

# Ethiopian Meteorology Institute

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## I. Foreword

This “Climate Information for the Health Sector” bulletin has been prepared to provide essential information on human thermal comfort conditions based on analyses of temperature and relative humidity, as well as on malaria-prone areas identified through analyses of temperature and rainfall. Monitoring temperature and rainfall can help assess the likelihood of malaria outbreaks with a lag period of one to two months, making this information valuable for early warning and preparedness.

The bulletin supports the Ethiopian Meteorology Institute’s strategy of expanding climate application services for key development sectors, including health, water resources, and agriculture. It is intended to assist public health professionals, tourism service providers, researchers, and other stakeholders interested in biometeorology and climate-sensitive diseases.

Careful and continuous use of this bulletin can contribute to improved early warning, preparedness, and response within the health sector. Comments and constructive suggestions are highly appreciated.

This same bulletin can be accessed online at:

[http://www.ethiomet.gov.et/bulletins/health\\_bulletins](http://www.ethiomet.gov.et/bulletins/health_bulletins)

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## II. Assumptions

### A. Malaria

According to the International Research Institute for Climate and Society (IRI), rainfall, temperature, and relative humidity are used to assess the potential incidence of malaria.

- High incidence: rainfall > 80 mm, temperature 25–32°C, and relative humidity > 80%.
- Moderate incidence: rainfall > 80 mm, temperature 20–25°C, and relative humidity 70–80%.
- Low incidence: rainfall > 80 mm, temperature 18–20°C, and relative humidity 60–70%.
- No incidence: temperature < 18°C, relative humidity < 60%, and rainfall < 80 mm.

Climate variables generally affect malaria transmission with a delay of one to two months.

### B. Human Thermal Comfort

The human heat index indicates how hot it feels when relative humidity is combined with actual air temperature.

- 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, with possible risks of heat exhaustion, heat cramps, heat stroke, and cardiovascular stress.

### C. Cattle Thermal Comfort

The cattle heat index reflects the combined effects of temperature and relative humidity on livestock.

- Not Stress: THI is <68, *free from heat stress*
- Threshold Stress: THI is 68 – 71, *impact less stress starting*
- Mild stress: THI is 72 – 79, *stress begins and calf rate affected*
- Moderate stress: THI is 80 – 89, *Milk production affected*
- Severe stress: THI is 90 – 99, *very significant losses in milk production*
- Extreme heat stress: THI is >100, *very high risk of mortality in cattle*



# 1. Weather impact Assessment on Health for August 2026



## 1.1 Malaria prone areas

During August 2026, climatic conditions ranging from low to moderately favorable for malaria breeding and transmission were observed across parts of Western and Eastern Oromia zones, Southwest Ethiopia, Eastern Gambela, Benishangul-Gumuz, Northern Somali, Dire Dawa, Afar, Southern and Western Tigray and most parts of Amhara region as illustrated in Figure 1.

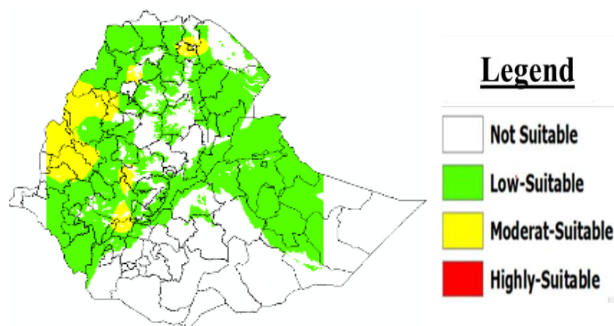


Figure 1: Malaria Prone areas

## 1.2 Human Thermal Conditions

Heat stress conditions were observed in most parts of Afar, Gambela, Metehara, Metema, Quara, Metekel, most parts of Somali region and around Ariba Minch in South Ethiopia. Most other areas of the country experienced comfortable to very pleasant conditions for daily human activities as shown in figure 2

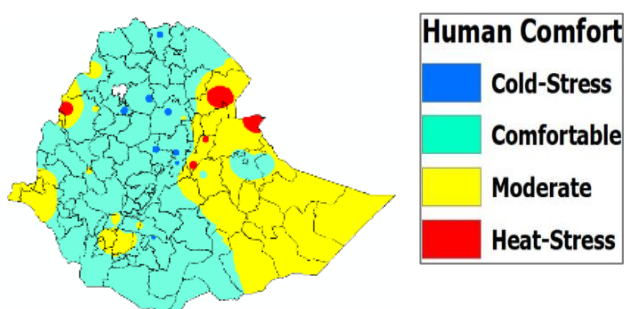


Figure 2: Human comfort index

## 1.3 Cattle Thermal Condition

As with human comfort, there were no significant heat stress conditions that affected cattle production; however, as No widespread severe heat stress was observed for cattle. However, moderate heat stress conditions occurred in some border areas of Afar illustrated in Figure 3

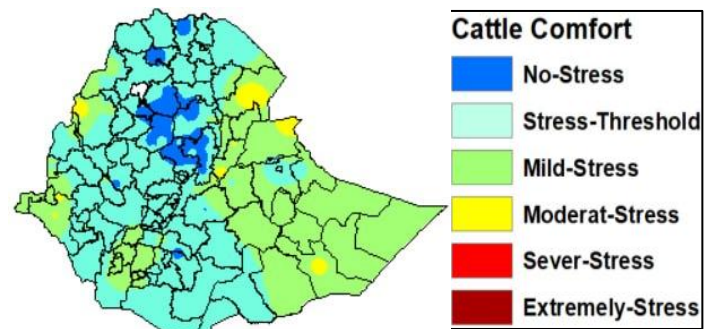


Figure 3: Cattle Comfort index





## 2. Expected Weather Impact on Health for first Dekad of September 2026



### 2.1 Expected Mosquito breeding areas

Conditions favourable for malaria breeding and transmission are expected across western, Central and Eastern Oromia zones; Benishangul-Gumuz region; Awi, North, East, and West Gojam; Central, Western, and Northern Gondar and parts of South Gondar; and most parts of western and Northern Tigray. While, most remaining areas are expected to remain generally unfavourable for malaria transmission as demonstrated in figure 4.

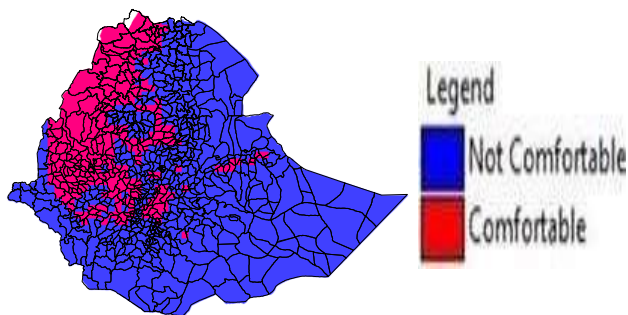


Figure 4: Expected malaria prone areas

### 2.2 Expected Human Thermal Comfort

Most parts of the country are expected to experience comfortable conditions. However, Afar, Gambela, southern and northern Somali, South Ethiopia, and the western Amhara lowlands (Metema and Quara) are expected to experience partially to fully uncomfortable conditions with possible heat stress as shown in Figure 5.

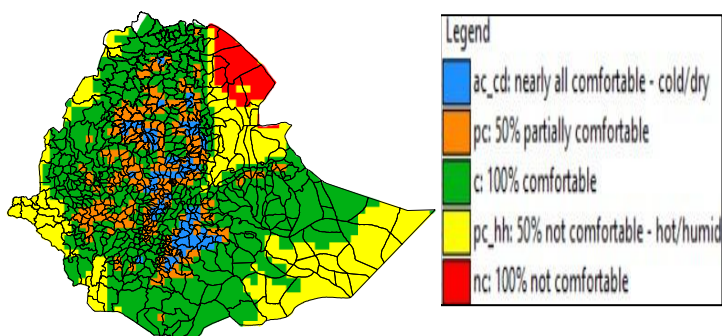


Figure 5: Expected Human comfort index

### 2.3 Cattle Comfort Condition

Mild to severe heat stress is expected across lowland areas of Afar, Somali, Gambela, South Ethiopia, Benishangul-Gumuz, and western parts of Amhara and Tigray. Midland and highland areas are expected to remain largely free from heat stress as illustrated in Figure 6.

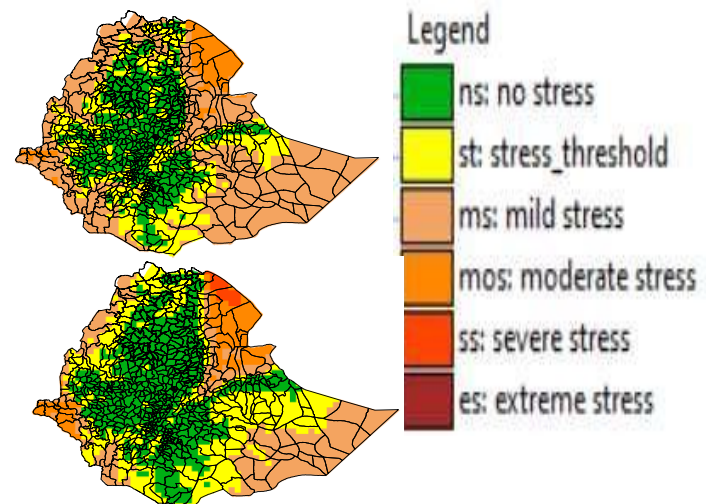


Figure 6: Expected Dairy (Top) and Non- Dairy (Bottom) Cattle comfort

### 3. Summary and Key Message

The climate–health assessment indicates low to moderate climatic suitability for malaria transmission across several Kiremt-benefiting areas (Northern and Western parts) during August 2026, with similar conditions expected in the first dekad of September 2026. Heat stress is likely to persist in the lowland areas of Afar, Gambela, Somali, South Ethiopia, and western Amhara, posing risks to human health.

### 4. Advisory and recommendations

#### 4.1 Malaria and Vector-Borne Diseases

- ✓ Strengthen malaria surveillance, early diagnosis, and prompt treatment in climatically favourable areas.
- ✓ Intensify vector control measures, including the use of long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS), and elimination of mosquito breeding sites.
- ✓ Enhance environmental sanitation and maintain adequate supplies of malaria diagnostics and treatment.
- ✓ Strengthen coordination between the EMI, health authorities, and local administrations to support climate-informed early warning and response.

#### 4.2 Heat Stress Advisory

Residents in Afar, Gambela, Somali, South Ethiopia, Metema, Quara, and other lowland areas should:

- ✓ Avoid strenuous outdoor activities during the hottest times of the day (12:00 p.m.–4:00 p.m.).
- ✓ Stay hydrated, wear light clothing, and remain in shaded or well-ventilated areas.
- ✓ Pay special attention to children, older adults, pregnant women, and people with chronic illnesses.
- ✓ Seek medical attention immediately if symptoms of heat-related illness occur.

#### 4.3 Public Health Preparedness

- ✓ Strengthen climate-sensitive disease surveillance and preparedness in high-risk areas.
- ✓ Disseminate timely climate-health advisories to communities through appropriate communication channels.
- ✓ Promote collaboration among the health, meteorological, agricultural, and disaster risk management sectors to reduce climate-related health impacts.