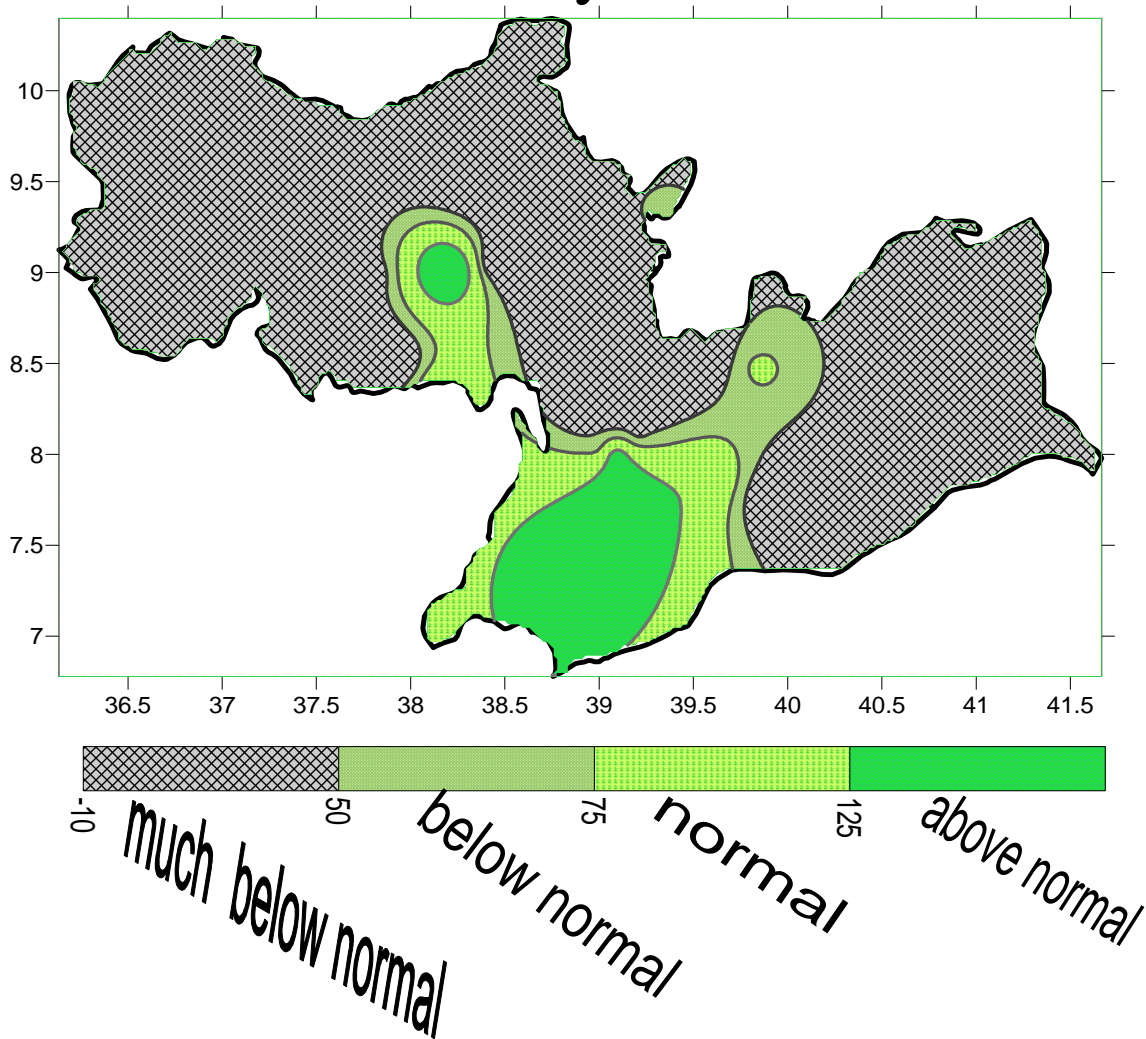


National Meteorological Agency Adama Branch Office Monthly Climate Bulletin February, 2011



In most of the regions the rainfall distribution observed much below normal and below normal. The regions of East Wellega, some part of north shoa, east shoa and east & West Harerge have got much below normal. In some part of west shoa and most part of Arsii zone have got normal to above normal rain fall

Foreword

This climatic bulletin is prepared and disseminated by the National Meteorology Agency of Adama Branch Office. Comments, suggestions, recommendations are significant to the branch office to up grade the quality as well as the quantity of the information contained in the bulletin.

The information contained in the bulletin is believed to assist many socio-economic activity of the region (Oromia) such as Tourism, Construction, Health and Agriculture at most. We strongly advice these sectors for serious follow up of this bulletin for more valuable benefits from the information in the bulletin.

This bulletin differs from the other real time and near real time bulletins issued by the branch office, 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 at least twenty days, the information contained in this bulletin is based on data coming from a much larger number of meteorological station. Moreover, the information contained in this bulletin is not sector-specific and a wide range of users can benefit from it.

National Meteorology Agency, Adama branch office has issued this bulletin monthly due to the delay of data from different stations the bulletin will be available for the users just 20 days later from the month marked. This may be improved in the near future with strong improvement of the data exchange method among the meteorological stations.

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Weather

1.1 Temperatures

February is the first month of Belg seasons. The temperature of this month in most of the regions was relatively hot. From mid of this month the temperature become slightly decrease in some of the regions. During this month the days are relatively hot over same parts of East– Shoa and West Wellega at which the monthly mean maximum temperature ranges from 29.5 up to 31.5 °c and 25.5 up to 31.5°c respectively. (refer fig.1) but the nights and early mornings were cooler over central adjoining parts of East Shoa and most part of North Shoa at which the monthly mean minimum temperature of February 2011 was below 11 °c.(refer fig.2)

An extreme maximum temperature of the month (February 2011) recorded in most of the regions. Extreme maximum temperature observed between 30.2 up to 34.6 °C over Alemtena, Ogolcho, Adama, Sodere, Sibusire, Kokadam, Backo, Ambo and Metehara in the magnitudes of 30.2, 30.5, 30.5, 30.6, 30.9, 31.7, 32.3, 34 and 34.6 in °C respectively. In Jeju, Mojo, Chefedonsa, Abomsa, Megabit 28 and Bedesa, their values were 28.4, 28.5, 28.6, 28.9, 29.3 & 29.7 °C of the extreme maximum temperature respectively (refer table 1).

In the month of February an extreme minimum temperature observed over Metehara, Ambo, Backo, Kokadam, Sibusire, Sodere, Adama, Ogolcho, Alemtena, Bedesa, Megabit 28 and Abomsa with the magnitudes of 1.6, 2.9, 3.4, 4.1, 5.4, 5.4, 6.4, 6.6, 6.6, 7.1, 7.3 & 7.8 in °C at a date of 11, 5, 20, 12, 14, 10, 9, 13, 12, 9, 8 & 6 respectively (refer table 2).

Relative to the previous year the mean air temperature of February 2011 was show an increment over most parts of the regions.

Table 1 station with extreme maximum temperature of greater than or equal to 28.4 °c during February, 2011.

Station name	Ext.max temperature	Date
Metehara	34.6	27
Ambo	34.0	28
Backo	32.3	26
Kokadam	31.7	11
Sibusire	30.9	18
Sodere	30.6	27
Adama	30.5	9
Ogolcho	30.5	22
Alemtena	30.2	21
Bedesa	29.7	9
Megabit 28	29.3	28
Abomsa	28.9	9
Cheffedonsa	28.6	9
Mojo	28.5	2
Jeju	28.4	3

Table 2 stations with extreme minimum temperature of less than or equal to 7.8 °c during February, 2011.

Station name	Ext.Min temperature	Date
Metehara	1.6	11
Ambo	2.9	5
Backo	3.4	20
Kokadam	4.1	12
Sibusire	5.4	14
Sodere	5.4	10
Adama	6.4	9
Ogolcho	6.6	13
Alemtena	6.6	12
Bedesa	7.1	9
Megabit 28	7.3	8
Abomsa	7.8	6

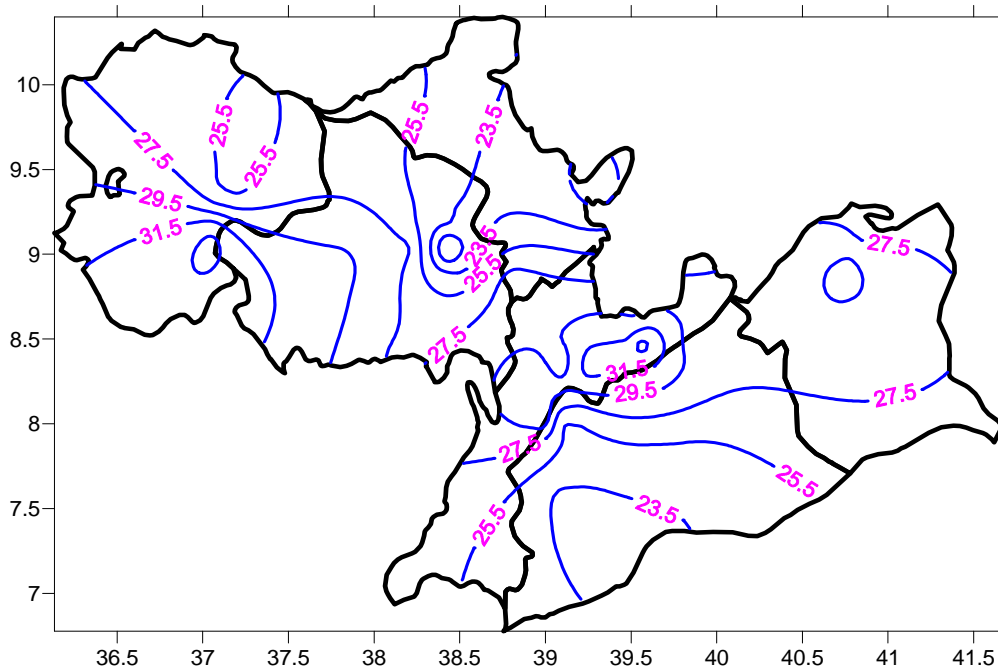


Fig 1: Mean maximum temperature of February 2011.

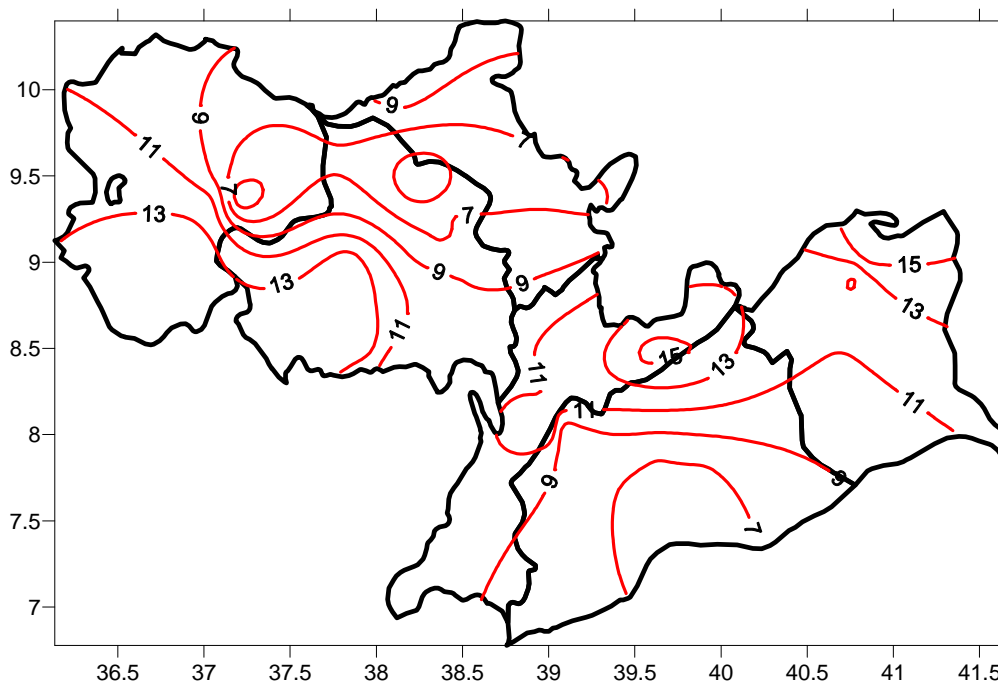


Fig 2: Mean minimum temperature of February 2011.

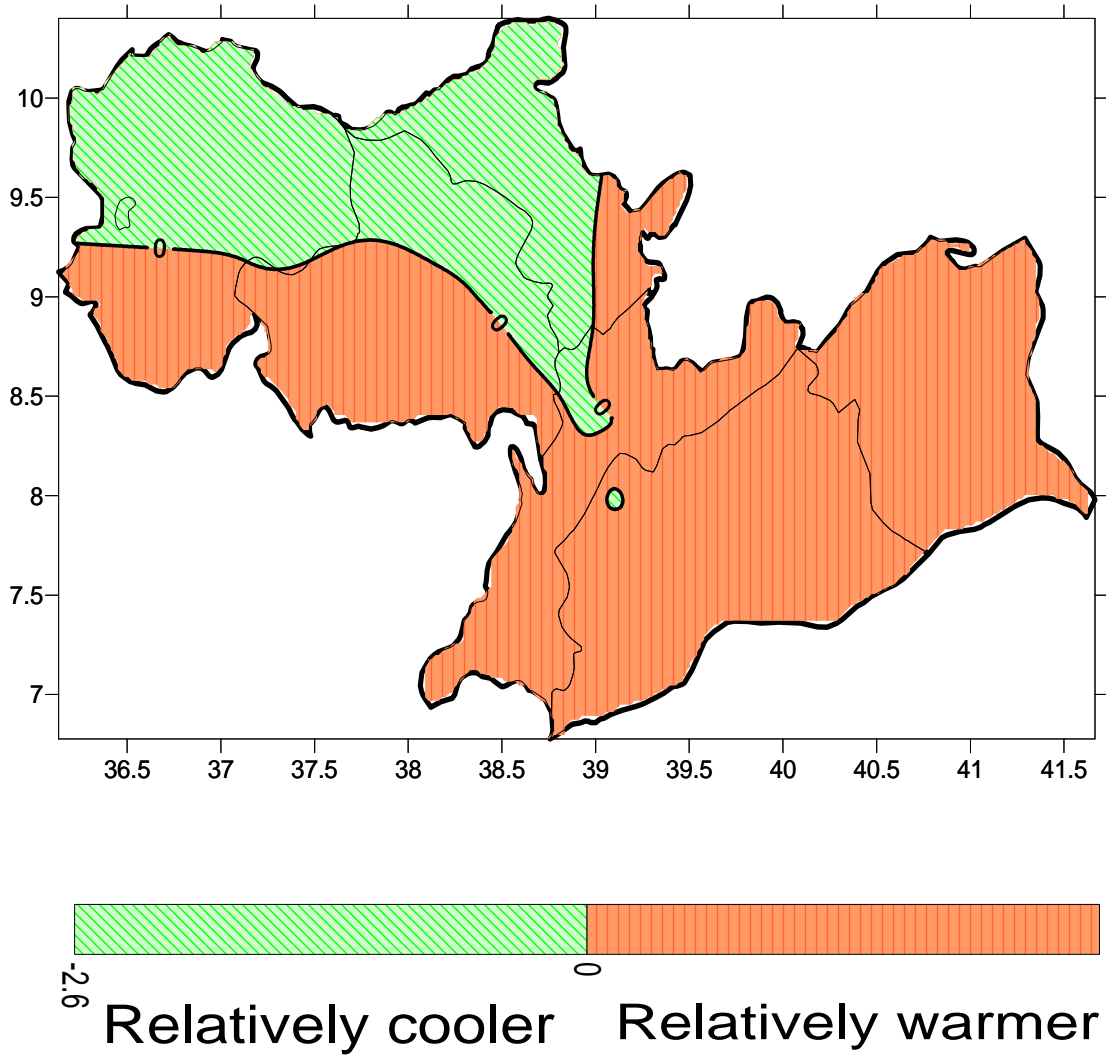


Fig 3: Temperature departure (mean air temperature of February 2011 minus the previous year mean air temperature of February.)

Rainfall

February is the first month of Belg seasons at which the rainfall distribution observed in the last of this month at some part of the regions. The main rain fall spatial distribution has shifted to the south part of country. During this month the station that administrate under Adama branch office some rainfall amount recorded over part of Arsi zone, some part of shoa, west & East Wellega (refer fig 5).

When we Compare to the previous month of February 2010 with this month of the amount rainfall distribution was relatively decrease in most of the regions (refer fig 5).

In most of the regions the rainfall distribution observed much below normal and below normal. The regions of East Wellega, some part of north shoa, east shoa and east & West Harerge have got much below normal. In some part of west shoa and most part of Arsii zone have got normal to above normal rain fall (refer fig 6).

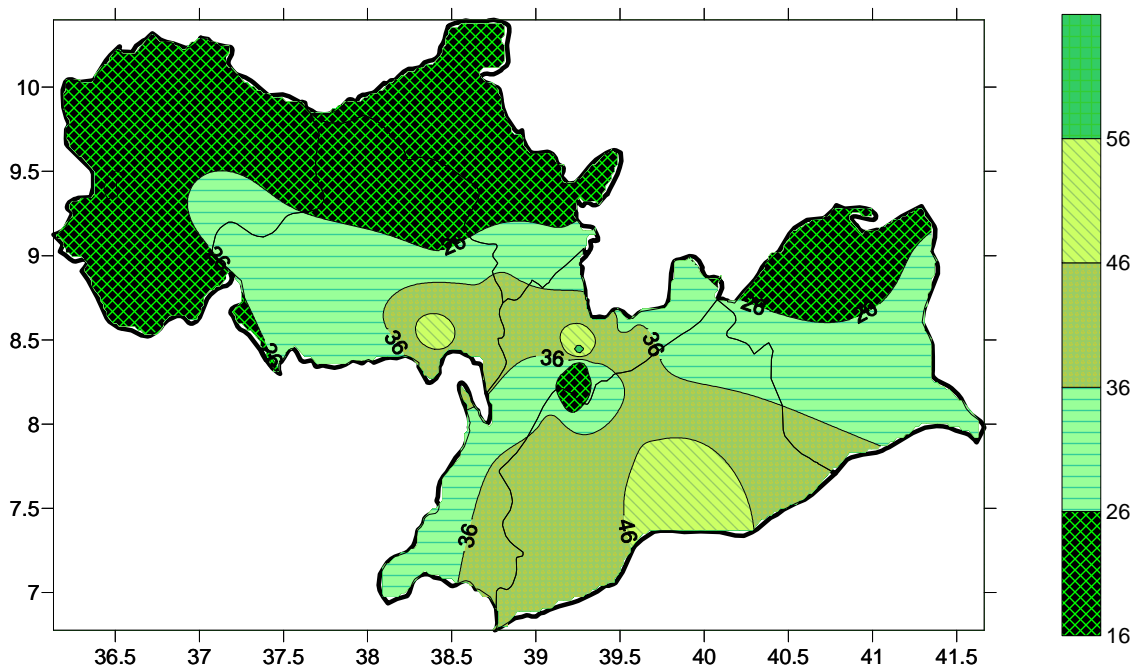


Fig 4: Monthly total rainfalls in mm during February 2011.

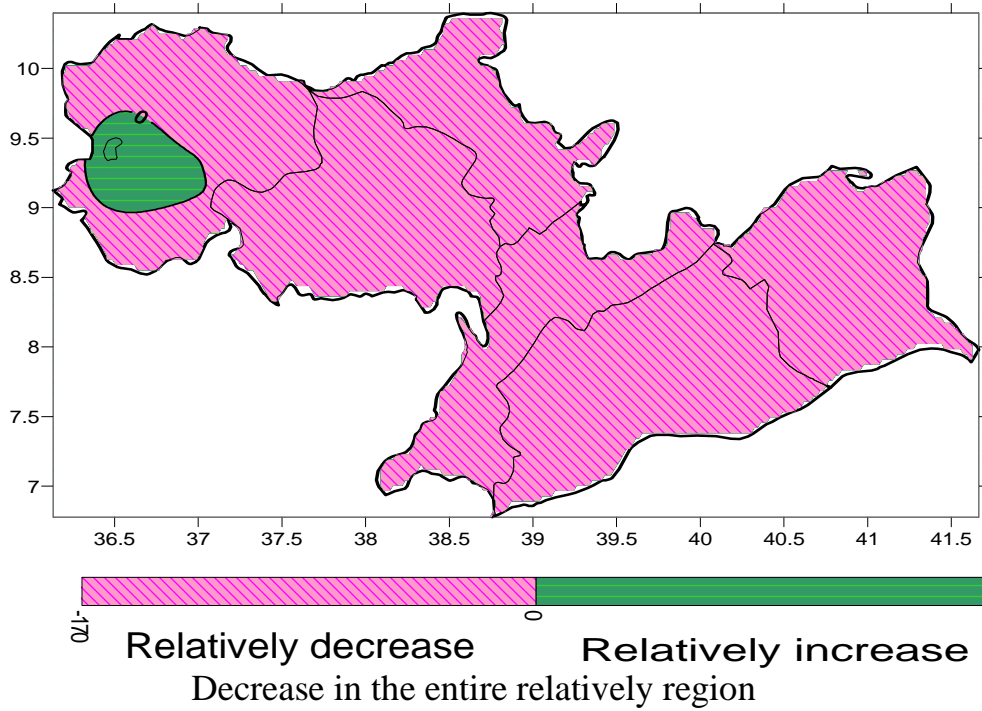


Fig 5: Rainfall departure of February (2011-2010).

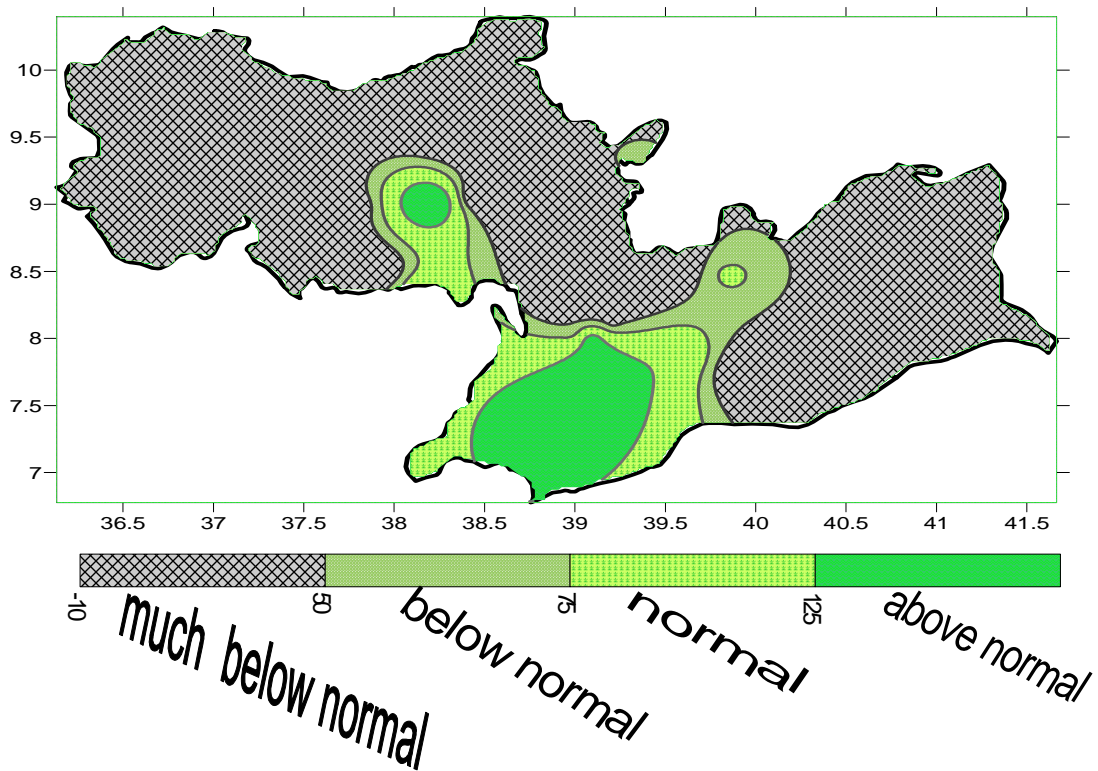


Fig 6: Percent of normal rainfall of February 2011.

Climate information on health sector

Foreword

This “climate information for the health sector” Bulletin has been designed to convey essential information regarding the monitoring of human comfort conditions based on the analysis of temperature and humidity data and also for the monitoring of malaria outbreak areas based on the analysis of temperature and precipitation data.

Since the monitoring of temperature and rainfall over a give area can be used to assess the likely hood of outbreak of malaria with a lag of two months, this information can be an important early warning tool if used judiciously.

The major objective of this bulletin is in line with the National Metrological Agency’s strategy of diversifying climate application products to the basic development sectors (such as the Health, the water, the agricultural sector etc...). This bulletin can be a very important source of information to health professionals engaged in the monitoring of public Health, to tourism Agents and institutions who advise tourists regarding the comfort conditions of the place to be visited by the tourists and to the researcher who is interested in the field of Bio-climatology.

We are of the opinion that careful and continuous use of this bulletin can benefit to the improvement of early warning system and preparedness in the health sector.

Mean while, your comment constructive suggestion is highly appreciated to make the objective of this bulletin a success.

1. Rainfall, Temperature and Humidity conditions

The total rainfall amount of February 2011 was less over most of the Belg rain benefiting area: with much below normal events to above normal events rain is recorded for the month of January over most of the region that administrated under Adama branch office. Besides, the monthly total rainfall amount did not exceed 80mm over all parts of the region rainfall recording stations. (Figures 1a and 1b)

On the other hand, the daily mean temperature values were between 18 to 32 °c except west North shoa, northern part of west Shoa and east Wellega some parts of Arsi regions. However the monthly average relative humidity did not exceed 60% over all regions. (Figures 2a and 2b)

As Per Grover-kopec et al 2006, the suitable climatic conditions for transmission of malaria in Africa are; **when the monthly precipitation (rainfall) accumulation is at least 80mm, the monthly mean temperature is between 18°c and 32°c and the monthly relative humidity is at least 60%.**

This some approach is applied to the rainfall, temperature and Relative humidity data of February 2011, of region that administrated under Adama branch office so as to produce figure 3. During February 2011, the monthly total rainfall amount did not exceed 80mm over all rainfall recording stations and **also relative humidity is less than 60% over all rainfall-recording stations.** On the other hand the daily mean temperature values were between 18 to 32 most part of region. But, climatologically conditions were not suitable for spread of malaria over all parts of the region. However; one needs to into account other **non climatic** conditions for monitoring the spread of malaria.

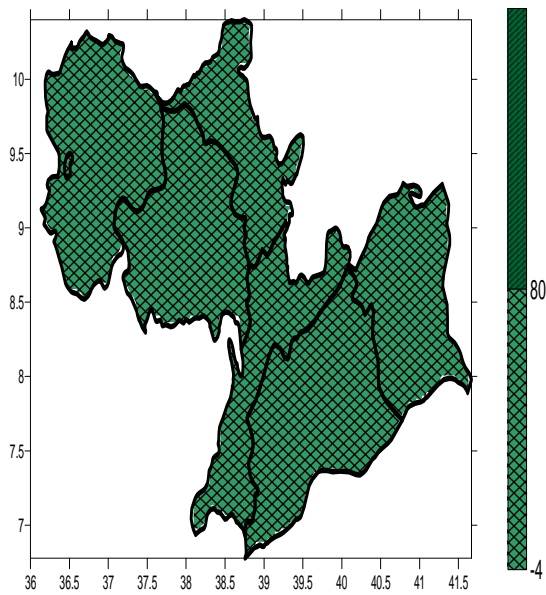


Fig .a

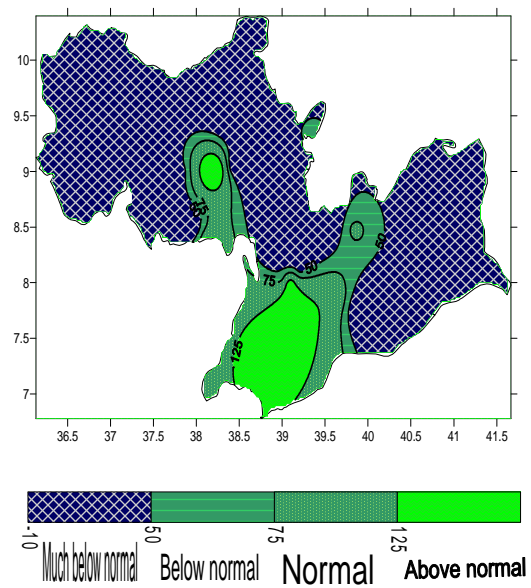


Fig. b

Figure 1 Rainfall assessment of February 2011. (a) Monthly total rainfall amount in mm. Hatched areas had monthly rain fall amount of at list 80mm, and (b) percent of normal rainfall February 2011.

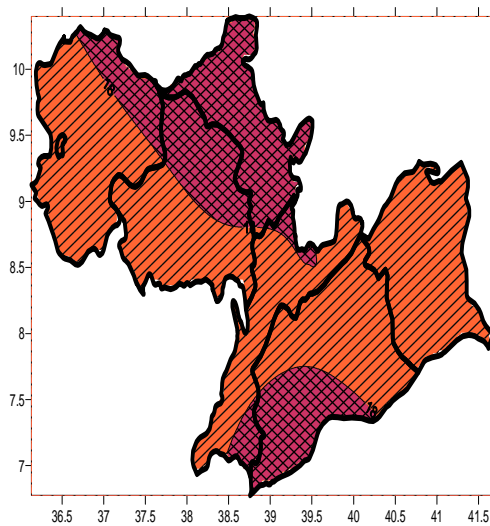


Fig .a

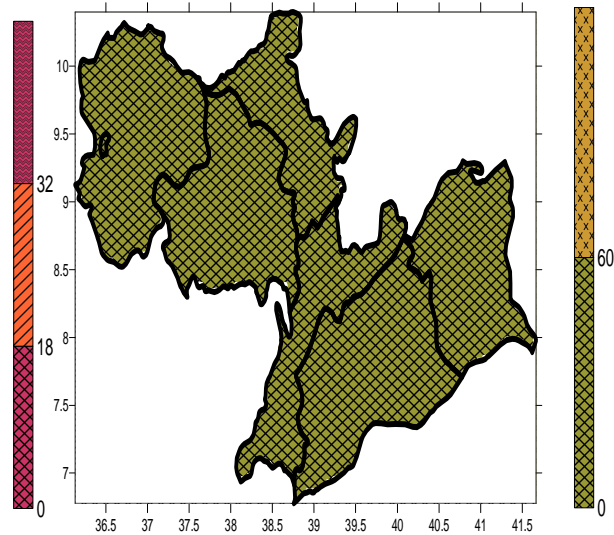


Fig. b

Figure 2 Temperature and Relative humidity assessment of February 2011.(a) daily mean temperature in °c of February 2011 Hatched area had daily mean temperature of 18 to 32 °c ,and (b) monthly average relative humidity of 60%and above.

2. Temperature Humidity Index (THI) conditions

The temperature Humidity Index (THI) approach, which was developed by the US weather Bureau in 1959, is applied to the temperature and humidity data over selected station in oromia region that administrated under Adama branch office to assess the discomfort condition during February 2011. According to this approach, if the THI value exceed 26 all most all population feel uncomfortable (here we refers to it is “uncomfortable”), the THI value between 21 to 26 half of the population feel uncomfortable (here we refers to it as ”moderate”) and if the THI value are less than 21 almost all population feel comfortable (here we refers to it as ” comfortable”) With respect to heat stress.

Based on this approach comfortable condition with respect to heat stress dominant over all places listed in the following during this month (Table1)

Table1. Temperature Humidity Index (THI) frequency over selected stations in Adama Branch during February 2011

station	Number of days with THI value			Total Number of Days With the Available Data
	>21 Comfortable	21-26 Moderate	>26 Uncomfortable	
Adama	26	2	0	28
Ambo	28	0	0	28
A/robe	28	0	0	28
Adele	28	0	0	28
Abomsa	28	0	0	28
Kulumsa	28	0	0	28
Metehara	3	25	0	28
Measo	24	4	0	28
Fitche	28	0	0	28
Gelemso	28	0	0	28
Shambu	28	0	0	28
Waliso	28	0	0	28

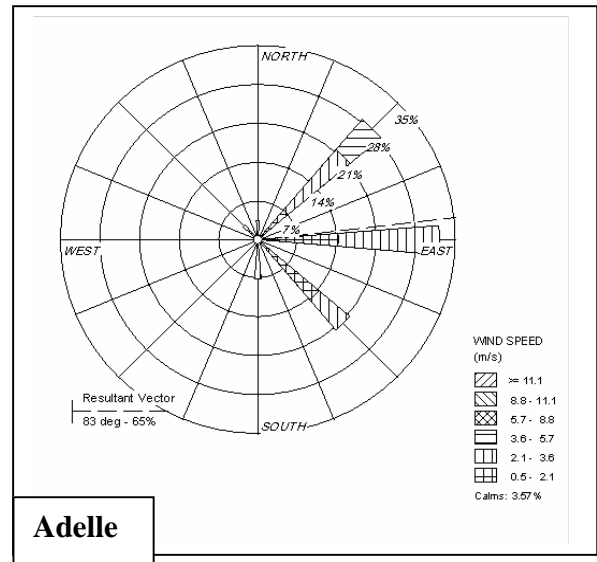
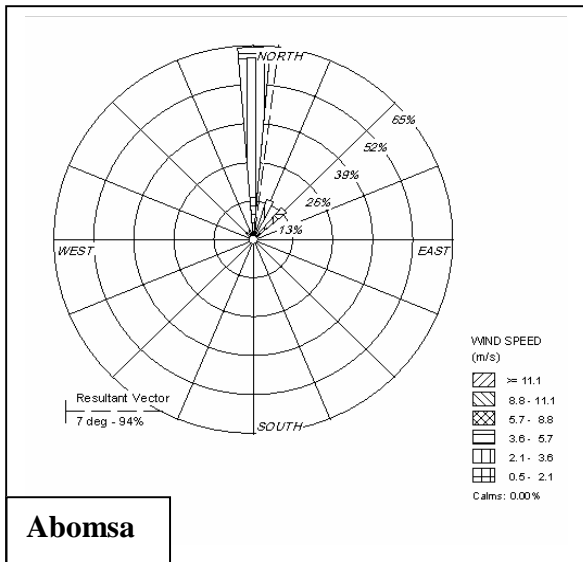
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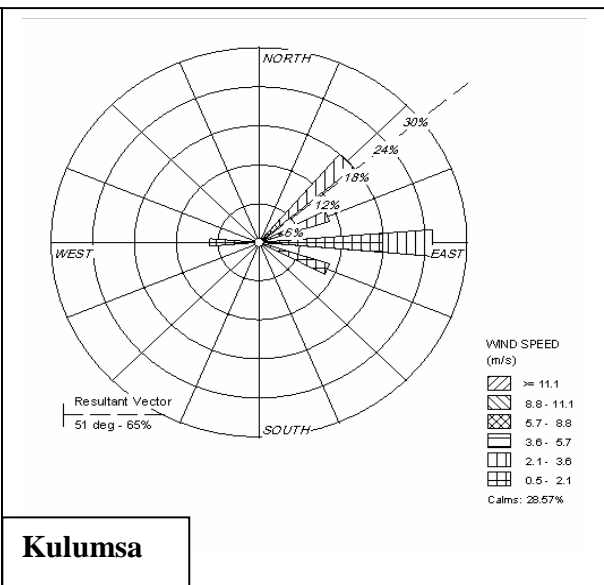
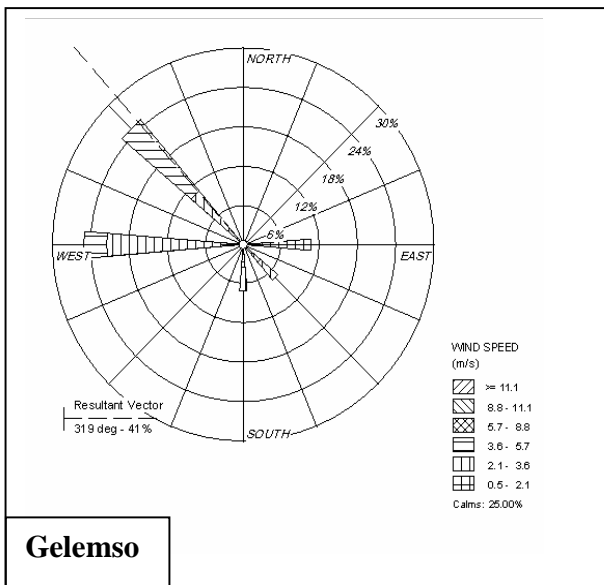
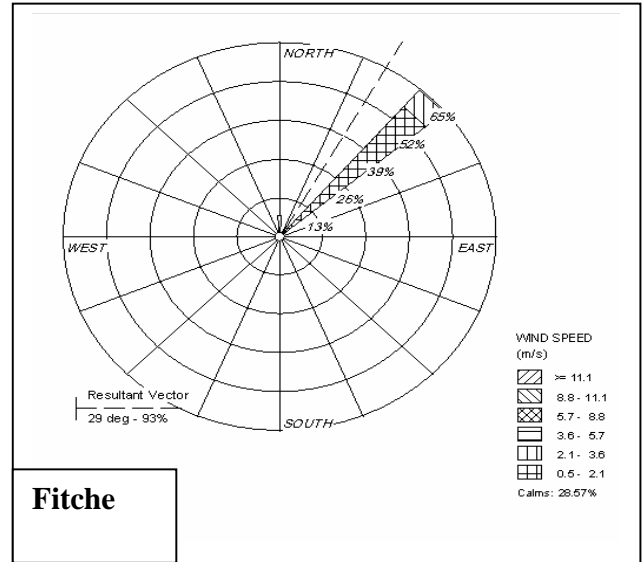
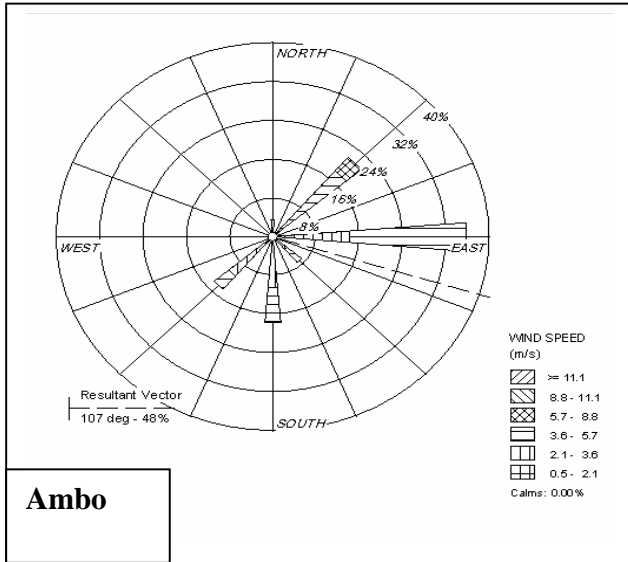
Grover-Kopek et al 2006 (-Web-based climate information resource for malaria control in Africa, Malar J.2006; 5:35 published online 2006July)

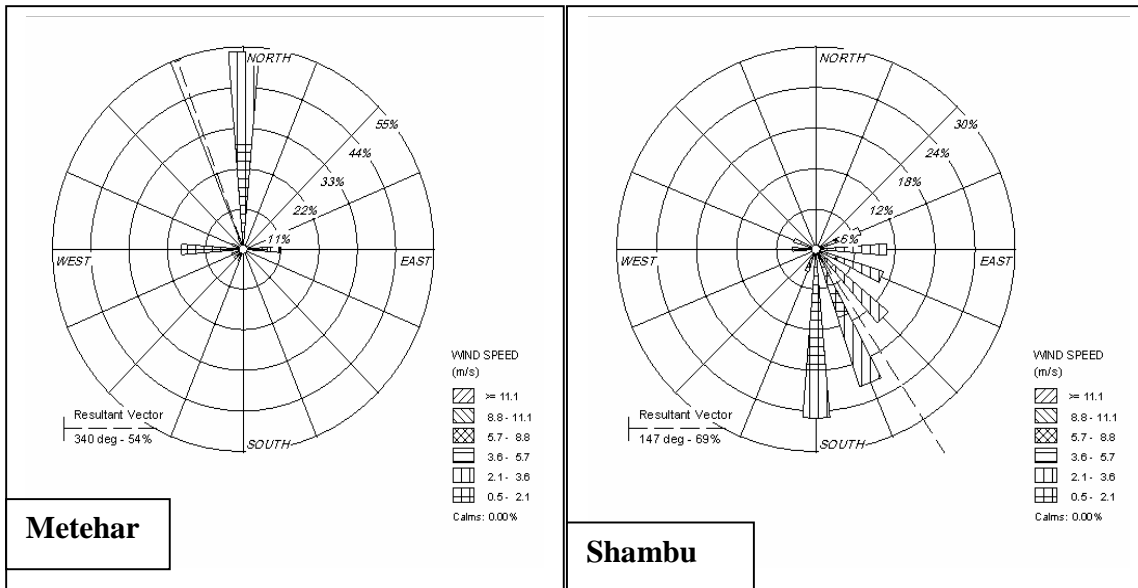
Wind Force

The wind rose diagram presented in table 3 shows the wind condition that prevailing during the month of February 2011 over different station of the branch office of Adama the center of the diagram represents a meteorological station into which the wind blows, while its tails shows where the wind comes from. The percentages points on the concentric circles can be used to make comparison among the length of the bars and so as to easily identify the more prevalent direction. The shading on the bars represents a specific speed ranges in meters per second (m/s) as shown on the key. During this month the highest wind force recorded over Shambu with values of 11.1 m/s (Refer table 3).

Table 3 Wind patterns of different stations of February 2011.







Weather Report from Different Station of Oromia during February, 2011.

Station Name	Lat	Long	T.RF	E.RF	Date	M.Max	E.Max	Date	M.Min	E.Min	Date	PON
Abomsa	8.48	39.84	18.2	17.0	13	28.9	32.0	9	15.0	12.0	6	86
Abssinia	9.04	38.72	17.2	15.2	13							
Adama	8.52	39.54	0.0			30.5	32.5	9	14.2	8.5	9	0
Addelle	7.75	39.9	0.0			24.2	26.5	9	6.4	3.5	6	0
Akaki	8.87	38.79	2.1	2.1	2	28.3	30.6	10	8.9	0.4	8	11
Alemtena	8.29	38.95	0.8	0.8	13	30.6	32.4	21	10.6	6.0	12	4
Aambo	8.99	37.84	7.0	3.0	2	29.7	35.6	28	14.5	12.2	5	36
Arsi Robe	7.88	39.63	17.2	16.5	15	25.5	27.5	24	7.1	4.0	21	114
Asebeteferi	9.07	40.86	0.0			27.3	29.4	7	16.9	14.8	1	0
Assela	7.57	39.08	25.2	23.8	13	23.2	25.5	26	8.3	5.5	6	167
Backo	9.12	37.06	0.0			34.0	35.3	26	13.1	12.4	20	0
Bedesa	8.92	40.77	0.0			30.2	32.2	9	11.0	6.7	9	0
Boneya	8.79	38.65	10.6	7.5	3							
Chancho	9.18	38.45	3.3	3.3	16	23.2	27.0	27	8.1	6.2	25	
Cheffedonsa	8.97	39.13	0.0			26.2	31.5	9	9.1	6.0	6	
Chitu	8.61	37.92	3.6	2.1	17							
Ejere	8.77	39.26	0.0									
Fital	9.62	38.65	0.0									
G/Guracha	9.48	38.25	0.8	0.8	1	25.1	26.5	13	2.9	-1.5	7	5
Gimbibila	9.03	38.12	0.0									
Gohastion	10	38.15	0.0			26.3	29.0	10	10.5	9.4	7	0
Gunjomariam	8.59	38.46	22.0	22.0	3							

Habe			1.4	1.4	13	24.4	26.6	9	1.6	-2.0	6	
Homi	9.37	37.14	0.0									
Huruta	8.08	39.2	9.1	9.1	13	26.7	30.0	9	9.8	4.5	20	53
Inchini	9.19	38.2	5.2	3.2	1							
Intoto	9.05	38.43	1.6	1.6	2	19.1	20.5	19	8.3	6.5	7	11
Jeju			7.8	4.1	15	27.4	31.2	3	4.1	1.5	6	
Kachise	9.35	37.2	0.4	0.4	2	25.3	25.6	28	3.4	1.0	3	2
Keranio			11.2	9.2	13	27.1	29.0	20	7.8	5.0	7	
Kimoye	9.02	38.21	37.9	37.9	16	27.7	29.7	9	9.0	6.0	7	214
Kokadam	8.38	39.25	0.0			32.3	35.0	11	12.6	8.0	12	0
Koremash	9.35	37.2	1.9	1.9	2							
Kotebe met		10.0	5.0	14								28
Kula	8.38	39.25	2.5	2.5	14	24.7	26.5	10	5.4	1.6	6	
Kulumsa	8	39.09	25.6	25.6	13	25.4	27.6	11	7.3	3.0	20	152
Medhanealem		33.7	29.5	13								
Megabit 28	9.03	33.44	16.3	16.3	2	29.3	32.1	28	8.4	5.1	8	
Metehara	8.51	39.55	1.8	1.8	13	34.6	36.5	27	15.9	9.0	11	8
Mojo	8.37	39.09	0.0			28.5	31.5	2	13.0	4.0	8	0
Ogolcho	8.02	39	14.6	12.6	14	30.5	32.5	22	13.1	7.5	13	70
Sebeta	8.55	38.36	13.5	6.9	15							
Shambu	9.34	37.07	1.2	1.2	1	26.3	27.8	27	11.5	9.2	4	
Sheno	9.33	39.3	7.4	6.7	1	20.7	23.0	23	6.6	3.0	18	59
Sibusire	8.02	36.52	0.6	0.3	3	31.7	33.8	18	13.8	12.0	14	
Sodere	8.24	39.22	5.5	5.5	14	30.9	33.5	27	12.6	8.0	10	
Sululta	9.1	38.43	5.3	2.7	15	22.2	26.0	27	5.4	3.0	21	
Tefki			3.4	3.4	2	28.4	30.6	9	6.6	2.5	7	
Tokkerensa	8.58	37.41	8.9	8.7	1							
Tulubolo	8.39	38.12	17.8	12.0	16	27.1	28.5	14	8.6	7.0	6	107
Wellenchity	8.39	39.25	0.0									
Welliso	8.515	37.96	1.2	1.2	3	28.6	30.2	27	13.8	11.2	2	6

Explanatory note: - T.RF- monthly total rainfall
M.Max- Main maximum temperature
E.Max- Extreme maximum temperature
M.Min- Main maximum temperature
E,Min- Extreme minimum temperature
PON- Percent of normal rainfall
Lat— latitude
Lon -- longitude

