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Table of Contents

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 Heath 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

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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 32^0C, 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 18^0C-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 Second Dekad of December 2025

1.1 Malaria prone areas during Second dekad of December 2025

During the second dekad of December 2025, the climatic conditions were suitable for malaria breeding and transmission over South Omo, Dawuro and Moyal in Oromia region of the country as illustrated in Figure 1.

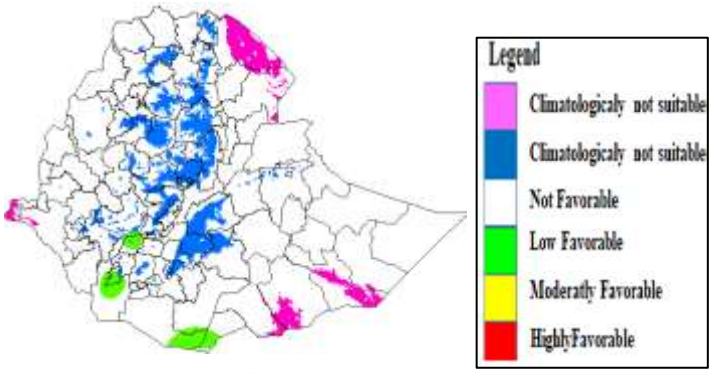

Figure 1: Malaria Prone

1.2 Climate comfort Conditions

1.2.1 Comfortability for Human

Most parts of the country was in pleasant weather conditions for human day-to-day activities, but Western Amhara, Benishangul Gumuz, Gambela, South Ethiopia region, Southern and Northern Somali and Afar region were experienced heat stress condition as illustrated in Figure 2.

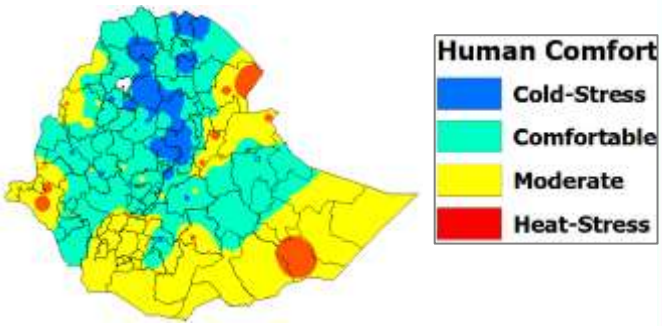

Figure 2: Human comfort index

1.2.2 Comfortability for Cattle

Similar to the human comfort, there was no significant heat stress conditions that affected cattle production and productivity during this second deked of December 2025; however, as illustrated in Figure 3, some border parts of Afar, Somali, Gambela and lowlands of South Ethiopia region were experienced heat stress conditions of the country.

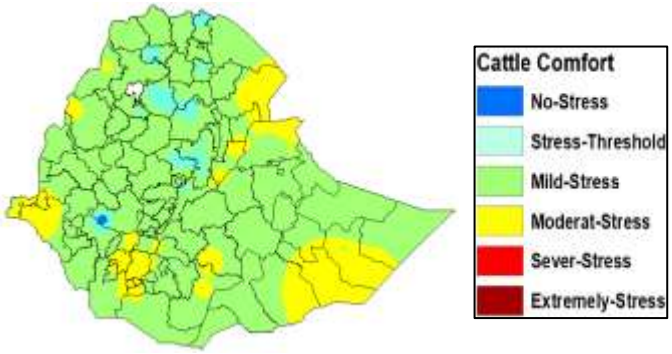

Figure 3: Cattle Comfort index

2. Expected Weather Impact on Health for third dekad of December 2025

2.1 Expected Mosquito breeding areas

In the coming ten days of December 2025 3rd dekad, the weather condition for malaria breading and transmission will suitable over, Bench Maji, Konta, Dawuro and Keffa Zone in South West Ethiopia, and Gamo Gofa, South Omo, and Gedio zones in South Ethiopia region, Hadiya, Alaba in Central Ethiopia region, West Arsi, Jimma, Guji and West Hararge in Oromia region and Sidama region of the country as illustrated as red in figure 4.

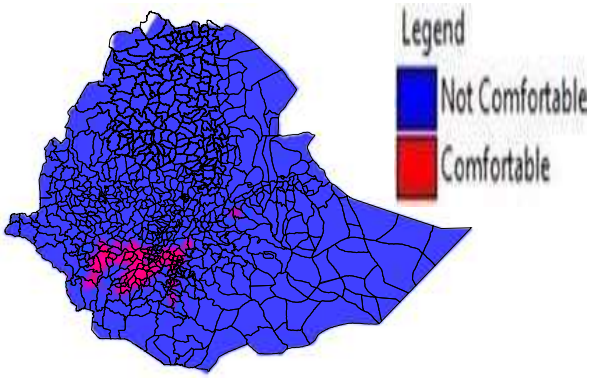

Figure 4: Expected malaria prone areas

2.1Temperature Humidity Index

2.2.1 Human Comfort Condition

For the coming third dekad of December 2025, pleasant weather conditions are expected over most parts of the country, except in Afar, South Ethiopia, Gambela and Southern Somali regions where conditions will be partially uncomfortable for human daily activities, indicating possible signs of heat stress, as shown in Figure 5.

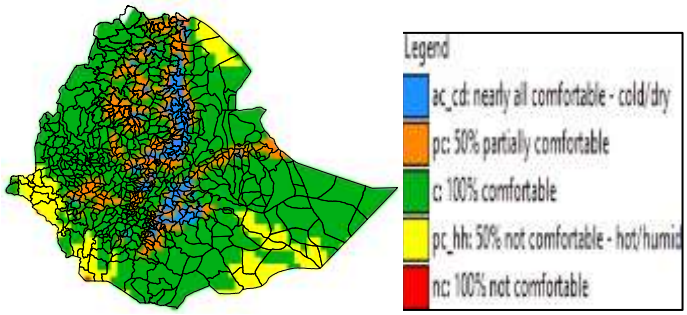

Figure 5: Expected Human comfort index

2.2.2 Cattle Comfort Condition

Similar to human comfort conditions, cattle are expected to experience mild to moderate heat stress over most lowland areas of Afar, Somali, Gambella, South Ethiopia, Benishangul Gumuz, and western Amhara during the third dekad of December 2025. However, the western, southern, central, and northern midland and highland areas of the country will expected to remain free from heat stress, as Shown in Figure 6.

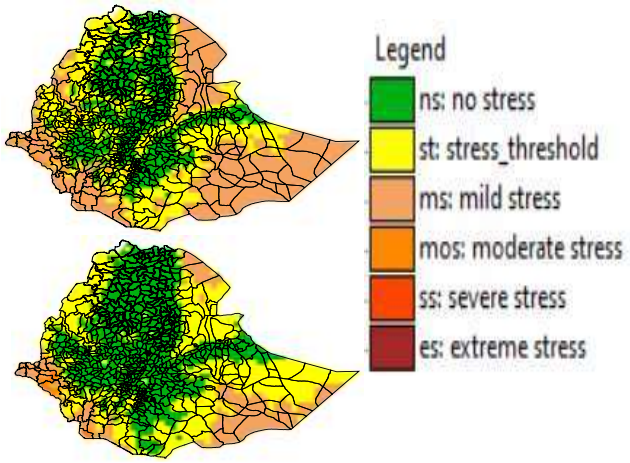

Figure 6: Expected Dairy (Top) and Non-Dairy (Bottom) Cattle comfort

3. Summary

According to the Second dekad of December 2025 climate-health analysis, most parts of the country were not suitable for the transmission and breading of malaria However, heat stress conditions exist in the low-lying border areas of Eastern, Northeaster, Western and Southern part of Ethiopia, which can affecting human and cattle activity and productivity.

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.