

Some Applications of Climate Information



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FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

MINISTRY OF WATER AND ENERGY

ETHIOPIAN METEOROLOGY INSTITUTE

METEOROLOGICAL DATA AND CLIMATOLOGY LEAD EXECUTIVE

SEASONAL CLIMATE BULLETIN BEGA 2024/25

HIGHLIGHTS

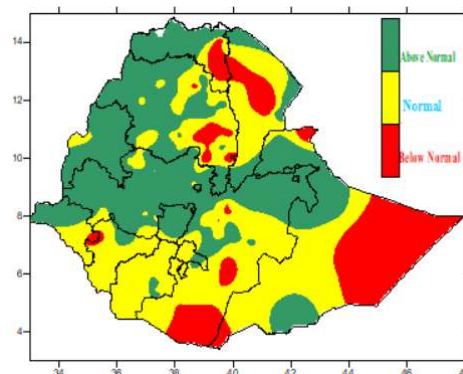
During Bega 2024/2025, days remained hot over North West, North East, West, and South East Parts of the Country. Extreme maximum temperature values exceeded 40 °C over Elidar, Gode, Dubti, Semera, Aysha, Gewane, Gode, Lare, Elidar, Gode, Gambella, Gode, Fugnido, Gambella, and Metema with values of 42.8, 42.2, 41.5, 40.6, 40.5, 40, 41.8, 41, 40.6, 41.7, 40.8, 41.8, 41.5, 40.6, and 40.4 °C .

On the other hand, the Northern, Central, and Western parts of the country experienced extremely low temperatures. Hence, The extreme minimum temperature values were as low as -1.8, 1, 1.2, 1.5, 2, 2, -2.8, -2, -0.4, 0, 0.2, 1, 1, 1, 2, 2, 2, 2, 2, -2, -1, -0.4, and 0.2 °C Over D/Birhan, jijiga, Sholagebaya, Wegeltena, Ambamariam, Bui, D/Brehan, Mehalmeda, Wegeltena, Jijiga, Alemaya, Debrezeit(Af), Bui, Sholagebaya, Adigrat, Arise Robe, Dangla, Debrawrek, Enewari, D/Birhan, Wegeltena, Alemaya, and Jijiga respectively.

The climate of this season is characterized by hot and dry days. The mean seasonal rainfall amount of this season is less than 450mm over much of the Bega-rain-benefiting areas. The seasonal total rainfall amount of Bega 2024/25 exceeded 450mm over the Western and South-Western parts of the country, such as Benishangul, and some tip areas of the Somalia region. And below 4500m in most parts of Afar, Tigray, Amhara, central Oromia, and the eastern parts of the Somali region.

In general, Bega 2024/25's seasonal rainfall was normal to above-normal over most parts of Tigray, Amhara, Oromia, and Gambella, and some parts of Afar, Somalia, Gambella, and SNNP. During Bega 24/2025's below normal rainfall amounts over some Areas of Tigray, Afar Oromia, and eastern parts of Somalia. During the season, most parts of Afar, Somalia, and Oromia and SNNP, as well as some parts of Tigray, Benishangul, and Somalia region experienced normal rainfall amounts.

Finally, during Bega 2024/25, most parts of northern, north eastern, north western, and eastern Ethiopia had wetter than the last year's Bega season, except some parts of the Amhara region. On the other hand, the southern, South Eastern and South western parts of the country were dry compared to last year's Bega season.



Percent of Normal Rainfall of Bega 2024/25

Foreword

The Ethiopian Meteorological Institute (EMI) prepares and disseminates this climate bulletin. It aims to provide climatological information to various community services involved in various socio-economic activities.

The information contained in this bulletin is believed to assist planners, decision-makers, and the community at large by providing details of the climatic conditions of the nation in each period.

This bulletin differs from the other real-time and near real-time bulletins issued by the Agency, which for their input depend only on meteorological stations equipped with single side band radio for data transmission. Though this bulletin is not real-time, published with a delay of some months, the information contained in this bulletin is based on data coming from a much larger number of meteorological stations. Moreover, the information contained in this bulletin is not sector-specific and a wide range of users can benefit from it.

The Agency disseminates monthly, seasonal, and annual climatological bulletins in which all necessary climatological information and significant climatic anomalies are highlighted.

We have a strong belief that various socio-economic activities related to planning disaster mitigation, water resources management, construction, environmental protection, transportation, recreation, tourism, and others will benefit most by the careful and continuous use of this bulletin. Meanwhile, your comments and constructive suggestions are highly appreciated to make the objectives of this bulletin a success.

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1. Introduction

1.1. General

This climate bulletin contains a summary of climatic conditions that prevailed over the country during Bega 2024/2025.

Bega is the period from October to January. It is a harvesting season for various parts of Ethiopia. Bega is normally a dry season characterized by cool nights and early mornings over the highlands of northern, northeastern, central and eastern Ethiopia and hot days over various parts of the country. It is also a short rainy season for places over southern, southeastern and southwestern parts of the country. Depending on the influences from midlatitude rain-bearing systems, some places over central, northern and northeastern Ethiopia also receive occasional shower. However, except over places of north & South Wollo, north Shoa and the adjoining areas, the long-term mean seasonal rainfall of these areas is less than 100mm, while the mean seasonal rainfall amount exceeds 100 mm over the seasonal rain benefiting areas of western, southwestern, southern and southeast Ethiopia..

1.2. Summary of Bega 2024/2025

On the other hand, the Northern, Central, and Western parts of the country experienced extremely low temperatures. Hence, The extreme minimum temperature values were as low as -1.8, 1, 1.2, 1.5, 2, 2, -2.8, -2, -0.4, 0, 0.2, 1, 1, 1, 2, 2, 2, 2, -2, -1, -0.4, and 0.2 °C Over D/Brehan, jijiga, Sholagebaya, Wegeltena, Ambamariam, Bui, D/Brehan, Mehalmeda, Wegeltena, Jijiga, Alemaya, Debrezeit(Af), Bui, Sholagebaya, Adigrat, Arise Robe, Dangla, Debrawrek, Enewari, D/Brehan, Wegeltena, Alemaya, and Jijiga respectively.

The climate of this season is characterized by hot and dry days. The mean seasonal rainfall amount of this season is less than 450mm over much of the Bega-rain-benefiting areas. The seasonal total rainfall amount of Bega 2024/25 exceeded 450mm over the western and South-Western parts of the country, such as Benishangul, and some tip areas of the Somalia region. And below 4500m in most parts of Afar, Tigray, Amhara, central Oromia, and the eastern parts of the Somali region

1.3. Surface

During October 2024, the Mascarene high with a mean central pressure value of above 1020 hPa was centered at about 32°S, 75°E. In the next month of the season, November 2024, the mean central pressure value was above 1020hPa and was centered at about 38°S, 80°E. In the following month the mean central pressure value was above 1020hPa and was centered at about 30°S, 80°E and finally the last month of Bega 2024/2025 a mean central pressure value of above 1020hPa was centered at about 35°S, 15°.

During October 2024, St. Helena's high with a mean central pressure value of above 1020hPa was centered at about 40°S, 30°E. In the next month of the season November 2024, the mean central pressure was situated at about 35°S, 10°W ° and in the following next month' the mean central pressure value of above 1020hPa was centered at about 35°S, 5°W and finally, during the last month of the Bega 2024/2025 the mean central pressure value of above 1020hPa was centered at about 35°S, 3°W.

During October 2024, the Azores' high with a mean central pressure value of 1010hPa was centered at about 32°N, 9°W, and in the next month of the season November 2024 the mean central pressure value of above 1020hPa was centered at about 28°N, 10°E and in the next month' the mean central pressure value of above 1020hPa was centered at about 25°N, 5°E and finally in the last month of Bega 2024/2025 the

mean central pressure value of above 1020hPa was centered at about 26°N, 10°E..

1.4. Lowertroposphere (850 hPa vector wind)

During the first month of Bega, 2024/2025, the cross-equatorial and easterly flow of below 0 to 8m/s was observed over the western Indian Ocean and easterly flow was dominant over the Arabian Peninsula. In the next month, the cross-equatorial and westerly flow of below 0 to 12m/s was flowing from the Arabian Peninsula to the Africa continent. Then in the month of December, the northeasterly flow of below 0 – 12 m/s was observed over the western Indian

Ocean, and easterly and northeasterly flows were dominant over the Arabian Peninsula. In the last month, the northeasterly flow of below 0 – 12 m/s was observed over the western Indian Ocean, and easterly flow was dominant over the Arabian Peninsula.

1.5 Middle Troposphere (500-hpa Geopotential Height)

During October 2024, the variation of geopotential height values was 3 to 9 gpm over central and eastern Africa. During November 2024, geopotential height values were 3 to 9 gpm. In January 2025, the last month of the season, the variation of geopotential height values was 3 to 12 gpm over central and eastern Africa.

1.6 Upper Troposphere (200 hp a vector wind)

During October 2024, Easterly flow associated with the Subtropical Northerly flow had a speed of the core 0-15 m/s along 5 to 15 °N latitude. During November 2024, it was the same as the previous month. In the next month, iDecember 2025, Easterly flow associated with the Subtropical Northerly flow had 0-15 m/s along 0 to 10 °N. January 2025 is the last month of the season and an Easterly flow associated with the Subtropical Northerly flow had a speed of the core 0-10 m/s along 0 to 10°N latitude

2. Atmospheric Highlights

During October 2024, sea surface temperatures (SSTs) remained near average across most of the equatorial Pacific. The latest monthly Niño indices were -0.3°C for the Niño 1+2 region, -0.3°C for the Niño 3.4 region and +0.1°C for the Niño 4 region. The depth of the oceanic thermocline (measured by the depth of the 20°C isotherm) was below average across the equatorial Pacific. The corresponding sub-surface temperatures were 1-4°C below average in the eastern equatorial Pacific.

During November 2024, sea surface temperatures (SSTs) remained near average across most of the equatorial Pacific. The latest monthly Niño indices were +0.3°C for the Niño 1+2 region, -0.1°C for the Niño 3.4 region, and

+0.1°C for the Niño 4 region. The depth of the oceanic thermocline (measured by the depth of the 20°C isotherm) was below average across the equatorial Pacific. The corresponding sub-surface temperatures were 1-3°C below average in the eastern equatorial Pacific.

During December 2024, sea surface temperatures (SSTs) were below-average across the central and east-central equatorial Pacific. The latest monthly Niño indices were -0.1°C for the Niño 1+2 region, -0.6°C for the Niño 3.4 region and -0.4°C for the Niño 4 region. The depth of the oceanic thermocline (measured by the depth of the 20°C isotherm) was below-average across the central and eastern equatorial Pacific. The corresponding sub-surface temperatures were 1-4°C below average in the eastern equatorial Pacific.

During January 2025, sea surface temperatures (SSTs) were below-average across the central and east-central equatorial Pacific. The latest monthly Niño indices were -0.2°C for the Niño 1+2 region, -0.7°C for the Niño 3.4 region, and -0.6°C for the Niño 4 region. The depth of the oceanic thermocline (measured by the depth of the 20°C isotherm) was below average across the central and eastern equatorial Pacific. The corresponding sub-surface temperatures were 1-5°C below average in the eastern equatorial Pacific.

Reference: NOAA, Climate Diagnostic Bulletin

3. Weather

3.1. Temperature

During Bega 2024/2025, days remained hot over North West, North East, West, And South East parts of the Country (Fig. 4.2.2). Extreme maximum temperature values exceeded 40 °C over Elidar, Gode, Dubti, Semera, Aysha, Gewane, Gode, Lare, Elidar, Gode, Gambella, Gode, Fugnuido, Gambella, and Metemawith with values of 42.8, 42.2, 41.5, 40.6, 40.5, 40, 41.8, 41, 40.6, 41.7, 40.8, 41.8, 41.5, 40.6, and 40.4 on the table (Table 4.1.1).

On the other hand, the Northern, Cntral, and Western Parts of The Country experienced extremely low temperatures recorded. Hence, The Extreme Minimum Temperature Values Were As Low As -1.8, 1.2, 1.5, 2, 2, -2.8, -2,

-0.4, 0, 0.2, 1, 1, 1, 2, 2, 2, 2, 2, -2, -1, -0.4, and 0.2 °C Over D/Brehanjijiga, Sholagebaya, Wegeltena, Ambamariam, Bui, D/Brehan, Mehalmeda, Wegeltena, Jijiga, Alemaya, Debrezeit(Af), Bui, Sholagebaya,, Adigrat, Arise Robe, Dangla, Debrawrek, Enewari, D/Brehan, Wegeltena, Alemaya, and Jijiga, respectively.

In general, the seasonal average temperature values were warmer than normal in northern, northwestern, western, north eastern, southern, and southeastern parts of the country rather ome parts of north, easternmost, eastern, and central parts of the country were cooler than normal (Fig. 4.2.5)

Table 4.1.1 Stations with extreme maximum temperature values of greater than 40 °C during Bega 2024/2025

Name	Month	Date	Amount
Elidar	Oct 2024	22	42.8
Gode	Oct 2024	1	42.2
Dubti	Oct 2024	5	41.5
Semera	Oct 2024	23	40.6
Aysha	Oct 2024	20	40.5
Gewane	Oct 2024	23	40
Gode	Nov 2024	30	41.8
Lare	Nov 2024	7	41
Elidar	Nov 2024	20 / 26	40.6
Gode	Dec 2024	2	41.7
Gambella	Dec 2024	30	40.8
Gode	Jan 2025	31	41.8
Fugnuido	Jan 2025	20	41.5
Gambella	Jan 2025	21	40.6
Metema	Jan 2025	30	40.4

Table 4.1.2 Stations with extreme minimum temperature values less than or equal to 2 °C during Bega 2024/2025.

St. Name	Month	Date	Extr. Tmin (°C)
D/Brehan	Nov 2024	16	-1.8
Jijiga	Nov 2024	15	1
Sholagebaya	Nov 2024	28	1.2
Wegeltena	Nov 2024	16	1.5
Ambamariam	Nov 2024	21	2
Bui	Nov 2024	17	2
D/Brehan	Dec 2024	31	-2.8
Mehalmeda	Dec 2024	31	-2

St. Name	Month	Date	Extr. Tmin (°C)
Wegeltena	Dec 2024	31	-0.4
Jijiga	Dec 2024	19	0
Alemaya	Dec 2024	21	0.2
Debrezeit(Af)	Dec 2024	13	1
Bui	Dec 2024	30	1
Sholagebaya	Dec 2024	5	1
Adigrat	Dec 2024	12	2
Arise Robe	Dec 2024	14	2
Dangla	Dec 2024	9	2
Debrawrek	Dec 2024	8	2
Enewari	Dec 2024	5	2
D/Brehan	Jan 2025	1	-2
Wegeltena	Jan 2025	1	-1
Alemaya	Jan 2025	20/21	-0.4
Jijiga	Jan 2025	19	0.2
Mehalmeda	Jan 2025	20	0.5
Debrezeit(Af)	Jan 2025	18/21	1
Sholagebaya	Jan 2025	1	1
Bui	Jan 2025	18	2
Arise Robe	Jan 2025	6	2.5
Bati	Jan 2025	18	2.6
Dangla	Jan 2025	27	3

4.1 Rainfall

Normally, Bega is a dry season in most parts of the country. During this time, scattered and sporadic rainfall may occur overnortheastern, eastern, central, and southern lowlands s. This period is marked by heavy fog and external disturbances in some parts of the country.

The climate of this season is characterized by hot and dry days. The mean seasonal rainfall amount of this season is less than 450mm over much of the Bega-rain-benefiting areas. The seasonal total rainfall amount of Bega 2024/25 exceeded 450mm over the western and south-western parts of the country, such as Benishangul, and some tip areas of the Somalia region. And below 450mm in most parts of Afar, Tigray, Amhara, central Oromia, and the eastern parts of the Somali region. In particular, the seasonal total rainfall exceeds 450 mm in Gatira, Arjo, Aman, Chira, Chagini, Masha, Bure, Sawula, Bullen, and Borewith amounts of 617.6, 523.4, 473.2, 466.8, 463, 462.1, 443.1, 419.9, 414, and 406. respectively.

In general, Bega 2024/25's seasonal rainfall was normal to above-normal over most parts of Tigray, Amhara, Oromia, and Gambella, and some parts of Afar, Somalia, Gambella, and SNNP. During Bega 2024/2025 below normal rainfall amounts observed over some areas of Tigray, Afar Oromia, and eastern parts of Somalia. During the season, most parts of Afar, Somalia, and Oromia and SNNP, as well as some parts of Tigray, Benishangul, and Somalia region, recorded normal rainfall amounts Finally, during Bega 2024/25, most parts of northern, north eastern, north western, and eastern Ethiopia had wetter than last year's Bega season, except some parts of the Amhara region. On the other hand, the Southern. South eastern and south western parts of the country were dry compared the last year's Bega season.

Table 4.2.1. Station(s) with more than or equal to 400 mm of total rainfall during Bega 2024/25

Name	Amount
Gatira	617.6
Arjo	523.4
Aman	473.2
Chira	466.8
Chagini	463
Masha	462.1
Bure	443.1
Sawula	419.9
Bullen	414
Bore	406.7

Name	Month	Date	Amount
Mankush	Oct	9	84.6
Majji	Oct	5	84.3
Bui	Oct	30	78.8
Ginir	Oct	1	75.6
Mehalmeda	Oct	22	74
Fugnuido	Oct	1	73.6
Gelemso	Oct	31	71.2
Bure	Oct	5	67.5
Algie	Oct	1	66
Meisso	Oct	8	62
Bahir Dar Met	Oct	30	61.4
Werabe	Nov	1	96
Bure	Nov	2	77.5
Metehara (NMSA)	Nov	22	75.8
Ginir	Nov	1	64
Awash Arba	Nov	2	60
Aykel	Dec	4	60

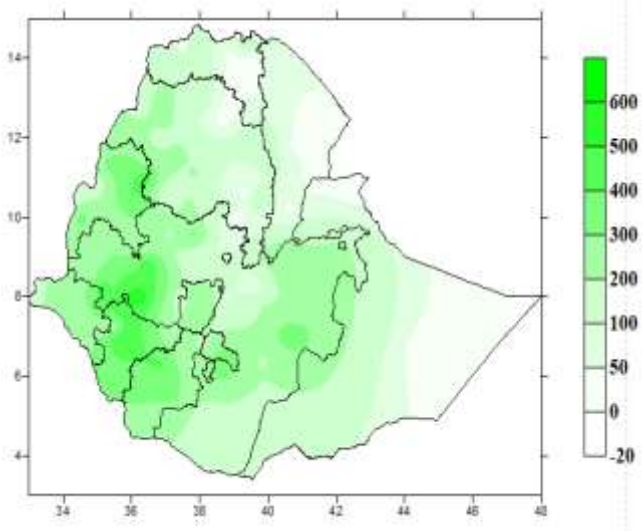


Fig. 4.2.1. Seasonal total rainfall in mm during Bega 2024/25.

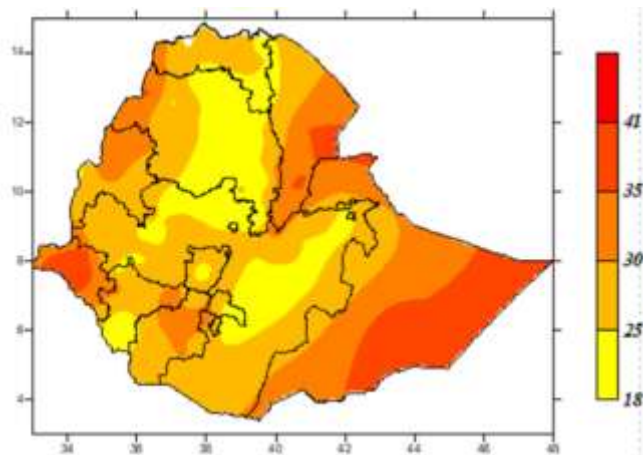


Fig. 4.2.2. Mean maximum temperature in °C During Bega 2024/25.

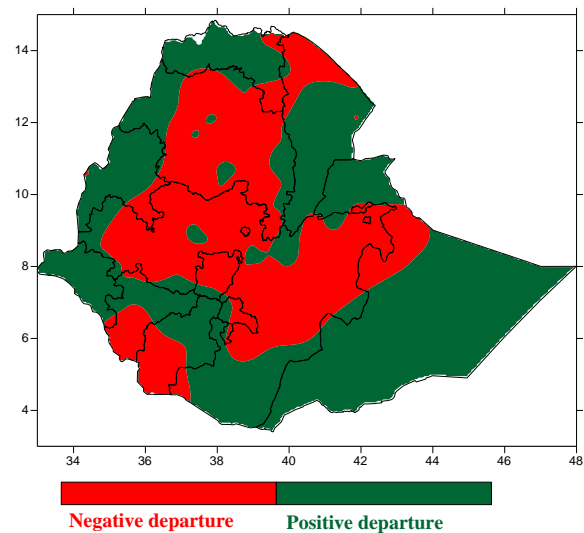


Fig 4.2.5. Seasonal temperature of Bega 2024/25 minus seasonal LTM of Bega.

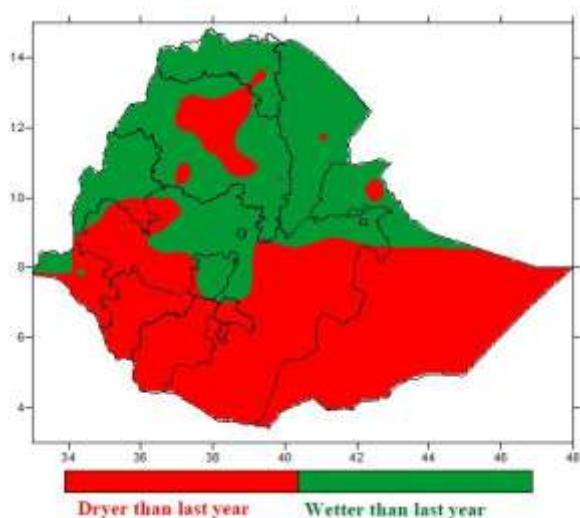


Fig. 4.2.3 Seasonal total rainfall of Bega 2024/25 minus seasonal total rainfall of Bega 2023/2024.

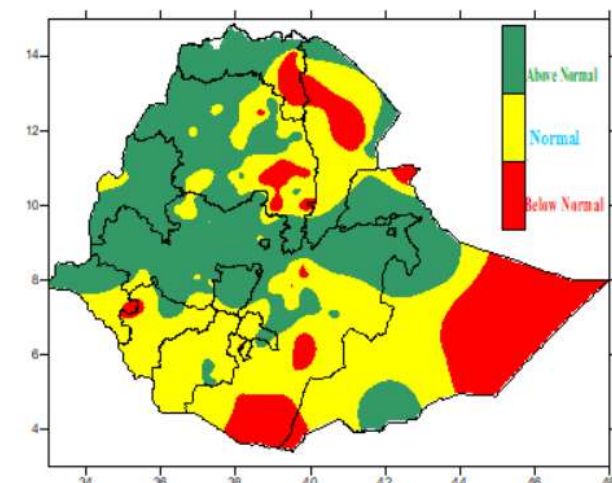
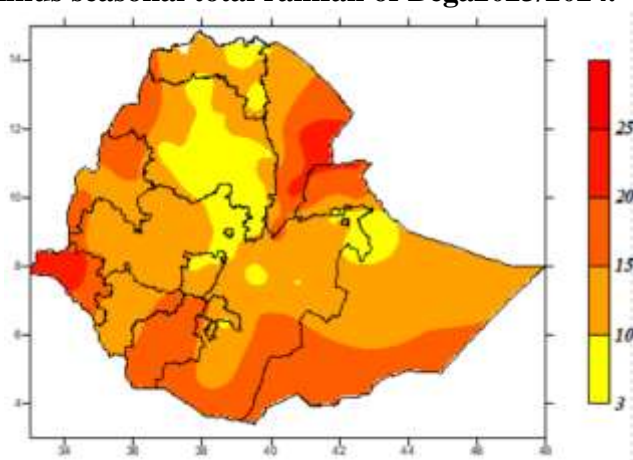


Figure. 4.2.6. Percent of normal rainfall during Bega 2024/25



4.2.4 Mean minimum temperature in °C during Bega 2024/2025.