FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
ETHIOPIA METEOROLOGY INSTITUTE
METEOROLOGICLA DATA AND CLIMATOLOGY
REMOTE SENSING AND CLIMATOLOGY DESK

MONTHLY CLIMATE BULLETIN

December 2023

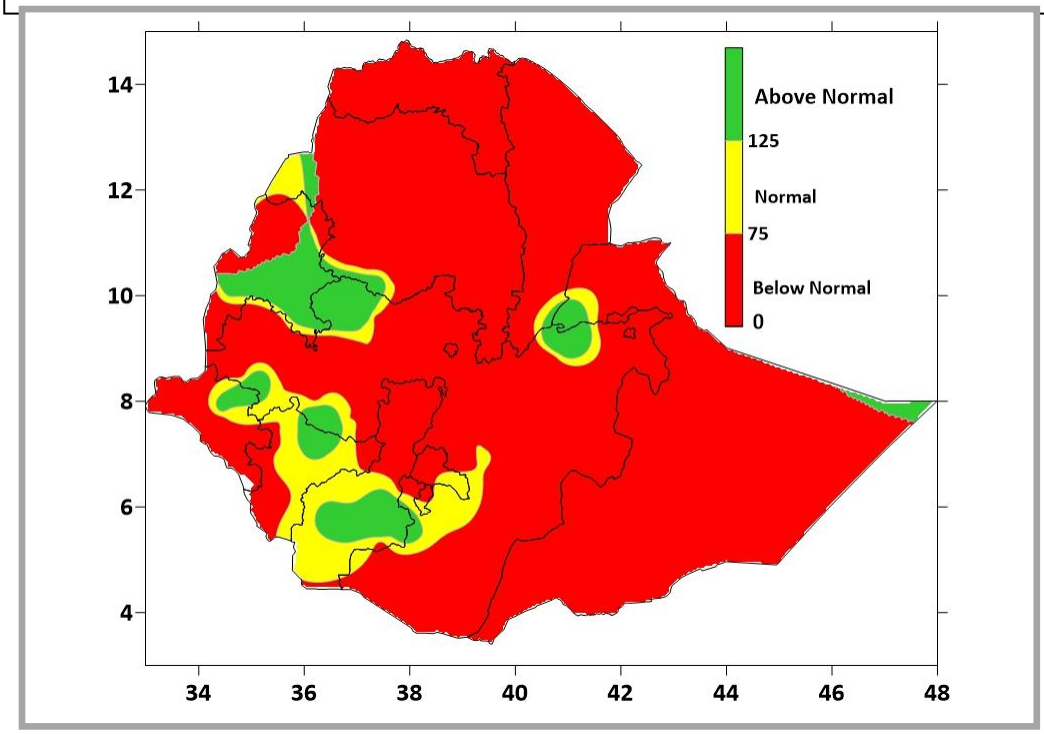
Some Applications of Climate Information

HIGHLIGHTS

During December 2023, days were remained hot over several portions of the country for instance Afar, Somale, Western Amhara, Northern Benishangule gumuz and Gambela. In particular, the extreme maximum temperature values were as high as 44.0, 40.6, 39.0, 38.4, 38.2oc over Gode, Elidar, Fugnuido, Abobo, and Metehara, respectively.

December is the third month of the dry season of Ethiopia. Hence, the monthly average rainfall doesn't exceed 50mm over most parts of the country, except over Southern and Southwestern Ethiopia. The monthly total rainfall amount of December 2023 had also exceeded 60 mm over southwestern Ethiopia and some pocket parts western Oromia. In particular, the monthly total rainfall values of December 2023 were as high as 70mm over Gidaayana, Arbaminch, Chira and Jinka. Besides, the daily rainfall values over Chira, Arbaminch and Gidaayana were as high as 45.2, 46.8 and 72.0 mm on the 27th , 31th, and 14th, of 2023 December respectively..

In general, the monthly total rainfall amount of December 2023 was normal to below normal over much areas of the country except over south and southwestern parts of the country, some parts of Benishangulgumuz and western Oromia. December 2023 was generally drier than December 2022 over the country except over some pocket parts of the country.



Percent of normal rainfall of November 2022

☎ 011 661 57 79 ✉ 1090 Fax 011 551 70 66 E-mail nmsa@ethionet.et Web: www.ethiomet.gov.et

Foreword

This climate bulletin is prepared and disseminated by the Ethiopian Meteorological Institute (EMI). It is aimed at providing climatological information to different services of the community involved in various socio-economic activities and giving some highlights about major synoptic situations.

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

This bulletin differs from the other real time and near real time bulletins issued by the Institute, 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 Institute 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 be benefited 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.

Fetene Teshome
Director General
Ethiopian Meteorological Institute
P.O.Box 1090
Tel: - +251-11-558-56-00/+251-11-551-22-99
Fax: - +251-11-552-8713/+251-11-558-7910
E-mail: nma1@ethiomet.gov.et
Addis Ababa

1. Synoptic Situation

1.1 Surface

The St. Helena high with a mean central pressure value of 1020hPa was centered at about 35°S, 95°E.

The Mascarene high with a mean central pressure value of 1020hPa was centered at about 32°S, 8°W.

The Azores high with a mean central pressure value of 1018hPa was centered at about 36°N, 20°W.

1.2 Lower Troposphere (850 hPa vector wind)

Week cross-equatorial and southeastern flow of above 4 to 12m/s was observed over northern and western Indian Ocean, Arabian Sea and the adjoining areas of the Horn of Africa.

1.3 Middle Troposphere (500-hPa Geo-potential height)

The geopotential height values were below normal to near normal over Mediterranean and red Sea.

1.4 Upper Troposphere (200 hPa vector wind)

The westerly wind, associated with the subtropical westerly jet, had strengthened further, while the upper level easterly flow, associated with the tropical easterly jet weakened further.

2. Tropical Oceanic and Atmospheric Highlights

During December 2023, sea surface temperatures (SSTs) remained well above-average across the central and eastern equatorial Pacific. The latest monthly Nino indices were +1.4C for the Nino 1+2 region, +2.0C for the Nino 3.4 region and +2.1C for the Nino 3 region. The depth of the oceanic thermocline (measured by the depth of the 20C isotherm) was above-average across the central and eastern equatorial Pacific. The corresponding sub-surface temperatures were 1-5C above-average in the far eastern equatorial Pacific.

Also during December, the lower-level wind anomalies were westerly over much of the central and eastern equatorial Pacific, while the upper-level wind anomalies were easterly over the eastern equatorial Pacific. Meanwhile, tropical convection was enhanced around the Date Line and suppressed over Indonesia. Collectively, these oceanic and atmospheric anomalies were consistent with strong El Nino conditions.

Reference: NOAA, Climate Diagnostic Bulletin of December 2023

3. Weather

3.1 Temperature

During December 2023, days were remained hot over several portions of the country for instance Afar, Somale, Western Amhara, Northern Benishangule gumuz and Gambela (Fig. 3.1.1). In particular, the extreme maximum temperature values were as high as 44.0, 40.6, 39.0, 38.4, 38.2^{o}c over Gode, Elidar, Fugnuido, Abobo, and Metehara, respectively (Table 3.1.1).

On the other hand, the extreme minimum temperature values were below 5°c over some highland parts of Amhara and Central pocket area of Oromia.

In particular, Bui, Sholageba, Haromaya and Debre Brehan had extreme minimum temperature values of below 3^{o}c during the month of December 2023 (Table 3.1.2).

In General, the monthly average temperature values were above normal over most parts of the country (Fig. 3.1.3).

Table 3.1.1 Stations with extreme maximum temperature values of greater than or equal to 38^0c during December 2023

Stations	Extreme maximum temperature	Date
Gode	44	24
ABOBO	38.4	26,29
DALIFAGI	38	26,27
ELIDAR	40.6	23
FUGNUIDO	39	18
GAMBELLA	38	24
Kibridahar	38	8
METEMA	38.2	22

Table 3.1.2 Stations with extreme minimum temperature values of below or equal to 5^oc during December 2023

Stations	Extreme Minimum temperature	Date
DEBREZEIT(AF)	4.0	26
ALEMAYA	2.0	2
AMBAMARIAM	3.8	17
ARISE ROBE	3.0	6
Bui	0.3	4
DANGLA	4.0	13
DEBARK	3.6	14
D/BREHAN	2.2	5
MEHALMEDA	2.8	9
SHOLAGEBAYA	1.0	18

3.2 Rainfall

December is the third month of the dry season of Ethiopia. Hence, the monthly average rainfall doesn't exceed 50mm over most parts of the country, except over Southern and Southwestern Ethiopia.

The monthly total rainfall amount of December 2023 had also exceeded 60 mm over southwestern Ethiopia and some pocket parts western Oromia. In particular, the monthly total rainfall values of December 2023 were as high as 70mm over Gidaayana, Arbaminch, Chira and Jinka. Besides, the daily rainfall values over Chira, Arbaminch and Gidaayana were as high as 45.2, 46.8 and 72.0 mm on the 27^{th} , $31^{th,}$ and $14^{th,}$ of 2023 December respectively. (Tables 3.2.1).

In general, the monthly total rainfall amount of December 2023 was normal to below normal over much areas of the country except over south and southwestern parts of the country, some parts of Benishangulgumuz and western Oromia (Fig. 3.2.2). December 2023 was generally drier than December 2022 over the country except over some pocket parts of the country (Fig. 3.2.3).

Table 3.2.1. Stations with more than 30 mm of rainfall in 24 hours during December 2023

Stations	Amount(mm)	Date
Arba Minch	46.8	31
BURJI	33.0	13
CHIRA	45.2	27
GIDAAYANA	72.0	14
Jinka	42.1	30
MEISSO	33.0	24

Table 3.2.2. Stations with more than 60 mm of monthly total rainfall during December 2023

Stations	Amount(mm)
ARBA MINCH	89.7
AMAN	68.8
CHIRA	109.1
GIDAAYANA	72.0
JINKA	125.4
MASHA	67.5

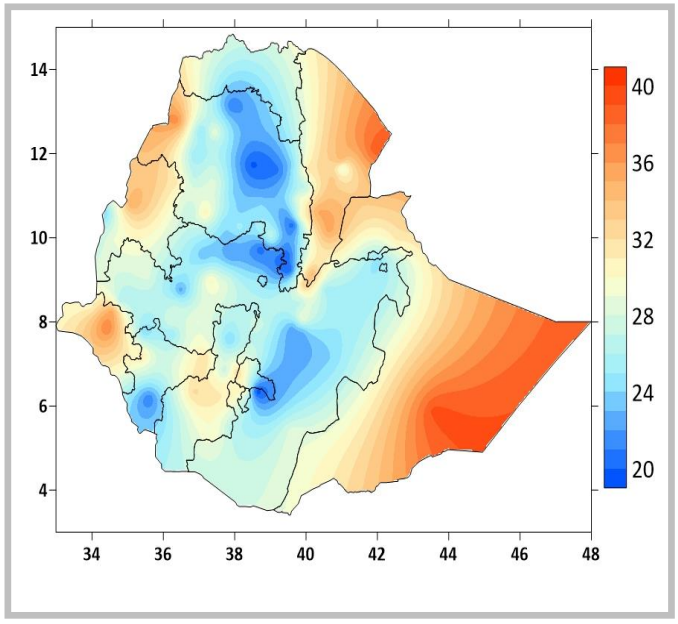


Fig. 3.1.1. Extreme maximum temperature in ^{o}c during December 2023

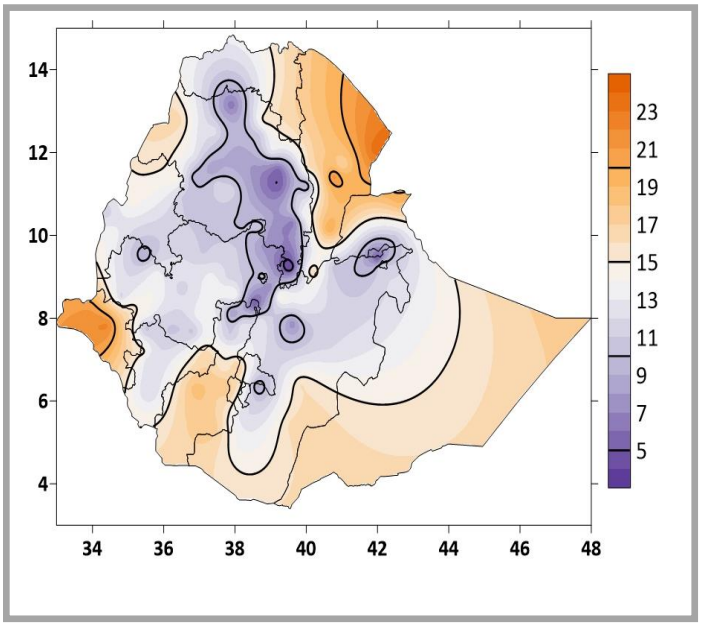


Fig. 3.1.2. Extreme minimum temperature in ^{o}c during December 2023

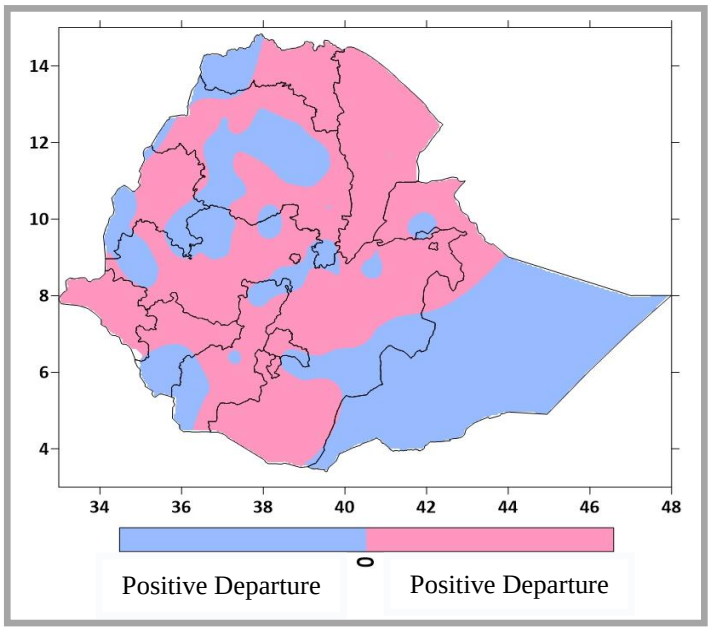


Fig.3.1.3. Departure of monthly average temperature from normal during December 2023

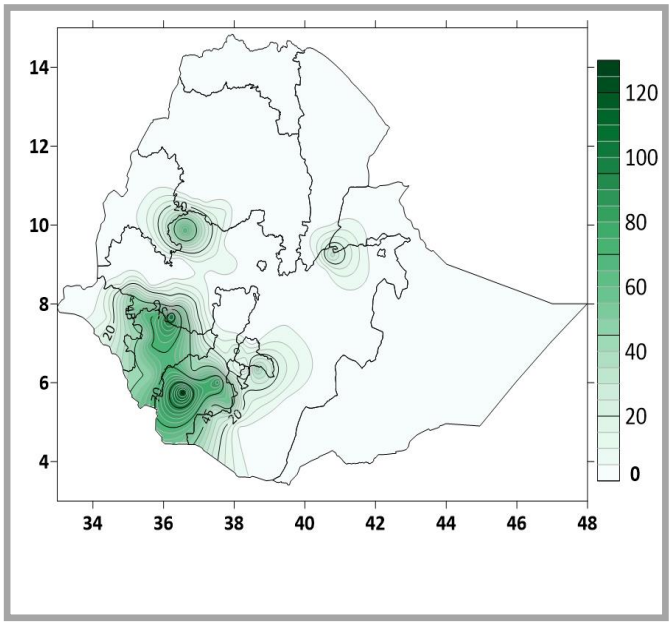


Fig.3.2.1. Monthly total rainfall in mm during December 2023

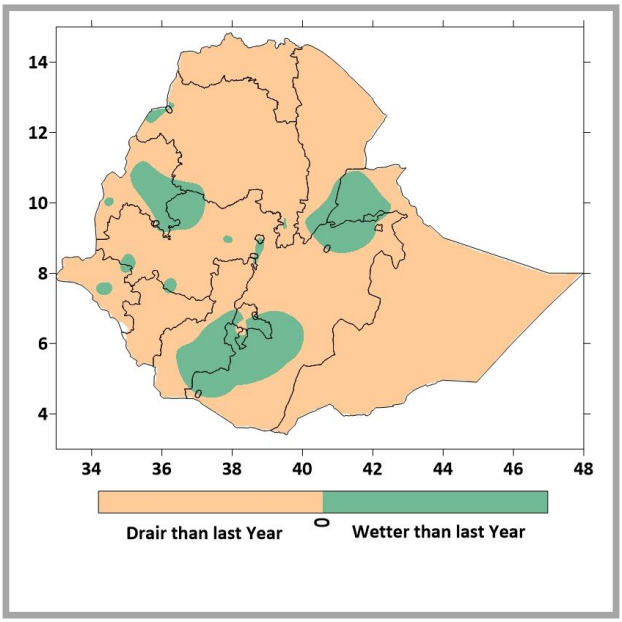


Fig. 3.2.3. Monthly total rainfall of December 2023 minus monthly total rainfall of December 2022

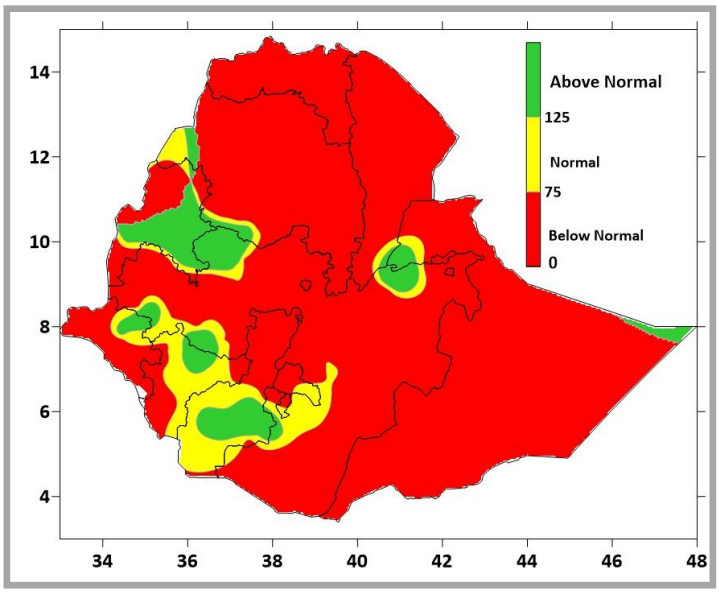


Fig. 3.2.2. Percent of normal rainfall during December 2023