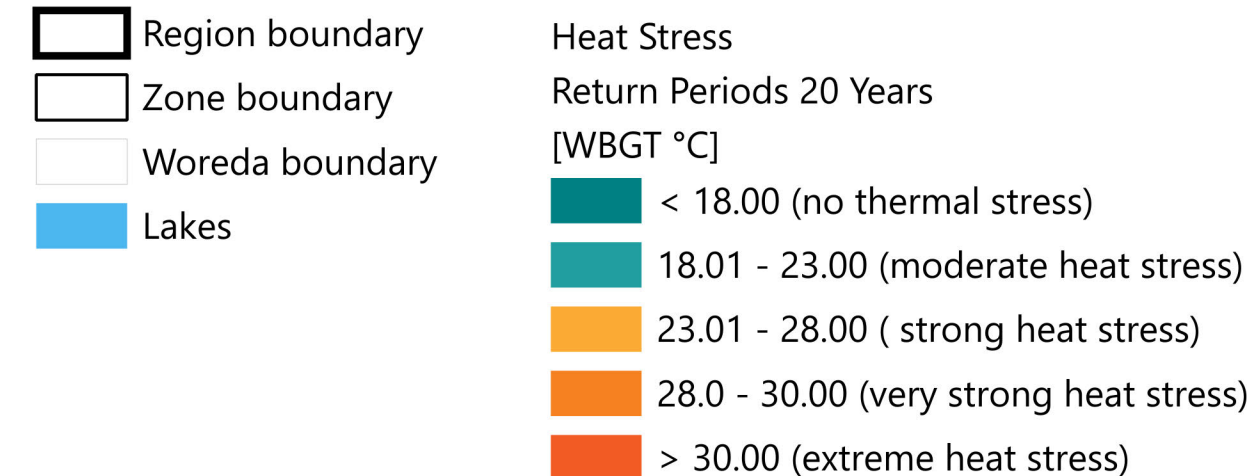


ETHIOPIA - CLIMATE HAZARD EXPOSURE AND IMPACT

Heat Stress: 20-year return period

For Humanitarian Purposes Only
Production date : 27 February 2025



Map Information:
The map labels regions, zones, and woredas, highlighting areas affected by extreme heat exposure. Such exposure can lead to serious health issues like heat stroke, exhaustion, cramps, and rashes, especially when combined with high humidity. These conditions pose significant threats to both health and infrastructure.

In Ethiopia, heat-related deaths among those aged 65 and older are currently about 3 per 100,000 annually. This number could rise to over 65 per 100,000 by 2080 if high emissions continue. Mean annual temperatures could increase by 4.8°C by 2100 under high emissions scenarios, but only by 1.3°C if emissions decrease rapidly (World Bank, 2021).

Understanding the distribution of heatwave risks is crucial for developing effective adaptation policies in Ethiopia. This analysis maps heat stress hazards, exposure, and vulnerability. The probability of heat stress is shown using the maximum daily Wet Bulb Globe Temperature (WBGT) from the World Bank GFDRR, focusing on values over 30°C. WBGT is a comprehensive measure of heat stress that considers air temperature, humidity, radiant heat, and air movement, providing a more accurate assessment of the potential impact on human health. This map illustrates the distribution of heat stress based on WBGT for 20-year return periods.

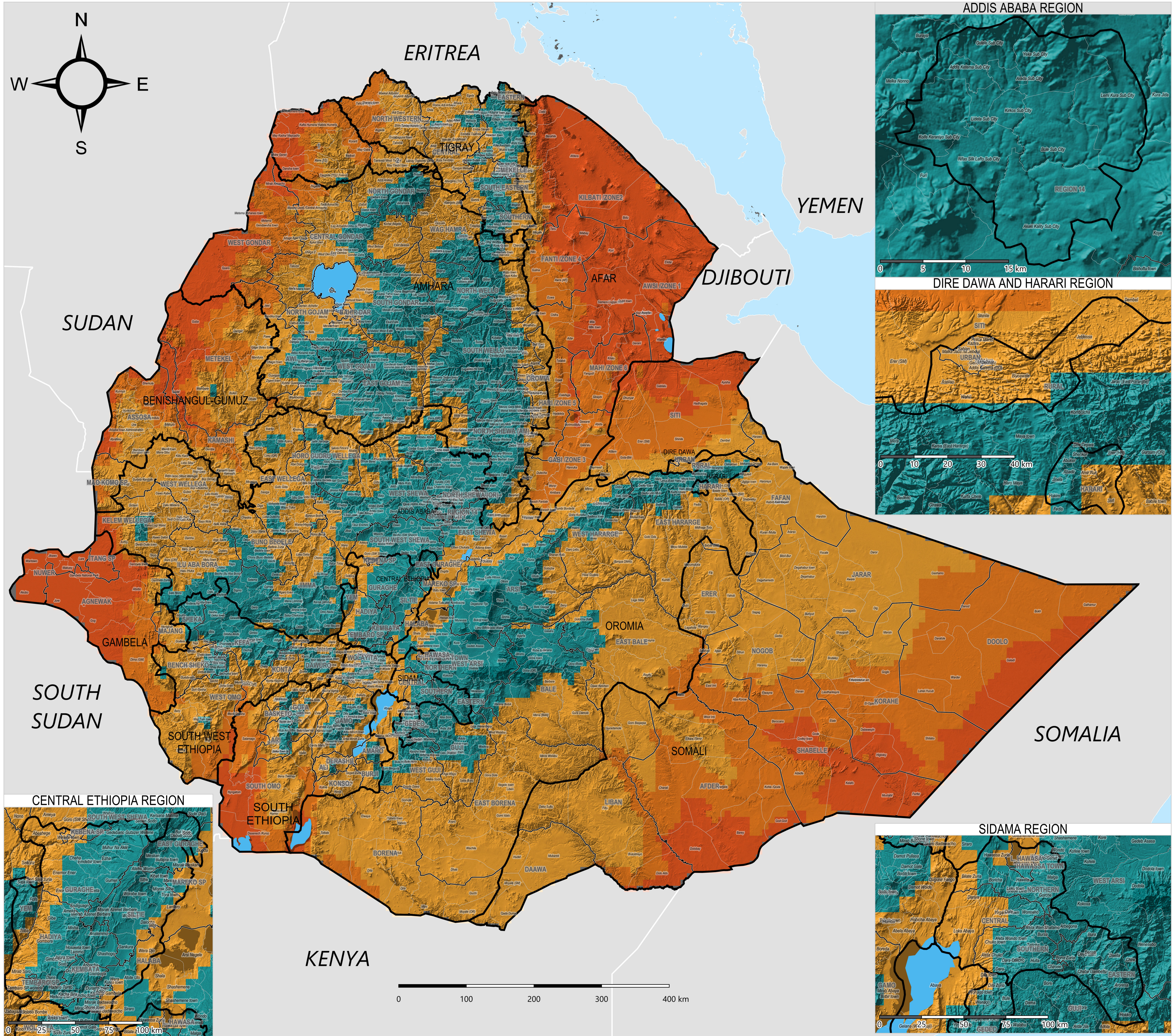
Uses and Limitations:
The aim of this map is to help planners and decision makers identify priority areas for interventions at woreda level. It is not designed as a standard tool for detailed site planning decisions. Map results need to be ground verified and decisions combined with specific on-site evaluation and appropriate technical expertise. Results are derived from remote sensing and computational modelling; they are not ground proofed and inherently limited by the quality of the input data or model assumptions. The hazard data do not necessarily imply exposure and, similarly, the areas outside the hazard extents are not necessarily free from any danger.

Data Sources:
Heat Stress Hazard: Wet Bulb Globe Temperature Heat Stress Hazard, World Bank - GFDRR-VITO, 2022.
Administrative Boundary: UN OCHA, 2024.
World Countries Boundary: Geoboundaries, 2020.
Shaded Relief: World Shaded Relief, ESRI, 2014.
Coordinate Reference System: WGS, 1984.

Disclaimers:
Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by the REACH partners, associates, donors or any other stakeholder mentioned on this map.

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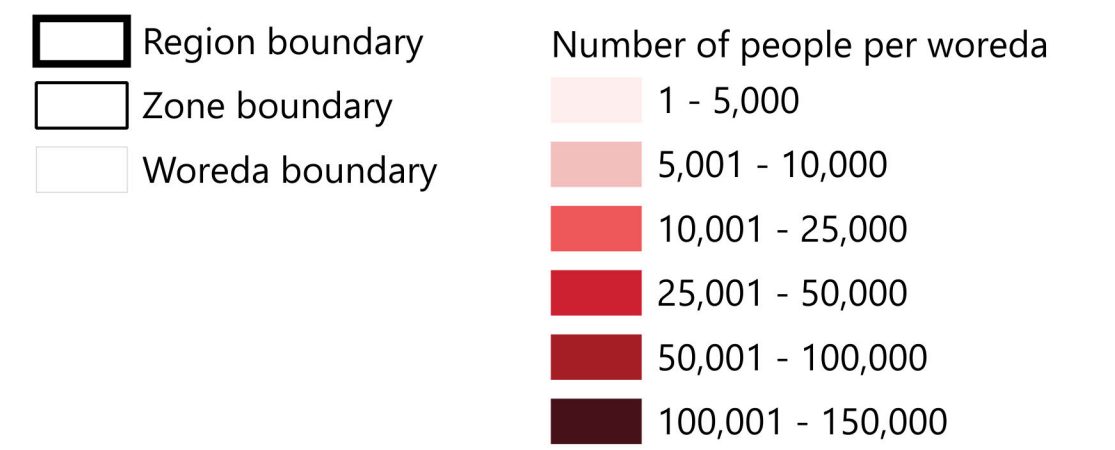
Funded by:



ETHIOPIA - CLIMATE HAZARD EXPOSURE AND IMPACT

Population exposure to heat stress

For Humanitarian Purposes Only
Production date : 27 February 2025



Map Information:
The map illustrates the annual expected population exposure by combining population density with heat stress hazards for a 20-year return period. Regions such as Nuwer, Itang Special Woreda, Agnewak, South Omo, Afder, Shabelle, Korah, Doolo, Awsi Zone 1, Fanti Zone 4, Kilbati Zone 2, and West Gondar stand out, each with more than 20,000 people exposed annually to extreme heat stress. Overall, it is estimated that more than 500,000 people in Ethiopia face extreme heat stress each year.

Heat stress is a significant concern across the lowlands of Ethiopia, where heat stress consistently exceed 30°C during heat stress episodes with a return period of once every twenty years, as shown on the map. The wet bulb globe temperature (WBGT) was used to assess the Heat stress. WBGT is a comprehensive measure of heat stress that takes into account air temperature, humidity, radiant heat, and air movement, providing a more accurate assessment of the potential impact on human health.

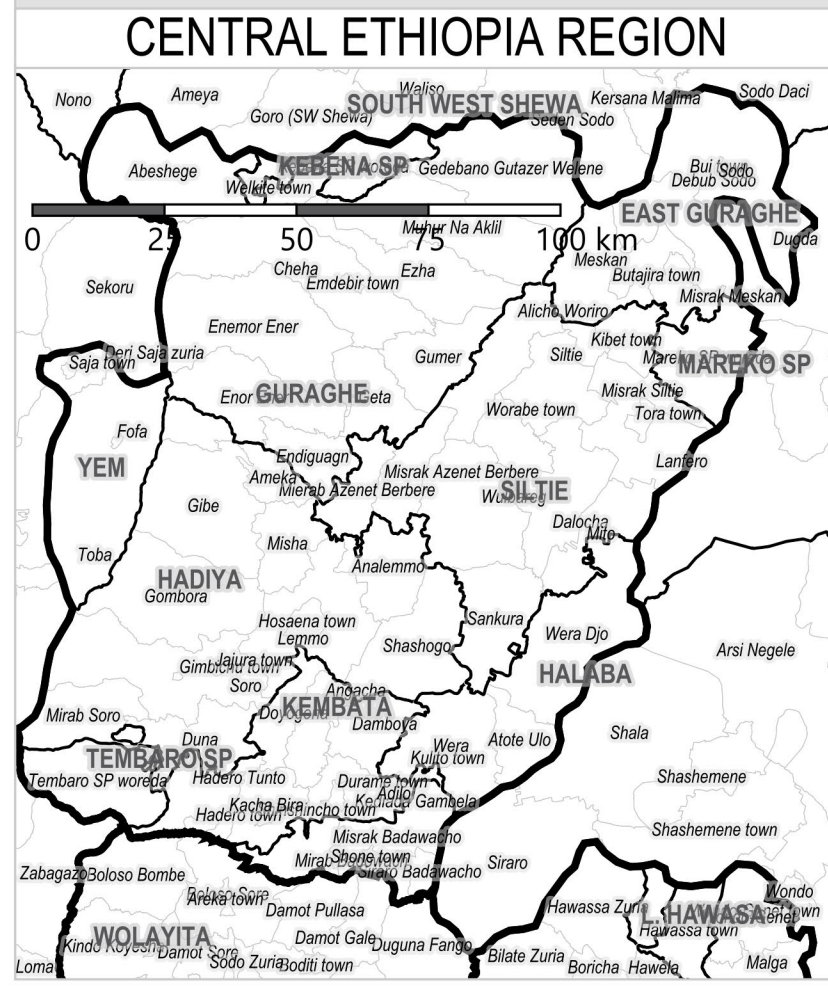
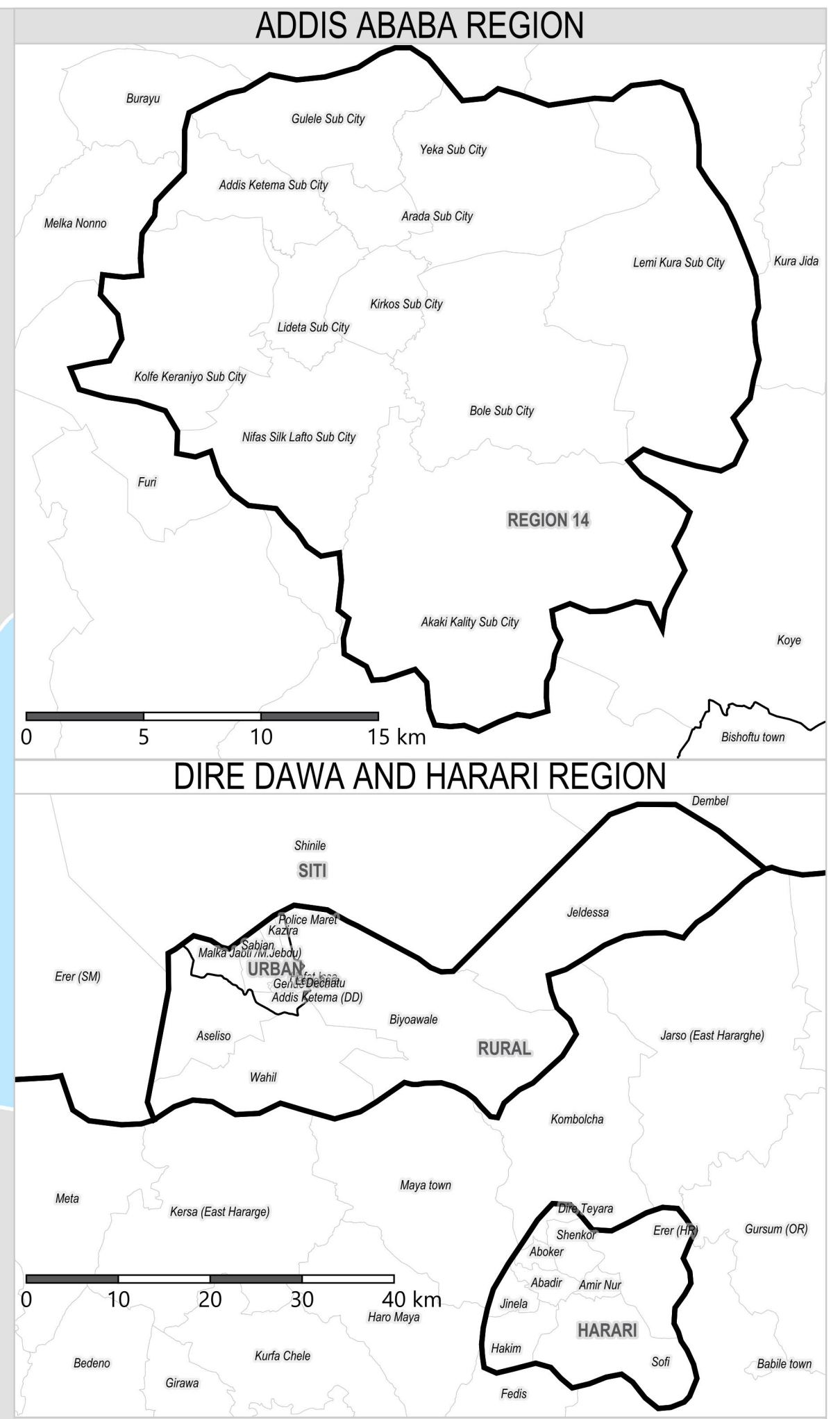
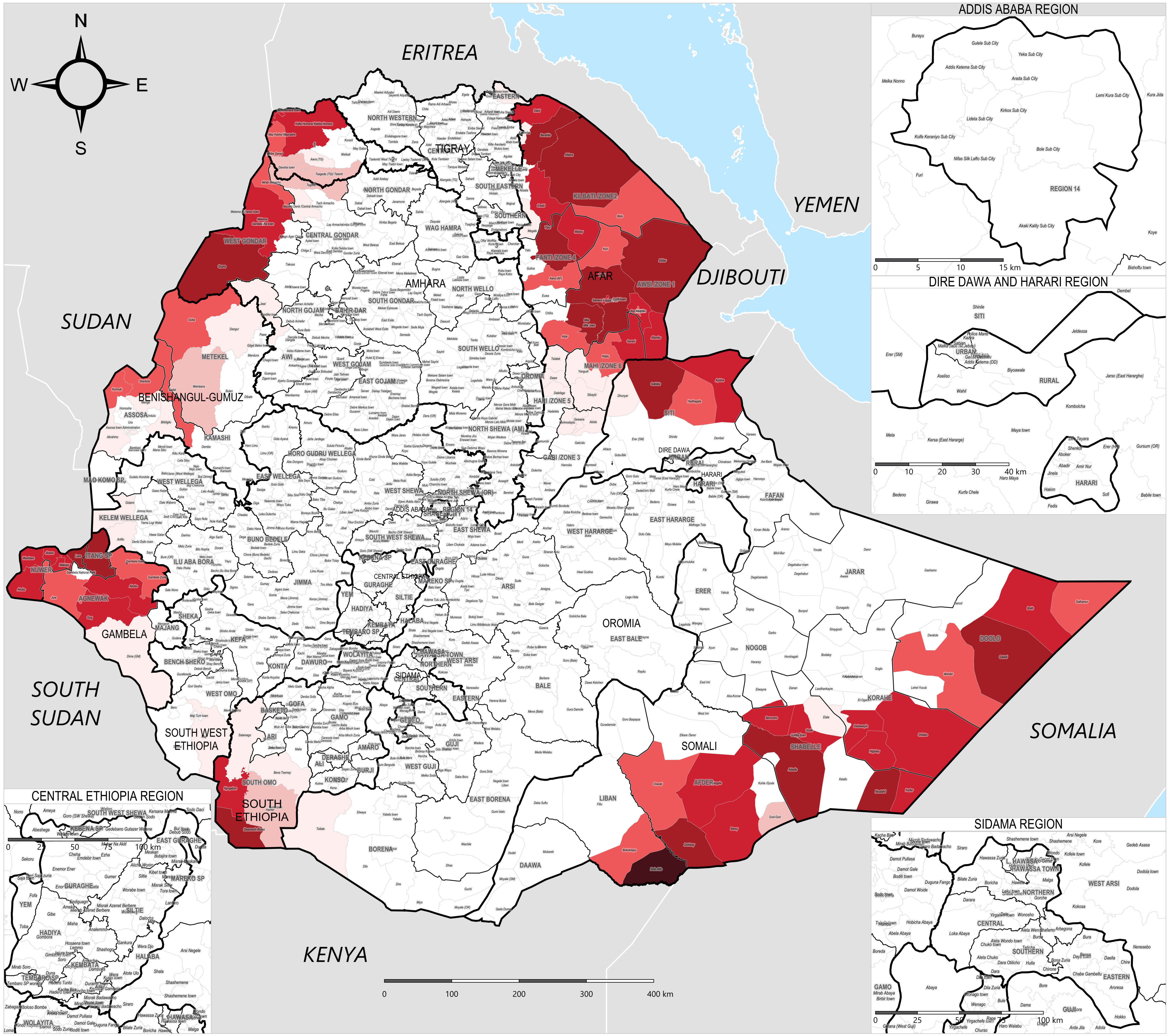
The highlands of Ethiopia fare comparatively better, yet still experience temperatures over 18°C, indicating considerable heat stress and potential danger to human health.

Uses and Limitations:
The aim of this map is to help planners and decision makers identify priority areas for interventions at woreda level. It is not designed as a standard tool for detailed site planning decisions. Map results need to be ground verified and decisions combined with specific on-site evaluation and appropriate technical expertise. Results are derived from remote sensing and computational modelling; they are not ground proofed and inherently limited by the quality of the input data or model assumptions. The hazard data do not necessarily imply exposure and, similarly, the areas outside the hazard extents are not necessarily free from any danger.

Data Sources:
Heat Stress Hazard: Wet Bulb Globe Temperature Heat Stress Hazard, World Bank - GFDRR-VITO, 2022.
Population: Gridded Population Count 100m, WorldPop, 2020.
Number of People Exposed: REACH Ethiopia Climate Hazard Exposure and Impact Assessment, February, 2025.
Methodology and Code: Amadio M. (World Bank - GFDRR) - CCDR tools data and methodology, 2024. Available at <https://gfdrr.github.io/CCDR-tools>
Administrative Boundary: UN OCHA, 2024.
World Countries Boundary: Geoboundaries, 2020.
Coordinate Reference System: WGS, 1984.

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