

# Ethiopian Meteorology Institute

## Health-Meteorology Bulletin

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© *Ethiopian Meteorology  
Institute*

**Tel:** 251(0)11 6615779

**Fax:** 251(0)11 6625292

**P.O.Box** 1090

**Website:**

<http://www.ethiomet.gov.et/>

**Telegram:**

<https://t.me/BiometService>



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## I. 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](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](http://www.ethiomet.gov.et)  
Addis Ababa, Ethiopia

## II. 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*

# 1. Weather impact Assessment on Health for March 2025



## 1.1 Malaria prone areas during March 2025

According to the collected and analyzed Climate data For March 2025, there was a Low to Moderate climate Condition for breeding and transmission of malaria over Jimma, Moyale and Tercha of the country were conducive for malaria transmission as illustrated in Figure 1

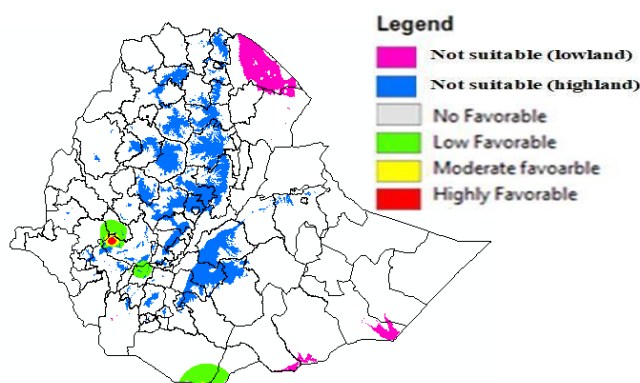


Figure 1: Malaria Prone areas

## 1.2 Climate comfort Conditions

### 1.2.1 Comfortability for Human

During March 2025, for human's a day to day activity, the climate condition were **pleasant** in most parts of the country. But in the Gambela, Afar, southern Somali and western Amhara Regions of the country, there were experienced heat experienced heat stress conditions as shown in figure 2.

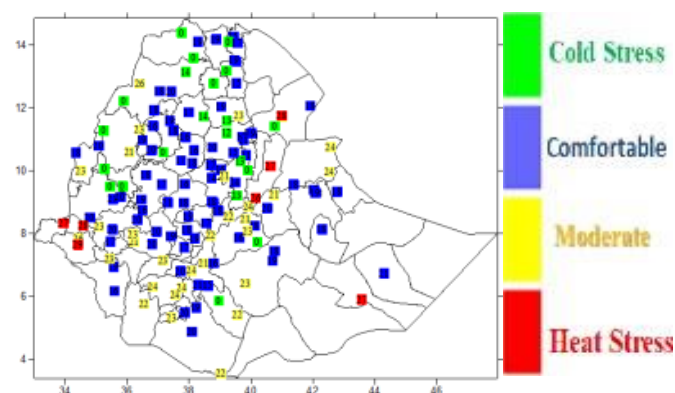


Figure 2: Human comfort index

### 1.2.2 Comfortability for Cattle

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

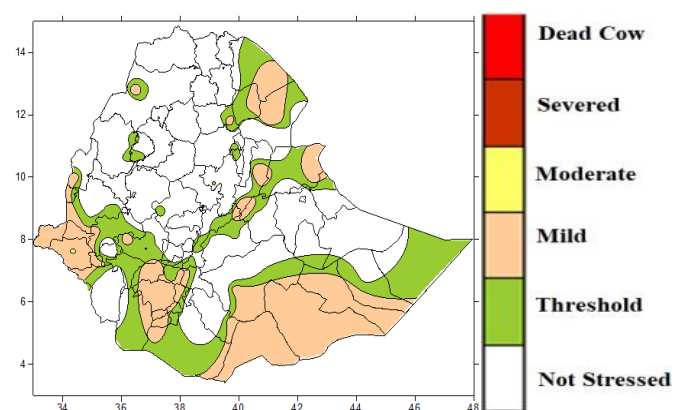


Figure 3: Cattle Comfort index





## 2. Expected Weather Impact on Health for first Dekad of April 2025



### 2.1 Expected Mosquito breeding areas

In the coming first Ten days of April 2025, In South west, Most woreda of Mirab-Omo, Bench-sheko, Keffa, Sheka, Konta-special, Dawro, Most woreda of Ilu Aba Bora, kelem-wolega, Bale, West-Guji, Most woreda of Basketo, South-Omo, Wolita, Gamo, Amaro, Gedeo, Gofa Most woreda of Agnewak, Majang and few Place of Daawa zones of the Country **will Be suitable weather conditions** for Malaria Breeding and transmission as illustrated as red in figure 4.

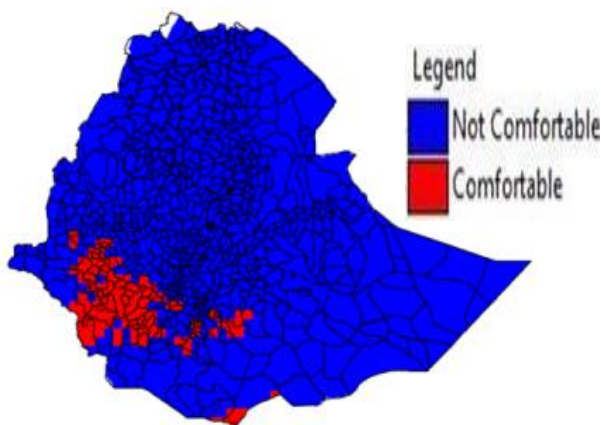


Figure 4: Expected malaria prone areas

### 2.2 Temperature Humidity Index

#### 2.2.1 Comfortability for Human

For the coming April first ten days, there will be a heat stress weather condition over; Afar, Gambela, southern-Somali, West Amhara, West Tigray and South Ethiopia regions, which will be **partially to fully not comfortable** for humans day to day activities (sign of heat stress expected) as looking in figure 5.

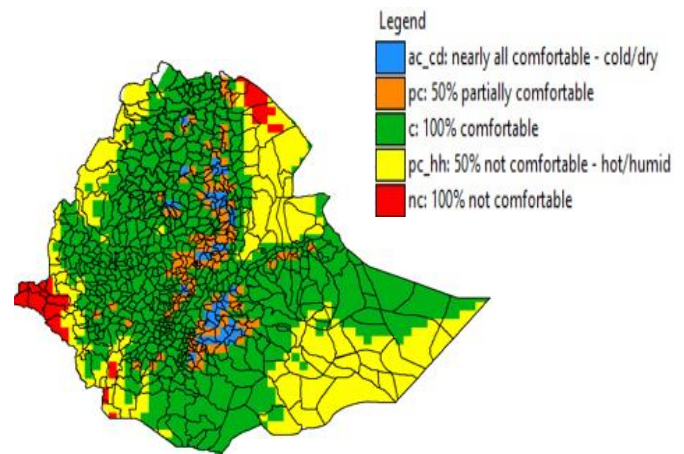


Figure 5: Expected Human comfort

#### 2.2.2 Comfortability for Cattle

Like the human comfortability climate conditions, cattle's comfort conditions for the next ten days of April first decade will have **Mild-Moderate** heat stress conditions over Afar, Somali, South- Ethiopia, Southwest-Ethiopia, Gambela, Benishangul Gumuz, Western Amhara and western Tigray parts of the country as shown in Figure 6

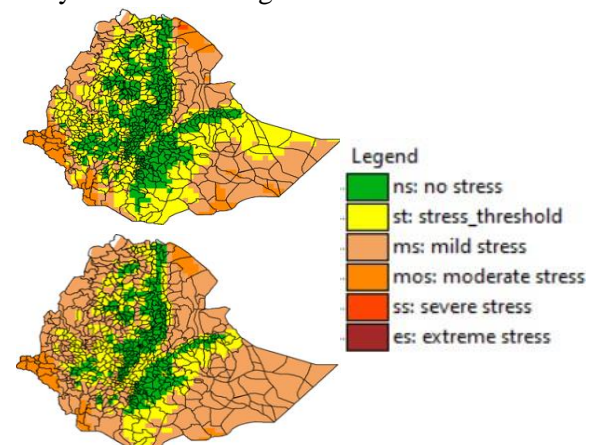


Figure 6: Expected Dairy (**Top**) and Non-Dairy (**Bottom**) Cattle comfort



### 3 Summary

Based on the climate-health analysis for March 2025 it has been observed that, there were low to moderate suitable climate conditions to the breeding and transmission of malaria over Jimma and Moyale zones. And also in the next ten days, there will be an advance transmission condition over southern portions of the country. Regarding climate comfortability conditions, most parts of the country have experienced pleasant conditions for both humans and livestock. Till, in some lowland portions of the country, there were mild-moderately heat stress conditions over Afar, Gambela, southern-Somali, West Amhara, West Tigray and South Ethiopia regions. Looking ahead to the next 10 days of April 1st decade, the low-lying border areas of the country, especially Afar, southern Somali, Gambela, Metema, and the South Ethiopia region, will experience moderate heat stress, which will affect both humans and cattle.

### 4 Advisory



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



Attention to any incidence, especially for malaria disease in such favorable 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



Avoid any exposure of the community to mosquitoes by ensuring clean environment and using Mosquitoes nets.

