

FOREWARD

This bulletin is prepared and disseminated by Jimma sub-branch office of the National Meteorological Agency.

It is aimed at providing metrological information to different services of the community involved in various socio-economic activities within its area of responsibility that encompasses Jimma, Illubabor, Misrak and Merab Wollega administrative zones.

The bulletin contains general information on **Climatology, Agro meteorology, Hydrometeorology and Forecasting** which gives users bird's eye view on human comfort, malaria outbreak, minimizing weather born risks, increase efficiency, maximize yield by analyzing different meteorological elements.

Jimma sub branch office disseminates monthly and seasonal bulletins in which all necessary information is highlighted.

We have a strong believe that various socio-economic activities related to planning, disaster mitigation, water resources management, health sectors, construction, environmental protection, transportation, recreation tourism and others will benefit most. Mean while your comments and suggestions are very essential to enhance the benefit this bulletin gives to the community at large.

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Monthly Meteorological Bulletin for September 2008.

Monthly Weather Report.

1: Temperature

In meteorological practices, the surface air temperature refers to the temperature of free air at a height between 1.25 and 2m above the ground. But for agricultural purposes air temperature may be measured at different levels from the ground up to about 10m the upper limit of predominant vegetation. Air temperature should be taken at fixed times, together with the extreme values attained during the day.

Extreme maximum temperature during September 2008 .

During September 2008, days remained relatively hot over pocket area of central Jimma and Merab wollega, Western part of Illubabor and Northern and Eastern parts of Misrak wollega zones. (Refer fig.1:1)

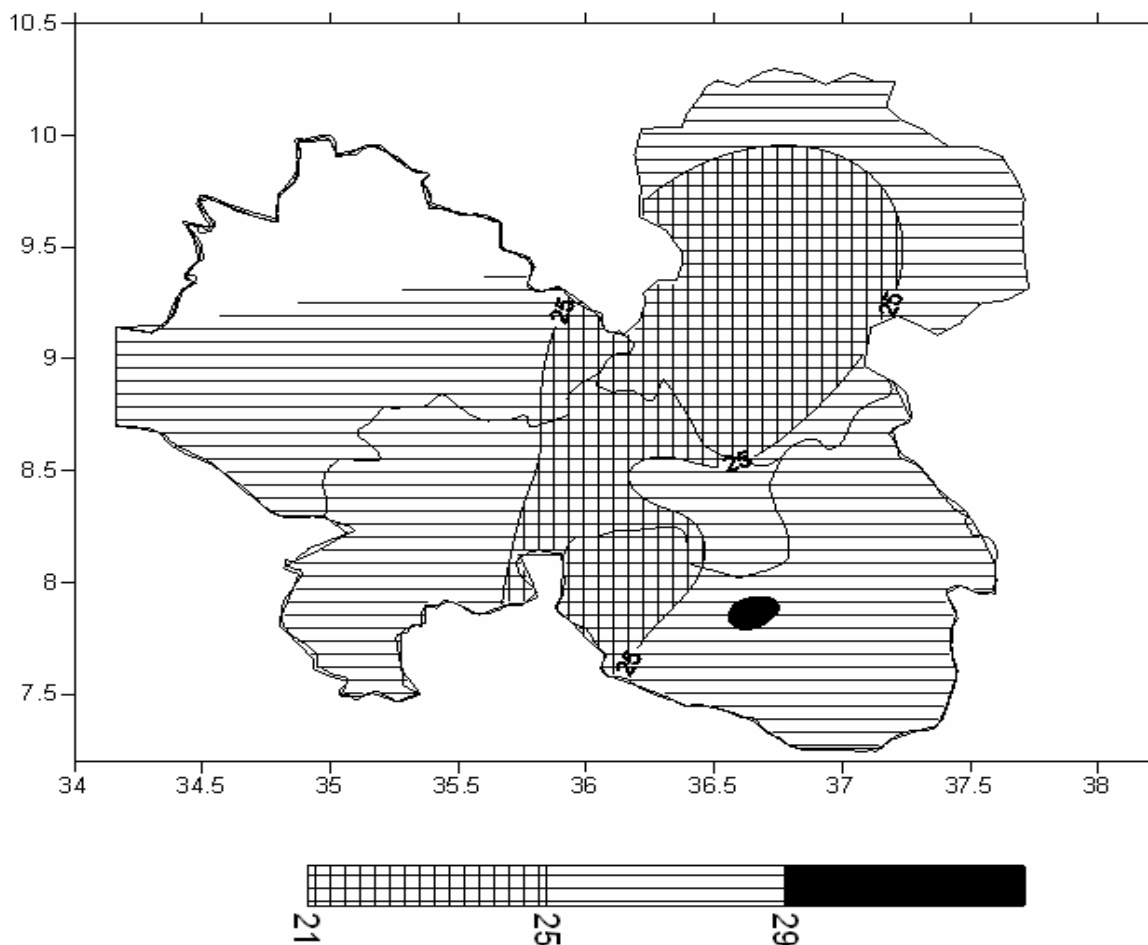


Fig 1.1 Extreme maximum temperature in °c during September 2008

In particular, the extreme maximum temperature values exceeding 28°c observed over Agaro, Limu Genet, Nejo and Natri. (See table Fig.1:1)

Table 1:1 Stations with extreme max. Temperature values greater than 28°c during September 2008.

Stations	Extreme max. Temperature in °c	Dates
Agaro	30	27,30
Limu Genet	28.5	27
Nejo	28.8	23
Natri	28.5	16

When we compare each zone the whole parts of Misrak wollega and small area of Eastern part of illubabor zone experienced low maximum temperature than the rest parts of the zones.

Extreme minimum temperature during September 2008.

During September 2008, days remained relatively cold over the whole parts of misrak wollega, North eastern border line of Illubabor, South eastern pocket area of Merab wollega, and small pocket areas of eastern Jimma zone. . (See fig.1: 2)

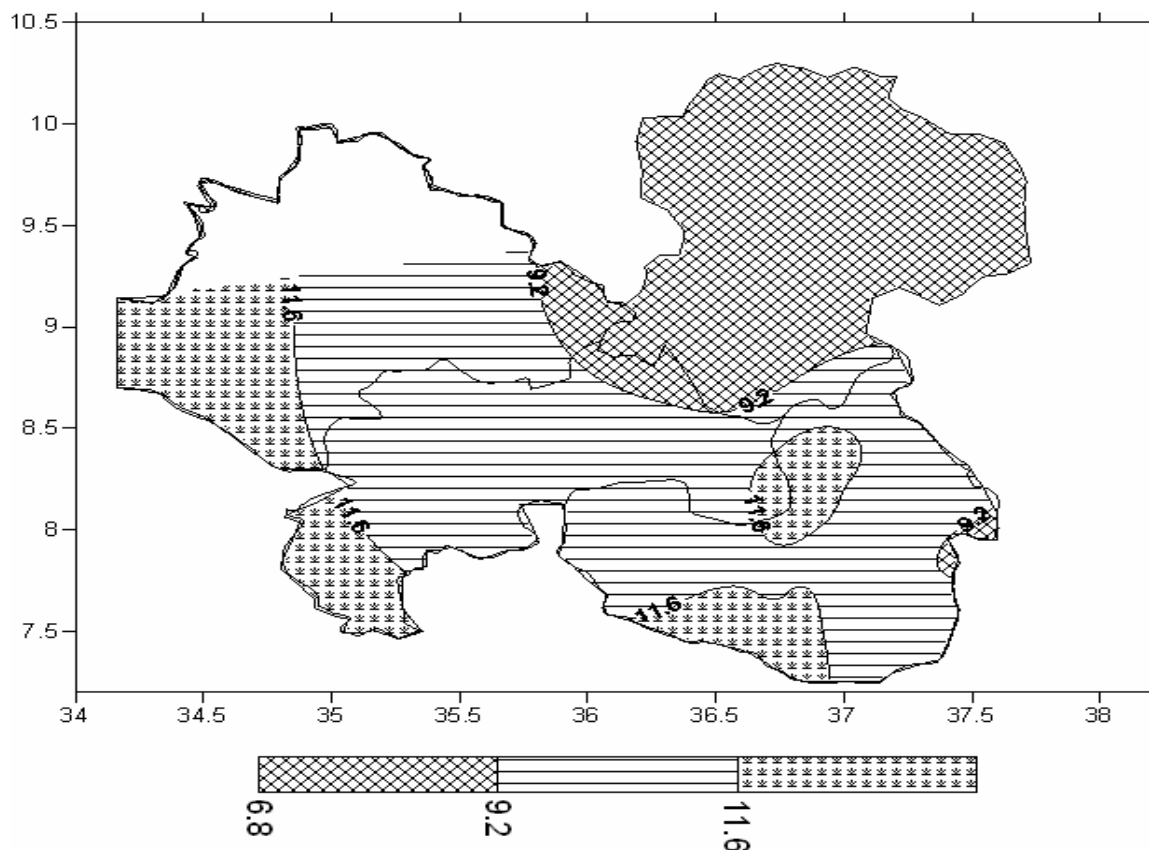


Fig. 1.2. Extreme minimum temperature in °c during September 2008

When we compare each zone, the whole parts of misrak wollega, North eastern border line of Illubabor, South eastern pocket area of Merab wollega, and small pocket areas of eastern Jimma zone were colder than the rest parts of the zones. In particular, minimum temperature values were as low as 6.8°C, 9°C and 9.8°C over Arjo, Sekoru, and Natri respectively. (See table 1:2)

Table 1:2 stations with Extreme min. temperature less than 10 °c during September 2008.

Stations	Extreme min. temperatures in °c	Dates
Arjo	6.8	4
Sekoru	9.0	12
Natri	9.8	15

2/Rainfall assessment during September 2008

Number of rainy days in the month of September 2008

September is the month of kiremt (rainy season). During this month pocket area of Mirab Wollega and south west of Ilubabor zones were receiving above 24 rainy days.

For more information refer the following (Fig 2:1)

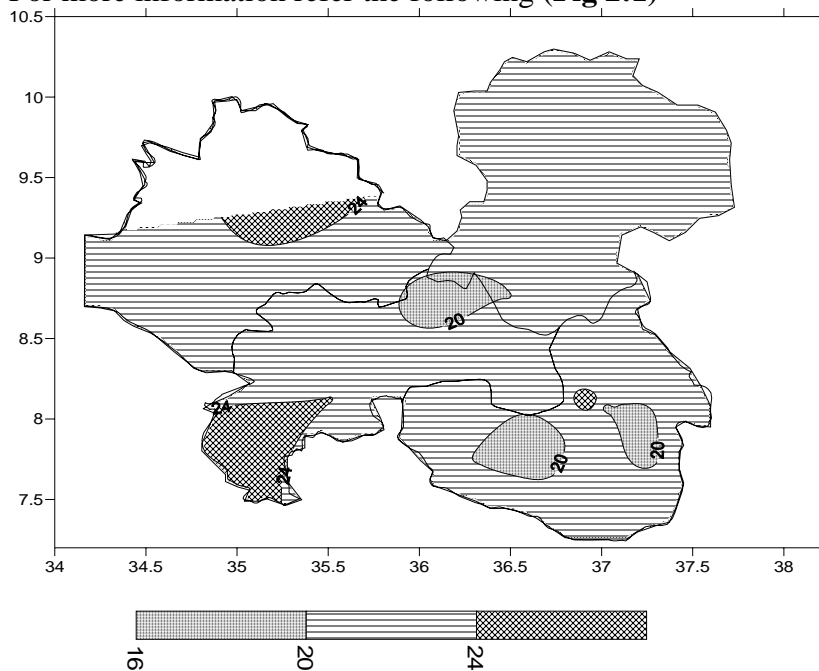


Fig.2: 1 Number of rainy days in the month of September 2008

When we compare each zone, some part of mirab wollega zone, small pocket area of south west Ilubabor zones, had more rainy days than the rest parts of zones.

Monthly total rainfall in mm during September 2008

Monthly total rainfall amount of September 2008 has exceeded 360mm recorded over centra parts of Misrak Wollega zone. (Refer **fig 2:2**)

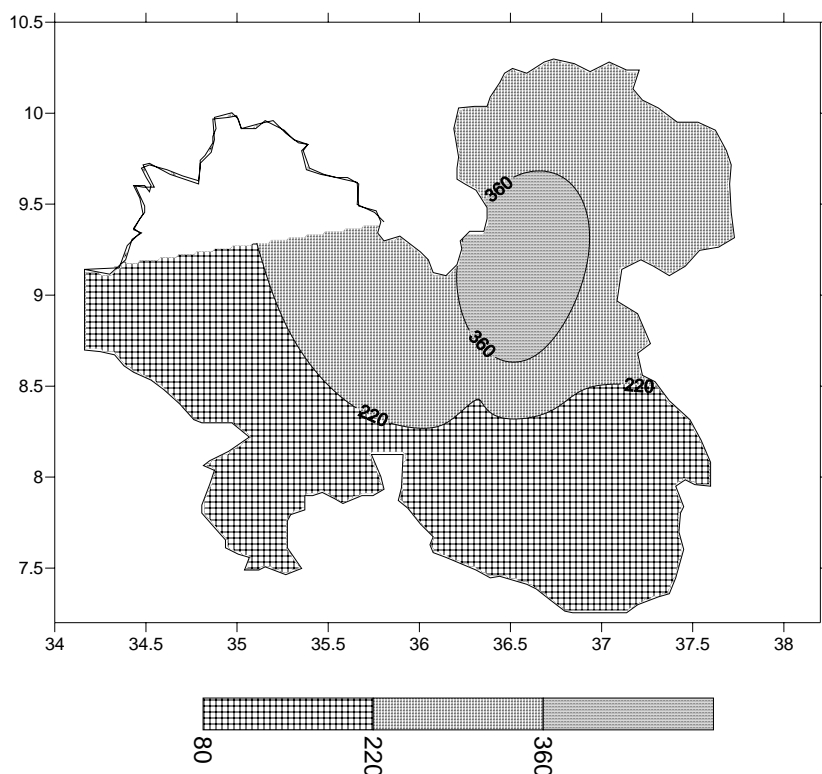


Fig 2:2 monthly total rainfall in mm during September 2008

When we compare each zone, large area of east Ilubabor, eastern parts of mirab wollega and the whole parts of misrak wollega zones had more rain fall distribution than the rest parts of zons.

In particular, stations recorded total monthly rainfall greater than 220mm were Arjo, Dega, Nejo, and Bedelle. (See **table 2:1**)

Table 2:1 Station(s) with greater than 220 mm of monthly total rainfall during September 2008.

Station(s)	Amount in mm
Arjo	442.3
Dega	267.7
Nejo	265.5
Bedelle	220.8

Monthly total rainfall amount in September 2008 was close to normal over the most parts of our administration zones. Over the major portion of eastern Jimma, Illubabor & major portion of Mirab Wollega zones received normal rainfall distribution. When we see the half parts of western Jimma, Illubabor & west parts of Mirab Wollega zones, they were received below normal rainfall distribution. On the other hand, except segment area of east and northwest the whole parts of Misrak Wollega zone exhibited above normal rainfall distribution.

Generally, September rainfall condition was satisfactory for livestock and on going agricultural activities of the zones. For more information you can see the following figure. (refer fig. 2:3)

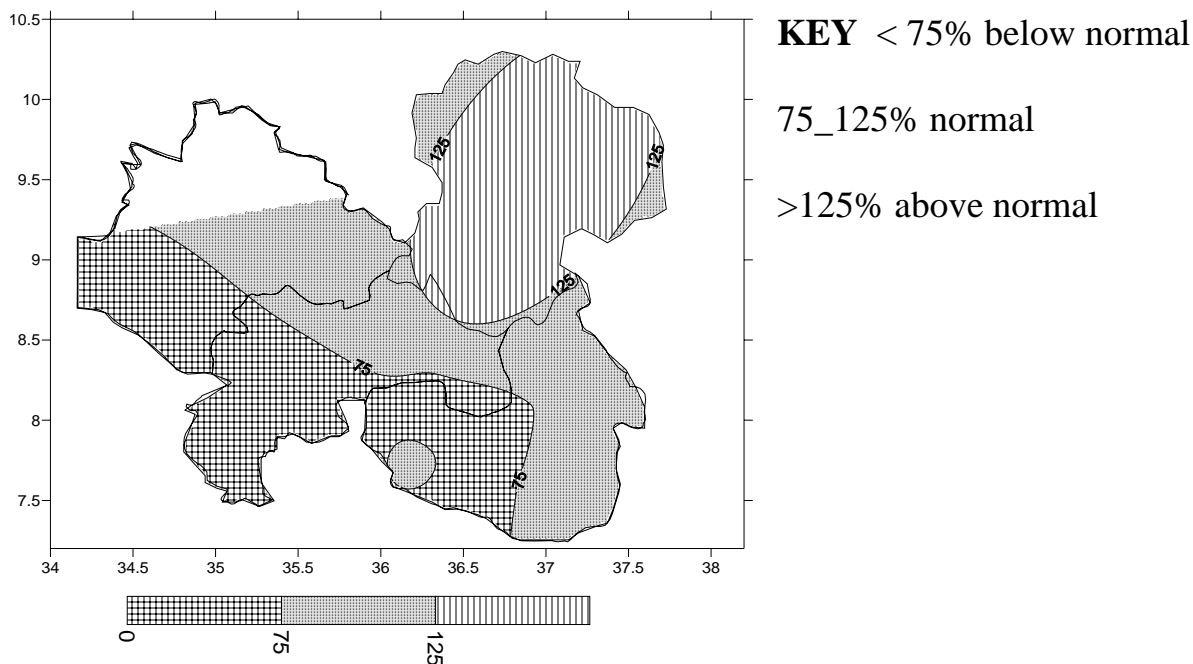


Fig 2:3 Percentage of normal rainfall during September 2008.

Also there were stations that recorded rainfalls greater than **45 mm with in 24hrs** during September2008. (See **table 2.2**)

Table 2:2 Stations with rainfall greater **45mm** with in 24hrs during September 2008.

Stations	Max. RF within 24hrs in mm	Dates
Arjo	53.2	18
Nejo	84.6	13
Dega	45.7	20

Rainfall departure of September 2008.(September2008-September 2007).

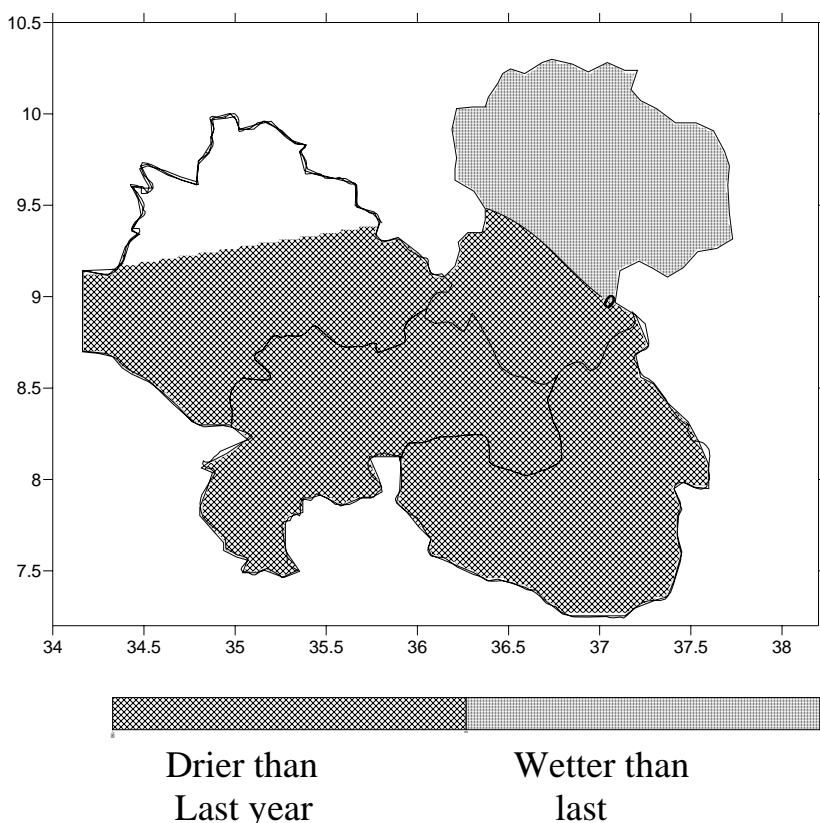


Fig 2:4 Rainfall departure of September2008.(September 2008-September2007)

The map shows except north part of Misrak Wollega zone which was positive departure, the rest zones were negative departure .Generally the rain fall distribution of September 2008 wasnot better than that of September2007.

Rainfall Outlook during the coming October (1- 31) with respect to long year mean

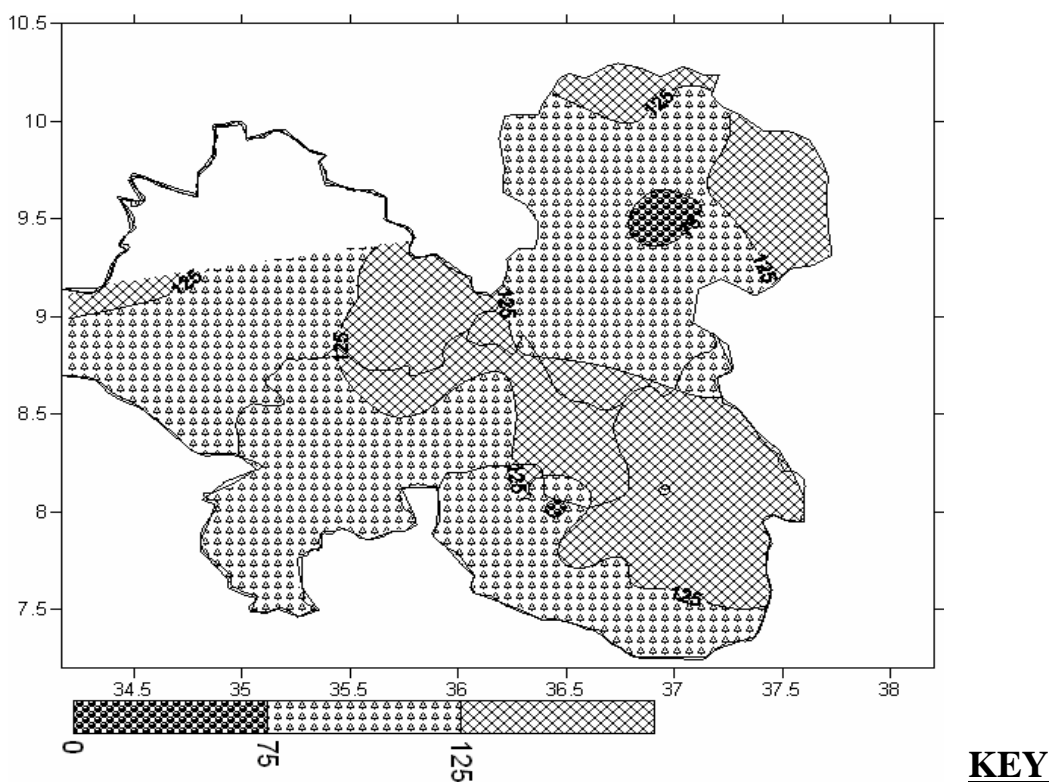


Fig 2:5 Shows percentage of spatial rainfall distribution with respect to long term Means expectation of the coming October 2008

October is the first month of Bega (dry) season,so that during this month rainfall amount and distribution is decreasing slowly and sunshine strength,windy and cold temperature in the morning are expected to start at the end of the month. Over the major portions of the zones rainfall amount and distribution is normal with respect to long years mean.Areas such as the central pocket areas of misrak wollega expected to receive **below normal** rainfall.The major portions of mirab wollega, Illubabor except the northeastern portion of the area, south and eastern portion of Jimma and the major portion of misrak wollega zones are expected to receive **normal** rainfall.The northernwestern and eastern portions of mirab wollega, north and eastern portions of Illubabor,north and eastern portions of Jimma and misrak wollega zones are expected to receive **above normal** rainfall.In general the major portions of the zones are expected to receive normal rainfall.

3/ Hydrological Analysis

The result of hydrological analysis is presented on the map indicating comparisons of the monthly total rainfall, moisture status and temperature conditions. The blanked area of our interest is $112.121 \times 10^3 \text{ km}^2$. (the area of four administration zones). The moisture index is calculated by using Thornth Waite method, which introduced the concept of the precipitation effectiveness index (PE), which is computed from the monthly values of precipitation and evapotranspiration.

The evapotranspiration is expressed in terms of monthly mean temperature. Moisture index is the ratio of monthly precipitation to monthly evapotranspiration represented by percent (%). If the index value is 0-16 Arid, 16-32 Semi Arid, 32-64 Semi Humid, 64-128 Humid and >128 Wets. Thornth Waite method express only the Atmospheric condition not the soil moisture index.

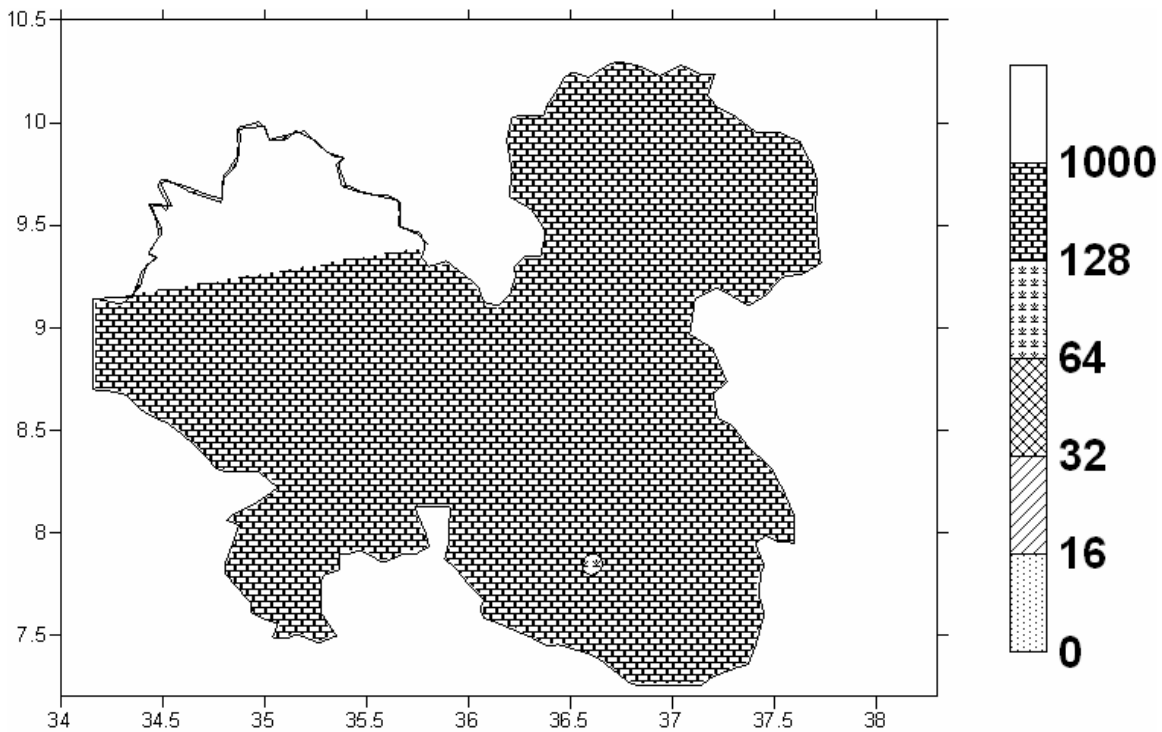


Fig 3.1 *Spatial moisture indexes distribution for September 2008 analysis.* The moisture status shown on the above map, in all parts of our zones, monthly moisture indexes value more than 128%, but some pocket area around Agaro was less than 128%, so it was under humid condition. The rest all area was under wet condition.

4/ Agrometeorology

Stations	MONTHLY Total Eto	Monthly Total RF	Eto/RF
Bedelle	54.18	214.1	0.22
Begi	73.19	189.6	0.38
Chira	82.73	304.3	0.28
Gore	87.29	215.8	0.35
Jimma	91.83	226.7	0.35
L/genet	90.31	316.7	0.29
Nedjo	90.76	293.1	0.33
Sekoru	91.03	237.8	0.33
Shambu	81.08	344.3	0.23

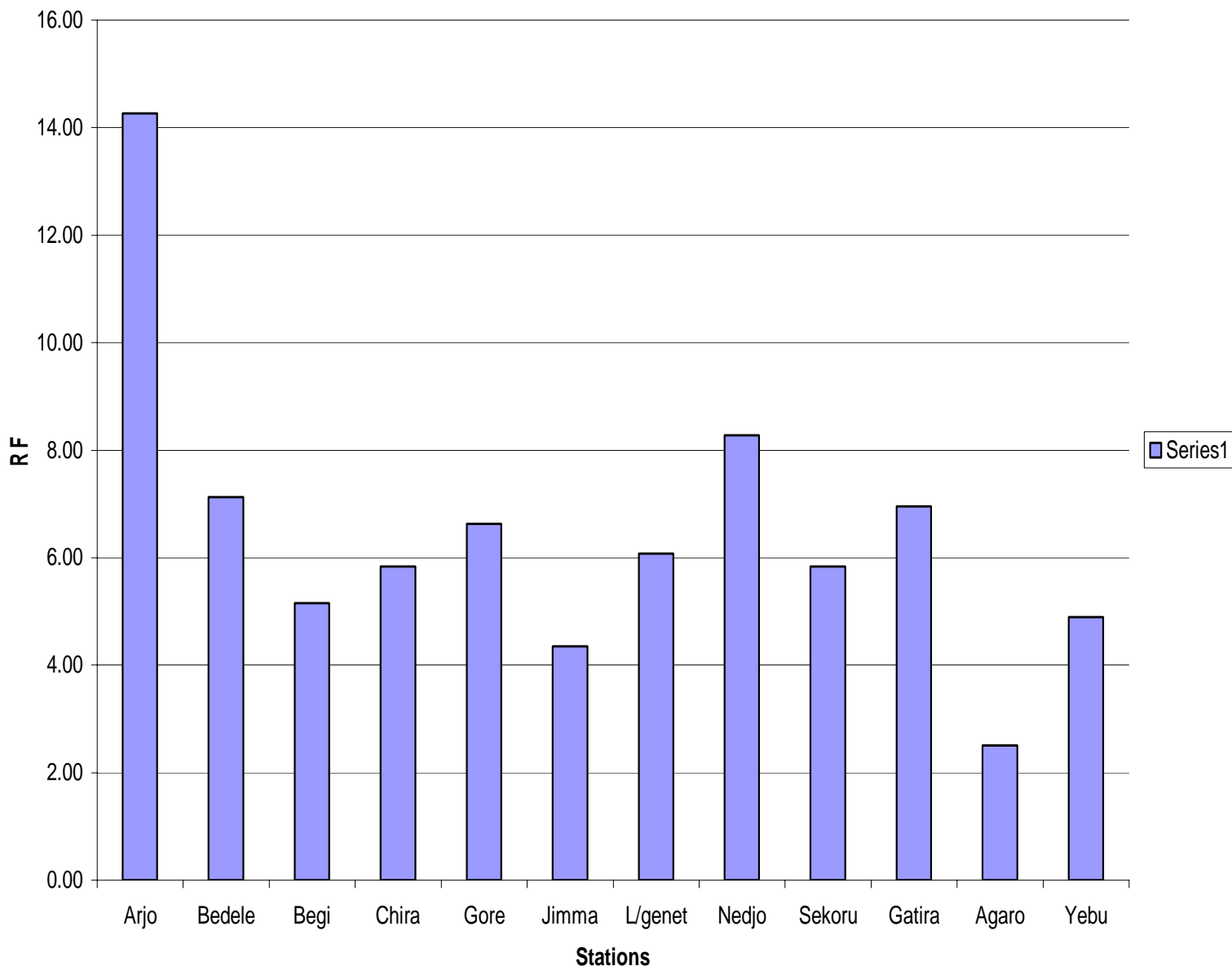
Keys: $Eto/RF=0.25-0.5$ Suitable to Land preparation

- 0.5 Sowing
- $0.1 < Eto/RF < 0.25$ Moderate dry
- Eto(Evapotranspiration) is greater than rain fall(RF)
- So according to the above table almost all stations are recommend to land preparation but out of station Bedlle and Shambu then this is suitable for crop collection

Penological report of some crops

Maize is at wax rip stage at Bedelle while at chira ,sekoru and Nedjo is at harvsting and full rip stage. Teff is at shooting stage at Bedelle while tasseling stage at Limu genet.

Daily average Rain Fall



During the month of september 2008 there was less rain distribution for most of staions except some stations like arjo and nedjo.Thus, this decreasing of rainfall in the coming month is use full for crop collaction.

5 /Effects of Meteorological Elements On Health Condition

Climate information for the health sectors has been prepared to convey essential information regarding the monitoring of human comfort conditions based on the analysis of temperature and humidity data and also for monitoring of malaria out break based on the analysis temperature and rainfall data.

Therefore human comfort conditions can be explained as follow.

Temperature Humidity Index (THI) conditions/Comfort Index

It was developed by the **US weather Bureau** in 1959.It is applied to the temperature and humidity data over selected stations in our area of responsibility (**Jimma, Illubabor, misrak and mirab Wollega**) to assess the discomfort conditions during September 2008 based on the THI formulae or approach.

According to this approach there are three cases

Case1 If the THI value exceeds 26, all most all the population feels discomfort. (Here we refer to it as "**uncomfortable**").

Case2 If the THI value is inclusively 21 to 26, half of the population feels discomfort. (Here we call it "**moderate**").

Case3 If the **THI** value is less than 21, almost all the population feel comfortable. (Here we refer to it "**comfortable**") with respect to heat stress.

Based on this, we have some selected stations with the number of days and values of THI as follow. (**See the table 5.1**)

Table 5:1 Temperature humidity index (THI) frequency over selected stations of September 2008.

No	Stations	No of days with THI values of			No of days with available Data
		<21 (Comfortable)	21-26 (Moderate)	>26 (Uncomfortable)	
1	Jimma	12	18	0	30
2	Chira	27	3	0	30
3	Begi	18	12	0	30
4	Shambu	20	0	0	20
5	Bedelle	29	1	0	30
6	Gore	24	2	0	26
7	Limu Geneti	15	15	0	30
8	Nejo	18	12	0	30
9	Sokoru	19	11	0	30
10	Arjo	30	0	0	30

As we see from the above **table 5:1**, Arjo was comfortable conditions throughout the month while none day was moderate out of 30 days based on the data of September 2008.On the other hand Jimma was comfortable station with 12 days and moderate with 18 days. In the same manner we can interperate for the other stations in the above **table 5:1**

Generally, **THI index** or **discomfort index** indicated that midland areas of the zones were characterized by moderate conditions during most of the days of the month of September 2008 where as highlands of the zone were characterized by dominantly comfortable condition.

5.2 /Effects of Meteorological Elements On the spread of malaria.

Climate information has been used to develop the conditions that are suitable for malaria out break so that health sectors and the community should follow up the bulletin. Environmental climate includes humid conditions or precipitations, which facilitate adult mosquitos' life span and warm temperature that allow malaria parasite to develop rapidly. Thus, according to International Research Institute (**IRI**) there are three approaches based on: -

- 1/ Monthly average temperature (**TT**).
- 2/ Monthly average relative humidity (**RH**)
- 3/ Monthly total rainfall (**RF**) that is related with malaria spreading.

In addition to the above IRI criteria some facilitated conditions like infected persons and particular species of the parasite and vectors may be necessary for the outbreak.

Table 5: 2 Sample computations done for September 2008 at selected stations are shown in the following tables

No	Stations	Variables			Conditions
		TT	RF	RH	
1	Chira	17.5	180.8	70.2	No
2	Jimma	19.9	134.7	67.9	Yes
3	Bedelle	18.2	220.8	73.5	Yes
4	Gore	18	205.3	73.9	Yes
5	Limu Geneti	19.5	188.2	69.5	Yes
6	Nejo	18.8	265.5	67	Yes
7	sekoru	18.5	180.9	69	Yes
8	Begi	19.7	159.7	71.2	Yes
9	Arjo	15.1	442.3	81	No

In the above table there is the words "**No**".& "**Yes**"

"**Yes**" indicates that there was a probability of the malaria outbreak.

"**No**", indicates that there was no a probability of the malaria outbreak

Stations with a "**No**" word failed (did not satisfy the three criteria) because of the reduction of the variables specially rainfall.

