



**MINISTRY OF ENVIRONMENT, CLIMATE CHANGE AND FORESTRY**

STATE DEPARTMENT FOR ENVIRONMENT AND CLIMATE CHANGE

*KENYA METEOROLOGICAL DEPARTMENT*

Dagoretti Corner, Ngong Road,  
P. O. Box 30259, 00100 GPO, Nairobi, Kenya.

Tel: 254 (0) 20 3867880-7, 0724 255 153/4

E-mail: [director@meteo.go.ke](mailto:director@meteo.go.ke), [info@meteo.go.ke](mailto:info@meteo.go.ke)

Facebook: [fb.com/KenyaMeteorologicalDepartment](https://www.facebook.com/KenyaMeteorologicalDepartment) X: [@MeteoKenya](https://twitter.com/MeteoKenya)

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## CLIMATE OUTLOOK FOR DECEMBER AND REVIEW FOR NOVEMBER 2024

### 1.1. The Rainfall Outlook for December 2024

December typically marks the end of the October-November-December (OND) “short rains” season in Kenya. The forecast for December indicates that most parts of the eastern sector are likely to experience below-average (generally depressed) rainfall, while the western and parts of the central regions are expected to receive near to above-average rainfall. The rainfall distribution, both in time and space, is expected to be generally poor. However, episodes of heavy rainfall are likely to continue in some parts of the country during this period. The OND 2024 seasonal rainfall is expected to cease between the first and fourth weeks of December across several regions of the country.

This climate outlook for December 2024 is mainly based on the prevailing and expected Sea Surface Temperature Anomalies (SSTAs) over the Pacific, Indian Ocean and Atlantic Ocean. The El Niño–Southern Oscillation (ENSO) is currently neutral, with SSTs being near average in the central and eastern Pacific Ocean. La Niña typically brings drier-than-normal conditions to parts of East Africa, though its impact can vary. The Indian Ocean Dipole (IOD) has been in a negative phase since mid-October but is expected to return to neutral conditions in December. Additionally, the Madden-Julian Oscillation (MJO) which was active over the Indian Ocean, and led to enhanced rainfall in parts of the country in November has moved into the maritime continent.

Temperature is expected to be warmer than average over the whole country with higher probabilities for warmer temperatures expected over the Southeastern and coastal parts of the country.

### 1.2 The Outlook for December 2024 to February 2025

The outlook for the next three months indicates that most parts of the country will be generally sunny and dry in January and February, with rainfall expected primarily in December, especially in the southern part of the country. However, some areas—particularly the Highlands West and East of the

Rift Valley, including Nairobi, the southeastern lowlands, and the coastal region—may experience a few rainy days in January and February. The northern half of the country is likely to receive occasional rainfall at the beginning of December, followed by generally dry conditions for the remainder of December, January, and February. Temperatures are expected to be warmer than average across the entire country, with higher probabilities of elevated temperatures in the northern, central, and eastern regions.

## 2. Climate Outlook for December

### 2.1 Rainfall Forecast for December 2024

The forecast indicates that most parts of the eastern sector are likely to experience below-average rainfall during the month. However, the western and parts of the southern regions are likely to receive near-average rainfall, with a few areas in the extreme southern parts expected to receive near to above-average rainfall, as depicted by Figure 1. Despite the generally poor rainfall distribution expected during the month, isolated episodes of heavy rains and flooding are likely to occur in some parts of the country.

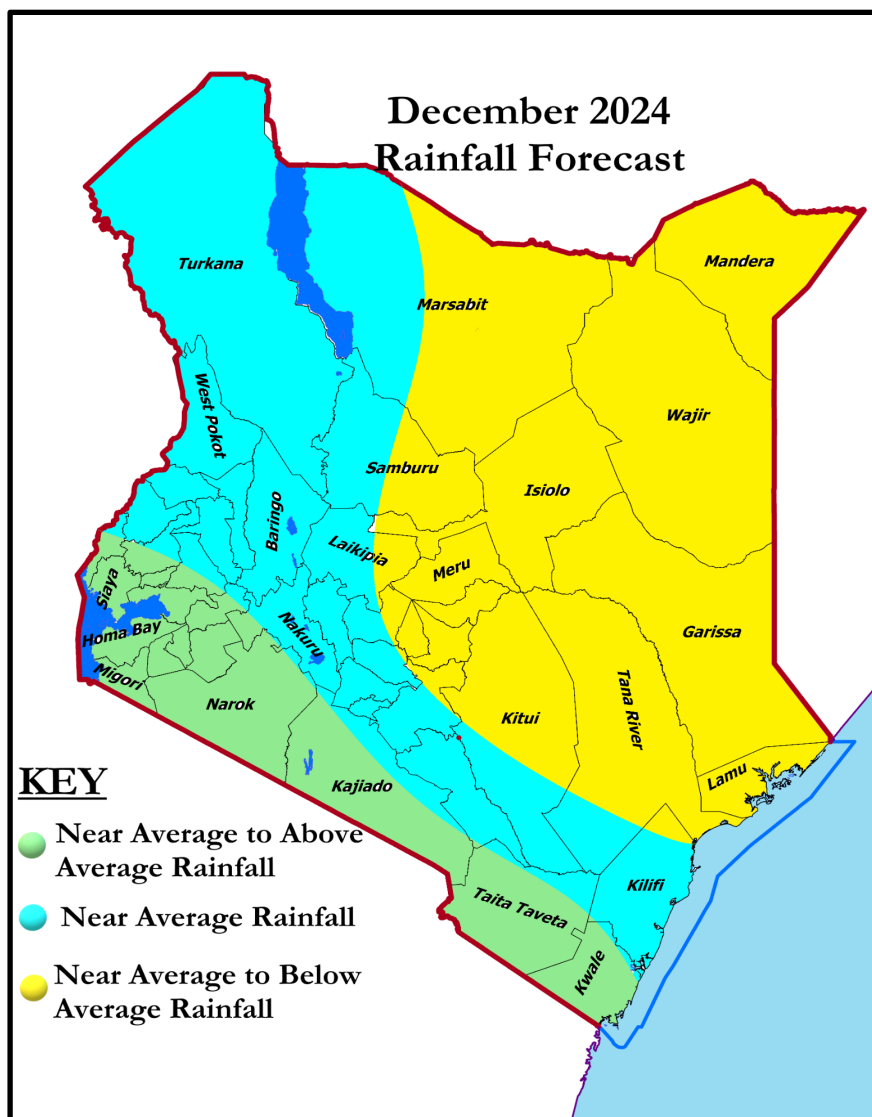


Figure 1: December 2024 Forecast

## 2.2 Outlook for specific areas

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

**2.2.1 The Lake Victoria Basin, Highlands West of the Rift Valley and Central and South Rift Valley** (Siaya, Kisumu, Homa Bay, Migori, Kisii, Nyamira, West Pokot, Trans Nzoia, Baringo, Uasin Gishu, Elgeyo-Marakwet, Nandi, Laikipia, Nakuru, Narok, Kericho, Bomet, Kakamega, Vihiga, Bungoma and Busia counties): Rainfall with occasional breaks is expected during the month. The rainfall is likely to be near to above the long-term average amounts for December in the southwestern region, the South Rift Valley, and the Lake Victoria Basin. Near-average rainfall is expected over the rest of the Highlands West of the Rift Valley and the Central Rift Valley.

**2.2.2 North-western Region** (Turkana, and Samburu counties): Mainly sunny and dry conditions are likely to prevail during the month. However, occasional rainfall may be experienced in a few areas. The expected rainfall amounts are likely to be near the long-term average for December in Turkana County and the western parts of Samburu, while the eastern parts of Samburu County are likely to receive below-average rainfall.

**2.2.3 Highlands East of the Rift Valley and Central Kenya** (Nairobi, Nyandarua, Nyeri, Kirinyaga, Murang'a, Kiambu, Meru, Embu, and Tharaka Nithi counties): Rainfall with occasional breaks is expected during the month. The total rainfall amounts are likely to be near to below the long-term average for December.

**2.2.4 North-eastern Region** (Marsabit, Mandera, Wajir, Garissa and Isiolo counties): Mainly sunny and dry conditions are likely to prevail during the month. However, occasional rainfall may be experienced in a few places. The expected rainfall amounts are likely to be below the long-term average for December.

**2.2.5 South-eastern Lowlands** (Kajiado, Kitui, Makueni, Machakos, Taita Taveta and Tana River counties): Rainfall with occasional breaks is expected during the month. The expected rainfall amounts are likely to be near to above the long-term average for December in Machakos, Taita Taveta, Kajiado, Makueni, and the southern parts of Kitui, while below-average rainfall is expected in Tana River and the northern parts of Kitui County.

**2.2.6 The Coastal Strip** (Mombasa, Kilifi, Lamu, Kwale counties and Coastal part of Tana River County): Rainfall with occasional breaks is likely during the month. The expected rainfall amounts are likely to be near the long-term average for December over the South Coast and parts of the North Coast (Kilifi), while below-average rainfall is expected over Lamu and coastal part of Tana River County.

## **2.3 POTENTIAL IMPACTS AND ADVISORIES**

The following are the likely impacts during the month of December 2024:

### **2.3.1 Agriculture and Food Security**

The expected near to above-average rainfall in the Lake Victoria Basin, the Highlands West of the Rift Valley, and the South Rift Valley is likely to sustain sufficient soil moisture levels for agricultural and livestock production.

### **2.3.2 Disaster Management**

Cases of isolated flooding may occur, especially in poorly drained urban centers and along rivers. The public is advised not to drive or walk through flooded areas to avoid the risk of loss of life. In the Highlands West of the Rift Valley, lightning strikes are highly probable, particularly in Kisii, Kisumu, Nandi, Kakamega, and Bungoma (Mt. Elgon areas) counties. In ASAL areas, especially in the northeast and parts of the southeast (Tana River), where sunny and dry conditions are expected to prevail, resource-based conflicts may arise.

### **2.3.3 Water Resources Management and Energy**

The major river catchment areas for the country's hydroelectric power-generating dams are expected to experience occasional rainfall. The water levels in the dams across the country are likely to remain stable due to the enhanced rainfall received in November. Close monitoring, however, is necessary to ensure stable power supply. Communities in areas expected to receive rainfall are encouraged to practise water harvesting to meet their water needs.

A few areas in the eastern sector of the country, particularly the northeast and the coastal region, may experience water shortages due to the depressed rainfall expected in these areas. Communities in these areas are advised to use the available water efficiently.

### **2.3.4 Environment**

December marks the end of the Short Rains season in Kenya. However, occasional rainfall over the western and southern parts of the country is expected to sustain soil moisture. The public should take advantage of these conditions to conserve moisture for tree growth during the anticipated dry period after the cessation of the rains. There may be cases of human-wildlife conflicts, particularly in the northeastern part of the country, where depressed rainfall is expected, as animals migrate in search of pasture and water.

### **2.3.5 Health**

There may be an increase in vector-borne diseases in areas where floods lead to stagnant water, creating conducive conditions for disease-causing pathogens. In areas expected to receive depressed rainfall, there may be an increase in respiratory and diarrheal diseases due to extended dry and dusty spells and compromised hygiene standards, especially over the northern parts of the country.

### **2.3.6 Transport and Public Safety Sector**

The expected occasional rainfall may cause slippery roads in some parts of the country, increasing the risk of accidents. Flash floods could create transport challenges, especially during rush hours, and more so in areas where the roads become impassable when it rains.

## **2. CLIMATE REVIEW FOR NOVEMBER 2024**

### **3.**

#### **3.1 Rainfall Review for November 2024**

The month of November marks the peak of the October-November-December Short Rains season in Kenya. During the month, near to above-average rainfall was recorded over the Highlands West and East of the Rift Valley, including Nairobi County, the Lake Victoria Basin, South and parts of the Central Rift Valley, Northwest, most of the Southeastern lowlands, and parts of the Northeast and Coastal regions. However, a few stations, including Nakuru, Jomo Kenyatta International Airport, Machakos, Moyale, Marsabit, Wajir, Malindi, Mtwapa, and Mombasa, recorded below-average rainfall.

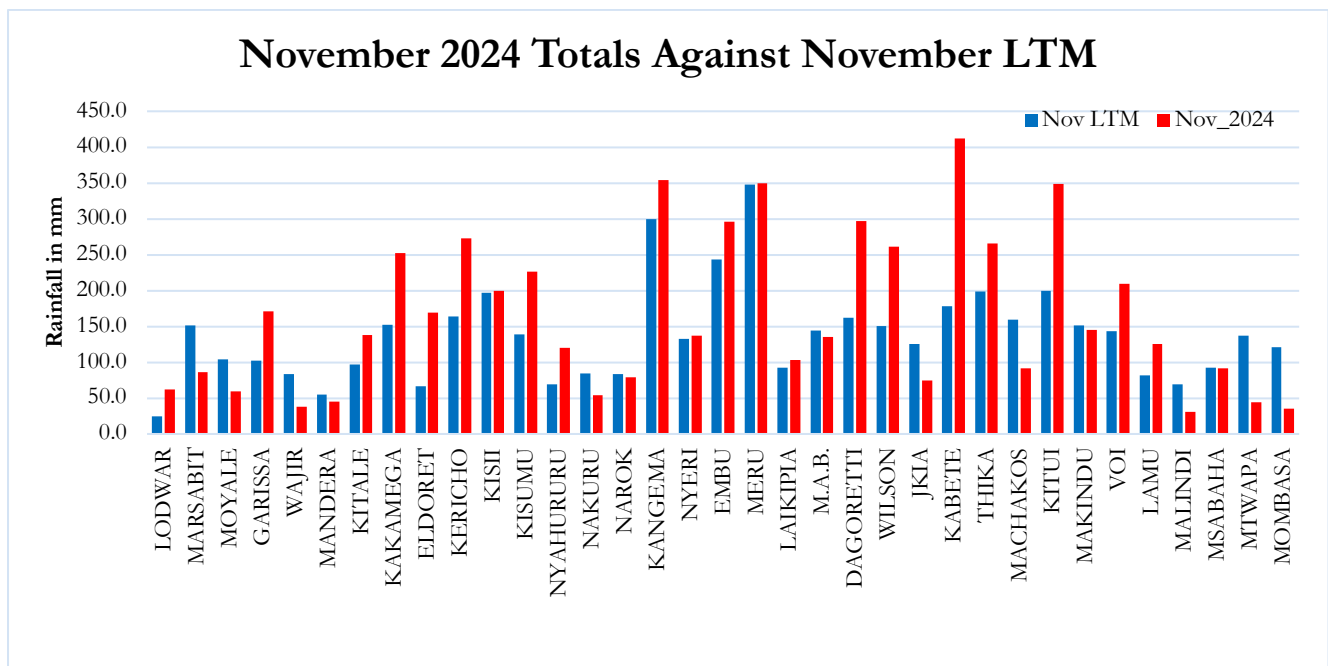
An analysis of rainfall up to 27th November shows that the highest amount of rainfall (576.4mm) was recorded at Managia station in Embu County, followed by Kitobo Seed Farm in Taita Taveta with 416.5mm. Other stations that reported above 400mm include Makwa Coffee Estate in Kiambu (414.9mm), Safari in Embu (412.7mm), Kabete in Nairobi (411.8mm), Gitii Ngura in Embu (406mm), and Kirie, also in Embu (405.5mm). The remaining stations recorded less than 400mm, with some stations over the Coastal and Northeast regions reporting less than 50mm throughout the month.

The month was characterized by severe storms in some parts of the Highlands East of the Rift Valley, Southeastern lowlands, and the Lake Basin, as shown in Table 1.

**Table 1: Examples of Stations that recorded heavy rainfall in twenty hours**

Station	County	Amount in mm	Date
Managia rainfall station	Embu	185.9	14-11-2024
Kabete meteorological station	Nairobi	181.2	24-11-2024
Kirie rainfall station	Embu	150.4	14-11-2024
Kasafari rainfall station	Embu	144.3	14-11-2024
Kitobo seed farm rainfall station	Taita Taveta	140.0	21-11-2024
Kyumbisyo rainfall station	Kitui	117.5	20-11-2024
Makwa coffee rainfall station	Kiambu	117.0	6-11-2024
Mtakuja rainfall station	Taita Taveta	113.5	20-11-2024
Kalungu rainfall station	Kitui	111.5	14-11-2024
Ithumula rainfall station	Kitui	110.4	12-11-2024
Kisumu meteorological station	Kisumu	105.2	24-11-2024
Gitii Ngura rainfall station	Embu	101.5	10-11-2024
Kalungu rainfall station	Kitui	99.7	10-11-2024
Wundanyi rainfall station	Taita Taveta	93.0	15-11-2024
Kasafari rainfall station	Embu	96.1	9-11-2024
Embu meteorological station	Embu	92.3	14-11-2024
Meru meteorological station	Meru	91.0	14-11-2024
Kiatune rainfall station	Kitui	87.5	14-11-2024
Kyumbisyo rainfall station	Kitui	87.0	16-11-2024
Kaliku rainfall station	Kitui	85.7	14-11-2024
Mutomo agriculture rainfall station	Kitui	83.0	14-11-2024

Figure 2a shows the total rainfall amounts recorded in November (red bars) compared to the November long-term means (LTM) (blue bars). Figure 2b illustrates the rainfall performance in November 2024 as a percentage of the November LTM, while Figure 2c displays the November rainfall totals.



**Figure 2a: November 2024 Rainfall Totals (mm) against November LTM**

# November 2024 Rainfall Percent of Normal (%)

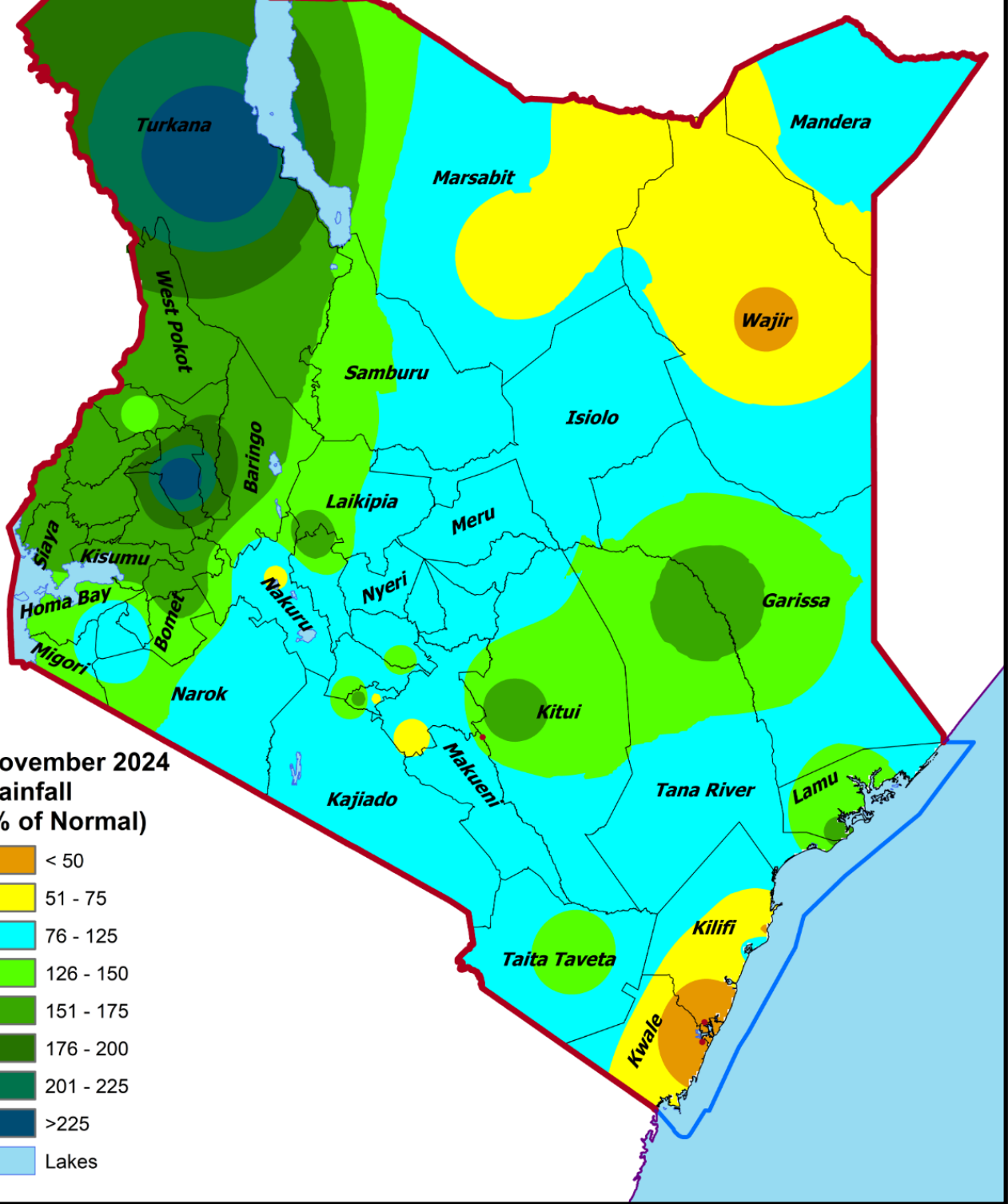


Figure 2b: November 2024 Rainfall (% of Rainfall)



# November 2024 Rainfall Totals

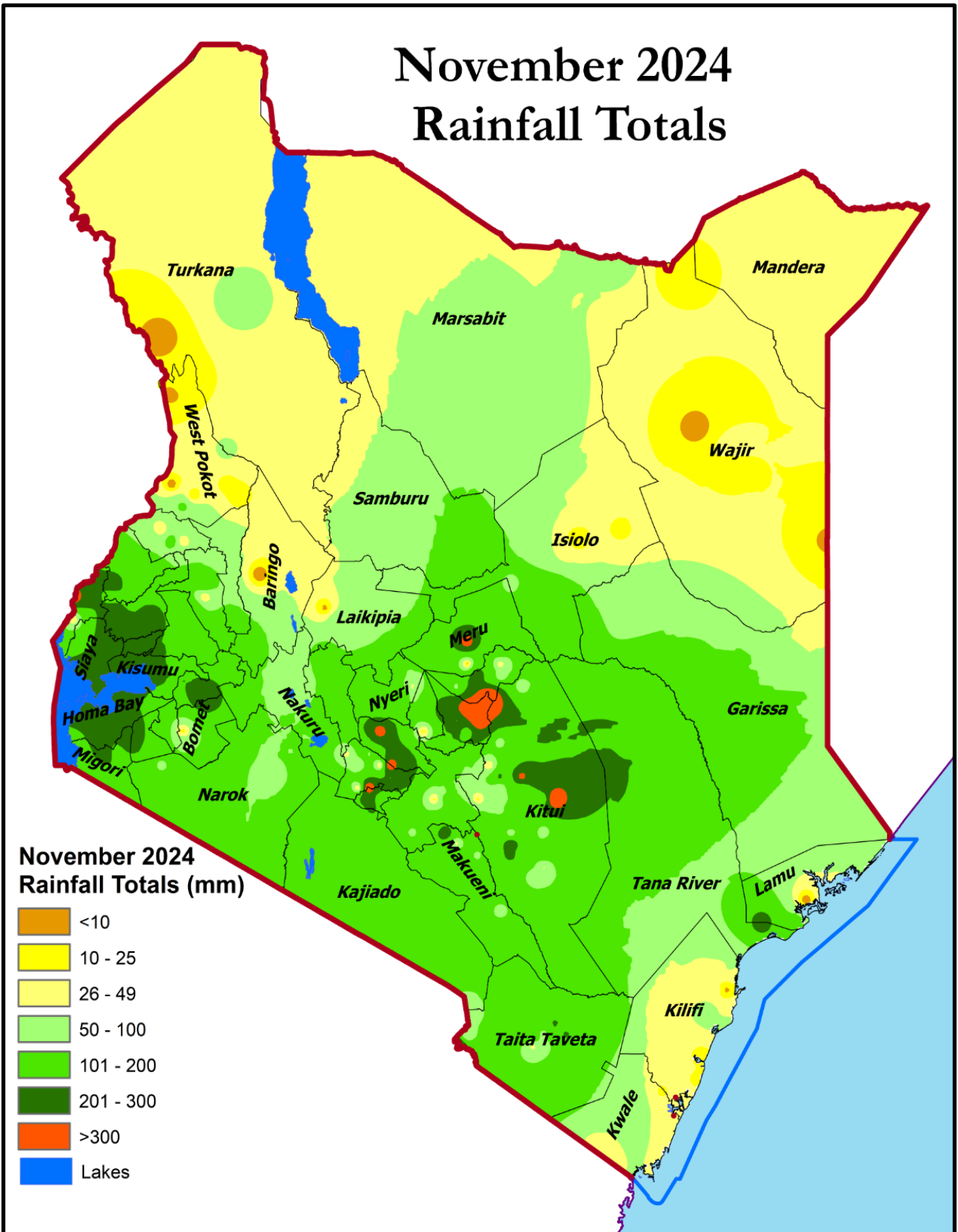


Figure 2c: November 2024 Rainfall Totals



### 3.2 Temperature Review

The maximum temperature was warmer than average over most parts of the country, except for Kisii, where temperatures were near the November LTM. The highest positive anomalies were reported over the central and eastern zones, where most stations recorded high values of 1 and above, as seen in Figure 3a. The highest monthly average maximum temperature (35.6°C) was recorded in Lodwar, while Nyahururu recorded the lowest monthly maximum temperature (21.4°C).

The minimum temperature was also warmer than average across the entire country, as shown in Figure 3b. The highest monthly minimum temperature (25.8°C) was recorded in Lodwar, while Nyahururu recorded the lowest monthly minimum temperature (9.6°C).

**Note: Anomalies refer to the deviation from the mean. Positive anomalies indicate that the temperature was higher than normal, while negative anomalies indicate that the temperature was lower than normal.**

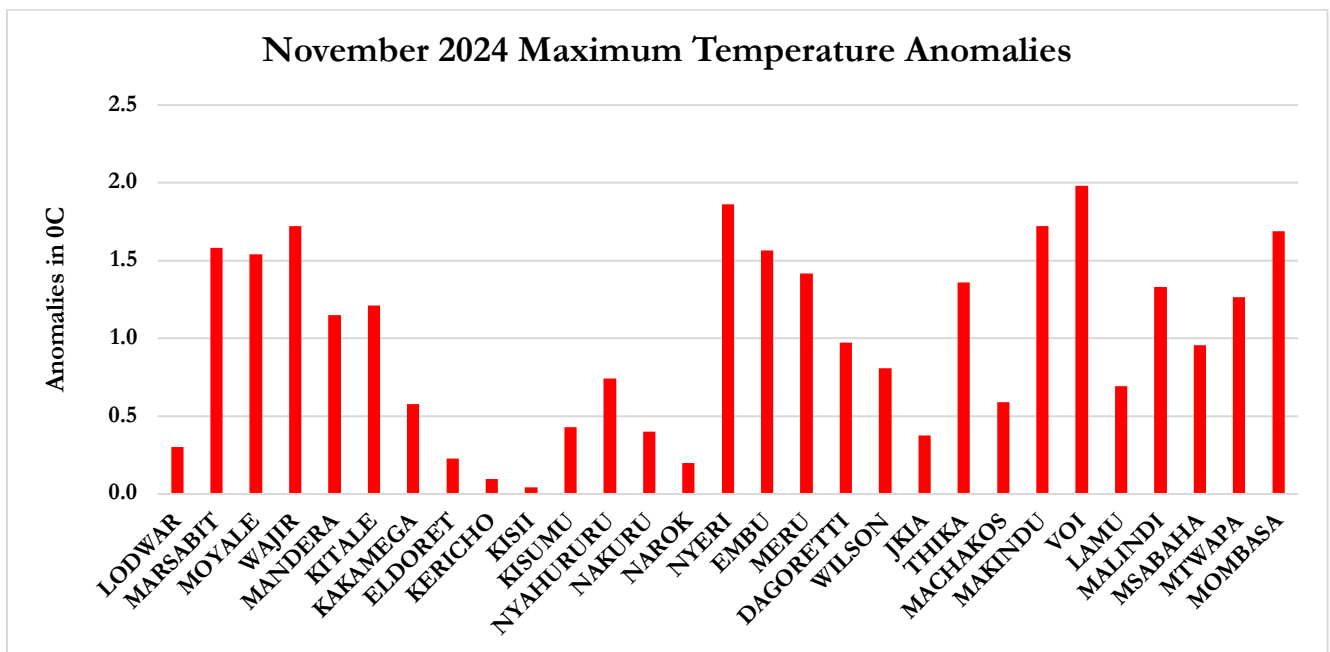
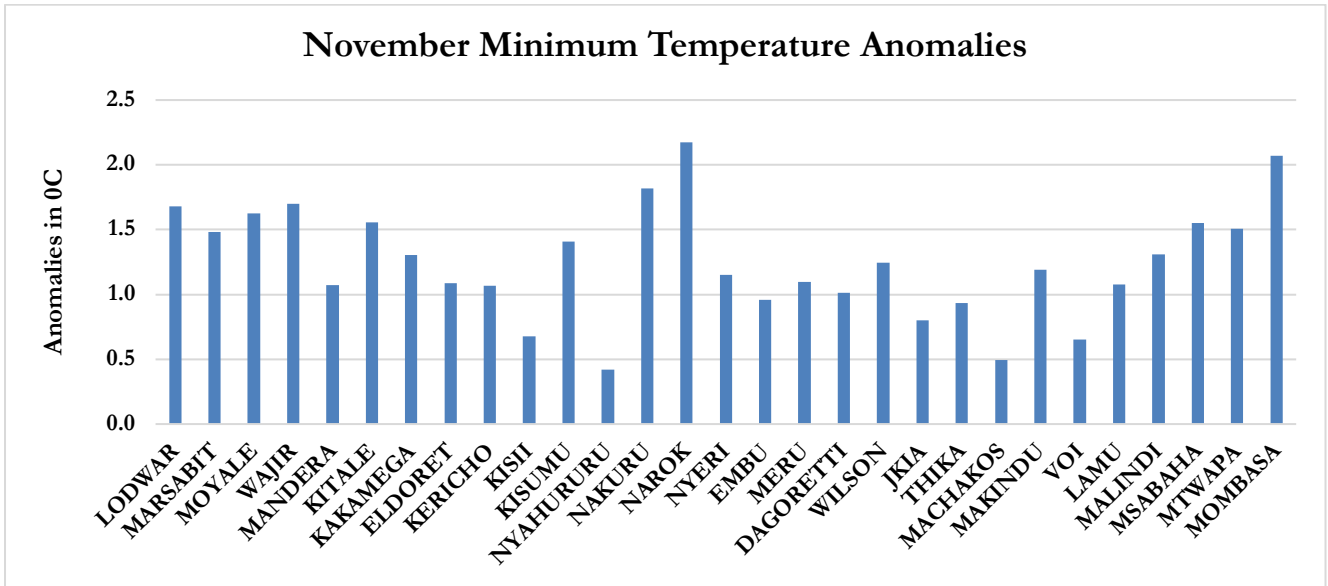


Figure 3a: Maximum Temperature Anomalies



**Figure 3b: Minimum Temperature Anomalies**

***NB: This outlook should be used together with the 24-hour, 5-day, 7-day, monthly, special forecasts and regular updates/advisories issued by this Department as well as Weekly and Monthly County forecasts developed and availed by County Meteorological Offices.***

**Dr. David Gikungu**  
**Director of Meteorological Services**