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THE WEATHER OUTLOOK FOR THE JUNE-JULY-AUGUST (JJA) 2021 SEASON AND THE RAINFALL PERFORMANCE DURING THE MARCH-APRIL-MAY (MAM) 2021 "LONG RAINS" SEASON

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1. Highlights

1.1. The Outlook for June-July-August 2021 Rainfall Season.

The outlook for the June-July-August (JJA) 2021 rainfall season indicates that the Highlands West of the Rift Valley, Lake Victoria Basin Region, Central and Southern Rift Valley as well as 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 areas in the Central Highlands and Nairobi area are expected to experience cool/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 2021 Rainfall Season

The March to May 2021 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 strip as had been predicted.

The distribution, both in time and space, has been generally poor over most parts of the country. The month of March saw depressed rainfall over the whole country. In April and May 2021, several parts of the country received near to below average rainfall. An assessment of the rainfall recorded from 1st March to 25th May 2021 indicates that the rainfall performance was near average to below average over most parts of the country. Only three stations (Eldoret, Lodwar and Meru) recorded rainfall that was above their MAM LTM. The most enhanced rainfall of 143.5% was recorded at Eldoret station. This was followed by Lodwar at 131.7% and Meru at 131.3%. Lamu Meteorological Station in the coastal strip recorded the lowest amount of 36.8mm (7.6% of MAM LTM). As of 25th May, Kisii Meteorological Station recorded the highest seasonal rainfall total of 641.2mm.

The onset of the seasonal rainfall was late over several parts of the country except over the Highlands West of the Rift Valley, the Lake Victoria Basin and parts of the Highlands east of the Rift Valley where the onset was as forecasted.

2. Forecast for June-July-August 2021

2.1. June-July-August Season

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

The climate outlook for June to August 2021 is based on the expected evolution of global Sea Surface Temperature (SST) patterns as well as upper air circulation patterns. The forecast process involved regression of Sea Surface Temperature Anomalies (SSTAs), Quasi-Biennial Oscillations (QBO), Southern Oscillation Index (SOI) and the Indian Ocean Dipole (IOD) on the Kenyan rainfall. The expected distribution is also based on statistical analysis of past years, whose characteristics were found to exhibit similarities to the current year.

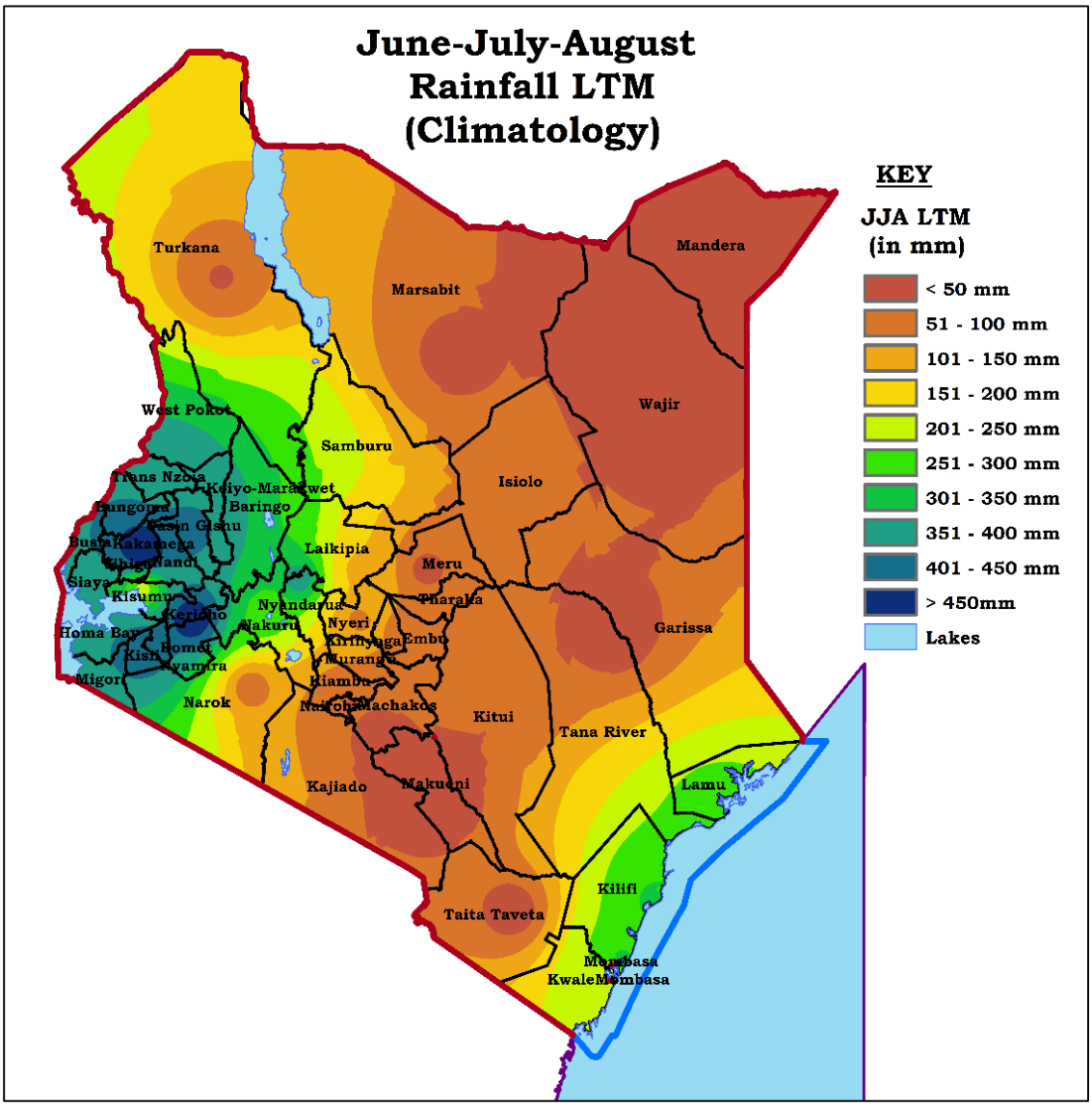

Figure 1a: June-July-August Climatology

2.2. Rainfall Forecast for June-July-August 2021

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, North western region and parts of Central Kenya are likely to receive near average with a slight tendency to 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 as depicted in ***Figure 1b***.

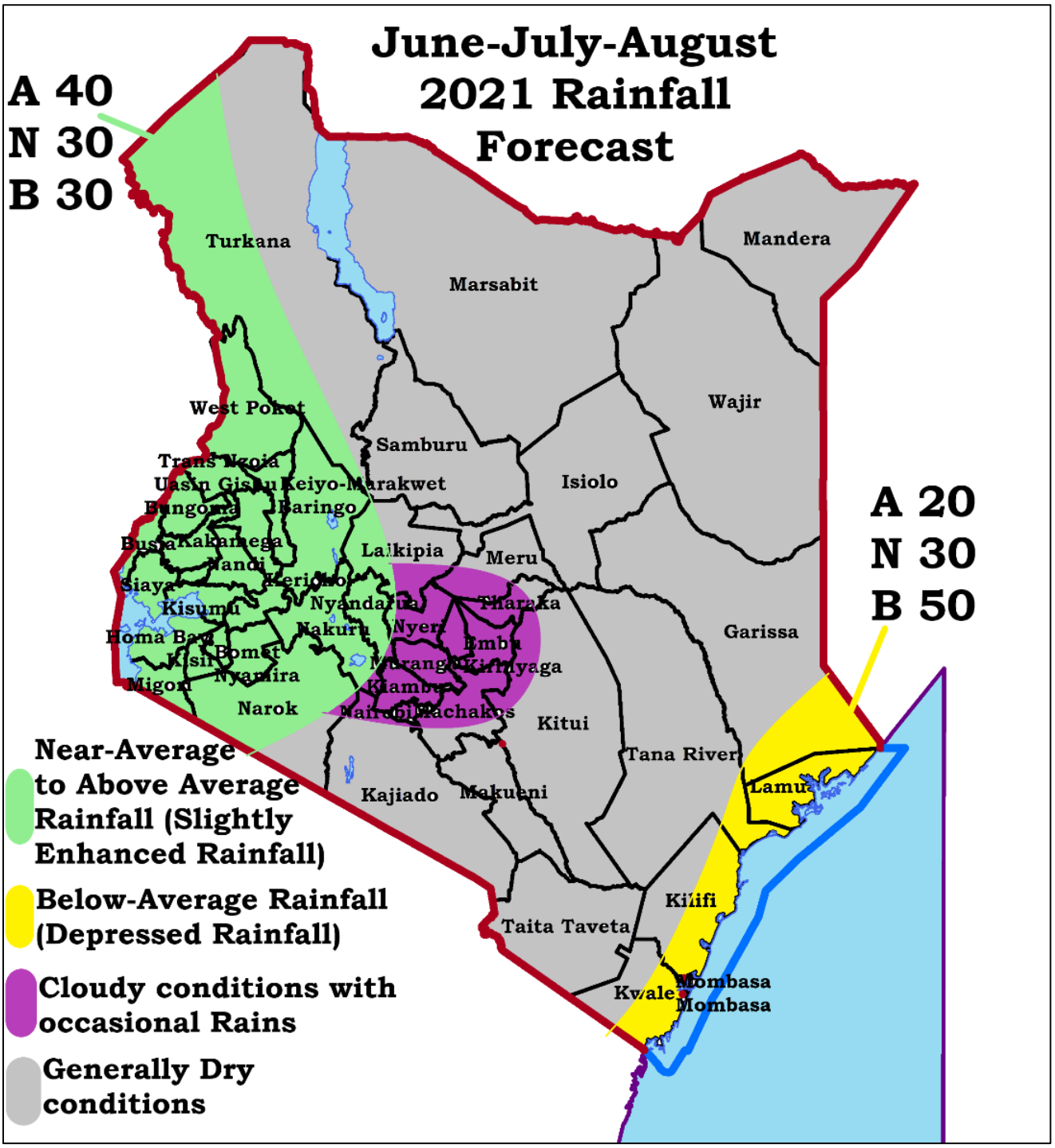

Figure 1b: June-July-August Rainfall Forecast

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/night showers are likely.

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 (near to above normal) for the season.

2.2.2. Northwestern regions especially the areas bordering Uganda/South Sudan (Turkana, West Pokot) 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 (near to above normal) for the season.

2.2.3. The Coastal Strip (Mombasa, 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.

2.2.4. Highlands East of the Rift Valley (including Nairobi area): (Nyandarua, Nyeri, Kirinyaga, Murang'a, Kiambu, Meru, Embu, Tharaka Nithi and Nairobi) are likely to experience cool and cloudy conditions with occasional light rain/drizzle. Occasional afternoon/night showers are also likely especially during the month of June. The total rainfall amounts during the period are likely to be slightly above the long term mean for the season.

2.2.5. North-Eastern Region (Mandera, Marsabit, Wajir, Garissa and Isiolo); parts of Northwestern region (Samburu County): is expected to be generally sunny and dry throughout the forecast period. Occasional rains may occur over few places.

Strong southerlies to southeasterlies of more than 25knots are likely during the season.

2.2.6. South-eastern Lowlands (Kitui, Makueni, Machakos, Taita Taveta and parts of Kajiado,): are expected to be generally sunny and dry throughout the forecast period. Areas bordering the Central Highlands (parts of Machakos County) are likely to experience occasional cool and cloudy conditions with light rains.

2.3. Temperature Forecast for JJA 2021

During the June, July and August (JJA) 2021, 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.

The temperature outlook for the June, July and August (JJA) 2021 season is as indicated in **Figure 2**.

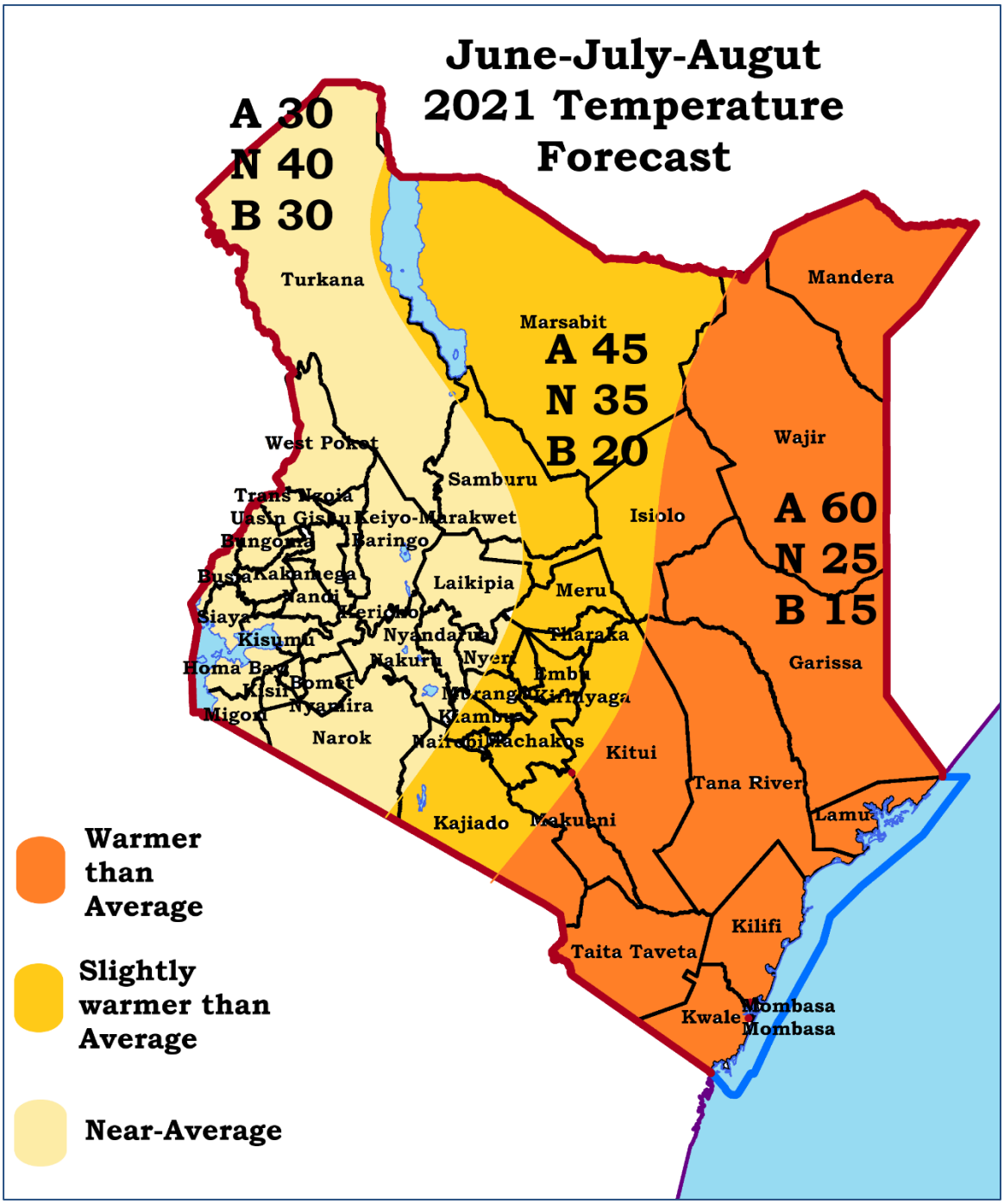

Figure 2: June-July-August (JJA) Temperature Forecast

The temperature outlook is as follows:

2.3.1. Highlands East of the Rift Valley including Nairobi (Nyandarua, Nyeri, Kirinyaga, Murang'a, Kiambu, Meru, Embu, Tharaka Nithi and Nairobi), **parts of Northeastern** (Marsabit and parts of Isiolo) as well as parts of **Southeastern region** (parts of Kajiado, Machakos, parts of Kitui, parts of Makueni): these areas are expected to experience near-average with a tendency to above average temperatures (slightly above normal for the season). Occasional prolonged hours of overcast skies (cloudy conditions) resulting in cold and chilly conditions are also expected. A few days may turn out to be extremely cold with daytime temperatures falling below 18°C.

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

2.3.3. **Counties in the Coastal** (Lamu, Tana River, Kilifi, Mombasa, Kwale), **Northeastern region** (Mandera, Wajir, parts of Isiolo, Garissa) **and Southeastern regions** (parts of Kitui, Makueni, Taita Taveta, parts of Kajiado) are likely to have warmer than average temperatures.

3. EXPECTED POTENTIAL IMPACTS

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

3.1. Agriculture and Food Security Sector

The expected occasional rainfall in Western Kenya is likely to maintain sufficient soil moisture for agricultural production. However, there is likelihood of occasional occurrence of frost in parts of the Central Highlands as well as Southern and Central Rift Valley, which may affect crop production. Counties in the Southeastern, Northeastern and Coastal strip and other ASAL regions are likely to remain food insecure owing to the poor performance of rains during the MAM season and the expected dry conditions during the coming months.

3.2. Disaster Management Sector

Cases of isolated flooding are still likely in low lying areas especially over the Lake Victoria Basin and parts of western Kenya.

3.3. Health Sector

In areas such as Nairobi County, the Highlands East of the Rift Valley, the Central Rift Valley and parts of the Highlands West of the Rift Valley, cases of respiratory diseases like asthma, pneumonia, flu and common cold are likely to increase due to the expected cool/cold conditions. The general public is advised to adopt warm dress codes and follow advise from the Health Authorities.

NB: It is advisable that during chilly days, *jikos* in poorly ventilated houses should be avoided as burning charcoal produces carbon monoxide gas that is lethal when inhaled.

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 country's airports.

3.5. Water Resources Management and the Energy Sectors

The water levels in the main dams are likely to remain high during this period. However, there may be water scarcity in parts of the northeastern, northwestern, coast and southeastern counties that experienced below normal rainfall during the MAM season and are expected to remain dry during the JJA season. Water trucking services to those in need of water and far from water sources should be put in place.

3.6. Environment

The expected rainfall over the Highlands West of the Rift Valley, Lake Victoria Basin Region, Central and Southern Rift Valley as well as the occasional rains over the Highlands East of the Rift Valley are expected to maintain conducive soil moisture for growing of trees and regeneration of vegetation. Therefore, the public should take advantage of this by growing trees to increase tree cover.

4. REVIEW OF MARCH-MAY (LONG-RAINS) 2021 SEASONAL RAINFALL

The March-April-May (MAM) 2021 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, Coastal Strip as had been predicted. The distribution, both in time and space, has been generally poor over most parts of the country. The month of March saw depressed rainfall over the whole country. In April and May 2021, several parts of the country received near to below average rainfall. An assessment of the rainfall recorded from 1st March to 25th May 2021 indicates that the rainfall performance was near average over the western sector and below average over the northeast, southeastern and the coastal counties.

Only three stations (Eldoret, Lodwar and Meru) recorded rainfall that was above their MAM LTM. The most enhanced rainfall of 143.5% was recorded at Eldoret station. This was followed by Lodwar at 131.7% and Meru at 131.3%. Stations that recorded near average rainfall include Wilson (124.1%), Dagoretti (118.3%), Kisumu (110.4%), Moi Air Base (109.1%), Thika (96.1%), Kisii (90.1%), Kericho (88.4%), Makindu (88.3%), Laikipia (87.4%), Kakamega (87.3%), Embu (83.1%), Narok (79.2%), Mandera 78.2%), Moyale (77.2%), Nyahururu (76.5%), J.K.I.A (76.3%) and Nakuru (75.5%). The remaining stations recorded less than 75% of their MAM LTMs with the lowest rainfall being recorded in Mtwapa and Lamu at 10% and 7.6% respectively.

As of 25th May, Kisii Meteorological Station recorded the highest seasonal rainfall total of 641.2mm. Other stations that have recorded more than 400mm of rainfall during the season include Kakamega (600.7mm), Meru (594.1mm), Kericho (591.2), Kisumu (582.7mm), Dagoretti (566.9mm), Wilson (496.9mm), Embu (489.7mm), Eldoret (475.0mm), Moi Air Base (450.2mm) and Thika (425.2mm). The rest of the stations recorded between 100mm and 300 mm with Voi, Mombasa, Mtwapa, Wajir, Garissa and Lamu recording less than 100mm of rainfall during the season. Lamu Met Station recorded the least amount of 36.8mm.

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 2021 season **(Blue bars)** up to 25th May 2021 as compared to the MAM seasonal LTMs **(Red bars). Figure 3b** shows the MAM 2021 seasonal rainfall performance as a percentage of the LTMs.

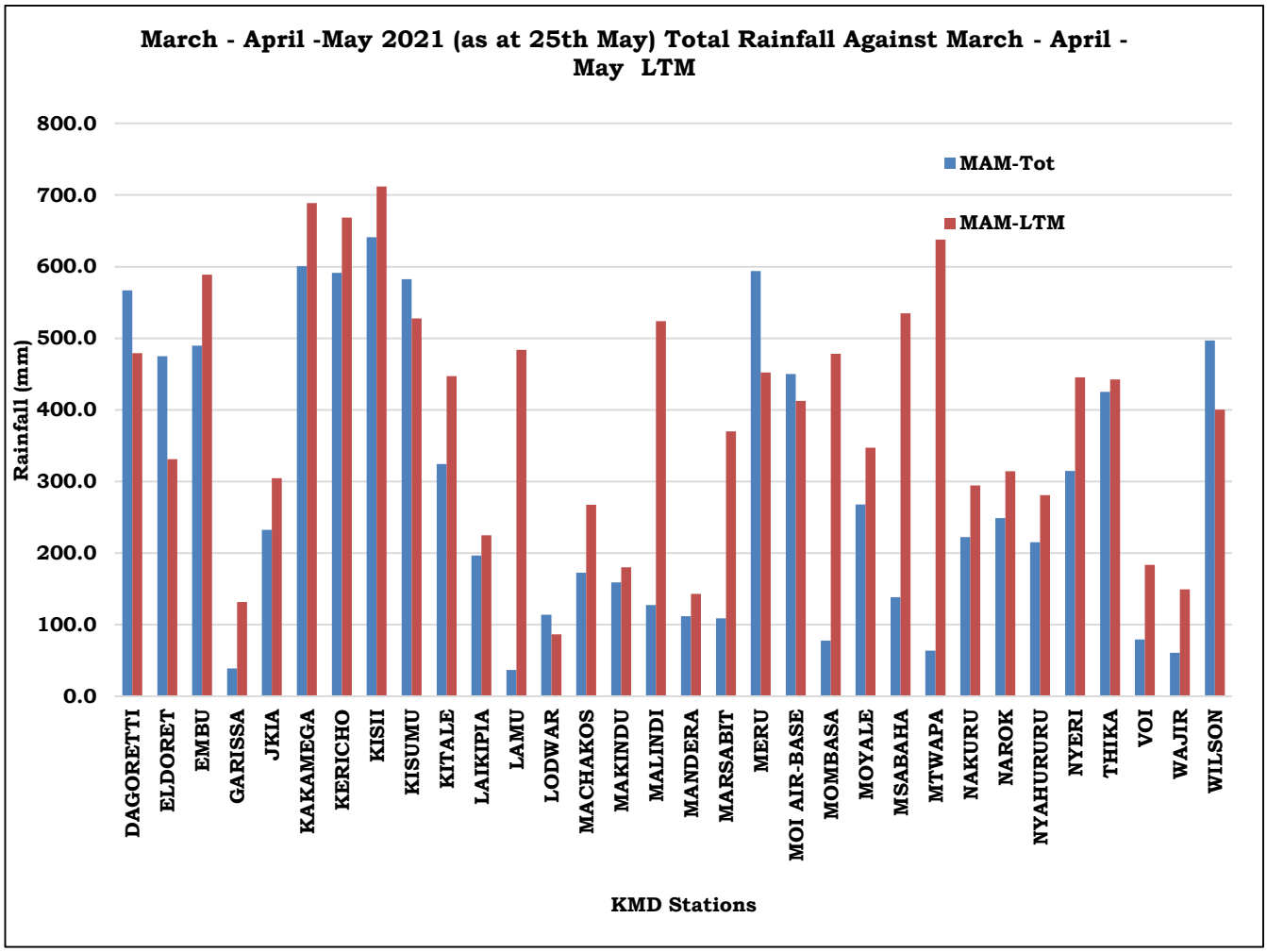

Figure 3a: MAM 2021 Rainfall Totals Compared to MAM Seasonal LTM.

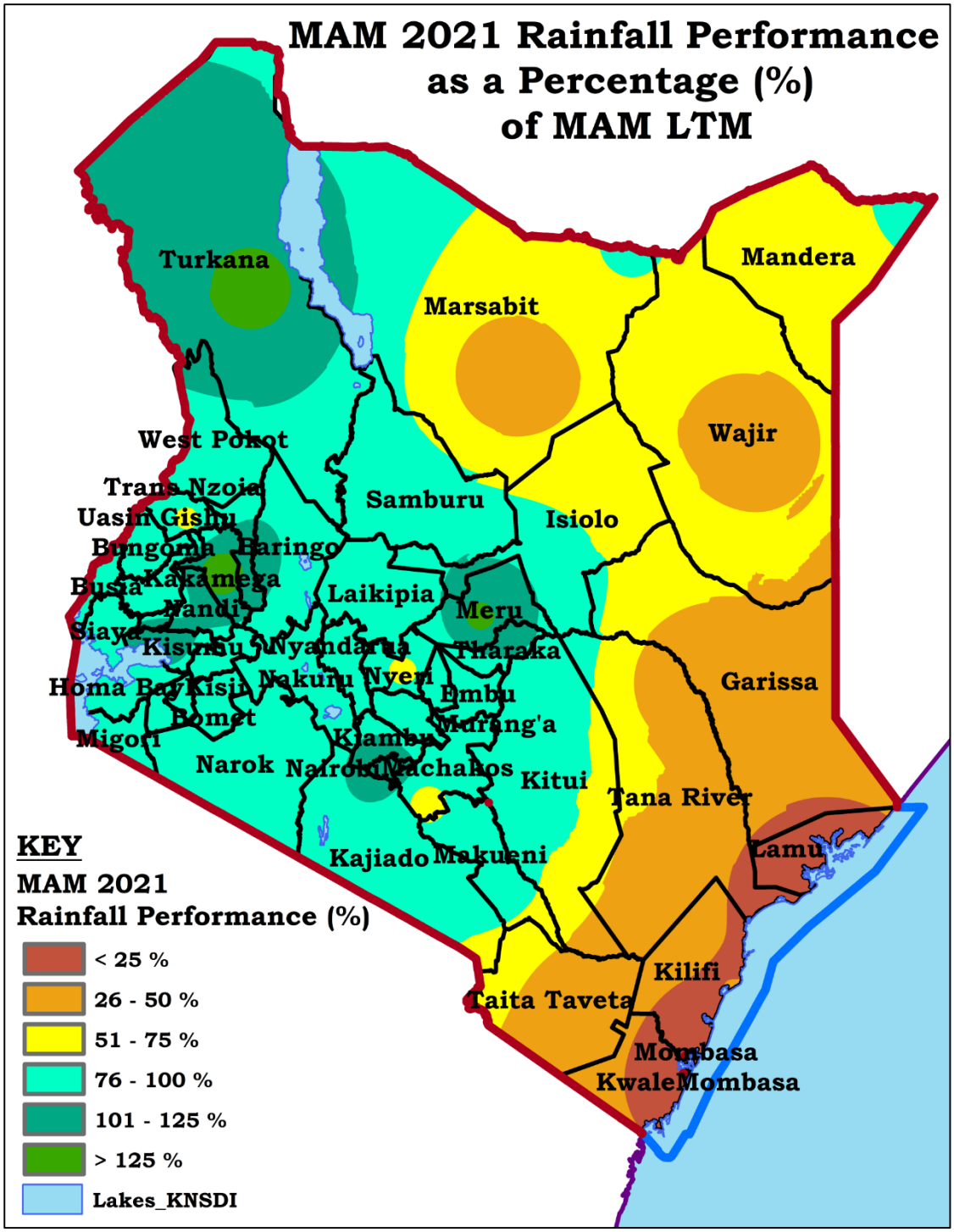

Figure 3b: MAM 2021 Rainfall Performance as a Percentage (%) of MAM LTM

4.1. EXPERIENCED IMPACTS OF MAM 2021

5.1.1 Agriculture and Food Security Sector.

The long dry spells over the northern sector led to reduced pasture for livestock in the pastoralist community. During the season, there were reports of livestock deaths in Mandera, Marsabit and Turkana Counties. There were reports of crop failure in Soy and Moiben constituencies of Uasin-Gishu County in the Highlands west of Rift valley.

5.1.2 Disaster Management Sector

There was a reported case of landslide in Muranga County that led to destruction of property. Flooding affected several counties especially those within the Lake Victoria

basin and few over the Tana basin. These include Tana River, Budalangi, Kisumu, Homabay, Migori and Busia. Baringo, Kiambu and Nairobi counties were also affected by floods. These floods led to displacement of people and destruction of property. Livestock was washed away in Baringo south. Flooding in Nairobi County led to loss of lives. Learning was paralysed in Budalangi, Kisumu and Homabay counties as schools were flooded and school property destroyed. Heavy rains caused power lines to fall on the ground in Nakuru near Kabarak University. Hailstones reported in Naivasha and Kisii led to destruction of crops. Drought was reported in Turkana County where over 185,000 people face acute water and food shortage. There is also shortage of water and pasture for livestock.

5.1.3 Health Sector

There were no reports of disease outbreaks associated with weather.

5.1.4 Transport and Public Safety

Flooding in Tana River and the Lake Victoria basin led to the destruction of roads and bridges. For instance, sections of Garissa-Hola-Garsen road and Bura-Madogo road were washed away due to heavy rains. In the Lake Victoria basin, the Migori-Homa Bay Road was cut off after the Oria-Riat bridge on river Kuja collapsed. The Bondo-Usenge road was also cut off after Dhogoye bridge was destroyed by heavy rains. There was paralysis of transport and traffic snarl-up in Nairobi following heavy rains and flooding.

5.1.5 Water Resources Management and the Energy Sectors.

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. There was power outage in sections of Nairobi as the Nairobi west substation was flooded after the Nairobi dam burst its banks following heavy rains in the city.

5.1.6 Environment

The occasional rainfall in the Lake Victoria basin, Highlands West of the Rift Valley and Highlands East of the Rift Valley provided sufficient moisture to sustain vegetation growth

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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