INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
CGIAR IFPRI

What do we know about THE FUTURE OF FOOD SYSTEMS?

CHAPTER 23

What do we know about THE FUTURE OF AGRICULTURE IN ARGENTINA, BRAZIL, PARAGUAY, AND URUGUAY?

Nicolas Jorge (Bolsa de Cereales), Silvia Kanadani Campos (Embrapa), Juan Pablo Gianatiempo (IFPRI), Vanessa da Fonseca Pereira (MAPA and Embrapa), and Valeria Piñeiro (IFPRI)

Key messages

- Argentina, Brazil, Paraguay, and Uruguay (ABPU) have significant weight in the global agricultural market. In 2020–2022, the bloc accounted for 53.1 percent of Latin America and the Caribbean's total agricultural exports, and 9.3 percent of the world total. This contribution is key in many products at the global level too, such as soybean products (for which the group accounts for 56 percent of world trade), corn (32 percent), bovine meat (26 percent), poultry meat (20 percent), pork meat (6 percent), and wheat (6 percent) (2020–2022 Comtrade data).

- These commodities are essential for global food security, particularly in regions with growing populations and increasing food demand, notably Asia and Africa. Ensuring the sustainability of ABPU production is paramount not only for food security but also for environmental concerns.

- ABPU projections show robust growth in cereal and oilseed production, which is expected to increase by 26 percent (118 million tons) by 2033/34 relative to 2023/24. Total exports of cereals and oilseeds are projected to rise by 74 million tons, reaching 355 million tons, driven largely by corn, soybeans, and wheat.

- Despite slowing growth in global demand and trade of food products, opportunities exist for ABPU countries to increase their food production and exports. Making the most of these opportunities will require increasing yields to maintain production growth while ensuring sustainability. To this end, technological advancements such as minimal soil disturbance, permanent cover cropping, crop diversification, intensive fattening, biotechnology, biological inputs, and precision agriculture can help increase productivity while minimizing environmental impact.

- The investments required to increase the use of enhanced technology could benefit greatly from a more stable political and macroeconomic context, as well as clear and consistent policies. For example, multilateral trade negotiations in agriculture should not be undermined.
- Collaboration among ABPU countries could greatly enhance the strategies needed to achieve these sustainability and food security objectives. The analysis described here is intended to kick-start this collaboration, which has shown significant potential for future work.

RECENT TRENDS AND CHALLENGES

The Argentina, Brazil, Paraguay, and Uruguay (ABPU) bloc plays an important role in global food systems and food security, as the world's leading net food-exporting region. It is a substantial economic force, with total agricultural exports valued at US$186 billion and net agricultural trade at US$164 billion.

In particular, in 2020–2022, the bloc accounted for 53.1 percent of Latin America and the Caribbean's total agricultural exports, and 9.3 percent of the world total. This contribution is key in many products at the global level too, such as soybean products (for which the group accounts for 56 percent of world trade), corn (32 percent), bovine meat (26 percent), poultry meat (20 percent), pork meat (6 percent), and wheat (6 percent) (2020–2022 Comtrade data).

The huge contribution of the agriculture sector to ABPU exports makes the sector crucial for these countries. Among their top 20 exported products, 10 are from the agrifood sector. In terms of trade trends, ABPU countries' share of grain and oilseed exports has risen. Notably, participation of Asian countries among export destinations is increasing, while shares to North America and the European Union (EU) have declined.

Two disruptive factors influencing global agrifood systems are emerging: climate change and increasing geopolitical fragmentation. Both disruptors would generate a heterogeneous impact on different regions and countries and thus alter their relative advantages in production and trade. Disruptions generated by climate change would have a greater impact. In particular, product groups mainly destined for domestic markets would be more vulnerable and the adverse effects are expected to be greater in the countries that produce them. This phenomenon alters the structure of international trade, with certain products and regions gaining advantages due to climate change and geopolitical fragmentation, while others experience adverse effects. ABPU countries would improve their comparative advantages in vegetable oils, dairy and eggs, and fruits and vegetables. These emerging trends raise critical questions about the future of global trade, necessitating further analysis to understand the implications of these disruptions. The modeling section below will present quantitative results that further illustrate these dynamics.

The region is facing several specific challenges already, including an increasing number of certifications, the EU 2023/1115 regulation,[1] and slow growth or stagnation in total factor productivity (TFP). While the Latin America and Caribbean region experienced relatively high total factor productivity (TFP) growth during the 1990s and 2000s, this growth slowed considerably in the past decade. The notable exception is Brazil, which has maintained exceptionally high TFP growth over the last 20 years (Laborde and Piñeiro 2022). Additionally, countries are grappling with the growing number of unilateral measures imposed by some nations, exemplified by the EU's Deforestation Regulation (EUDR), which require exporters to ensure product traceability and compliance with stringent regulations.

Addressing these challenges in ABPU amid the disruptive scenarios posed by climate change and geopolitical fragmentation is vital for ensuring global food security. Moreover, coordinated political action within this bloc is essential. By working together, member countries can leverage their collective strengths to develop innovative

1 EU Deforestation Regulation (Regulation (EU) 2023/1115), published in mid-2023, aims to minimize deforestation and forest degradation associated with agricultural raw materials imported into the European Union. It is part of the EU's biodiversity strategy running to 2030.

strategies that adapt to environmental changes and shifting global markets. This collaborative approach could not only bolster food security in the region but also promote sustainable production practices, ensuring that food systems are both environmentally friendly and economically viable. Coordinated action also has the potential to attract green investment, strengthening the capacity of ABPU countries to contribute to global food security in a sustainable way.

LATEST FORESIGHT RESEARCH

Developing an agricultural outlook for the MERCOSUR founding countries — Argentina, Brazil, Paraguay, and Uruguay — is essential for understanding the region's specific agricultural dynamics. While international organizations such as the Food and Agriculture Organization of the United Nations (FAO) and the Organisation for Economic Co-operation and Development (OECD) provide valuable global projections, ABPU-focused forecasts offer localized insights that better reflect these countries' unique characteristics and perspectives. Given that various projections are based on differing assumptions about future trends, a tailored ABPU outlook adds significant value by addressing the region's distinct needs.

The process to develop these projections involved three steps. First, we established the assumptions for the key drivers, including population, macroeconomic growth, and productivity trends. Then we used partial equilibrium modeling to simulate the projected periods. In the third step, the results were reviewed with experts from ABPU countries, who analyzed and validated the model's assumptions and outputs and suggested corrections, moving the process back to the first step.

Although our focus is on ABPU countries, it is also critical to account for key global trends during the projected period (2023/24 to 2033/34), informed by sources such as OECD-FAO (2024) and the U.S. Department of Agriculture (USDA) (Dohlman, Hansen, and Chambers 2024). First, growth in global food demand is expected to slow compared to previous decades due to decelerating population and economic growth, though consumption growth will still exceed population growth. Additionally, current net exporters will likely expand their export capacity, while net importers are expected to increase their imports. Finally, price projections face high uncertainty, with potential volatility arising from economic fluctuations and extreme weather events that could significantly disrupt markets.

In the context of these global trends, ABPU projections show robust growth in cereal and oilseed production, which is expected to increase by 26 percent (118 million tons) by 2033/34 relative to 2023/24 (Figure 1). This growth will result from a combination of productivity improvements and a 12 percent increase (15 million hectares) in harvested area. Total exports of cereals and oilseeds are projected to rise by 74 million tons, reaching 355 million tons, driven largely by corn, soybeans, and wheat.

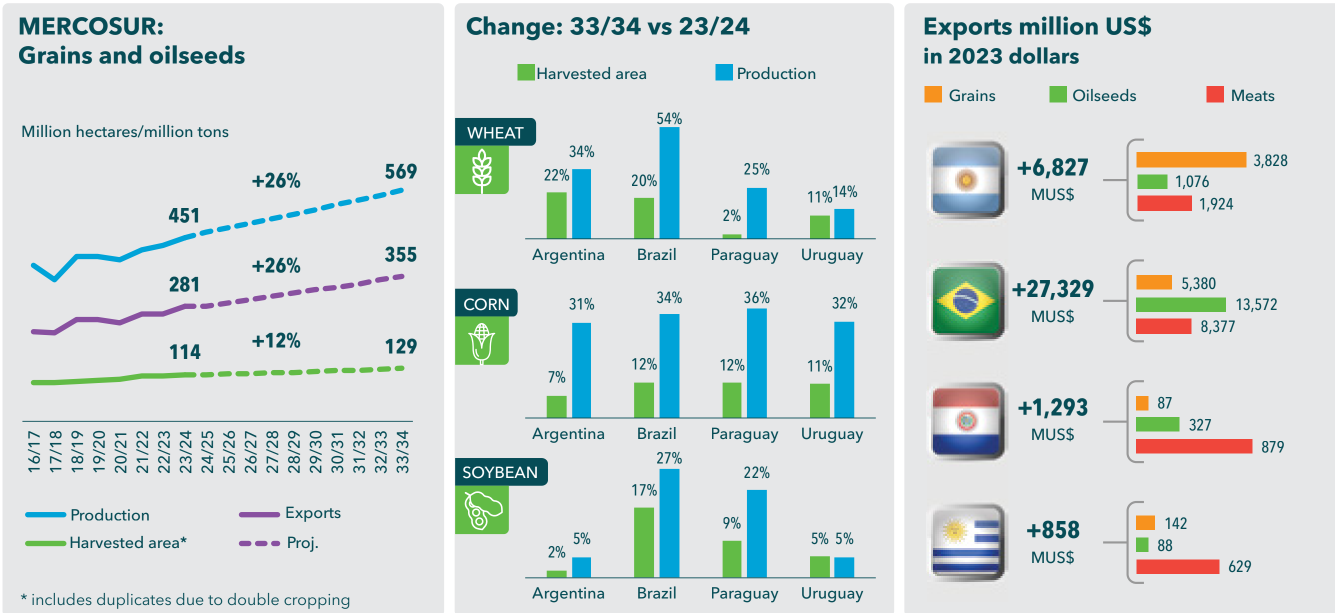
Specifically, ABPU wheat yields are projected to increase from 2.7 to 3.1 tons per hectare (+15 percent), corn from 5.9 to 7.1 tons per hectare (+20 percent), and soybeans from 3.2 to 3.5 tons per hectare (+8 percent). However, these projected 2033/34 yields remain below the potential yields estimated by the Global Yield Gap and Water Productivity Atlas. Corn production, in particular, is expected to increase by 58 million tons (+33 percent) over 2023/24 levels, with yield improvements contributing 68 percent of this growth. Corn exports are anticipated to grow by 31 million tons to reach 113 million tons. Part of Brazil's additional production serves domestic needs, especially animal feed and ethanol, but it also explains more than one-half of ABPU's increase in exports (+20 million tons). Argentina's exports will rise by 11 million tons, partly due to recovery from the 2023 corn stunt disease, while Paraguay and Uruguay are expected to see production growth largely absorbed by domestic use, resulting in minimal net trade changes.

ABPU countries' soybean production is projected to grow by 46 million tons (+21 percent), with exports increasing by 34 million tons to reach 141 million tons by the end of the period. Brazil will lead in soybean exports with an increase of 31 million tons, followed by Argentina with 4 million, Paraguay with 2 million, and Uruguay with 220,000 tons. Overall, soybean processing will increase by 13 million tons, with a rise in local soybean oil consumption, primarily for biodiesel.

Wheat production in ABPU countries is expected to increase by 9.9 million tons (+39 percent), with exports up by 3.7 million tons, led mainly by Argentina. Brazil's wheat consumption will grow by 2.6 million tons, but net imports will decline as local production rises.

In the meat sector, total production is projected to grow by 5.8 million tons, with poultry reaching 20 million tons,

FIGURE 1 Agricultural outlook for MERCOSUR



Source: Author's calculations based on PEATSim-AR model.

followed by beef at 17 million tons, and pork at 6.7 million tons. By the end of the projection period, poultry exports are expected to surpass beef exports in volume, with all ABPU countries showing substantial growth.

Overall, these projected exports are estimated to generate US$36.3 billion for ABPU countries, including $6.8 billion for Argentina, $27.3 billion for Brazil, $1.3 billion for Paraguay, and $0.85 billion for Uruguay.

KEY GAPS AND OPPORTUNITIES FOR FORESIGHT RESEARCH

This analysis could be improved or extended in many areas, each of them opening new research paths.
For example:

- ***Multicropping and integrated systems.*** Current results do not track the differences between first or second crops. They also do not consider integrated productive systems, such as crop-livestock-forestry systems. Projections for these would allow for better understanding of total land use and yield growth.
- ***Regionalization.*** Given that ABPU countries contain many heterogeneous productive regions, insights on the future evolution in smaller areas would be useful.
- ***Land use change.*** How will production growth affect land use change and deforestation? What is the expected impact of the increase of deforestation-free requirements affecting ABPU production and exports?
- ***Climate change.*** How would different climate change scenarios affect production and food availability in these countries?
- ***Climate change adaptation.*** What specific adaptation measures are needed in different regions of ABPU to mitigate the impacts of climate change on agricultural production?
- ***Policy coordination.*** How can ABPU countries better coordinate their agricultural policies to enhance regional competitiveness and address shared challenges?
- ***Sustainable intensification.*** How can technological innovations and sustainable agricultural practices be promoted to increase yields while minimizing environmental impacts?

- ***Logistics.*** How are agrifood products transported in these countries, and what investments are required? What would be the impact of major logistics and infrastructure projects?

- ***Stochastic analysis.*** Given that projections are heavily affected by alternative assumptions regarding gross domestic product growth and weather events, it would be interesting to estimate confidence intervals for the main variables.

- ***Nutritional analysis.*** How can we enhance our understanding of the nutritional content of food produced in different agriculture systems? Investigating nutrient availability alongside food production can inform policies aimed at improving food security and public health outcomes.

- ***Emissions measurement.*** Quantifying greenhouse gas emissions from agricultural practices in different regions could provide information on the most effective strategies to reduce emissions while maintaining productivity. The greenhouse gas emissions could also be used to environmentally adjust productivity measures.

- ***Sustainability.*** Understanding the interaction between water availability and agricultural production is crucial to ensure sustainable food production.

- ***Competing markets.*** What would be the impact on ABPU of increased agricultural production in Africa?

This chapter was supported by the CGIAR Research Initiative on Foresight and the CGIAR Science Program on Policy Innovations. We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund.

The authors of this chapter are **Silvia Kanadani Campos**, a Researcher at the Brazilian Agricultural Research Corporation (Embrapa); **Juan Pablo Gianatiempo**, a Research Analyst in the Markets, Trade, and Institutions (MTI) Unit at the International Food Policy Research Institute (IFPRI); **Nicolas Jorge**, an Economist at Bolsa de Cereales, Argentina; **Vanessa da Fonseca Pereira**, an Advisor at the Ministry of Agriculture and Livestock (MAPA) and an Analyst at Embrapa, Brazil; and **Valeria Piñeiro**, Regional Representative for Latin America and the Caribbean and Senior Research Coordinator in MTI at IFPRI.

The authors acknowledge the collaboration provided by Jimena Masaro (CEO Group); Miguel Carriquiry (UDELAR); Manuel Brusquetti (UGP); Nelson Illescas and Washington Duran (GPS); Cecilia Conde, Sebastián Gariboldi, and Estefanny Vasquez (Buenos Aires Grain Exchange); Adalberto Araujo, Alcido Wander, Álvaro Dossa, André Moraes, Aryeverton Fortes, Glauco Carvalho, Hilton Ferraz, Jason Duarte, Marcelo Miele, Moacir Pedroso Junior, Paulo do Carmo Martins, Rafael Mingoti, and Rosana Guiducci (Embrapa); and Nicholas Blikstad (Scholarship holder at Embrapa).

Related chapters on the future of food system drivers and impacts, regional and national perspectives, food commodities, and foresight tools are available in our Table of Contents.

Citation: Kanadani Campos, S., J.P. Gianatiempo, N. Jorge, V. da Fonseca Pereira, and V. Piñeiro. 2025. "What Do We Know About the Future of Agriculture in Argentia, Brazil, Paraguay, and Uruguay?" In *What Do We Know About the Future of Food Systems?*, eds. K. Wiebe and E. Gotor, Chapter 23. Washington, DC: IFPRI. https://hdl.handle.net/10568/175019

Photo credit: Mix Tape/Shutterstock

References

UN Comtrade Database. https://comtradeplus.un.org/

Dohlman, E., J. Hansen, and W. Chambers. 2024. *USDA Agricultural Projections to 2033*. Washington, DC: U.S. Department of Agriculture.

Global Yield Gap and Water Productivity Atlas. 2024. Accessed Aug. 30, 2024. www.yieldgap.org

Laborde, D., and V. Piñeiro. 2022. "The Impact of Changes in the Fundamental Drivers of Trade: Productivity, Trade Costs, and Trade Policies." Background paper for *The State of Agricultural Commodity Markets 2022*. Rome: Food and Agriculture Organization of the United Nations. https://doi.org/10.4060/cc3135en

OECD (Organisation for Economic Co-operation and Development) and FAO (Food and Agriculture Organization of the United Nations). 2024. *Agricultural Outlook 2024–2033*. Paris: OECD Publishing; Rome: FAO. https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2024-2033_4c5d2cfb-en

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

A world free of hunger and malnutrition

IFPRI is a CGIAR Research Center

1201 Eye St, NW, Washington, DC 20005 USA | T. +1-202-862-5600 | F. +1-202-862-5606 | Email: ifpri@cgiar.org | www.ifpri.org | www.ifpri.info

Handle: https://hdl.handle.net/10568/175019