

Virtual USDA-DG AGRI Workshop on Measurement, Trends, Drivers, and Sustainability Impacts of Agricultural Productivity Growth

On May 3, 2022, the Collaboration Platform on Agriculture (CPA) of the U.S. Department of Agriculture (USDA) and the European Commission Directorate-General for Agriculture and Rural Development (DG AGRI) hosted a virtual Workshop on Measurement, Trends, Drivers, and Sustainability Impacts of Agricultural Productivity Growth.

The CPA was launched in November 2021 at the direction of European Commissioner for Agriculture Janusz Wojciechowski and USDA Secretary Tom Vilsack. The CPA's objectives are to a) collaborate and deepen communication, b) exchange knowledge and information, and c) promote mutual understanding and trust between the United States and European Union on agricultural challenges.

This workshop was the first activity under the CPA. The objective of the workshop was to foster exchange among USDA and DG AGRI officials about the role of agricultural productivity growth in advancing/hindering progress on social, economic, and environmental objectives and how the concept is treated and assessed in EU and U.S. approaches to building more sustainable food systems. In sum, 42 U.S. and EU government officials participated.

The workshop included formal presentations from five subject matter experts: Jesús Antón, Head of Unit in the Agriculture and Resource Policies Division in the Organization for Economic Cooperation and Development; Edoardo Baldoni, a Scientific Project Officer at the Joint Research Centre of the European Commission; Robert Bertram, Chief Scientist in the US Agency for International Development's Bureau for Resilience and Food Security; Keith Fuglie, a Senior Economist with the Economic Research Service, U.S. Department of Agriculture; and William Martin, a Senior Research Fellow at the International Food Policy Research Institute.

The main takeaways, facilitated by the speakers, moderators, and participants, were that:

- Global food systems are facing multiple challenges, including supplying food and nutrition for all, enhancing farmer and farmworker livelihoods, conserving resources, and mitigation and adapting to climate change.
- Improvements in agricultural productivity growth are not only important for addressing these challenges and improving the viability of the agricultural sector but are a fundamental precondition for sustainable economic growth.
- Productivity growth, as measured by total factor productivity (TFP), which is the most comprehensive measure of productivity growth, is the ratio of aggregate outputs to aggregate inputs (land, labor, capital and other inputs). It is not a measure of output from input intensification (more labor, capital, and other inputs per acre) or land expansion.
- TFP growth is not the same as output growth, in fact, TFP growth may not result in any growth in output. It could result from the use of proportionately less input for the production of the same or a smaller amount of output.

Finding from expert presentation (Fuglie): From 1961-2021, TFP growth in Europe has reduced inputs while keeping production stable, while in North America TFP growth has expanded production while keeping inputs stable.

- Innovation is a major driver of TFP growth. R&D is a primary policy tool to support TFP growth.

Finding from expert presentation (Martin): We need to invest in green innovations that raise yields and cut emissions. This could provide significant potential to deliver benefits for people, the economy, and the planet.

- TFP has replaced input intensification as a principal source of agricultural growth and has resulted in dramatic reductions in poverty, food insecurity, resource use, and agricultural land extensification.

Findings from expert presentation (Bertram): Raising agricultural productivity increases farm income and lowers costs of production; lowers food prices and reduces share of household expenditure for food, especially for poorest; and creates “multiplier effects” that stimulates growth in non-farm sector (especially in rural areas). Agricultural productivity growth has made food substantially more affordable. Lower food prices are major drivers of poverty reduction and economic development, especially in low-income countries. Agricultural total factor productivity growth curbs global cropland expansion and GHG emissions

Findings from expert presentation (Anton): Improvements in TFP have greatly mitigated the upward trend in agricultural emissions by decreasing the emission intensity of agricultural production (i.e., emissions per unit of output). Continued improvement in agricultural TFP should therefore contribute to reductions in emissions intensity – both through decreases in the use of emission-intensive inputs and mitigation of land use change.

- TFP, while more comprehensive than single-factor productivity, is still limited as a complete measure of resource efficiency since it does not account for non-marketed inputs such as environmental services and negative environmental impacts of agricultural production. There is ongoing research on how to incorporate environmental inputs into measures of TFP.

Findings from expert presentation (Anton): To ensure overall reductions in emissions, productivity improvements alone are insufficient and accompanying measures need to be in place to protect natural resources.

Finding from expert presentation (Baltoni): Incorporating environmental externalities into TFP measures requires assigning a price to externalities reflecting realistic trade-offs between inputs, good outputs, and bad outputs. Linking farm productivity data with regional data on environmental performance such as soil erosion and methane emissions, can complement standard TFP measures

- Nor does TFP measure broader impacts of agricultural productivity on social outcomes, including equity and impacts on diverse types of farmers.
- As all three sustainability dimensions (social, economic, and environmental) cannot be equally represented through TFP, there is a need to invest in analysis that links TFP with environmental and social performance.

- Ongoing work exploring approaches to improve TFP growth measurement and triangulate indicators of TFP growth with those on sustainability outcomes (social, environmental, and economic) could help provide policymakers with improved information to support policies targeting sustainable agricultural development.
- A possible follow-up CPA workshop to further explore this ongoing work will be considered alongside other issues for the 2023 CPA work program. Discussions between the EU and the U.S. will continue in the framework of the UNFSS coalition on sustainable productivity growth and in the OECD Network on Agricultural Total Factor Productivity and the Environment.