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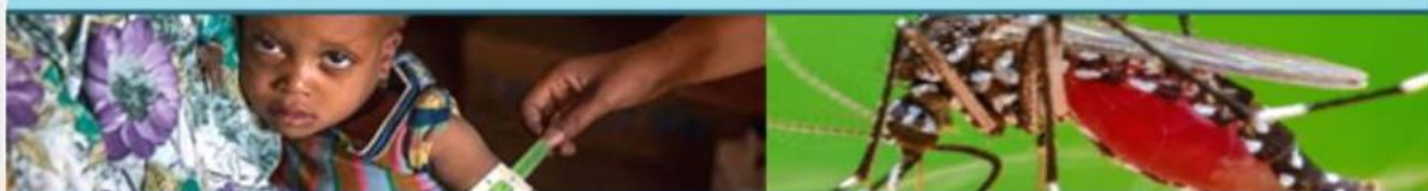


Table of Contents

Foreword.....	3
I. Assumptions.....	4
i. Malaria.....	4
ii. Human heat index:.....	4
iii. Cattle heat index:.....	4
Part One.....	5
1. Weather impact Assessment on Health for the second dekad of November 2024	5
1.2 Climate comfort Conditions November 2024 2nd Dekad.....	5
1.2.1 Comfortability for Human.....	5
1.2.2 Comfortability for Cattle.....	5
Part Two.....	6
2.1 Expected Mosquito breeding areas.....	6
2.2 Temperature Humidity Index	6
2.2.1 Comfortability for Human.....	6
2.2.2 Comfortability for Cattle.....	6
3. Summary.....	7
4. Advisory	7

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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I. 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°C, 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°C-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*

Part One

1. Weather impact Assessment on Health for the First dekad of November 2024

1.1 Malaria prone areas during November first dekad

According to the collected and analyses climate data for November 2024 1st Dekad, there was a dominantly **low to moderately favorable** climate conditions for the breeding and transmission of malaria over western and southern half of the country. Regions such as South-west, Central, and South Ethiopia, Sidama, western and southern Oromia, and Benishangul Gumuz of the country were very conducive for malaria transmission as illustrated in

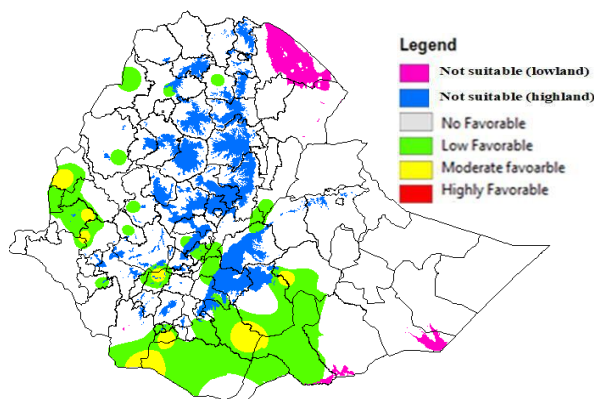


Figure 1: Malaria Prone areas

1.2 Climate comfort Conditions October 2024 2nd Dekad

1.2.1 Comfortability for Human

As a result of the Temperature-Humidity Index (THI) analysis of October 2024 2nd dekad heat stress was not experienced over all the country.

But the most parts of the country were experienced comfortable and moderately comfortable weather conditions as shown in figure 2.

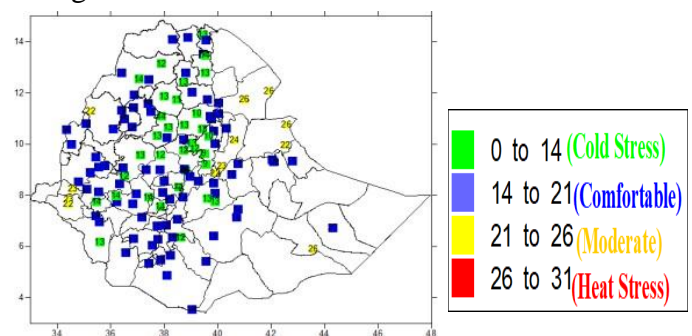


Figure 2: Human comfortable index

1.2.2 Comfortability for Cattle

Moderately heat stress was experienced in Afar and central Gambela. And also Non-significant heat stress condition was observed in eastern and northern Somali, most parts of Afar, Gambela, Benishangul and some lowlands parts of western Amhara regions. Whereas much of the country were dominated by non-stress climate conditions as shown in figure 3.

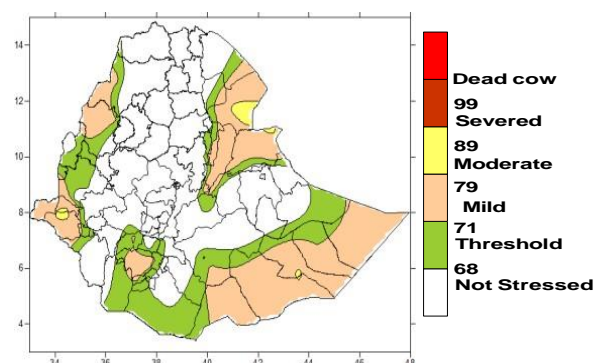


Figure 3: Cattle Comfort index

Part Two

2. Expected Weather Impact on Health for Second dekad of November 2024

2.1 Expected Mosquito breeding areas

During the upcoming Second (11-20) dekad of November 2024; encouraging climate condition for mosquito breeding and development will be expected over most western half, South and south eastern parts of the country; regions such as south and southwest Ethiopia, Gambela, Benishangul, Southern and western Oromia, western parts of Amhara, and southern parts of Somali Ethiopia. This expanded and amplified situation of previous month flattering climate effect will be aggravation incidence cases as illustrated in red in figure 4.

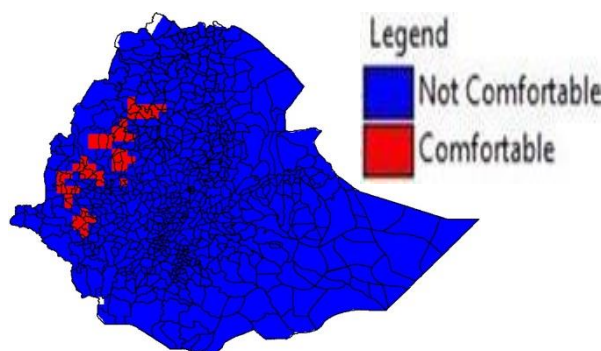


Figure 4: Expected malaria prone areas

2.2 Temperature Humidity Index

2.2.1 Comfortability for Human

During the impending Second (11-20) dekad of November 2024, in the most parts of northern Afar will be in 100% stressful conditions. While Gambela, northern and southern Somali, border of western Amhara, lowlands of south Ethiopia and the rest parts of Afar regions will be in partially stressed areas for the coming 10 days. The remaining most

Midland and high land areas of the country are in a pleasant condition as looking in figure 5.

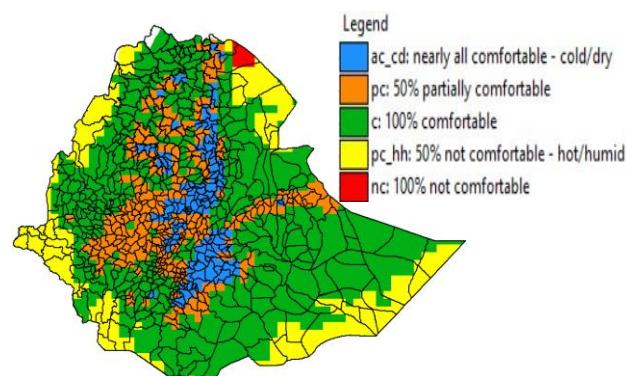


Figure 5: Expected Human comfort index

2.2.2 Comfortability for Cattle

Moderately stress conditions will be expected for the coming ten days in Afar, southern Somali and Gambela for dairy and none-dairy cattle respectively. For the rest parts of the country there will be non-significant heat stress condition as shown in Figure 6.

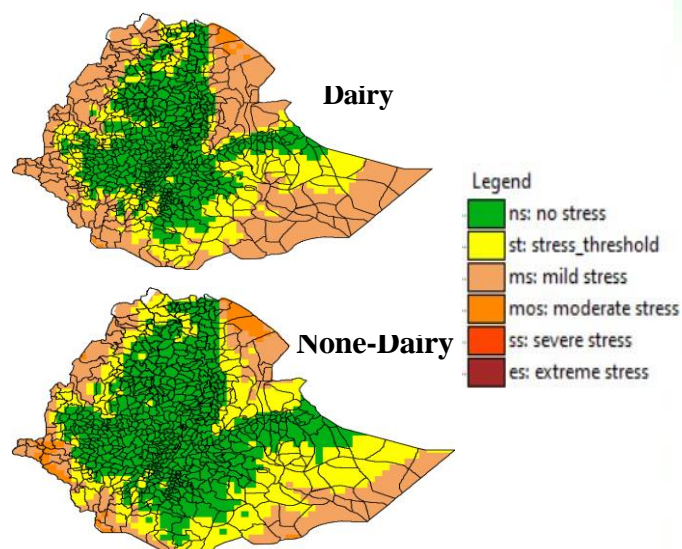


Figure 6: Expected Cattle comfort index







3. Summary

Based on the climate-health analysis for November 1st dekad, it has been observed that, there were low to moderate suitable climate conditions to the breeding and transmission of vector-borne diseases in Western, south and southeastern of the country. Similarly, over the next 10 days, the western, southern and north western half of the country will continue to experience expanded suitable conditions 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 Second dekad of November, the low-lying border areas of the country, especially Afar region will experience moderately to severe heat stress, which will affect both humans and cattle.

4. Advisory

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

-  Attention to any incidence, especially for malaria disease in such favorable 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
-  As per the threshold of malaria, the impact will start after the end of this month, and be ready to respond before it leads to significant impacts
-  Avoid any exposure of the community to mosquitoes by ensuring clean environment and using Mosquitoes nets.

For Further Information

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