1 Overview and Recent Challenges

Sunday Odjo, Fousseini Traoré, Chahir Zaki, and Charlotte Hebebrand

Background and Overview

The Africa Agriculture Trade Monitor (AATM) is an annual flagship publication of the International Food Policy Research Institute (IFPRI) and AKADEMIYA2063. This seventh edition provides an overview of short- and long-term trends and drivers behind Africa's global trade, intra-African trade, and trade within Africa's regional economic communities (RECs), with a focus on the nexus of trade and climate change. The six chapters of this 2024 AATM report are as follows.

This first chapter offers an overview of the food security concerns in African countries in the wake of the global crisis related to the COVID-19 pandemic, the Russia–Ukraine war, and the global resurgence of protectionist policies. It examines trade through a food security lens, including availability, utilization, accessibility, and stability of food supplies, as well as the effects of tariffs, nontariff measures (NTMs), and deep trade agreements on food security in Africa. Special attention is paid to fertilizers, given the importance of these inputs for agricultural productivity and food security. As a result of Africa's heavy dependence on fertilizer imports, farmers, and particularly smallholders, were severely challenged in the recent crisis when spikes in international fertilizer prices were compounded by high rates of domestic inflation.

Chapter 2 looks at Africa's participation in world agricultural trade in terms of gross value and carbon emissions. Increases in trade and contributions to global trade value are first analyzed by comparing Africa with other world regions. The chapter then examines Africa's most traded products and degree of trade partner diversification, as well as identifying the world's largest players in global agricultural markets. Second, the chapter explores the continent's contributions to the global carbon footprint through trade in agricultural products, again comparing Africa with other regions. The origins and destinations of carbon emissions embodied in Africa's imports and exports are examined, contrasting emissions from agriculture with those generated in other sectors, including the fishing, textiles and apparel, mining and quarrying, and food and beverages sectors. The chapter highlights the importance of transitioning to sustainable production technologies and practices in Africa and of importing from suppliers that use cleaner production technologies.

Intra-African agricultural trade and its virtual water content are examined in Chapter 3. The chapter begins with a review of trade in value terms, focusing on trends and patterns within and among regional economic communities (RECs), and then examines the patterns of virtual water trade between African subregions for a dozen export products. An econometric analysis explores the determinants of virtual water trade among African countries, including the impact of water productivity and water and land endowments, along with other factors, on trade at the continental level, among RECs, and for specific commodities. This analysis supports a call for greater intra-African trade to alleviate the impacts of water scarcity.

Chapter 4 provides a detailed analysis of Africa's participation in fruit and vegetable value chains (FVVCs) and discusses challenges and opportunities within these value chains, including the potential impact of the African Continental Free Trade Area (AfCFTA). The chapter begins by examining the importance of the fruit and vegetable sector for Africa, as well as the risks inherent in this sector, with special attention to smallholders. It then identifies the main trends in exports and imports of fruits and vegetables, differentiating among unprocessed, semi-processed, and processed products. The chapter offers an analysis of the challenges affecting Africa's participation in FVVCs, including the region's capacity to increase its downstream presence in these value chains. It concludes with some policy recommendations focused on opportunities for improved intra-African integration in FVVCs.

Chapter 5 examines the impact of climate change on trade with a focus on how climate change will likely affect Africa's comparative advantages and regional integration. The chapter starts with an examination of Africa's high level of exposure to climate change. It then reviews the literature on shifts in Africa's comparative advantages caused by climate change and the associated impacts on trade flows. In addition, the sensitivity of individual unprocessed agricultural products to changes in temperature and water stress are investigated, identifying products at different levels of risk, ranging from very high to very low. Drawing on these findings, the chapter points to the importance of trade policy for mitigating these risks and adapting to climate change.

Agricultural trade integration in the Economic Community of West African States (ECOWAS) is the focus of Chapter 6 in this year's report. The chapter begins with a historical review of early regional integration initiatives in Africa and the main steps in the construction of ECOWAS. It then assesses intraregional trade costs, covering tariffs, NTMs, and logistics performance, with a special focus on currency diversity as an impediment to trade within the REC; it also assesses intraregional trade flows, including informal cross-border trade. The chapter then reviews key achievements and main challenges to greater ECOWAS integration, including the risk posed to the REC by the recent withdrawal of Mali, Burkina Faso, and Niger. It also calls for the monitoring and mainstreaming of substantial informal cross-border trade data in official statistics.

Trade and Food Security

How does trade contribute to food security?

The contribution of trade to food security has been much debated. According to the proponents of protectionism, some degree of trade restriction is necessary to promote local production and attain food self-sufficiency, which should yield food security. At the other end of the spectrum, proponents of trade liberalization consider trade paramount for food security, as it allows people to access affordable and more diverse food, thus improving food security and diets. Recent crises—such as the Russia–Ukraine war and the resurgence of noncooperative trade policies in key countries—have intensified the debate, and more countries are now calling for food self-sufficiency or food sovereignty. In this section, we shed light on both sides of this debate by considering the relationship of trade to each of the four dimensions of food security: availability, accessibility, stability, and utilization.

The first channel through which trade impacts food security is availability. The objective of opening a country to trade is to increase the quantity of food available to consumers, either complementing or replacing local production. Trade contributes to both the intensive and extensive margins of availability, that is, it both increases the quantity of products that are readily available and introduces new varieties. In addition, in a context marked by climate change and shifting comparative advantages, supply disruptions can be expected in many areas of the world. Trade can be critical for mitigating the impacts and maintaining the supply of food products under climate change, especially in Africa, where the impacts are expected to be significant (Gouel 2022; Gouel and Laborde 2021). However, the opponents of trade liberalization often argue that the contribution of trade to food availability is ambiguous and the strategy risky, given that dependence on world markets transmits global price shocks to local markets and creates market volatility. In addition, some global markets are highly concentrated around a few exporting countries, and when a crisis occurs, these countries turn to restrictive noncooperative (beggar-thy-neighbor) trade policies, with negative impacts in net importing countries (Laborde, Matchaya, and Traoré 2023).

The second channel is food accessibility, including both physical and economic accessibility. For trade to enhance physical access to food requires low transaction costs and good infrastructure for storing and moving food from food surplus to deficit areas. In terms of economic accessibility, trade is expected to ease access to cheaper food through production based on countries' comparative advantages and exploitation of arbitrage opportunities. In addition, by exporting products in which they have a comparative advantage, countries can generate sufficient income through export earnings to purchase more nutritious food for their own population. The logic here mirrors the options at the individual level: self-sufficiency in food production versus relying on one's comparative advantage and selling to the market to get the income needed to purchase more and higher quality food.

Stability is a key component of food security. Risk averse consumers seek stable supply and prices as an essential component of welfare, but there are divergent views on how to achieve this. On the one hand, domestic production may be more volatile than world production, given that domestic production is imperfectly correlated with external shocks and is affected by other domestic factors. In that context, trade can reduce the volatility of domestic food markets and stabilize prices. This stabilization mechanism can be at play even at the regional level, when regional aggregate production is less volatile than domestic production (Badiane, Odjo, and Jemaneh 2014); in this case, supply diversification can increase stability. On the other hand, when the external markets are more volatile than domestic production, domestic markets can become more volatile when open to trade. In that context, a set of policy instruments are available to governments, but these tools should be used with care as they can exacerbate the volatility of both domestic and world markets. For example, in a period of high and volatile prices, removing import duties—a frequent policy response—will increase demand and compound tensions in domestic and world markets.

Finally, trade can contribute to better food utilization. As mentioned, trade can improve the availability and access to more nutritious food, and the literature suggests it can improve the quality of diets by increasing dietary diversity and nutrient adequacy (Ruel 2003). However, trade can negatively impact nutritional outcomes if it increases the consumption of foods rich in fat, sugar, and other elements associated with increased risk of noncommunicable diseases (Shankar 2017). Thus, the net contribution of trade to food utilization is ambiguous, and complementary policies are needed to improve nutritional outcomes.

Is there a role for trade policy?

With this background on the channels through which trade affects food security, this section explores the trade policies that can affect food security. We focus on three main tools: tariffs, NTMs, and trade agreements.

When importing countries impose a tariff, all four dimensions of food security can be affected. First, tariffs lead to higher domestic prices (tariff pass-through) and thus to a reduction in the consumer surplus, which affects both accessibility and utilization of imported goods (Aboushady and Zaki 2023; Barlow et al. 2020). Second, tariffs can reduce incentives to import, thus reducing the availability of these products. However, the net effect on availability will be less than the decrease in imports, since tariffs can be expected to boost local production. Because Africa is net importer of agricultural goods, the high agricultural tariffs in African countries (15 percent on average) at the global level, and even between some countries within the same RECs, risk negative impacts on food security. This is especially true of tariffs on imported inputs. For example, Tanzania implemented a 10 percent tariff on imported edible oils as a means to protect domestic production and reduce dependence on imports; however, because the

country also levied a high tax on inputs needed for domestic production of edible oils, as well as because of poor transport infrastructure, the protectionist tariff did not improve food security or the competitiveness of Tanzanian producers (Mgeni 2018).

The effect of NTMs, which include export bans, sanitary and phytosanitary (SPS) standards, and technical barriers to trade (TBT), is rather heterogenous (Hepburn et al. 2021). First, export bans imposed by exporting countries (to ensure domestic supply) will negatively affect food security in importing countries, as both food accessibility and availability can be expected to decrease. Export bans also lead to higher world food prices (Gillson and Busch 2014) and an increase in price volatility in the country imposing them (Martin et al. 2024). Second, the effect of SPS and technical barriers to trade depends on countries' compliance. If exporting countries comply with the standards set by importing countries, trade increases and consumers have access to imported goods. When exporting countries do not comply, goods cannot cross borders, and food accessibility and availability are reduced. Bouët and Laborde (2016) examine the impact of different NTMs (such as import quotas, export taxes, export subsidies and export restrictions) and show that, while some measures increase self-sufficiency, they can also behave as beggar-thy-neighbor noncooperative policies, which negatively affect food security in importing countries. In addition, NTMs are highly protectionist. For instance, Cadot and Gourdon (2014) show that SPS regulations on imports of rice led to an increase in prices of 42 percent in Kenya and 30 percent in Uganda.

Trade agreements (both regional and multilateral) can affect food security. However, few studies have examined the impact of the depth of trade agreements on food security. The literature distinguishes between the horizontal and the vertical depth of trade agreements. Horizontal depth refers to the inclusion of provisions that go beyond tariff removal; vertical depth refers to the enforceability and precision of such provisions. The deeper the agreement, the more likely it can promote food security as it can include provisions related to NTMs, services, innovation, and other areas beyond tariffs. For instance, innovation-related provisions can promote technological transfer in soil, seeds, and production techniques, which increase production capacities and improve food security. Provisions related to NTMs can support mutual recognition or harmonization of standards and thus increase trade in agricultural products. In terms of regional trade, Raimondi et al. (2023) argue that global value chain integration is the main channel through which regional trade agreements (RTAs) can affect trade policy and thus food security. They show that, compared with countries with weaker participation in global value chains, countries characterized by stronger global value chains have lower tariffs with partners outside RTAs as well as lower NTMs with partners both inside and outside those agreements.

At the multilateral level, the World Trade Organization (WTO) can have a crucial impact on food security, as it can help to guarantee that members do not restrict trade in food unnecessarily (WTO 2023). In addition, through its various committees and agreements (especially the Agreement on Agriculture, the Agreement on Trade Facilitation, the Agreement on Technical Barriers to Trade, and the Agreement on Sanitary and Phytosanitary Measures), the WTO can provide the basis for trade negotiations relevant to food security in a multilateral setting. However, some studies show that the multilateral system has not increased trade in food. For instance, Mujahid and Kalkuhl (2015) argue that, despite the positive impact of the WTO and RTAs on trade among participant countries, trade in food is not affected by WTO membership. In contrast, RTAs have led to increased food trade among their participants.

Trade in fertilizers and food security

A focus on the links between food security and trade must consider trade of and access to agricultural inputs. The great majority of phosphate and potash fertilizers are produced in a few major producing regions that have phosphate and potash resources. While nitrogen can be produced anywhere, major producers tend to be in regions with access to relatively low-priced natural gas (or coal). As a result, a large share of fertilizers applied around the world are imported from a limited number of major producing regions.

Fertilizers provide essential nutrients to crops and play an important role in increasing agricultural productivity and, by extension, food security. Nitrogen, phosphate, and potash are essential macronutrients provided by fertilizers, but soils also need secondary nutrients (calcium, magnesium, and sulfur) as well as eight micronutrients that are also provided by chemical fertilizers. Nutrients can also be provided by organic fertilizers, including manure and plant residues, and via biological nitrogen fixation (through legumes). However, mineral fertilizers play a crucial role, since they offer higher levels and known quantities of needed nutrients in a form more readily available to plants. Nitrogen fertilizers alone have been estimated to account for half of global agricultural production.

Sub-Saharan Africa had an average fertilizer application rate of 22 kilograms per hectare in 2018, compared to the average global application rate of 139 kilograms. Low fertilizer application rates help to explain the much lower crop yields (estimated to be 30 percent of global averages) in sub-Saharan Africa compared with other regions, as well as the fact that increases in agricultural production in the region are largely achieved through cropland expansion rather than productivity gains.

Increasing fertilizer application would provide an important boost to agricultural productivity in sub-Saharan Africa and promote food security on the continent. African countries continue to be dependent on fertilizer imports, particularly nitrogen and potash, from outside of Africa. Although African nitrogen production capacity has increased substantially in recent years (notably in Nigeria), most of this new production is exported outside of Africa. African countries thus remain vulnerable to fertilizer price shocks and supply disruptions, such as those witnessed following the Russian invasion of Ukraine, which led to an estimated 25 percent decline in African fertilizer use in 2022 (AU 2024). The fact that sub-Saharan Africa accounts for 3 to 4 percent of global fertilizer consumption makes it especially vulnerable to shocks, as suppliers may bypass Africa to export to larger markets during periods of high prices. High transportation costs, regulatory bottlenecks to intra-African trade, and a lack of financing available to fertilizer value chain players also hinder the movement of fertilizers across borders and last-mile delivery in Africa.

The importance of increasing intra-African fertilizer trade is recognized in the Nairobi Declaration, which was signed by African heads of state at the May 2024 Africa Fertilizer and Soil Health Summit (AU 2024). The Declaration calls for leveraging the AfCFTA to double intra-Africa fertilizer trade by 2034; harmonizing national and regional policies and regulatory frameworks to ensure coherence and promote regional and continental trade; and strengthening public–private partnerships to enhance investments in the fertilizer value chain.

Likewise, the 10-year African Fertilizer and Soil Health Action Plan released at the Summit, which sets a goal of tripling of fertilizer use to 54 kilograms per hectare by 2034, calls for the promotion of regional and continental trade; greater facilitation of farmers' access to local, national, and international input and output markets; and new incentives for the private sector to invest in African food systems as well as increased government investments in transportation and communications infrastructure to lower the costs of food trade among African countries.

Data and Methodology

The AATM report relies heavily on trade statistics to monitor trade in agriculture. As high-quality statistics are essential for developing good policy recommendations, and the continent's official data on agricultural trade are often inaccurate and include little information on pervasive informal cross-border trade, the construction of a high-quality trade database was essential for the preparation of the AATM. Here we present the statistical approach we have adopted to ensure rigorous analysis.

As in the previous editions, the 2024 release of the AATM is based on an original dataset constructed to provide better statistics on global and African trade. This analytical database employs the United Nations' commodity trade statistics (UN Comtrade Database). Raw trade data are processed to provide an accurate estimate of formal cross-border trade in Africa (no estimate of informal trade is included in this 2024 edition of the AATM dataset). However, informal trade is considered in the chapter devoted to ECOWAS (Chapter 6).

In the first step, the data are harmonized and cleaned. Trade flows of less than US$1,000 at the product and bilateral levels are discarded, since they are associated with significant noise in quantity estimates. Because countries report in different Harmonized System (HS) nomenclatures, all data are converted to the HS 2012.

In the second step, we reconstruct unique trade flows in the presence of discrepancies in mirror trade flows, that is, the import and export declarations of the same trade transaction. Rather than averaging the two declarations, a series of checks aimed at identifying the most reliable declaration is conducted. First, export and import unit values for each trade flow (trade value divided by the corresponding trade quantity) are computed; outliers are identified, and their associated trade flows discarded. An observation is considered an outlier if the absolute deviation is greater than three times the mean absolute deviation (the average distance between each data point and the mean). This gives us a sense of the variability in the dataset. The remaining trade flows are selected based first on the importer's declaration—these are generally more reliable because collection of customs duties requires that imports be monitored carefully. When an importer's declaration is not available or was previously discarded, the exporter's declaration is used.

Finally, the trade flows are all expressed in CIF (cost-insurance-freight) value. When the exporter's FOB (free-on-board) declaration has been used, a CIF/FOB correction is applied. The estimates of the CIF/FOB ratios used to make this correction are obtained using a gravity equation including distance, contiguity, common official language, and colonial relationship as explanatory variables. When estimating the gravity equation, trade values are weighted by quantities using the gap between the reported mirror quantities to give more importance to trade flows similarly reported by both partners. From the gravity equations, estimates at the HS 2-digit level of the CIF/FOB ratio are derived and applied to export declarations.

The annual AATM aims to provide a thorough analysis of Africa's trade in agriculture. Over the years, the AATM database has gained in accuracy and the length of time covered. As highlighted in preceding editions of this report, the measurement and integration of informal trade data in the AATM database remains a challenge that must be addressed to obtain a complete picture of intra-African trade flows. Here a recent initiative led by the United Nations Economic Commission for Africa (UNECA), the African Union, and Afreximbank is worth mentioning. The initiative has developed a methodology for collecting harmonized data on informal cross-border trade flows. Its next phase will launch a set of pilot studies before extending the methodology to the whole continent. In coming years, the data collected under this initiative could enrich the AATM database.

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