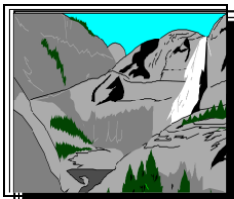


FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
ETHIOPIAN METEOROLOGICAL INSTITUTE
METEOROLOGICAL DATA AND CLIMATOLOGY LEAD EXECUTIVE
REMOTE SENSING AND CLIMATOLOGICAL DESK
SEASONAL CLIMATE BULLETIN FOR KIREMT 2024

*Some Applications
of Climate Information*



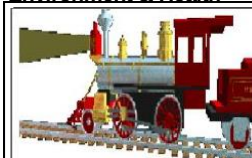
Disaster Management



**Water Resources
Management**



Environment & Health



Transport



Recreation & Tourism

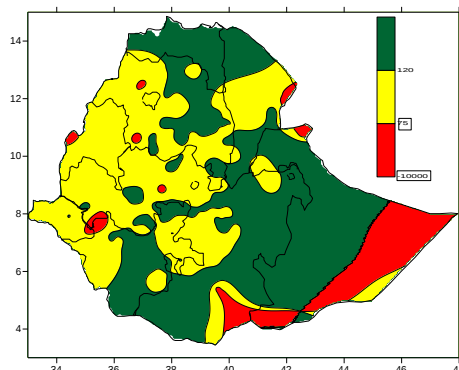
HIGHLIGHTS

Normally Kiremt is the wet season for Kiremt- rain-benefiting areas of western, central, northwestern, and southwestern Ethiopia. The climate of this season is characterized by cold and wet days. The seasonal rainfall amount of this season exceeds 1250 mm over much of the Kiremt-rain-benefiting areas with larger amounts of rainfall occurring over western, Central, and North-Western Ethiopia. The seasonal total rainfall amount of Kiremt 2024 exceeded 1250 mm over Benishangul, southernmost of the Amhara region, central-western Tigray and Gambela, the western part of SNNPR, and parts of western Oromia.

During Kiremt 2024, days remained hot over Southeast, northeastern and western parts of Ethiopia. In particular, extreme maximum temperature values exceeded 40.0oC over Dire Dawa, Metehara, Awash Arba, Aysha, Chifra, Dalifagi, Elidar, Gewane, Semera, Gode, Awash Arba, Aysha, Elidar, Gewane, Semera, Elidar, Gode, Semera, Aysha, Elidar, Gode, and Semera

The extreme minimum temperature values were as low as 6. 5.4, 5, 4, 5.2, 4.4, 3.1, 5.8, 4.8, 4.7, 4, 5, 4.8, 4.2, 4, and 3 in °C over Alemketema, Ambamariam, over Sholagebaya, Bui, Alemketema, Ambamariam, Sholagebaya, Alemketema, Ambamariam, Bui, Sholagebaya,, Alemketema, Ambamariam, D/Brehan, Mehalmeda, and Sholagebaya

In general, the seasonal rainfall amount of Kiremt 2024 was below normal over Gambela, Benishangul, and Amhara regions, northern and northwestern Benishangul Gumuz, some parts of northern Tigray, pocket area of SNNP, Oromia, and Afar regions. In most parts of Somalia, southeastern parts of SNNPRs, southern parts of Oromia, and some pocket areas of central Ethiopia were getting above normal. Finally, Normal rainfall conditions have occurred over most of Benishangul Gumuz, Gambela, Amhara region, western-central Oromia, and some pocket areas of SNNP and Somalia region .



Percent of Normal Rainfall of the Kiremt 2024

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 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 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 success.

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1. Introduction

1.1. General

This climate bulletin summarizes climatic conditions that prevailed over the country during *Kiremt* 2024. *Kiremt* is the main rainy season, covering the period from June to September. The Kiremt rainfall covers most parts of the country except for some parts of the south and southeast of Ethiopia. The season's climate is mostly characterized by Cold and moist conditions. Generally, the rainfall of this season is very important for the growing of Meher crops.

2. Synoptic Situation

2.1 Surface

During the first month of *Kiremt* 2024, June, the Mascarene high with a mean central pressure value of above 1020 hPa was centered at about 35°S, 60°E. During the next month of the season, July 2024, the mean central pressure value was above 1020 hPa and centered at about 30°S, 78°E. The following month, the mean central pressure value of above 1020hPa was and centered at about 33°S, 62°E. Finally, in the last month of *Kiremt*2024, a mean central pressure value of above 1020hPa was centered at about 33°S, 88°E.

During June 2024 St. Helena's high with a mean central pressure value of above 1020hPa was centered at about 30°S, 5°EW. In the next month of the season, July 2024, the mean central pressure value of above 1020hPa was centered at about 28°S, 5W °, and the next month's mean central pressure value of above 1020hPa was centered at about 25°S, 5°W. and finally, in the last month of the *Kiremet* 2024 season, a mean central pressure value of above 1020hPa was centered at about 35°S, 3W°E.

During June 2024, the Azores' high with a mean central pressure value of 1016hPa was centered

at about 40°N,8°W, and in the next month of the season, July 2024, the mean central pressure value of above 1020hPa was centered at about 38° N, 8°W and in the following month, mean central pressure value of above 1020hPa was centered at about 40°N, 8°W and finally during the last month of *Kiremt* 2024 season a mean central pressure value of above 1020hPa was centered at about 40°N, 9°W.

2.2 Lower Troposphere (850 hPa Vector Wind)

During the beginning month of Kiremt 22024, the cross-equatorial and easterly flow of below 0-8 4m/s was observed over the western Indian Ocean and the easterly flow was dominant over the Arabian Peninsula, and next month Cross-equatorial and westerly flow of 0-16m/s was flowing from the Arabian Peninsula to Africa continent. Then in August, the northeasterly flow of below 0 - 12m/s was observed over the western Indian Ocean and easterly and Northeasterly flow was 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.

2.3 Middle Troposphere (500 hPa Geopotential Height)

When analyzing the geopotential height from the Climate Diagnostics Bulletin in June 2024, the fluctuation of geopotential height values over central and eastern Africa was 6 to 9 gpm. In Ethiopia, the *Kiremt* season runs from June 2024 to September 2024. The geopotential height values varied by 3 to 6 gpm over central and eastern Africa in July 2024, the following month. Subsequently, in August 2024, geopotential height values varied between 3 and 12 gpm in east and central Africa. Lastly, the geopotential height fluctuation over central and eastern Africa in September 2024 ranges from 3 to 18 gpm

2.4 Upper Troposphere (200 hPa wind vector).

Upper Troposphere (200 hPa Vector Wind) analysis over Ethiopia during the *Kiremt* 2024 season, June to September 2024, as examined in Climate Diagnostics Bulletin gave the speed and location of the wind at 200 hPa level in the northern hemisphere in. The 200 hPa vector wind during the starting month of the season, Jun2024, Easterly flow associated with the Subtropical westerly flow had a core speed of 0-15m/s along 0 to 10°N latitude. Then in July, the core 15- 30 m/s north Easterly flow along 0 to 10°N latitude was linked to the Sub Tropical westerly flow. Subsequently, in August, the Easterly flow connected to the Sub Tropical south westerly flow ultimately had a core speed of 15–30 m/s over 5–15 °N latitude. The Sub Tropical southwesterly flow, which is linked to the south-easterly flow, had a core speed of 0 to 30 m/s along 5 to 15°N latitude during the final month of the season.

Reference: Climate Diagnostics Bulletins were published in 2024.

3. Tropical Highlights – June-September 2024

During June 2024, sea surface temperatures (SSTs) remained near average across the east-central and eastern equatorial Pacific. The monthly Niño indices were -0.7°C for the Niño 1+2 region, $+0.2^{\circ}\text{C}$ for the Niño 3.4 region and $+0.7^{\circ}\text{C}$ 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 $1-6^{\circ}\text{C}$ below average in the far eastern equatorial Pacific.

During July 2024, sea surface temperatures (SSTs) remained near average across the east-central and eastern equatorial Pacific. The monthly Niño indices were -0.4°C for the Niño1+2 region, $+0.2^{\circ}\text{C}$ for the Niño 3.4 region and $+0.6^{\circ}\text{C}$ 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 $1-4^{\circ}\text{C}$ below-average in the eastern equatorial Pacific.

During August 2024, sea surface temperatures (SSTs) remained near average across most of the equatorial Pacific. The monthly Niño indices were -0.3°C for the Niño 1+2 region, -0.1°C for the Niño 3.4 region and $+0.5^{\circ}\text{C}$ 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 $1-4^{\circ}\text{C}$ below-average in the eastern equatorial Pacific.

During September 2024, sea surface temperatures (SSTs) remained near average across most of the equatorial Pacific. The monthly Niño indices were -0.7°C for the Niño 1+2 region, -0.2°C for the Niño 3.4 region and $+0.3^{\circ}\text{C}$ 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 $1-4^{\circ}\text{C}$ below average in the eastern equatorial Pacific.

Weather

4.1 Temperature

During *Kiremt* 2024, days remained hot over Southeast, northeastern, and western parts of Ethiopia (Fig.4.2.2). In particular, extreme maximum temperature values exceeded 40.0°C over Dire Dawa, Metehara (NMSA), Awash Arba, Aysha, Chifra, Dalifagi, Elidar, Gewane, Semera, Gode, Awash Arba, Aysha, Elidar, Gewane, Semera, Elidar, Gode, Semera, Aysha, Elidar, Gode, and Semera and the extreme maximum temperature values had about 45.8, 44. 43, 41.2, 41, 40.6, 40, 40, 45.2, 43.8, 43.6, 42.4, 41, 40.4, 40, 43.8, 42, 40.4, 40.5, 43.8, 42.2, and 43 in $^{\circ}\text{C}$ on the 4th Jun, 3rd Jun, 5th Jun, 19th Jun, 7, 19, 14th Jun, 7, 19th Jun, 9th Jun 6th Jun, 9th Jun 8th July, 5, 6th July, 3rd July, 11th July, 11th July, 9th July, 7th Aug, 27th Aug, 15th Aug, 21st Sep, 25th Sep, 2th Sep, 12th of Sep, respectively (Table 4.1.1).

On the other hand, the extreme minimum temperature values were as low as 6, 5.4, 5, 4, 5.2, 4.4, 3.1, 5.8, 4.8, 4.7, 4, 5, 4.8, 4.2, 4, and 3°C over Alemketema,

Ambamariam, Sholagebaya, Bui, Alemketema, Ambamariam, Sholagebaya, Alemketema, Ambamariam, Bui, Sholagebaya, Alemketema, Ambamariam, D/Brehan, Mehalmeda, and Sholagebaya on 25th Jun, 30th Jun, 19th Jun, 19th Jun, 19th July, 24th July, 24th July, 28th Aug, 27th Aug, 24th Aug, 15th Sep, 30th Sep, 23rd Sep, 23rd Sep, and 24th Sep respectively (Table 4.1.2). The temperature anomaly was a negative departure over most parts of Afar and Somalia, eastern and southern Oromia, central Amhara, and Benishangul Gumuz. On the other hand, positive departure was observed over Tigray, Gambela, and SNNP, north-southern Amhara, some parts of Oromia, and northern Benishangul Gumuz (Fig. 4.2.5).

Table 4.1.1 Stations with extreme maximum temperature values of greater than 40oC during Kiremt 2024.

Name	Value	Date	Month
Dire Dawa	45.8	4	Jun
Metehara	44	3	Jun
Awash Arba	43	5	Jun
Aysha	41.2	19	Jun
Chifra	41	7,19,14	Jun
Dalifagi	40.6	7/19/	Jun
Elidar	40	9	Jun
Gewane	40	6	Jun
Semera	45.2	9	Jun
Gode	43.8	8	July
Awash Arba	43.6	5,6	July
Aysha	42.4	3	July
Elidar	41	11	July
Gewane	40.4	11	July
Semera	40	9	July
Elidar	43.8	7	Aug
Gode	42	27	Aug
Semera	40.4	15	Aug
Aysha	40.5	21	Sep
Elidar	43.8	25	Sep
Gode	42.2	42.2	Sep
Semera	43	12	Sep

Table 4.1.2 Stations with Extreme Minimum temperature values less than 6°C during Kiremt 2024.

Name	Value	Date	Month
Alemketema	6	25	Jun
Ambamariam	5.4	30	Jun
Sholagebaya	5	19	Jun
Bui	4	19	Jun
Alemketema	5.2	19	July
Ambamariam	4.4	24	July
Sholagebaya	3.1	24	July
Alemketema	5.8	28	August
Ambamariam	4.8	27	August
Bui	4.7	24	August
Sholagebaya	4	1	August
Alemketema	5	15	September
Ambamariam	4.8	30	September
D/Brehan	4.2	23	September
Mehalmeda	4	23	September
Sholagebaya	3	24	September

4.2. Rainfall

Normally *Kiremt* is the wet season for *Kiremt*- rain-benefiting areas of western, central, northwestern, and southwestern Ethiopia. The climate of this season is characterized by cold and wet days. The seasonal rainfall amount of this season exceeds 1250mm over much of the *Kiremt*-rain-benefiting areas with larger amounts of rainfall occurring over western, Central, and North-Western Ethiopia. The seasonal total rainfall amount of Kiremt 2024was exceeded 1250 mm over Benishangul, southern and most of Amhara region, central-western Tigray and Gambela, western part of SNNPR as well as parts of western Oromia (Fig 4.2.1).

While heavy falls in 24 hours are greater than or equal to 80mm, during *Kiremt* 2024, had values about 87.7, 87.2, 83, 118.2, 112, 86, 80, 96, 95, 86, 84.8, 84.6, 84.4, 80.8, 80.3, and 86.6 in mm over Chira, Debark, Limugenet, Algie, Atsebi, Enewri, Lalibela, Bullen, Chifra, Fiche, Gelemso, Gewane, Hageremariam, Harer, Tepi, and Debrawrek and were reported on the Jun 27th, Jun 25th, Jun 27th, July 18th, July 16th, July 28th, July 6th, Aug 24th, Aug 5th, Aug 19th, Aug 12th, Aug 13th, Aug 25th, Aug 20th, Aug 8th, and Sep 1st, 2024 (Table 4.2.1).

In general, the seasonal rainfall amount of *Kiremt* 2024 was below normal over pocket areas of Oromia, Afar, and Gambella, southern and southeastern parts of Somlai, and pocket areas of southern Oromia. In most parts of Somalia, southeastern parts of SNNPRs, southern parts of

Oromia, and some pocket areas of central Ethiopia were getting above normal rainfall. Finally, Normal rainfall conditions prevailed over Benishangul Gumuz, Gambela, most of Amhara region, western-central Oromia, and some pocket areas of SNNP and Somalia region (Fig.4.2.6).

Table 4.2.1. Station(s) with more than or equal to 80mm of rainfall in 24 hours during *Kiremt* 2024.

Name	Value	Date	Month
Chira	87.7	Jun	27
Debark	87.2	Jun	25
Limugenet	83	Jun	27
Algie	118.2	July	18
Atsebi	112	July	16
Enewari	86	July	28
Lalibela	80	July	86
Bullen	96	August	24
Chifra	95	August	5
Fiche	86	August	19
Gelemso	84.8	August	12
Gewane	84.6	August	13
Hageremariam	84.4	August	25
Harer	80.8	August	20
Tepi	80.3	August	8
Debrawrek	86.6	Septem ber	1

Table 3.2.2. Kiremt 2024 Total rainfall Amount Exceeding 1250 mm.

Name	Value
Ambamariam	1795
Arejo	1467.2
Bahir Dar Met	1431.9
Chagini	1430.4
D/Tabor	1426.2
Dangla	1375.4
Gatira	1369.7
Gidaayana	1341
Gimbi	1321.6
Imdiber	1286
Nekemte	1275.1

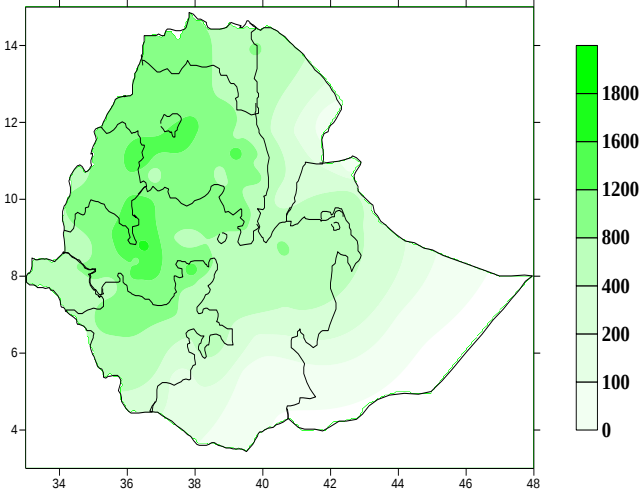


Figure. 4.2.1. Seasonal Total Rainfall in mm during *Kiremt* 2024.

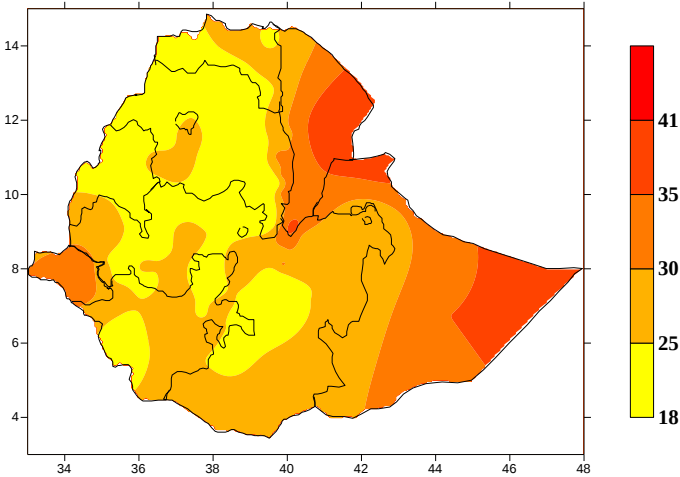


Figure. 4.2.2. Mean maximum Temperature in °C during *Kiremt* 2024.

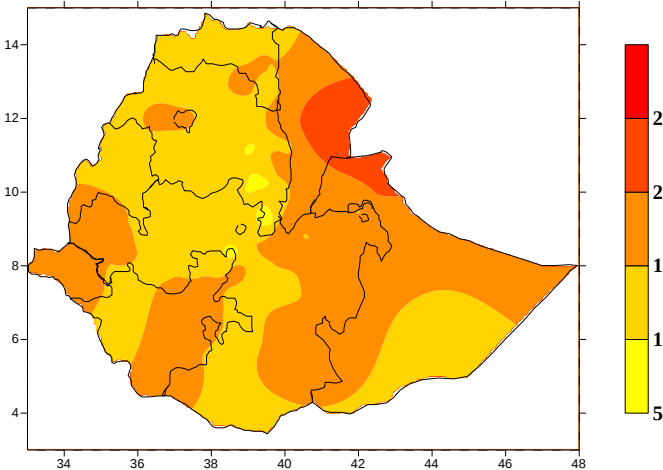


Figure. 4.2.3 Mean minimum Temperature in °C During *Kiremt* 2024

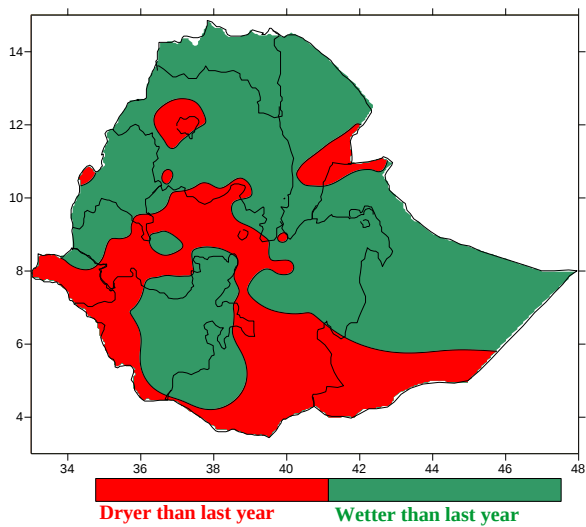


Fig 4.2.4 Seasonal total rainfall of *Kiremt* 2024 minus seasonal total rainfall of 2023.

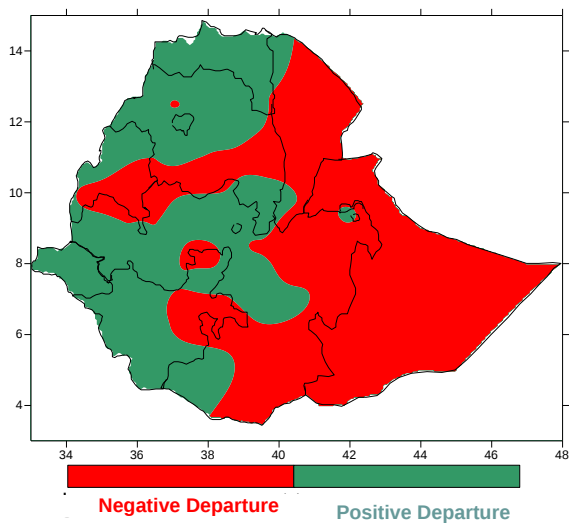


Fig 4.2.5. Seasonal temperature of *Kiremt* 2024 minus seasonal LTM of *Kiremt*.

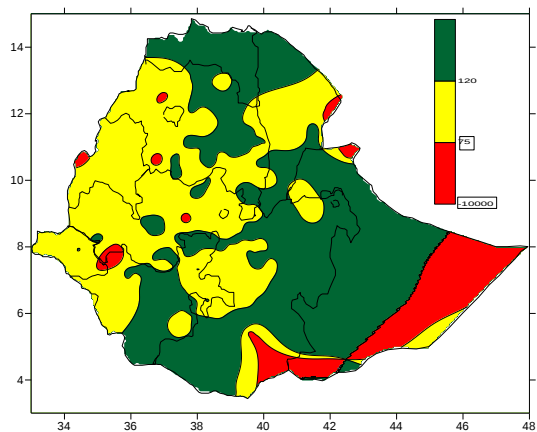


Figure. 4.2.6. Percent of Normal Rainfall. during *Kiremt* 2024.