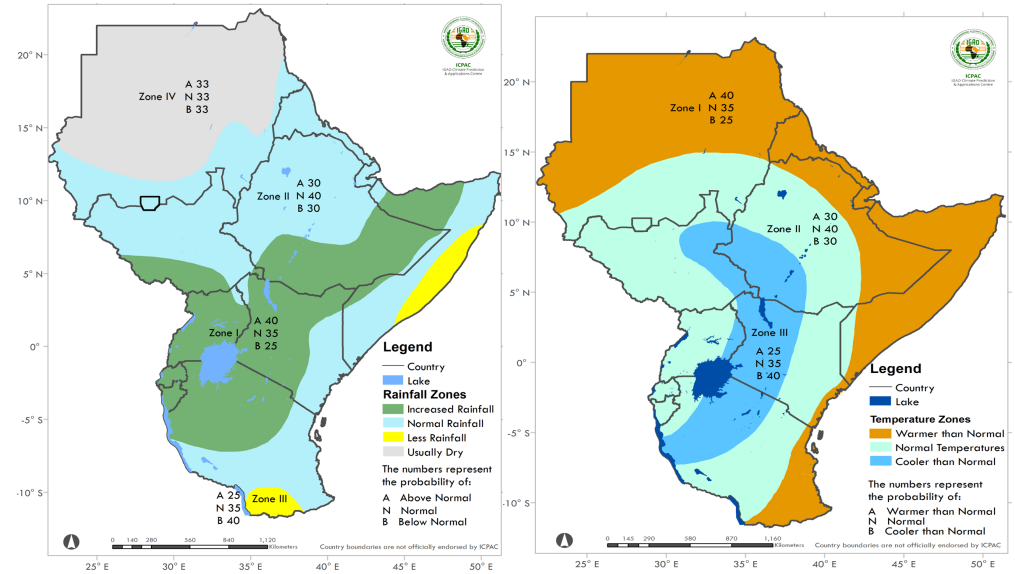
### 3.1 Rainfall outlook

The regional consensus climate outlook for the MAM 2019 season indicates increased likelihood of above to near normal rainfall over much of the equatorial sector **(Figure 2a).**

Near normal rainfall over much of the equatorial region (5°S – 5°N), with higher likelihood of supressed rainfall in the eastern parts of the region.

Most parts of the region are likely to have earlier seasonal rains onset but with earlier withdrawal (**Figure 3**).

### 3.2 Mean Surface Temperature Outlook

There is also increased likelihood of warmer than normal mean surface temperatures over much of the northern and eastern regions, while cooler to near normal temperatures are indicated over the western parts of GHA. The central parts of the region is forecasted to be cooler than normal (**Figure 2b**).
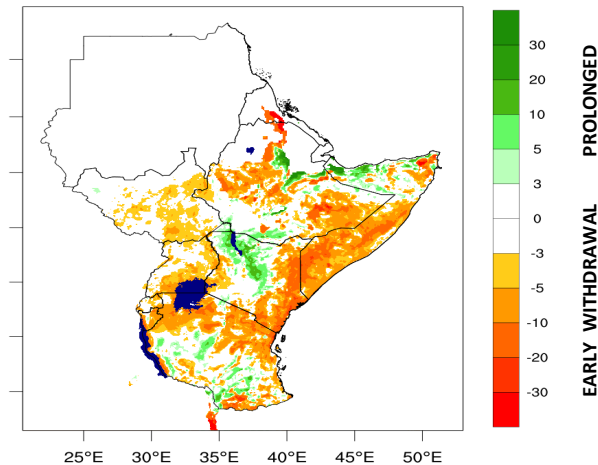


(a) Rainfall          (b) Mean Surface Temperature

**Figure 2: The seasonal climate outlook for March – May (MAM) 2019**
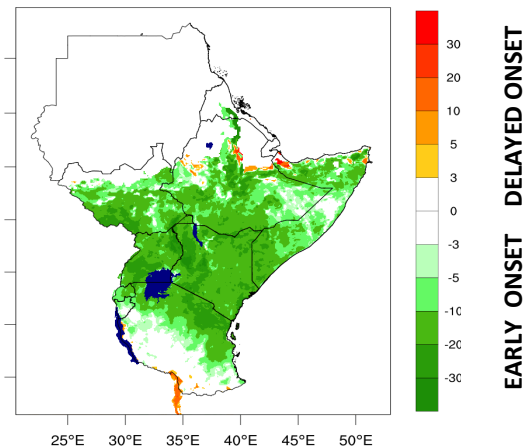


**(a) Anomaly in onset of seasonal rains from LTM (days)**          **(b) Anomaly in cessation of rains from long-term mean (days)**

**Figure 3: Forecasted onset and cessation anomalies for MAM 2019 seasonal rainfall. Anomaly is computed as the deviations from long term average (1989 - 2008)**

4

The sectors analysed during the forum include Agriculture and Food Security, Water and Energy, Livestock, Health, Conflict Early Warning, and Disaster Risk Management.

### 4.1 Drought Risk and Vulnerability Analysis

The prospect for drought hazard in the region appears to be minimal given the enhanced rainfall forecast for March to May (MAM) 2019 season (**Figure 5**). However, as some areas have experienced dry spells since October 2018 like the coastal areas of Somalia, a precaution is needed to closely monitor meteorological and agricultural drought indicators at decadal and monthly scale especially in the countries where MAM constitutes long/short rains.

### 4.2. Flood risks and vulnerability Analysis

**Figure 5** shows the flood prone areas and flood frequency ranges from the GRID with 100years return period for Above normal and normal parts of the March to May 2019 forecast.

There is an increased chance of flash and riverine flood risks due to normal to above normal rainfall forecast mainly in flood prone areas of Kenya, Uganda, Burundi, Rwanda, South Sudan and Tanzania. The enhanced rains might also trigger landslides, mudslides and outbreak of epidemics in some areas in the region.

This calls for putting in place all preparedness and mitigation measures with close monitoring of the rainfall events during the MAM 2019 season.

### 4.3 Mitigation measures for Disaster Risk Management

**Ethiopia: -** MAM is the main rainfall season ("Belg") for South Eastern and North Central parts of Ethiopia with pastoral and
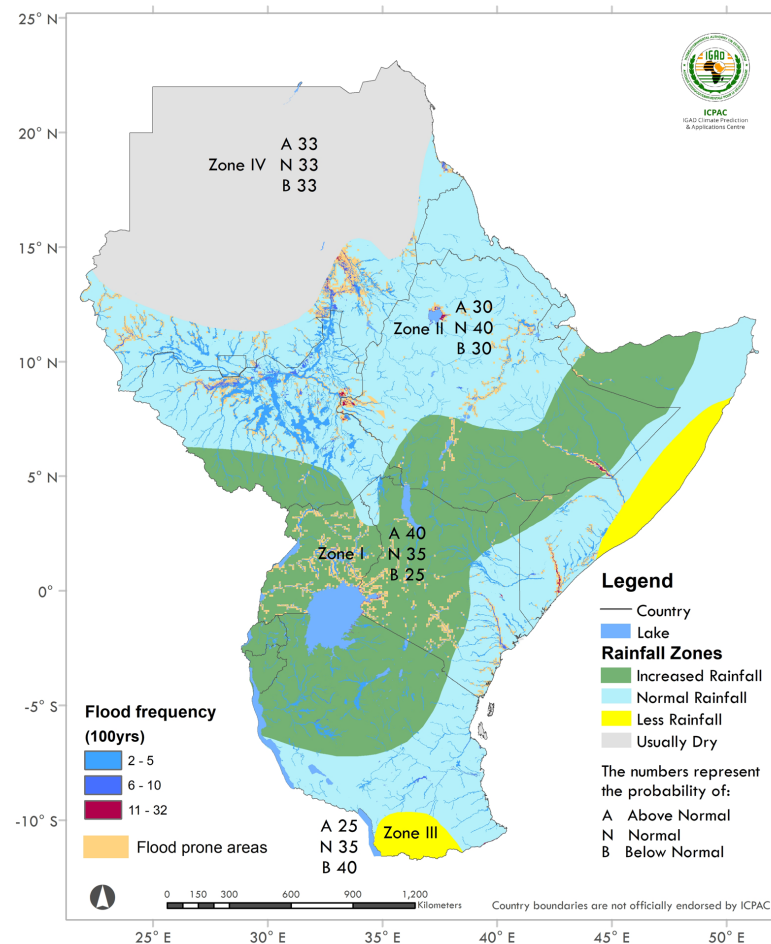


**Figure 5: March - May 2019 rainfall outlook and historically flood prone areas of the region.**

5

agro-pastoral livelihood systems. Favorable conditions for water and pasture availability with trifling risk for droughts. However, some pocket areas might still experience dry spells as was the case in the recent past years. Conversely, the above normal rains might also cause flood and associated risks in places susceptible to floods (riverine and flash) and associated risks. Re-activate flood contingency plans.

**Kenya: -** MAM 2019 forecast is favourable for crop, pasture and water availability. However, for some places, the enhanced rains might result in floods especially in the western region and places which are prone to floods. This can also trigger landslides. Mitigation strategy, sensitization, press releases, engage Members of the Parliament, stocking of pasture, medicine and preparation of a full-fledged contingency plan including urban flooding are some of the measures identified.

**South Sudan: -** The enhanced rains in the southern parts of the country will likely exacerbate flooding. As a mitigation strategy the disaster risk management authority needs to mobilize stakeholders and disseminate the information to all stakeholders in different ways (radio, bulletin, workshops…etc).

**Sudan: -** The condition will remain dry and heat waves are the major risks associated with the dry conditions which might also exacerbate scarcity of water and wild fires.

There is needs for fire breaks to control wild fire from spreading to crop and grazing areas. Apart from this the government also needs to stabilize the market through making food crops available to the public.

**Burundi: -** The enhanced rains will heighten chances for floods and epidemics. There is a need to develop and update community contingency plans, activate community platform for DRR and setup national committee for prevention/control of disasters in Burundi.

**Djibouti: -** The normal to near normal rainfall is not expected to result in drought nor flood conditions. However, close monitoring of the situation is advised for unanticipated events like the tropical cycles. The DRM secretariat of Djibouti has set to undertake rapid assessment for possible impacts of quick onset hazards and will work to strengthen institutional capacity.

**Somalia: -** Increased chance for drought conditions in which might aggravate the already dry conditions experienced during October to December season. A possibility for flash floods cannot be ruled out given that the upstream areas of Juba and Shebelle rivers receive above normal rains. The Ministry of Humanitarian Affairs and Disaster Management (MOHDAM) together with other stakeholder needs to review and activate Contingency plans and reposition of life saving items in case of any disaster risk.

**Tanzania: -** The forecast shows an increased rainfall conditions which can lead to floods and damage to infrastructure and other associated risks. There is very minimal risk of droughts despite the indication for below normal rains in the southern tip of the country as rain is not expected during the March to May season. Contingency plans for flash floods in the flood prone areas and issuing timely early warning information, clearing of drainage lines are needed. Coordination with relevant ministries like ministry of health for prevention and response in case of disease outbreak is advised.

**Uganda: -** The increased rainfall conditions might pose a risk of flooding, landslide/mud slide for western areas and disease outbreak. This might also hamper mobility due to damage to road infrastructure. As part of mitigation strategy, community sensitization, issuing early warning for floods, landslides and disease outbreaks and supporting the DRM committees at local level are identified.

## 5.1 Agriculture and Food Security Sector

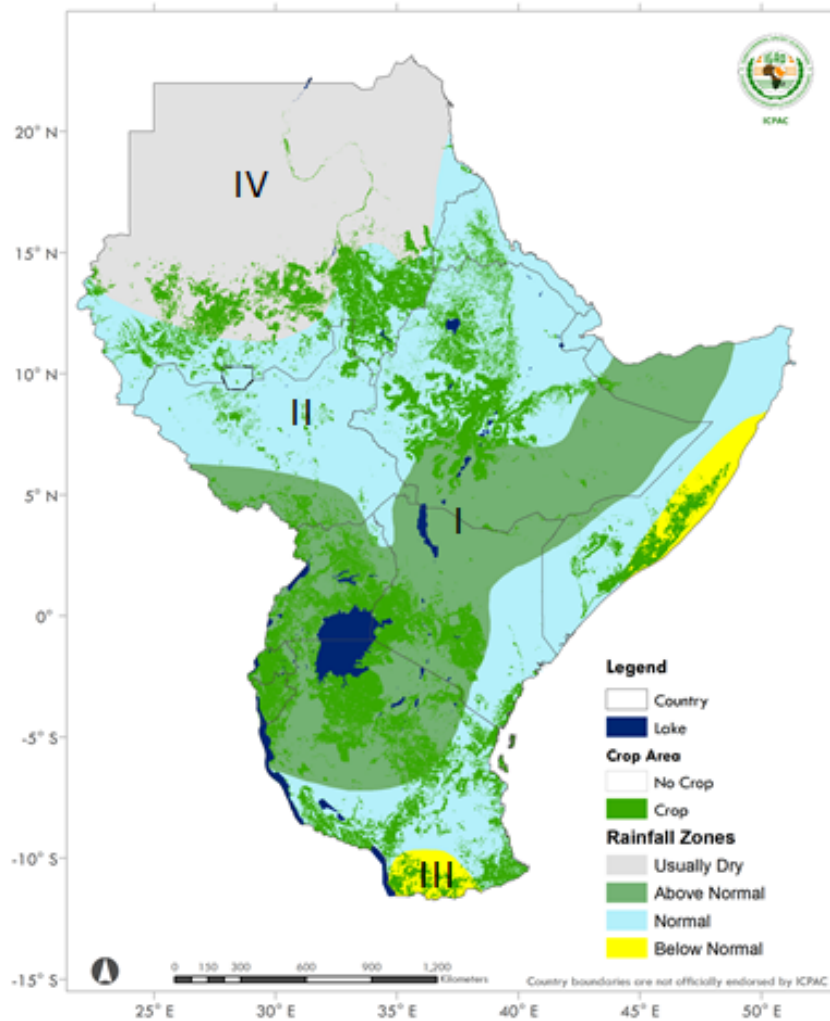### 5.1.1 Implications of MAM 2019 for Agriculture



**Figure 7a: Cropping areas overlaid with the MAM 2019 rainfall outlook**

**Zone I:** - Good crop and pastoral prospects are generally expected. Further, there is a likelihood of a reduction in fall army worm infestation as high rains is unfavorable for their multiplication and thus high prospects for food security. Expected enhanced rains are likely to bring some relief especially in areas that had experienced moisture deficits in the previous season (OND 2018). In general, good crop projections are expected if the rains do not exceed the specific crop requirement amount.

Flash flooding and waterlogging and landslides in some localized places is also likely. Crops that cannot tolerate too much water are likely to perform poorly. Further, there is high likelihood of washing away of fertilizer and pesticides, high incidences of hailstones and lightening, and likelihood of marked deterioration of road infrastructure thus affecting transport and trade of agricultural produce.

**Zone II: -** In most of this areas, early onset (by 10-20 days) and early withdrawal (by 10 days) is expected. Minimal impacts is generally expected in this zone with a likelihood of slight improvement in food security conditions of agricultural produce.

**Zone III: -** There is early withdrawal in Somalia with early to late in Tanzania.

In Somalia, food insecurity is already quite high so further shocks would likely lead to further deteriorations which is a key area of concern. Impacts on crops and food security is likely to be minimal in Tanzania as the crops has passed critical stages and provided that there is no prolonged dry spells.

### 5.1.2 Mitigation measures for Agriculture

**Zone I:** Early land preparation and planting is recommended, investment in post-harvest technologies to avoid loses in areas where harvesting is expected, and water harvesting and storage for future use. Early warning Information on the likelihood of early rains should be conveyed to farmers and agro-dealers who are the suppliers of farm inputs. Further, household-level cereal storage and regional trade is encouraged.

Finally, stocking of pesticides and disease treatments will help in dealing with the menace of pests, diseases and weeds.

**Zone II:** Early warning information should be availed to farmers and agro-dealers about the expected early rains. Smallholder farmer resilience building is advised.

**Zone III:** Livestock off-take from smallholder livestock farmers are encouraged, water trucking, and food and nutrition assistance.

### 5.2 Water Sector

### 5.2.1 Implication of MAM 2019 seasonal rainfall forecast for water Sector

**Figure 8** shows the major regional rivers and basins overlaid with the March to May 2019 seasonal rainfall outlook.

**Zone I:** The anticipated above normal to near normal rainfall provide a good opportunity for water harvesting, ground water recharge, increased hydro power generation from large and micro-hydro power stations in Kenya, western part of Burundi, Rwanda (Sebeya and Nyabarogo), Ethiopia and Uganda. However, this also poses a risk of flash flood especially over the southern part of Ethiopia (Genale dawa and Wabishebele basin), western and central parts of Burundi, northern and western Rwanda, western

Kenya, lowlands of South Sudan (Jonglei state), central Tanzania (Dodoma and Tabora). Mudslides are also anticipated over the mountain areas of Uganda and western Burundi.
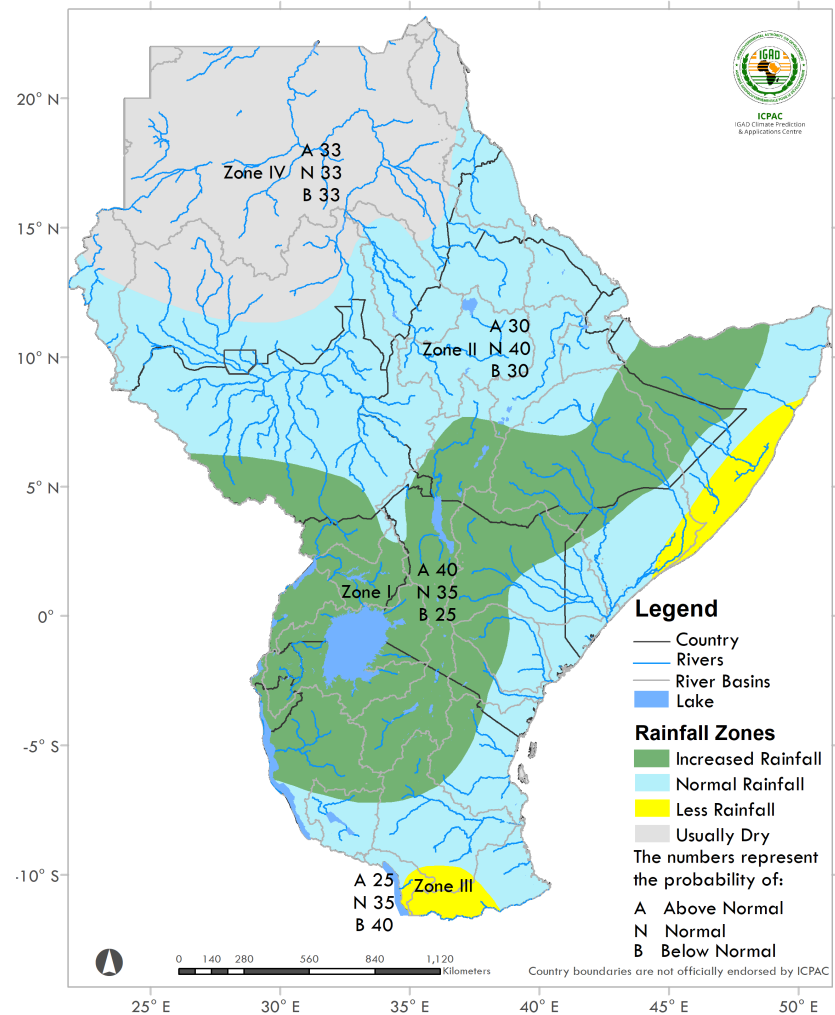


**Figure 8: The implication of MAM 2019 seasonal forecast for the water sector.**

8

**Zones II:** Normal conditions are expected in Zone II which provides a good opportunity for water harvesting for domestic use and livestock especially in the Arid and Semi-Arid lands of the region, and stable hydro-power generation in Tanzania and Sudan. Within the same zone, floods are likely to occur in Dar es Salaam, Tanzania.

**Zone III:** This is anticipated to have below normal to normal rainfall conditions that may lead to scarcity of water for domestic use especially along coastal Somalia as well as reduced flow into rivers mainly over southern Tanzania.

**Zones IV:** Much of this Zone is usually dry during this season with likelihood of water scarcity. Not much economic activities are expected in this area. This is likely to lead to depletion of water resources in Sudan that will result to human migration.

**5.2.2   Recommended actions/measures**

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The following measures are proposed for Zones I and II;

- Stakeholder engagement to create community awareness over risk areas.
- Advisory issued to municipal council to open up drainages
- Construct flood control structures and resettle people out of flood prone areas
- Maximizing on hydropower generation
- Enhanced monitoring of rivers for riverine floods.
- Issue early warning on time to areas prone to flooding through print/social medias

For Zones III and IV it is advisable to improve water use through:

- Rainwater harvesting and household level and open area pans
- Encourage effective reservoir management.
- Water tanker supply domestic use.

**5.3 Livestock Sector**

**5.3.1 Implications of MAM 2019 Outlook for Livestock Sector**

This section discusses the impacts of MAM 2018 seasonal forecast on livestock sector in the GHA region.

**Zone I:** Above to normal rainfall

**Ethiopia**

**Mitigation measures**

General monitoring of the season's performance

**South Sudan**

Pastures and water will be enhanced although the area has less livestock. Flooding around lower lands in Juba if heavy rains in Uganda will contribute to the flooding. Livestock in Toch (dry season grazing) will return home.

**Mitigation**

Vaccinations and deworming

**Uganda**

Most of Uganda is in this zone. Flooding expected both in country and in the lower south Sudan areas. Improved pastures expected. However, Vector-Borne Diseases outbreaks is expected as well.

**Mitigation measures**

Vaccination, surveillance and treatment of sick animals.

**Zone II:** Normal to above/below normal

**Ethiopia: -** Disease outbreak is likely in some lowland areas such as Afar and Somali regions.

**Mitigation measures**

Vaccination and surveillance and treatment of sick animals. Capacity building in vaccination and surveillance

Close monitoring of performance and resource utilization

Cultivation of animal feed

**Kenya: -** Conditions already poor in some of the areas. Further deterioration of pasture likely if season underperforms. There is likely livestock movements in search of pasture and water. Resource based conflicts in Tana delta, Kitui, Turkana/Karamoja area, West Pokot/Turkana cannot be ruled out.

Disease outbreaks due to the movements

**Mitigation measures**

Close monitoring of rainfall performance and pastures/water. Enhance data collection of early warning data.

Activating the Pastoral Risk management committees to facilitate peaceful migrations

Disease surveillance, prevention and treatment

Investment in water infrastructures necessary

**Somalia: -** Improved pastures to supplement the stock from GU season. Likely livestock movements on pocket areas could lead to conflicts around Hiraan and galgadud

**Mitigation**

Close monitoring of season's performance required

**South Sudan: -** Likely regeneration of pastures. Expected livestock movements southwards from Sudan with possibility of disease outbreak.

**Mitigation**

Proper coordinated animal movements and vaccination to be conducted to avoid disease outbreak. Movement facilitation meetings have already began

**Sudan: -** Outbreaks of pneumonias and foot and mouth diseases expected

**Mitigation**

Disease surveillance and monitoring recommended.

**Zone III: Below-Normal to Normal rainfall**

**Somalia: -** Mostly sheep and goats zone. These will be expected to move inwards for pasture

**Zone IV: Climatology**

**Sudan: -** Migrations out to Ethiopia, South Sudan, Central African Republic. Other movement will be to near the large agricultural areas to benefit from agriculture. This is a vector borne diseases season. Pneumonias are likely.

**Mitigations**

Government to release national strategic stockpile. The government policy to utilize 30% of fodder for export locally to be effected.

Vaccinations for priority diseases pneumonias, Sheep and goat pox especially for sheep and goats to secure live exportation to the gulf states

## 5.4 Health Sector

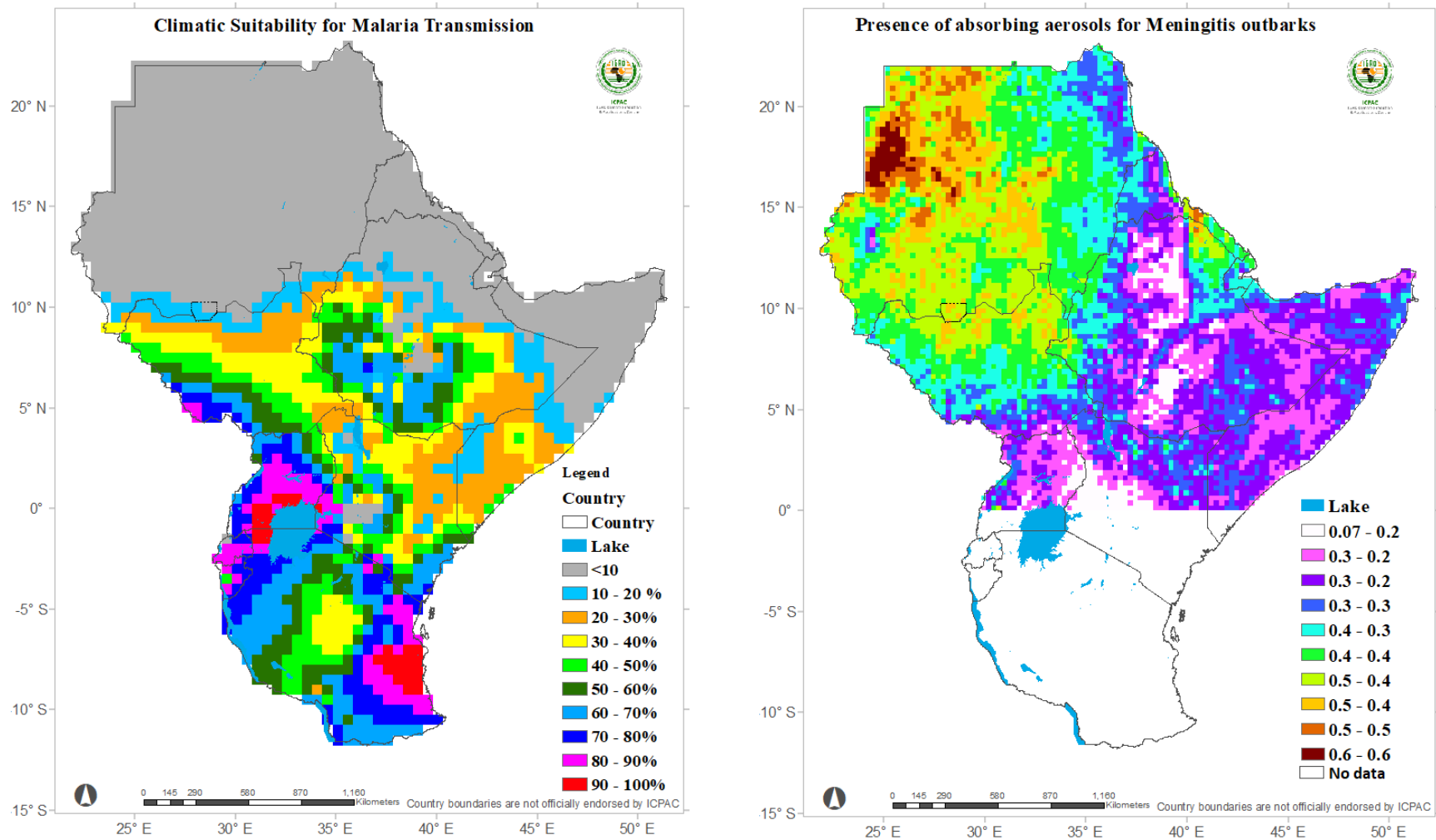### 5.4.1 Implication of MAM 2019 Seasonal rainfall forecast on Health Sector



**Figure 9a: Historical suitability (%) of climate conditions for malaria transmission during MAM using Rainfall, temperature and relative humidity (*Data source courtesy of IRI Maproom*).**

**Figure 9b: The presence of absorbing aerosols suitability for Meningitis outbarks (*Data source: NASA*)**

The implication of MAM 2019 seasonal rainfall and temperature forecast on health especially suitability of Malaria outbreaks and other vector and water borne diseases and presence of absorbing aerosols suitability for Meningitis outbreaks are presented in **Figure 9.**

**Sudan: -** High chances of Meningitis cases, heat stroke**,** skin diseases. Mitigation measures include implementing Indoor Residual Spraying (IRS), distribution of mosquito net, immunization campaign, control of flies, health education.

**Djibouti: -** Expecting respiratory diseases and Meningitis outbarks due to dust, conjunctivitis due to dusty conditions. Mitigation measures include distributing Long Lasting Insecticide treated Nets (LLIN), IRS and supplies for case management, strengthen WASH program and symptomatic case management.

**Somalia:** - Acute Watery Diarrhoea (AWD), Cholera, Tuberculosis (TB), and respiratory infections expected. The mitigation measures are case management of AWD, continuation of measles and malaria prevention measures.

**Ethiopia: -** expected to have high AWD associated with flooding, malaria cases among others. The mitigation measures are monitoring the basic supplies for malaria, strengthen surveillance and improve alert system to ministry of health (MOH) and local health facilities.

**South Sudan:** Epidemic Meningitis, Hepatitis E Virus and Malaria cases are expected. Mitigation measures are Global Alliance for Vaccines and immunizations to procure vaccines for meningitis, immunization country wide, Integrated health WASH response planned to map possible sources of contamination and to improve access to safe water and sanitation in the affected locations, LLINs mass distribution campaign.

**Kenya:** Likelihood of increased Malaria transmission among other vector borne infections, Sporadic outbreaks of AWD expected in Lake region and cities along major highways, dengue fever in the coastal strip. Mitigation measures include continued net use campaigns; awareness efforts to be enhanced; increased treatment supplies, hygiene promotion and strengthened treatment services.

**Uganda:** Malaria upsurges in most parts of the country, diarrhoeic diseases e.g Cholera, Typhoid, Rift valley fever around the cattle corridors. Close surveillance using the weekly malaria normal channels for early detection and response to any epidemics, LLIN use and Early seeking behaviour, Surveillance of Cholera prone areas around fishing grounds of Lake Albert, Kyoga and in slummy areas of Kampala.

**Rwanda:** Malaria cases likely in different parts of country, some cases of cholera/diarrhea diseases expected in Western areas of the country-around Lake Kivu. Reinforce treatment and management in health facility, Indoor residual spraying, Redistribution of LLINs in all 30 Districts, deworming of children between 5-15 years (more affected) in March 2019, raising awareness and improving community sanitation and latrine usage/construction.

**Burundi:** Increase in malaria and AWD. Respond plan, Case identification and symptomatic treatment; Health education on WASH; LLINs distribution, mobile clinics with distribution of Remote Diagnostic Technologies (RDT) and anti-malaria drugs+++, Health education on Bed nets utilization.

**Tanzania:** Expected increase cases of Cholera, Typhoid, Mosquito borne diseases (Malaria, dengue, chikungunya, lymphatic filariasis, rift valley fever). Behavior change campaign (proper use of toilet, hand washing), strengthen surveillance, distribution of enough medication, distribution of enough medication to health facilities, use nutrient supplements.

## 5.5 Conflict Early Warning (CEWARN)

### 5.5.1 Potential implications of March - May (MAM) 2019 Outlook on conflict in GHA region

**Figure 10** depicts areas in the region that traditionally experience climate related conflicts. These are mostly cross boarder areas where pastoralist communities graze their animals.

**Zone 1 Composition: Kenya, Uganda, S. Sudan and Ethiopia**

Most of the areas under consideration are in **Zones 1 and 2** that portents availability of water and pasture likely to be impacted by floods (Turkana, Kotido). Crops are likely to be destroyed in rich agricultural areas.

Strong windy conditions common in South Sudan likely to destroy properties and destruction of infrastructure such as bridges by floods are likely to be witnessed in Karamoja, Turkana while access will become problematic.

With such conditions forecasted, pastoralists will migrate back to their homes-stock thefts to increase (re-stocking) increasing geographic spread of conflict.

Above average rains will exacerbate siltation of valley dams.

**Implications of delayed onset**

Persistent and prolonged resource based conflicts.

Activities associated with insurgents are likely to increase during the coming season.
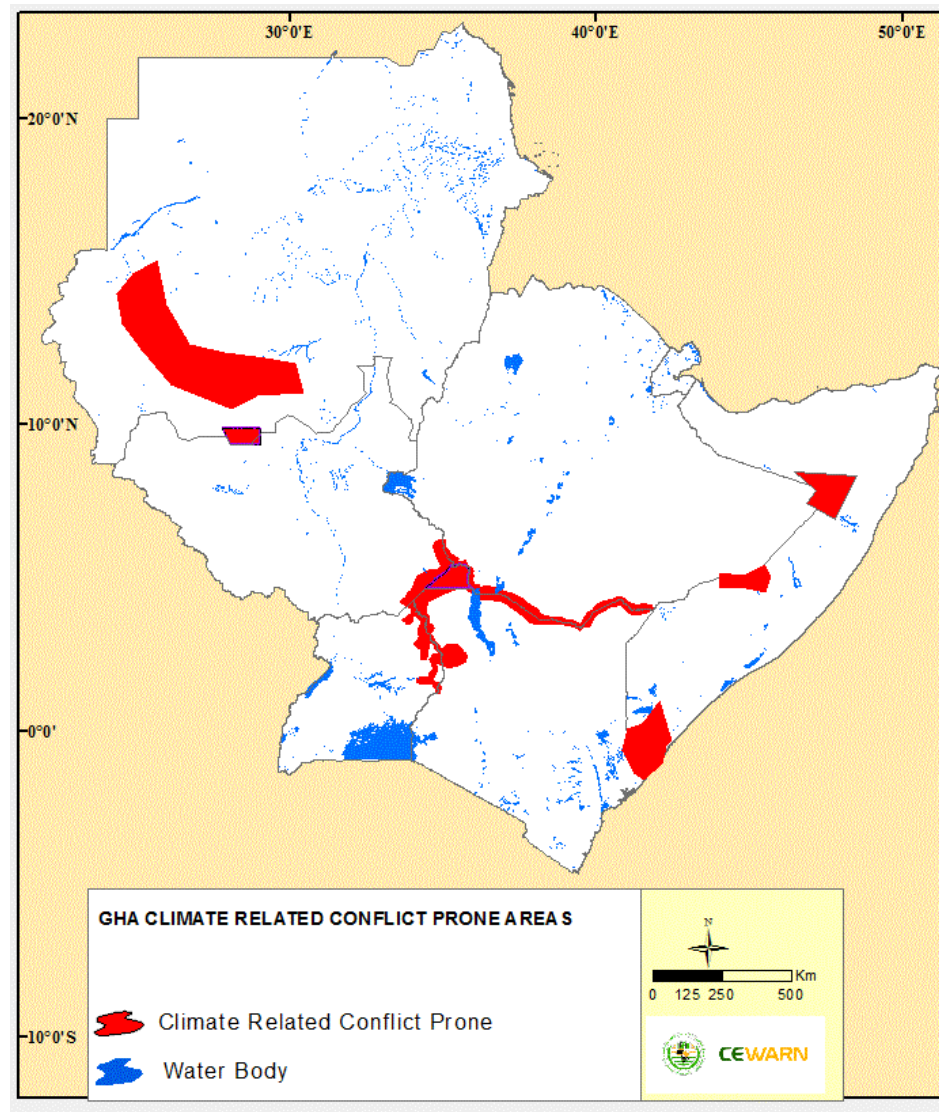


**Figure 10: Historically climate related conflict prone areas.**

13

### 5.5.2 Interventions and Mitigation measures

- Downscaling and dissemination of climate information to end users and stakeholders.

- Implement IGAD transhumance protocol to track and manage movement of animals

- Strengthening of joint resource sharing committees-providing them with early warning information.

- Continuous peace dialogues –one is planned for early March involving Uganda and Kenya.

- Engaging with Environmental protection Authorities and law enforcers on optimal responses to crimes related to environmental encroachment and destruction.

- Strengthening of early warning mechanism –recruiting of Civil Society Organisations (CSOs) in collecting early warning information

- Safe guards against personal security –rapes and child recruitment

- Strengthening the response strategy-improving network relations-local community and security, NGOs, administrations

- Diversifying response to include programmes that address gender issues like woodlots, hay projects to reduce security risks

- Education and awareness programmes against bad vices like burning of grass

- Promote the consumption of climate information in schools

- Strengthening of alternative dispute resolution mechanisms-like traditional systems

- Commemoration of peace accords and cultural festivities (e.g., Lokiriama-47 years Moru Annaeche, L. Turkana festival)

## 6. Summary and Conclusions

Most of the GHA region is likely to receive enhanced to normal rains with earlier seasonal rains onset and withdrawal. There is increased likelihood of warmer than normal mean surface temperatures over much of the northern and eastern regions with cooler to near normal temperatures over the western parts of the region.

Good rains in several parts of the equatorial sector will bring relief to agriculture and livestock sectors especially in areas such as central and south eastern Kenya and southern parts of Ethiopia that performed poorly during OND 2018. The notable area is central and western coast of Somalia that consecutively performed poorly.

Stakeholders are advised to implement the proposed mitigation and response measures across the different socio-economic sectors. There is need to strengthen disaster risk reduction strategies including response capacities, coordination, resource mobilization, communication and advocacy at the regional, national and sub-national levels for all sectors likely to be impacted.