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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 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 July first dekad 2025

1.1 Malaria prone areas during July 2025 first dekad

As of the climate condition for Malaria breading and transmission of 2025 July 1st dekad, there were low to moderately suitable climate condition over All zones of South, South-west, Central Ethiopia, Sidama, and Benishangul Gumuz region, and all Western zones of Oromia region, Itang, Majang, and Agewak zones in Gambela, all western Amhara zones and wag Hmara and north Wollo zones of East Amhara, all zones of Tigray region, Dire Dawa , Harar regions ,Fafan, Siti and Erer zones in Somali regions as illustrated in Figure 1

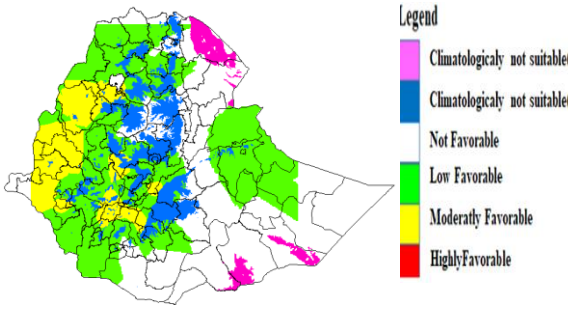

Figure 1: Malaria Prone areas

1.2 Climate comfort Conditions

1.2.1 Human Comfort Condition

For the daily activity of humans comfort condition the climate during July 2025 1st dekad in some parts of Afar, and Somali region s 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.

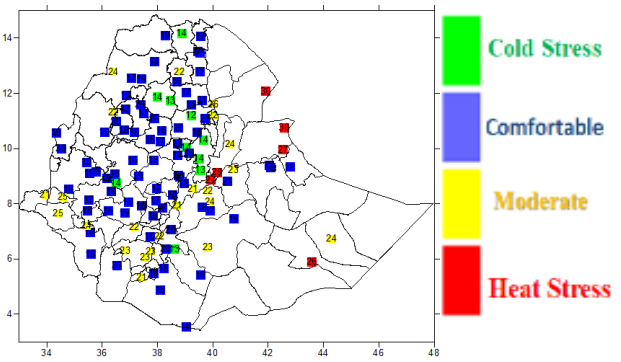

Figure 2: Human comfortable index

1.2.2 Cattle Comfort Condition

During the last ten days of July 1st dekad, there were non-significant (sign-of-heat-stress-begins) heat stress condition was observed over Eastern Afar, Somali, Metema, central parts of South Ethiopia and Gambela regions as shown in figure 3.

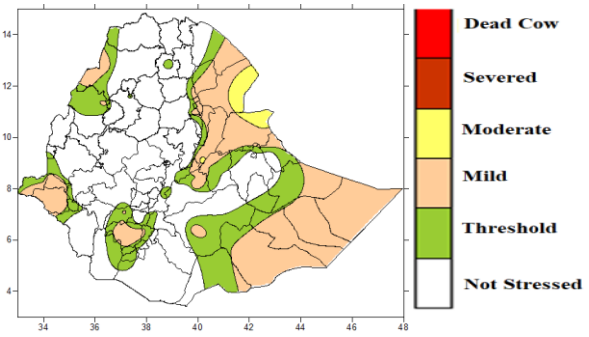

Figure 3: Cattle Comfort index

2. Expected Weather Impact on Health for second dekad of July 2025

2.1 Expected malaria-mosquito breeding areas

In the coming Ten days of July 2025 2nd dekade, the climate condition for malaria breading and transmission **will suitable** over; Benishangul Gumuz, Gambella, Tigray, South west Ethiopia, Harari, some pocket areas of West and East Wellega, Kelem Wellega, Illu Aba Bora, East Showa, West Guji, west and East Hararge zones in Oromia, Awi, East and West Gojam, North, South and Central Gondar, North and South Wollo, North Shewa, Wag-Himra Zones in Amhara Region, Guraghe, Kembata Tembaro, Hadiya in Central Ethiopia, Gofa, Basketo, Derashe,Wolaita, south Omo , Amaro and Gamo zones in South Ethiopia and Fafen Zone in Somalia country as illustrated as red in figure 4.

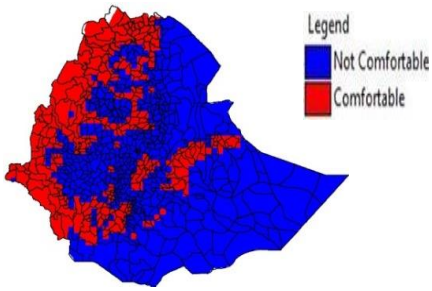

Figure 4: Expected malaria prone areas

2.2 Comfort condition

2.2.1 Human Comfort Condition

For the coming Second dekade of July 2025 there will be pleasant weather condition over most parts of the country **except**; Afar, south & North-Somali, western Amhara-Metema which will be partially to fully not comfortable for humans daily activity (sign of heat stress expected) as looking in figure 5.

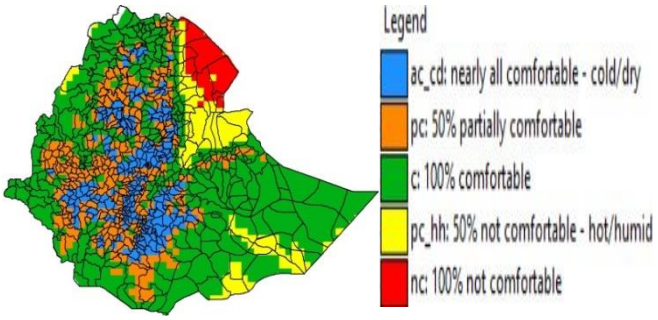

Figure 5: Expected Human comfort

2.2.2 Cattle Comfort condition

Like the human comfort condition, cattle's comfort Condition for the next dekade of Second dekade of July 2025 will have mild to moderately heat stress conditions over most lowland parts of Afar, Somali, Gambela, South-Ethiopia, Benishangul Gumuz, 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.

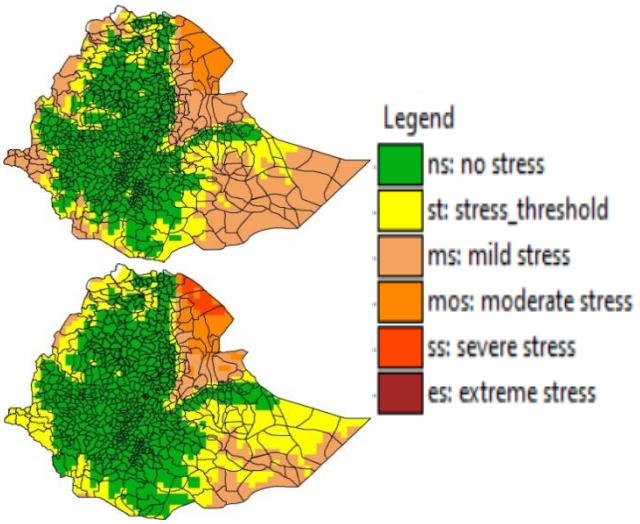

Figure 6: Expected Dairy (***Top***) and Non-Dairy (***Bottom***) Cattle comfort index

3. Summary

As of the climate-health analysis result in July 2025 1st and 2nd dekade, 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.