

# How we support agricultural adaptation to climate change



Left: Staff members at the International Rice Research Institute in Los Baños, Philippines adjust water conditions for stress-tolerant rice in greenhouses where heat and humidity tests are conducted. ©Bill & Melinda Gates Foundation/Suzanne Lee  
Right: A farmer uses a mobile phone in her field in eastern Tanzania. ©Bill & Melinda Gates Foundation/Frederic Courbet

Vulnerable communities around the world urgently need support in adapting to the climate crisis, which the World Bank projects will displace 256 million people and drive more than 132 million into poverty by 2030. Adaptation is particularly important for the hundreds of millions of people who depend on agriculture to support their families. That includes the majority of people in sub-Saharan Africa and South Asia, where most households earn income by producing a mix of crops and livestock. According to a study published in *Nature Climate Change* in 2021, global average increases in farm productivity over the past 60 years have been 20% lower than they would have been without climate change, and in some African countries the increases have been at least 40% lower. As the effects of climate change intensify, we need to do more than simply maintain past progress.<sup>1</sup>

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<sup>1</sup> Climate change impacts on food production systems are expected to intensify after 2030 and particularly after 2050, further affecting yields, interannual variability, and the amount and location of arable land, according to the United Nations Food and Agriculture Organization.

Our foundation’s work is driven by the belief that everyone has the right to live a healthy, productive life. This will not be possible for most small-scale farmers unless they can adapt to the stresses caused by climate change. We are working with an international coalition of partners to ensure that these farmers have access to a wide range of climate-smart innovations and can improve their adaptive capacity. This work is part of our broader effort to support environmentally sustainable, resilient food systems that generate a good income for rural farming families, provide consumers with access to healthy and affordable diets, create economic opportunities that empower women, and are driven by an agenda established by local stakeholders.

## The urgency of agricultural adaptation

It is imperative to act now on agricultural adaptation for the following reasons:

- The impacts of climate change on small-scale food producers have already become major drivers of hunger and poverty.<sup>2</sup>
- Climate stresses and vulnerabilities will escalate in the coming decades, even if countries make the necessary progress toward “net-zero” emissions by 2050.
- Farming households that are suffering the most are among those who have contributed the least to climate change, and they often have the fewest tools and resources to adapt.
- In low-income countries in particular, the inequalities exacerbated by climate change disproportionately affect small-scale farming households (and particularly women and young people), making agricultural adaptation a matter of social justice.
- Adaptation is critical for post-pandemic recovery. Agriculture remains a major source of jobs, especially in rural communities, and the sector can play a significant role in helping countries in Africa and South Asia recover from the impacts of the COVID-19 pandemic. But the power of agriculture to provide a sustainable, resilient path to recovery is constrained by the capacity of farmers to adapt to climate change.
- Advances in data collection and analytical methods are powering a new generation of affordable climate forecasting services, agriculture-related early warning systems, and more sustainable farming practices that can:
  - Inform the promotion and deployment of adaptive farming strategies, input logistics, and crop mix and variety choices, as

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<sup>2</sup> According to projections published in *Nature Climate Change* in 2016, critical thresholds for some agricultural systems in sub-Saharan Africa may be crossed as soon as 2025, to the detriment of livelihoods and food security.

- Improve early detection and monitoring of pest and disease outbreaks and help determine appropriate action
  - Map agricultural soils at lower cost and with greater frequency, help fine-tune local soil fertility management options, reduce erosion, and conserve water resources across the landscape
- Adaptation helps conserve and protect resources. The core principles of agricultural adaptation include increasing farm output per unit of water and nutrients and implementing ecosystem-wide farming strategies that more effectively manage water, especially in rainfed systems. Accelerating adaptation among small-scale producers aligns with commitments to building sustainable, equitable, and resilient communities while minimizing further land conversion and natural resource overexploitation.
- Agricultural adaptation strategies often provide multiple benefits. For example, improved water and soil management can help farmers increase food production, sequester carbon, support biodiversity, and bolster ecosystem services.
- After years of underinvestment, political commitment to supporting adaptation is rapidly increasing. The Global Commission on Adaptation developed an agenda for action that has sparked greater international focus on investing in adaptation in vulnerable communities. In 2019, an international coalition pledged US\$791 million for agricultural adaptation, including US\$652 million for work led by the CGIAR system of agricultural research centers. The U.S. has announced a tripling of adaptation financing by 2024, and the UK has made adaptation financing a priority of its G7 and COP26 presidencies. Meanwhile, the Agriculture Innovation Mission for Climate initiative created by the UAE, U.S., and UK can help translate these commitments into practical solutions.

While climate change presents great peril, we also live in a world of great promise. With the right investments and political support, the world can develop and deliver a wide range of adaptation innovations for small-scale producers. We have ramped up efforts to ensure that climate adaptation is embedded in all of our Agricultural Development program's work—and that we are fully applying the foundation's advocacy, grantmaking, and technical expertise to address unmet needs.

## Our strategy for supporting agricultural adaptation

The Agricultural Development team has the resources and partnerships to provide significant adaptation support for millions of small-scale farmers in sub-Saharan Africa and South Asia. We also understand that the challenges are significant. A successful adaptation strategy will require a better planning, innovation, and delivery infrastructure—one that aligns with an adaptation agenda that is established by local stakeholders and can be quickly scaled up to deliver solutions in response to rapidly evolving conditions, including long-term climate stress and extreme weather events.

We believe that our experience with supporting country-led inclusive agricultural transformation gives us a strong foundation for helping countries implement adaptation solutions. We have started by more deeply integrating adaptation priorities into our existing efforts and building a new complementary and enabling grantmaking portfolio. This will allow us to deliver results in several key areas:

- Establishing the foundation as a champion of an evidence-driven adaptation agenda that serves small-scale producers and promotes gender equity
- Strengthening African and Asian representation and leadership on climate research and adaptation decision-making
- Accelerating policy and institutional innovation to promote cost-effective scaling up of context-specific adaptation in national food agriculture systems and ecosystems
- Addressing the effects of increasing heat and water stress on the livelihoods and food security of small-scale producers
- Fostering more responsive, inclusive, and integrated country systems that make climate adaptation a priority in planning, policy design, and financing
- Employing predictive analytics and advances in modeling and data science to enable more cost-effective early action to mitigate losses, manage risk, and develop locally tailored adaptations
- Promoting innovative research on plant and animal genetics to accelerate progress on climate tolerance, and field testing innovative approaches to breeding and seed delivery