

Ethiopian Meteorology Institute

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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

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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 August 2025



1.1 Malaria prone areas during August 2025

During the month of August 2025 climate assessment for malaria breeding and transmission, most south-western, Western, Northern and Central parts of the Kiremt rainfall benefiting areas of the country were under suitable conditions; specifically in Oromia all western oromia zones, Eastern Harergie and Eastern Shewa zones, all zones of South, South west, and central Ethiopia regions and Sidama rigion, in Gambela region Aghuak and majaning zones and Itang sp.woreda, all zones of Benishangul Gumuz region, Awi, North and West Gojam, Wag Hamra, all Gondar zones, and some pocket lowland parts of south and north Wello zones in Amhra region, all zones of Tigray, Dire Dawa, Harari and Siti and Fafan zones in Somali regions of the country that were suitable to malaria transmission areas over the country as illustrated in Figure 1

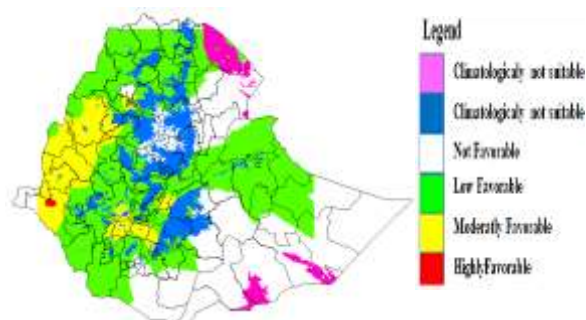


Figure 1: Malaria Prone areas

1.2 Climate comfort Conditions

1.2.1 Comfortability for Human

During August 2025, for human's day-to-day activity, the climate conditions were very **pleasant** in most parts of the country; except some low land parts of Afar regions and

Northern Somali regions were under in **heat stress** conditions as shown in figure 2.

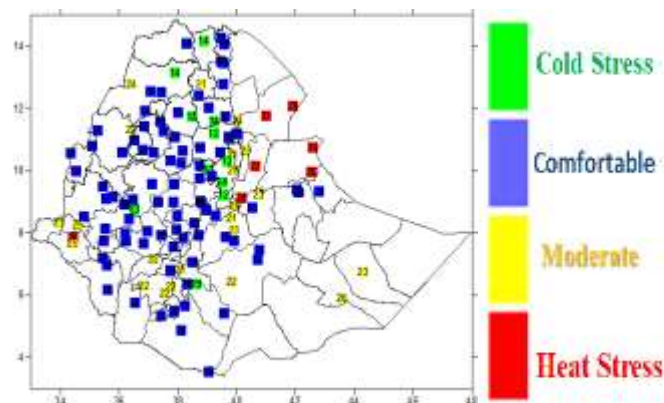


Figure 2: Human comfort index

1.2.2 Comfortability for Cattle

Similar to the human's comfortability condition, there were no-significant heat stress climate conditions that impacts the cattle's productivity, but from moderately heat to mild heat stress were experienced in Afar, Somali, and Gambela regions of the country as shown in figure 3.

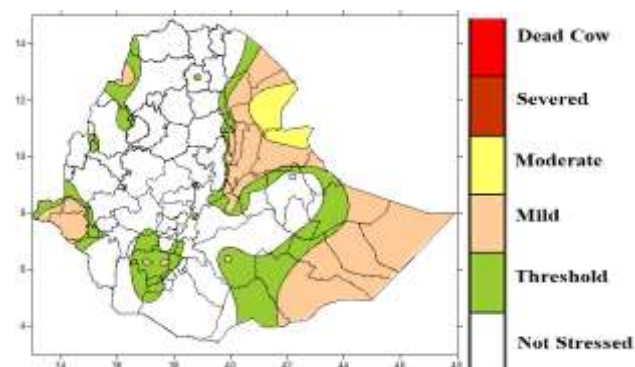


Figure 3: Cattle Comfort index

2. Expected Weather Impact on Health for first dekad of September 2025



2.1 Expected Mosquito breeding areas

In the coming first ten days of September 2025, the climate condition for malaria breeding and transmission will be suitable over all zones of Gambela, Tigray, Benishangul Gumuz, Dire Dawa, Harari, and Sidama regions, and in Oromia region East Hararge, east Shewa, Illu Aba Bora, Kellem, East and West Wellega, in Amhara region Awi, West Gonder, North Gonder, and Central Gonder and Wag Himera and Bench Sheko, Sheka, Kona and Dawro in South-west Ethiopia, Gamo, Gofa, Wolaita, Amaro, Gedeo, Derashe and Basketo in South Ethiopia and a few places of Fafan zone in Somalia the country as illustrated as red in figure 4.

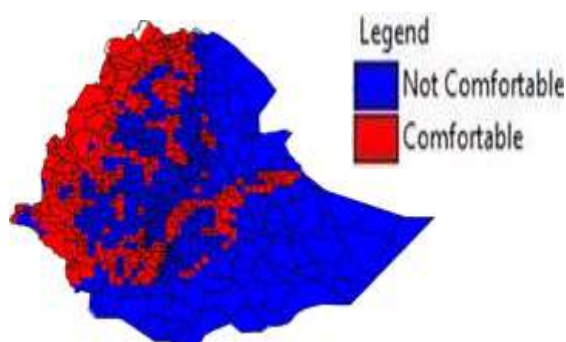


Figure 4: Expected malaria prone areas

2.2 Temperature Humidity Index

2.2.1 Human Comfort Condition

For the coming September first ten days, there will be pleasant weather condition over most parts of the country except Afar, Southern & Northern Somali and southern parts of South Ethiopia, Western Amhara and Tigray, Gambella regions, which will be partially (50%) to fully (100%) uncomfortable for humans day-to-day activity (sign of heat stress expected) as looking in figure 5.

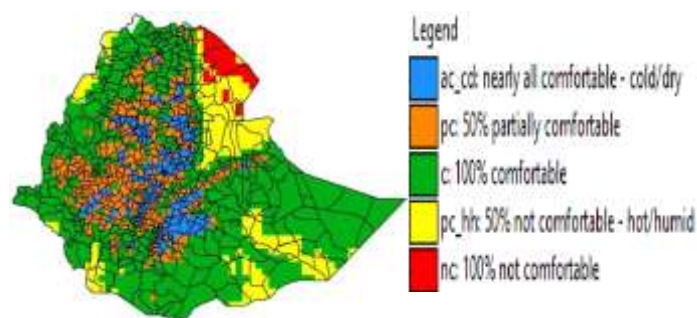


Figure 5: Expected Human comfort

2.2.2 Cattle Comfort Condition

Like the human comfort, cattle's comfort for the coming ten days of September first decade will have moderately heat stress condition over Afar regions while other most low land border part of the country will experience with none significant heat stress (mild-stress) conditions as shown in Figure 6.

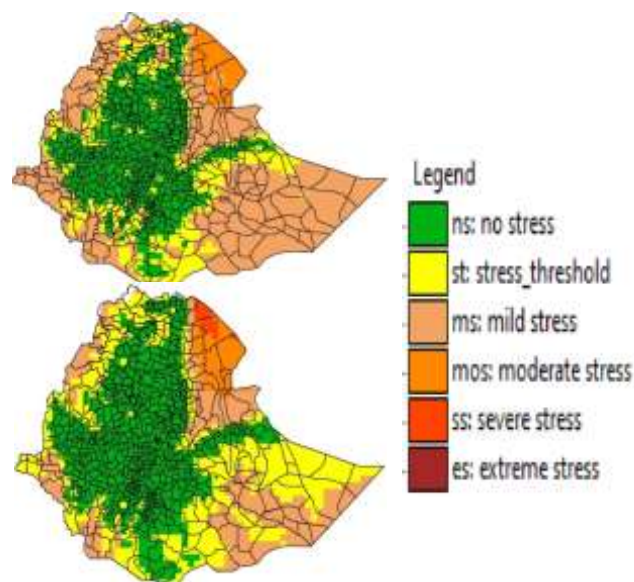


Figure 6: Expected Dairy (*Top*) and Non-Dairy (*Bottom*) Cattle comfort



3. Summary

According to the August 2025 monthly climate-health analysis indicates that Western and Northern half (i.e. south-west, west, north, north-west, and Central pocket) parts of the country were in suitable climate condition for the transmission and expansion of malaria vector. So, especially in the Kiremt rainfall benefiting areas of Western and Northern half of the country will in an increasing of malaria exposure. Moreover, the heat-stress conditions will decrease in strength and area distribution over most parts of the country. But over the low-laying border parts of the Eastern Ethiopia dominantly in Afar region have heat stress conditions for humans and cattle's 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.

