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**CLIMATE OUTLOOK FOR THE JUNE-JULY-AUGUST (JJA) 2022 SEASON AND
RAINFALL PERFORMANCE DURING THE MARCH-APRIL-MAY (MAM) 2022
“LONG RAINS” SEASON**

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1. Highlights

1.1. *The Outlook for June-July-August 2022 Rainfall Season*

The outlook for the June-July-August (JJA) 2022 rainfall season indicates that the Highlands West of the Rift Valley, Lake Victoria Basin Region, Central and Southern Rift Valley, and the Northwestern region are likely to receive slightly above-average rainfall. The Coastal strip is likely to receive below-average rainfall. The rest of the country is expected to remain generally dry.

Most Central Highlands and Nairobi areas are expected to experience cold and cloudy conditions with occasional rain or drizzle. The temperatures are likely to be slightly warmer than average for the season.

1.2. *Performance of the March-April-May 2022 Rainfall Season*

The March to May 2022 seasonal rainfall has ceased over several parts of the country except over the Lake Victoria Basin, the Highlands West of the Rift Valley, the Central and South Rift Valley, and the Coastal region where rainfall is expected to continue.

The distribution, both in time and space, has been generally poor over most parts of the country. The month of March recorded depressed rainfall over most parts of the country except Kisumu, Moyale, and Voi which recorded near average rainfall. In April and May 2022, several parts of the country received below-average rainfall except for Eldoret, which recorded above-average rainfall in April. An assessment of the rainfall recorded from 1st March to 26th May 2022 indicates that the rainfall performance was below average over most parts of the country except Eldoret, Kisumu, Moyale, and Narok which recorded near average rainfall. All the other stations recorded rainfall that was below 75% of their MAM LTMs (depressed rainfall). The highest seasonal rainfall total (529mm (74.3%)) was recorded in Kisii Meteorological station while the lowest total (7.5mm (8.7%)) was recorded at Lodwar station.

The onset of the seasonal rainfall was within the predicted period over parts of Southern Rift Valley, Lake Victoria Basin, Highlands East of the Rift Valley, southeastern lowlands, South Coast, and Northeast (Moyale). It was late over the Highlands West of the Rift Valley and most of the Coastal region. The onset was, however, followed by a dry spell during the first half of April. Most places over the Northeast and Northwest and a few areas over Central Rift Valley did not realize their onset.

2. Forecast for June-July-August 2022

2.1. June-July-August Season

Rainfall is normally concentrated over the western region and the coastal strip during the June-July-August (JJA) season, while the rest of the country remains generally dry as seen in **Figure 1a**.

The climate outlook for June to August 2022 is based on the expected evolution of global Sea Surface Temperature (SST) patterns as well as upper air circulation. The forecast process involved regression of Sea Surface Temperature Anomalies (SSTAs), Quasi-Biennial Oscillations (QBO), Pacific Decadal Oscillation, (PDO) Southern Oscillation Index (SOI), and the Indian Ocean Dipole (IOD) on the Kenyan rainfall. The expected distribution is also based on a statistical analysis of past years, whose characteristics were found to exhibit similarities to the current year.

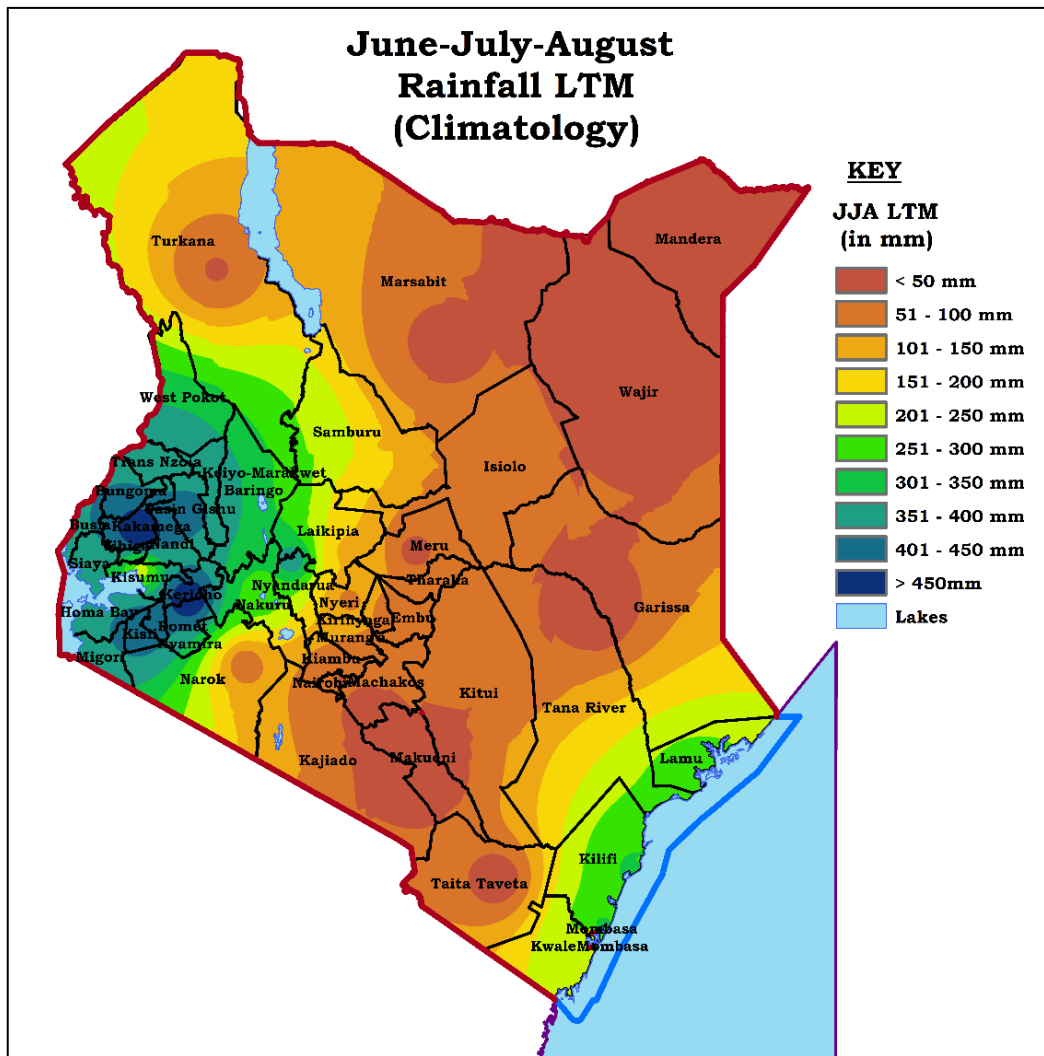


Figure 1a: June-July-August Climatology

2.2. Rainfall Forecast for June-July-August 2022

The forecast for the June-July-August rainfall period indicates that the Highlands West of the Rift Valley, the Lake Victoria Basin, Central Rift Valley, Northwestern region, and parts of Central Kenya are likely to receive slightly above-average rainfall while the Coastal Strip is likely to experience below-average rainfall (depressed rainfall). The rest of the country is expected to be generally dry (see **Figure 1b.**)

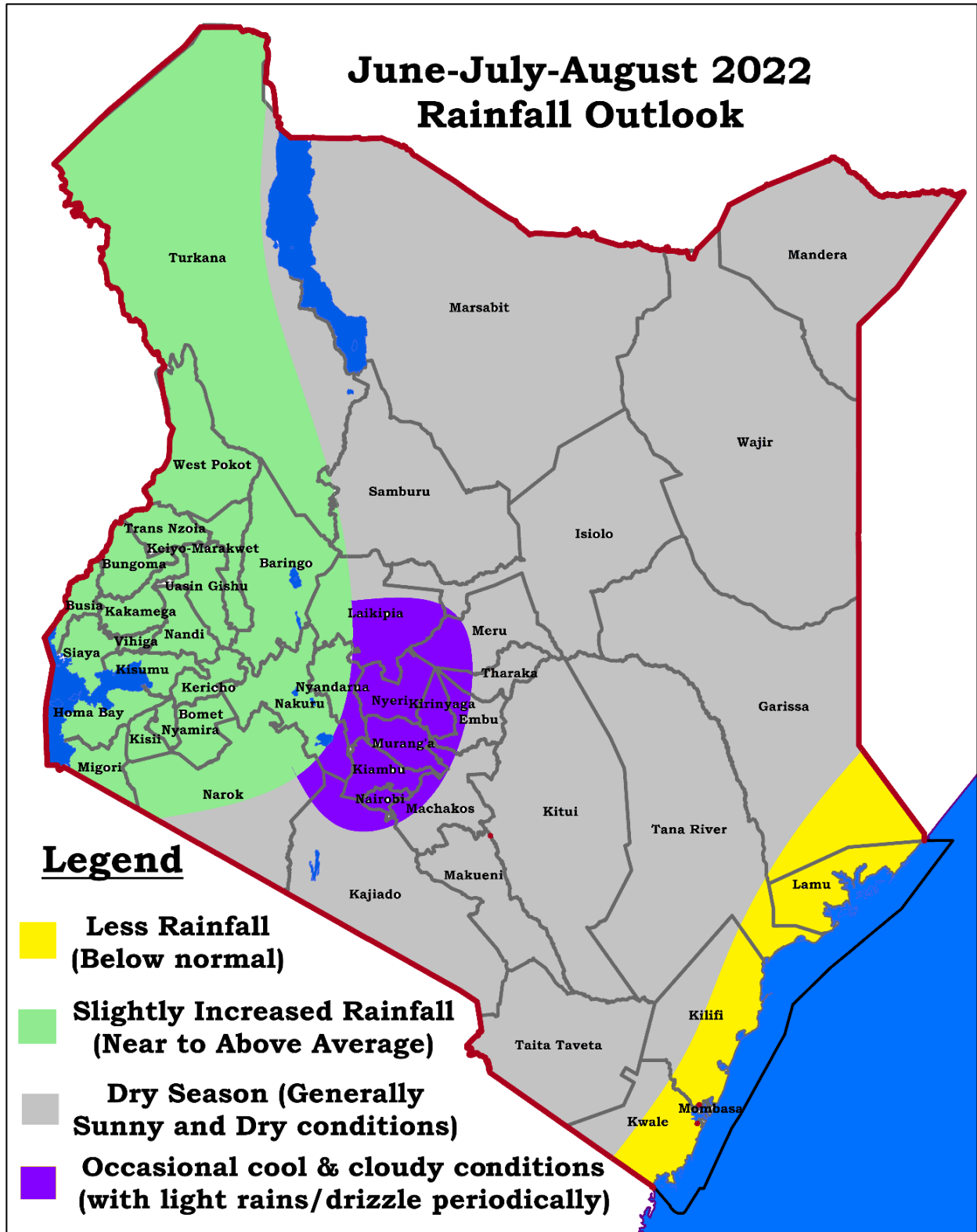


Figure 1b: June-July-August Rainfall Forecast

Most areas in the Highlands East of the Rift Valley (including Nairobi County) are expected to experience cool and cloudy conditions with occasional drizzle or light rains. Occasional afternoon and night showers are also expected.

The outlook for specific areas is as follows:

- 2.2.1. The Lake Victoria Basin, the Highlands West of the Rift Valley, and the Central and South Rift Valley:** (*Siaya, Kisumu, Homa Bay, Migori, Kisii, Nyamira, Trans Nzoia, Baringo, Uasin Gishu, Elgeyo Marakwet, Nandi, Laikipia, Nakuru, parts of Narok, Kericho, Bomet, Kakamega, Vihiga, Bungoma and Busia*): Occasional showers and thunderstorms are expected to continue throughout the season. The expected total rainfall amounts are likely to be slightly higher than the long-term average amounts (slightly wetter than usual) for the season. The distribution both in time and space is expected to be fairly good.
- 2.2.2. Northwestern regions** especially the areas bordering Uganda/South Sudan (Turkana, parts of Samburu) are also likely to receive occasional showers and thunderstorms. The expected total rainfall amounts are likely to be slightly higher than the long-term average amounts (slightly wetter than usual) for the season.
- 2.2.3. The Coastal Strip** (*Mombasa, parts of Tana River, Kilifi, Lamu, and Kwale*) is expected to receive occasional rainfall during the season. The expected total rainfall amounts are likely to be below the average amounts for the season (drier than usual) for the season. The distribution both in time and space is expected to be poor.
- 2.2.4. Highlands East of the Rift Valley (including Nairobi area):** (*Nyandarua, Laikipia, Nyeri, Kirinyaga, Murang'a, Kiambu, Meru, Embu, Tharaka Nithi, and Nairobi*): These counties are likely to experience cool and cloudy conditions with occasional light rains. Occasional afternoon and night showers are also likely especially during the month of June. The total rainfall amounts during the period are likely to be close to the long-term average for the season.
- 2.2.5. North-Eastern Region** (*Mandera, Marsabit, Wajir, Garissa, Isiolo*) and **parts of the Northwestern region:** Samburu County) are expected to be generally sunny and dry throughout the forecast period. Occasional rains may occur in a few places, especially over Marsabit County. Strong southerlies to southeasterlies winds of more than 25knots are likely during the season.
- 2.2.6. South-eastern Lowlands** (*Kitui, Makueni, Machakos, Tana River, Taita Taveta, and Kajiado counties*) are expected to be generally sunny and dry throughout the forecast period. Areas bordering the Central Highlands (parts of Machakos and Kitui Counties) are likely to experience occasional cool and cloudy conditions with light rains.

2.3. Temperature Forecast for JJA 2022

During the June, July, and August period, most areas in the Highlands East of the Rift Valley (including Nairobi County) usually experience cool and cloudy conditions with occasional drizzle or light rains. Prolonged hours of overcast skies (cloudy conditions) are expected to cause cold and chilly conditions on some days.

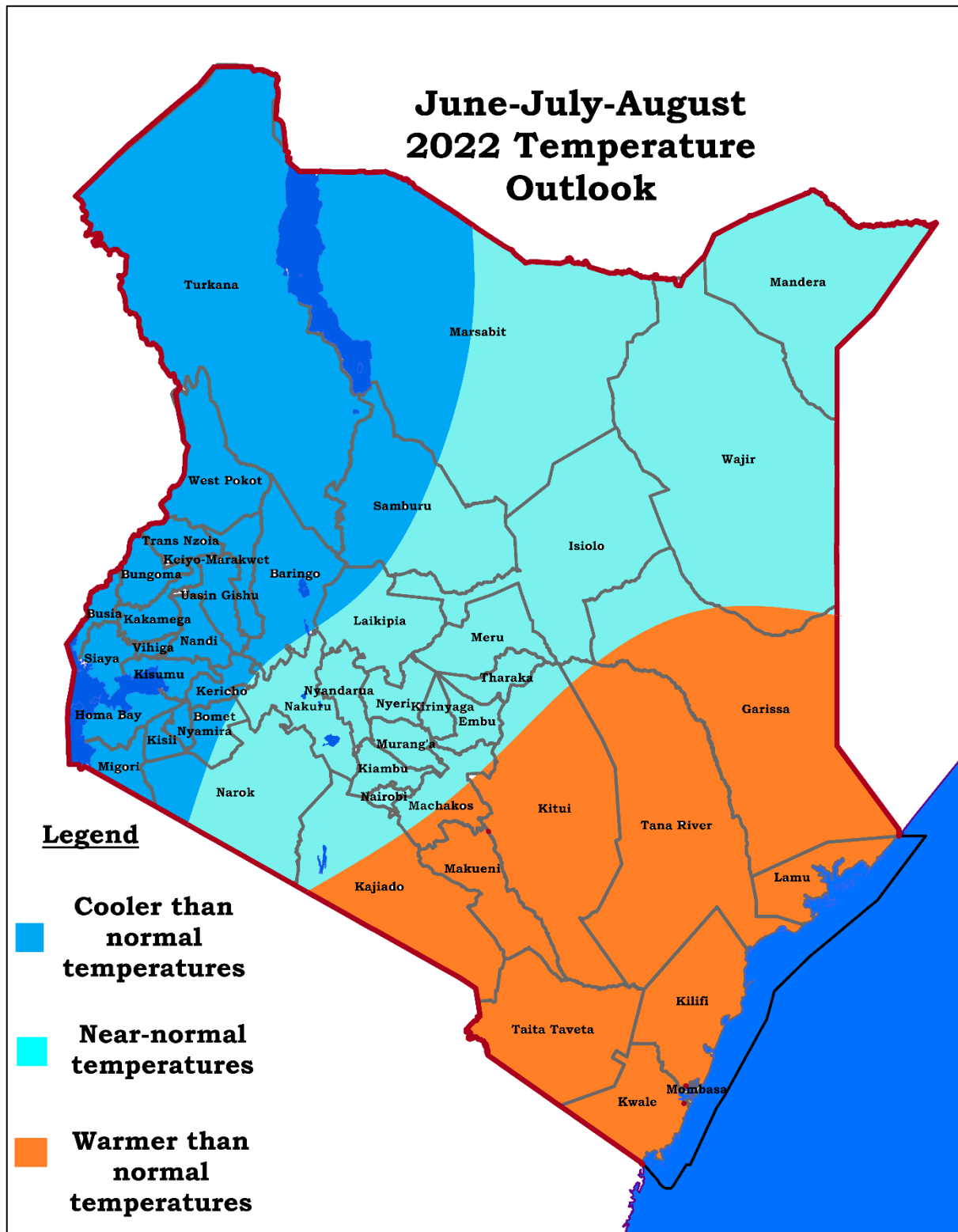


Figure 2: June-July-August Temperature Outlook

The temperature outlook is as follows:

2.3.1. Highlands East of the Rift Valley including Nairobi (*Nyandarua, Laikipia, Nyeri, Kirinyaga, Murang'a, Kiambu, Meru, Embu, Tharaka Nithi counties*) are expected to experience near-normal temperatures where daytime (Maximum temperatures) are expected to occasionally fall below 18°C as a result of prolonged hours of overcast skies (cloudy conditions).

2.3.2. Counties in the Northeastern Region (*Marsabit, Isiolo, Mandera, Wajir*) are likely to experience near-normal temperatures where sunny and dry conditions are expected.

2.3.3. Counties in Northwestern Kenya (*Turkana and parts of Samburu*) several counties in the **Highlands West of the Rift Valley** (*Trans Nzoia, West Pokot, Uasin Gishu, Elgeyo Marakwet, Kakamega, Nandi, Vihiga, Bungoma, Kisii, Nyamira*), counties in the **Lake Victoria Basin Region** (*Busia, Kisumu, Siaya, Homa Bay, Migori*), **Southern and Central Rift Valley** (*Nakuru, Baringo, Narok, Bomet, Kericho and parts of Laikipia*) are likely to experience near to below-average temperatures (slightly cooler than average for the season).

2.3.4. Counties in the Coastal region (*Lamu, Tana River, Kilifi, Mombasa, Kwale*), **lower Northeastern Kenya** (*Garissa County*), and **Southeastern lowlands** (*Machakos, Kitui, Makueni, Taita Taveta, Kajiado*) are likely to experience warmer than average temperatures (Warmer than usual for the season).

3. EXPECTED POTENTIAL IMPACTS

The following are the likely impacts during the June-July- August season:

3.1. Agriculture and Food Security Sector

The current shortage of water, food, pasture and browse for both human and livestock over the **ASAL areas of the Northeastern and parts of Northwestern** Kenya is expected to worsen owing to the poor performance of the March-May rainfall season and the dry conditions expected over these regions during the JJA season. Relevant authorities and humanitarian institutions are therefore advised to intensify the measures already put in place to avert loss of lives, livelihoods, and livestock.

The expected occasional rainfall over the **Highlands West of the Rift Valley, the Lake Victoria Basin, and Central and South Rift Valley** is likely to maintain sufficient soil moisture for agricultural production as well as reduce the infestation of the African armyworms and fall armyworms.

3.2. Disaster Management Sector

The current drought being experienced over the **ASAL areas of the Northern and parts of the eastern sectors** of the country is expected to persist. This may in turn lead to conflicts over the limited resources especially water, pasture and browse. The National and County governments, as well as

humanitarian organizations, are therefore advised to enhance the measures that are already being implemented to avert the loss of lives, livelihoods, and livestock. Local leaders are also advised to promote peace and encourage resource sharing among the communities.

3.3. Health Sector

Respiratory diseases like asthma, pneumonia, flu and the common cold are likely to increase over Nairobi County, the Highlands East of the Rift Valley, parts of Central Rift Valley, and Highlands West of the Rift Valley due to the expected cold conditions and also over parts of Northwest as a result of below-average temperatures expected over this region. The general public is advised to adopt warm dress codes and follow advice from the Ministry of Health. They are also advised to avoid using charcoal *jikos* in poorly ventilated houses as these *jikos* produce carbon monoxide gas that is lethal when inhaled.

Cases of Malaria are also expected but this may not rise beyond normal transmission due to the predicted reduced temperatures during the season. Waterborne diseases may also increase in these areas as a result of contamination of domestic water sources. Health authorities are therefore advised to preposition and redistribute medical supplies and insect-treated nets in the affected areas as well as carry out public health education on disease prevention and Water Sanitation and Hygiene (WASH).

Food shortage over the ASAL areas of the northern and eastern sectors of the country may lead to an increase in malnutrition-related diseases. The food security assessment should therefore be carried out to identify the most vulnerable communities and provide them with water, food or food supplements.

3.4. Transport and Public Safety Sectors

Fog formation in the areas that are expected to experience cold and cloudy conditions may pose danger for motorists due to low visibility. Care should be taken while driving in these areas, especially along the Nairobi-Naivasha Highway and particularly on the Kikuyu-Kinungi stretch.

Light rains and drizzles may also cause roads to be slippery. All road users are advised to take utmost care to minimize accidents that may result from such weather conditions.

Foggy weather is also likely to occasionally cause operational disruption at the Wilson and Jomo Kenyatta International Airports.

3.5. Water Resources Management and the Energy Sectors

Water scarcity is expected to persist over the ASAL areas of Northeast, Southeast, and parts of the Coast. Thus, efficient water management and trucking should be carried out to ensure enough water resources are available for the animal and human population needs in these areas.

The hydropower dams are expected to receive normal to below normal inflow and this may affect hydropower production. Careful reservoir management and continuous monitoring of water levels should be carried out in order to stabilize power production.

3.6. Environment

The above-average rainfall expected over the Highlands West of the Rift Valley, Lake Victoria Basin, and Central and Southern Rift Valley is likely to maintain conducive soil moisture for the growing of trees and regeneration of vegetation. Therefore, the public should take advantage of this by growing trees to increase tree cover. However, these areas may also experience land degradation including soil erosion as a result of flooding. Thus, soil conservation measures should be put in place.

There may be an increase in human-wildlife conflicts as wild animals migrate in search of forage and water. Relevant authorities are advised to provide fodder and water to wildlife in protected areas as well as mobilize animal control rangers and veterinary units to handle these conflicts.

There is a likelihood of increased wildfires in areas expected to remain dry. Thus, fire management practices should be put in place.

4. REVIEW OF MARCH-MAY (LONG-RAINS) 2022 SEASONAL RAINFALL

The March-April-May (MAM) 2022 seasonal rainfall has ceased over most parts of the country except over the Lake Victoria Basin, the Highlands West of the Rift Valley, the Central and South Rift Valley, and the Coastal Strip. The distribution, both in time and space, has been generally poor over most parts of the country. The month of March was characterized by long dry spells for most of the month except for the fourth week which experienced rainfall over several parts. April was also characterized by long dry spells during the first half over most parts. Dry weather conditions have been observed in the month of May over several parts except over the Highlands West of the Rift Valley, Lake Victoria Basin, Central and South Rift Valley, the Coastal region, and a few areas over the Highlands East of the Rift Valley where rainfall was recorded.

The start of the seasonal rains (onset) was well within the predicted times: continuation from February over parts of South Rift Valley (Narok) and Lake Victoria Basin (Kisii and Nyamira) and the fourth week of March over the Highlands East of the Rift Valley (including Nairobi County), the South-eastern lowlands, parts of the south coast and parts of the northeast (Moyale). Onset was delayed over the Highlands West of the Rift Valley where it was expected during the second to the third week of March but was realized over the fourth week. However, this onset was followed by long dry spells over most parts of the country in the first half of April. Over the Coastal region, onset was expected over the fourth week of March to the first week of April but was realized during the third week of April. Onset was not realized over the northwest, most of the northeast, and parts of the Central Rift Valley (Nyahururu).

An assessment of the rainfall recorded from 1st March to 26th May 2022 indicates that the rainfall performance was below average over most parts of the country except Eldoret, Kisumu, Nakuru, Moyale, and Narok which recorded 108.1%, 97.4%, 78.0%, 76.7%, and 76.3% respectively. All the other stations recorded rainfall that was below 75% of their MAM LTMs (depressed rainfall). The highest seasonal rainfall total of 529 (74.3%) was recorded in Kisii Meteorological station followed by Kisumu at 514.3mm. Other stations that recorded high amounts of rainfall are Kakamega

(496.7mm), Kericho (464.8mm), Embu (372.5mm), Eldoret 357.8mm), Lamu (319.3mm) and Mombasa (307.7mm). All the other stations recorded between 100 and 290mm of rainfall with Machakos, Makindu, Wajir, Garissa, Mandera, and Lodwar recording less than 100mm. Lodwar recorded the least amount of rainfall (7.5mm) throughout the season.

Rainfall performance categories	
Range	Category
Below 75% of the LTM	Below Normal (Depressed) rainfall
Between 75% and 125% of the LTM	Near normal rainfall
Above 125% of the LTM	Above Normal (Enhanced) rainfall

Figure 3a shows the amount of rainfall recorded during the MAM 2022 season (Blue bars) up to 26th May 2022 as compared to the MAM seasonal LTMs (Red bars). **Figure 3b** shows the MAM 2022 seasonal rainfall performance as a percentage of the LTMs.

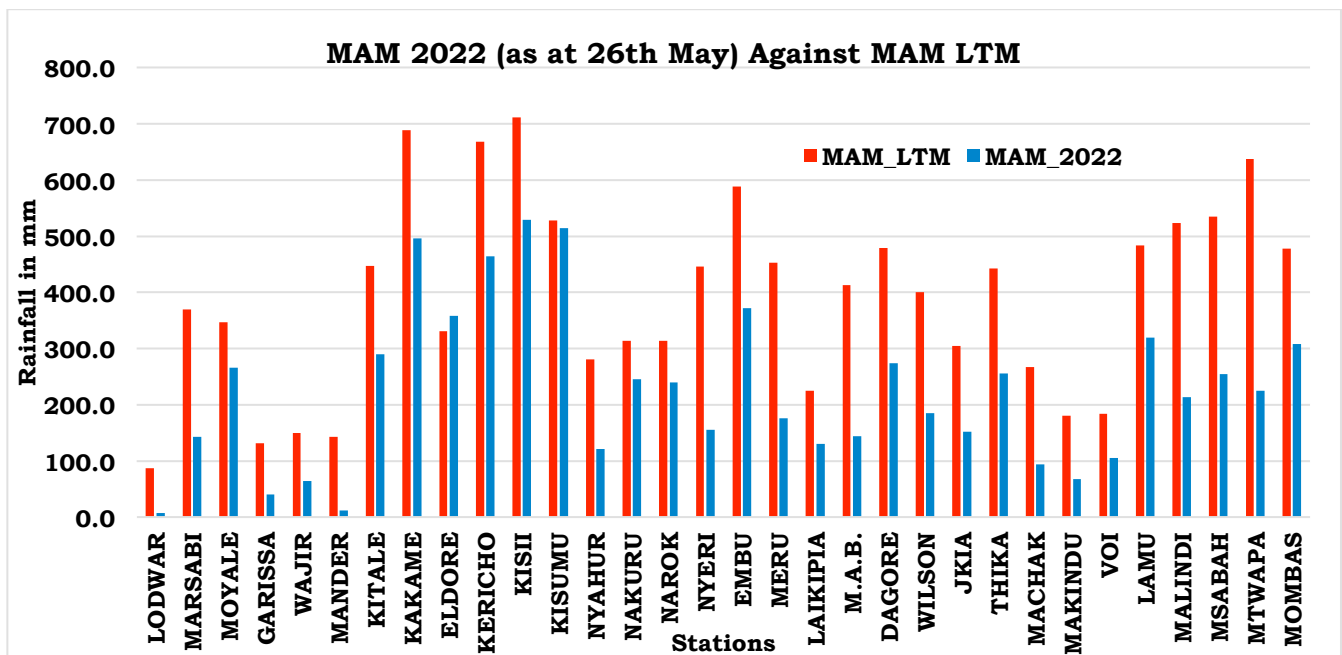


Figure 3a: MAM 2022 Rainfall Totals Compared to MAM Seasonal LTM.

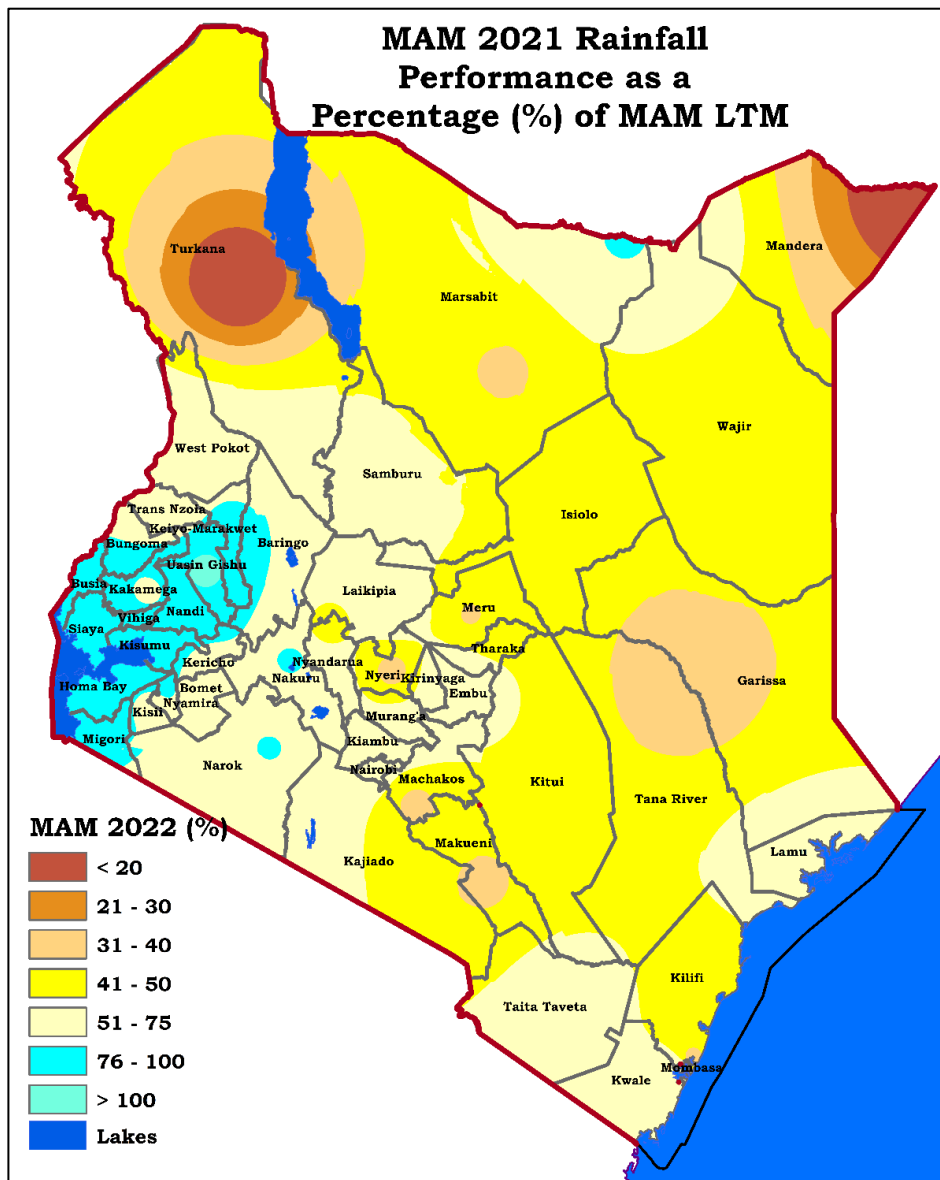


Figure 3b: MAM 2022 Rainfall Performance as a Percentage (%) of MAM LTM

4.1. EXPERIENCED IMPACTS OF MAM 2022

4.1.1 Agriculture and Food Security Sector

The below-average rainfall over most of the northern sector led to a further reduction in water, pasture, and browse for livestock in the pastoralist community. During the season, there were livestock deaths in Samburu, Mandera, and Marsabit Counties. The remaining livestock in these areas was emaciated as a result of the ongoing drought.

The long dry spell during the month of March and the first half of April provided conducive ground for the moths of the African armyworms and fall armyworms to lay and hatch eggs which developed into larvae and fed on crops over parts of the Highlands West and East of the Rift Valley, the Lake Victoria Basin, and the Southern Rift Valley. The worms invaded farms and destroyed crops leading to huge losses as some farmers had to replough and replant.

Acute food shortage was reported in most of the ASAL areas where over 3.5 million people are food insecure. The cost of milk went up across the whole country as a result of below-average rainfall which affected milk production.

4.1.2 Disaster Management Sector

The long dry spells experienced during the season have worsened the drought conditions over the ASAL areas of northern and eastern sectors of the country.

4.1.3 Health Sector

There were no reports of disease outbreaks associated with weather. However, malnutrition-related diseases were reported over parts of northern Kenya.

4.1.4 Transport and Public Safety

A section of Kitobo-Taveta road was swept away by floods in April. During the same month, a footbridge that connects villages in Baringo was also swept away by flash floods.

4.1.5 Water Resources Management and the Energy Sectors

Water shortage for both human and livestock consumption continued in the northern sector of the country where residents had to walk long distances daily in search of water.

Some rivers including the Mara, Tana, and Ewaso Ngiro and several streams across the country had reduced water flow due to depressed rainfall experienced in the catchment areas.

4.1.6 Environment

There were cases of human-wildlife conflicts in Laikipia and Samburu counties where buffaloes and zebras invaded homes and farms.

Heavy rains caused severe soil erosion in Msawau Mwangea in Taita Taveta County.

NB: This outlook should be used together with the 24-hour, 5-day, 7-day, monthly forecasts and regular updates issued by this Department. Weekly County forecasts are available from County Meteorological Offices.



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