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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 second dekad 2025



1.1 Malaria prone areas during August 2025

second dekad

As of the climate condition for Malaria breeding and transmission of 2025 August 2nd dekad, there were low to moderately suitable climate condition over All zones of oromia except highlands areas, All regional zones of Southwest, South, and Central Ethiopia zones, Sidama regions, Benishangul Gumuz, Tirgray, Amhara except eastern Amhara high land areas, Dire Dawa, Harari, eastern parts of Gambela , Afar and Erer, Jara, Fafan and Siti zones in Somali region of the country as illustrated in Figure 1

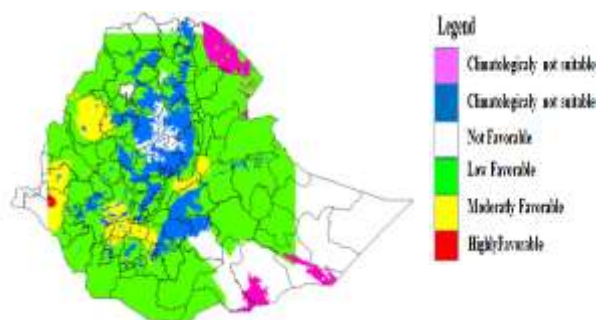


Figure 1: Malaria Prone Aareas

1.2 Climate comfort Conditions

1.2.1 Human Comfort Condition

For the daily activity of humans comfort condition the climate during August 2025 2nd dekad in some parts of Afar, Gambela and Somali region there were heat stress conditions, while in the rest most parts of the country were full comfortable for any humans daily activity as shown in figure 2.

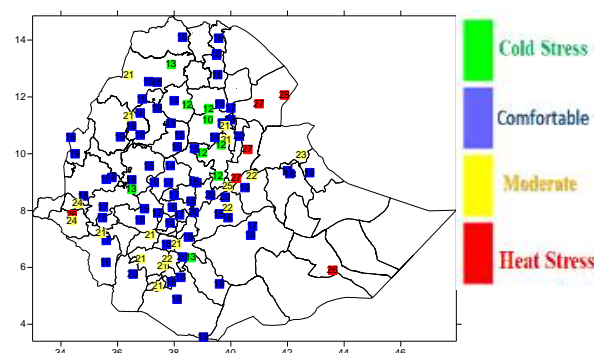


Figure 2: Human comfortable index

1.2.2 Cattle Comfort Condition

During the last ten days of August Second dekad, there were non-significant (sign-of-heat-stress-begins) heat stress condition was observed over Afar, Somalia, and Gambella regions as shown in figure 3.

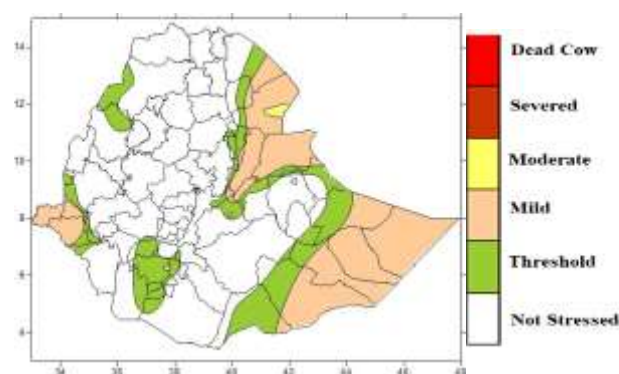


Figure 3: Cattle Comfort index



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

2.1 Expected malaria-mosquito breeding areas

In the coming Ten days of August 2025 3rd dekade, the climate condition for malaria breeding and transmission **will suitable** over; Benishangul Gumuz, Gambella, Tigray, some pocket areas of Kelem Wellega, East Wellega, Illu Aba Bora, East and North Show, East Bale, West and East Hararghe, Arsi and west Arsi zones in Oromia, Wag-Himra , Central and West Gondar in Amhara Region, Bench Sheko, Konta, Kefa, Dawro and Mirab Omo zones in South Ethiopia, Gamo, Basketo, Gofa and Wolayita zones in South west Ethiopia and Western Sidama Zone as illustrated as red in figure 4.

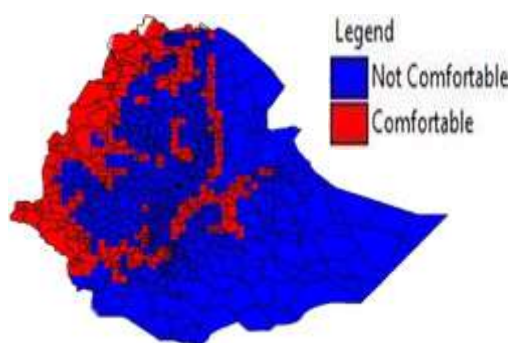


Figure 4: Expected malaria prone areas

2.2 Comfort condition

2.2.1 Human Comfort Condition

For the coming third dekade of August 2025 there will be pleasant weather condition over most parts of the country **except**; A few Place of Afar, South Ethiopia and Southern Somali which will be partially comfortable for humans daily activity (sign of heat stress expected) as looking in figure 5.

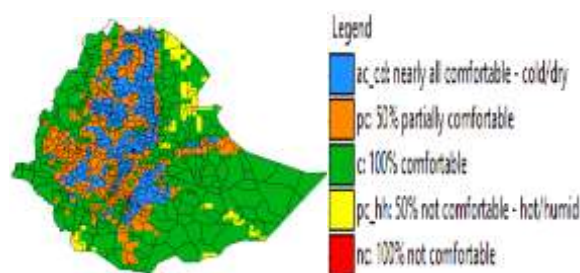


Figure 5: Exnected Human

2.2.2 Cattle Comfort condition

Like the human comfort condition, cattle's comfort Condition for the next dekade of August 2025 will have mild to moderately heat stress conditions over most lowland parts of Afar, Somali, Gambela, South-Ethiopia, and Western Amhara of the country. However, the western, southern, central and northern most midland and highland parts of the country will have non-stress conditions, as shown in Figure 6.

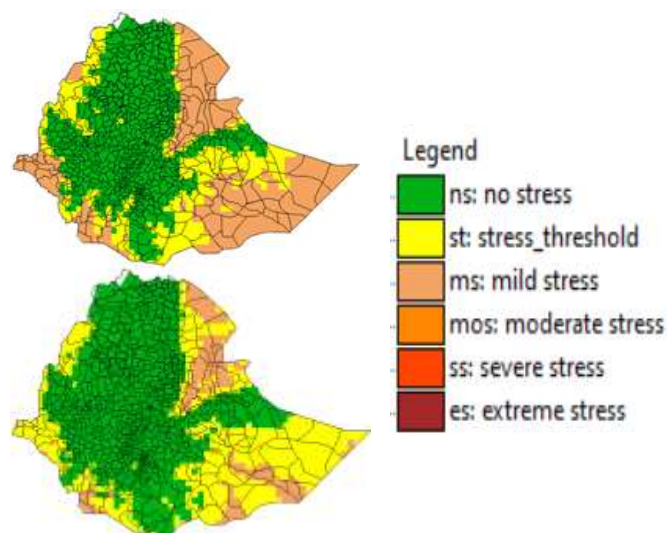


Figure 6: Expected Dairy (**Top**) and Non-Dairy (**Bottom**) Cattle comfort index



3. Summary

As of the climate-health analysis result in August 2025 2nd and 3rd decade, the transmission and expansion of malaria will expand in the Western, South-Western, Northern and North-western parts of the country. Moreover, the insignificant heat-stress conditions will exist over the low-laying border parts of the North-eastern, Southern, Western, and North-western parts of the country, while the mid-to-high-land parts of the country have remain in good condition 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.

