

ETHIOPIA - CLIMATE HAZARD EXPOSURE AND IMPACT

Rainfall triggered landslide

For Humanitarian Purposes Only
Production date : 25 February 2025



Region boundary
 Zone boundary
 Woreda boundary
 Lakes

Landslide Hazard Index
 0.0010 - 0.0100 (Medium)
 > 0.0100 (High)

Map Information:
This map reveals that landslide hazards are prevalent in the mountainous regions of Ethiopia, particularly in the North-Northwest (N-NW), central, and South-Southwest (S-SW) highlands, as well as along the rift margins. These areas are especially vulnerable following intensive precipitation events. The impacts of these landslides vary, affecting lives, built infrastructures, agricultural lands, and the natural environment.

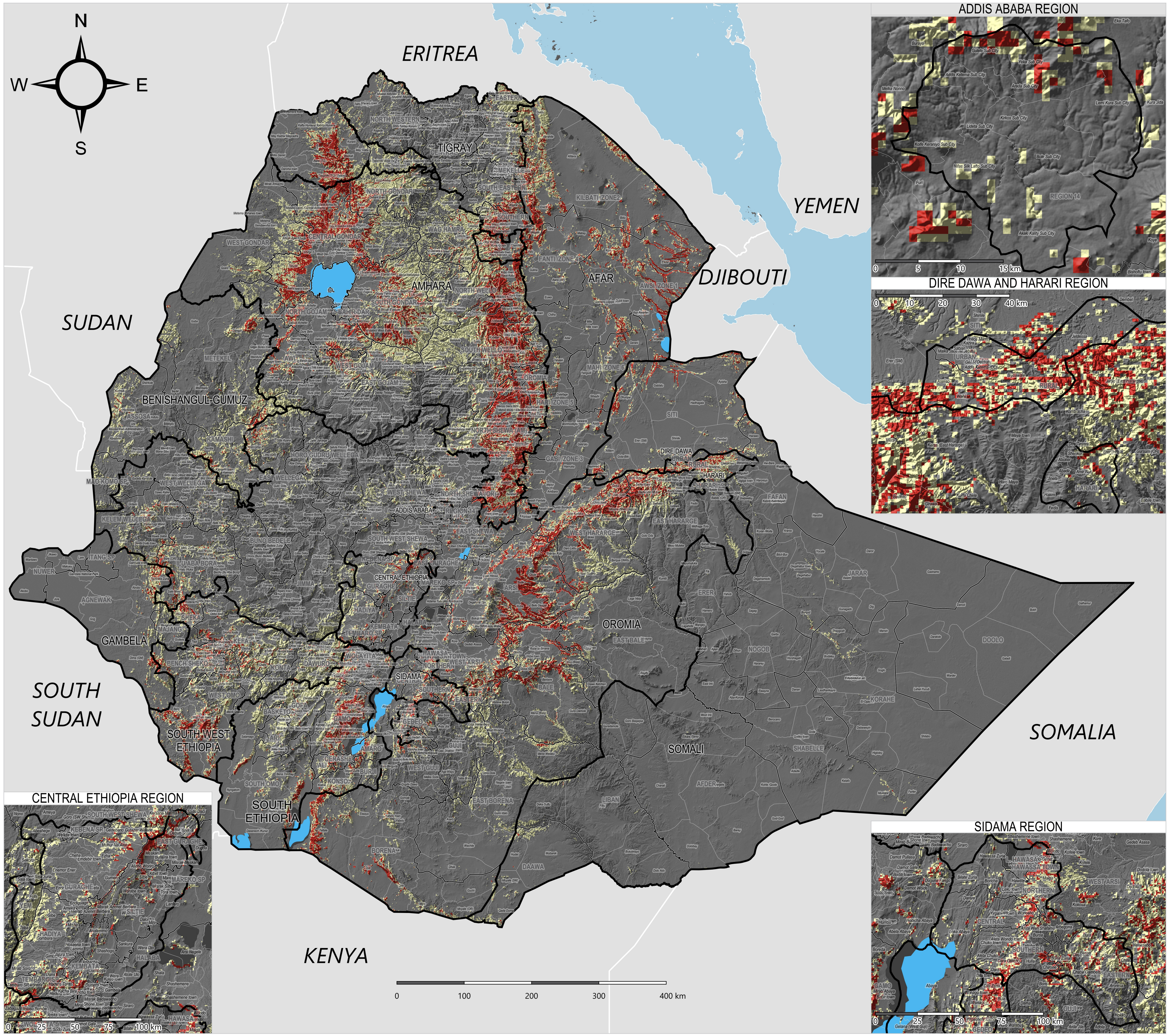
The Landslide Hazard Map is a gridded dataset that assesses landslide hazards within Ethiopia. Landslides can have devastating impacts on people and the built environment. To better understand the spatial and temporal distribution of landslide hazards, World Bank-GFDRR and Arup conducted a comprehensive global landslide hazard assessment. This hazard data, developed using a landslide inventory, susceptibility information from NASA, and an innovative machine learning model, resulted in a quantitative landslide hazard map. The dataset includes maps of estimated annual frequency of significant landslides per square kilometer. These significant landslides are those likely to be reported if they occurred in populated areas, generally larger than 100 m². The data provides frequency estimates for landslides triggered by seismicity and rainfall. The index can be low, medium or high, but there are only medium or high were found.

Uses and Limitations:
The aim of this map is to help planners and decision makers identify priority areas for interventions. 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:
Landslide Hazard: Rainfall-induced Landslide Hazard , World Bank - GFDRR- ARUP, 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.

Contact Information: reach.mapping@impact-initiatives.org

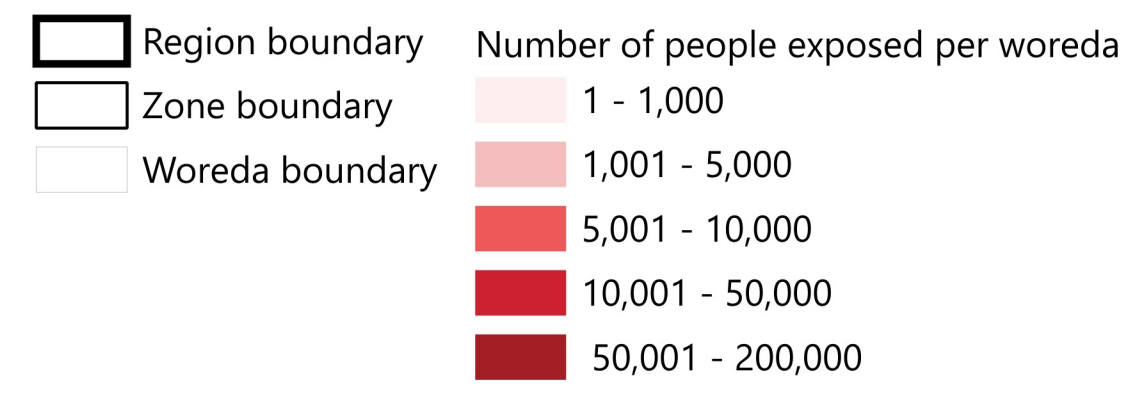


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ETHIOPIA - CLIMATE HAZARD EXPOSURE AND IMPACT

Population exposed to high landslide

For Humanitarian Purposes Only
Production date : 25 February 2025



Map Information:
This map shows the built-up areas in hectares exposed to high landslide hazard risk. A Landslide Hazard Index value greater than 0.01 is considered high. The Hazard Index data is aggregated at the built-up dataset resolution level, and further zonal statistics are calculated to understand the human settlement areas in hectares exposed to the hazard.

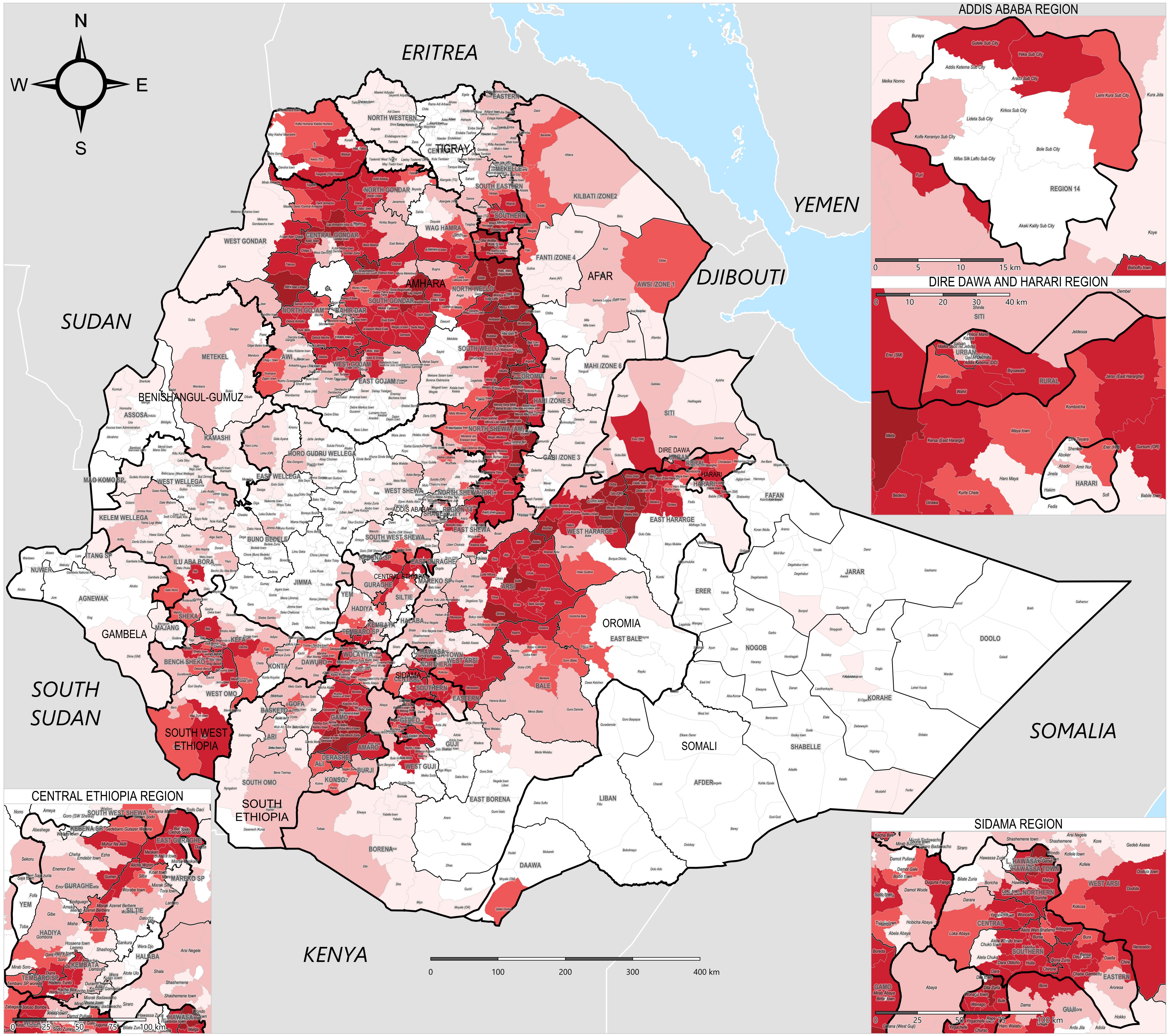
Landslides have a significant impact on population mortality in Ethiopia. Recent landslides in the Gofa Zone, South Ethiopia Region, have resulted in the deaths of hundreds of people. For instance, landslides in July 2024 caused over 250 fatalities, with the death toll expected to rise as search and rescue operations continue. The affected areas often include vulnerable populations, such as children and pregnant women, who are at higher risk during such disasters. The destruction of homes and infrastructure further exacerbates the situation, making it difficult for emergency services to reach and assist those in need. Effective land-use planning, early warning systems, and community preparedness are essential to reduce the mortality rate associated with landslides.

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. The map does not provide any information about water flow. 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:
Landslide Hazard: Rainfall-induced Landslide Hazard , World Bank - GFDRR- ARUP, 2022.
Population: Gridded Population Count 100m, WorldPop, 2020.
Number of Population 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://gfdr.github.io/CCDR-tools>
Administrative Boundary: UN OCHA, 2024.
World Countries Boundary: Geoboundaries, 2020.
Coordinate Reference System: WGS, 1984.

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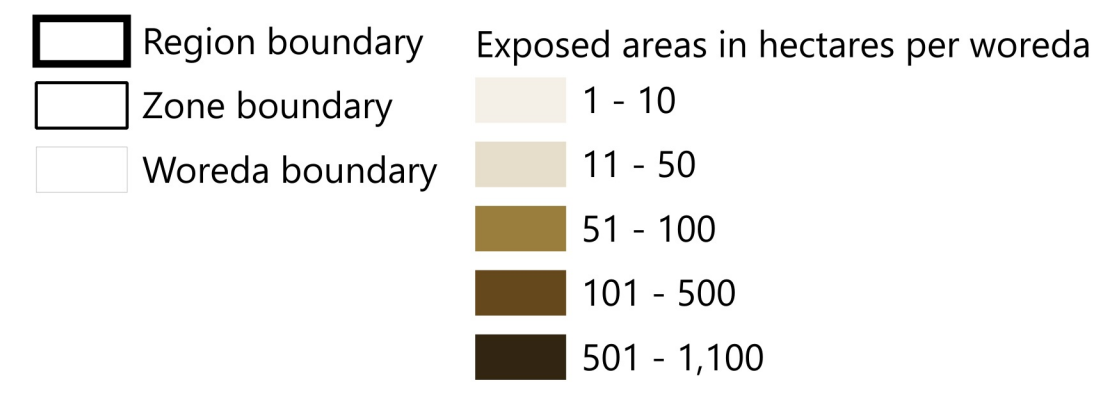
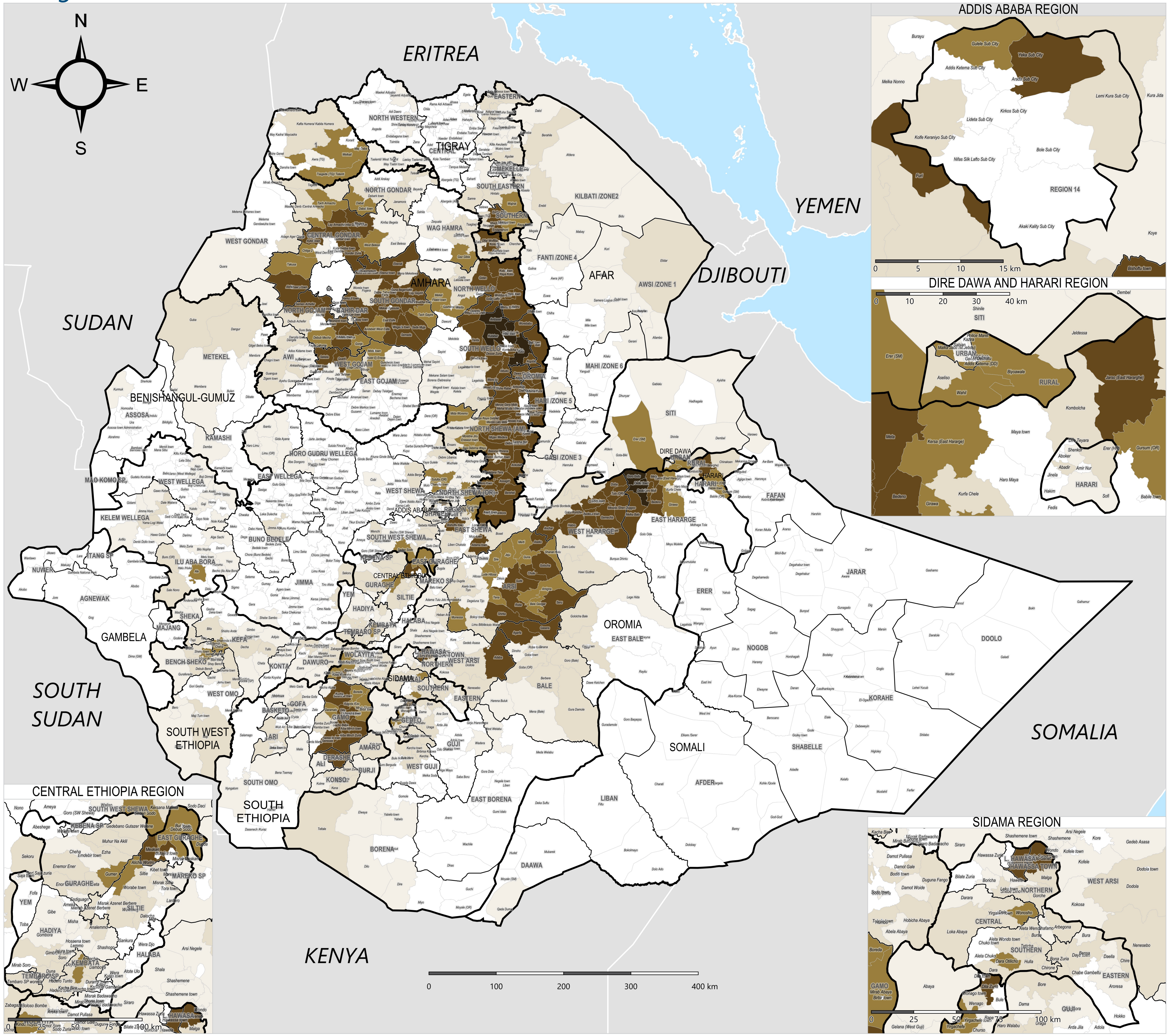


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ETHIOPIA - CLIMATE HAZARD EXPOSURE AND IMPACT

Built-up environment exposed to high landslide

For Humanitarian Purposes Only
Production date : 25 February 2025



Map Information:
This map shows the built-up areas in hectares exposed to high landslide hazard risk. A Landslide Hazard Index value greater than 0.01 is considered high. The Hazard Index data is aggregated at the built-up dataset resolution level, and further zonal statistics are calculated to understand the human settlement areas in hectares exposed to the hazard.

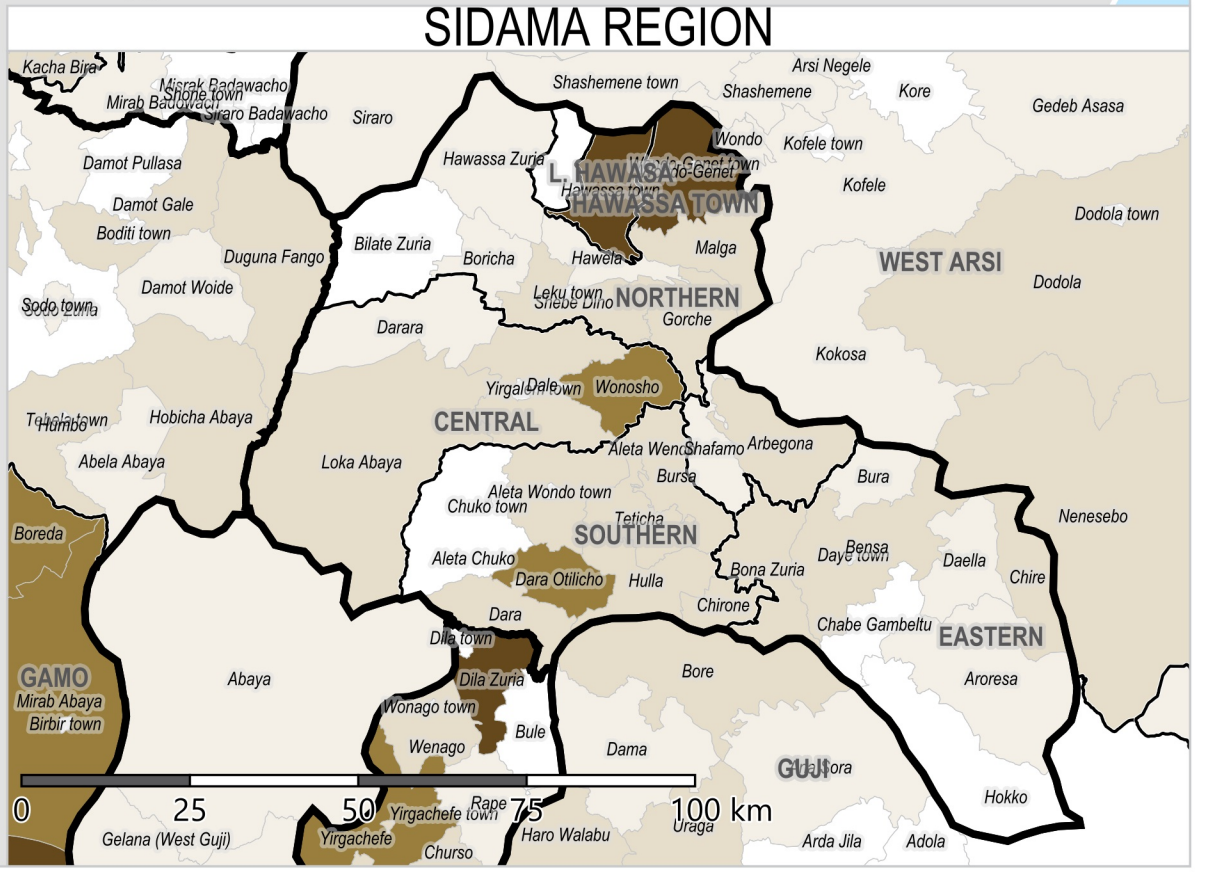
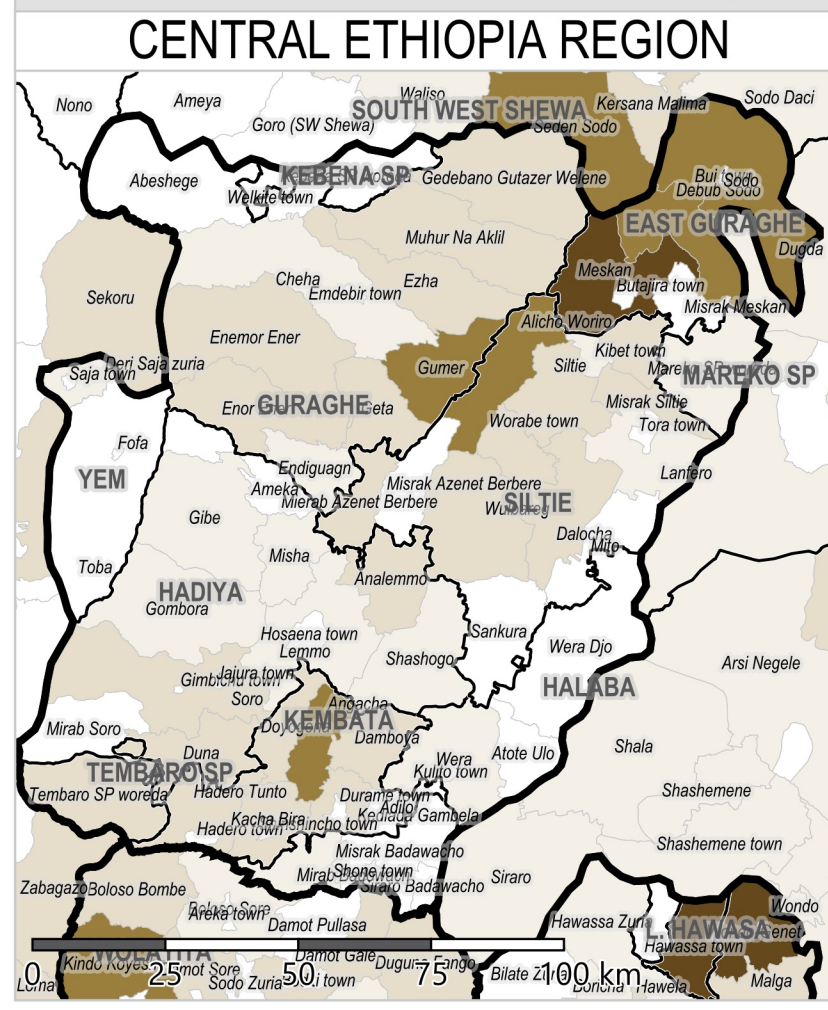
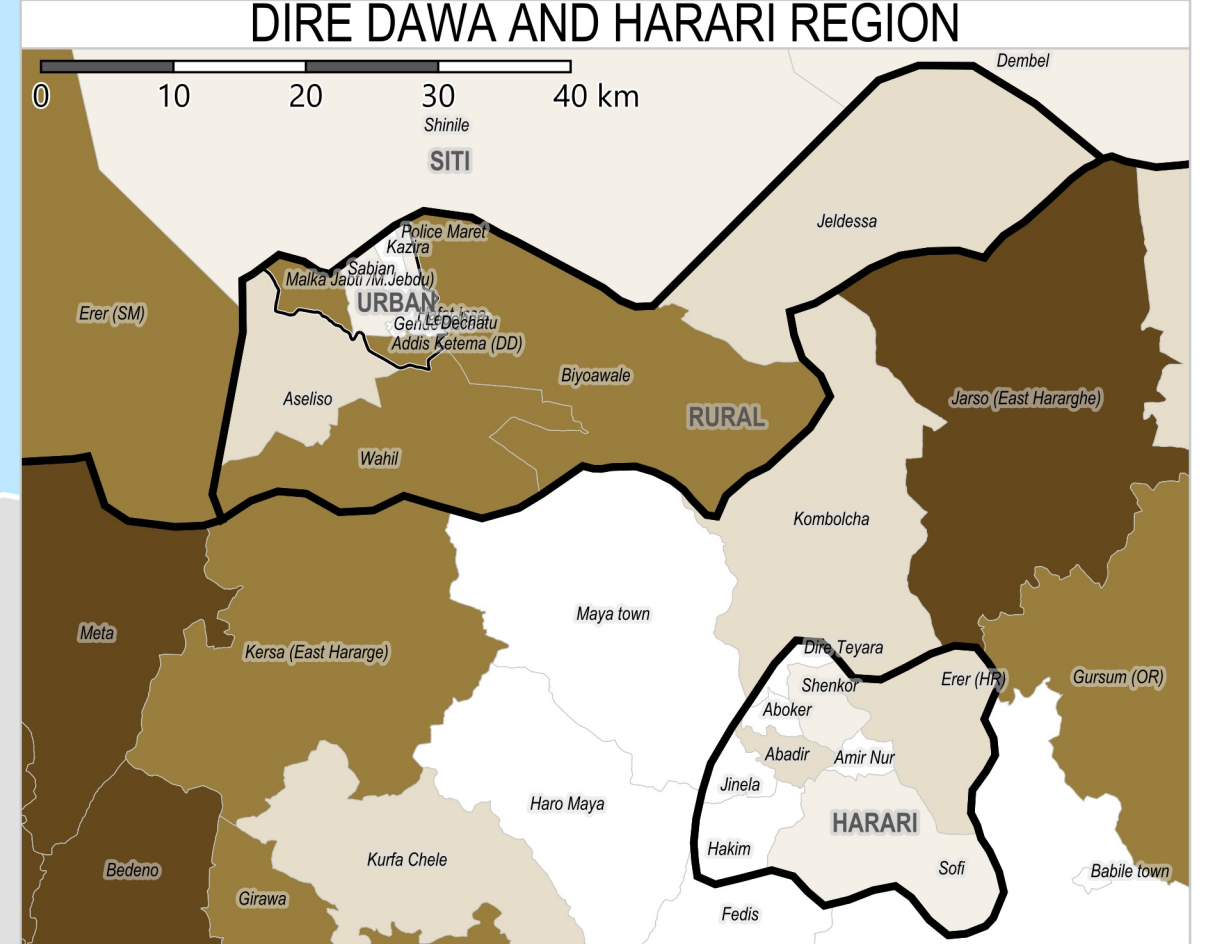
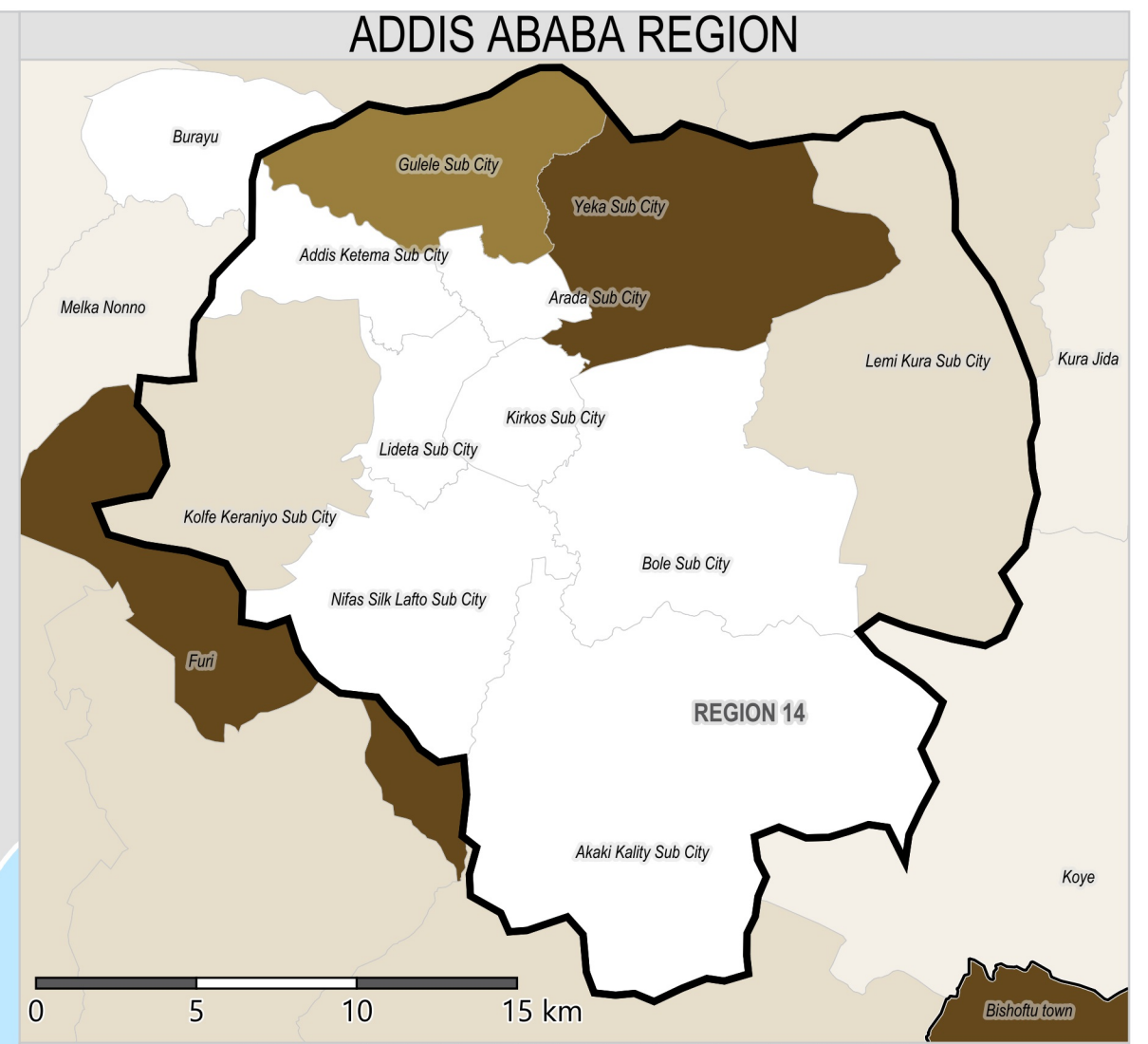
Landslides have a significant impact on built-up areas, particularly in regions with steep terrain and high rainfall. The sudden movement of soil and rock can destroy homes, infrastructure, and essential services, leading to displacement and loss of life. In Ethiopia, recent landslides have caused extensive damage to residential areas, resulting in the destruction of hundreds of homes and the displacement of thousands of people. The disruption of roads, bridges, and utilities further complicates rescue and recovery efforts, leaving affected communities vulnerable and isolated. To mitigate these impacts, it is crucial to identify the highly exposed area and implement effective land-use planning, enforce building codes, and invest in early warning systems and community preparedness programs.

Uses and Limitations:
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Data Sources:
Landslide Hazard: Rainfall-induced Landslide Hazard , World Bank - GFDRR- ARUP, 2022.
Built-up Areas: World Settlement Footprints 100m, WSF 2019.
Built-up Areas 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://gfdr.github.io/CCDR-tools>
Administrative Boundary: UN OCHA, 2024.
World Countries Boundary: Geoboundaries, 2020.
Coordinate Reference System: WGS, 1984.

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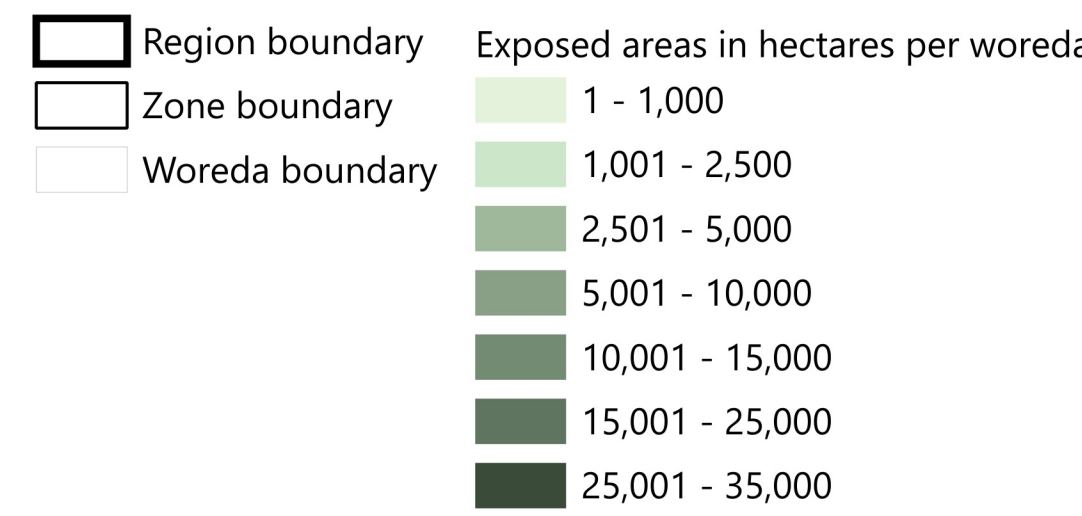
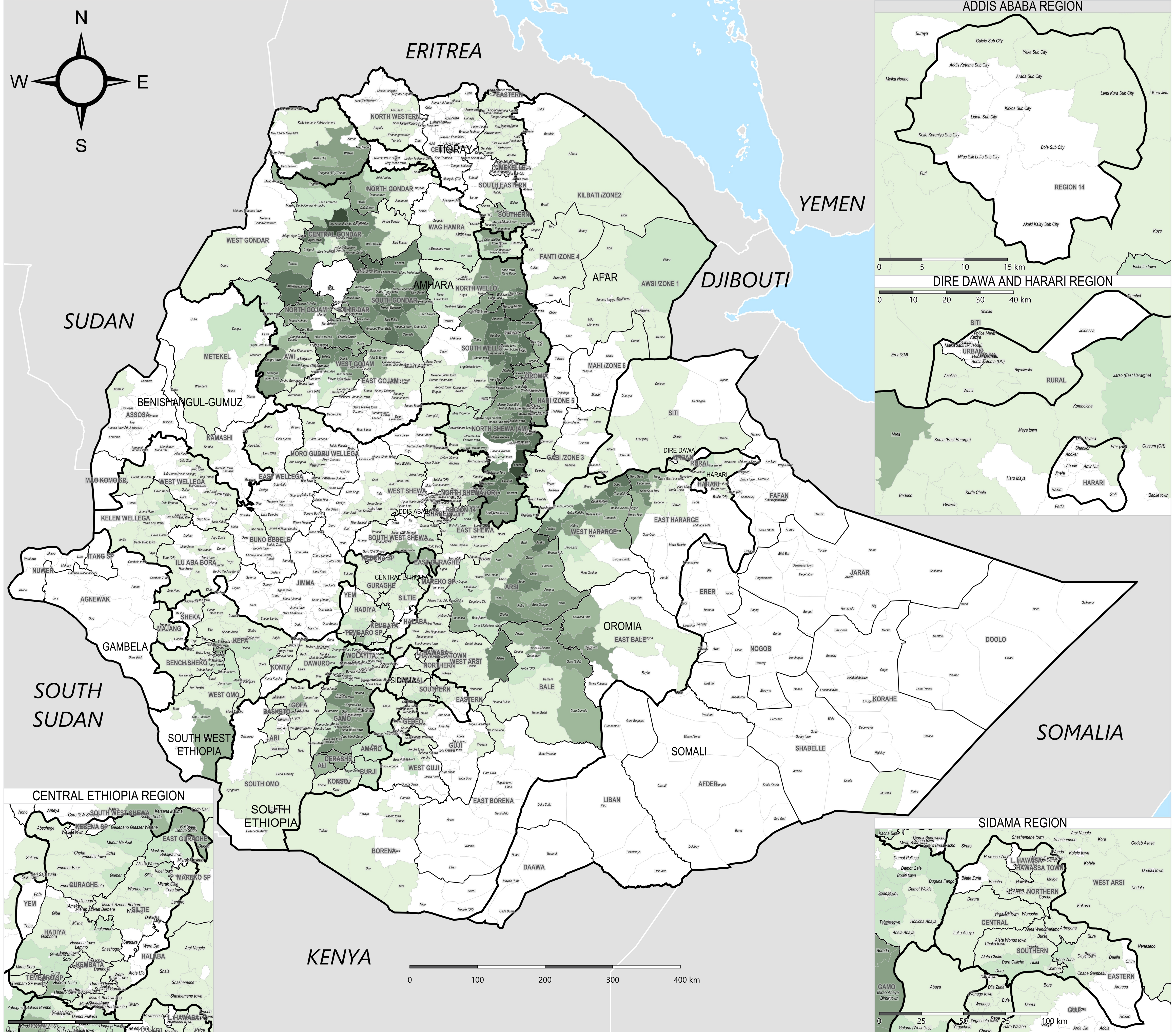


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ETHIOPIA - CLIMATE HAZARD EXPOSURE AND IMPACT

Agricultural land exposed to high landslide

For Humanitarian Purposes Only
Production date : 25 February 2025



Map Information:
This map displays the areas in hectares of agricultural lands at high risk of landslides. A Landslide Hazard Index value greater than 0.01 is considered high. The Hazard Index data is aggregated at the agricultural land dataset resolution level, and further zonal statistics are calculated to understand the dynamics of croplands exposed to the hazard at the woreda level.

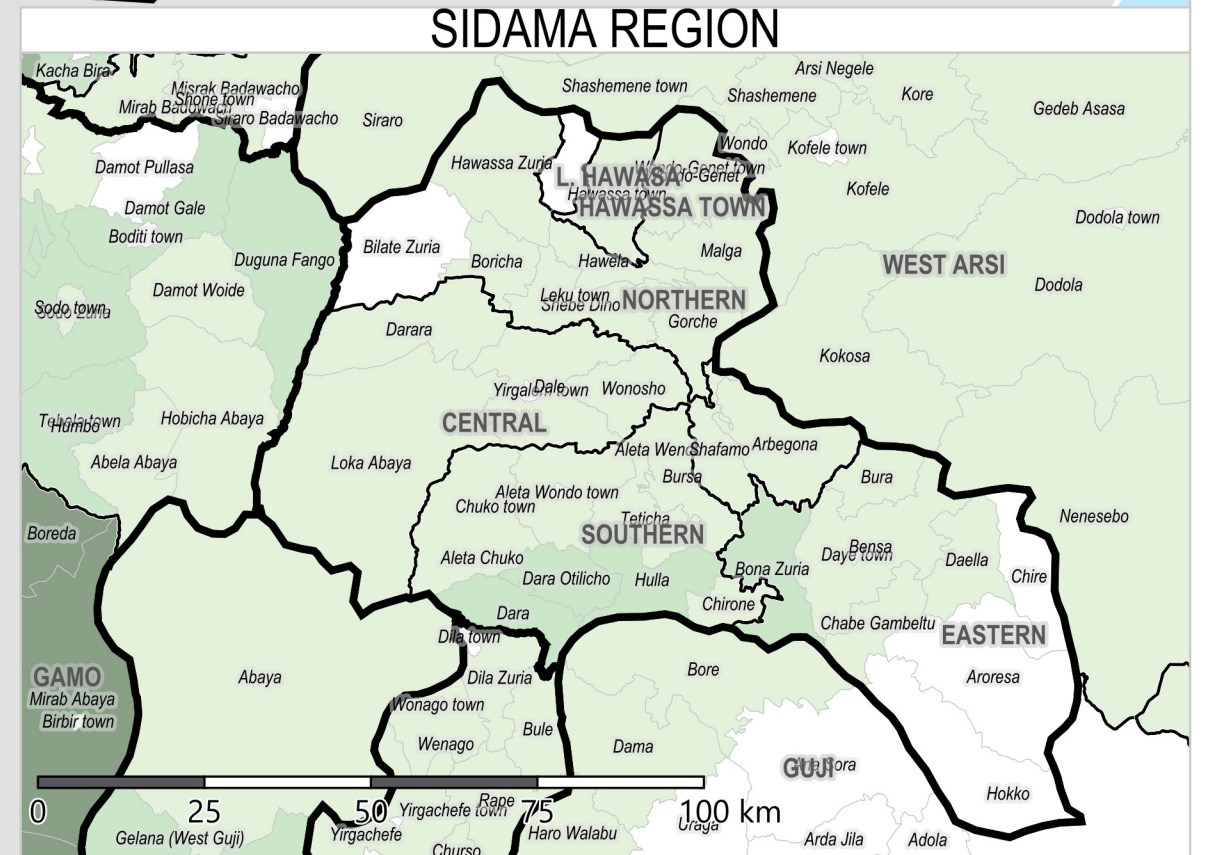
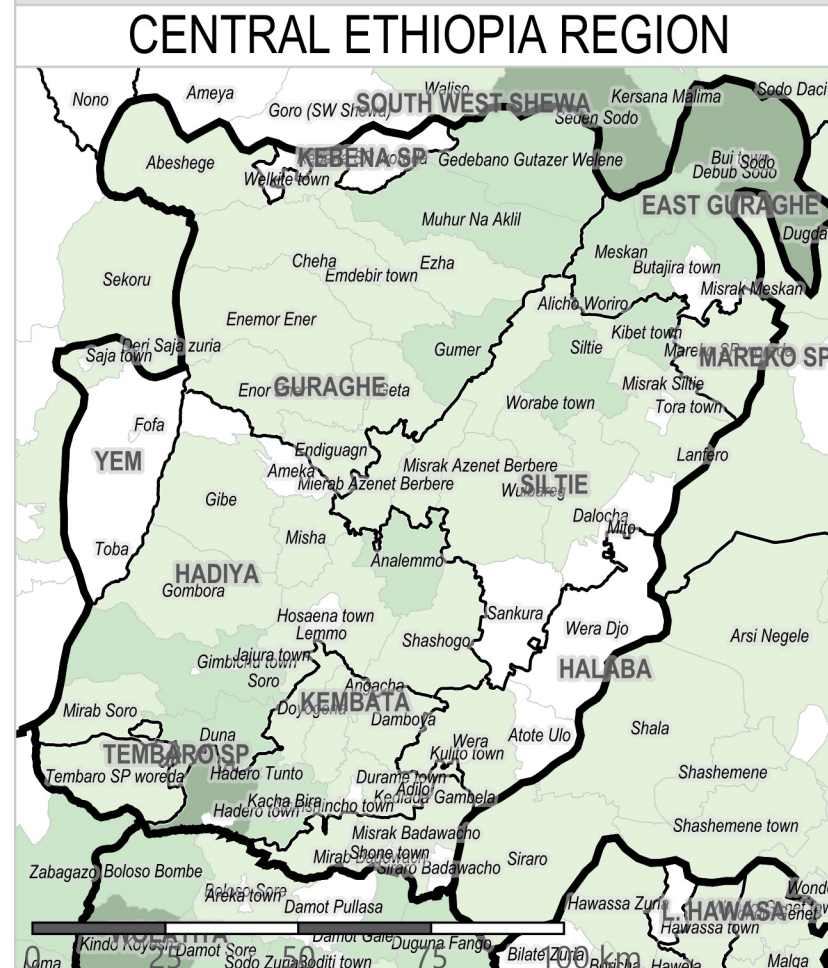
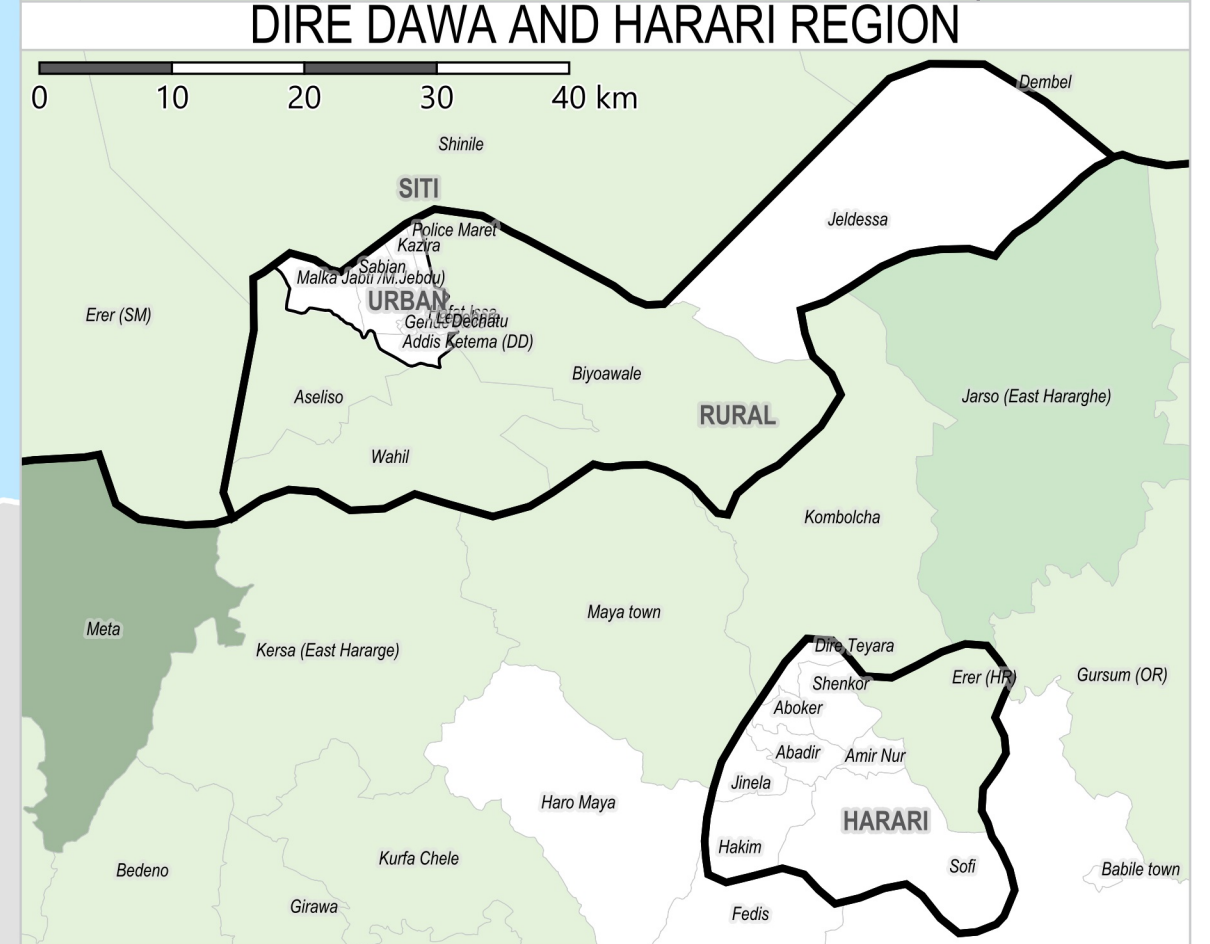
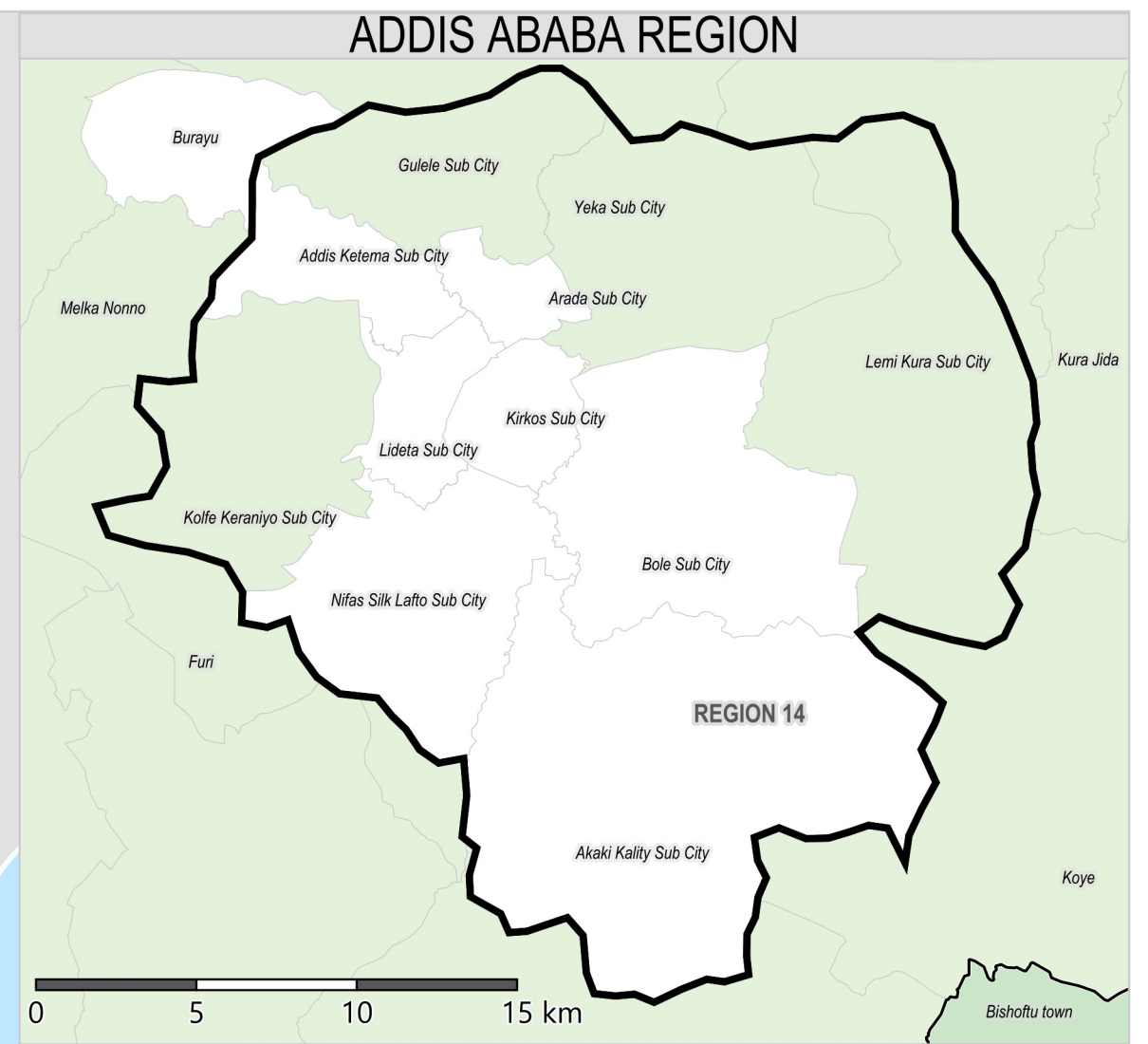
Landslides have a significant impact on agriculture, particularly in regions with steep terrain and high rainfall. The sudden movement of soil and rock can bury croplands, destroy irrigation systems, and disrupt planting and harvesting schedules. This not only leads to immediate crop loss but also long-term soil degradation, making the land less fertile and more prone to future landslides. Farmers in affected areas often face reduced yields and increased costs for land rehabilitation and erosion control measures. To mitigate these impacts, it is crucial to implement sustainable land management practices, such as terracing, reforestation, and the use of cover crops, to enhance soil stability and reduce the risk of landslides.

Uses and Limitations:
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Data Sources:
Landslide Hazard: Rainfall-induced Landslide Hazard, World Bank - GFDRR- ARUP, 2022.
Agricultural Land: 100m resampled Cropland, ESRI 2023 Landcover.
Exposed Agricultural Lands: REACH Ethiopia Climate Hazard Exposure and Impact Assessment, February, 2025.
Methodology and Code: Amadio M. (World Bank - GFDRR) - CDDR tools data and methodology, 2024. Available at <https://gfdr.github.io/CDDR-tools>
Administrative Boundary: UN OCHA, 2024.
World Countries Boundary: Geoboundaries, 2020.
Coordinate Reference System: WGS, 1984.

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