

Ethiopia

Summary

Climate change is projected to have significant damaging impacts on Ethiopia. Altered precipitation patterns are simultaneously expected to increase the potential for extreme drought and flooding, affecting various aspects of daily life, including food security.

Climate change is expected to increase the risk of extreme drought. Compared to historical drought trends, we expect the northwestern region to experience a 50–100% increase in the probability of extreme drought by 2070. Agriculture in Ethiopia is 95% rain-fed, making it highly susceptible to climate variability.¹ The economic implications of drought on the agricultural system in Ethiopia are significant, as over 85% of the country's labor force works in the agriculture sector.²

More extreme drought can also impact food security. During the 2015 drought, milk production declined by up to 27%³ and grain production fell by 66%.⁴ Compared to the highlands, the lowlands have historically experienced more intense and prolonged periods of food insecurity; during the period 2009–2024, parts of Afar, Oromia, and Somali spent 50–60% of their time in a food insecurity crisis.⁵ Food security relies on a combination of environmental and sociopolitical factors, so even though crop production per capita is currently on track to outpace population growth, future food security cannot be guaranteed.

In contrast to drought, we found that the 100-year 1-day rainfall event⁶ is expected to increase by 20–40% depending on the region. With more extreme precipitation events, flood risk greatly increases, especially for communities built on or near floodplains. Floods have occurred in 19 of the last 25 years in Ethiopia, affecting 5.6 million people. We estimate that the 100-year flood will impact more than 840,000 structures and cause greater than \$1.47 billion in 2025 USD.

We studied two rivers and found that annual streamflow is projected to increase by 20 m³/s (129%) by 2050. While an increase in flow volume will increase opportunities for hydropower—though infrastructural adaptations may be needed to handle larger volumes and filter out increased sediment mobilized by intense flows—large increases in flow volumes pose risks to lives and infrastructure.

In May 2025, after presenting these climate risk assessment results, we held a capacity-building workshop in Addis Ababa, providing training in climate data analysis, extreme value assessment, and satellite-based flood monitoring. The goal of the workshop was to equip participants with practical tools and methodologies for climate risk assessment and adaptation planning.

Climate change has the potential to majorly disrupt the agriculture, infrastructure, and economic systems of Ethiopia through droughts and flooding. We encourage more granular research to be done to examine the impacts of climate change at the household level.

¹ Chandrasekharan, K. M., Subasinghe, C., & Hailelassie, A. (2021). [Mapping irrigated and rainfed agriculture in Ethiopia \(2015–2016\) using remote sensing methods](#). International Water Management Institute (IWMI).

² *Ibid.*

³ [Agricultural-Sample-Survey-Livestock-Poultry-and-Beehives-2015 | Ethiopian Statistics Services](#). (Oct 8, 2024). Retrieved July 10, 2025.

[Livestock-and-Livestock-CharacteristicsPrivate-Peasant-Holdings-2014-15-2007-E.C. | Ethiopian Statistics Services](#). (Dec. 26, 2024). Retrieved July 10, 2025.

⁴ [Agricultural-Sample-Survey-Area-and-Production-Meher-Season-2016 | Ethiopian Statistics Services](#). (Dec. 26, 2024). Retrieved July 10, 2025.

[Agricultural-Sample-Survey-Product-Utilization-Meher-Season-2015 | Ethiopian Statistics Services](#). (Dec. 26, 2024). Retrieved July 10, 2025.

⁵ Source: FEWSNet, Nov 2020–Nov 2022 data is excluded. As of this writing, data from FEWSNet is not available; updates beyond September 2024 are not possible.

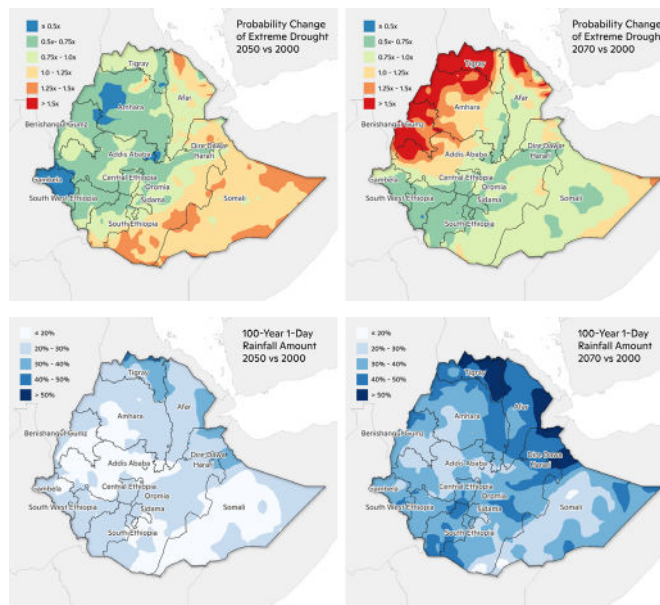
⁶ A rainfall event so intense that it has a 1% chance of occurring every given year.

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Woodwell
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Woodwell Climate conducts science for solutions at the nexus of climate, people and nature. We partner with leaders and communities for just, meaningful impact to address the climate crisis. Our scientists helped to launch the United Nations Framework Convention on Climate Change in 1992, and in 2007, Woodwell Climate scientists shared the Nobel Prize awarded to the Intergovernmental Panel on Climate Change. For 40 years, Woodwell Climate has combined hands-on experience and policy impact to identify and support societal-scale solutions that can be put into immediate action. This includes working with municipalities on the frontlines of the climate crisis.

For more information about this analysis, or Woodwell Climate's other climate risk assessments, please contact us at: policy@woodwellclimate.org

Woodwell's Climate Risk Assessments

The way that Earth's natural systems respond to a rapidly warming climate will impact our quality of life for generations to come. Communities to countries worldwide must be armed with the most up-to-date science so that planning, zoning, and adaptation decisions can be made in the near term to protect against future climate-driven risks. Understanding the scale and nature of climate risks can also be an important motivator of mitigation action.

Combining technical expertise with local knowledge creates the most complete climate risk profile—one that is intentionally created to actually be used by local decision makers. Woodwell has already cultivated municipal partnerships with cities and towns throughout the world that have long-term sustainability goals, providing them with the science they need to make climate-smart decisions.



Communities for which Woodwell Climate has completed or is preparing municipal risk assessments.

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We have expertise studying a wide range of climate hazards

Drought	Flooding	Water Scarcity	Sea Level Rise
Heat Stress	Hurricanes	Agriculture Yield	Permafrost Loss
Wildfires	Storm Surge	Precipitation	