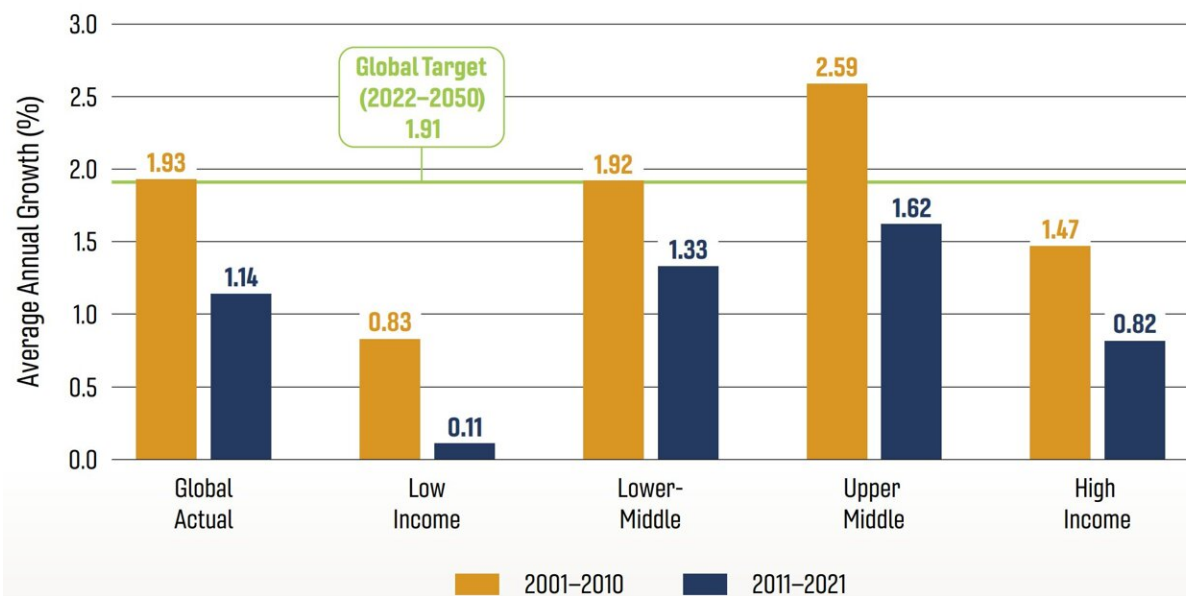


2023 GAP Report: Only by working together will agricultural productivity meet demand

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Source: USDA Economic Research Service (2023).

TFP Growth by Country Income Group, 2001–2021. Credit: *The 2023 GAP Report: Every Farmer, Every Tool* (2023)

Agricultural productivity growth is crucial for ensuring food security and for meeting the nutritional needs of a growing global population while simultaneously meeting environmental goals.

However, the growth of global [agricultural productivity](#) has significantly

contracted and current efforts to sustainably expand production are inadequate, according to the 2023 [Global Agricultural Productivity Report](#), or GAP Report, that was released through the College of Agriculture and Life Sciences at Virginia Tech on Oct. 3 at an event at the National Press Club in Washington, D.C.

New findings from the GAP Report, this year titled "Every Farmer, Every Tool," suggest that not enough producers are able to access [productivity](#)-enhancing technologies and efficient practices. To correct course, the globe must reach a higher target productivity growth rate of 1.91 percent annually to meet global agricultural needs without relying on unsustainable practices.

Pressure is mounting to find solutions to both short- and long-term challenges facing local, regional, and global food systems. Major global shocks, climatic variability, and rapidly changing demand for [agricultural products](#) show that a new mode of operations is needed to reach the target growth rate.

"To increase agricultural productivity, we must produce more outputs with the same or fewer resources used," said Tom Thompson, associate dean at the college and director of CALS Global. "Global agricultural productivity growth has continued its downward trend. We must change this trajectory together so that we can improve and enhance food and nutrition security, sustainability, and resilience. Every farmer needs to have the tools in their hands to be as successful as possible."

Productivity growth must be sustainable

Increasingly at the forefront of global policy dialogs, sustainable productivity growth is recognized as the single most effective solution to meeting demand for agricultural output and environmental goals. Collaboration between the public, private, and civil sectors is critical to

giving every farmer access to every proven tool for sustainable agricultural productivity growth.

Agricultural productivity is increasing, but not at a high enough rate. From 2011-21, global total factor productivity, a measure of the world's agricultural productivity, grew at an average of just 1.14 percent annually. To meet the agricultural needs of a growing global population by 2050, 1.91 percent annual growth is the new target. Failure to meet this target could result in an overreliance on unsustainable production practices and accelerate the decline in total factor productivity growth.

If producers at all production scales can access proven, sustainable, appropriate, productivity-enhancing tools, significant strides can be made in closing the growth gap. Increasing access to and adoption of these tools will require strengthening the enabling environment, addressing influences of food system actor behaviors, and mitigating the effects of external shocks and forces.

"We already have a lot of proven tools available that would help us close the productivity gap. But there are inequalities in the system, ineffective policies, and significant barriers for farmers to access and use these tools—gender, socioeconomic status, risk, to name a few," said Jessica Agnew, associate director of CALS Global. "These barriers also impact farmer livelihoods, [food security](#), and [environmental health](#) by causing farmers to use substandard and effective tools instead."

Tools are available to help

There are well-established tools—including technologies, practices, and strategies—that have demonstrated success in improving farm efficiency and productivity by optimizing resource utilization and minimizing environmental and economic costs. Ongoing research, especially at land-grant institutions such as Virginia Tech, improves existing tools and

identifies new ones to sustainably improve productivity, producer livelihoods, environmental and human health, and economic growth.

- **Improved genetics:** Improved crop and livestock genetics help to maximize yield and nutritional quality while increasing tolerance to various environmental stresses and minimizing input requirements.
- **Precision agriculture:** Data, technology, and automation are leveraged to make production management more precise and resource-efficient.
- **Soil health and management:** Healthy soil is integral to sustainable productivity. Soil health and management practices reduce erosion, maximize water infiltration, improve nutrient cycling, reduce the need for inputs, and improve land resilience.
- **Integrated production systems:** Local integration of production systems, including controlled environment agriculture, increases agricultural output while strengthening [ecosystem services](#) and reducing the environmental impacts of resource use.
- **Pest and disease management:** Pests and disease are a major threat to producer productivity and input costs. Efficient and effective control of these threats while also maintaining ecosystem services is critical to sustainable productivity growth.
- **Mechanization and automation:** Machinery and agricultural engineering maximizes labor productivity, improves output quality, minimizes loss, and maximizes resource utilization efficiency.
- **Knowledge-sharing platforms:** Training on new and existing tools to increase productivity is necessary for optimizing the use of the tools and minimizing costs. Knowledge sharing on how to incorporate innovative technologies into indigenous farming practices is critical for attaining productivity growth.

"Every farmer across the world should have access to the same tools,"

said Ruramiso Mashumba, a panelist at the GAP Report release event, a Zimbabwean farmer, and the African regional lead for the Global Farmer Network. "Farmers, not just in sub-Saharan Africa, should have the tools to make them more sustainable and productive. Some of the methods I have seen that could help in Zimbabwe is conservation agriculture techniques to mitigate challenges. Farmers are ready to adapt but we need the training."

The panelists—which also included Tony Fernandes, deputy assistant secretary at the U.S. State Department; Sergio Rivas, the chief executive officer of Tanage; Eugenia Saini, managing director at FONTAGRO; and Paul Spencer, the global trade policy and advocacy leader at Corteva—agreed that technological opportunities, whether it be new seeds, equipment, or techniques, need to be better provided to farmers and producers across the globe.

"Farmers need to be getting the technology into their hands. We see a lot in research and development that just does not make it into the field," said Paul Spencer, the global trade policy and advocacy leader at Corteva.

Six next steps

The 2023 GAP Report offers six data-driven policy and investment priorities to inform actionable next steps for policymakers, investors, researchers, implementers, and other interested agricultural productivity enthusiasts:

- 1. Invest in public agricultural research and development and extension services:** Public sector agricultural research and development and Extension services generate innovation and information that facilitate environmentally sustainable agricultural output growth, improve human health, and support a

vibrant agricultural economy.

2. **Embrace science- and information-based technologies and practices:** These technologies and techniques enable producers of all scales to manage environmental and economic risks by improving their sustainability, resilience, and competitiveness.
3. **Improve the infrastructure and market access for agricultural inputs and outputs:** Efficient transportation, communications, financial infrastructures, and affordable and equitable access to markets for agricultural inputs, services, and outputs support sustainable economic growth, diminish waste and loss, and reduce costs for producers and consumers.
4. **Cultivate partners for sustainable agriculture and improved nutrition:** Public-private-producer partnerships supporting agricultural development, gender equity, and nutritious food systems leverage public and private investments in economic development, natural resource management, and human health.
5. **Expand and improve regional and global trade:** Forward-looking trade agreements, including transparent policies and consistently enforced regulations, facilitate the efficient and cost-effective movement of agricultural inputs, services, and products to those who need them.
6. **Reduce post-harvest loss and food waste:** Reducing post-harvest losses and food waste increases the availability and affordability of nutritious food, eases the environmental impact of food and agricultural production, and preserves the value of the land, labor, water, and other inputs used in the production process.

Behavioral influences such as capability, opportunities, and motivators will play a critical role in driving sustainable agricultural productivity growth by impacting producer and food system actors' adoption of existing and emerging productivity-enhancing tools. Adoption-oriented interventions, tool development, and ongoing support must be designed

in light of the complexity of experiences, beliefs, gender, values, and perceptions of individuals and communities involved in agriculture.

Policy and investment action to improve agricultural productivity must consider how external shocks and forces may impact the continuity of agricultural innovation application to ensure that sustainable productivity gains are not lost and to continue to accelerate returns to the producer, society, the environment, and the economy.

More information: Report: [globalagriculturalproductivity...ve-Summary_FINAL.pdf](#)

Provided by Virginia Tech

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