

Ethiopian Meteorology Institute

Health-Meteorology Bulletin

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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 given area can be used to assess the likelihood of outbreak of Malaria with a lag of two months, this information can be an important for early warning tool if used judiciously.

The major objective of this bulletin is in line with the Ethiopia Meteorological Institute strategy of diversifying climate application products to the basic developmental 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 places to be visited by the tourists and to the researcher who is interested in the field of Bio-Climatology.

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

Meanwhile, your comments and constructive suggestions are highly appreciated to make the objective of this bulletin a success,

This same bulletin can be accessed online at: http://www.ethiomet.gov.et/bulletins/health_bulletins

Director General
Ethiopia Meteorology Institute
P.O.Box 1090
Tel: 251(0)11 6615779
FAX 251(0)11 6625292
Web: www.ethiomet.gov.et
Addis Ababa, Ethiopia

I. Assumptions

i. Malaria: According to the International Research Institute for Climate and Society, (IRI), the predicted conditions of rainfall, temperature, and relative humidity are used in determining the degree of incidence for malaria.

- When rainfall is above 80 mm, the temperature is between 25°C and 32°C, and relative humidity is greater than 80%, the region is at high risk and is placed under high incidence.
- When the temperature is between 20°C and 25°C, relative humidity is between 70 and 80%, and rainfall is above 80 mm, then moderate incidence is advised.
- Low incidence for malaria is issued when the temperature is in the range of 18°C-20°C, relative humidity is 60 - 70% and rainfall is above 80 mm.
- No incidence is required when the temperature is less than 18°C, relative humidity less than 60%, and rainfall amount below 80 mm.

Based on these, climate variables have *a one to two months* postponed (delayed) effect on the spread of malaria.

ii. Human heat index: is a measure of how hot it feels when relative humidity is factored with the actual air temperature. The levels of caution for heat index are classified as follows:

- Cold stress when THI is <14, *Asthma, Pneumonia, Common Cold and flu*
- Comfortable when THI is 14-21, *pleasanter*
- Moderate when THI is 21-26, *No more effects*
- Heat stress when THI is >26, *heat stroke, heat cramps, hyperthermia, respiratory and cardiovascular diseases*

iii. Cattle heat index: The climatic condition for Cattle is a measure that accounts for the combined effects of environmental temperature and relative humidity on cattle. The level of heat stress for cattle classified as follows:

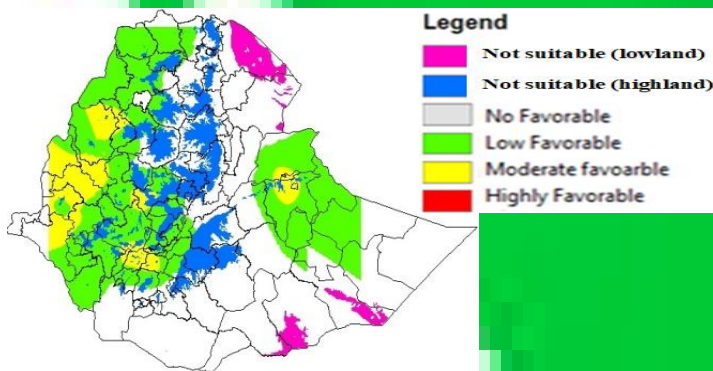
- Not Stressed when THI is <68, *free from heat stress*
- Stressed threshold when THI is 68 – 71, *impact less stress starting*
- Mild stress when THI is 72 – 79, *stress begins and calf rate affected*
- Moderate stress when THI is 80 – 89, *Milk production affected*
- Severe stress when THI is 90 – 99, *very significant losses in milk production*
- Extremely stress when THI is >100, *ultimate dead of cows*

Part One

1. Weather impact Assessment on Health for the second dekad of September 2024

1.1 Malaria prone areas during September 2024 second dekad

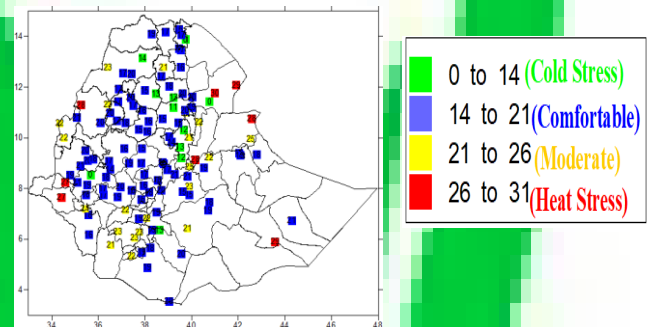
According to the collected and analysed climate data of September 2024 2nd Dekad, there was a **low to moderately favourable** climate conditions for the breeding and transmission of malaria over the western half and eastern central parts of the country. Regions such as Eastern Gambela, South-west and South Ethiopia region, central Ethiopia, eastern and western Oromia, most parts of western Amhara and Tigray, central Somali and Benishangul Gumuz of the country were very conducive for malaria transmission as illustrated in Figure 1. The impact of this suitable climate condition has a delaying effect of one-to-two month postponed.



1.2 Climate comfort Conditions September 2024 2nd Dekad

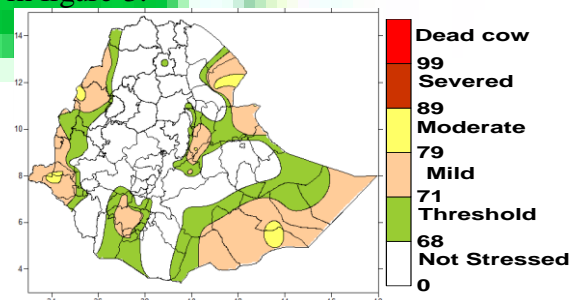
1.2.1 Comfortability for Human

As a result of the Temperature-Humidity Index (THI) analysis of September 2024 2nd Dekad heat stress was experienced over a few pocket lowland areas of Gambela, Northern and southern Somali, Benishangul Gumuz and Afar regions who experienced heat stress condition; whereas the rest of most parts of the country were experienced pleasant comfortable and moderately comfortable weather conditions for human daily activity as shown in figure 2.



1.2.2 Comfortability for Cattle

Moderately heat stress was experienced in some pocket areas of Afar, Somali, Gambela and western Amhara. And also Non-significant heat stress condition was observed in the rest most parts of Somali, Afar, Gambela, Benishangul, lowlands of south Ethiopia and some lowlands parts of western Amhara regions. Whereas much of the country were dominated by non-stress climate conditions as shown in figure 3.

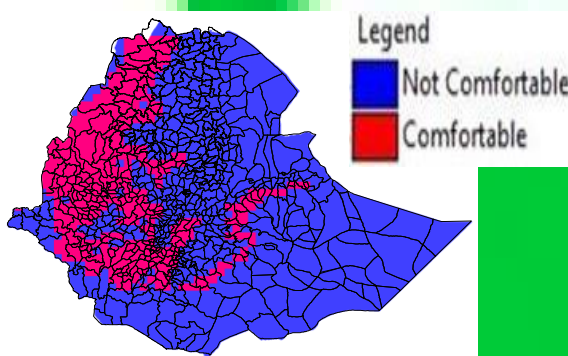


Part Two

2. Expected Weather Impact on Health for third dekad of September 2024

2.2 Expected Mosquito breeding suitable areas

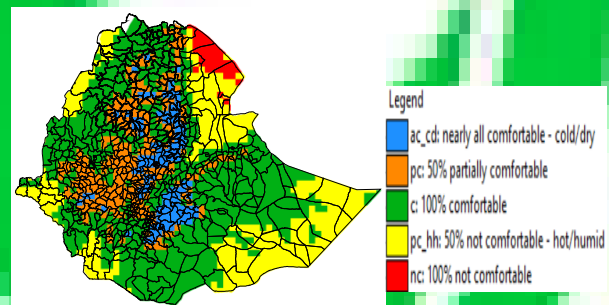
During the upcoming Third (21-30) dekad of September 2024; encouraging climate condition for mosquito breeding and development will be expected over most parts of Kiremt benefiting areas ranging from southwest Ethiopia to northern Ethiopia; namely Benishangul, western and pocket areas of eastern and southern lowland areas of Oromia, western Amhara and western Tigray, southwest, south and central Ethiopia regions. This expanded and amplified situation of previous month flattering climate effect will be aggravation incidence cases of malaria as illustrated in red in figure 4.



2.1 Temperature Humidity Index

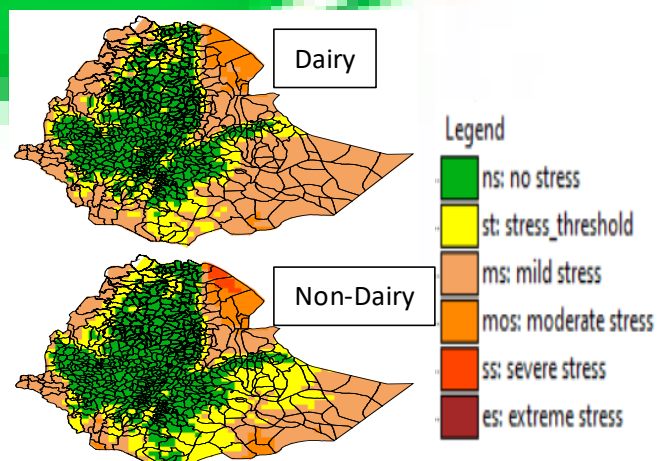
2.2.1 Comfortability for Human

During the impending third decade of September 2024, in the most parts of northern Afar will be in 100% stressful conditions. While Gambela, northern and southern Somali, border of western Amhara, lowlands of south Ethiopia and the rest parts of Afar regions will be in partially stressed areas for the coming 10 days. The remaining most midland and high land areas of the country are in a pleasant condition as looking in figure 5.



2.2.2 Comfortability for Cattle

Moderately to severe stress will be expected for the coming ten days in Afar and Somali for dairy and non-dairy cattle respectively. For the rest parts of the country there will be non-significant heat stress condition as shown in Figure 6.



Part Three

3. Summary and Advisory







3.1 Summary

Based on the climate-health analysis for September 2nd dekad, it has been observed that, there were low to moderate suitable climate conditions to the breeding and transmission of vector-borne diseases in most parts of western half and central eastern parts of the country. Additionally, over the next 10 days, the western, south-western and north western half of the country will continue to experience expanded suitable conditions for the breeding and development malaria.

In terms of climate comfortability conditions, most parts of the country have experienced pleasant conditions for both humans and livestock. However, certain regions like Afar, Somali, and Gambela might be affected by heat stress in some hotspot lowland areas. Looking ahead to the next 10 days of September 3rd dekad, the low-lying border areas of the country, especially Afar region will experience moderately to severe heat stress, which will affect both humans and cattle.

3.2 Advisory

Use and implement the following recommendations in places that are favourable for the development of malaria and other vector-borne related diseases;

-  Attention to any incidence, especially for malaria disease in such favourable areas
-  Controlling measures and activity are advised
-  Reducing the environmentally aggravating condition
-  Awareness creation campaign to the community and sharing of the climate-health update
-  As per the threshold of malaria, the impact will start after the end of this month, and be ready to respond before it leads to significant impacts
-  Avoid any exposure of the community to mosquitoes by ensuring clean environment and using Mosquitoes nets.

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