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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 April 2026

1.1 Malaria prone areas during First Dekad of April 2026

During the First Dekad of April 2026, the prevailing climatic conditions across the country were generally **Low to Moderate favorable** for malaria vector breeding over West Wellega, Kelem Wellega, Ilu Aba Bora, Borena, East Borena, Guji, East Guji, Bale and East Bale, East and West Hararghe, and Jimma zone in Oromia, North and South Somalia, Fanti, Awsi in Afar, South Ethiopia, Benishangul gumuz, Gambela, Sidama, South west Ethiopia Region as illustrated in Figure 1.

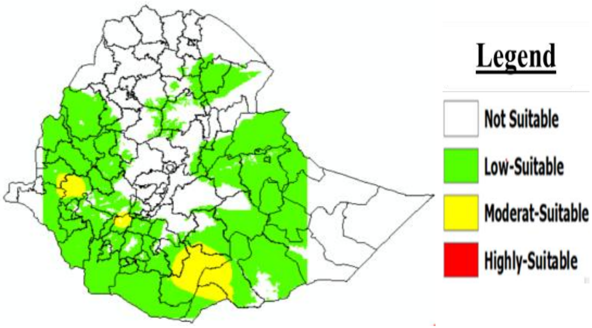

Figure 1: Malaria Prone areas

1.2 Climate comfort Conditions

1.2.1 Comfortability for Human

During the First Dekad of April 2026 month, most parts of the country experienced pleasant weather conditions suitable for normal day-to-day human activities. However, Moderate to heat stress conditions were observed over South and Noth parts of the Somali, Afar Region, West Gonder (Metema) in Amhara region, Metekel in Benishangul Gumuz Nuwer, Agnewak in Gambela, South Ethiopia. These conditions had noticeable impacts on routine human activities, as illustrated in Figure 2.

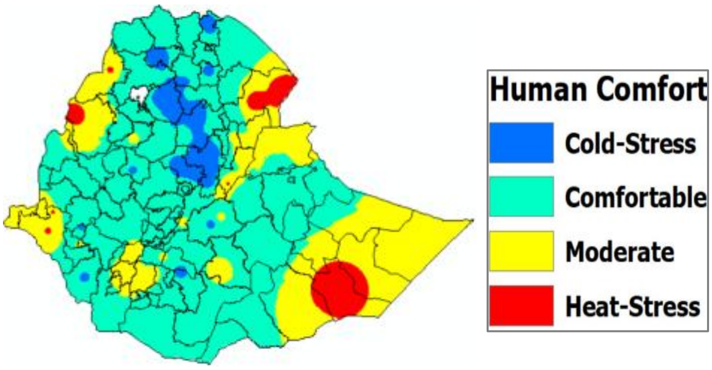

Figure 2: Human comfort index

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 were observed during the First Dekad of April 2026. However, as shown in Figure 3, Certain areas of Southern parts of the Somali Region, Afar Region, Benishangul Gumuz, Metema in Amhara region and Gambela, South Ethiopia part of the country were experienced noticeable heat stress conditions.

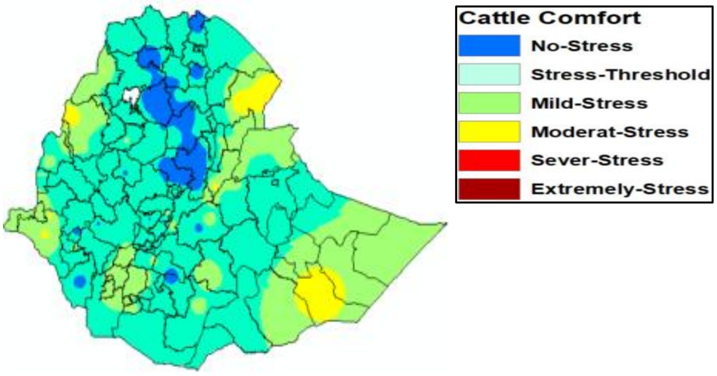

Figure 3: Cattle Comfort index

2. Expected Weather Impact on Health for Second Dekad of April 2026

2.1 Expected Mosquito breeding areas

In the Coming Second Dekad of April 2026 the weather condition for malaria breading and transmission will suitable over, Bench seko, keffa, Sheka in South-west Ethiopia, Wolaita, Gamo, Derashe, Alle , Konso, Burji, Dawro, in South-Ethiopia, Sidama, Western and Eastern Hararghe, Bale, Guji, Borena, Jimma Ilu Aba Bor and West Shewa in Oromia, western border of Afar and Daawa, Liben, Afder in Somalia regions of the country there will be suitable climate condition for the breading and transmission of malaria during the coming Second Dekad of April 2026, as shown in figure 4

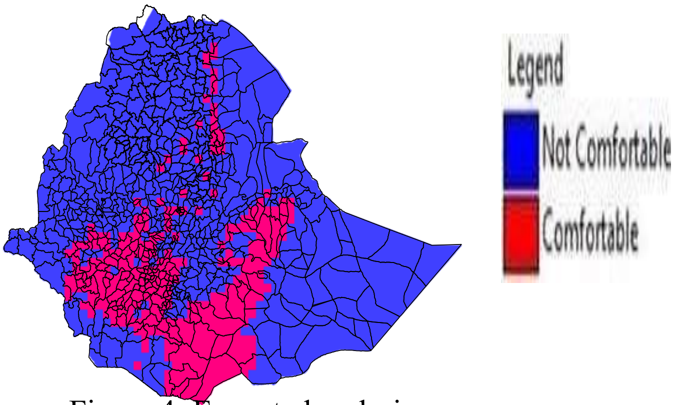

Figure 4: Expected malaria prone areas

2.1 Temperature Humidity Index

2.2.1 Human Comfort Condition

For the coming Second Dekad of April 2026, pleasant weather conditions are expected over most parts of the country, except in Afar, South Ethiopia, Gambela and southern Somali region, where conditions will be partially uncomfortable for human daily activities, indicating possible signs of heat stress, as shown in Figure 5.

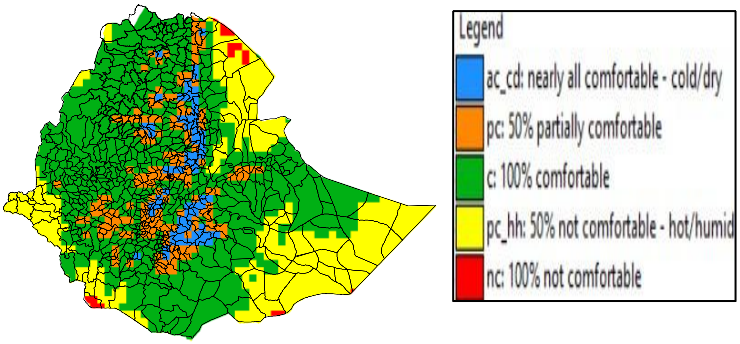

Figure 5: Expected Human comfort index

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, South west Ethiopia, Benishangul Gumuz, Western Amhara and Western Tigray in the coming Second Dekad of April 2026. However, the Southern, central, and northern midland and highland areas of the country will expect to remain free from heat stress, as shown in Figure 6.

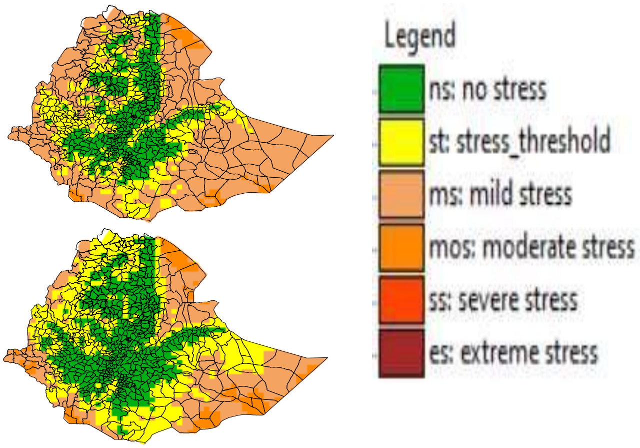

Figure 6: Expected Dairy (Top) and Non- Dairy (Bottom) Cattle comfort

3. Summary

As of first Dekad of April 2026, most parts of the country experienced generally pleasant weather conditions human activities. However, moderate-to-high heat stress was observed and is expected to persist in some lowland areas, particularly Afar, Somali, Gambela, and South Ethiopia, potentially affecting daily activities and vulnerable populations. Climatic conditions during this period were and are expected to remain unfavourable for malaria breeding and transmission countrywide. For livestock, mild to moderate heat stress is expected over lowland areas, including Afar, Somali, Gambela, South Ethiopia, Benishangul-Gumuz, and western Amhara, while midland and highland areas are projected to remain largely free from heat stress.

4. Advisory

Use and implement the following recommendations in places that are favourable for the development of malaria and other vector-borne related diseases;

- Strengthen malaria surveillance in favourable areas
- Implement vector control measures
- Promote environmental sanitation
- Conduct community awareness campaigns
- Encourage mosquito net usage
- Monitor heat stress impacts on vulnerable populations and livestock