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Bulletin N°12/2024

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Climatological Bulletin of December 2024

1. INTRODUCTION

The bulletin has three main components, which include: (i) the review of climate conditions observed over Rwanda during December 2024, (ii) rainfall prediction for January 2025 and (iii) the highlights on the socio-economic impacts associated with both observed and predicted climate conditions.

2. HIGHLIGHTS

- **Rainfall performance in December 2024:** The accumulation of observed rainfall during the month of December 2024 was below the range of the Long-Term Mean (LTM) in most parts of the country, with 25 stations out of 44 recorded rainfall deficit. However, most part of Eastern Province and some part of Northern and Southern Provinces as well as Ngororero and Rusizi Districts recorded rainfall above the range of Long-Term Mean (LTM).
- **Rainfall expected during January 2024:** The amount of rainfall ranging between 0 and 180 mm is expected across the country. The expected rainfall is in the range of LTM (0-150 mm) except many parts of Rusizi and Nyamasheke Districts, western parts of Nyaruguru and Nyamagabe Districts and small part of southern Karongi District which are expected to receive slightly above LTM (0-180 mm). In this month, the minimum and maximum temperatures are expected to be in the range of LTM.
- **The impact associated with both observed and predicted climate conditions:** Due to observed rainfall in December 2024, soil moisture content was good over most parts of the country, thus impacted agriculture activities positively. In January 2025, the normal rainfall compared to the Long-Term Mean is expected with soil moisture slightly decreasing over many parts of country. Thus, the harvesting activities will benefit from sunny interval conditions, however it may have negative impacts to the agriculture and water sectors.



3. CLIMATE PATTERNS

This section provides the climatological summary of rainfall and temperature of December 2024 in comparison with its long-term mean (LTM) over Rwanda.

3.1 Rainfall amount in December 2024

During the month of December 2024, rainfall amount recorded over Rwanda ranged between 48.5 and 195.7mm. High rainfall amount of 195.7 mm was recorded at Mibirizi weather station in Rusizi District while less rainfall amount of 48.5 recorded at Nyamata (Paroisse) station in Bugesera District.

- **Weather stations of the Central region including Kigali City:** rainfall amount of 102.6 mm was recorded at Gitega weather station located in Nyarugenge District while Kigali International Airport weather station located in Kicukiro District recorded 49.7 mm.
- **Weather stations of the Southern Province:** Kibeho weather stations recorded 178.2 mm, Kibangu 143.8 mm, Kaduha 136.3 mm, Gihinga Gacurabwenge 135.2 mm, Gikongoro 102.2 mm, Byimana 86.5 mm, Nyakibanda 74.2 mm, Cyahinda 72.9 mm, Nyamiyaga Paroisse 57.4 mm, Kansi 54.8 mm and Rubona recorded 52.9 mm.
- **Weather stations of the Western Province** recorded amount of rainfall as follow: Mibirizi weather station recorded 195.7 mm, Kamembe-aero 183.0 mm, Rubengera 149.3 mm, Ntendezi 141.3 mm, Kirimbi 139 mm, Muramba 133.7 mm, Bugarama recorded 124.5 mm, Murunda 121.3 mm, Nyange 118.2 mm, Rwankeri 84.4 mm and Gisenyi Aero station recorded 70.7 mm.
- **Weather stations of the Northern Province** recorded rainfall as follows: Butaro recorded 164.7 mm, Kinigi 153.2 mm, Cyabingo 138.9 mm, Rushaki 122.4 mm, Rutongo 98.6 mm, Busogo 87.7 mm and Byumba station recorded 55.4 mm.
- **Weather stations of the Eastern Province:** Zaza recorded 163.0 mm, Kibungo-Kazo 159.6 mm, Nyagahanga 102.7 mm, Nyagatare station 96.5 mm, Kirehe 81.2 mm, Kagitumba 78.3 mm, Kawangire recorded 74.8 mm, Mpanga 69.0 mm, Mwiri station 67.7 mm, Ruhuha 60.0 mm and Nyamata Paroisse recorded 48.5 mm.



3.2 Rainfall performance in comparison to the Long-Term Mean

Comparing the performance of the rainfall during the month of December 2024 with the Long-Term Mean (LTM) for the same period, it was observed that the rainfall of December 2024 was below normal range of the Long-Term Mean (LTM) except the most part of Eastern Province and some part of Northern and Southern Provinces as well as Ngororero and Rusizi Districts, which recorded above normal range of Long-Term Mean (LTM). The Figure 1 shows that over 44 weather stations, twenty-five (25) stations recorded rainfall deficit, while nineteen (19) stations recorded rainfall surplus.

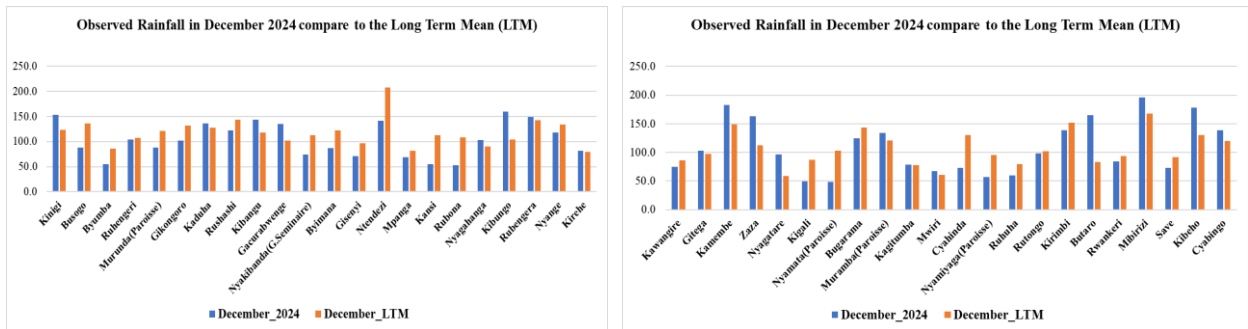
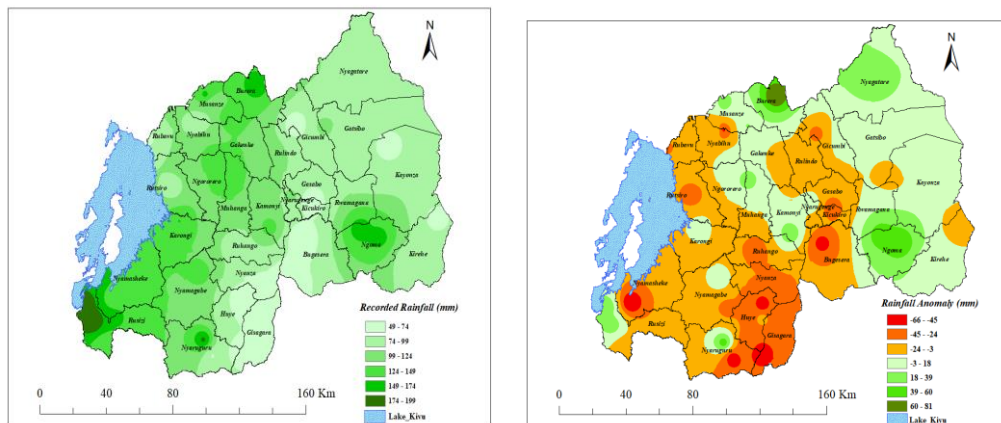


Figure 1 &2 above show rainfall performance during December 2024 and the deviation from the Long-Term Mean (LTM) for the same period.



Map1: Rainfall distribution of December 2024 Map2: December 2024 rainfall anomaly

3.3 Temperature analysis

Maximum and minimum temperatures were higher in most parts of the country compared to the Long-Term Mean (LTM). The lowest maximum temperature recorded was 20.9 °C at Kinigi weather



station in the Northern Province, while the highest maximum temperature recorded was 30.0 °C at Bugarama station in Western Province. The minimum temperature ranged between 11.1 °C at Busogo station in the Northern Province and 20.5 °C at Bugarama station in the Western Province. Generally, most parts of Kigali City, Eastern Province, Rusizi and Kamonyi Districts were warmer compared to other parts of the country, whereas Nyabihu and Musanze Districts were cooler compared to the remaining parts of the country (Map 3 and 4).

Figure 3 and 4 below show temperature deviation (anomalies) from the Long-Term Mean (LTM) in December 2024

Compared to the Long-Term Mean, the maximum temperature showed an increased trend over most parts of the country with Ntendezi and Byimana stations which increased by 1.8 °C in December 2024 while Kansi Station observed a decrease of 2.5°C. Concerning the minimum temperature; it was increased in numerous locations of the country with Kinigi station increased by 3.1°C, and with the exception of Mpanga station which decreased by 0.7 °C

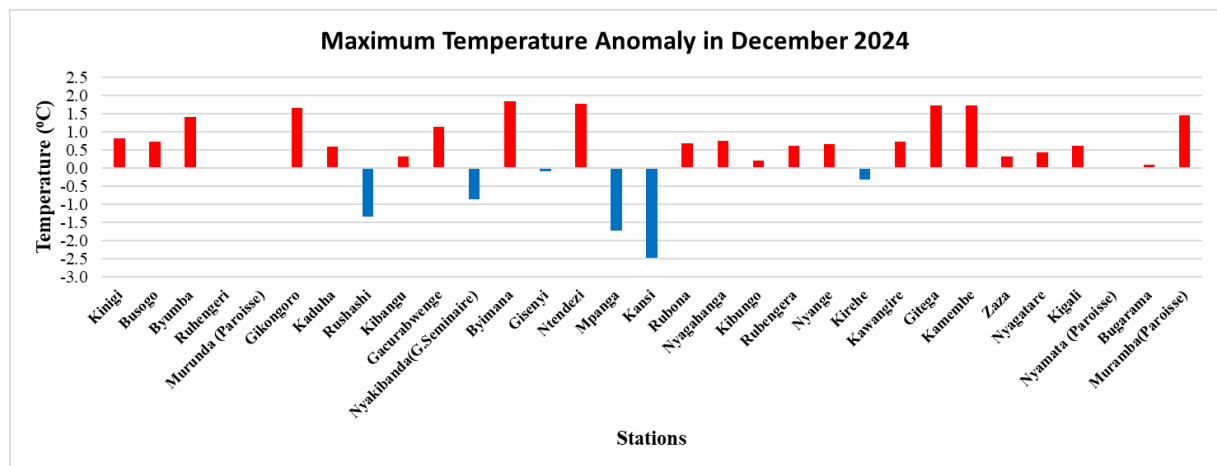


Figure 3 shows that the maximum temperature increased over many parts of the country during December 2024 compared to the Long Term Mean except in in few parts of Southern Province.

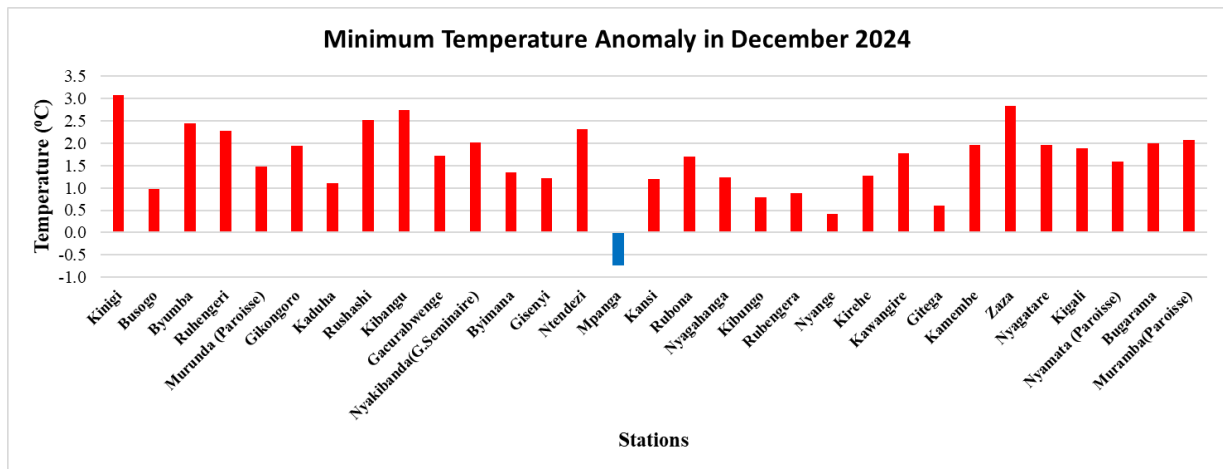
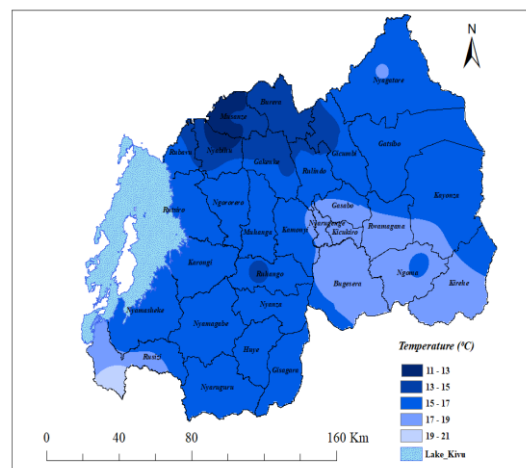
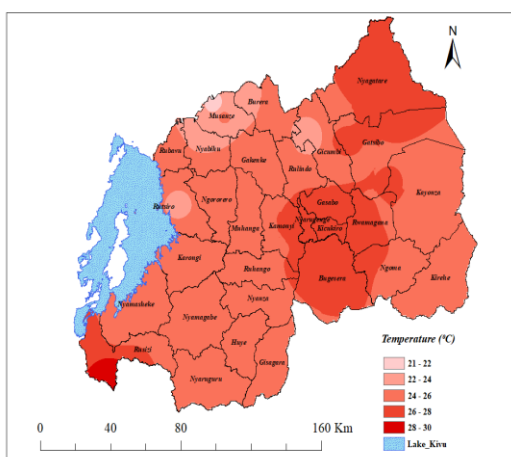


Figure 4 shows that the minimum temperature increased in most parts of the country during December 2024 compared to its Long Term Mean.



Map3: December 2024 Maximum Temperature Map4: December 2024 Minimum Temperature

4. Soil Moisture Index (SMI)

The soil moisture content increased over many parts during the first and second dekads of December 2024 due to the rainfall accumulation across the country while it decreased during third dekad. The soil moisture is expected to continue decreasing in January 2025, due to the reduction of expected rainfall.



5. Climate outlook for January 2025

For more information on January 2025 climate outlook click [here](#)

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed climatic conditions and the likely impacts in the forecasting period are illustrated below:

6.1 Impacts of observed climate condition.

The observed rainfall in December 2024 had a positive impact on the agriculture sector, particularly on pasture and crops that required water. In some areas of the country, negative effects such as crops damage and disaster related to the strong wind were observed.

6.2 Potential likely impacts for January 2025

Expected rainfall in January 2025 will be in the range of the Long-Term Mean (LTM) in many parts of the country, particularly in the first dekad. The soil moisture content is expected to decrease due to the reduction of rainfall, which may have some negative consequences, particularly for the agriculture and water sectors. Harvesting activities are also expected to benefit from this weather conditions.

N.B: This forecast should be used in conjunction with the Six hours, daily (24-hour), Three (3), Five (5) Seven (7) and 10 days' forecasts issued by the Rwanda Meteorology Agency (METEO RWANDA).