

FDRE
Ministry of Water and Energy
EMI
Bio Meteorology and Insurance Index Desk



Climate Information
For
The Health Sector

June_2023

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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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1. Introduction

The breeding and development of Climate Sensitive Diseases are highly dependent on weather and climate conditions though other climate factors can play significant roles. Temperature, Rainfall and Humidity are the key parameters which often determine the suitability of the environment for breeding and transmission of Malaria, which is the current Public Health threat in Ethiopia. The outbreak level of malaria depends on certain threshold value of Temperature, Rainfall and Humidity. Thus,

- i. If the monthly total Rainfall is $\geq 80\text{mm}$, suitable for mosquito breeding and malaria transmission.
- ii. If the monthly mean air Temperature is $18 \leq T^{\circ} \leq 32^{\circ}\text{C}$, favorable for Mosquitoes development
- iii. If the mean monthly RH is $\geq 60\%$, favorable to complete the transmission cycle of Mosquitoes.

The comfortability of the environment for human and animals depend on if the value of mean daily temperature and relative humidity exceeds a given thresholds. The threshold values are computed as:

- $\text{THI} = 0.8 * T + \text{RH} * T / 500$ for Human
- $\text{THI} = 0.8 * T + \text{RH} * (T - 14.4) + 46.4$ for Cattle

1.1. RTH Conditions for Malaria transmission during June 2023

According to the collected and analyzed climate data, during the month of June, most weather observing stations in the Western, Southwestern, Central Eastern, North half and Central parts of the country were recorded rainfall exceeding 80mm. While the monthly mean relative humidity of 60% and above were recorded over Southwest, Eastern, Western, North Western and Southern parts of the country. Similarly, the monthly mean temperature between 18°C and 32°C was observed over in most parts of the country except on some Southern, Western and Southern Highlands and north eastern lowland section of the country. As illustrated in figure 1, favorable climate conditions for the breeding and developments of malaria over the square patterns of the map below were observed in Northern Somalie, Central, Western and Eastern half areas of Oromia, Benishangul gumuz, Most parts of SNNPR, Some areas of Western Amhara, Gambela and Harar regions.

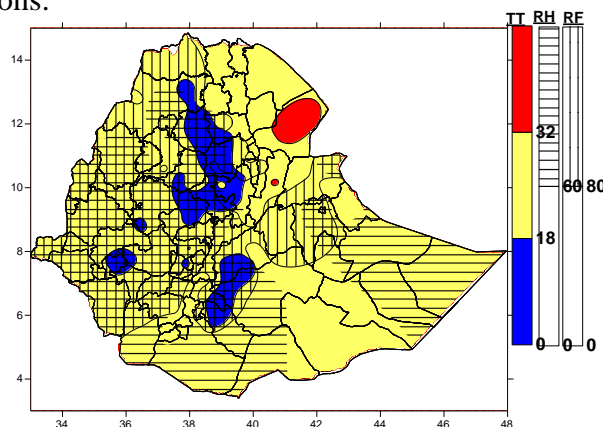


Fig 1:- Combined temperature, rainfall and relative humidity analysis for June 2023.

2. THI Conditions during June 2023

2.1 THI for Human

As a result of Temperature-Humidity Index (THI) analysis, during the month of June heat stress was observed over few places in the lowland parts of Gambella, Somali, and Afar regions and which contributes only 12% of the recorded stations. Whereas the rest most parts of the country (66% of the recorded stations) experienced comfortable climate conditions.

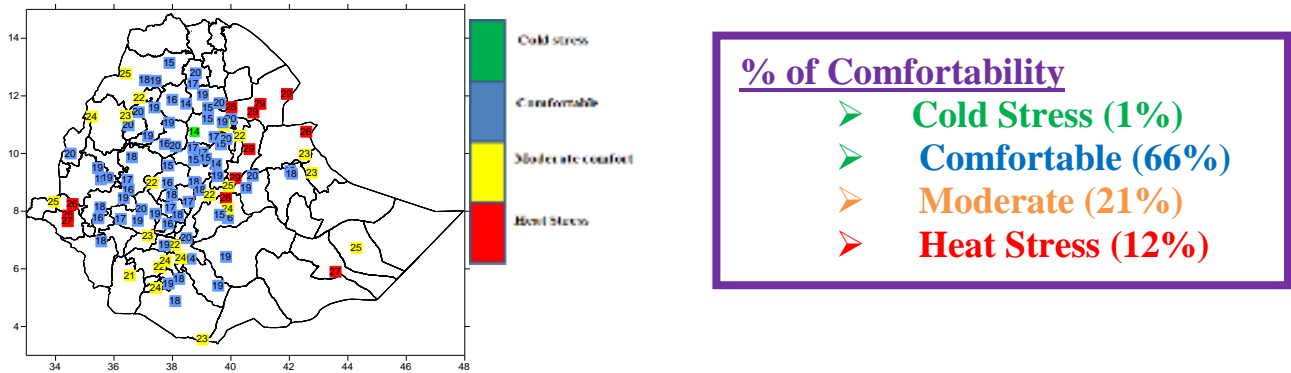


Fig 2; THI for human during June 2023

2.2. THI for Cattle.

According to the collected meteorological data of June 2023, moderate heat stress for Cattle's was observed over Afar regions. The rest parts of the country were experienced from mild to Not-stress conditions.

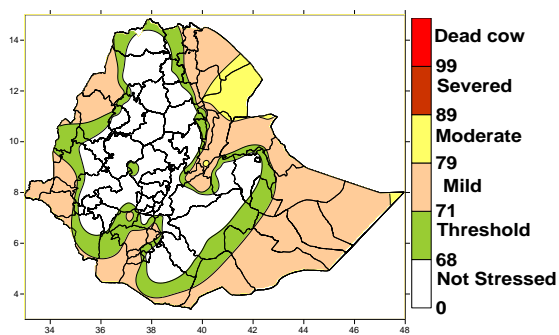


Fig 3:- THI values for Cattle's during the month of June 2023.

3. Expected Weather Impacts and Advisory on health for first(1-10) dekad of July 2023

3.1. Expected Mosquito breeding suitable areas

During the coming first dekad of July 2023 favourable climate condition for Mosquito breeding and development will be expected over most western parts of Kiremt rainfall benefiting areas. Most parts of Western, Southwestern, Northwestern and Central pocket areas of Ethiopia will be under suitable conditions for Mosquito breeding sites. particularly western and Central pocket areas of Oromia, Northern SNNPR, Gambela region, most parts of Western Amhara and Benishangul Gumuz regions will be suitable for malaria transmission. Therefore, we advise the concerned bodies to avoid the exposure of the community to Mosquitoes through ensuring a clean environment and using Mosquito nets. All measures of controlling mechanisms for vector distribution must be applied.

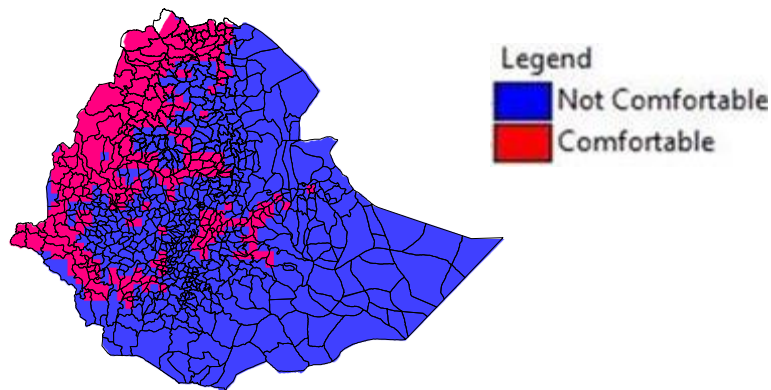


Fig 4: Suitable weather condition for malaria vector for July 1st dekad 2023

3.2 Temperature Humidity Index (THI)

3.2.1 THI for Cattle

During the coming first dekad of July 2023, Severe stress weather conditions will be expected over Northern Afar and Mild to Moderate stress conditions for Cattle's will be expected over most of Afar, Somali, Benishangul gumuz, Western border of Amhara, Southern SNNPR and Gambela regions for dairy cattle's and for non dairy cattle's in such areas. While the rest highland portion of the country will be expected to be under none stress conditions.

Generally we advise to perform heat stress reducing mechanisms for cattle like making a shade, Providing Drinking, Conduct Monitoring, control, and surveillance of animal diseases.

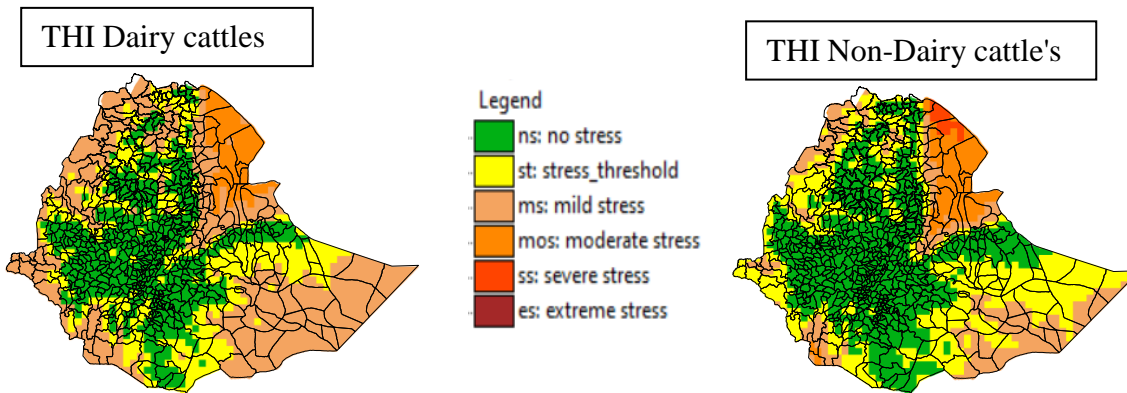


Fig 5: THI condition for Dairy and Non-dairy Cattles

3.2.2 THI for Human

During the coming first dekad of July 2023, 100% uncomfortable weather conditions will expect over Afar. and also hot and humid 50% uncomfortable conditions will expect over Southern and Northern Somali, Southern Afar, Lowlands of Western Amhara and lowlands of Southern SNNPR regions of the country. The rest most parts of the country will be under comfortable weather conditions.

For the coming ten days, in Afar region northern parts residents reduce exposure of heat and make all measuring mechanisms of heat stress like Drink more water than usual, light-colored clothing and sunscreen, Take cool showers or baths to cool down, Avoid overdressing,

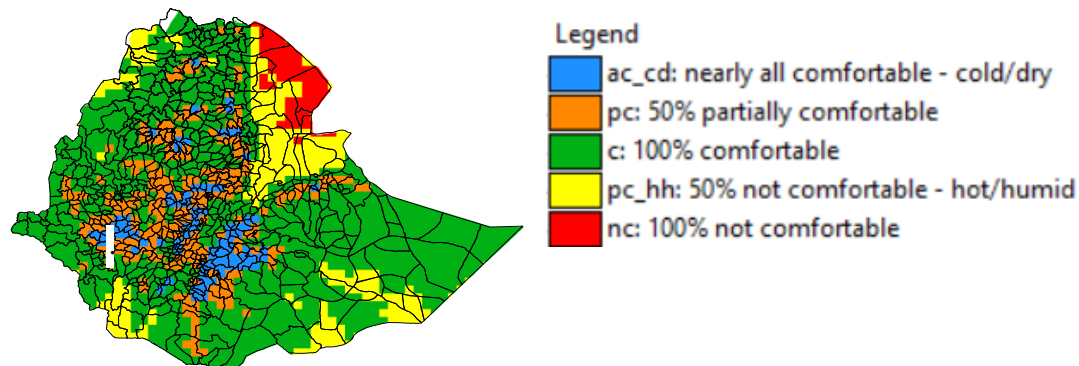


Fig 6 : THI for Human July 1st dekad 2023.