ETHIOPIAN METEOROLOGY INSTITUTE

METEOROLOGICAL DATA AND CLIMATOLOGY DIRECTORATE

SEASONAL CLIMATE BULLETIN

BEGA 2021/2022

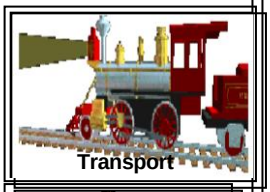
Some Applications of Climate Information

Disaster Management

Water Resources Management

Construction

Environment & Health



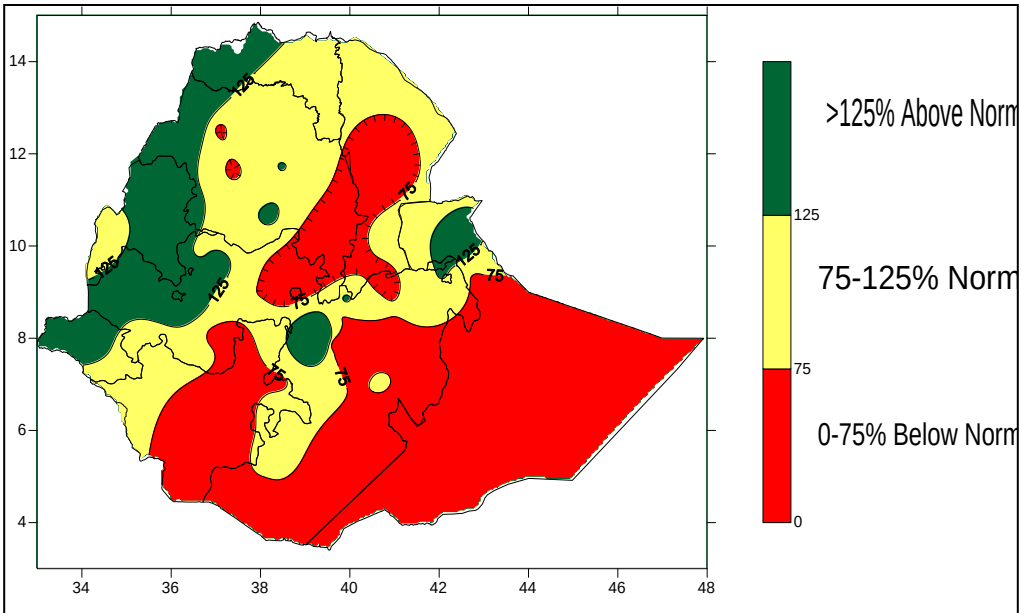
Transport

Recreation & Tourism

HIGHLIGHTS

During Bega of this year, sea surface temperatures were below-average across much of the equatorial Pacific and east-central. October to January 2021/2022 Oceanic and atmospheric anomalies were consistent with La Niña conditions. The rainfall activity of Bega 2021/2022 was above normal over western, small areas of eastern and central parts of the country, whereas central, eastern Tigray Afar and Harar, south of Gambella, northeastern parts of SNNPR and central Oromiya was under Normal and central Afar, eastern Amhara, central and southern SNNPR, southern and central Oromiya and all parts of Somali was under Below Normal condition.

Extreme maximum temperatures was recorded at Somali and Afar, In contrary with this, Extreme minimum temperatures was recorded at southern Amhara. Gambella, southern tips of SNNPR and Afar regions but cooler than last Bega season at the rest parts of the country was hotter than 2020/2021.



Percent of Normal Rainfall of the Bega 2021/2022

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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 ,cell phone and email for data transmission. Though this bulletin is not real time, published with a delay of 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 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.

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1. Introduction

1.1. General

This climate bulletin contains summary of climatic conditions that prevailed over the country during Bega 2021/2022.In line with this October-January 2021/2022, sea surface temperatures were below-average across much of the equatorial Pacific and east-central.

Bega which is October to January in Ethiopia is harvesting season for various parts of Ethiopia. It is normally a dry season characterized by cool nights and misty condition in the 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 mid-latitude rain-bearing systems, some places over central, northern and northeastern Ethiopia also receive occasional shower. However, except over places of north and 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, south and Southeast Ethiopia.

1.2. Summary of Bega 2021/2022

During Bega 2021/2022, central Tigray, Amahara, Oromiya, Benishangul-Gumuz and western adjoin areas of Afar was under cold nights and early mornings. Hence, the extreme minimum temperature values were as low as -5.8^{o}C upto -0.4^{o}C over Debrebirhan, Mehalmeda and Alemaya.

The seasonal total rainfall amount of Bega 2021/2022 exceeded 140.0mm over northwest of SNNPR,eastern Gambella,western Oromiya,eastern Benishangul-Gumuz and western Amahara was recorded. In general, the seasonal rainfall amount of Bega 2021/2022 was normal to above normal over most parts of the country except over western Afar,southern Amahara, southern Oromiya and all parts of Somali.

2.0 Synoptic Situation

2.1 Surface synoptic systems

As all Ethiopian Synoptic systems have highly affected by 4 pressures, the Mascarene high with a mean central pressure value of 1020hPa was centered at 45-90^{0}E,35-40^{0}S, While the St. Helena high with a mean central pressure value 1020hPa and centered at about 0^0,30-35°S.The Azores high with a mean central pressure value of 1020hPa was centered at about 30°-45^0 at the season. Particularly, Azores was at 45° in October and November while 30-45°E in the months of December and January having a latitude of 30-40°N.

2.2 Lower Troposphere (850hPa vector wind)

South-easterly in the months of October and north-easterly in the rest of the three months crossing equator and adjoin areas of horn of Africa, eastern Indian ocean and the like with magnitude 2-8 m/s was dominantly observed around the areas.

2.3 Middle Troposphere (500-hPa Geopotential Height)

The 500-hPa height field during October-January featured an anomalous wave pattern across the South Pacific Ocean and a tilt toward above-average heights over the South Atlantic, Indian Oceans and above-average heights over the North Pole, Sea of Okhotsk, Black Sea, North Atlantic Ocean, and western U.S., and below-average heights over northeastern Canada, Scandinavia, and western Europe.

2.4 Upper Troposphere (200 hPa vector wind)

The north easterly flow wind crossing equatorial, Indian Ocean and the adjoin areas of the horns of Africa would divert to south easterly direction with the speed of 4-8m/s along 0-90^o E and 10S^o-10^{o}N of latitude.

3. Tropical Oceanic and Atmospheric Highlights

During October-January 2021/2022, sea surface temperatures (SSTs) were below-average across much of the equatorial Pacific. The latest monthly Niño indices were -0.2°C for the Niño 1+2 region, -0.8°C for the Niño 3.4 region and -0.7°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 eastern equatorial Pacific. The corresponding sub-surface temperatures were 1-7°C below-averages. Also during these months the

lower-level easterly winds and the upper-level westerly winds were above-average over most of the equatorial Pacific. Meanwhile, tropical convection was suppressed over the central and western equatorial Pacific and enhanced over Indonesia. Collectively, these oceanic and atmospheric anomalies were consistent with La Niña conditions.

Reference: Climate Diagnostics Bulletin 2021/22.

4. Weather

4.1 Temperature

During Bega 2021/2022, days remained hot over the lowlands of north-east of Afar and southeast Somali (Fig. 3.1.1). In particular, extreme maximum temperature values exceeded 40.0^{o}C and above over Gode, Ayisha, Dubti, Elidar, Gewane …with the values of 41.8 ,42.0,40.5,43.8 and 41.4^{o}C …in the months of October, November, December and January(Table 3.1.1). On the other hand, the highlands of central Amahara and some areas of central Oromiya had cold nights at early mornings. Hence, the extreme minimum temperature values were as low as -5.8^{o}C to -0.4^{o}C over Debrebirhan, Mehalmeda and Alemaya (Table 4.1.1 and Fig 3.1.2).

Table 4.1.1.Seasonal Extreme Maximum Temperature greater than 40.0^{o}Cand above during Bega 2021/2022

Station	Maximum Temperature	Date	Month
Gode	41.8	18	October
Aysha	42.0	18	October
Dubti	40.5	2	October
Elidar	43.8	4	October
Gewane	41.4	5	October
Mille	40.0	5,7,14,21,29	October
Semera	42.2	10	O October
Gode	42.0	25	November
Aysha	40.0	3	November

Mille	40.0	6,13,22	November
Gode	41.4	28	December
Fugnuido	41.0	13	December
Gode	42.0	28	January
Fugnuido	42.0	11	January
Gambella	40.0	25	January
Metema	40.0	12	January

Table 4.1.2 Stations with extreme minimum temperature values of less than or equal to 3.0^{o}C in Bega 2021/2022

Station	Minimum Temperature <3.0	Days	Month
D/Brehan	-5.8	11	December
D/Brehan	-2.8	30	November
Mehalmeda	-2.2	9	December
Alemaya	-0.8	10	December
Mehalmeda	-0.5	19	November
D/Brehan	-0.4	22	October
Adelle	1.0	11	December
Arise Robe	1.4	10	December
Yitnora	1.4	13	December
Dangla	1.5	11	December
Jimma	1.8	11	December
Bui	2.0	10	December
Debrawrek	2.0	10	December
Debrezeit(Af)	2.2	6	December
D/Tabor	2.5	10	December

Enewari	2.5	7	December
Indiber	2.8	10	December
Mehalmeda	3	22	October
Fiche	3.0	11	December

4.2 Rainfall

It is also an extension of kiremt rainy season that places of kiremt rain benefiting areas would obtain different amount of rain as kiremt secessions from northern parts of the country gradually to southern parts. Depending on the influences from mid-latitude rain-bearing systems, some places over central, northern and northeastern Ethiopia also receive occasional showers. However, places of north & south Wollo, north Shoa and Afar and the adjoining areas has mean seasonal rainfall of less than 100mm, while the mean seasonal rainfall amount exceeds 100mm over the seasonal rain-benefiting areas of west, southwest, southern and southeast Ethiopia.

The seasonal total rainfall amount of Bega 2021/2022 was exceeded 200mm and above over southern Oromiya,Northern parts of SNNPR, southern Gambella, eastern Benishangul-Gumuz, central Oromiya, and Amahara recorded total rainfall over Abobo, Alge, Arjo, Bure, Chagni, Chira, Dembidolo, Dilla, Gambella, Gida-Ayana, Gimbi, Ginnir, Gore, Hageremariyam, Jimma, Jinka, Masha, Nekemet and Shambu with amount of 200.4,358.6,359.7,229.4,328.2,326.6,265.6,301.7,215.4,235.8,322.5,239.6, 298.4,213.5,206.2,210.7,490.2340.1 and 203.7 consecutively (Fig. 3.2.2)

Table 4.2.1 Seasonal total Rainfall amount in Bega 2021/2022 with 200mm and above.

station	Amount
Abobo	200.4
Algie	358.6
Arejo	359.7
Bure	229.4
Chagini	328.2
Chira	326.6
Dembidolo	265.6
Dilla	301.7
Gambella	215.4
Gidaayana	235.8
Gimbi	322.5

Ginir	239.6
Gore	298.4
Hageremariam	213.5
Jimma	206.2
Jinka	210.7
Masha	490.2
Nekemte	340.1
Shambu	203.7

Table 4.2.2. Station(s) recorded with more than or equal to 50.0mm of rainfall in 24 hours during Bega 2021/2022

Station	Maximum Rainfall ≥50.0mm	Day	Month
Dembidolo	66.2	2	November
Gambella	51.8	9	November
Mankush	64.2	8	November
Dire Dawa	80.5	9	October
Abobo	87.0	5	October
Algie	60.0	13	October
Chewka	62.0	1	October
Ejaji	70.6	6	October
Fugnuido	73.0	1	October
Gambella	63.1	7	October
Gololcha	73.5	9	October
Nefasmewucha	63.0	31	October

Blate	63.8	**17**	January
Bore	67.0	17	January
Bui	78.0	**17**	January
Dilla	75.2	17	January
Konso	61.0	**17**	January

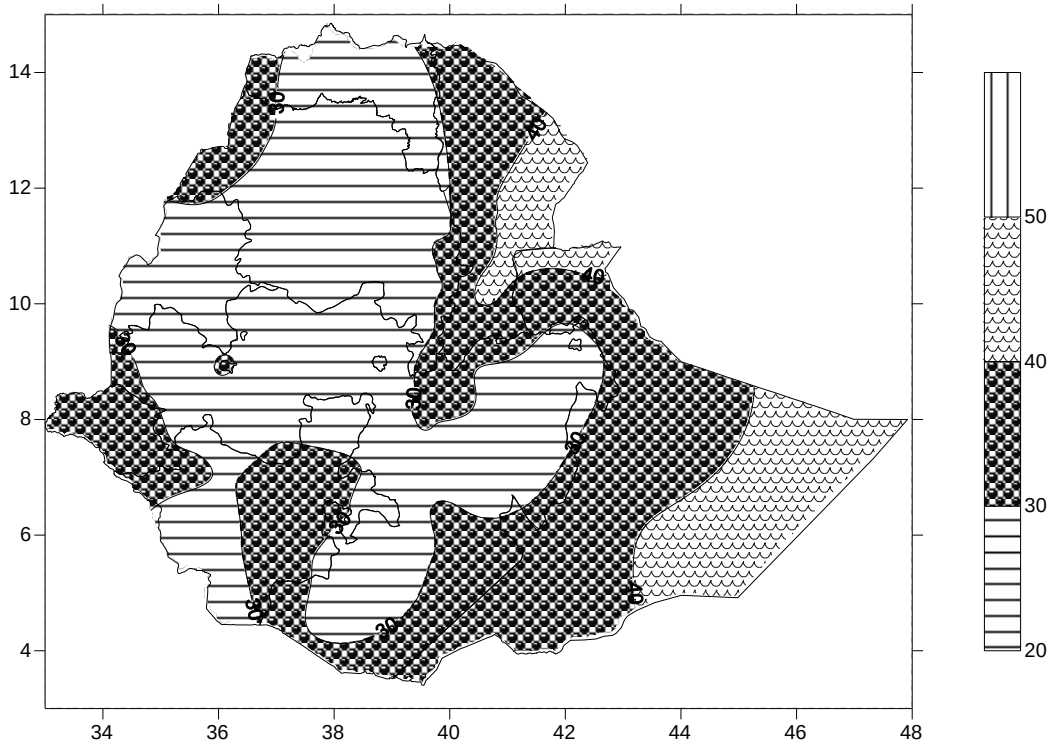

Figure 3.1.1.Seasonal Maximum Temperature in ^{o}C for the Bega 2021/2022

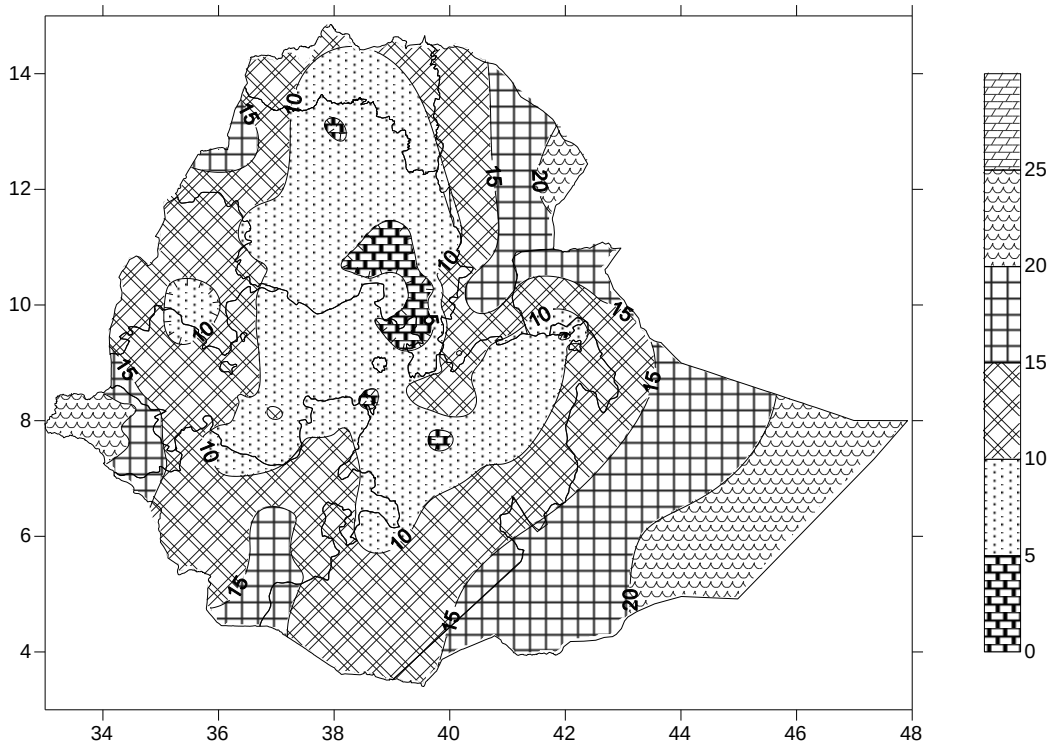

Figure 3.1.2 seasonal Minimum Temperature in ^{o}C for Bega 2021/2022

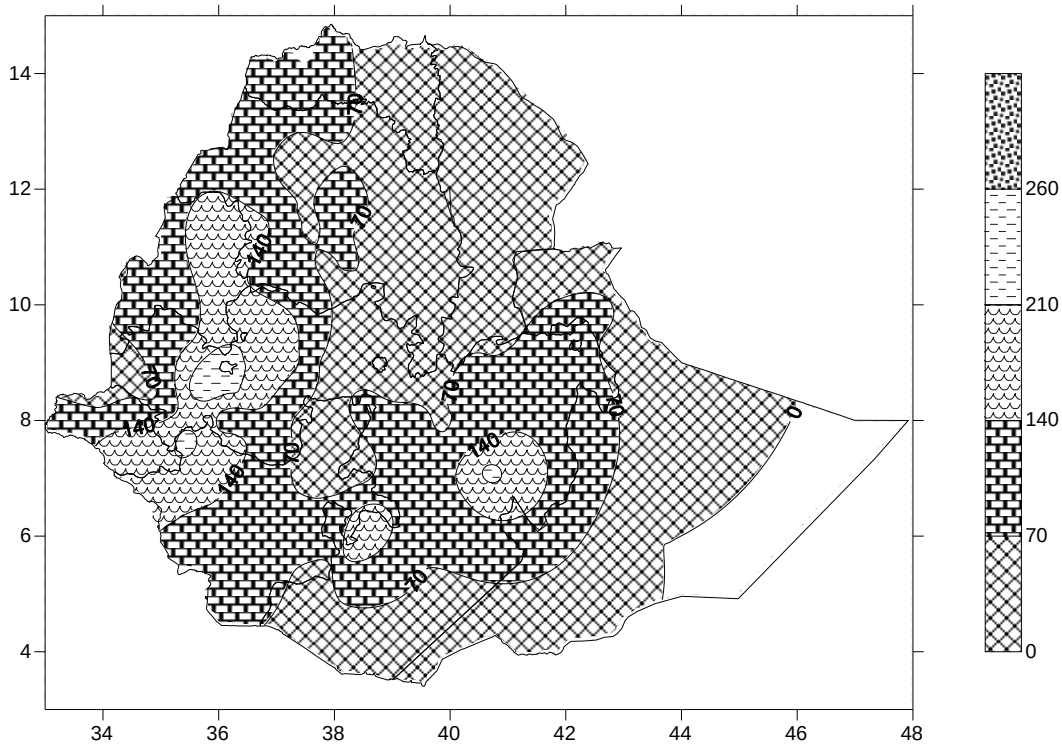

Figure 3.1.3.Seasonal Total Rainfall in mm for Bega 2021/2022

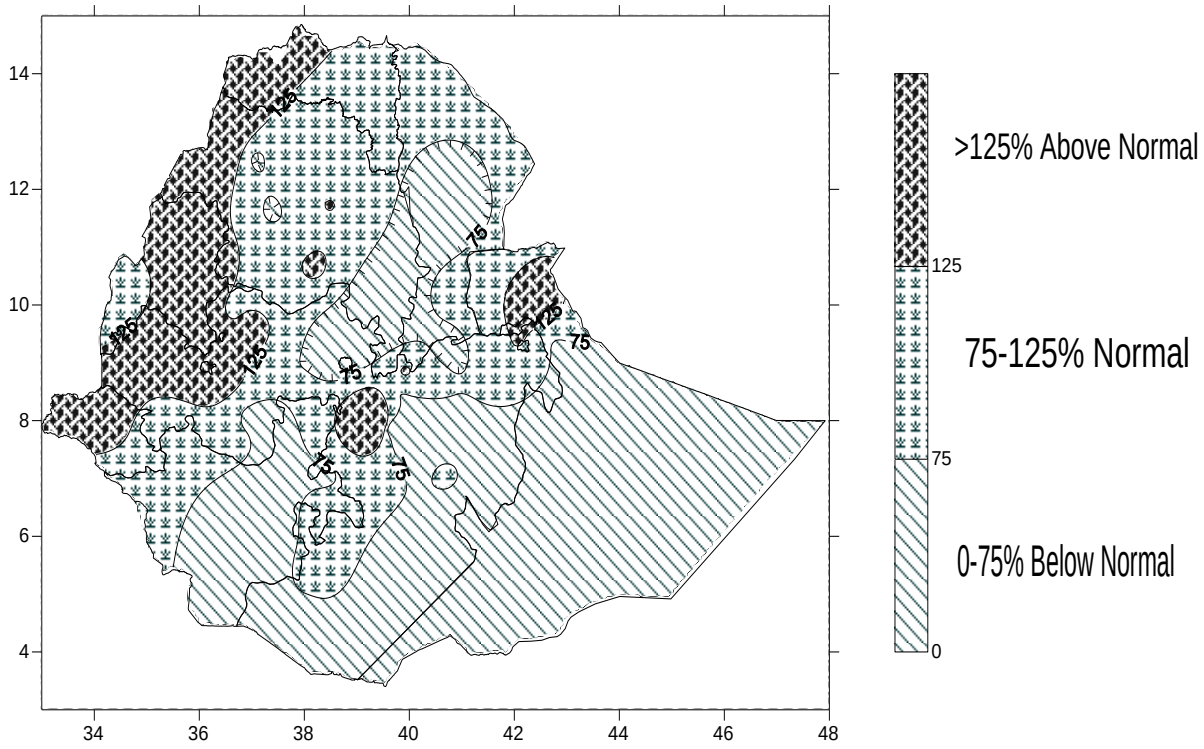

Figure 3.1.4. Percent of Normal Rainfall of the Bega 2021/2022

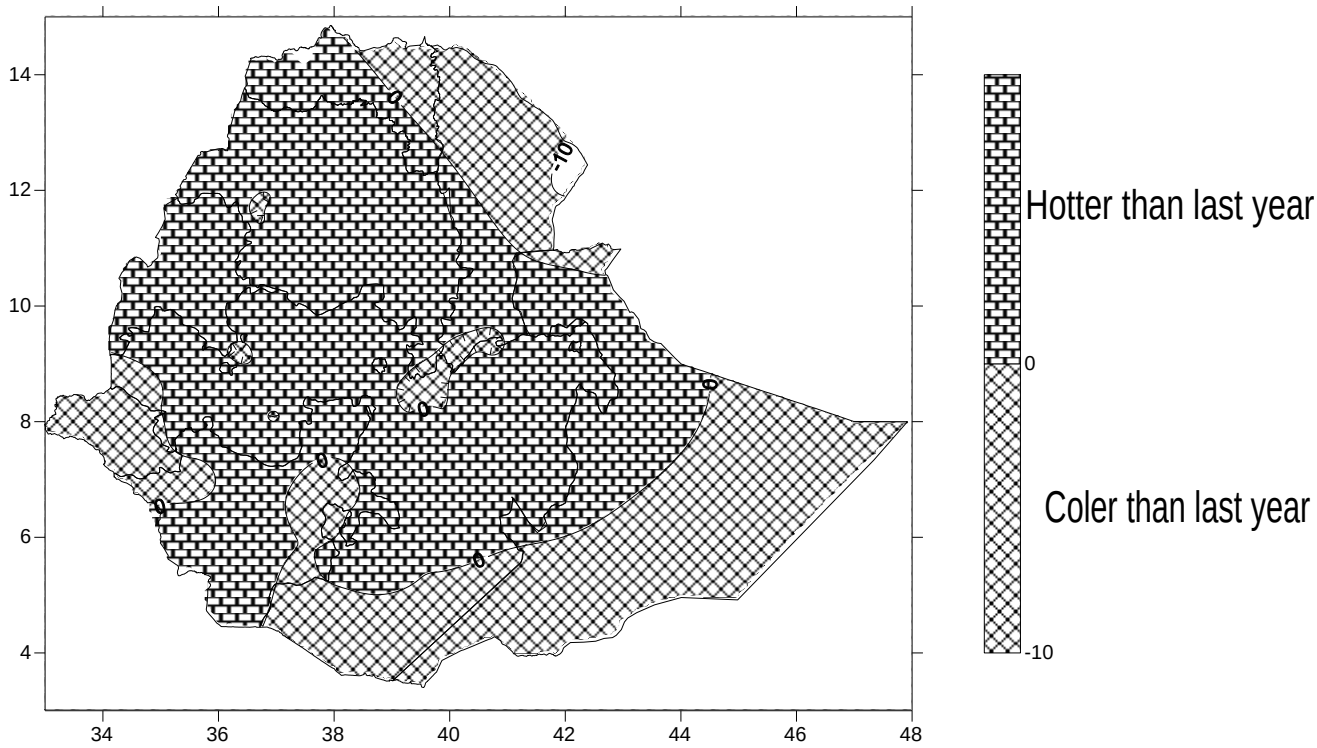

Figure 3.1.5. Seasonal Bega mean Temperature in ^{o}C for 2021/2022 *minus* Bega 2020/2021