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REVIEW OF RAINFALL DURING THE 2017 "LONG RAINS" (MARCH TO MAY SEASON) AND THE OUTLOOK FOR THE JUNE-JULY-AUGUST (JJA) 2017

1. HIGHLIGHTS

1.1 PERFORMANCE OF THE MARCH-APRIL-MAY 2017 RAINFALL SEASON

- *The March to May 2017 seasonal rainfall has ceased over most parts of the country except the western, the Coastal strip and some parts of central highlands including Nairobi,*
- *Most parts of the country experienced below-normal rainfall that was mainly recorded in April and May 2017. A few stations in southeastern Kenya, and the Coastal strip recorded above-normal (enhanced) rainfall (more than 125 percent of their seasonal Long-Term Means (LTMs) for March-April-May (MAM).*
- *The distribution, both in time and space, was generally poor over most parts of the country including the western and central regions. The seasonal rainfall onset was very late over the entire country with most areas remaining sunny and dry throughout the month of March 2017.*

1.2 OUTLOOK FOR JUNE-JULY-AUGUST 2017 PERIOD

The outlook for June-July-August (JJA) 2017 season indicates that:

- *The Western highlands, the Lake Victoria Basin, and parts of central Rift Valley (Nakuru, Nyahururu) are likely to receive near-normal rainfall with a tendency towards above normal (enhanced rainfall). The Coastal strip is also likely to receive near normal rainfall with a tendency to above normal.*
- *The rest of the country is expected to remain generally dry.*
- *Most areas in the Central Highlands and Nairobi area are expected to experience cool/cold and cloudy conditions with occasional light rains/drizzles. The day-time temperatures are however likely to be slightly warmer than average.*

2. REVIEW OF MARCH-MAY (LONG-RAINS) 2017 SEASONAL RAINFALL

The March-April-May (MAM) 2017 seasonal rainfall has ceased over most parts of the country. An assessment of the rainfall recorded from 1st March 2017 up to date indicates that the rainfall performance was generally poor over most parts of the country. The seasonal rainfall was also characterized by late onset as well as poor distribution, both in time and space. Generally sunny and dry weather conditions were dominant over the much of the country during the month of March 2017. Much of the rainfall was recorded during the second half of April and in May 2017.

Most meteorological stations in the country recorded below 75 percent of their seasonal Long-Term Means (LTMs) for March to May. However, Machakos station in Southeastern Kenya and Mtwapa and Mombasa along the Coastal strip recorded above-normal (enhanced) rainfall of more than 125 percent of their seasonal LTMs. Short-lived heavy rainfall events at these stations significantly contributed to the seasonal rainfall totals. Machakos was pounded by 61.7mm, 47.5mm and 53.3mm on 6th April, 18th April and 4th May 2017 respectively while Mtwapa experienced 63.1mm, 49.6mm, 75.2mm and 192.5mm respectively on 17th March, 17th April, 4th May and 8th May 2017. Stations that recorded near-normal rainfall (between 75 and 125 percent of their seasonal LTMs) include Kisumu, Kakamega, Kericho, Eldoret and Kisii in western Kenya, Nyeri and Meru in central Kenya, Msabaha, Lamu and Malindi in the Coastal strip and Makindu in Southeastern Kenya. The most depressed rainfall of less

than 40 percent of the seasonal LTM was recorded at Nyahururu, Mandera, Moi Airbase, Wilson Airport, Marsabit and Lodwar.

Several rainfall storms (intense rainfall within short time intervals) were recorded during the season. Mombasa, for example, recorded 235.1 mm on 8th May.

Up to 28th May, Mtwapa Meteorological station recorded the highest rainfall amount of 848.7mm, which was 140% of its seasonal LTM. Other stations that recorded MAM seasonal rainfall totals exceeding 500mm include; Kakamega 623.7mm (92%), Mombasa 620.9mm (129%), Kericho 581.4mm (86%), Kisii 560.3mm (82%) and Kisumu 536.4mm (99%). Msabaha, Nyeri, Malindi, Lamu, Embu, Meru, Machakos, Eldoret Airport and Kitale stations recorded between 300 and 500mm while the rest of the stations recorded less than 300mm as seen in **figure 1**. The lowest amount of 22.2mm (23%) was recorded at Lodwar station in Northwestern Kenya.

3. EXPERIENCED IMPACTS

The poor rainfall performance and delayed onset over much of the country was associated with, among others:

- Late planting of crops in the agricultural areas especially in the central and western highlands including the maize-basket areas of Trans Nzoia and Uasin Gishu;
- Poor pasture regenaration for livestock in the pastoral areas of Narok, Kajiado and other areas within Rift Valley as well as the northern parts of the country;
- Slight improvements in the water levels in the Seven-Forks as well as Turkwel and Sondu Miriu hydroelectric power generation dams;

The heavy rainfall recorded in the Coastal areas including Kwale, however, resulted into floods and displacement of more than 1500 local residents. In Mombasa County, 15 people lost their lives six of whom died due to a collapse of wall in Kizingo following the heavy and continuous rainfall in the region. The situation was worsened by poor urban drainage leading to surface runoff of huge volumes of water that destroyed infrastructure and property.

4. FORECAST FOR JUNE-JULY-AUGUST 2017

Rainfall is normally concentrated over the western and the coastal regions during the June-July-August (JJA) season. The rest of the country remains generally dry (**F*igure 2*).**

The climate outlook for June to August 2017 is based on the expected evolution of global Sea Surface Temperature (SST) patterns as well as upper air circulations patterns. The process involves regression of sea surface temperature anomalies (SSTAs), SST gradients, Wind patterns in the upper levels (Quasi-Biennial Oscillations (QBO), Southern Oscillation Index (SOI) and Indian Ocean Dipole (IOD) on the Kenyan rainfall. The expected distribution is derived from statistical analysis of past years, whose characteristics were found to exhibit similarities to the current year.

The forecast indicates that the Western highlands, the Lake Victoria Basin, parts of central Rift Valley (Nakuru, Nyahururu) and the Coastal strip are likely to receive near-normal rainfall with a tendency to above normal (enhanced rainfall).

The rest of the country is expected to remain generally dry (***Figure 3***). However; most areas in the Central Highlands and Nairobi area are expected to experience cool and cloudy conditions with occasional drizzles or light rains. The specific outlooks for individual areas are as follows:

The Western Highlands (***Kitale, Kericho, Nandi, Eldoret, Kakamega, Bungoma, Butere/Mumias, Vihiga etc***)**, Lake Victoria Basin** (***Kisumu, Nyando, Kisii, Busia***)**, parts Central Rift Valley (Nakuru,**

***Ol Kalao, Nyahururu*)** are likely to receive near-normal rainfall with a tendency to above-normal (enhanced) rainfall;

The entire Coastal strip (Lamu, Malindi, Msabaha, *Mombasa, Kilifi, and Mtwapa)* is also likely to receive near-normal rainfall tending to above-normal (enhanced) rainfall;

The southern parts of Central Rift Valley (*Narok, Kajiado*) and northwestern regions especially those bordering Uganda/Sudan (*Lokichoggio, Lokitaung etc*) are likely to receive occasional rainfall (showers and thunderstorms). Long dry spells are, however, likely to dominate.

The Central Highlands *(Kiambu, Nyeri, Embu, Meru, Murang'a*); Nairobi Area (*Dagoretti, Kabete, Wilson, Jomo Kenyatta International Airport, Eastleigh etc*); are likely to experience cool and cloudy conditions with occasional light rains/drizzles. Occasional prolonged hours of overcast skies (cloudy conditions) resulting to cold and chilly conditions are expected. The daytime temperatures are, however, likely to be warmer than average during the period. However, a few days may turn out to be extremely cold with temperatures falling below 18°C in some areas (**Figure 4).**

Most parts of Northeastern Kenya (*Wajir, Mandera, Garissa, Moyale, Marsabit, Isiolo, and Garbatulla*) and Southeastern lowlands (*Machakos, Makindu, Kitui, Mwingi, Kibwezi, Voi, Taveta*) are expected to remain generally sunny and dry throughout the period. The southeastern regions bordering the central districts (Machakos area) are likely to experience occasional cool and cloudy conditions with light rains.

5. POTENTIAL IMPACTS EXPECTED

The following are the expected impacts during the coming season:

5.1 Agriculture and Food Security Sector

The expected enhanced rainfall in western Kenya will lead to improvement in crop performance and subsequent agricultural production. The cloudy and drizzly conditions in central highlands are also favorable for good crop performance.

Poor harvest is likely to characterize most parts of the southeastern lowlands where the MAM rainfall performed poorly and generally dry weather conditions are expected in June-July-August period.

5.2 Disaster Management Sector

In the Arid and Semi-Arid Lands (ASALs), problems related to water scarcity and limited pasture for livestock are likely to start emerging as the pasture and water gradually deteriorate due to the expected sunny and dry conditions in June-July-August. Close monitoring of the evolving conditions is necessary to avert any incidents. Flooding in the western parts of the country may be expected and precautions need to be instituted.

ADVISORY: During chilly days, the public is advised not to light jikos in poorly ventilated houses. Burning charcoal produces Carbon Monoxide gas that is lethal when inhaled.

5.3 Health Sector

In areas such as Nairobi, Central highlands, Central Rift Valley and parts of the highlands west of the Rift Valley, cases of respiratory diseases like asthma, pneumonia and common colds (flu) are expected to be on the increase due to the expected cool/cold conditions. The general public (especially the young and elderly members of society) is advised to adopt warm dress code to avoid contracting such diseases.

In western and Nyanza, cases of Malaria may increase as a result of the forecasted enhanced rainfall coupled with the already very wet conditions in the region. The health authorities should therefore be on the lookout to facilitate supply of drugs necessary to combat these diseases.

5.4 Transport and Public Safety

Wet conditions are expected to continue occurring in Western Kenya and some parts of Central Rift Valley. This may lead to transport problems, especially in areas where the roads become impassable when it rains. Fog formation leading to poor visibility may also pose dangers to motorists and pedestrians along the Nairobi-Naivasha road, especially along the Kikuyu-Kinungi stretch. All should, therefore, take utmost care to minimize accidents that may result from such weather conditions.
Landing at Jomo Kenyatta International Airport (JKIA) may occasionally be made impossible by thick fog and associated very poor visibility leading to diversion of aircrafts to other airports.

5.5 Water Resources Management and the Energy Sectors

The poor performance of the "Long Rains" March-May 2017 led to low water inflows in hydro-electric power generating dams. The levels are likely to decrease further in the Seven-Folks dams in the coming three months as a result of the expected dry weather conditions. The water levels in the western Kenya reservoirs such as Turkwel are, however, likely to gradually increase due to the forecasted enhanced rainfall coupled with the low evaporation rates in the river catchment areas.
The water capacity for domestic use is likely to deteriorate in the coming three months in the ASALs areas due to the expected generally dry weather conditions.

NB: This outlook should be used with 24 hour forecasts and regular updates on 5-day, 7-day and monthly time scales as well as advisories issued by this Department.

MR. PETER AMBENJE
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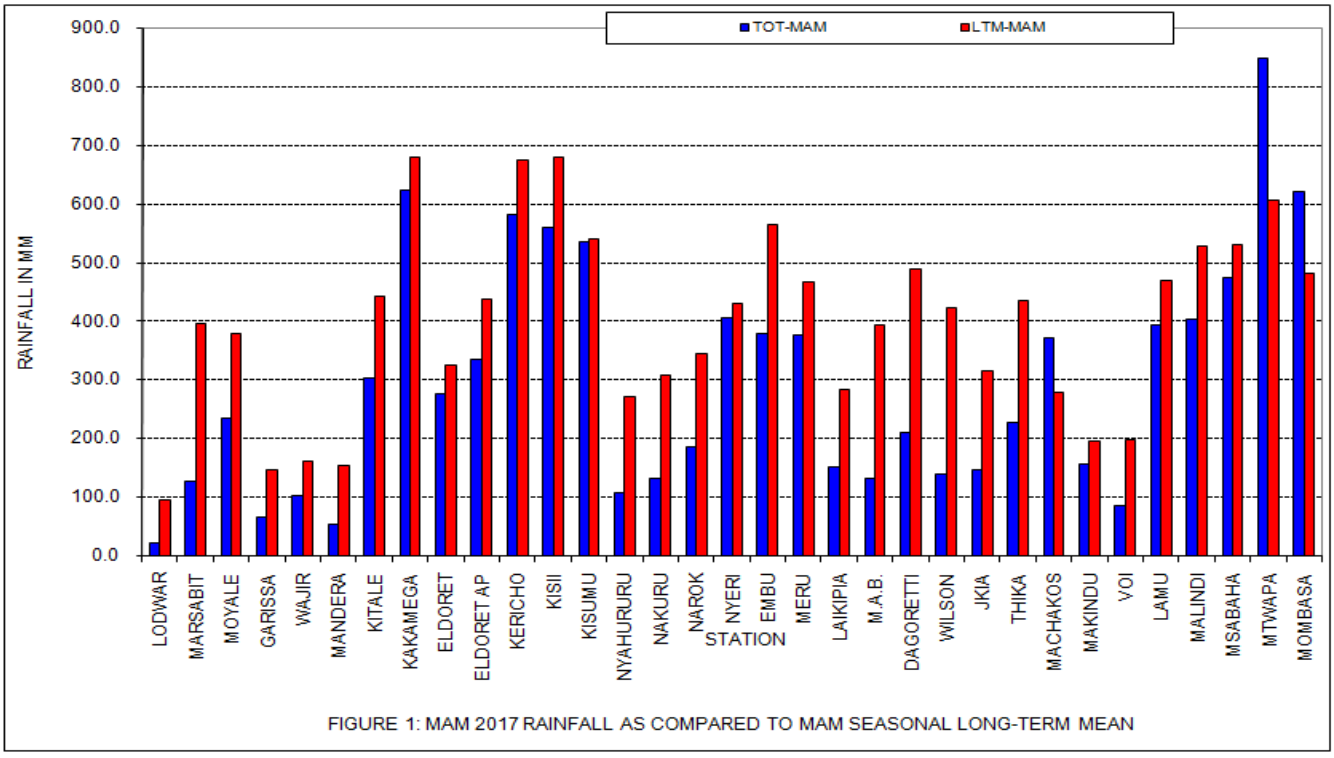

FIGURE 1: MAM 2017 RAINFALL AS COMPARED TO MAM SEASONAL LONG-TERM MEAN

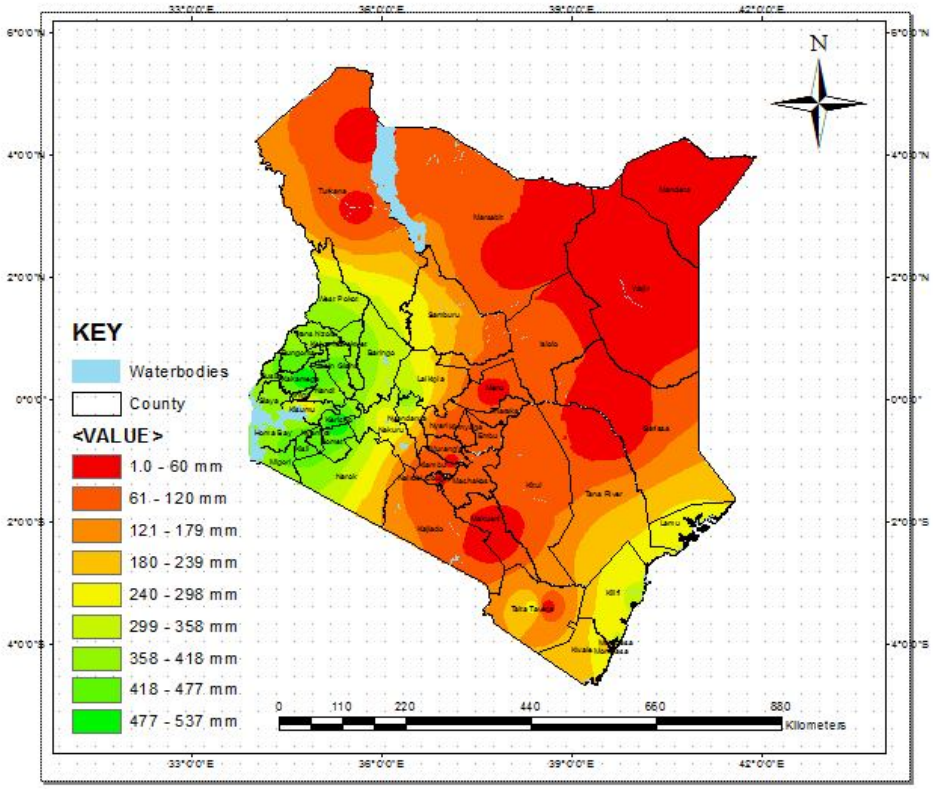

Figure 2: June-July-August (JJA) Rainfall Climatology of Kenya (1981-2010).

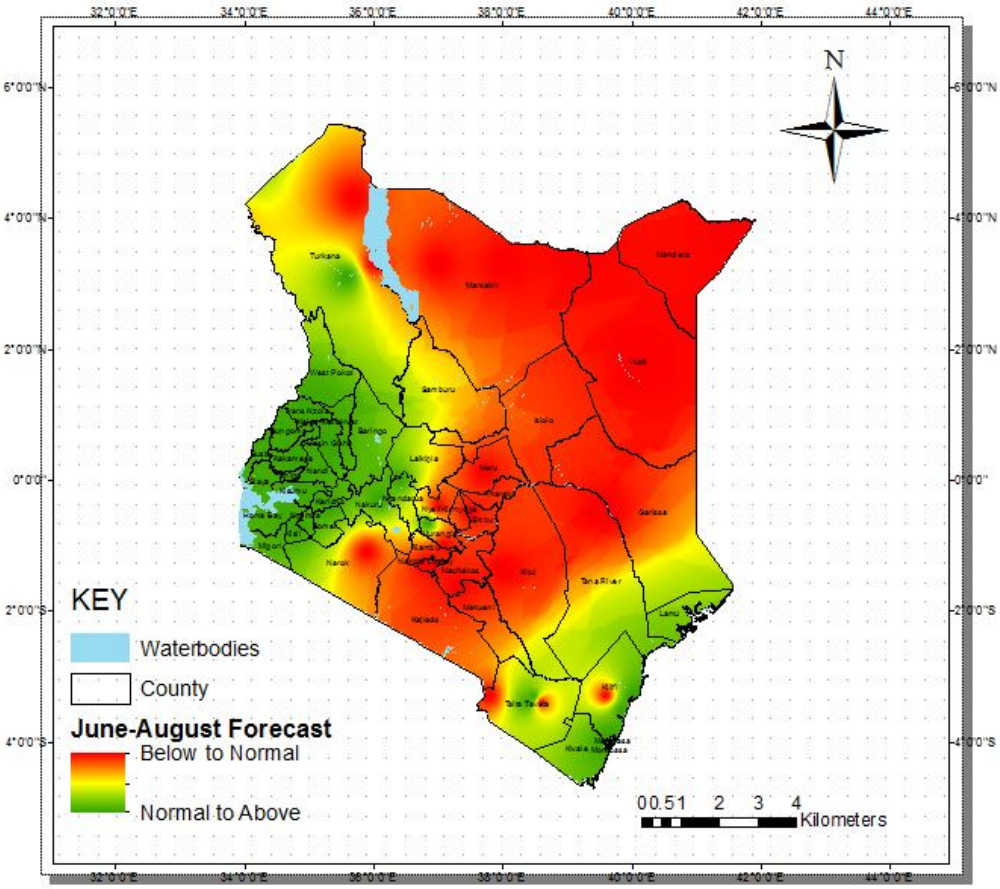

Figure 3: June, July August (JJA) 2017 Rainfall Outlook

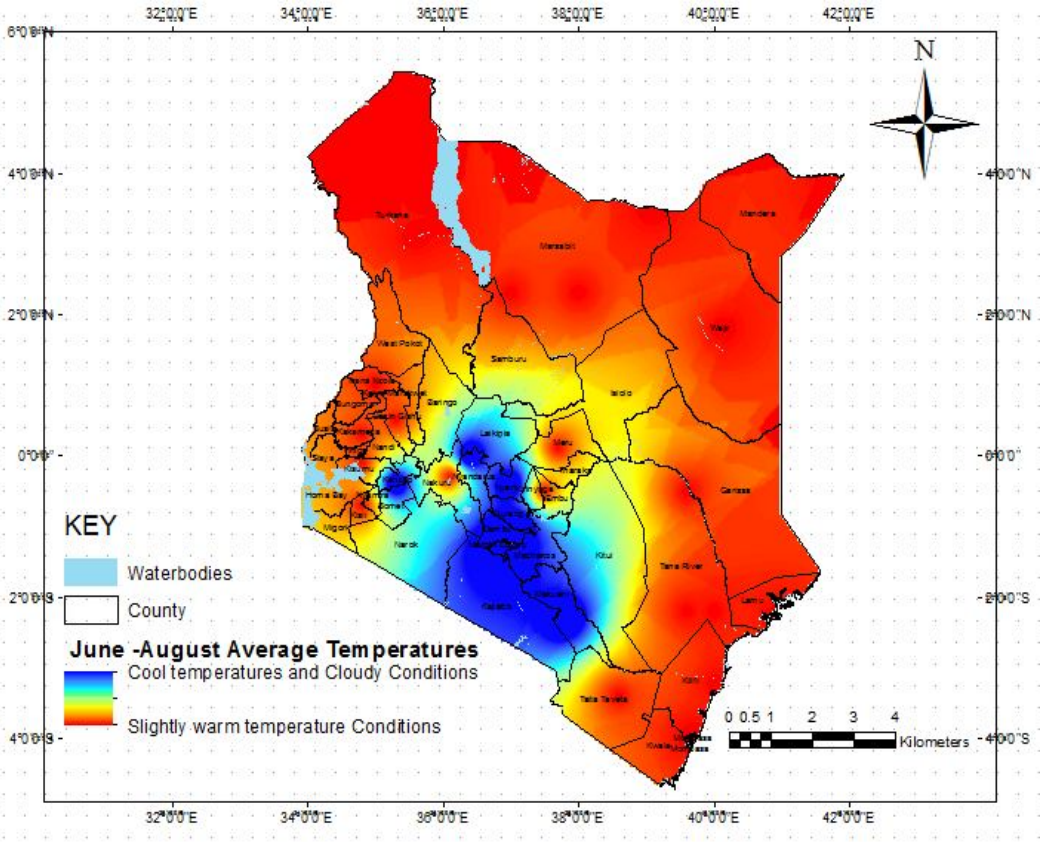

Figure 4: June, July August (JJA) 2017 average Temperature Outlook