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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.

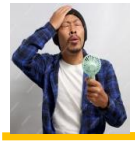
Based on these, climate variables have ***a one to two months*** postponed (delayed) effect on the spread of malaria.

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 December 2024

1.1 Malaria prone areas during December 2024

During December 2024 monthly climate assessment for malaria breeding and transmission, in any parts of the country there was **no** suitable areas for malaria transmission over the country as illustrated in Figure 1

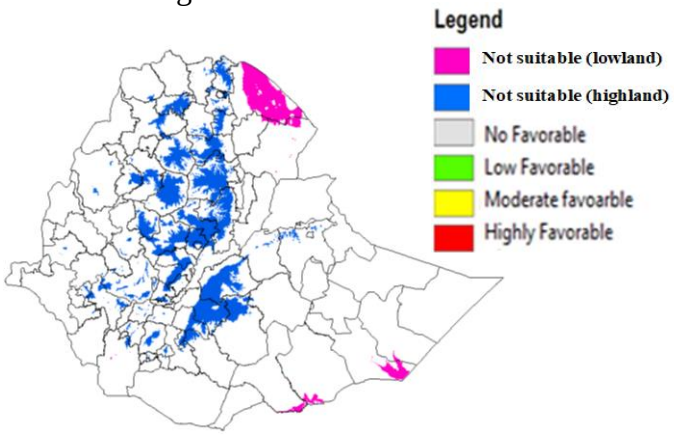


Figure 1: Malaria Prone areas

1.2 Climate comfort Conditions

1.2.1 Comfortability for Human

During December 2024, for human's daily activity the climate condition was very **pleasant** in most parts of the country. But in the northern and central high lands parts of the country, **there was morning and evening cold stress condition** as shown in figure 2.

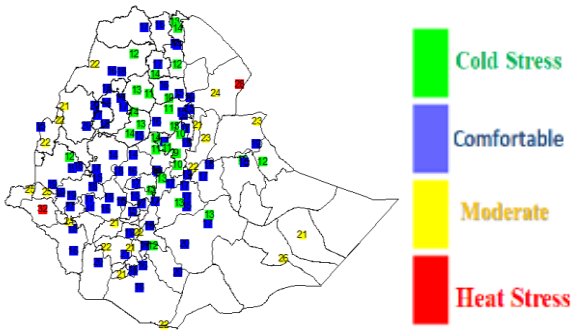


Figure 2: Human comfort index

1.2.2 Comfortability for Cattle

Similar to the human's daily activity comfort index, cattle's comfort index there was no-significant heat stress that impacts the cattle's production. But from Moderately heat stress to mild heat stress was experienced in eastern Afar, southern Somali, and Gambela regions of the country as shown in figure 3.

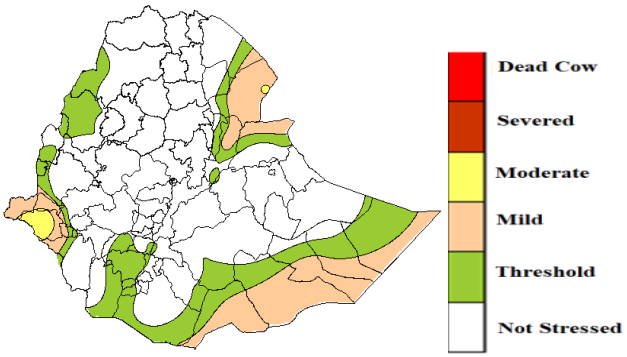
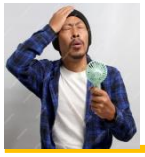


Figure 3: Cattle Comfort index



2. Expected Weather Impact on Health for first dekad of January 2025

2.1 Expected Mosquito breeding areas

In the coming first Ten days of January 2025, the climate condition for malaria breading and transmission **will not suitable** all over the country as illustrated as red in figure 4.

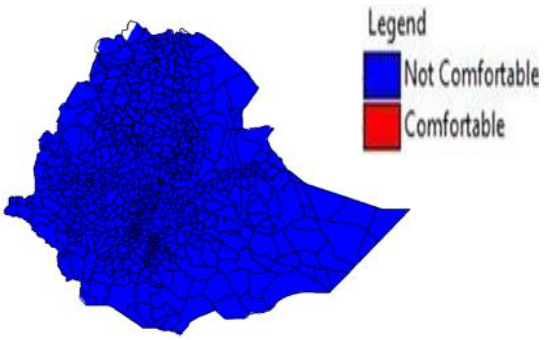


Figure 4: Expected malaria prone areas

2.2Temperature Humidity Index

2.2.1 Comfortability for Human

For the coming January first ten days, there will be pleasant weather condition over most parts of the country except **Northern-Afar,Eastern-Gambela, Southern-Somali and southern parts of South Ethiopia** regions, which will be partially (50%) discomfortable for humans daily activity (sign of heat stress expected) as looking in figure 5.

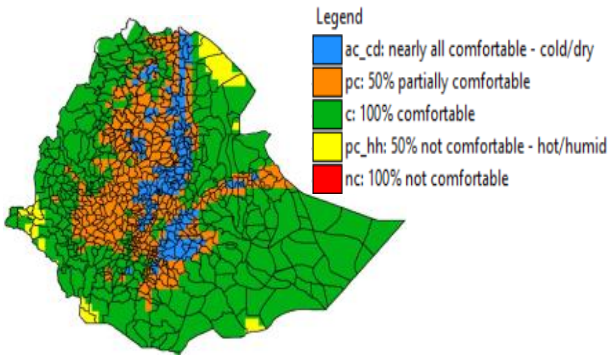


Figure 5: Expected Human comfort

2.2.2 Comfortability for Cattle

Like the human comfort index, cattle's comfort index for the next ten days of January first ten days will have **no** significant heat stress over the country. However, the country's **lowland-border parts** will be in mild heat stress conditions as shown in Figure 6

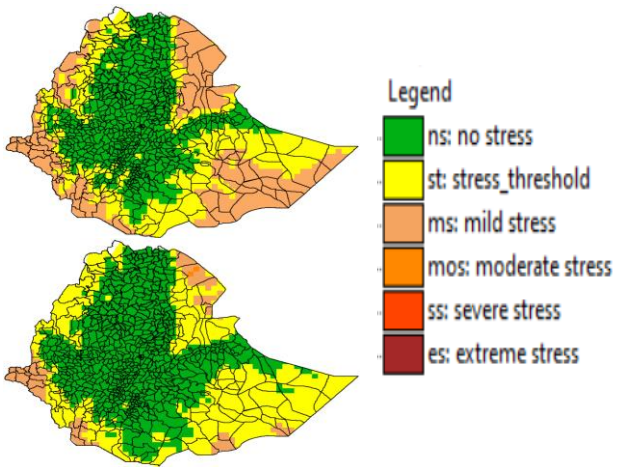
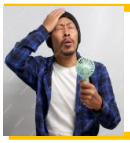


Figure 6: Expected Dairy (***Top***) and Non-Dairy (***Bottom***) Cattle comfort index



3. Summary

Based on the climate-health analysis for December 2024 month, it has been observed that, there were **no-suitable** climate conditions to the breeding and transmission of malaria in the country. Similarly, over the next 10 days of January 2025 first dekad, there will no-suitable climate condition for the breeding and development mosquitoes.

In terms of climate comfortability conditions, most parts of the country have experienced pleasant conditions for both humans and livestock. Looking ahead to the next 10 days of January 1st dekade, the low-lying border areas of the country, especially Afar, southern Somali, and South Ethiopia region will experience mild (no impact) heat stress, which will affect both humans and cattle.

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.