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REVIEW OF THE WEATHER IN NOVEMBER AND THE OUTLOOK FOR DECEMBER 2018

1. SUMMARY

Below-average (depressed) rainfall was recorded over most parts of the country during the month of November (the rainfall peak month) 2018. Several meteorological stations in the country recorded less than 75 percent of their November Long-Term Means (LTMs). Stations like Garissa, Narok, Eldoret Airport, Msabaha, Lodwar and Malindi recorded less than 10 percent of their November LTMs. Mandera station in Northeastern Kenya, however, recorded above-average (more than 125 percent) rainfall. The station recorded 175 percent of its November LTM. Kisumu and Machakos recorded near-average (between 75 and 125 percent) rainfall. The rainfall distribution, both in time and space, was generally poor over most parts of the country especially during the first half of the month.

The outlook for December 2018 indicates that most parts of the country are likely to experience near-average rainfall with a tendency to above-average. Most of the Northwestern and parts of Southwestern Kenya are, however, likely to experience near-average to below-average (generally depressed) rainfall during the month.
The rainfall distribution, both in time and space, is expected to be generally poor especially over the northern parts of the country.
The October-November-December (OND) 2018 seasonal rainfall is expected to cease during the first to second week of December over the northern parts of the country. The cessation over the Western, Central and Southeastern Kenya is expected during the third to fourth week of December.

2. WEATHER REVIEW FOR NOVEMBER 2018

The November 2018 rainfall analysis indicates that the performance was generally poor over most parts of the country. Most meteorological stations recorded rainfall that was below 75 percent of their November LTMs. Malindi station, for example, recorded no rainfall at all throughout the month while stations like Garissa, Narok, Eldoret Airport, Msabaha and Lodwar recorded less than 10 percent of their November LTMs. Mandera was the only station that recorded above-average rainfall (more than 125 percent of its LTM). The station recorded 175 percent while Kisumu and Machakos recorded near-average (between 75 and 125 percent) rainfall. Nyeri, Moyale, Kericho, Meru, Kisii, Wajir and Laikipia Airbase recorded between 50 and 75 percent of their LTMs. The rest of the stations recorded less than 50 percent of their LTMs.
A few rainfall storms were recorded during the second half of the month. Kitui Meteorological station recorded 101.2mm on 20th November while Machakos and Mandera stations recorded 66.2mm and 57.5mm on 19th and 16th November respectively.
Up to 27th November, Meru station recorded the highest amount of 211.2mm, followed by Kisii –

136.7mm, Kisumu – 121.6mm, Machakos – 120.8mm and Kericho - 102.3mm. Embu, Mandera, Nyeri, Moyale, Dagoretti Corner, Voi, and Moi Airbase (Eastleigh) recorded between 50 and 100mm while the rest of the stations recorded less than 50 mm. ***Figure 1*** shows the total rainfall amount recorded in November (**red bars**) as compared to the November LTMs (**blue bars)**.

3. REVIEW OF THE OCTOBER-NOVEMBER-DECEMBER (OND) 2018

The seasonal rainfall analysis from 1st October to 26th November 2018 indicates that depressed rainfall was recorded over most parts of the country. Quite a number of stations recorded below 50 percent of their LTMs for the season. However, a few stations namely Mombasa, Mandera, Lamu, Kisumu and Mtwapa had already recorded near-normal rainfall by November 26th. The stations recorded 106, 99, 84, 81 and 77 percent of their seasonal LTMs respectively. Lodwar, Garissa and Narok recorded the lowest percentages of just 1%, 7% and 9% of their seasonal LTMs respectively.

The highest seasonal amount of 301.8mm was recorded at Mombasa station. Kisumu, Meru, Kisii, Mtwapa and Kakamega stations recorded 287.0mm, 286.8mm, 274.1mm, 223.1mm and 222.7mm respectively. Kericho, Marsabit, Moyale, Nyeri, Dagoretti Corner and Embu stations recorded between 150 and 200mm while the rest of the stations recorded less than 150mm.

Figure 2 shows the total rainfall amount recorded in October-November (**red bars**) as compared to the OND LTMs (**blue bars)**.

4. THE PREVAILING GLOBAL SEA SURFACE TEMPERATURES (SSTs) CONDITIONS

Warmer than average Sea Surface Temperatures (SSTs) were observed over the eastern and central equatorial Pacific Ocean (the Niño areas) while cooler than average SSTs prevailed over western equatorial Pacific Ocean. This was an indication that El Niño-like conditions were present in the Pacific Ocean. Various models forecasted an increased likelihood of Positive ENSO towards the end of the year 2018.

Cooler than average SSTs were observed over eastern equatorial Indian Ocean (adjacent to Australia) while western equatorial Indian Ocean (adjacent to the East African coast) experienced slightly warmer than average SSTs. Warm SSTs also prevailed to the northeast of Madagascar Island. This was conducive for the formation of the Intense Tropical Cyclone "Alcide" that developed in this part of the Indian Ocean at the beginning of November and significantly reduced the moisture influx into the country. Unseasonal very heavy rainfall over the Arabian Peninsula and Gulf region kept the rainfall belt diffuse and confined to the north of Kenya. This led to generally depressed in Kenya.

5. EXPERIENCED IMPACTS DURING OCTOBER AND NOVEMBER 2018

The poor rainfall performance over most parts of the country resulted into poor crop performance over most agricultural areas of the country. This was more so over the Central and Southeastern Kenya. The poor rainfall recorded in the catchment areas of the Seven-Folks hydroelectric power generating dams resulted into poor inflows and reduced water levels in the dams.

6. FORECAST FOR DECEMBER 2018

This climate outlook for December 2018 is mainly based on the prevailing and expected Sea Surface Temperature Anomalies (SSTAs) over the Pacific, Indian and Atlantic Oceans. The current El Niño-like conditions in the Pacific Ocean and the near-neutral Indian Ocean Dipole were also considered.

The predicted Cessation and distribution of rainfall were derived from statistical analysis of past years, which exhibited similar characteristics to the current year.

The forecast indicates that most of the country is likely to experience near-average to above-average rainfall during the month of December 2018 as depicted in **figure 3**.

The rainfall distribution, both in time and space, is expected to be generally poor over most the northern parts of the country. The specific outlook for individual areas is as follows:

The Highlands West of the Rift Valley (Kericho, Nandi, Kakamega), North-Rift (Eldoret, Kitale), Central Rift Valley (Nakuru, Narok, Kajiado), Central Highlands (Nyeri, Muranga, Nyandarua, Kiambu, Embu, Meru, Nanyuki), Nairobi area (Dagoretti, Wilson, Kabete, MAB), Northeastern Kenya (Marsabit, Moyale, Mandera, Wajir, Garissa, Isiolo), Southeastern Kenya (Machakos, Makindu, Voi, Taita, Taveta, Galole) and the Coastal Strip (Mombasa, Kwale, Mtwapa, Kilifi, Malindi, Msabaha, Lamu) are likely to receive near-average rainfall with a tendency to above-average (slightly enhanced) rainfall.

The Northwestern regions (Lodwar, Lokichoggio, Lokitaung) and the southern parts of the Lake Victoria Basin (Kisii, Kisumu) are likely to receive near-average rainfall with a tendency to below-average (generally depressed) rainfall.

7. EXPECTED CESSATION

- The OND 2018 short-rains over most parts of Nyanza, Western, North Rift Counties, Central highlands including Nairobi, Southern Rift Valley areas (Narok, Kajiado, etc), Southeastern Kenya and parts of central Rift Valley are expected to cease during the third to fourth week of December. Narok County is, however, likely to experience rainfall up to the end of December and into early January 2019;
- Cessation over Northern Rift Valley (Northwestern Kenya) and the Coastal strip is expected during the first to second week of the December;
- Northeastern and Northern areas are expected to experience their cessation during the fourth week of November to first week of December. The month of December is likely to be generally dry over the extreme northern parts of this region (**see figure 4**).

8. POTENTIAL IMPACTS

- Poor crop performance will be expected in most agricultural areas of the country despite the forecasted near-normal rainfall. This is due to the poor rainfall performance experienced in October and November.
- Foliage and pasture conditions in the pastoral areas of Northern, Northwestern and Northeastern Kenya are expected to slightly diminish due to the expected sunny and dry conditions for most of December.
- Water levels in both the Seven Folks and Turkwel hydroelectric power generating dams are likely to be maintained due to the forecasted average rainfall in the catchment areas.

N.B: This forecast should be used in conjunction with the daily 24-hour and the weekly forecasts issued by this Department.

Stella Aura, MBS
DIRECTOR OF KENYA METEOROLOGICAL DEPARTMENT

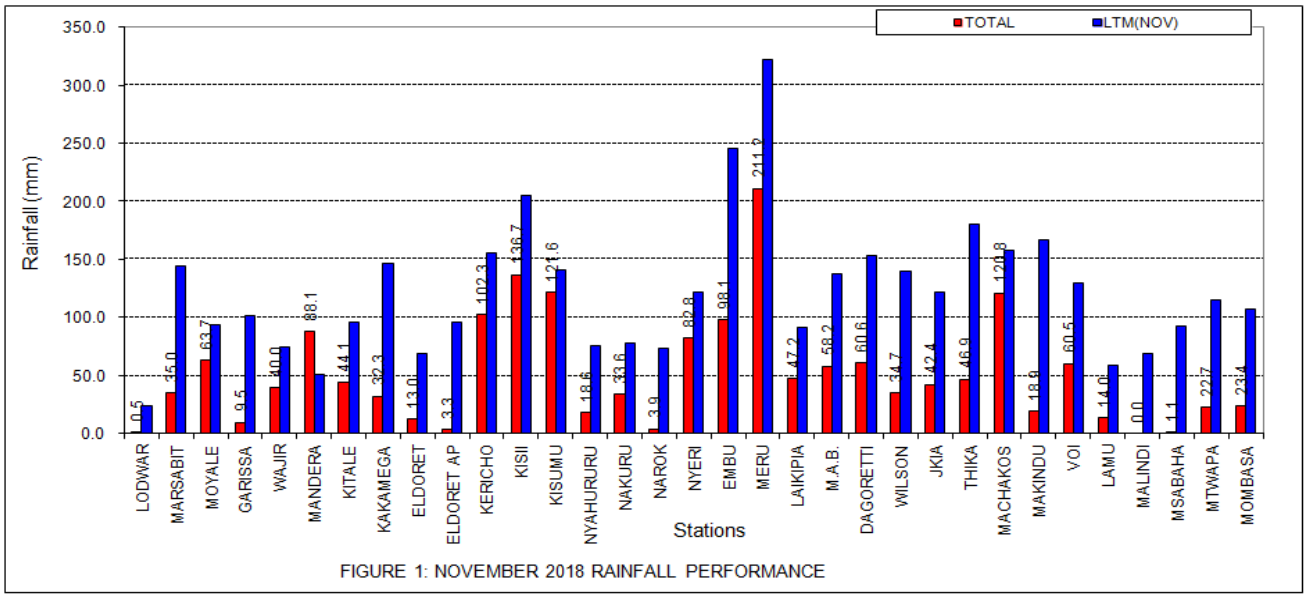

FIGURE 1: NOVEMBER 2018 RAINFALL PERFORMANCE

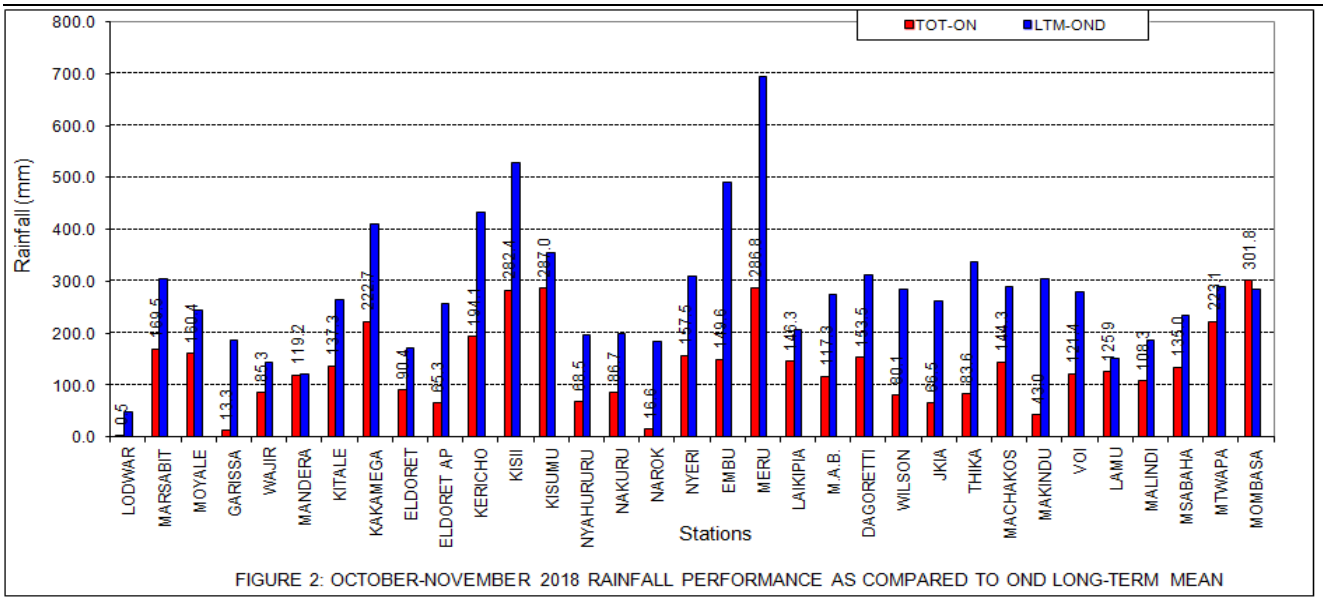

FIGURE 2: OCTOBER-NOVEMBER 2018 RAINFALL PERFORMANCE AS COMPARED TO OND LONG-TERM MEAN

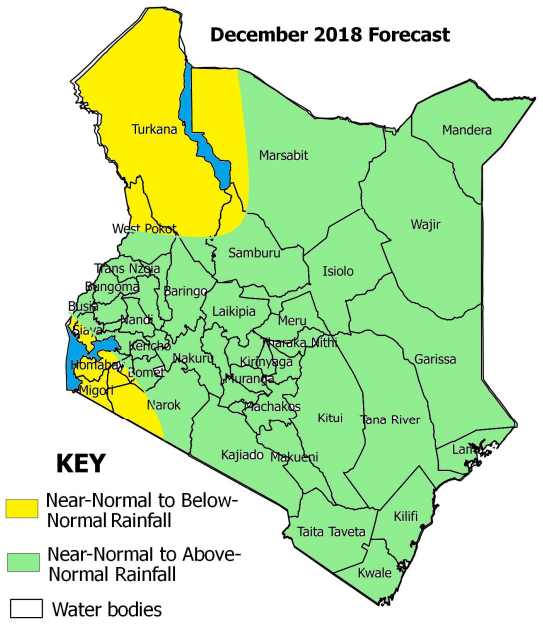

Figure 3: Rainfall outlook for December 2018

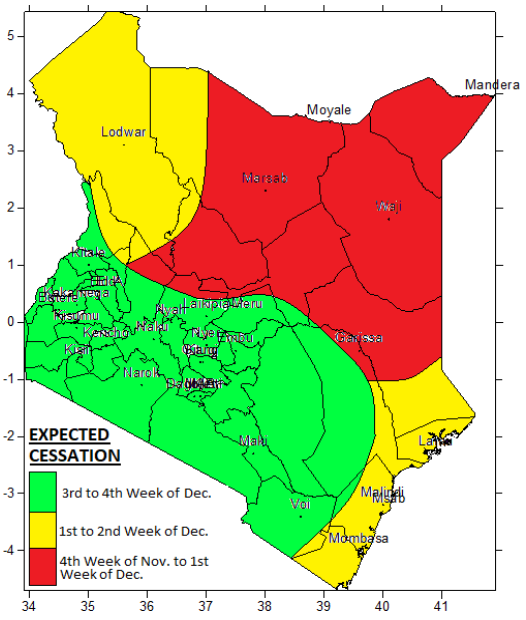

Figure 4: Expected Cessation of OND 2018