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Climatological Bulletin of November 2019

1. INTRODUCTION

This bulletin has three main components which are: (i) the review of climate conditions observed over Rwanda in November 2019, (ii) the prediction of the rainfall in December 2019 and (iii) the highlights on the socio-economic impact associated with the both observed and predicted climate conditions.

2. HIGHLIGHTS

- Rainfall performance in November : the accumulation of rainfall observed was above the LTM (Long-Term-Mean) in the most stations of the country, except in Busogo, Bugarama, Musanze and Kawangire.
- Rainfall during the December: it is expected to receive rainfall in all districts of the country and the amount ranging between 100 mm and 200mm.
- The impact associated with both observed and predicted climate conditions: the soil moisture is increasing and will continue to increase, which improve the pasture and foliage for livestock performance, while high rainfall might lead to final yield losses as we approach harvesting.

3. CLIMATE PATTERNS

This section provides the climatological summary for the rainfall and temperature in terms of amount for November 2019 and Rainfall performance as compared to the Long Term Mean over Rwanda.

3.1 Rainfall amounts in November 2019

During the month of November, rainfall amount recorded over Rwanda was ranging between 79.2.mm and 220.3mm. The Kigali city, Southern Province and some parts of Western province have received much rainfall compared to other provinces. The central region represented by Gitega and Kigali Aeroport weather stations of Kigali city recorded 220.3mm and 204.6mm respectively. Nyamagabe and Byimana station of the Southern Province received 204.8mm and 155.7mm respectively. The western province also received 206.6 over Rusizi, Rubavu 192.3mm, Rubengera 131.7mm and bugarama recorded 107.4mm. Gicumbi, Busogo and Musanze weather station of the Northern Province have received 170.4mm, 171.9mm and 111.3mm respectively.

The Eastern Province received the rainfall ranging between 79.2mm(over Kawangire), 137.4mm(over Nyagatare) and 176mm over Ngoma.

3.2 Rainfall performance as compared to the Long Term Mean

The the performance of the rainfall in the month of November 2019 shows that the cumulative rainfall over Rwanda was above as compared to the LTM (Long-Term Mean) in most part of the country, but for some part including Kawangire, Bugarama, Busogo and Musanze stations, the observed rainfall was below the long term mean.

The Table and histogram below indicate the rainfall performance as compared to the (Long Term Mean).

Stations	Nov_2019	Nov_LTM
Kigali	204.6	122.8
Rusizi	206.6	178.1
Rubavu	192.3	145.6
Nyamagabe	204.8	128.6
Ngoma	176	130.6
Gicumbi	170.4	125.5
Busogo	171.9	181.5
Bugarama	107.4	152.9
Musanze	111.3	153.3
Gitega	220.3	116.9
Rubengera	131.7	111
Byimana	155.7	129.5
Kawangire	79.2	147.7
Nyagatare	137.4	93.5

Table1: *Cumulative rainfall recorded as compared to the LTM*

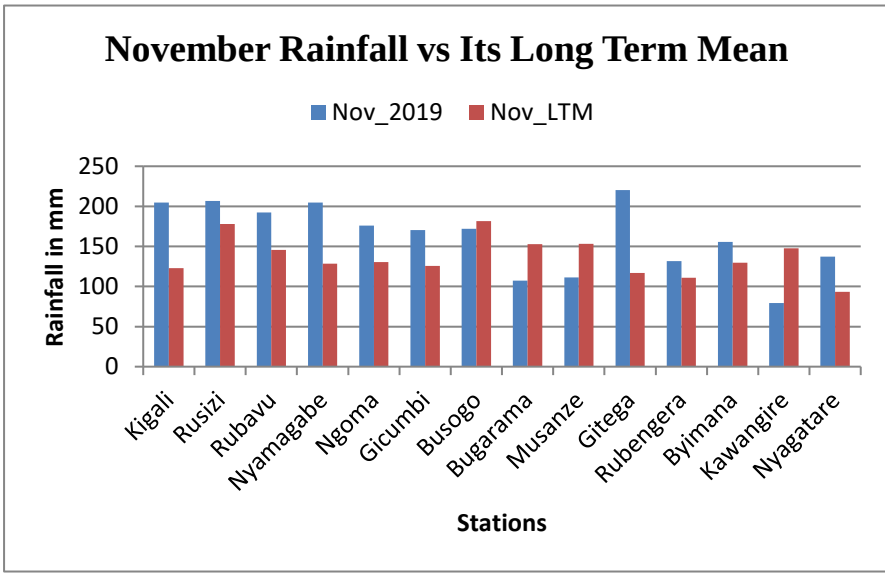


Figure1: *Rainfall performance as Compared to the LTM*

Figure 2& 3 above show rainfall distribution during November and the rainfall distribution for the same period in the long term .

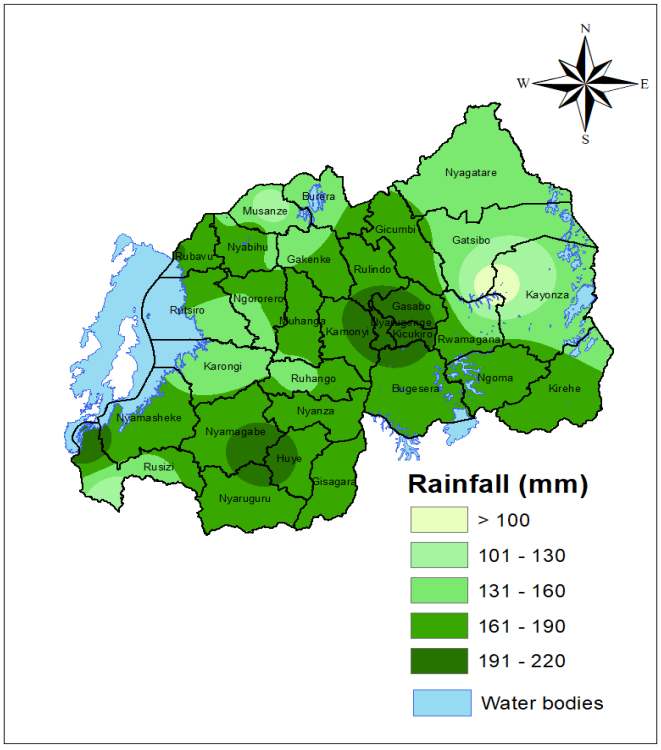


Figure2*: *Rainfall distribution of November 2019

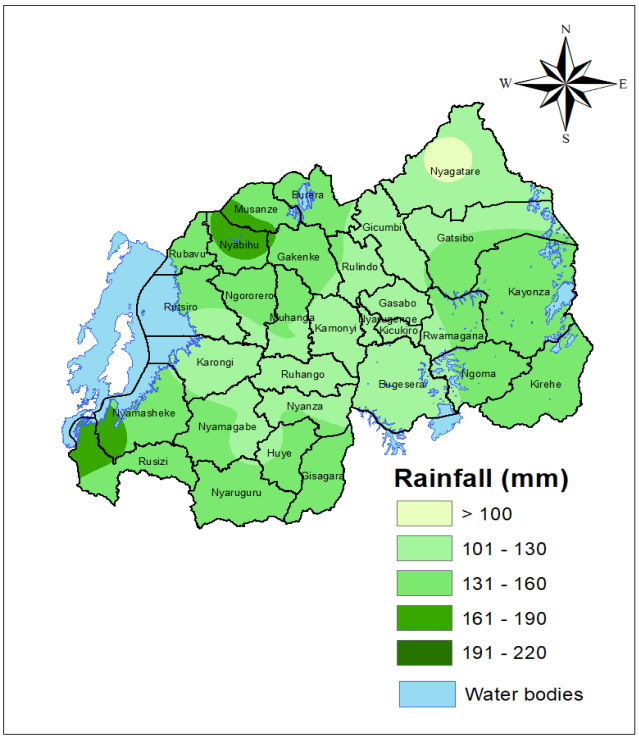


Figure3*: *Long Term Mean rainfall distribution

3.3 Temperature analysis

The highest average maximum temperature of 30.4^{0}C was observed in the Southwest region at Bugarama station. The lowest average maximum temperature was observed in the Northern Province at Gicumbi station with 21.0^{0}C.

The average of minimum temperature was ranging between 11.1 and 18.7^{0}C. The Northern and Southern provinces are cooler compared to the Eastern and Central regions and western provinces of the country (Figure 4 and 5).

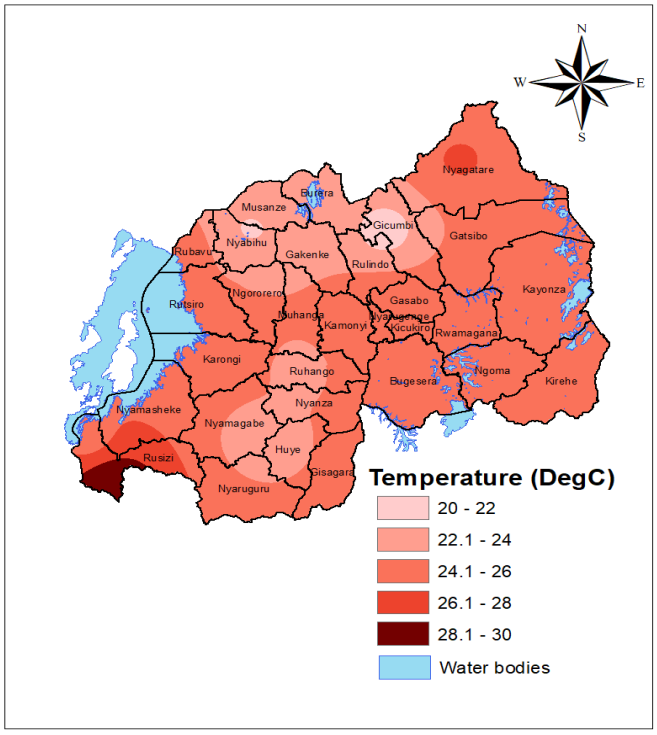


***Figure4**:November Maximum Temperature*

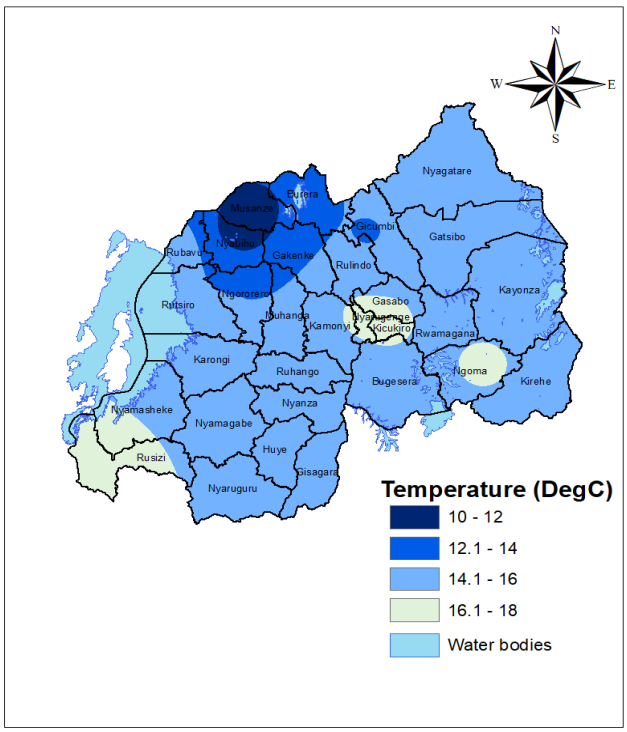
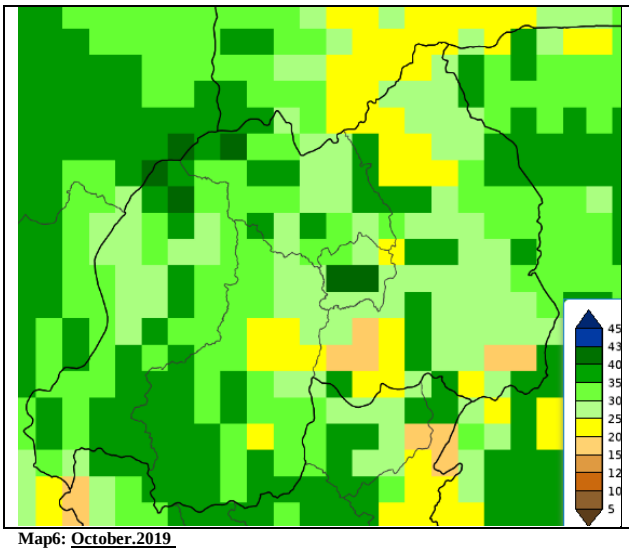


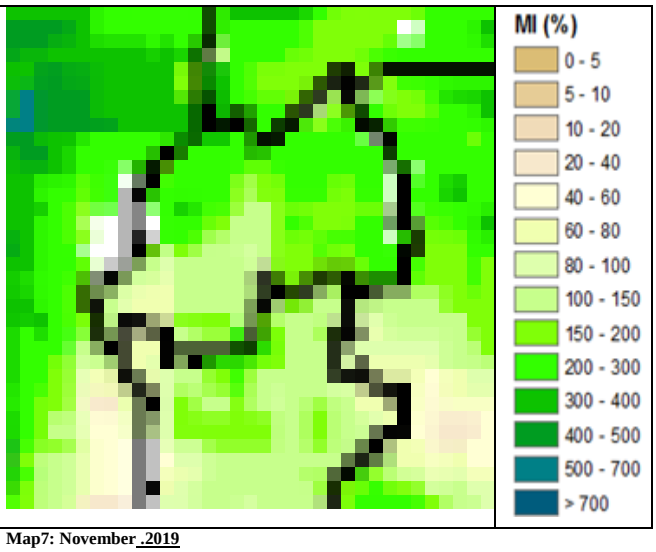
***Figure5**:NovemberMinimum Temperature*

4. Soil Moisture Index (MI)

Comparing the October and November soil moisture, the satellite derived moisture is showing that the soil moisture is increased and continues to increase as a result of the wet weather condition observed over the country. (see **Map6&7**).



Map6: October.2019



Map7: November .2019

5. Rainfall forecast for December

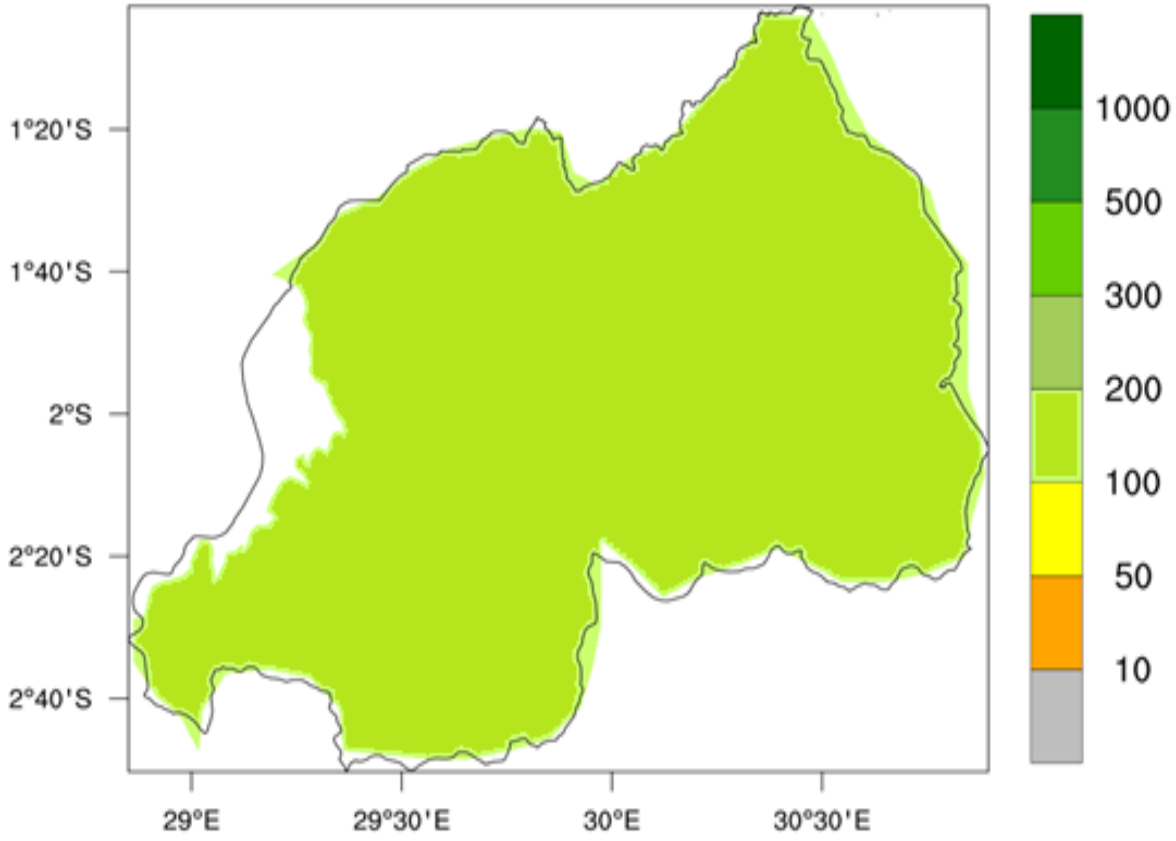


Figure 8: rainfall prediction for October

The rainfall during October 2019; in this period of thirty days, the rainfall is expected in all districts of Rwanda, the expected range will be between 100mm to 200mm

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socioe-conomic impacts associated with observed long term climatic conditions during the month of November are illustrated below:

6.1 Impacts of observed climate condition.

During this period of November, the rainfall accumulation was above the long term mean (LTM) in some parts of the country, and impacts associated with:

- Improved, pasture and foliage conditions;
- Floods in some areas

6.2 Potential likely impacts for the December 2019.

The areas expected to receive good rainfall are likely to have the following impacts:

- Improvement in pasture and foliage for livestock;
- Possible losses of final crop yield;
- Due to the expected enhanced rainfall in western and southern parts, the areas should be closely monitored for floods;
- Lightning strikes especially in the Western side of Congo Nil;
- Transmition of water related diseases.

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