



9 November 2023

(23-7581)

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Committee on Sanitary and Phytosanitary Measures
Committee on Agriculture
Committee on Agriculture – Special Session
Committee for Trade in Goods

Original: English

**ENHANCING FOOD SECURITY: THE WTO'S ROLE IN SUPPORTING INNOVATION
AND SUSTAINABLE GROWTH IN AGRICULTURAL PRODUCTIVITY**

COMMUNICATION FROM THE UNITED STATES

The following communication, dated 9 November 2023, is being circulated at the request of the delegation of the United States.

1.1. WTO Members recognize the importance of food security to global and national economic prosperity, security, and political stability. Challenges to advancing food security are prevalent throughout agri-food systems. The challenges of growing populations, continuing conflicts, and growing negative impacts of climate change, among others, cannot be minimized as we strive to enhance food security, which will require more resilient and sustainable agri-food systems.

1.2. The Organization of Economic Cooperative Development (OECD) and the Food and Agriculture Organization (FAO) estimate that average global agricultural productivity must increase at a rate triple of that recorded over the last decade in order to achieve the 2030 Zero Hunger target while simultaneously keeping agricultural emissions on track to meet the Paris Agreement targets. To achieve these targets, one cannot rely solely on past methods to boost agricultural productivity. Instead, we must continue to find ways to increase agricultural productivity in a sustainable manner that will create more resilient agri-food systems to enhance long-term food security and address short-term food crises. This global challenge of increasing sustainable agricultural productivity will require coordination and cooperation across the international community and will need to include leveraging public and private investments to support research and development of science-based innovative approaches and technologies, promoting knowledge and experience sharing, encouraging capacity building, developing and implementing science-based regulatory regimes, and utilizing the multilateral rules-based trading system.

1.3. The US submission of 27 March 2023 stated that the World Trade Organization (WTO) can play a critical and unique role in enhancing food security.¹ By focusing on using trade rules that complement the food security initiatives of other international organizations, the WTO can enhance food security by promoting the safe and reliable trade of food, innovation in sustainable agri-food systems through Members' adoption of science-based regulatory regimes, and the advancement of economic growth and sustainable development goals.

1.4. This submission explores the roles of WTO Members and the WTO in trade and trade rules to promote sustainable agricultural productivity growth, including through the use of innovative tools and technologies, to enhance food security.

¹ US Communication "The World Trade Organization's Role in Enhancing Food Security". [JOB/CTG/25](#); [JOB/AG/241](#); [JOB/MA/160](#); [JOB/SPS/28](#); [JOB/TBT/501](#); [JOB/COMTD/1](#); and [JOB/TF/233](#).

1 SUSTAINABLE AGRICULTURAL PRODUCTIVITY AND CLIMATE CHANGE

1.1. The relationship between sustainable agricultural productivity growth and climate change is intricate and warrants careful consideration as WTO Members make efforts to enhance their own food security. Researchers have already detected the disruptive impacts of climate change on agricultural production and productivity growth.² Changes in temperature, rainfall patterns, and extreme weather events that occur more frequently and with greater severity can reduce crop yields or lead to crop failures, which in turn affects the availability and affordability of food. Research has also shown that there are substantially more severe impacts on agricultural productivity in warmer regions such as Africa, Latin American, and the Caribbean, compared to other parts of the world. Extreme weather can also disrupt agricultural supply chains and impede the ability to get food to areas where it is most needed.

1.2. Further, certain, unsustainable agricultural practices have adverse impacts on the environment and worsen the effects of climate change, such as input intensification, land use expansion, misuse of pesticides, over-tilling of soil, and use of inefficient animal and plant production practices. Research suggests that keeping the current agricultural practices and levels of agricultural productivity constant through 2050 would require clearing most of the world's remaining forests and releasing enough greenhouse gas emissions to exceed the 1.5 °C and 2.0 °C warming targets of the Paris Agreement – even if emissions from all other human activities were eliminated.³ If global temperatures were to exceed these targets, it is projected there could be an additional 530-550 million undernourished people.⁴ Improved efficiency of inputs and natural resource use has been increasingly emphasized as the single most effective solution to simultaneously achieving production and environmental goals.⁵ The WTO and its Members must use multilateral trade rules to promote smarter, innovative, and more productive and efficient agri-food systems that are sustainable and resilient in order to address food security while simultaneously tackling the challenges of climate change.

2 SUPPORTING SUSTAINABLE GROWTH IN AGRICULTURAL PRODUCTIVITY

2.1. Enhancing food security is a priority for all WTO Members. To this end, some policymakers may be inclined to take actions that appear to protect farmers' livelihoods through guaranteeing prices for their products and maintaining domestic capacity to produce more food. However, increasing production volumes in unsustainable ways only contributes to near-term food security while exacerbating the difficulties of addressing food security going forward. Historically, production growth has relied heavily on increasing inputs into production rather than increasing productivity through approaches like precision agriculture or the use of improved seed varieties.⁶ As a result, agriculture's impact on climate change and degradation of the environment has grown as more land and resources have been directed to increasing production.

2.2. Policymakers should therefore shift their food security focus to prioritize supporting farmers' incomes and domestic production capacity through incentivizing growth in agricultural productivity. Such growth would increase output (e.g., food) per a given quantity of inputs (e.g., land, water, labor, capital, chemicals, fertilizers, and gas/electricity) – or reduce inputs per a given level of output. By boosting productivity growth, the agricultural sector can conserve and optimize resources, mitigate and adapt to climate change, and ensure long-term food security. The OECD has noted that productivity growth can play a major role in the mitigation of and adaptation to climate change.⁷ Further, increased productivity can lead to increased competitiveness for farmers – a one percent

² Ortiz-Bobea, A., T. Ault, C. Carrillo, R. Chambers, and D. Lobell. 2021. "Anthropogenic Climate Change Has Slowed Global Agricultural Productivity Growth". *Nature Climate Change* 11: 306–12.

³ World Resources Institute, 2019, *Creating a Sustainable Food Future*.
<https://www.wri.org/research/creating-sustainable-food-future>.

⁴ Hasegawa, T., et al., 2016.

⁵ Searchinger et al., 2019; Agnew, J. & Hendery, S. (2023). 2023 Global Agricultural Productivity Report: Every Farmer, Every Tool. Virginia Tech College of Agriculture and Life Sciences.

⁶ USDA ERS, International Agricultural Productivity, <https://www.ers.usda.gov/data-products/international-agricultural-productivity/summary-findings/>.

⁷ OECD, 2021. *Making Better Policies for Food Systems*. https://www.oecd-ilibrary.org/agriculture-and-food/making-better-policies-for-food-systems_ddfba4de-en.

increase in productivity growth is equivalent to a one percent decrease in the cost of producing, storing, and selling a food product.⁸

2.3. However, growth in agricultural productivity alone is insufficient to meet food security and climate change goals. For example, efforts must also be focused on improving productivity of, and better management of, natural resources and ecosystem services, including those resources brought into production. Such an approach can contribute to meeting food security needs of current and future generations while enhancing the wellbeing of farmers, agricultural workers, consumers, and the environment, and building more sustainable, resilient, and inclusive food systems.

3 THE ROLE OF INNOVATION IN SUPPORTING SUSTAINABLE GROWTH IN AGRICULTURAL PRODUCTIVITY AND FOOD SECURITY

3.1. Innovation, funded through both public and private investments in research, is crucial for accelerating sustainable growth in agricultural production. Innovations, such as heat and drought tolerant seeds, practices to improve soil health and irrigation, inputs to improve feed conversion efficiency for animals, and increasing access to climate information and early warning systems, have already proven their utility in increasing food availability and reducing vulnerability to a changing climate.⁹ However, persistent challenges—including those that may intensify due to climate change, such as limited arable land, water scarcity, soil degradation, and changes in the distribution and frequency of pest outbreaks—coupled with increasing food demand mean that even more innovative tools and technologies are needed. Innovations in cutting-edge technological advancements in soil, seed, pest, animal health, and farm management, along with innovative managerial and operational approaches to farming, including those utilizing digital technologies, are critical and require significant capital and investments.

3.2. In addition, collaborative initiatives between governments, the private sector, research institutions, and civil society organizations can drive innovation by fostering knowledge exchange, providing financial support for research and development, and creating an enabling environment for entrepreneurship and investment in the agricultural sector. Access to and adoption of proven, appropriate, productivity-enhancing tools, including new innovative technologies and approaches, will allow farmers to improve their productivity and resilience, while addressing challenges that undermine their ability to contribute to enhanced food security.

3.3. While accelerating sustainable agricultural productivity growth is necessary to enhance food security by increasing the availability of food in the face of climate change, it is also necessary for reducing agriculture's environmental footprint and reducing greenhouse gas emissions from agriculture, which contribute to climate change. Many adaptation-focused climate-smart agriculture investments, including nature-based solutions, have climate change mitigation co-benefits. For example, soil health investments can increase yields and reduce mineral fertilizer requirements; new seed varieties can increase productivity and resilience to drought; improved feed can increase milk yields while reducing methane emissions in livestock; and improved food storage can reduce food loss and waste.¹⁰

3.4. Innovative technologies and approaches also contribute to enhancing food security through practices that extend beyond the field or farm gate. Efficient transportation, storage, cold chain management, and advanced packaging techniques, along with the removal of other barriers to movement of food that increase costs and delay shipments, reduce post-harvest losses and extend the shelf life of perishable goods, ensuring a larger portion of farmers' harvests reach consumers with less spoilage thereby increasing food availability and affordability. There is also a growing commercial and consumer interest in new food systems innovations to meet the challenges of supporting an increasing global population and to boost sustainable food production. Consequently,

⁸ [Agnew, J. & Hendery, S.](#) (2023). 2023 Global Agricultural Productivity Report: Every Farmer, Every Tool. Virginia Tech College of Agriculture and Life Sciences.

⁹ For example, improved crop varieties raised productivity of adopting areas in sub-Saharan Africa by an average of 47% between 1980 and 2010. ([Walker, T. S., and Alwang, J.](#) 2015) Additionally, seeds that are drought- and heat-resistant can increase yields by up to 25% under climate patterns expected in Africa by 2050 under a "business-as-usual" scenario. ([Cacho et. al.](#), 2020).

¹⁰ [IFPRI](#), 2022. Global Food Policy Report: Climate Change & Food Systems. <https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/135893/filename/136099.pdf>.

WTO Members can work together to share information on new innovations and technologies to continue regulating the safety of food and agricultural products.

4 THE WTO'S ROLE IN SUPPORTING SUSTAINABLE GROWTH AND INNOVATION IN AGRICULTURAL PRODUCTION

4.1. In coordination with other international organizations, WTO-based work can help enhance food security by encouraging investment in innovation, promoting adoption of new technologies and approaches, strengthening the policy capacity of WTO Members, and facilitating the safe trade of agricultural products, including those produced with more sustainable methods.

4.2. Starting with the existing WTO agreements, WTO Members can reinforce their use of the rules-based multilateral trading system, which supports scientifically-sound regulatory schemes and open and predictable markets. Such an enabling environment will attract financial support and greater participation from the private sector in efforts to boost productivity while maintaining trade volumes and market opportunities. When entrepreneurs see global market potential and certainty for new approaches or technologies for producing food, they will be more likely to make investments.

4.3. An enabling regulatory environment underpinned by a rules-based trading system allows farmers or other agricultural-related businesses to more easily see the opportunity to sell food produced with these new investments and in turn will encourage their adoption. However, if WTO Members make regulatory or administrative decisions that are unjustified, are inflexible, or are perceived as unpredictable, then the necessary investments will not be made in new innovations to improve global food security and farmers will be unwilling to adopt them.

4.4. It is critical to note that WTO Members should not prescribe the ways in which other Members should meet their own sustainability and food safety goals. Continuing the sustainable growth of agricultural productivity necessary to achieve food security will require context-specific strategies tailored to the unique characteristics and challenges of different geographies, crops, farm types, markets, and socio-economic conditions. This will enable the implementation of targeted innovations that maximize productivity while minimizing negative economic, environmental, and social impacts. When WTO Members take a prescriptive approach, such as requiring the adoption of certain practices or technologies, rather than an outcomes-based approach, it can ultimately undermine sustainable agricultural productivity and food security.

4.5. To be clear, it is critical that actions taken by Members are based on science and evidence and that Members avoid prescriptive approaches that ultimately could undermine the achievement of global sustainability and food security goals. For example, assessments must be made to determine whether new innovations are providing the desired outcomes, such as whether the use of a technology associated with reduced greenhouse gas emissions actually leads to lower emissions. To harness the full potential of productivity growth and to advance social, environmental, and economic sustainability goals, it may be necessary to conduct holistic assessments of the intended and unintended impacts of the innovative agricultural practices and policies. A systematic approach that manages trade-offs and safeguards social and environmental welfare is crucial to ensure that productivity growth aligns with sustainability objectives and supports the long-term well-being of both people and the planet.

4.6. Even the best innovation is of limited value if farmers are unable to use a new practice or technology, and efforts must also be made to encourage the adoption of innovative practices and technologies as they are developed. Here again, collaborative initiatives involving diverse stakeholders, such as scientists, farmers, policymakers, and industry representatives, can drive adoption of new innovations, including through the dissemination of information regarding the benefits of and best practices associated with these innovations. Since experiences with new tools and technologies may vary among countries, collaborative exchanges among WTO Members will foster a greater understanding of these innovations, especially with regard to their safety and the ways in which Members use science-based approaches to regulate their use.

4.7. By actively promoting and sharing knowledge about these innovations, along with creating and utilizing science-based regulatory regimes that ensure predictability for the acceptance of new technologies and approaches, WTO Members may facilitate widespread adoption of these innovations, thus supporting sustainable advancements in agricultural productivity and global food

security. The WTO itself, as a multilateral deliberative forum, may also be able to facilitate connections between WTO Members and relevant work being done in other international fora.

4.8. Just as farmers need policies to help them adapt to shocks from market upheaval and variable weather, they will also need policies that incentivize and empower them to continue the transition to more sustainable production practices. However, well-intentioned policies, whether aimed at protecting farmers' livelihoods, enhancing food security, or incentivizing sustainable production methods, if not well-constructed, may have unintended negative or counterproductive effects while delivering limited benefits. Here, the WTO, as a multilateral deliberative forum, can help find ways of encouraging policies that support sustainable agricultural practices and strong institutional frameworks and research programs that facilitate innovation and adoption of new technologies. At the same time, the WTO can discourage those policies that result in over-production, overuse or misallocation of resources, market distortions, or other negative impacts, environmental or otherwise.
