



ICPAC
IGAD Climate Prediction
& Applications Centre

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EXECUTIVE SUMMARY

March to May usually constitutes the long rain and a very important cropping season for most countries in the Greater Horn of Africa (GHA) region. However, the regional consensus climate outlook for the March to May 2017 season indicates an increased likelihood of below normal to near normal rainfall over northern and eastern Tanzania; north, eastern and coastal Kenya; southern and north-western Somalia; north and western Djibouti; western and south-eastern Eritrea; north-eastern, eastern and southern Ethiopia; southern parts of South Sudan; north-eastern Uganda and southern parts of Sudan. On the other hand, the Central and western Tanzania, much of Burundi and Rwanda, western Uganda and south-western parts of South Sudan have increased probability for above to near normal rainfall. Likewise, the southern Tanzania, western, parts of South Rift and central Kenya; much of central Uganda, northern parts of South Sudan, extreme southern parts of Sudan, western Ethiopia, much of Eritrea and parts of central and north-eastern Somalia are likely to have probability of near normal to above normal rainfall.

The forecasted performance of the MAM 2017 rainfall is expected to have mixed implications for food security, livestock production and productivity, water, health in different parts of the region. The climate outlook is likely to lead to both drought and flood related disasters in different parts of the region. Some regions that are predicted to receive depressed rainfall during the MAM 2017 rainfall season also experienced poor rainfall performance during the OND 2016 rainfall season which has pushed areas like Somalia, parts of Kenya, Uganda and Southern Ethiopia into serious food insecurity. Poor performance of the MAM 2017 rainfall will only exacerbate the already deteriorating situation in these countries. On the other hand, there are risk of flooding in some parts of Tanzania; flooding and landslides in parts of Burundi and Rwanda, western Uganda and south-western parts of South Sudan due to the increased probability for above to near normal rainfall.

In order to address the likely impact and take advantage of the MAM 2017 seasonal forecast, the stakeholders are advised to implement the proposed mitigation and response measures across the different socio-economic sectors. In order to reduce the impacts of the forecast in the region, 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 people living in cities, landslide and flood prone zones, structural and non-structural mitigation measures are recommended to avoid damage and losses to lives and properties. For actors working in the Agriculture and food security sector, there is need to diversify livelihoods, plant early maturing and drought tolerant crops in areas with depressed rainfall, maximize the good rains to boost crop and forage production, and avoid planting crops in flood and landslide prone zones. Priorities for the livestock sector include massive livestock vaccination; promote livestock insurance, among others. In the water sector, there is need to close open river banks/dykes and strengthening weak ones; intensify rainwater harvesting; maintain strategic borehole for pastoralists; de-silt water pans and carry out construction of new ones; and carry out effective reservoir management as well as manage conflict in known hotspot zones.

1. INTRODUCTION

This bulletin provides a summary of the GHA October – November – December (OND) 2016 seasonal rainfall performance and March to May (MAM) 2017 consensus climate outlook, its implications and mitigation measures. It is consolidated from the contributions of the Forty Fifth Greater Horn of Africa Climate Outlook Forum (GHACOF45) convened from 06 to 07 February 2017 at Intercontinental Hotel, Addis Ababa, Ethiopia by the IGAD Climate Prediction and Applications Centre (ICPAC) and partners. The bulletin is relevant for the GHA region comprising of Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, Uganda as well as Burundi, Rwanda and Tanzania. The forum was supported by the World Bank (WB), United States Agency for International Development (USAID), United Nations International Strategy for Disaster Reduction (UNISDR), United Nations Development Programme (UNDP), and UK-Met Office.

GHACOF45 reviewed the state of the global and regional climate systems, including their implications on the March to May seasonal rainfall, over the region. Principal factors taken into account were the observed and predicted ocean conditions in the Indian and Atlantic Oceans, interaction of global and circulation regional systems. Special reference was made to the current Indian Ocean Dipole (IOD) in neutral phase, continued La Niña conditions in December 2016 with negative sea surface temperature (SST) anomalies manifesting across the central and eastern equatorial Pacific with models predicting ENSO-neutral continuing through the first half of 2017. Neutral conditions refer to the state when neither El Niño nor La Niña is occurring and the SSTs in the equatorial Pacific area are close to average.

The user community that participated in the forum was drawn from agriculture and food security, livestock, water resources, disaster risk management, communications among many others. They analysed the potential implications of the consensus climate outlook and developed mitigation measures for their respective countries and sectors.

1. PERFORMANCE OF OCTOBER – DECEMBER (OND) SEASON 2016

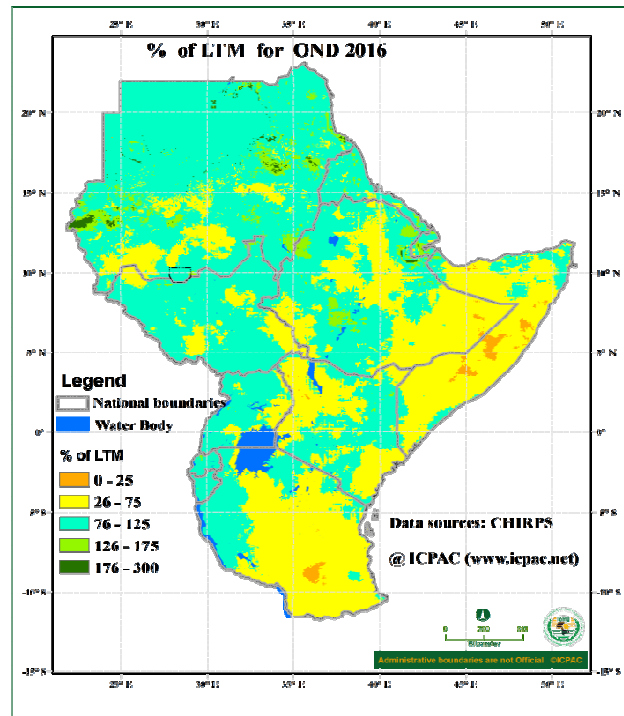


Figure 1: October to December (OND) 2016 rainfall expressed as % of long term mean(1981-2010)

The October – December (OND) season is the second rainfall season for the equatorial areas of the GHA region with normal cessation around mid-December. The OND 2016 seasonal rainfall characterized by late onset (concentrated in the month of November), early withdrawal coupled with poor spatial distribution of rainfall generally performed poorly across the region. Analysis to compare the performance of OND 2016 season with the long term mean was conducted and the result (e.g. figure 1) showed that many areas received below rainfall compared to their long term mean.

In particular, north-western and central Somalia; northern, north-western and coastal areas of Kenya; south-eastern Ethiopia, Central and south eastern Tanzania among others experienced highly depressed rainfall (below 75% of long term average, Fig 1). Small pockets in Central Somalia, Turkana area of Kenya and southern Tanzania received less than 25% of the long term seasonal rainfall amounts.

In the Agriculture and food security sector, the failure of the OND 2016 rainfall season resulted into widespread crop failures of between 70% and 100% across most of cropping areas of Somalia, coastal and north eastern Kenya as well as eastern, central and south-western parts of Uganda. This has led to significant deterioration of food security within the affected areas of Somalia, parts of Kenya, Uganda and Southern Ethiopia.

In the livestock sector, the poor performance of the OND 2016 season it led to significant deterioration of pasture, depletion of water points which led to early migration of pastoralists, loss of livestock, and increased tension in pastoral areas over most parts of the region.

With the exception of Rwanda, Sudan and South Sudan the rest of the region had low reservoir level leading to lower than average hydropower production and water shortage facing both the pastoralist and municipal population.

Despite the poor rainfall performance in most parts of the equatorial sector, a few places like western Uganda, and central highlands and South Rift regions of Kenya received near normal rainfall amount which was beneficial for crop and livestock production.

1. THE MARCH – MAY 2017 CONSENSUS CLIMATE OUTLOOK

3.1 Rainfall outlook for March – May 2017 season

The regional consensus climate outlook for the March to May 2017 season indicates an increased likelihood of below normal to near normal rainfall over northern and eastern Tanzania; north, eastern and coastal Kenya; southern and north-western Somalia; north and western Djibouti; western and south-eastern Eritrea; north-eastern, eastern and southern Ethiopia; southern parts of South Sudan; north-eastern Uganda and southern parts of Sudan (yellow zones in figure 2).

The Central and western Tanzania, much of Burundi and Rwanda, western Uganda and south-western parts of South Sudan have increased probability for above to near normal rainfall (The green zone in figure 2).

Increased probabilities of near to above normal rainfall are indicated over southern Tanzania, western, parts of South Rift and central Kenya; much of central Uganda, northern parts of South Sudan, extreme southern parts of Sudan, western Ethiopia, much of Eritrea and parts of central and north-eastern Somalia (the blue zones in figure 2)

The major processes considered as key drivers of the regional climate during March-May 2017 season included the predicted neutral phase of Indian Ocean Dipole and neutral El-Niño / Southern Oscillation (ENSO) conditions in the Pacific Ocean together with local circulation features.

The average onset of rains over the equatorial sector is predicted for the second week of March and April 2017 (Figure 3a) while the southern sector is already in its seasonal rains. Several dry spells will be experienced in the season (Figure 3b). The mean cessation dates will be in the third and fourth week of May 2017 (Figure 3c). These could however change if tropical cyclones develop along the western Indian Ocean.

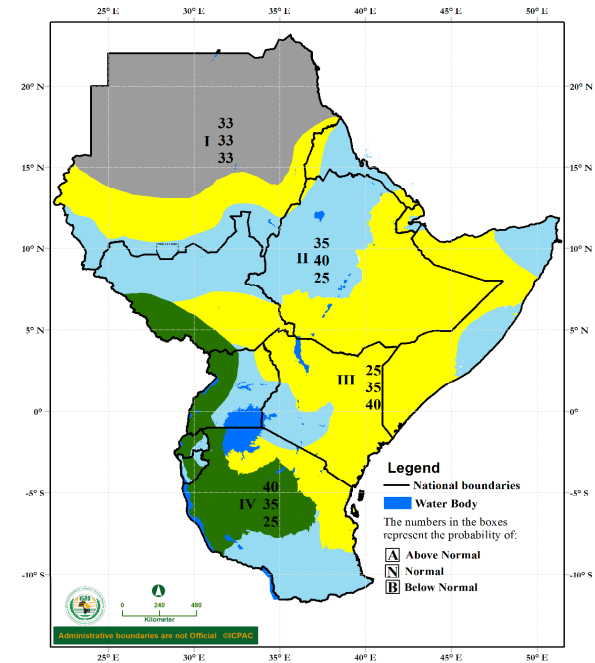


Figure 2: The GHA region rainfall outlook for March – May 2017 season

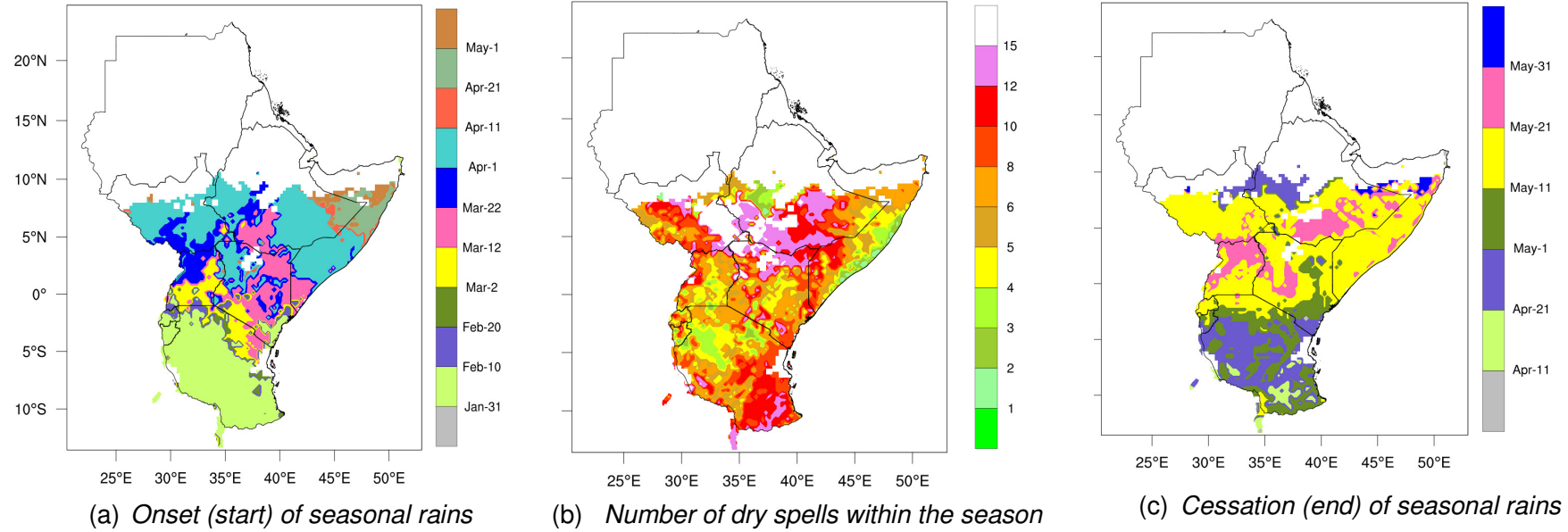


Figure 3: Forecasted (a) Onset (b) Dry Spells and (c) Cessation of MAM 2017 seasonal rainfall

3.2 Mean Surface Temperature Outlook for March – May 2017 season

The mean surface temperature outlook for March – May 2017 season is shown in figure 4 and explained as below.

There is an increased likelihood of warmer than averages mean surface temperatures over several parts of the GHA as shown in figure 4.

Unlike rainfall, the mean surface temperature of the region is generally known to be homogeneous. The consensus mean surface temperature outlook for the GHA region was given in two categories of near average to warmer than average (Figure 4). Most of the western half and north-eastern horn of the region is forecasted to be warmer than average while central Kenya, central Ethiopia, northern Somalia, central Eritrea, much of Rwanda, western Burundi and north-eastern Sudan will be under normal to above normal category.

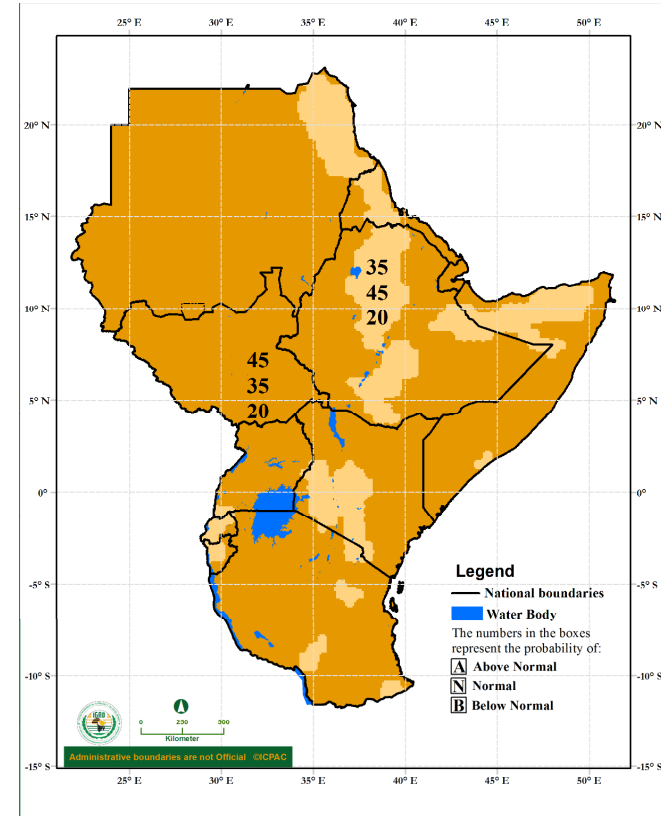


Figure 4: GHA Region mean surface temperature outlook for March – May 2016 season

NB: The numbers for each zone in Figures 1 and 3 indicate the probabilities of climate parameters occurring in each of the three categories, above-, near-, and below-normal.

2. HAZARD, RISK AND VULNERABILITY ANALYSIS

The MAM 2017 rainfall forecast has implication for droughts, floods and other associated hazard such as natural resource based conflicts, disease outbreak for both human and livestock population over the Greater Horn of Africa as explained below:

4.1 Drought Risk and Vulnerability Analysis

The implication of the MAM 2017 season on drought is obtained by overlaying the seasonal forecast with drought prone areas and the result is shown in figure 5. With the exception of Sudan and Rwanda, the October - December 2016 rains failed in most countries in the Greater Horn of Africa region. Although the MAM usually constitutes the long rain and cropping season for most countries in the GHA, the seasonal forecast indicates that most countries in the regions will receive depressed rainfall during the MAM 2017 rainfall season (Figure 3). The below average MAM rains will likely have a negative impact on food security and water availability in the region especially as the below normal rainfall is predicted to occur in already known drought-prone areas. The situation will be worse in countries already experiencing drought that include Somalia, Kenya, Ethiopia, parts of Uganda, South Sudan and parts of Tanzania. Many parts of the region will experience serious water stress Enhanced capacity for water harvesting is recommended.

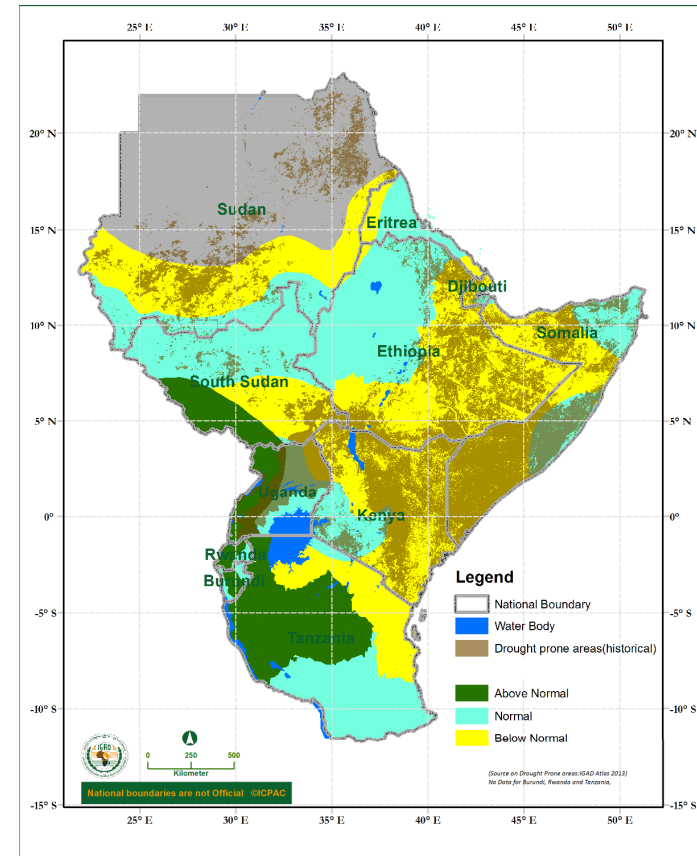


Figure 5: Effects of the March - May 2017 climate outlook on Drought Prone areas of the region

4.2. Flood risks and vulnerability Analysis

The implication of the MAM 2017 season on flooding is obtained by overlaying the seasonal forecast with flood prone areas and the result is shown in figure 6.

The MAM 2017 rainfall forecast indicate that some areas in the region specifically Western parts of South Sudan, Uganda, Burundi, Rwanda and parts of Tanzania are likely to receive enhanced rains during the same period. These may result in flooding and landslides especially in already identified flood and landslide prone areas.

4.3 Natural Resources based Conflict

Conflict being experienced in some countries in the region such as South Sudan and Somalia is likely to be exacerbated by the extreme climatic conditions. In the most likely scenario, failure of the MAM 2017 rainfall season is like to lead to a serious humanitarian crisis in the region.

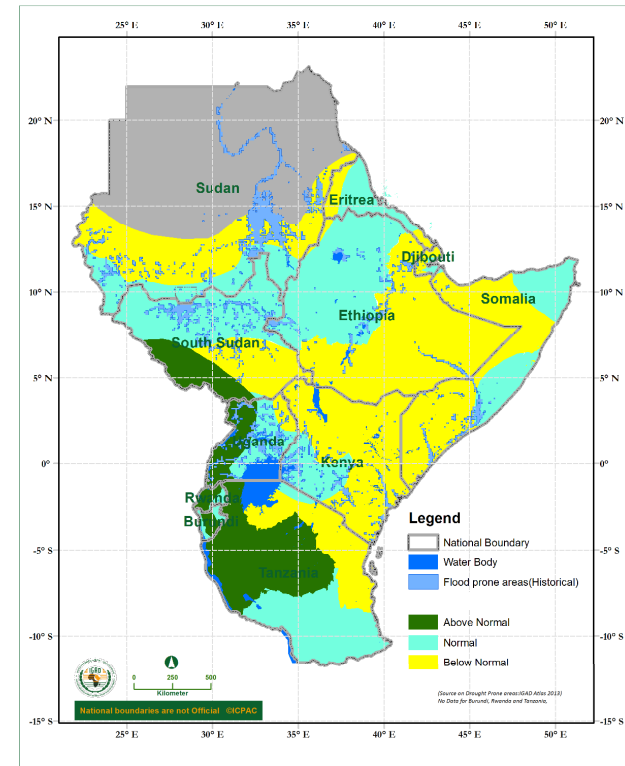


Figure 6: Effects of the October - December 2016 climate outlook on Flood Prone areas of the region

4.4 Mitigation measures for Disaster Risk Management

The MAM 2017 seasonal forecast reinforces the existing risk and vulnerability that may lead to serious negative impacts if not attended to. The following mitigation measures are therefore recommended.

Strengthen regional and national coordination mechanisms for mitigation and response: It is recommended that regional coordination led by IGAD be strengthened to enhance coordination of mitigation, response, recovery and resource mobilization for the current emergency.

Mitigation and response interventions: IGAD Member States, Development Partners together with the DRR and humanitarian communities are called upon to step up mitigation measures and humanitarian capacities to ensure effective response in the areas of food assistance, provision of water and sanitation, human and livestock health associated with drought and floods. Working through the regional and national coordination mechanisms, there is need to conduct rapid humanitarian needs assessment to ascertain the number of people in need of urgent humanitarian assistance, the current interventions and the gaps for intervention in critical sectors.

In the flood prone areas, there is need to strengthen structural and non-structural mitigation measures such as opening up of water ways and dykes, rehabilitation of irrigation canals to accommodate increased water flow, and awareness creation

Strengthen communication and Advocacy campaign: A robust communication strategy should be put in place to facilitate effective mitigation and response at regional, national and local level. Additionally, there is need to strengthen public awareness and advocacy at the community level by state and non-state actors.

5.0 SECTOR IMPLICATIONS AND MITIGATION STRATEGIES

The hazard, risk and vulnerabilities emanating from the MAM 2017 seasonal climate outlook has serious implication for major socio-economic sectors in the Greater Horn of Africa. Such implications and their mitigation strategies are discussed for key sectors such as Agriculture and Food Security, Water and Livestock. These are discussed in the following sections below:

5.1 Agriculture and Food Security Sector

5.1.1 Implication of MAM seasonal rainfall forecast for Agriculture and Food Security Sector:

The implication of the MAM 2017 season for agriculture and food security sector is obtained by overlaying the seasonal forecast (expected rainfall amounts) with crop suitability map and the result is shown in figure 7 below.

In consideration of the MAM 2017 seasonal forecast, the agricultural areas expected to receive below 200mm of rainfall will not be suitable for production of most food security crops, especially long-maturing crops and those with high seasonal water requirements, except for those areas where rains will just be starting. Areas in this category include parts of eastern Somalia, central Tanzania, and localized areas of Eastern province of Kenya. These areas are shaded Yellow on the map.

Areas expected to receive between 200 and 300mm will be suitable for certain short maturing, drought tolerant crop varieties and others with minimal seasonal water requirements. This includes the following areas: southern Somalia, localized areas in Kenya (Coastal, Central and Western provinces), central and northern Tanzania, Karamoja area in Uganda, and parts of South Sudan and localized areas of central Ethiopia. On the other hand, areas expected to receive 300mm and above have increased potential for optimal crop performance. These

include much of Uganda, Rwanda, western, southern and coastal Tanzania, much of Burundi, Green Belt of South Sudan, central Ethiopia, and much of western and central Kenya.

Finally, communities expected to receive above 500mm of rainfall have got highest opportunities for production of crops with high water requirements and high yield potential such as maize, plantation crops (i.e. sugarcane, tea, coffee, bananas, agro-forestry trees, etc.). In these areas, however, there are high risks of flooding, landslides and outbreaks of insect pests, weeds and crop diseases (especially fungal and bacteria) due to high potential for extended humid periods and prolonged wetness. These areas include lake region of Kenya, south-western Ethiopia and south-eastern Tanzania.

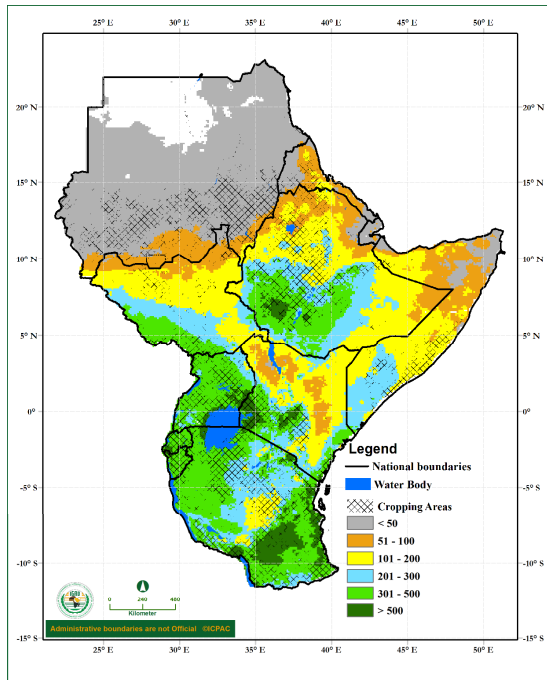


Figure 7: Implication of MAM 2017 Seasonal forecast for Agriculture and food security sector

5.1.2 Mitigation measures for Agriculture and Food Security Sector:

In light of the above implications, the followings are the proposed measures to be implemented in order to mitigate the impact of MAM 2017 seasonal forecast on agriculture and food security sector:

Diversification of livelihoods: Farmers in parts of eastern Somalia, central Tanzania, northern parts of South Sudan and localized areas of Eastern Province of Kenya that are expected to receive below 200mm of rainfall are encouraged to diversify their livelihoods by engaging in alternative income generating activities, such as livestock rearing, greenhouse farming and production of vegetables supplemented with irrigation. Food and nutrition conditions in these areas need to be closely monitored.

Plant early maturing and drought tolerant crops: The population in the areas of southern Somalia, localized areas in Kenya (Coastal, Central and Western provinces), central and northern Tanzania, Karamoja area of Uganda, parts of South Sudan and localized areas of central Ethiopia which expected to receive between 200 and 300mm are encouraged to plant short maturing, drought tolerant crop varieties. Supplemental irrigation would certainly be beneficial. Water harvesting and storage for future use is highly encouraged timely pest and disease control is also encouraged.

Maximize the good rains to boost production volumes: Due to good expected rainfall, much of Uganda, Rwanda, western, southern and Coastal Tanzania, much of Burundi, South Sudan Green Belt, central Ethiopia, and much of Western and Central Kenya have increased

potential for optimal crop performance. Farmers in these areas are encouraged to maximize the expected good season by perfecting the following agronomic practices in order to boost food production volumes: early land preparation and planting, proper seed selection, planting varieties with high yielding potential such as hybrids, soil fertility management such as use of manure and fertilizers, timely pest, weed and disease control, etc.

Increased agronomy and establish plantation farms: Communities expected to receive above 500mm of rainfall have got highest opportunities for increased performance of crops with high water requirements such as maize, plantation crops (i.e. sugarcane, tea, coffee, bananas, agro-forestry trees), etc. Farmers in these areas should be motivated to maximize the available moisture by planting the right crops and practicing best agronomy and perfecting agronomic practices.

Avoid planting crops in flood and landslide prone zones: cases of flooding and landslides may be experienced in areas such as Green Belt of South Sudan, eastern and western highlands of Uganda, Western Kenya, Rwanda, Burundi, lake region of Uganda, Kenya and Tanzania and southern Tanzania, which are expected to receive 300mm of rainfall and above. There are also high risks of outbreaks of insect pests, weeds and crop diseases (especially fungal and bacteria) due to high potential for extended periods of high relative humidity and leaf wetness. Pest and disease control, soil erosion control and proper agronomy are therefore equally encouraged.

5.2 Water Sector

5.2.1 Implication of MAM seasonal rainfall forecast for Water Sector:

The implication of the MAM 2017 season for the water sector is obtained by overlaying the seasonal forecast with the water basins in the Greater Horn of Africa and the result is shown in figure 8 below.

Upstream catchments of Awash, Tana, Athi, Lake Victoria Basins and downstream of White Nile and Dharor and Nugal basins are forecasted to have normal to above normal precipitation leading to enhanced water resources availability for both human and animals with potential for flooding.

Basins/catchments in North and East Kenya, Juba-Shabele and Pangani are forecasted to have below normal to normal precipitation leading to depressed water availability. This may lead to acute water shortage with potential for conflicts and loss of lives.

Catchments of Lake Albert & Lake George, Lake Tanganyika, Rufiji and Kagera are forecasted to have above normal to normal precipitation and may lead to flooding and landslides while providing the opportunity for abundant water for storage and hydropower production.

5.2.2 Mitigation measures for Water Sector

In light of the above implications, the followings are the proposed measures to be implemented to in order to mitigate the impact of MAM 2017 seasonal forecast on water sector:

For zones that will receive near normal to above normal rainfall (zones shaded blue and yellow in figure...) it is advisable that:

- DRM institutions create awareness on risks to the vulnerable population
- Ministries of Water or water agencies to carry out work related to closing open river banks/dykes and strengthening weak ones.
- Reservoir Management authorities are encouraged to carry out effective reservoir management suitable for above normal inflows
- Ministries of Water or water agencies intensify rainwater harvesting.

For zone that is forecasted to receive near normal to below normal rainfall

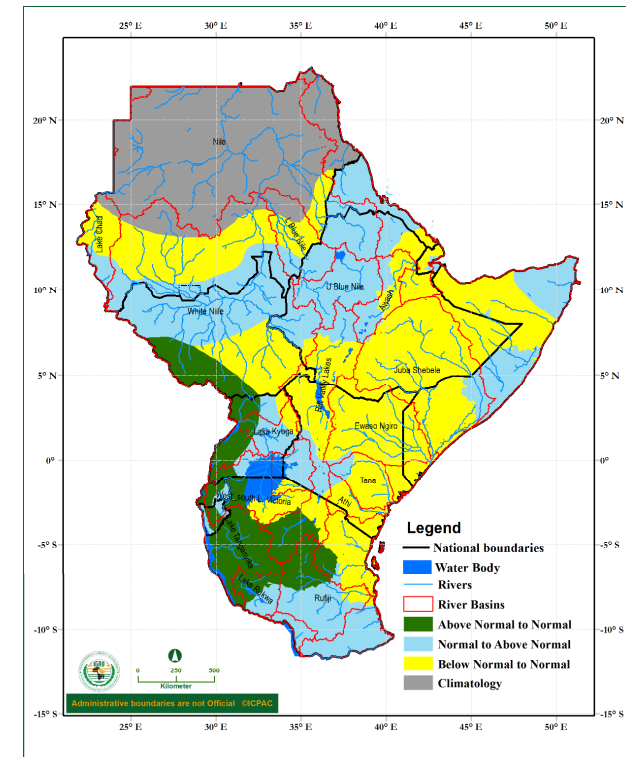


Figure 8: The implication of MAM 2017 seasonal forecast for the water sector

(zone shaded yellow in figure...) it is advisable that:

- Ministries of Water or water agencies intensify rainwater harvesting and identify and maintaining strategic borehole for pastoralists
 - Reservoir Management authorities are encouraged to carry out effective reservoir management suitable for below normal inflows
 - Municipal Water Management Authorities need to take water conservation and demand management actions.
-
- DRM institutions and NGO's to carry out conflict management in known hotspots in this zone

5.3 Livestock Sector

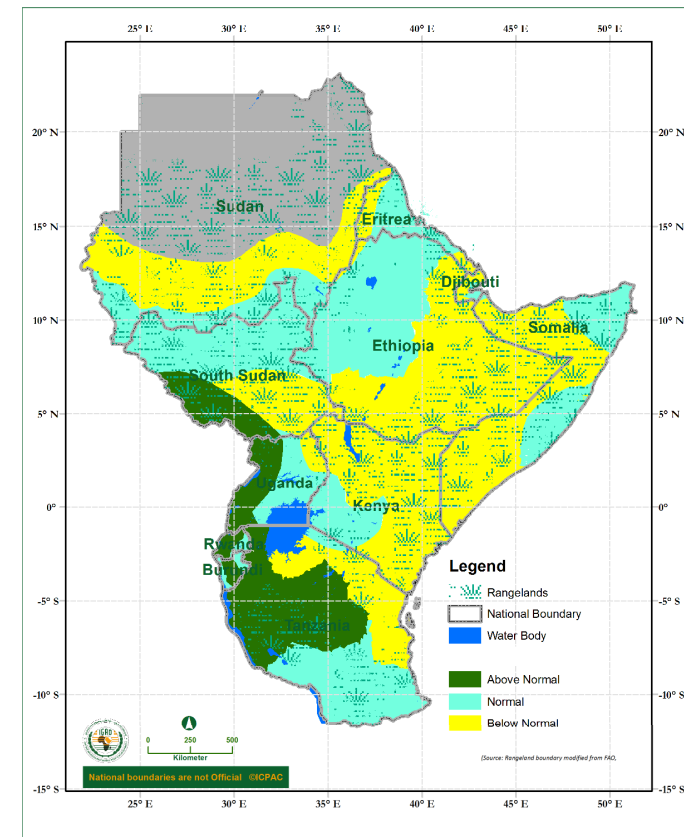
5.3.1 Implication of MAM seasonal rainfall forecast for Livestock Sector

The implication of the MAM 2017 season for the livestock sector is obtained by overlaying the seasonal forecast with the rangeland map in the Greater Horn of Africa and the result is shown in figure 9 below.

The normal to enhanced rainfall in western Kenya, the central and Northern parts of Uganda, western Ethiopia, north of South Sudan, and south east of Tanzania; and Puntland in Somalia will lead to good pasture regeneration in these areas and recharging of water pans and valley tanks. The availability of pasture and water is expected to support livestock production and productivity. However, there is a likelihood of an upsurge of diseases such as trypanosomiasis, blackquarter CBPP, PPR and FMD in these areas which may compromise livestock production and productivity.

Both the coastal strip of Kenya and the Karamoja strip in Uganda are expected to receive sufficient rainfall to support pasture regeneration (200-500mm and 200-300mm of rainfall for coastal and Karamoja strips respectively) during MAM rainfall season. This will boost livestock production due to availability of water and pasture for grazing.

In the north western Uganda and western equatorial region of Southern Sudan, the above normal to normal rainfall is expected to lead to regeneration of pastures



and recharges of private valley tanks and pans. However, low lying areas are likely to experience scorching of pastures due to water logging leading to possibility of infections like anthrax, blackquarter, RVF.

Figure 9: Implication of MAM 2017 seasonal forecast for the livestock sector in IGAD region

However, the Somali region of Ethiopia is expected to receive less than 200mm of rainfall. The Short duration characterized by late onset and early cessation will compromise the ability of pasture regeneration in this region. This is likely to adversely affect livestock production and productivity.

5.3.2 Mitigation measures for Livestock Sector

In light of the above implications, the followings are the proposed measures to be implemented in order to mitigate the impact of MAM 2017 seasonal forecast on the livestock sector:

Desilting of water pans: The stakeholders should take advantage of the current dry season to carry out de-silting of water pans and carry out construction of new ones.

Production and storage of fodder: The government and communities in zones II and III should take advantage of the normal to above normal rainfall to produce and store fodder for use by self or for sale to pastoralists in the rain depressed areas. Cut and carry opportunity for production, preservation or distribution of fodder to dry areas. This will also lead to self-limitation of certain viral infections e.g. the current avian influenza.

Livestock vaccination: For the areas that are likely to have outbreak of diseases, coordination of actors for vector surveillance and vaccination of animals is key to avoid an upsurge of diseases such as trypanosomiasis, blackquarter CBPP, PPR and FMD

Restoration and reseeded of degraded lands: The Karamoja strip in Uganda is currently under a lot of grazing pressure from neighboring countries. Therefore, with the good rains it is important that any of the degraded lands are restored and reseeded done to ensure enough pastures in seasons to follow.

Awareness campaign: Awareness to be given to pastoralists not to move unnecessarily to avoid conflict with neighbouring countries over pasture and water for livestock.

Livestock insurance: Member States and the pastoral communities are encouraged to promote and scale-up livestock insurance schemes as a risk transfer mechanism.

6.0 CONCLUSIONS RECOMMENDATIONS

This outlook is relevant for the March-May 2017 season as a whole and for relatively large areas. Local and month-to-month variations might occur as the season progresses. It is likely that episodic heavy rainfall events leading to flash floods might occur even in areas with an increased likelihood of below normal to near normal rainfall. ICPAC will provide regional updates on regular basis while the National Meteorological and Hydrological Services (NMHSs) will further downscale and provide detailed national and sub national updates.