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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 First Dekad of March 2026

1.1 Malaria prone areas during First dekad of March 2026

During the first dekad of March 2026, the prevailing climatic conditions across the Belg rainfall benefiting areas of the country were generally favorable for malaria vector breeding, development, and transmission dynamics over South-west Ethiopia, South Ethiopia, Central Ethiopia, Sidama, Southern Oromia, South-western Somali, Southern Afar and Eastern Amhara regions. Temperature and moisture conditions were conducive for optimal Anopheles mosquito proliferation or for shortening the parasite's extrinsic incubation period, as illustrated in Figure 1.

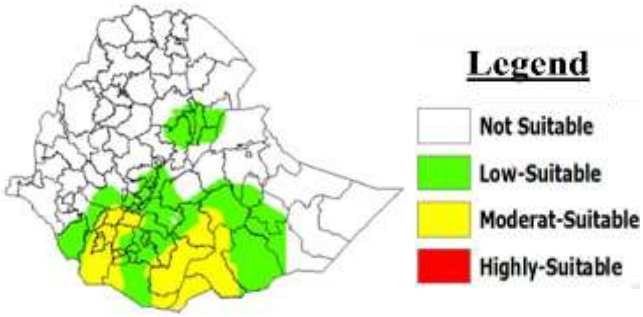

Figure 1: Malaria Prone areas

1.2 Climate comfort Conditions

1.2.1 Comfortability for Human

During the previous ten days of March 2026, most parts of the country experienced pleasant weather conditions suitable for normal day-to-day human activities. However, moderate to high heat stress conditions were observed over Gambela, southern Somali, and Afar Region. These conditions had noticeable impacts on routine human activities, as illustrated in Figure 2.

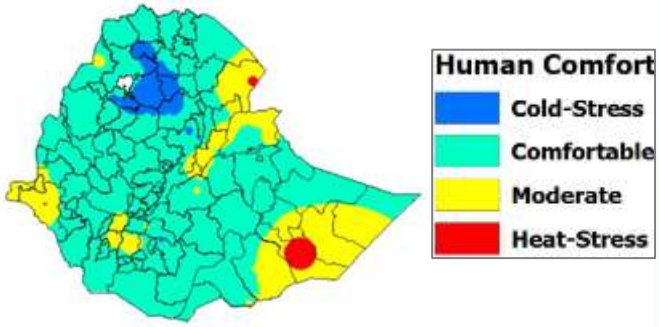

Figure 2: Human comfort index

1.2.2 Comfortability for Cattle

Similar to the human thermal comfort conditions, **no** significant heat stress that could negatively affect cattle production and productivity was observed during the second dekad of March 2026 as shown in Figure 3.

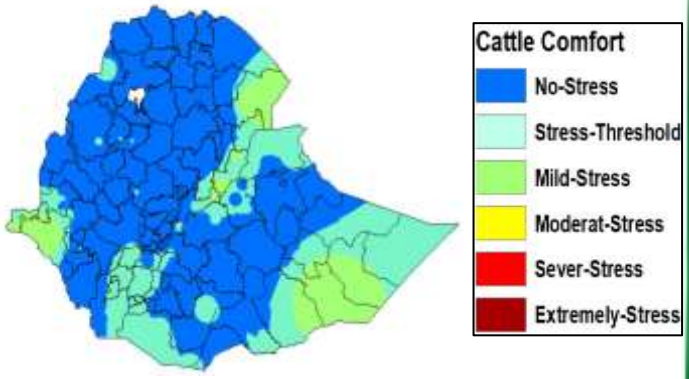

Figure 3: Cattle Comfort index

2. Expected Weather Impact on Health for Second dekad of March 2026

2.1 Expected Mosquito breeding areas

During the upcoming **second** dekad (ten-day period) of March 2026, the forecasted weather conditions across the country are expected to favorable for malaria breeding and transmission over the following Zones of the country; Benchi Maji, Keffa, Konta, Dawuro, Gamo Gofa, South Omo, Basketo, Wolayita, Hadiya, Selti, Sidama, Gedeo, Jimma, West Arsi, Guji, Bale, South Wollo, Oromia Special Zone, and North Wollo. Temperature and rainfall patterns will be support optimal mosquito development maturation, as indicated by the red shading in Figure 4.

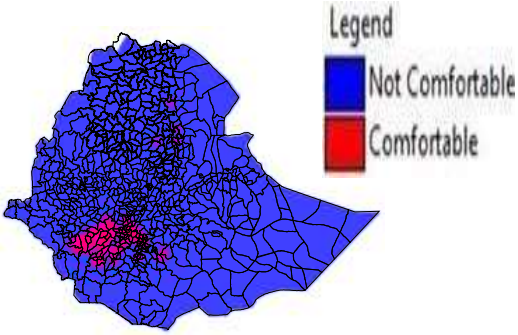

Figure 4: Expected malaria prone areas

2.1Temperature Humidity Index

2.2.1 Human Comfort Condition

During the upcoming second dekad of March 2026, generally favourable and comfortable weather conditions are expected over most parts of the country, supporting normal day-to-day human activities. However, parts of Afar, Gambela, Southern Somali and the South Ethiopia Region are expected to experience partially to fully uncomfortable thermal conditions, with moderate to high heat stress levels (see Figure 5).

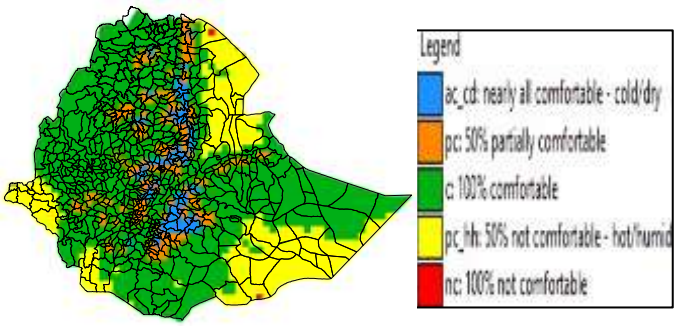

Figure 5: Expected Human comfort index

2.2.2 Cattle Comfort Condition

Cattle are expected to experience mostly mild to moderate heat stress across the lowland areas of Afar, Somali, Gambella, South Ethiopia, Benishangul-Gumuz, and western Amhara during the second dekad of March 2026. In contrast, the western, southern, central, and northern midland and highland areas of the country are expected to remain largely free from heat stress conditions, as shown in Figure 6.

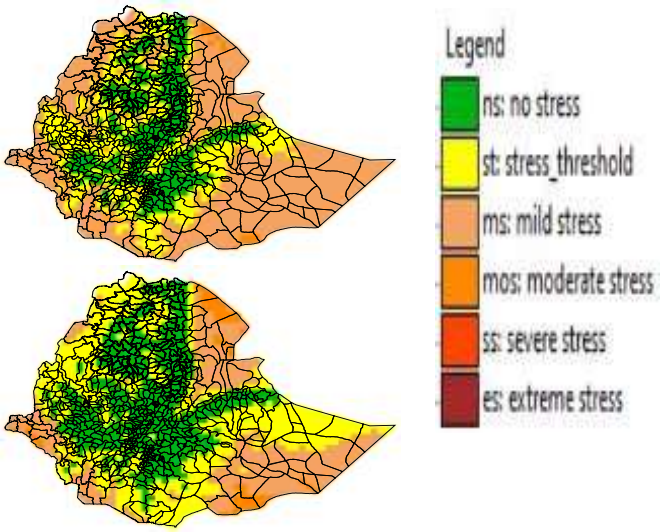

Figure 6: Expected Dairy (Top) and Non-Dairy (Bottom) Cattle comfort

3. Summary

During the first and second dekads of March 2026, most parts of the country experienced generally pleasant weather conditions suitable for normal human activities. However, moderate to high heat stress was observed and is expected to persist in some lowland areas, particularly Afar, Somali, Gambella, and Southern Somali, potentially affecting daily activities and vulnerable populations. Climatic conditions during this period were and are expected to favorable for malaria breeding and transmission over Belg Benefiting areas. For livestock, No-significant heat stress was observed and expected over lowland areas-including Afar, Somali, Gambella, South Ethiopia, Benishangul-Gumuz, and western Amhara.

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.