

# Ethiopian Meteorology Institute

## Health-Meteorology Bulletin

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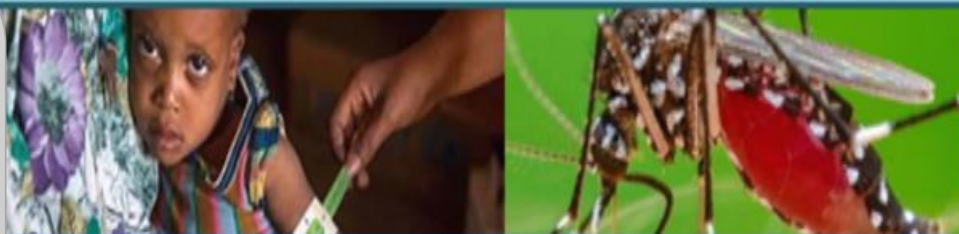
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## Table of Contents

<b>I.</b>	<b>Foreword .....</b>	<b>3</b>
<b>II.</b>	<b>Assumptions .....</b>	<b>4</b>
i.	Malaria .....	4
ii.	Human heat index: .....	4
iii.	Cattle heat index: .....	4
1.	Weather impact Assessment on Health for March first dekad 2025 .....	5
1.1	Malaria prone areas during March 2025 second dekad.....	5
1.2	Climate comfort Conditions.....	5
1.2.1	Comfortability for Human .....	5
1.2.2	Comfortability for Cattle .....	5
2.	Expected Weather Impact on Health for second dekad of March (11-20/ 2025) .....	6
2.1	Expected Mosquito breeding areas .....	6
2.2	Comfort condition .....	6
2.2.1	Comfortability for Human .....	6
2.2.2	Comfortability for Cattle .....	6
3.	Summary .....	7
4.	Advisory .....	7

## 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)

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## 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 first dekad 2025



## 1.1 Malaria prone areas during March 2025 second dekad

During the last 1<sup>st</sup> Dekad of March 2025, there were no any suitable areas for malaria breeding and transmission all over the country as illustrated in Figure 1

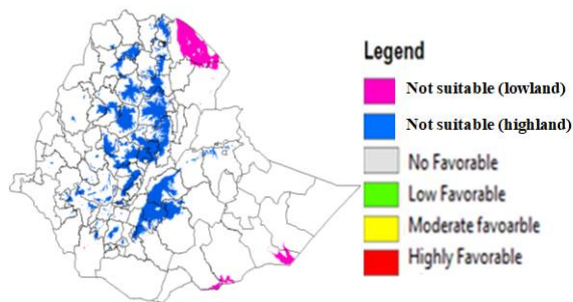


Figure 1: Malaria Prone areas

## 1.2 Climate comfort Conditions

### 1.2.1 Comfortability for Human

In the day-to-day human activity during the 1<sup>st</sup> dekad of March 2025, Gambela, Afar, Benishangul Gumuz and Bilate was in heat stress condition, while the rest most parts of the country was moderately heat stress to pleasant condition as shown in figure 2.

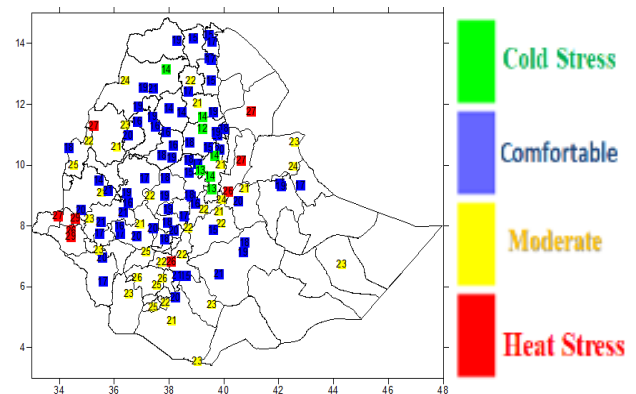


Figure 2: Human comfortable index

### 1.2.2 Comfortability for Cattle

In the other way, during the last ten days of March 1<sup>st</sup> dekad, there was a moderately heat stress condition over Gambela and Mild-heat stress condition over Somali, Afar, Western Amhara, South Ethiopia regions as shown in figure 3.

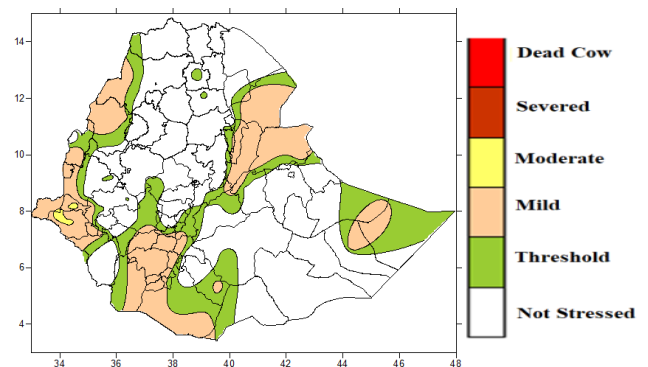
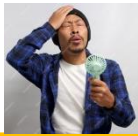


Figure 3: Cattle Comfort index



## 2. Expected Weather Impact on Health for second dekad of March (11-20/ 2025)



### 2.1 Expected Mosquito breeding areas

In the coming Ten days of March 2025, Kobo woreda in north Wollo, most woredas of Jimma, west Arsi, Bale, and Guji zones, most woredas of Sidam region, most woredas of Gamo Gofa, South Omo, Dawuro, Basketo, Hadiya, Konta, Keffa and Bench Maji zones of the country will be suitable for Malaria breeding and transmission as illustrated as red in figure 4.

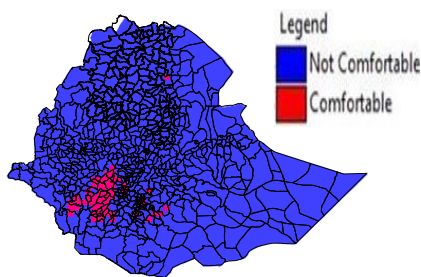


Figure 4: Expected malaria prone areas

### 2.2 Comfort condition

#### 2.2.1 Comfortability for Human

In the coming March 2<sup>nd</sup> Dekad, there will be a heat stress weather condition over; northern-Afar, Gambela, southern-Somali, and southern parts of 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.

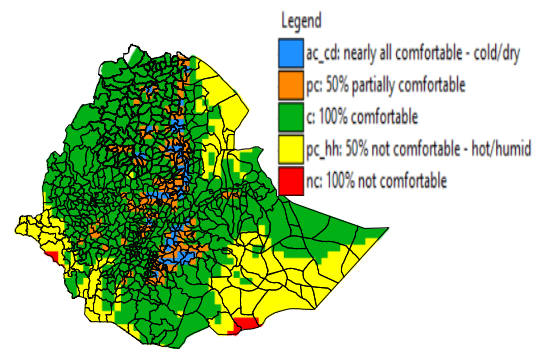


Figure 5: Expected Human comfort index

#### 2.2.2 Comfortability for Cattle

Similarly, in the coming ten days of March 2<sup>nd</sup> dekad, most lowland-border parts of the country will under in moderate heat stress condition for cattle. However, the country's **highland parts** will have non-stress conditions, as shown in Figure 6.

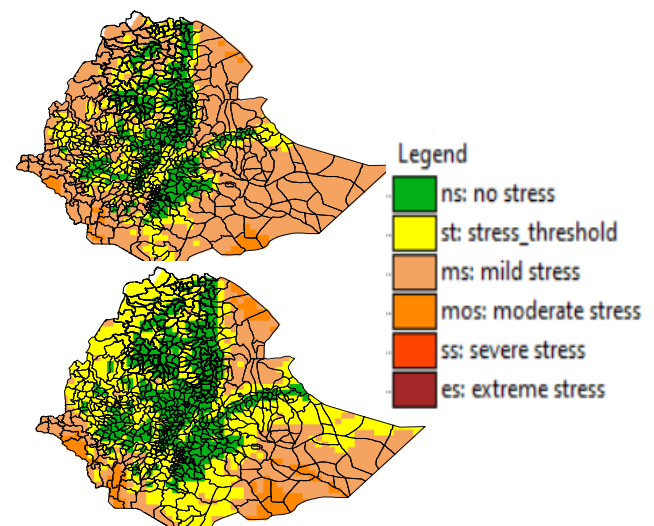


Figure 6: Expected Dairy (*Top*) and Non-Dairy (*Bottom*) Cattle comfort index





### 3. Summary








The transmission of Malaria was limited during March 1<sup>st</sup> dekad, but in the next ten days, there will be an advance transmission condition over southern portions of the country.

In terms of climate-comfort conditions, most highland and mid-land parts of the country have experienced pleasant conditions for both humans and livestock. But the lowlands of the border areas was experienced heat stress condition in the last ten days. while in the next 10 days of March 2<sup>nd</sup> decade, the low-lying border areas of the country, especially Afar, Somali, South Ethiopia, western Amhara, Benishangule Gumuz and Gambela regions will experience moderate heat stress, which will affect both humans and cattle.

### 4. 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
-  Avoid any exposure of the community to mosquitoes by ensuring clean environment and using Mosquitoes nets.
-  Use more fluids in heat prone-areas
-  Limit the outdoor activities and rearrange the working times

