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COMMITTEE ON COMMODITY PROBLEMS

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IN BRIEF
THE STATE OF AGRICULTURAL COMMODITY MARKETS (SOCO) 2020

"AGRICULTURAL MARKETS AND SUSTAINABLE DEVELOPMENT: GLOBAL VALUE CHAINS, SMALLHOLDER FARMERS AND DIGITAL INNOVATIONS"

Food and Agriculture Organization of the United Nations

2020

IN BRIEF

THE STATE OF AGRICULTURAL COMMODITY MARKETS

AGRICULTURAL MARKETS AND SUSTAINABLE DEVELOPMENT: GLOBAL VALUE CHAINS, SMALLHOLDER FARMERS AND DIGITAL INNOVATIONS

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COVER PHOTOGRAPH ©iStock.com/hadynyah
VIET NAM. A woman selling tropical fruits in the old town of Hoi An city.

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FOREWORD

The 2020 edition of *The State of Agricultural Commodity Markets* (SOCO 2020) comes out at a crucial juncture for the global economy and the global food systems, as we join our efforts to contain the global pandemic triggered by the spread of COVID-19.

The pandemic has clearly shown us that, in an interconnected world, diseases and the effects of measures taken to contain them spread rapidly over national borders. While the pandemic is not the central theme of this report, it highlights the close relationship between the production, consumption and trade of food. This fact underlines the importance of adopting an integrated approach to food systems and makes the release of SOCO 2020 even timelier.

I invite you to read this report carefully, as it contains important information on how markets can bring us closer to achieving the Sustainable Development Goals of Agenda 2030. SOCO 2020 provides novel data analysis for trade and markets around the world. It offers a detailed study of major global trends in agri-food markets to identify how to reap economic, environmental and social gains and spur development.

Trade in food and agriculture has more than doubled in real terms since 1995. Emerging and developing countries have become active participants in global markets, and they now account for about one-third of global trade. Technological advancements have made it possible to transform production and trade processes, which has in turn enabled global value chains in food and agriculture to emerge. SOCO 2020 estimates that about one-third of global agricultural and food exports are traded within a global value chain.

A central argument of this report is that well-functioning markets are key for development and economic growth. International trade can be a powerful instrument, and markets can be harnessed to foster sustainable economic, social and environmental outcomes. Global value chains can make it easier for developing countries to integrate into global markets. As they link our food markets closely, they also provide a mechanism to diffuse best practices to promote sustainable development.

But in this rapidly transforming market environment, we should leave no one behind. We need to redouble efforts to include smallholder farmers in modern food value chains, thus securing rural incomes and food security in both rural and urban areas. Smallholder farmers face many challenges that can undermine their attempts to farm and market their products effectively. Policies and mechanisms that support them in this regard will be indispensable to encourage their productivity and market participation.

Digital technologies can help markets to function better and can improve farmers' access to them. Innovations, such as food e-commerce, can benefit both farmers and consumers. However, to guarantee that the dividends of digital innovation are shared with the poorest, we must reduce the current digital divide. Nevertheless, it is difficult to foresee all the impacts that technological innovation could have on how we grow, process, trade and consume food. Today, we know that further usage of technology can help us achieve significant gains in this area. But it is worth noting that some of the risks involved in technology adoption are not yet fully understood. We have to strengthen our joint efforts and ensure that the digital revolution reinforces development.

SOCO 2020 makes it abundantly clear that we need to rely on markets as an integral part of the global food system. This is all the more important in the face of major disruptions, whether they come from COVID-19, locust outbreaks or climate change.

We all have a role to play in sustainable development and the eradication of hunger. FAO is here to support its Members and partners in this endeavor.

Qu Dongyu
FAO Director-General

MAIN MESSAGES AND POLICY RECOMMENDATIONS

➔ Since 1995, international trade in food and agriculture has more than doubled in real terms but its growth rate has been slower since the 2008 financial crisis. Developing countries and emerging economies are increasingly participating in global markets, and their exports make up more than one-third of global agri-food trade.

➔ Increased awareness of developments in global agricultural and food markets and a systematic understanding of trade policies are crucial for addressing challenges related to the transformation process, financial shocks, natural disasters and health-related crises, such as the COVID-19 pandemic.

➔ Global value chains have emerged rapidly and are widespread in food and agriculture. About one-third of global agricultural and food exports are traded within global value chains.

➔ Lower trade barriers can promote global value chains and contribute to growth in agriculture and the food industry. Every time products cross borders, they are subject to import tariffs, which escalate along global value chains and hinder value added creation.

➔ Trade policies that foster open markets should be complemented by measures that improve the capacity to compete in modern global value chains. These include investments in infrastructure, effective regulation and, most importantly, measures targeting the upgrade of skills for farmers and workers.

➔ In many developing countries, farmers face significant constraints to access markets. For women, these constraints are even higher. Stringent requirements in modern food value chains could further isolate farmers from the market mechanism.

➔ Increasing farmers' participation in markets expands their choices. Markets allow farmers to better decide on how and what to produce and how to invest in their farms, their families and themselves. This can lead to livelihood improvements in agriculture or in other economic sectors.

➔ Agricultural and food markets can be harnessed to deliver sustainable development outcomes. Promoting and widely applying voluntary sustainability certification schemes can address trade-offs between economic, environmental and social objectives.

➔ Digital technologies can be leveraged to address multiple market failures and facilitate smallholder farmers' integration in markets and value chains. They can also promote international trade and effectively improve market-based institutional arrangements for contributing towards sustainable outcomes.

➔ Understanding the challenges that arise from digital technologies and addressing the risks associated with their use require enhanced collaboration and consensus among all stakeholders, including governments, the private sector and the farmers themselves, to improve governance mechanisms.

SUMMARY

TRADE, MARKETS AND SUSTAINABLE DEVELOPMENT

Trade and markets lie at the heart of the development process. In food and agriculture, markets expand consumers' choices and create incentives for farmers. Markets thereby enable the optimal allocation of resources and provide the avenues which link agriculture with other sectors of the economy. This makes markets crucial for the structural transformation of the economy. How trade and markets contribute to sustainable development is the subject matter of this 2020 edition of *The State of Agricultural Commodity Markets* (SOCO).

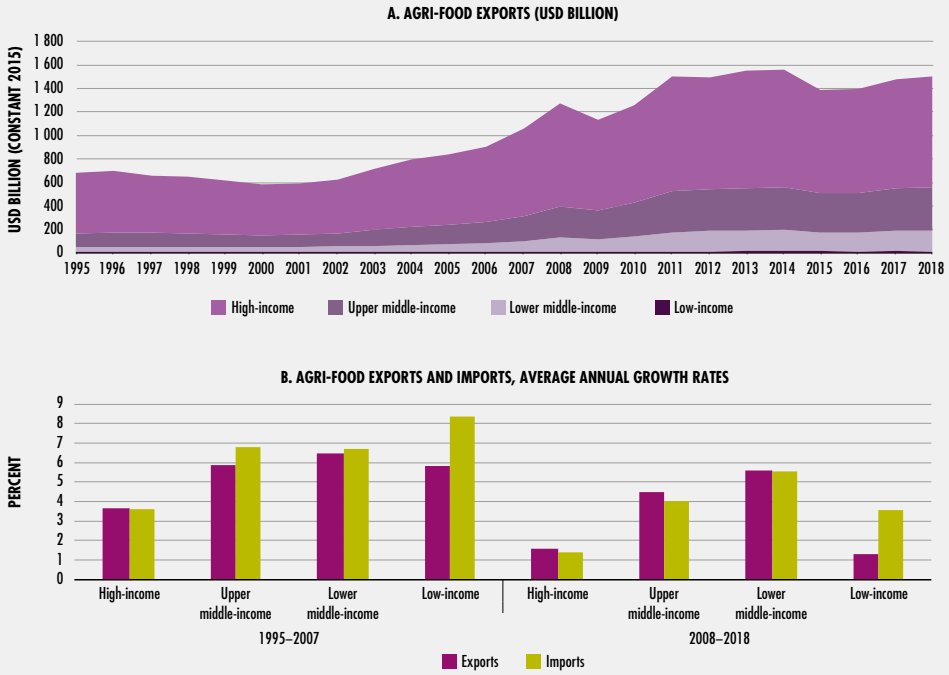
The role of well-functioning markets in driving economic growth is significant; however, the market mechanism cannot guarantee the provision of a range of social and environmental benefits that are central to sustainable development. In some instances, markets may fail to reconcile the interests of individuals with those of society as a whole, but also with the needs of future generations, which are embedded in the 2030 Agenda for Sustainable Development.

The 2030 Agenda and its 17 Sustainable Development Goals (SDGs) aim at a better and more sustainable future for all. They address the global challenges we face, including ending poverty and hunger and restoring and sustainably managing natural resources. The SDGs integrate the three dimensions of sustainable development – economic, social and environmental – with closely interwoven targets.

Agriculture is central to the 2030 Agenda. Its linkages with food security, economic growth, employment and poverty eradication, the environment and natural resource management, and nutrition and health are reflected in most of the SDGs. Markets identify these linkages. This report discusses policies and institutions that can promote economic growth and also harness agricultural and food markets to contribute towards sustainable outcomes – economic, social and environmental.

SOCO 2020 explores the evolution of trade and markets and examines their roles in growth and sustainable development. It looks specifically at the emergence of global value chains in food and agriculture; the extent to which smallholder farmers in developing countries participate in value chains; and the transformative impacts of digital technology on markets.

FIGURE 1.1 EVOLUTION OF AGRI-FOOD TRADE, 1995–2018 (COUNTRIES CLASSIFIED IN GROUPS BY INCOME LEVEL)



NOTE: All calculations are based on values of trade at 2015 prices. Country income groups are based on the classification of the World Bank. The calculations in Panel B are based on three-year averages of values of trade at 2015 prices.
SOURCE: FAO calculations using UN Comtrade data (accessed May 2020).

The evolution of trade and markets

Since 1995, international trade in food and agriculture more than doubled in real terms to amount to USD 1.5 trillion in 2018. Emerging economies and developing countries are increasingly participating in global agricultural and food markets; their exports have grown to more than one-third of the world total (Figure 1.1).

This growth in trade is the result of several drivers. Lower transport costs have made it cheaper to trade. Trade policies and the decline in import tariffs – resulting from the World Trade Organization (WTO) Agreement on Agriculture that entered into force in January 1995 and many bilateral and regional trade agreements – have also been key drivers in promoting trade in food and agriculture.

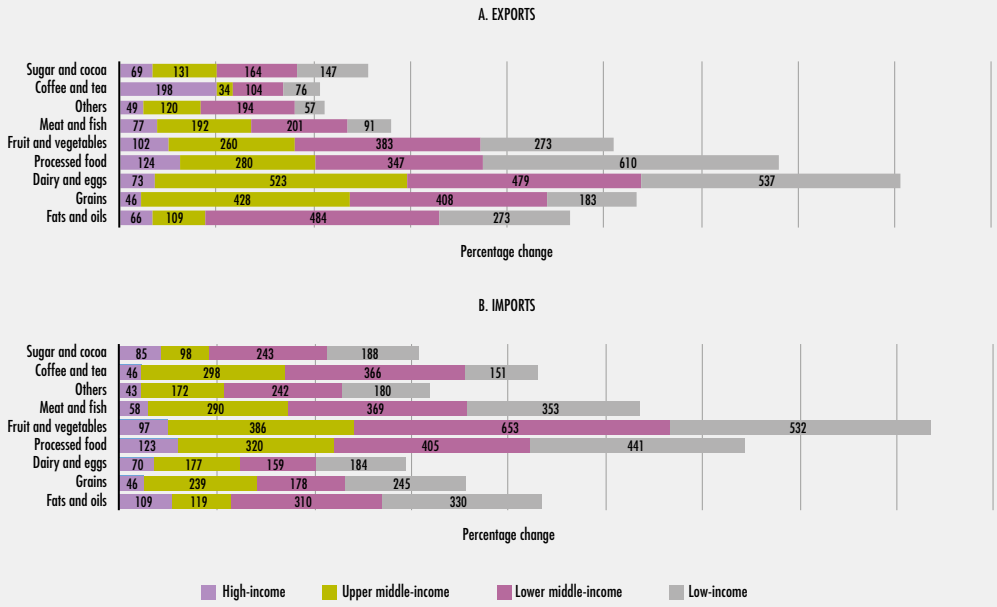
These drivers, together with increases in income in both developed and developing countries, have fueled trade expansion in food and agriculture. Income growth is also associated with demographic trends, such as urbanization, which all bring about new lifestyles and changes in diets, thereby affecting trade and markets. As countries develop, people consume less staple foods and more meat, dairy products, and fruit and vegetables. These changes in diets are reflected on international trade patterns (Figure 1.4).

Urbanization is occurring at a more rapid pace in the developing world than it did, for example, in Europe and has affected domestic food markets. Consumers' preferences for convenience, food quality and safety are strengthening the vertical coordination of food value chains. In countries in Asia and Latin America and the Caribbean, sales of leading supermarket chains increased up to tenfold between the beginning of the century and 2018. In sub-Saharan Africa, urban consumers are also more likely to shop in supermarkets, and they spend a higher share of their income eating out.

At the same time, advances in digital technology have improved communication between people and are having a profound impact on economies and societies. Better communication brings about cultural proximity which, in turn, affects consumers' preferences for food. Also, as farmers and firms find it easier to communicate, they can better coordinate their operations across borders and become part of global value chains. This report estimates that about one-third of trade in food and agriculture takes place within global value chains and crosses borders at least twice, as primary commodities are initially exported to be processed into food products, which, in turn, are re-exported (Figure 2.1).

The evolution of international trade and agri-food global value chains were interrupted by the financial crisis in 2008. Since then, the slowdown of the global economy, and especially in emerging economies, has affected trade and global value chains (see Figure 1.1). In the first part of 2020, markets, both domestic and global, are once more facing significant challenges due to the outbreak of COVID-19 and to the restrictions on people's movement and international travel that were imposed to contain its spread. The pandemic and its impact on the global economy are expected to affect trade considerably. The WTO suggested that world merchandise trade would plummet by

FIGURE 1.4 CHANGE IN EXPORTS AND IMPORTS BY FOOD AGGREGATE, 1995–2018 (COUNTRIES CLASSIFIED IN GROUPS BY INCOME LEVEL)

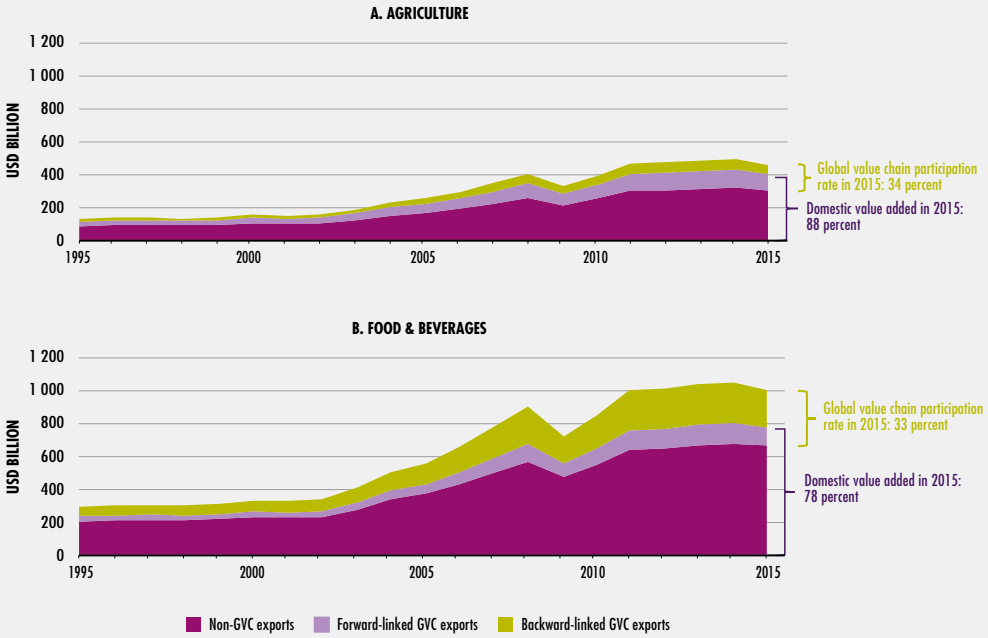


NOTE: The calculations are based on three-year averages of values of trade at 2015 prices. For illustration purposes, the percentage change from 1995 to 2018 per country income group is shown in one bar by food aggregate. The percentage changes within food aggregates cannot be added up.
SOURCE: FAO calculations using UN Comtrade data (accessed May 2020).

13–32 percent due to the COVID-19 pandemic disrupting economic activities.

Governments and the private sector are attaching high priority to keeping food value chains alive and functioning amid movement restrictions. Efforts are being made to link food production areas with urban centres through special channels (following safety measures, such as testing, physical distancing and other hygienic practices) to accelerate the delivery of perishable and nutritious foods to affected populations. At the global level, policy-makers in many major food exporting countries

FIGURE 2.1 GROSS EXPORTS AT GLOBAL LEVEL AND GVC PARTICIPATION, 1995–2015



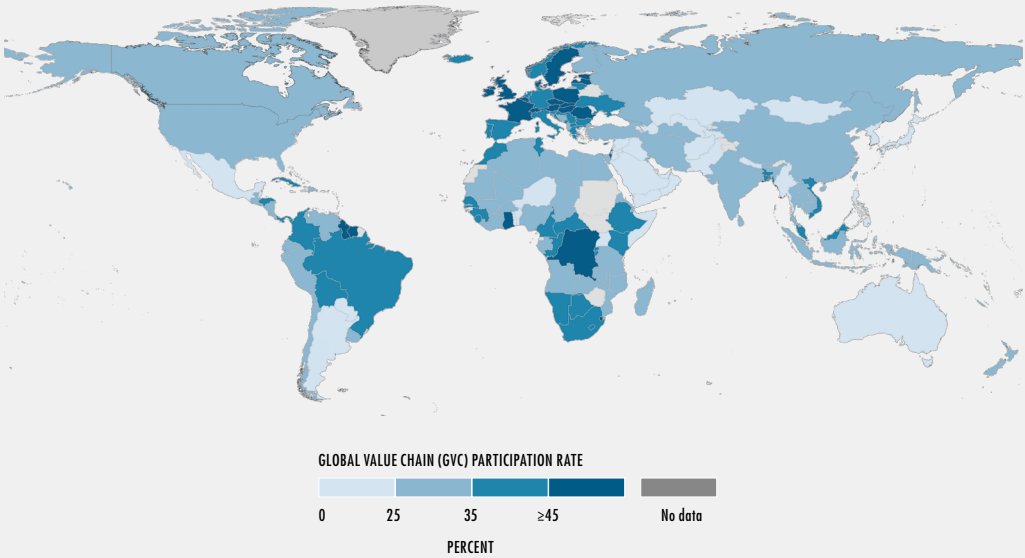
NOTE: Backward-linked global value chain (GVC) exports is the sum of foreign value added (FVA) across countries, that is all value added that has already been part of exports earlier in the value chain; at the global level, this represent double-counted value added. Forward-linked GVC exports are exports that will later be re-exported, again aggregated across countries. Non-GVC exports are exports that do not flow through GVCs. Backward- and forward-linked exports add up to GVC participation; forward-linked exports and non-GVC related exports add up to domestic value added (DVA), aggregated across countries. The sum of the three elements equals gross exports. See Box 2.1 for definitions.
SOURCE: FAO analysis by Dellink *et al.* 2020.

committed not to impose restrictive trade measures, such as export bans, to ensure that trade could continue to move food and agricultural products from surplus to deficit regions, thus promoting food security globally. ■

THE CONTRIBUTION OF AGRICULTURAL AND FOOD GLOBAL VALUE CHAINS TO ECONOMIC GROWTH

Global value chains (GVCs) have become an important part of food and agricultural trade (Figure 2.2).

FIGURE 2.2 GVC PARTICIPATION RATES IN AGRICULTURE IN 2015

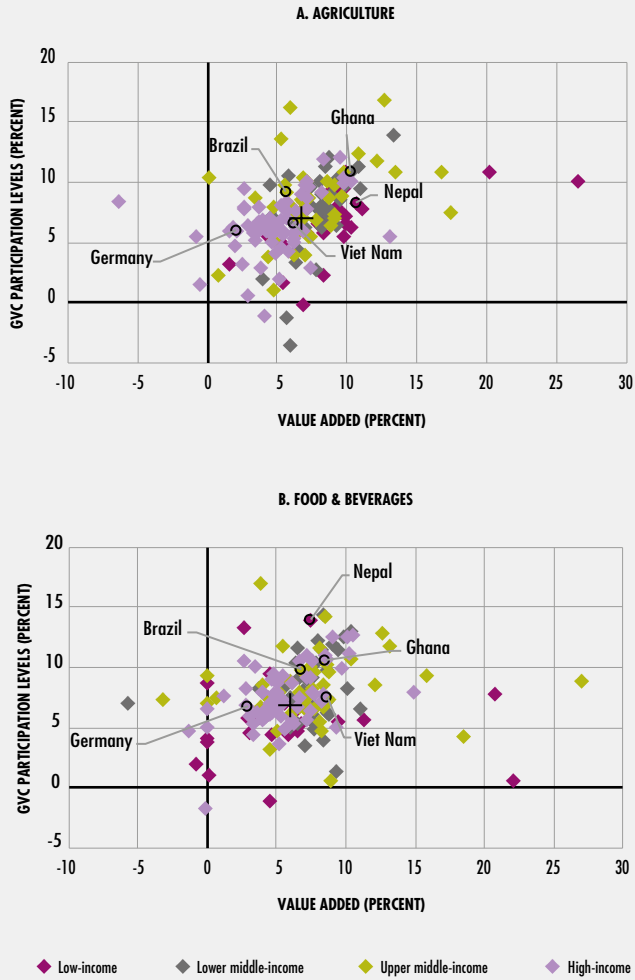


NOTE: GVC participation rates are the sum of backward and forward GVC linkages as ratio of gross exports. See Box 2.1 for definitions.
SOURCE: FAO analysis by Dellink *et al.* 2020.

GVCs unbundle the production process into stages in different countries to achieve efficiency gains. This allows farmers and firms in developing countries to overcome limitations arising from the lack of well-developed and export-orientated domestic food sectors. People have more options to join global markets and can better leverage their comparative advantage at any stage of the value chain they choose.

Emerging evidence shows that participation in value chains can be even more beneficial for growth and productivity than bilateral non-GVC trade. Indeed, there is a positive association between growth in agri-food value added and growth in GVC participation, although this does not imply a causal relationship (Figure 2.6). In both sectors – agriculture and food and beverages – those countries that exhibit a higher average growth rate in value »

FIGURE 2.6 RELATIONSHIP BETWEEN GROWTH IN VALUE ADDED AND GROWTH IN GVC PARTICIPATION BETWEEN 1995 AND 2015 (COUNTRIES CLASSIFIED IN GROUPS BY INCOME LEVEL)



NOTE: Global value chain (GVC) participation reflects growth in participation levels, not rates. Value added reflects total sectoral value added in production. Growth rates reflect average annual growth rates between 1995 and 2015.
SOURCE: FAO analysis by Dellink *et al.* 2020.

» added tend to have higher growth in GVC participation levels.

For developing countries, GVCs can be a significant avenue to growth. Being closely coordinated, GVCs can sharpen the effects of international trade on growth – technology and knowledge spillovers that can increase productivity, improve employment opportunities and raise incomes. Research undertaken for SOCO 2020 suggests that, on average and in the short term, a 10 percent increase in agriculture's GVC participation can result in an increase of around 1.2 percent in labour productivity. This immediate impact also translates into sustained long-term positive effects on productivity which can bring about important benefits to developing countries.

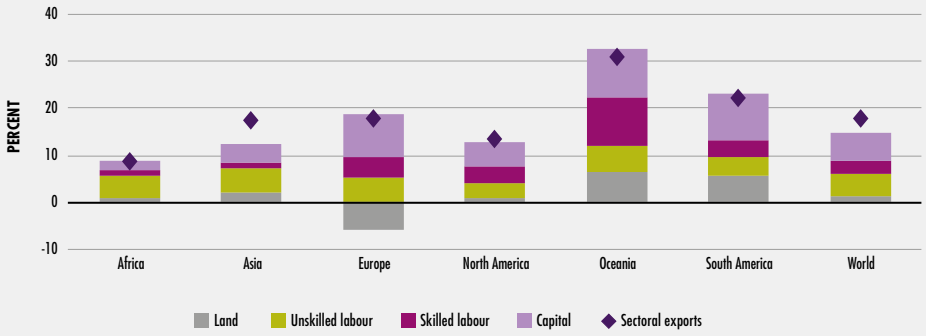
Increased GVC participation can have positive and negative environmental outcomes. On the one hand, GVCs foster growth; on the other, they may not necessarily result in better management of natural resources. For example, there are concerns that increased crop production for exports, a result of trade openness, contributes to deforestation. However, GVCs that are coherent with sustainable development objectives, for example those that adhere to regulation and standards, can spread sustainable technologies and practices. At the same time, they can promote productivity and income growth across countries. An active effort needs to be made to add sustainability to trade.

Trade policies are crucial. As GVCs run across countries, products cross borders multiple times and are subject to tariffs at each of them. Fewer and lower trade barriers can help promote GVCs. For developing countries, this is important. Lowering import tariffs along a GVC can increase imports of inputs and intermediate products. This, in turn, can stimulate production and exports, resulting in considerable gains in productivity, employment and incomes.

Opening global markets and promoting GVCs can create important spillover effects by transferring technology and know-how. But, to translate these into lasting gains, complementary policies are necessary to underpin competitiveness, such as measures that improve governance and infrastructure, upgrade skills, and remove rigidities from labour markets. However, there are concerns about the short-term effects of opening trade, especially the impacts on income distribution and inequality.

On average, trade and GVC participation can have a positive effect on agricultural income, both in terms of domestic value added and the share that accrues to labour. Especially in developing countries, increased GVC participation could create more jobs for unskilled workers. Indeed, increased GVC participation through the removal of trade barriers and distortive policies is projected to lead to a relatively large increase in the demand for unskilled labour in regions where average income per capita is relatively low (see Figure 2.9).

FIGURE 2.9 PROJECTED EFFECTS OF OPENING TO TRADE ON EXPORTED AGRI-FOOD VALUE ADDED BY PRODUCTION FACTOR, PERCENT CHANGES



NOTE: The simulation scenario consists of removal of all (agri-food and other) tariffs, subsidies and taxes on agri-food outputs and land inputs. Sectoral exports reflect both domestic and foreign value added exported by the agri-food sectors.
SOURCE: Based on analysis provided by Salvatici. 2020.

Regional trade agreements can also be instrumental in promoting GVC trade. Lower tariffs between signatories can promote vertical coordination and value chains. Coverage of many economic sectors by such agreements can strengthen their effect on agri-food GVCs, as a significant share of agri-food exports' value originates from other sectors besides food or agriculture. For example, globally, about 38 percent of the value added in food exports originates from imported services.

Regional trade agreements can also contain clauses on competition policy, or standards harmonization, resulting in policy reform and high levels of integration between signatories. Although many view these agreements as building blocks of a global trading system, increased emphasis on regional trade should also be complemented by promoting multilateral trade to contribute to economic growth in countries, such as those located in sub-Saharan Africa, that trade mostly with global rather than regional partners.

The impact of COVID-19 on agricultural and food trade and global value chains

The financial crisis of 2008 and the consequent economic slowdown stalled »

BOX 2.7 TRADE POLICY RESPONSES TO THE COVID-19 PANDEMIC

In the spring of 2020, the COVID-19 pandemic and the restrictions on the movement of people to contain it had a severe impact on goods and services that rely on transport, especially ground and air freight, as well as on the availability of agricultural labour domestically and internationally. These factors induced overall disruptions in the logistics of the food value chains, both global and domestic, impeding the transportation of food and agricultural inputs (see also Box 1.2 in Part 1). At the time this report was being produced, sea freight had not been significantly affected – with port state authorities coordinating their actions to keep ports and maritime transport functioning. Nevertheless, disruptions to air freight – as worldwide flights declined by 70 percent between January and April 2020 – gave rise to challenges, especially for the trade of perishable foods such as fruits.

Although the pandemic has, once more, triggered the debate on globalization, the restrictions on travel and movement may necessitate some short-term rebalancing between global and domestic value chains to ensure food availability, particularly for the most vulnerable population segments. In the long run, the economic impacts of the pandemic may lead to adjustments of trade patterns, which, similarly to the economic slowdown after the 2008 financial crisis, could affect global value chains. GVCs foster channels through which technology and knowledge are diffused. These same channels also transmit economic shocks and their impacts. Severing these channels to address the trade-off between efficiency and resilience to shocks should not form a long-run strategy. Shifting away from international trade and GVCs, could significantly undermine efficiency gains that are associated with comparative advantage and may result in increasing domestic food prices – an undesired outcome in times of declining incomes. The COVID-19 pandemic requires international collaboration and coordination rather than pursuing self-sufficiency in food. As impacts across the world are not occurring at the same time, international trade can help manage risks and contribute to resilience.

However, the most significant threat to food security comes from export bans. FAO, together with other international organizations such as the International Fund for Agricultural Development (IFAD), the World Food Programme (WFP), WHO, WTO and the World Bank, underlined both the need to keep value chains in food and agriculture functioning and the detrimental effect export restrictions could have on the global market. In the 2007–2008 food price crisis, panic-driven export bans and rapid escalation in food stock procurement through imports exacerbated price volatility. The results of these measures proved extremely damaging for low-income food-import

BOX 2.7 (CONTINUED)

dependent countries, as well as to the efforts of humanitarian organizations to procure supplies.

Global policy-makers responded. During the Meeting of G20 Agriculture Ministers on 21 April 2020, ministers committed to "guard against any unjustified restrictive measures that could lead to excessive food price volatility in international markets and threaten the food security and nutrition of large proportions of the world population, especially the most vulnerable living in environments of low food security". They also agreed to implement measures that are transparent and temporary and that do not result in disruptions to global food supply chains, in line with WTO rules.

Furthermore, the European Union and 21 other WTO members also pledged to ensure well-functioning global food supply chains and committed to open and predictable trade in agricultural and food products during the pandemic.

SOURCES: FAO, WHO & WTO. 2020; FAO, IFAD, World Bank & WFP. 2020; G20 Extraordinary Agriculture Ministers' Statement, April 2020; WTO. 2020.

» the evolution of agri-food GVCs, and the COVID-19 pandemic is expected to disrupt their potential in global trade and growth further. GVCs foster trade linkages that act as channels of technology and knowledge diffusion during periods of economic growth; similarly, they can transmit economic shocks and their impacts. As firms address the trade-off between efficiency and resilience to the economic slowdown, they may pursue a process of localization of food production by reshoring activities for foods that allow it (Box 2.7).

Such strategies could significantly undermine efficiency gains that are associated with comparative advantage and could increase domestic food prices – which is undesirable in times of declining incomes. Relying on food and agriculture from domestic and multiple sources across the world is a form of resilience against food insecurity and economic downturns. Global shocks like the 2008 financial crisis and the COVID-19 pandemic require international collaboration and coordination rather than measures that promote self-sufficiency in food, especially when impacts are not occurring in all countries at the same time. Therefore, trade provides an efficient avenue to better manage risks arising from a shock and to increase resilience. In the context of COVID-19, efforts to minimize the disruption of GVCs and promote agricultural and food trade can generate both short- and long-term benefits. ■

INTEGRATING SMALLHOLDER FARMERS INTO VALUE CHAINS FOR SUSTAINABLE DEVELOPMENT

The relationship between trade and growth is complex, and the effect of globalization on the distribution of income across and within countries has been under debate for a long time. As trade expands, all countries gain, and many experience fast rates of growth. However, at the same time, the gap between low-income developing countries and the developed and emerging economies can widen. Some analysts suggest that the forces of globalization do not benefit those who cannot compete globally.

In agriculture, for example, a major issue is how to integrate smallholder farmers into markets, both global and domestic, and include them in the development process. In developing countries, nearly all farmers sell to and buy from markets. But markets function poorly, and the costs of transactions are high. Many smallholder farmers have low rates of commercialization (see Figure 3.4 and Figure 3.5). For many, markets, such as those for insurance and credit, fail to function and are entirely missing. This has important implications for food security, livelihoods and development.

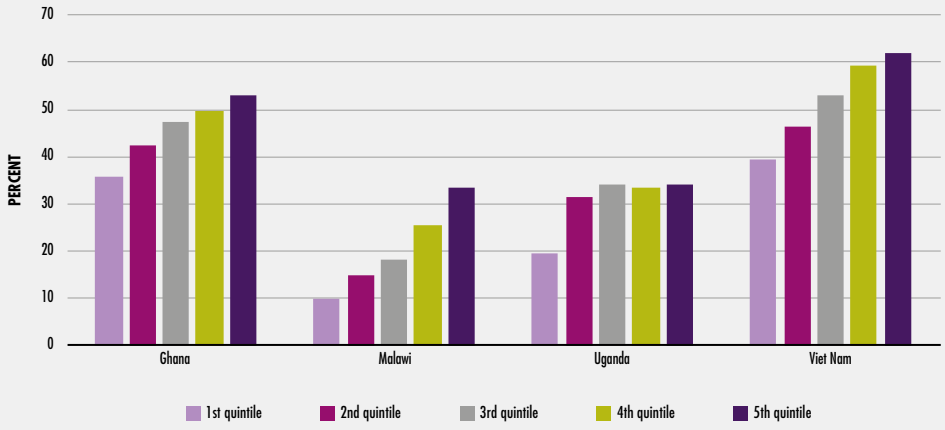
The emergence of GVCs, with their stringent requirements in terms of food quality and safety, can further marginalize smallholders.

Broad policies are necessary to create an environment that enables markets to flourish – for example, improved rural infrastructure and services, education and productive technology. In addition to these policies, inclusive business models, such as contract farming, driven by the private sector and supported by governments and the civil society, can help farmers integrate into modern and more complex value chains.

Innovative solutions also include multifaceted programmes that simultaneously address the multiple constraints farmers face in marketing, technology and finance. For example, contract farming schemes can obviate market failures related to price risk, access to productive inputs and credit, and access to technology and knowledge. These can improve productivity, raise commercialization rates, increase incomes and reduce poverty. Although contract farming can improve access to value chains and generate benefits for many smallholders, its effects can be highly diverse.

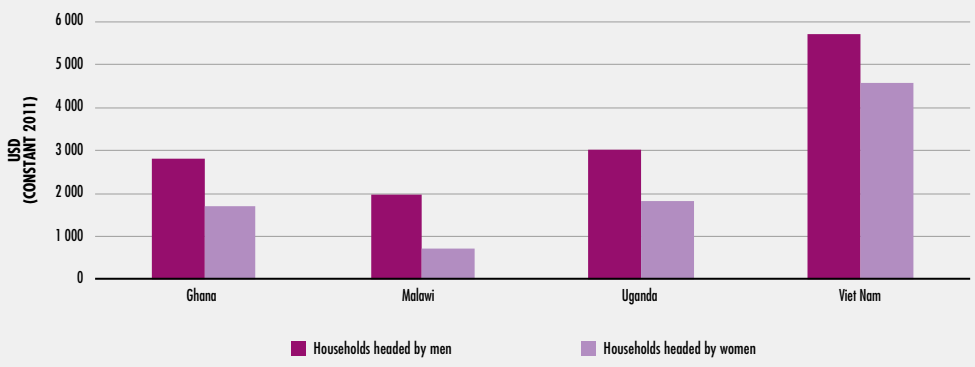
Contract schemes may exclude farmers with very small landholdings, failing to address inequality issues fully. They can also be subject to reversals and may collapse frequently. There is a high rate of exit, as farmers move in and out of contracts, possibly because farmers have difficulty in meeting quality requirements or because participation was not profitable compared to alternative activities. If markets and »

FIGURE 3.4 SHARE OF HOUSEHOLD PRODUCTION SOLD IN MARKETS ACROSS THE FARM SIZE DISTRIBUTION IN GHANA, MALAWI, UGANDA AND VIET NAM, QUINTILES



SOURCE: Smallholder DataPortrait, FAO (available at http://www.fao.org/family-farming/data-sources/dataportrait/farm-size/en/).
The data were compiled from Living Standards Measurement Studies (Ghana 2013, Malawi, 2011, Uganda 2012, Viet Nam 2008).

FIGURE 3.5 AVERAGE TOTAL HOUSEHOLD INCOME BY GENDER OF HOUSEHOLD HEAD (USD, VALUED AT 2011 PRICES)



SOURCE: Smallholder DataPortrait, FAO (available at http://www.fao.org/family-farming/data-sources/dataportrait/farm-size/en/).
The data were compiled from Living Standards Measurement Studies (Ghana 2013, Malawi, 2011, Uganda 2012, Viet Nam 2008).

» value chains are to contribute to development, sustained participation is necessary. The positive effects of contract farming on farmers will be larger if participation is continuous, as investments on productive assets, technologies and knowledge take time to generate benefits.

Increases in commercialization and trade can improve incomes and livelihoods but, at the same time, may lead to undesirable environmental outcomes. Intensification in agricultural production for exports, stimulated by trade openness and globalization, could result in water pollution, increased greenhouse gas emissions and biodiversity loss. These impose costs to society as a whole in terms of, for example, low water quality, global warming and declines in crop pollination.

Governments have a range of policy tools to address such costs. For example, taxes can make markets take into account various environmental costs to society. Public policies apart, certain arrangements can leverage markets to align private aspirations with public ones; those arrangements can thereby contribute towards sustainable development, especially in the context of global value chains. Value chains combined with sustainability certification schemes can develop markets for food produced sustainably.

For example, in Nicaragua, coffee farms complying with a range of sustainability standards (including Coffee and Farmer Equity [C.A.F.E.] Practices, Fairtrade, Organic, Rainforest Alliance and UTZ) demonstrated improved environmental performance. This included greater carbon stocks in trees used for shade-grown coffee production, better practices for soil conservation and recycling of coffee pulp, and application of organic fertilizers.

Sustainability standards are gaining importance in global markets, especially for high-value products with established links to global value chains. Growing consumer demand for sustainability certified products has resulted in increases in the share of agricultural land under sustainability certification. About one-quarter of the global coffee and cocoa areas are certified through sustainability standards developed by non-governmental organizations and the private sector. The market provides information in terms of prices. Harnessing the market mechanism to also provide information on how food is produced and on the benefits this brings to the environment and society, can address the trade-offs between economic, social and environmental objectives. ■

THE TRANSFORMATIVE IMPACT OF DIGITAL TECHNOLOGIES ON MARKETS

Digital technologies are rapidly transforming all stages of the value chain from the farm to the table. Their adoption is improving efficiency, creating new jobs, generating new income streams and saving resources. However, digital technologies can be disruptive, modifying or displacing value chain activities and products.

At the farm level, digital technology applications help address market failures and facilitate the integration of farmers in value chains by driving down information and transaction costs. Improvements in information and communications technology have also underpinned the development of global value chains, effectively linking farmers to traders and consumers across regions and countries. In 2020, the COVID-19 pandemic revealed the potential of digital technologies in improving the functioning of food markets. Estimates suggest that in the People's Republic of China, the share of the online market increased from 11 to 38 percent of total food retail purchases in February 2020.

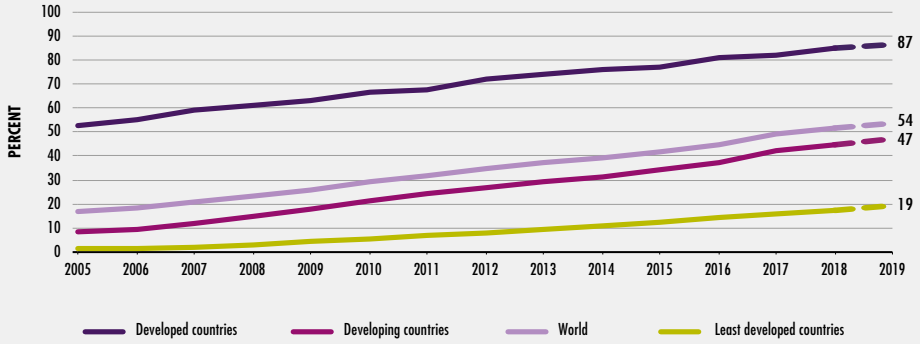
Despite the rapid diffusion of digital technologies during the last three decades, a digital divide exists between countries, between urban and rural areas, and between men and women (Figure 4.3). On average, in rural Africa, only 10 percent of households have access to the internet. In order to include everyone in the digital economy, effective public-private partnerships, good regulations to crow-din the private sector, and policy coherence are needed to improve digital infrastructure and skills in rural areas of developing countries.

Gender imbalances also extend into the digital realm, with rural women having the least access to the internet. Worldwide, 48 percent of women have access to the internet, compared to 58 percent of men.

Rural areas in developed countries are better connected to the internet. Denmark has the highest connectivity rate, with 97 percent of both rural men and women using the internet, and nearly no gap with respect to urban areas. In developing countries, there is a significant gap between urban and rural areas. In Bolivia (Plurinational State of), 15 percent of rural women reportedly use the internet, compared to nearly 53 percent of urban women. In Niger, only 0.6 of rural women use the internet (Figure 4.4).

From text messages through mobile phones' Short Messaging Service (SMS) to e-commerce platforms and distributed ledger technologies, digital applications reduce transaction costs, improve the flow of information and promote efficient matching between farmers, traders and consumers. This

FIGURE 4.3 INDIVIDUALS USING THE INTERNET, PERCENT OF POPULATION



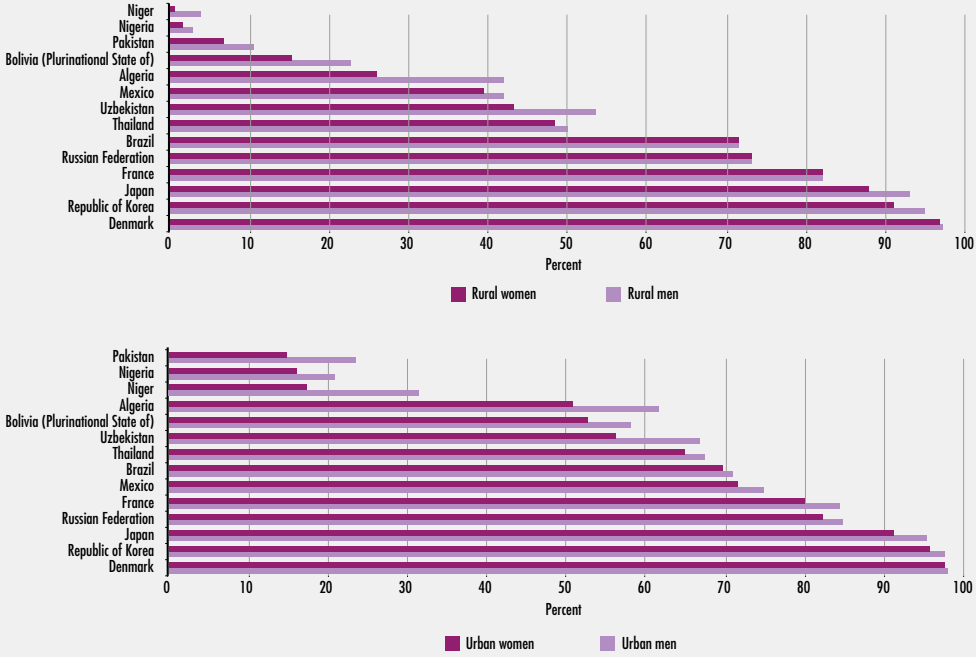
NOTE: 2019 values correspond to ITU's estimate for 2019 as of 28 October 2019.
SOURCE: ITU. 2020. ITU Statistics: ICT Key Indicators. Available at https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx (accessed May 2020).

leads to increased market access and better outcomes in terms of income and welfare. Digital platform initiatives reviewed in this report, such as E-Choupal in India, Esoko in Africa and Taobao villages in the Peoples' Republic of China, demonstrate how digital technologies can improve the functioning of markets (see Box 4.2).

Access to credit and insurance is also being revolutionized. Digital innovations in earth observation, satellite rainfall estimations and remote sensing, combined with *in situ* data and blockchain technology, can support index-based insurance programmes at lower costs. This can help in reaching millions of smallholder farmers, many of whom were previously considered uninsurable.

The transformational impacts of digital innovations can support a range of market outcomes. Digital technology applications for agricultural and food markets can generate significant economic, social and environmental benefits and accelerate progress towards achieving the SDGs. For example, digital technologies promote financial inclusion as they allow financial institutions to enter rural markets without establishing a costly physical presence. E-commerce platforms

FIGURE 4.4 INDIVIDUALS USING THE INTERNET IN SELECTED COUNTRIES BY GENDER AND LOCATION, 2018 (PERCENT)



NOTE: This figure concerns individuals using the internet from any location. Data refer to 2018 or latest year available.
SOURCE: ITU. 2019. *Yearbook of Statistics: Telecommunication/ICT Indicators 2009–2018*. Statistical Reports. Geneva, ITU.

incite educated youth and women to remain in or return to rural areas. This can transform rural areas into more attractive places to live and work. Blockchain technology can build trust and promote transparency and thus increase the traceability of food throughout the value chain. This can support the implementation of sustainability standards and labelling that provide information to consumers on environmental and social dimensions of production.

At the same time, digital technologies also entail risks and challenges. For »

BOX 4.2 DIGITAL INNOVATION FOR CROSSCUTTING BENEFITS: THE CASES OF E-CHOUPAL IN INDIA AND ESOKO IN GHANA

E-Choupal is an initiative to help smallholder farmers overcome multiple market failures in India (https://www.echoupal.com). It functions through a network of internet kiosks run by a farmer who acts as a focal point. The farmer provides access to the e-Choupal online platform which offers information on farming practices, market prices, weather forecasts and advice by agricultural experts. E-Choupal reportedly reaches 4 million farmers across India. It also partners with banks to increase farmers' access to financial services and has built a network of warehouses to provide inputs to farmers and assess output quality. Evidence suggests that e-Choupal services have helped improve farming practices and increase farm incomes. For example, the introduction of e-Choupal kiosks had a positive effect on soybean prices, which increased between 1 and 3 percent. This innovation also resulted in a 19 percent increase in soy production, leading to an overall 33 percent rise in farmers' net profits. A part of the increase in profits was due to a redistribution of surpluses from traders to farmers. There was also evidence that 1 to 5 percent of traders' profit margins were transferred to farmers.

Esoko started operating in 2005 to provide information on market prices by SMS to smallholder farmers in Ghana (https://esoko.com). Over the years, the initiative evolved into an internet and mobile phone application that provides services to farmers through SMS, voice messages and call centres. These include extension information messages, farmer surveys and SMS polls, marketplace matching, and data collection. The platform provides two-way communication and information flow between farmers and other value chain actors. This has led to increased farmer knowledge and access to quality inputs, credit and formal markets. The business model of voice, video and call centres is easily accessible to illiterate farmers. At present, Esoko operates in ten countries in Africa and reportedly connects over 1 million farmers to essential services. Evidence indicates that farmers using its services have enjoyed a 10–11 percent rise in revenues, most likely through better information that resulted in increased bargaining power with traders. Some evidence suggests that this effect varies by crop type; income effects for yam, for instance, were present only in the first year of participation.

SOURCES: Nakasone, Torero & Minten. 2014; Trendov, Varas & Zeng. 2019; Aker, Ghosh & Burrell. 2016; Halewood & Surya. 2012; Tinsley & Agapitova. 2018; Goyal. 2010.

» example, issues related to the ownership and use of data collected through digital technologies on-farm have raised huge concerns. Addressing these issues can further promote digital technology adoption. Technology also affects the factors of production and their value, such as the demand for labour and wages. Digital technologies could also lead to deviations from competitive outcomes in markets, affecting prices or quantities and, therefore, welfare.

The potential of technology to impact agricultural and food markets needs to be further analysed. The issues mentioned above point to the necessity for enhanced collaboration between all stakeholders. They will also require a consensus on best practices that can shape a regulatory framework which will maximize the benefits of digital technology for food and agriculture and minimize the associated risks. ■

THE STATE OF THE WORLD

2020

THE STATE OF AGRICULTURAL COMMODITY MARKETS

AGRICULTURAL MARKETS AND SUSTAINABLE DEVELOPMENT: GLOBAL VALUE CHAINS, SMALLHOLDER FARMERS AND DIGITAL INNOVATIONS

The State of Agricultural Commodity Markets 2020 (SOCO 2020) aims to discuss policies and mechanisms that promote sustainable outcomes – economic, social and environmental – in agricultural and food markets, both global and domestic. The analysis is organized along the trends and challenges that lie at the heart of global discussions on trade and development. These include the evolution of trade and markets; the emergence of global value chains in food and agriculture; the extent to which smallholder farmers in developing countries participate in value chains and markets; and the transformative impacts of digital technology on markets.

Along these themes, SOCO 2020 discusses policies and institutions that can promote inclusive economic growth and also harness markets to contribute towards the realization of the 2030 Agenda and its Sustainable Development Goals.

The State of Agricultural Commodity Markets 2020 (full text)