# NATIONAL METEOROLOGICAL SERVICES AGENCY AGROMETEOROLOGICAL BULLETIN

## SEASONAL AGRO METEOROLOGICAL BULLETIN
## BELG, 2004
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# FORE WARD

This Agro met Bulletin is prepared and disseminated by the National Meteorological Services Agency (NMSA). The aim is to provide those sectors of the community involved in Agriculture and related disciplines with the current weather situation in relation to known agricultural practices.

The information contained in the bulletin, if judiciously utilized, are believed to assist planners, decision makers and the farmers at large, through an appropriate media, in minimizing risks, increase efficiency, maximize yield. On the other hand, it is vital tool in monitoring crop/ weather conditions during the growing seasons, to be able to make more realistic assessment of the annual crop production before harvest.

The Agency disseminates ten daily, monthly and seasonal weather reports in which all the necessary current information's relevant to agriculture are compiled.

We are of the opinion that careful and continuous use of this bulletin can benefit to raise ones agro climate consciousness for improving agriculture-oriented practices. Meanwhile, your comments and constructive suggestions are highly appreciated to make the objective of this bulletin a success.

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## SUMMARY
## Belg 2004

In accordance with NMSA's classification, the period from February to May is known as Belg season. Central parts of northern highlands, eastern highlands, parts of central, southwestern and southern Ethiopia are known as Belg growing areas. The contribution of Belg rainfall is ranging from 5-30% over north and northeastern where as 30-60% over south and southwestern parts of the country from annual total production of the areas. Normally, North Shewa, East and west Harargie, Arsi, Bale, North and South Wello, Borena and SNNPR (Kembata, Hadiya, Wolayta, Gurage, Keffa and Bench) start their land preparation and sowing activities during December to February. Belg (2004) was normal to above normal in terms of amount, however the distribution was erratic i.e. some areas fulfilled their mean value within a short period of time in a few number of rainy days over some areas of eastern Tigray and Amhara including some areas of SNNPR. Land preparation in southern Tigray and northeastern Amhara have been negatively affected by the late onset of Belg and the extended dry spells in February and March repeatedly disrupted Belg crop planting in some highland areas and caused wilting and near total failure of earlier planted crops in some lowland areas like Rayaazebo and Alamata weredas of southern Tigray. Besides, the late on-set of Belg rains may undermine agricultural activities in Belg dependent areas like some parts of SNNPR (FEWS NET 16 March 2004).

During the month of February 2004 the observed rainfall situation over most Belg growing areas was not sufficient for the on going early season's agricultural activities. As a result, crops, which were sown during the month of January, were under severe water stress in some areas of southern Tigrai, eastern Amhara and SNNPR. Besides, it could affect time of land preparation in some areas like eastern and central Oromiya where land preparation normally is performed during the month of February. With regard to air temperatures, some areas of central highlands like Debre Birhan, Meraro, Jima, Bui, Kulumsa, Mehal Meda, Koffele, Wegel Tena, Alemaya and Arsi Robe exhibited extreme minimum temperature below 5°C lowering up to –1.4. On the contrary, some lowlands of northeastern, northwestern and western parts of Ethiopia such as Gambela, Metema, Pawe and Asaita exhibited extreme maximum temperature above 35°C up to 42°C for 15 – 25 consecutive days. This situation could affect the normal growth and development of plants by increasing evapotranspiration.

During the month of March 2004, though the rainfall distribution covers most parts of Belg growing areas towards the second half of the month most parts of Belg growing areas exhibited below normal rainfall. Besides, as the analyzed moisture status data indicates most Belg growing areas show monthly values of dry to very dry moisture status. However, the rainfall situation observed particularly as of the second dekad of March was better over some Belg growing areas of southeastern Amhara, central Oromiya, pocket areas of eastern SNNPR. Thus, this condition could favour land preparation and sowing activities of long cycle crops like maize and sorghum. Under normal circumstance, it is time for land preparation and sowing activities (in case of long cycle crops) in some areas like Arsi Robe, Ziway, Bore, Kibre Mengist, Limu Genet, Hosaina, Aman, Tepi, Secoru, Wenago, Yirga Chefe, Kochere, Bule, Sidama, KT, Hadiya, Welayita, South Omo, Dawuro, Gurage, Silte, Bench and Keficho. Pursuant to the crop phenological report, sowing of maize and sorghum was underway in some areas of northeastern SNNPR during the second dekad of the month. Teff was at emergence stage over some areas of eastern Amhara. However, medium field condition has been reported due to water stress. The observed below normal rainfall condition over pastoral and agro pastoral areas of southern Oromiya and most parts of Somalia could exacerbate the prolonged deficient moisture situation that persisted over the areas. On the contrary, some areas of central, northeastern and eastern Ethiopia received heavy falls ranging

from 30 – 73 mm. As a result, some stations reported crop damage due to heavy falls like Bati and Sanka and some have reported damage due to flood like Werebabu and Assayta. The erratic rainfall situation over some areas of northeaster, southern, southeastern and eastern mid land and lowlands of Ethiopia would favor the occurrence of pest and disease.

During the month of April 2004, the overall rainfall condition was in a good shape in most parts of the country. Besides, as the moisture status analysis indicates most parts of the country exhibited moist to humid moisture condition. As a result, sowing of cereal crops like maize, sorghum and teff was under way in long cycle growing areas of the country. Sowing of potato was also in progress in some areas of northern SNNPR during the month under review. However, the observed heavy falls particularly as of the second dekad of April in some pocket areas of western, southern, southwestern, northwestern, northeastern and eastern parts of the country resulted in crop damage in some areas of low lying areas and near river banks. In case of pastoral areas with the exception of northern tip of Somali, the rest parts of the zones normally receive rainfall during the month of April, which normally provide pasture and drinking water in the areas. Thus, the observed abundant rainfall over south and southeastern lowlands could favour the availability of pasture and drinking water in the areas. Nevertheless, as the Food Security Monthly Report (16 April 2004) indicates livestock production is still below average in the eastern and central parts of Somali region, resulting in higher milk prices; and cattle and sheep deaths were reported in Gode and Warder Zones. The overall rainfall condition during the month of April was in a good shape in most parts of the country. As MOA report (No 9/96 E.C.) and the field report made by NMSA confirmed that, the observed rainfall condition during the month of April favourd cereal crops, which were at different phenological stages. Besides, it was favorable to perform land preparation and sowing activities of Meher crops on time.

During the month of May 2004 the observed below normal rainfall condition in most parts of the country could cause water stress on the recently sown crops and result in wilting. Besides, the dry weather condition that persisted during the month over Tigray, Amhara, northern Somali, most parts of Oromiya and SNNPR created moisture depletion on the existing crops growing on the field. For instance, Ziway and Sodo reported total drying and partial drying of maize crop due to water stress during the third dekad of May, respectively. However, the dry weather that persisted over some areas of Belg growing areas (northeastern highlands) could favour crops, which were ready for harvest. On the contrary, some areas of SNNPR, western and southern Oromiya, pocket areas of central and eastern Amhara received heavy falls ranging from 38 – 72 mm in one rainy day during the month. As a result, some areas like Dembe Dolo and Alge reported crop damage and some reported flooding (Konso) due to heavy falls. The observed normal to above normal rainfall distribution over some areas of western Oromiya, Gambela and northern tip of SNNPR had positive impact on the recently sown long cycle crops.

The erratic rainfall condition over some lowland areas of southeastern, northeastern and southern lowlands of the country could favour the occurrence of pests. Thus, attention should be required for those areas in order to mitigate the effect of adverse situation.

With regard to air temperature, a rise in maximum temperature ranges from 1.9 – 4.2 °C has been observed over some areas of northeastern, eastern and southeastern lowlands as well as along the Rift valley and its adjoining areas. Thus, this condition could increase evapotranspiration in the areas, thereby negatively affecting the water requirements of the plant and availability of pasture and drinking water in pastoral areas.

Pursuant to the crop phenological report ( May21 – 31, 2004 ), sowing of cereal crops like maize and sorghum was underway over some areas of western Oromiya while it was at emergency stage in some areas of eastern Amhara and western Oromiya. Maize was also at ninth leaf and tasseling stages in some areas of western, eastern and in some areas of highlands of southern Oromiya. Teff

was at full ripening stage in some areas of southeastern Amhara. Sorghum was at third leaf stage in some areas of western Oromiya.

Generally, though there was a delay in on-set of Belg season in most parts of the country, the rainfall condition as of last week of March in most parts of southern half of the country favored season's agricultural activities. As MOA's (No 9/96 E.C.) and NMSA's field reports confirmed that, the observed rainfall condition during the month of April favored cereal crops, which were at different phenological stages. Besides, it was favorable to perform land preparation and sowing activities of Meher crops (their contribution is 35% from annual production) on time.

The erratic nature of rainfall observed over some areas of eastern Tigay and Amhara could result in a decrease in Belg production in the areas. Fore instance as the minutes of Agricultural Task Force[1] meeting (April 28, 2004) shows "100% of Belg dependent areas are expected to be highly affected. Areas like South Tigray (Rayaazebo, Alamata, Endamahoni) and some areas of eastern Amhara like Legambo and Delanta are reported as areas where Belg has failed." Besides, due to the late onset of Belg rainfall, crops are at early vegetative stage in some areas of southeastern Amhara. Thus, this condition could delay the early Meher season's agricultural activities.

The observed rise in maximum temperature by 1.9 – 4.2 °C particularly during the month of May over some areas of northeastern, eastern and southeastern lowlands as well as along the Rift valley and its adjoining areas of the country could have negative effect by increasing the rate of evapo-transpairation, .

In case of pastoral areas, with the exception of northern tip of Somali the rest parts of the zones normally receive rainfall during the month of April, which normally provide pasture and drinking water in the areas. Hence, the observed situation particularly during the month of April was favorable for the availability of pasture and drinking water in pastoral and agro pastoral areas of southern and southeastern lowlands. Besides the situation could have positive impact for agro pastoral activities of the areas. Nevertheless, as the Food Security Monthly Report (16 April 2004) indicates livestock production is still below average in the eastern and central parts of Somali region. Thus, this situation indicates that those areas needing attention.

[1] A task force formed for montoring activities where members are representative from Ministry of Agriculture, National Meteorological Services Agency, DPPC, FAO and NGOs.

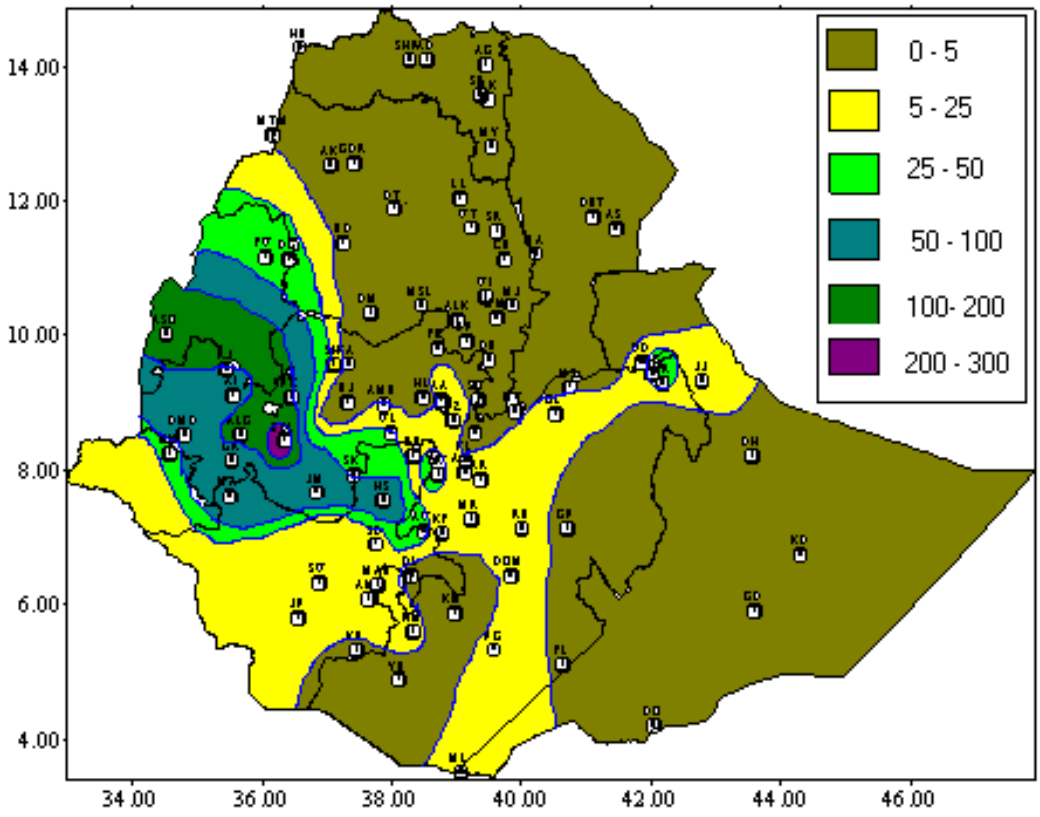


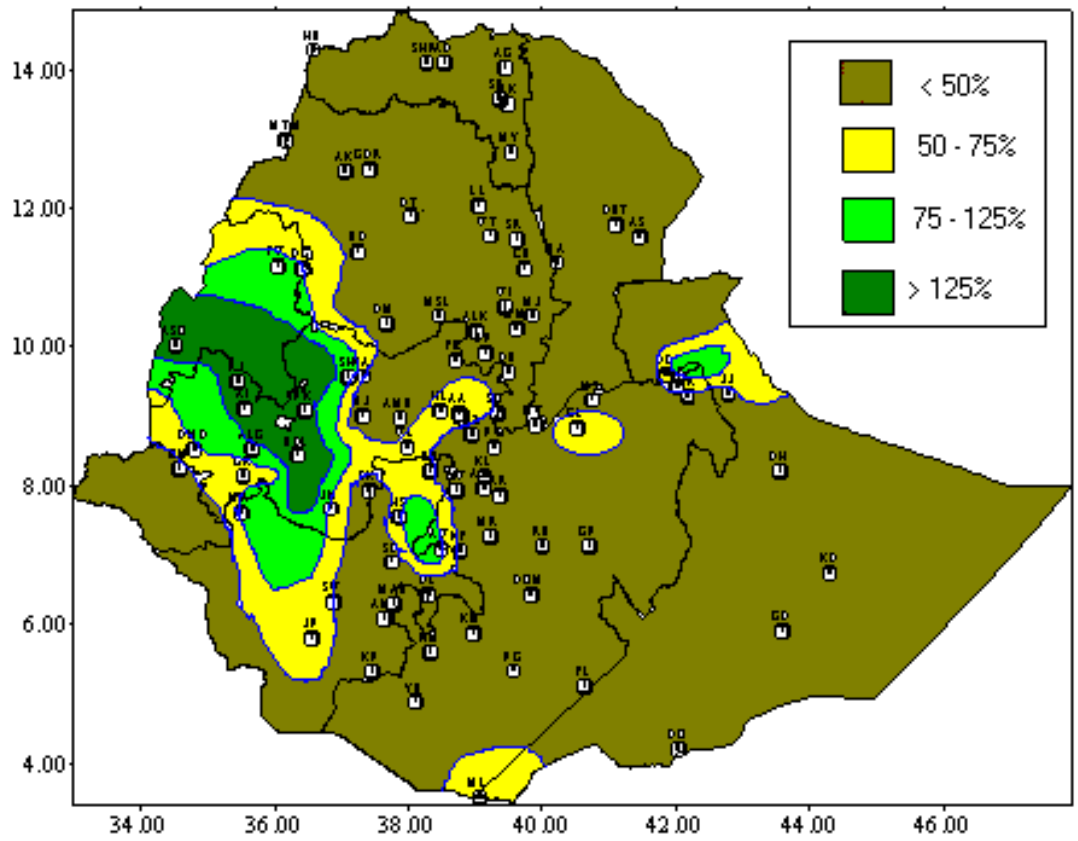

**Fig.1 Rainfall distribution in mm (21- 31 May, 2004)**

## 1. WEATHER ASSESSMENT

### 1.1 May 21-31, 2004

#### 1.1.1 Rainfall Amount (Fig 1)

Southern parts of Benishangul Gumuz and parts of western Oromiya received 100-200 mm of rainfall; Parts of Benishangul Gumuz and western Oromiya experienced 25 – 100 mm of rainfall; southwestern margin of Amhara, most parts of Gambela, SNNPR, most parts of central, parts of southern and eastern Oromiya and few areas of northern Somali received falls ranging from 5-25 mm; there was little or no rainfall for the rest of the country.




**Fig, 2 Percent of normal rainfall (21-31 May, 2004)**

**Explanatory notes for the legend:**
**<50 -- Much below normal**
**50—75% -- below normal**
**75—125% --- Normal**
**> 125% ---- Above normal**

### 1.1.2 Rainfall Anomaly (Fig. 2)

With the exception of Benishangul Gumuz, western Oromiya and few areas of northwestern SNNPR the rest of the country exhibited below to much below normal rainfall.

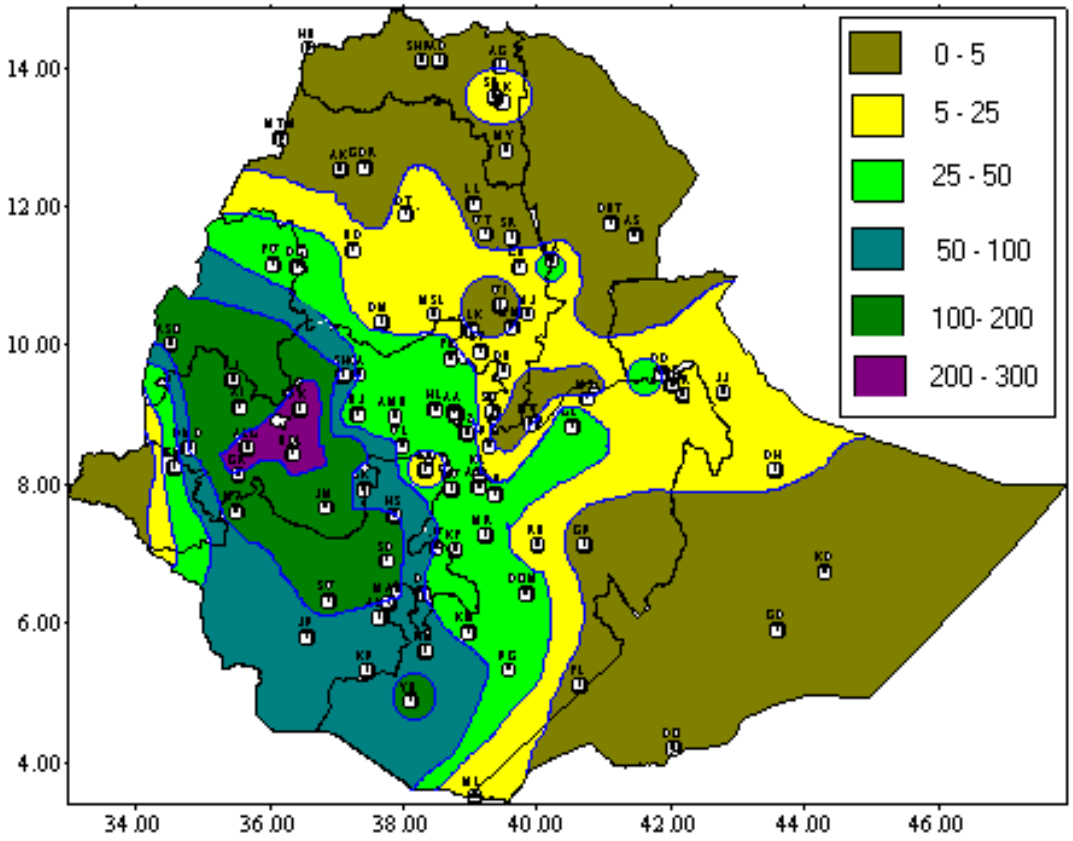



**Fig. 3 Rainfall distribution in mm for the month of May 2004**

## 1.2 May 2004

### 1.2.1 Rainfall Amount (Fig. 3)

Few areas of western Oromiya received falls greater than 200 mm of rainfall. Most parts of Benishangul Gumuz, parts of western Oromiya, most parts of SNNPR and parts of southern Oromiya received 50 – 100 mm of rainfall. Most parts of Amhara, Oromiya and parts of northern Somali experienced 5-50 mm of rainfall. The rest of the country received falls below 5 mm.

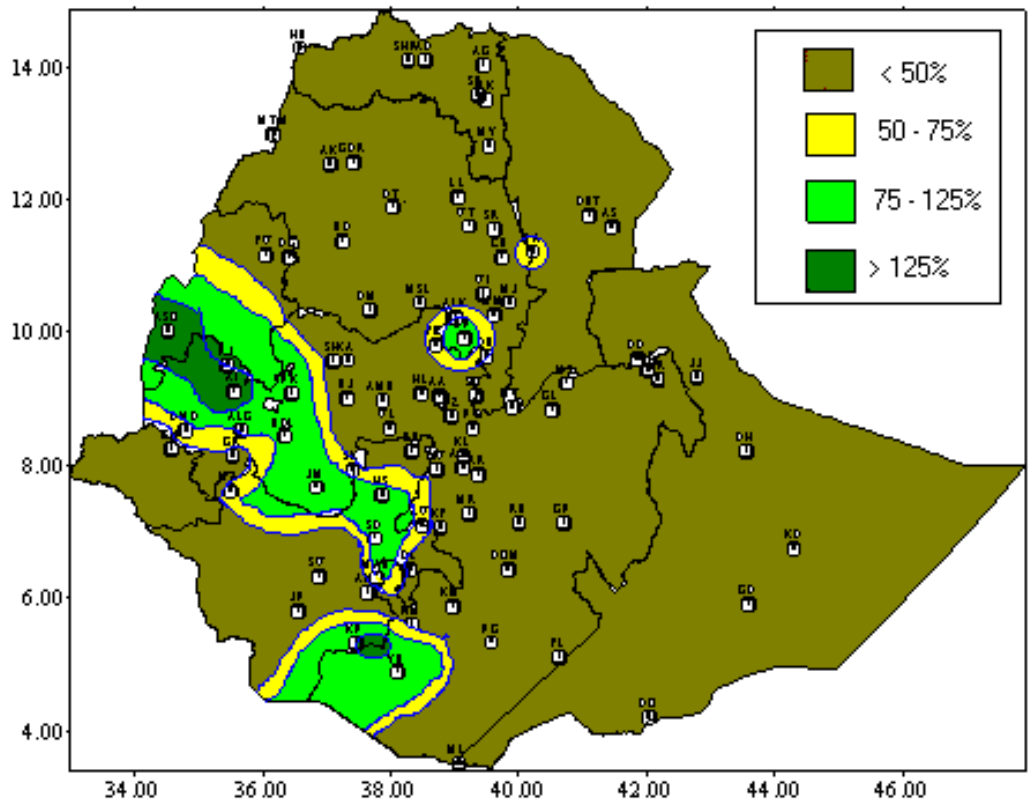



**Fig. 4 Percent of normal rainfall for the month of May 2004**

**Explanatory notes for legend**
**< 50 -- Much below normal**
**50 –75% --- Below normal**
**75 – 125% --- Normal**
**> 125% ---- Above normal**

### 1.2.2 Rainfall Anomaly (Fig. 4)

With the exception of southern half of Benishangul Gumuz, western Oromiya, few areas northern SNNPR, few areas of southwestern Oromiya and pocket areas of Amhara most parts of the country exhibited below to much below normal rainfall.

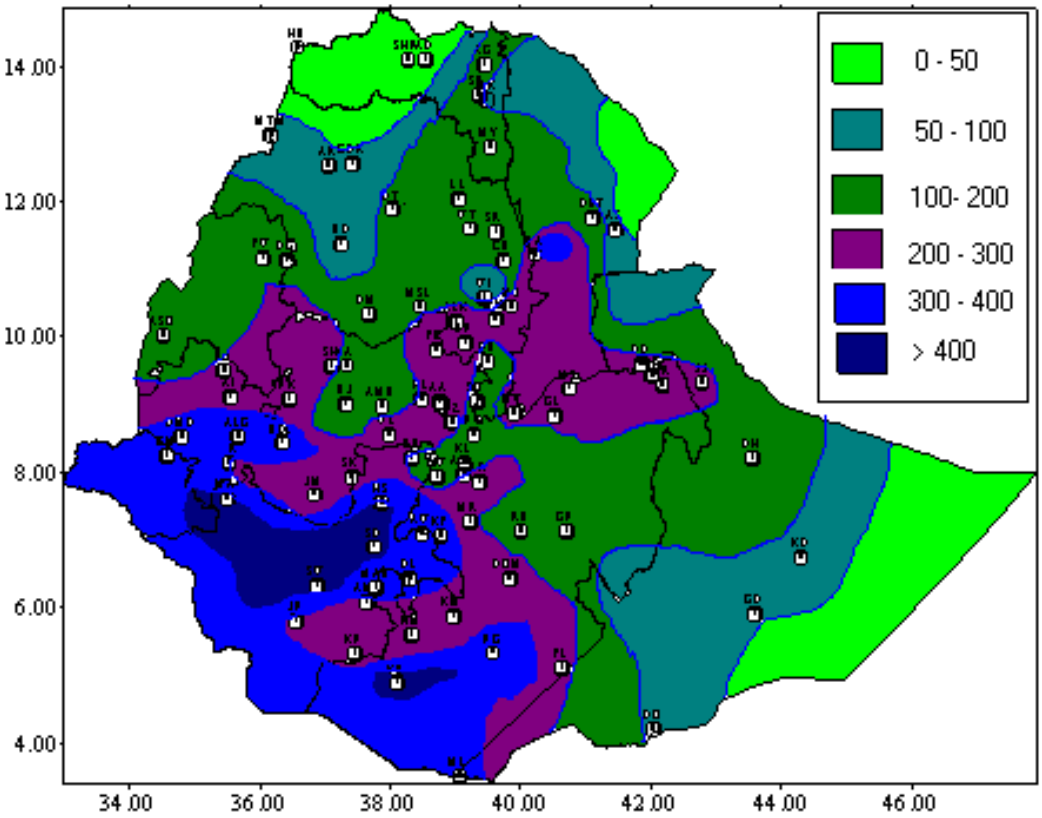



**Fig. 5 Rainfall distribution in mm for Belg 2004**

## 1.3 Belg 2004

### 1.3.1 Rainfall Amount (Fig. 5)

Parts of SNNPR and few areas of southern Oromiya received falls greater than 400 mm; parts of western Oromiya, Gambela, Parts of SNNPR and southern Oromiya experienced 300-400 mm of rainfall; few areas of eastern Amhara, most parts of southern half of Afar, parts of western, central, eastern and southern Oromiya, few areas of northern Somali and southeastern portion of Benishangul Gumuz received falls ranging from 200-300 mm; eastern Tigray, parts of northern Amhara, most parts of Benishngul Gumuz, parts of central and eastern Amhara including parts of central and southwestern Somali exhibited falls 100-200 mm. The rest parts of the country received falls below 100 mm.

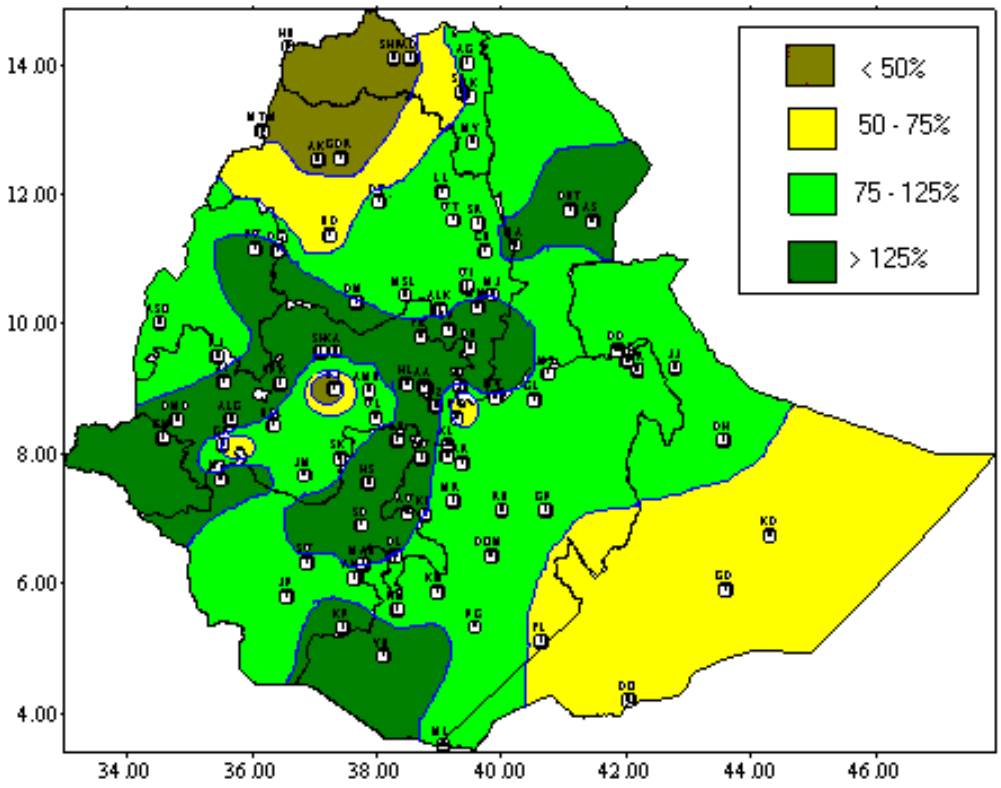



**Fig. 6 Percent of Normal rainfall for Belg season, 2004**

**Legend**

**<50 --- Much below normal**
**50-75% ----Below normal**
**75 –125% -- Normal**
**>125% -- Above normal**

### 1.3.2 Rainfall Anomaly

With the exception of most parts of Tigray, northern and parts of western Amhara including most parts of southern and southeastern Somali the rest of the country received normal to above normal rainfall.

### 1.4 TEMPERATURE ANOMALY

There was a rise in maximum temperature by 1.9 – 4.2 °C particularly during the month of May over some areas of northeastern, eastern and southeastern lowlands as well as along the Rift valley and its adjoining areas of the country.

## 2. WEATHER OUTLOOK

### 2.1 For June 1-10/2004

In the coming ten days much of Gambela, Benishangul Gumuz, western and northern sectors of SNNPR, western and central Oromiya and western Amhara will have normal to above normal rains. Besides, near normal rain is anticipated over southern and eastern Ethiopia. While southeastern and northeastern portions of the country will enjoy the dry weather condition.

### 2.2 For the month of June 2004

In the coming June, the rain producing systems are anticipated to take their normal position. Accordingly, the seasonal rains will progress following the normal trend across various portions of the country. In this context, much of Gambela, SNNPR, western and central Oromiya, Benishangul-Gumuz and western half of Amhara are anticipated to get normal to above normal rains. Heavy falls that accompanied with thunders and hails are also predicted over some places of the aforementioned regions. Similarly, despite the monthly rainfall fluctuations, southern and eastern highlands as well as much of Tigray will get near normal rains at many places. In contrast, light rains will fall for some days across northeastern portions of Ethiopia.

### 2.3 For the Kiremt season, 2004

In the coming season there are enhanced probabilities of getting normal to above normal seasonal rains across Gambela, central and western Oromiya, western half and northern portions of SNNPR, Benishangul-Gumuz as well as western Tigray and Amhara regions. Heavy falls that accompanied with flash floods are also anticipated to frequently occur over the aforementioned regions including the highlands of Ethiopia. Although, many places of eastern Tigray and Amhara, Afar, eastern and southern Oromiya, Dire Dawa, Harari, northern half of Somali and eastern sectors of SNNPR will get normal rains, below normal rains will prevail at some pocket places of the regions. At this moment, the seasonal rain is likely to cease in the normal dates across the nations.

# 3. AGROMETEOROLOGICAL CONDITIONS AND IMPACT ON AGRICULTURE

## 3.1 VEGETATION CONDITION AND IMPACT ON AGRICULTURE

Generally, though there was a delay in on-set of Belg season in most parts of the country, the rainfall condition as of last week of March in most parts of southern half of the country favored season's agricultural activities. As MOA's (No 9/96 E.C.) and NMSA's field reports confirmed that, the observed rainfall condition during the month of April favored cereal crops, which were at different phenological stages. Besides, it was favorable to perform land preparation and sowing activities of Meher crops (their contribution is 35% from annual production) on time.

The erratic nature of rainfall observed over some areas of eastern Tigay and Amhara could result in a decrease in Belg production in the areas. Fore instance as the minutes of Agricultural Task Force meeting (April 28, 2004) shows "100% of Belg dependent areas are expected to be highly affected. Areas like South Tigray (Rayaazebo, Alamata, Endamahoni) and from some areas of eastern Amhara like Legambo and Delanta are reported as areas where Belg has failed." Besides, due to the late onset of Belg rainfall, crops are at early vegetative stage in some areas of southeastern Amhara. Thus, this condition could delay the early Meher season's agricultural activities.

The observed rise in maximum temperature by 1.9 – 4.2 °C particularly during the month of May over some areas of northeastern, eastern and southeastern lowlands as well as along the Rift valley and its adjoining areas of the country could have negative effect by increasing the rate of evapo-transpairation.

In case of pastoral areas, with the exception of northern tip of Somali the rest parts of the zones normally receive rainfall during the month of April, which normally provide pasture and drinking water in the areas. Hence, the observed situation particularly during the month of April was favorable for the availability of pasture and drinking water in pastoral and agro pastoral areas of southern and southeastern lowlands. Besides the situation could have positive impact for agro pastoral activities of the areas. Nevertheless, as the Food Security Monthly Report (16 April 2004) indicates livestock production is still below average in the eastern and central parts of Somali region. Thus, this situation indicates that those areas needing attention.

## 3.2 EXPECTED WEATHER IMPACTS ON AGRICULTURE DURING THE COMING KIREMT SEASON

Pursuant to NMSA's classification, the period from June to September is known as Kiremt season. However, the rainfall amount and distribution particularly as of the second half of March has paramount importance for the performance of long cycle crops, which are considered as Meher production, and their contribution is about 35% from annual production.

The anticipated normal onset of Kiremt rainfall would be favorable for land preparation and sowing of cereals and pulses where the activities are under question like central (Abomsa, Kulumsa, Meraro, Ziway, Bui, Woliso, Ambo,), northern and northwestern (Benishangul Gumuz, some areas of western Oromiya) and north and northeastern highlands (Adwa, Fiche, Enewary, Alem Ketema, Debre Birhan, Sola Gebeya, Mehal Meda, Chefa, Amba Mariam, Laibela,). The normal onset would also create favorable condition for long cycle crops, which are already in the field with different phenological stages. According to NMSA's recent (21-31 May, 2004) crop phenological report, sowing of cereal crops like maize and sorghum was underway over some areas of western Oromiya while it was at emergency stage in some areas of eastern Amhara and western Oromiya. Maize also at ninth leaf and tasseling stages in some areas of western, eastern and in some areas of highlands of southern Oromiya. Teff was at full ripening stage in some areas of southeastern Amhara. Sorghum was at third leaf stage in some areas of western Oromiya. Thus, the situation would have paramount importance for the aforementioned areas. The expected normal rainfall distribution over most parts of northeastern, eastern, southern highlands and parts of central Ethiopia would favor season's agricultural activities. Nevertheless, the expected below normal rainfall condition over some pocket areas of the aforementioned areas would affect the water requirements of the crop. Thus, proper water harvesting techniques would advisable in drought prone areas of the above-mentioned areas. Besides, the deficient falls together with the sunny interval over some lowland areas of northeastern and eastern parts of the country including the Rift Valley and adjoining areas could favour the occurrence of pests. Thus, attention should be given for those areas in order to mitigate the effect of adverse situation. The anticipated better rainfall activities over northwest, parts of central, southwestern and western Ethiopia would create favorable condition for annual, perennial and horticultural crops (flower, fruit and vegetables) in the areas. Nevertheless, the expected heavy falls over northwestern, parts of central, southwestern and western Ethiopia particularly during the month of July and August would result in crop damage and livestock losses in some low lying areas of the aforementioned areas. Thus, proper precaution should be required ahead of time in order to mitigate the effect of excess water. The important thing what the users should give attention is to interpret the forecast in terms of their area of interest since meteorological normal not always coin side with agricultural normal.

Table 1 Climatic and Agro-Climatic elements of different stations for the month of May 2004

| | Stations | Region | A/ rainfall | Normal | %of Normal | Eto mm/day | Monthly Eto | Moisture status |
|---|---|---|---|---|---|---|---|---|
| 1 | Adigrat | TIGRAI | 3.9 | 49.5 | 7.9 | 5.38 | 166.78 | VD |
| 2 | Adwa | | 0 | 38.1 | 0.0 | 5.54 | 171.74 | VD |
| 3 | Mekele | | 7.1 | 31.6 | 22.5 | 6.74 | 208.94 | VD |
| 4 | Metema | | 0 | 65.7 | 0.0 | NA | NA | NA |
| 5 | Michew | | 0.9 | 7.2 | 12.5 | 5.22 | 161.82 | VD |
| 6 | Senkata | | 7.1 | 62.3 | 11.4 | 6.55 | 203.05 | VD |
| 7 | Shire | | 0 | 30.2 | 0.0 | 6.95 | 215.45 | VD |
| | | | | | | | | |
| 1 | Assayta | AFAR | 0 | 4.1 | 0.0 | 7.27 | 225.37 | VD |
| 2 | Dubti | | 0 | 11.7 | 0.0 | 6.06 | 187.86 | VD |
| | | | | | | | | |
| 1 | Alemketema | AMHARA | 0 | 73.4 | 0.0 | NA | NA | NA |
| 2 | Bahirdar | | 6.4 | 82.2 | 7.8 | 4.47 | 138.57 | VD |
| 3 | Bati | | 44.7 | 62.9 | 71.1 | 3.88 | 120.28 | MD |
| 4 | Combolcha | | 14.8 | 65.1 | 22.7 | 4.73 | 146.63 | D |
| 5 | Chefa | | 11.3 | 104.6 | 10.8 | 5.41 | 167.71 | VD |
| 6 | D.Birhan | | 5.6 | 46.2 | 12.1 | 6.34 | 196.54 | VD |
| 7 | D.Markos | | 20.2 | 59.3 | 34.1 | 4.6 | 142.6 | D |
| 8 | D.Tabor | | 19.1 | 92.8 | 20.6 | NA | NA | NA |
| 9 | Dangla | | 28.3 | 88 | 32.2 | 4.69 | 145.39 | D |
| 10 | Debark | | 0 | 87.4 | 0.0 | NA | NA | NA |
| 11 | Enwary | | 20.2 | 24.9 | 81.1 | 6 | 186 | D |
| 12 | Gonder | | 1.4 | 92.7 | 1.5 | 6.23 | 193.13 | VD |
| 13 | M.Selam | | 21.3 | NA | NA | 5.26 | 163.06 | VD |
| 14 | M.Meda | | 6 | 39.2 | 15.3 | 5.3 | 164.3 | VD |
| 15 | Majete | | 5.9 | 85.2 | 6.9 | 5.39 | 167.09 | VD |
| 16 | Lalibela | | 0 | 39.6 | 0.0 | NA | NA | NA |
| 17 | Sholagebeya | | 14.9 | 50.7 | 29.4 | NA | NA | NA |
| 18 | Sirinka | | 4.2 | 82.6 | 5.1 | 5.63 | 174.53 | VD |
| 19 | Woreilu | | 2.9 | 16.6 | 17.5 | 6.53 | 202.43 | VD |
| 20 | Wegeltena | | 4.9 | 39.9 | 12.3 | 5.54 | 171.74 | VD |
| | | | | | | | | |
| 1 | Aira | OROMIYA | 169.2 | 90.6 | 186.8 | 4.38 | 135.78 | H |
| 2 | Alemaya | | 39.7 | 109.7 | 36.2 | 5.09 | 157.79 | D |
| 3 | Ambo | | 17.3 | 80.3 | 21.5 | 5.19 | 160.89 | D |
| 4 | Arsi Robe | | 30.4 | 120.7 | 25.2 | 4.58 | 141.98 | D |
| 5 | Bedelle | | 247.5 | 226.1 | 109.5 | 3.88 | 120.28 | H |
| 6 | Bui | | 2.6 | NA | NA | 5.08 | 157.48 | VD |
| 7 | D.Dollo | | 185.5 | 208.9 | 88.8 | NA | NA | NA |
| 8 | D.Mena | | 30.8 | 127.5 | 24.2 | 3.89 | 120.59 | MD |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 9 | D.Zeit | | 9.4 | 53.3 | 17.6 | 5.24 | 162.44 | VD |
| 10 | Ejaji | | 9.4 | 114.2 | 8.2 | 5.14 | 159.34 | VD |
| 11 | Fitche | | 27.2 | 58.7 | 46.3 | 4.95 | 153.45 | D |
| 12 | Gelemso | | 46.8 | 129.7 | 36.1 | 4.51 | 139.81 | MD |
| 13 | Gimbi | | 141.9 | 195.1 | 72.7 | NA | NA | NA |
| 14 | Gore | | 115.1 | 248.3 | 46.4 | NA | NA | NA |
| 15 | Jimma | | 162.9 | 162.3 | 100.4 | 3.54 | 109.74 | H |
| 16 | K.Mengist | | 11.8 | 237.2 | 5.0 | NA | NA | NA |
| 17 | Koffele | | 86.3 | 106.2 | 81.3 | 3.64 | 112.84 | M |
| 18 | Kulumsa | | 24.5 | 85.5 | 28.7 | 5.73 | 177.63 | D |
| 19 | Masha | | 191.3 | 251.9 | 75.9 | 3.55 | 110.05 | H |
| 20 | Meisso | | 3.4 | 61.3 | 5.5 | 5.89 | 182.59 | VD |
| 21 | Metehara | | 0 | 41.8 | 0.0 | 5.85 | 181.35 | VD |
| 22 | Moyale | | 21.2 | 99.3 | 21.3 | NA | NA | NA |
| 23 | Nazreth | | 1.9 | 56.4 | 3.4 | NA | NA | NA |
| 24 | Neghele | | 45 | 163.1 | 27.6 | 4.06 | 125.86 | MD |
| 25 | Nedjo | | 159.1 | 192.9 | 82.5 | 4.21 | 130.51 | H |
| 26 | Nekemte | | 216.1 | 217.4 | 99.4 | 4.06 | 125.86 | H |
| 27 | Robe(Bale) | | 22.7 | 80.8 | 28.1 | 4.88 | 151.28 | D |
| 28 | Sekoru | | 62.9 | 168.9 | 37.2 | 4.06 | 125.86 | MD |
| 29 | Shambu | | 99.7 | 189.6 | 52.6 | NA | NA | NA |
| 30 | Woliso | | 47.4 | 81.7 | 58.0 | 5.3 | 164.3 | MD |
| 31 | Yabello | | 121.8 | 109.4 | 111.3 | 6.36 | 197.16 | M |
| 32 | Zeway | | 0 | 81.5 | 0.0 | 5.99 | 185.69 | VD |
| | | | | | | | | |
| 1 | Gode | SOMALI | 0 | 64.9 | 0.0 | 6.98 | 216.38 | VD |
| 2 | K.Dehar | | 0 | 61.4 | 0.0 | | | |
| 3 | Jijiga | | 21.4 | 98.8 | 21.7 | 5.25 | 162.75 | D |
| | | | | | | | | |
| 1 | A.Minch | SNNPR | 53.9 | 136.7 | 39.4 | 4.49 | 139.19 | MD |
| 2 | Awassa | | 81.4 | 121.6 | 66.9 | 4.36 | 135.16 | M |
| 3 | Hosaina | | 104.6 | 134 | 78.1 | 4.47 | 138.57 | M |
| 4 | Konso | | 62.2 | 45.9 | 135.5 | 4.69 | 145.39 | MD |
| | | | | | | | | |
| 1 | Pawe | B/GUMUZ | 49.4 | 116.6 | 42.4 | NA | NA | NA |
| | | | | | | | | |
| 1 | A.A.Obs. | A.A | 30.1 | 77.4 | 38.9 | 3.78 | 117.18 | MD |
| | | | | | | | | |
| 1 | Diredawa | D.D | 0.1 | 45.9 | 0.2 | 6.92 | 214.52 | VD |
| | | | | | | | | |
| 1 | Harar | Harai | 6.7 | 123 | 5.4 | 4.34 | 134.54 | VD |

Legend

| | | |
|---|---|---|
| VD | Very Dry | < 0.1 |
| D | Dry | 0.1 - 0.25 |
| MD | Moderatly Dry | 0.25 - 0.5 |
| M | Moist | 0.5 - 1 |
| H | Humid | >1 |

Explanatory Note

ETo Reference Evapotranspiration(mm)

**DEFNITION OF TERMS**

**ABOVE NORMAL RAINFALL:** - Rainfall in excess of 125% of the long term mean

**BELOW NORMAL RAINFALL**: - Rainfall below 75 % of the long term mean.

**NORMAL RAINFALL**: - Rainfall amount between 75 % and 125 % of the long term mean.

**BEGA**: - It is characterized with sunny and dry weather situation with occasional falls. It extends from October to January. On the other hand, it is a small rainy season for the southern and southeastern lowlands under normal condition. During the season, morning and night times are colder and daytime is warmer.

**BELG:** - Small Rainy season that extends from February to May and cover s southern, central, eastern and northeastern parts of the country.

**CROP WATER REQUIREMENTS**: - The amount of water needed to meet the water loss through evapotransipiration of a disease free crop, growing under non-restricting soil conditions including soil water and fertility.

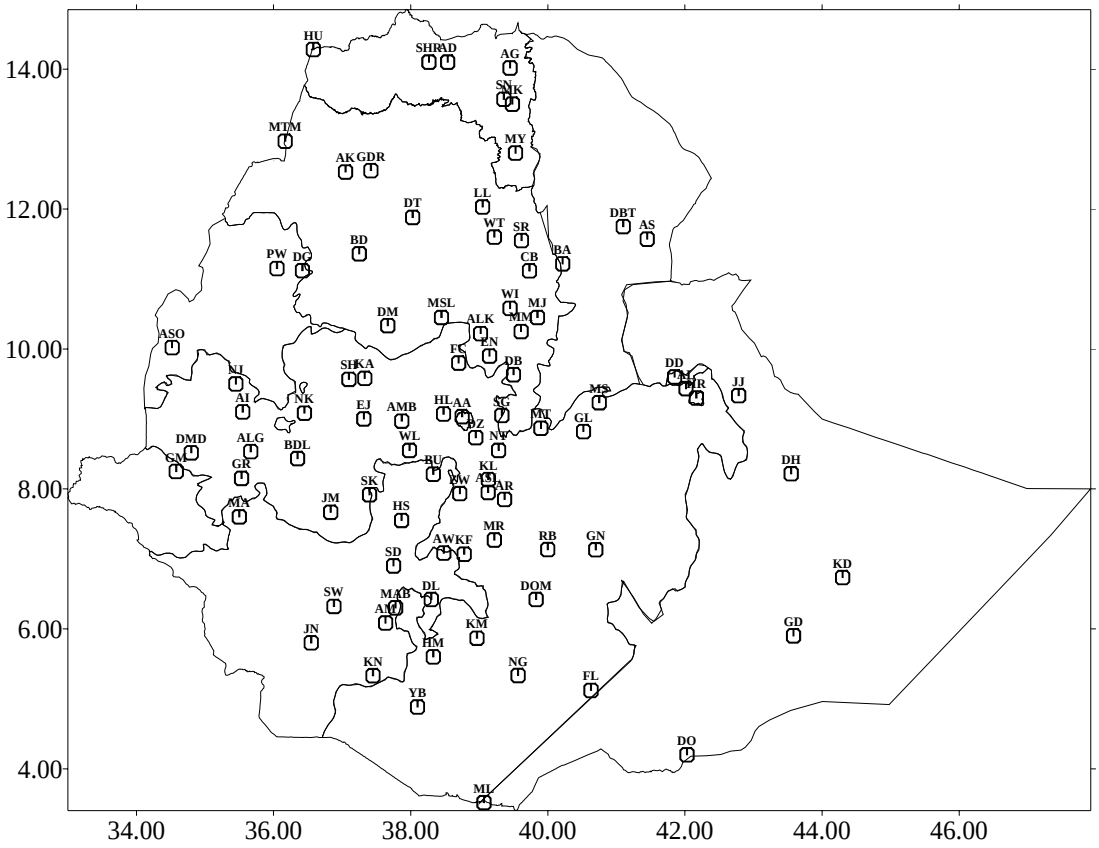
**DEKAD**: - First or second ten days or the remaining days of a month.

**EXTREME TEMPERATURE**: - The highest or the lowest temperature among the recorded maximum or minimum temperatures respectively.

**ITCZ**: - Intertropical convergence zone (narrow zone where trade winds of the two hemispheres meet.

**KIREMT:** - Main rainy season that extends from June to September for most parts of the country with the exception of the southeastern lowlands of the country.

**RAINY DAY**: - A day with 1 or more mm of rainfall amount.




**STATIONS DISTRIBUTION FOR THE PREPARATION OF AGROMETEOROLGICAL BULETINS**

| Station | Code |
|---|---|
| A. Robe | AR |
| A.A. Bole | AA |
| Adigrat | AG |
| Adwa | AD |
| Aira | AI |
| Alemaya | AL |
| Alem Ketema | ALK |
| Alge | ALG |
| Ambo | AMB |
| Arbaminch | AM |
| Asaita | AS |
| Asela | ASL |
| Assosa | ASO |
| Awassa | AW |
| Aykel | AK |
| B. Dar | BD |
| Bati | BA |
| Bedelle | BDL |
| BUI | BU |
| Combolcha | CB |
| D.Berehan | DB |
| D.Habour | DH |
| D.Markos | DM |
| D.Zeit | DZ |
| D/Dawa | DD |
| D/Mena | DOM |
| D/Odo | DO |
| D/Tabor | DT |
| Dangla | DG |
| Dilla | DL |
| Dm.Dolo | DMD |
| Dubti | DBT |
| Ejaji | EJ |
| Enwary | EN |
| Fiche | FC |
| Filtu | FL |
| Gambela | GM |
| Gelemso | GL |
| Ginir | GN |
| Gode | GD |
| Gonder | GDR |
| Gore | GR |
| H/Mariam | HM |
| Harer | HR |
| Holleta | HL |
| Hossaina | HS |
| Humera | HU |
| Jijiga | JJ |
| Jimma | JM |
| Jinka | JN |
| K.Dehar | KD |
| K/Mingist | KM |
| Kachise | KA |
| Koffele | KF |
| Konso | KN |
| Kulumsa | KL |
| Lalibela | LL |
| M.Meda | MM |
| M/Abaya | MAB |
| Maichew | MY |
| Majete | MJ |
| Masha | MA |
| Mekele | MK |
| Merraro | MR |
| Metehara | MT |
| Metema | MTM |
| Mieso | MS |
| Moyale | ML |
| M/Selam | MSL |
| Nazereth | NT |
| Nedjo | NJ |
| Negelle | NG |
| Nekemte | NK |
| Pawe | PW |
| Robe | RB |
| Sawla | SW |
| Sekoru | SK |
| Senkata | SN |
| Shambu | SH |
| Shire | SHR |

| | |
|---|---|
| Shola Gebeya | SG |
| Sirinka | SR |
| Sodo | SD |
| Wegel Tena | WT |
| Woliso | WL |
| Woreilu | WI |
| Yabello | YB |
| Ziway | ZW |