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COVID-19 & GLOBAL FOOD SECURITY

2 YEARS LATER

EDITED BY

John McDermott & Johan Swinnen



COVID-19
& GLOBAL
FOOD
SECURITY

2 YEARS
LATER

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John McDermott
& Johan Swinnen

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Preface

John McDermott and Johan Swinnen

This e-book builds upon the lessons presented in our earlier volume, [COVID-19 & Global Food Security](#) (2020). In that book, we documented the impacts of the COVID-19 pandemic as of mid-2020, particularly the disruptions to livelihoods and the food and nutrition security of billions of people. Early in the pandemic, many hoped that COVID-19 could be controlled and even eliminated through a short-term response phase and that attention could subsequently be shifted to recovery and resilience building. Instead, COVID-19 and its disruptions have persisted and evolved, with new waves of infections and deaths and ongoing impacts, particularly among poor and vulnerable populations.

As the pandemic has continued, so too has research on its impacts and the effectiveness of policy responses. In this e-book, we present analysis and lessons learned from the substantial body of literature that has developed over the past 18 months. We draw on two primary sources – IFPRI and the CGIAR COVID-19 Hub – to provide new insights, knowledge, and lessons. As in the first e-book, we relied on [contributions from IFPRI research](#), including evidence from primary research projects, [data and analysis with national partners](#), and COVID-19 [trade](#), [food price](#), and [policy response](#) tracking platforms. For this e-book, we also drew on contributions from the [CGIAR COVID-19 Hub](#), which is hosted by the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH). Through the Hub, we captured results from research projects across the CGIAR Centers and partners as well as four working groups on value chain fractures, One Health, food systems resilience, and responses to requests for support in five focus countries (Bangladesh, Ethiopia, Malawi, Myanmar, and Nigeria).

This e-book is organized in four sections: food security and poverty; agricultural production and value chains; nutrition, health, and social programs; and policy responses and implications. Each section includes two types of contributions. The first are new syntheses of lessons on key topics such as country impacts, food price changes, value chain fractures, social protection case studies, and fiscal and monetary responses and policy recommendations. The second are new or updated blogs from the [IFPRI COVID-19 series](#).

As in the previous book, Pamela Stedman-Edwards provided overall editorial guidance and coordination. Claire Davis edited the new contributions and Jason Chow designed the book layout. For the IFPRI blog contributions, Drew Sample and John McQuaid provided coordination and editorial support. From the CGIAR COVID-19 Hub, the Hub management group of John McDermott (IFPRI/A4NH, co-lead), Ekaterina Krivonos and subsequently, Sonja Vermeulen (CGIAR System Office; co-leads); Frank Place (IFPRI/PIM); Hung Nguyen (ILRI); Vincent Gitz (CIFOR/FTA); Tom Randolph (ILRI/Livestock), ably assisted by Janet Hodur (IFPRI/A4NH); Emma Quilligan (IFPRI); Tigist Defabachew (IFPRI/A4NH); and Ouchi Ezekannagha (CGIAR System Office) coordinated working group research and communication outputs across the CGIAR System COVID-19 responses.

In compiling material for this e-book, we were constantly reminded of the in-country work of our national partners and CGIAR colleagues. They have implemented and adapted research and supported policy actions under challenging conditions. We are grateful to them for being a critical source of the evidence and insight that underpin many of the contributions in this e-book.

INTRODUCTION





1. Beyond initial impacts: The evolving COVID-19 context and food system resilience

John McDermott, Deborah Lee, Brian McNamara, and Johan Swinnen

As we mark the second anniversary of the start of the COVID-19 pandemic, the health, economic, and social disruptions associated with this global crisis continue to evolve. The impacts of the pandemic are prolonged and likely to endure for years to come. Poor, marginalized, and vulnerable groups have been disproportionately affected, with informal and migrant workers, refugees and displaced persons, and women and children particularly vulnerable and adversely impacted.

The COVID-19 pandemic has highlighted the interrelationships between disease emergence and spread, different actors and segments of the agrifood system, and the multifaceted effects of the crisis. These complexities require policy responses grounded in solid evidence and supported by systemic research. Increased constraints on fiscal resources – in part a consequence of the continuing crisis – demand that such policies be informed, smart, and effective, contributing to agrifood system resilience and protecting the most vulnerable. Responses must be coordinated, linking health, environmental, social, and financial objectives, and their implementation should minimize unintended harms. In addition to emergency response measures such as income support programs, policies focused on the most vulnerable groups must target their basic needs, including sanitation and nutrition, to improve their ability to cope.

Our previous book, [COVID-19 & Global Food Security](#) (Swinnen and McDermott 2020), focused on the multiple disruptions and impacts of the COVID-19 pandemic during the first six months of 2020. Key messages demonstrated how fears of poor health and a global recession, movement control, and other health measures had major impacts on households, particularly on poor and vulnerable people. We also found that disruptions occurred across all sectors – health, economic, food, social programs, and education. However, food production, supply, and trade were relatively protected from shocks, as they were considered essential and production was concentrated in less population-dense areas. In this book, we focus on the lessons learned in the subsequent months that have direct implications for food security and food system resilience.

Evolving COVID-19 context

Since the onset of the COVID-19 pandemic in 2020, both the impacts of the crisis and responses to it have evolved substantially. As the timeline of major COVID-19 events and summary figures of cumulative cases and deaths illustrate, the pandemic is truly global in nature and carries a reported mortality rate of approximately 2 percent. However, these figures cannot demonstrate the dynamic nature of the pandemic, with its multiple waves and the emergence of new variants. These waves reflect the

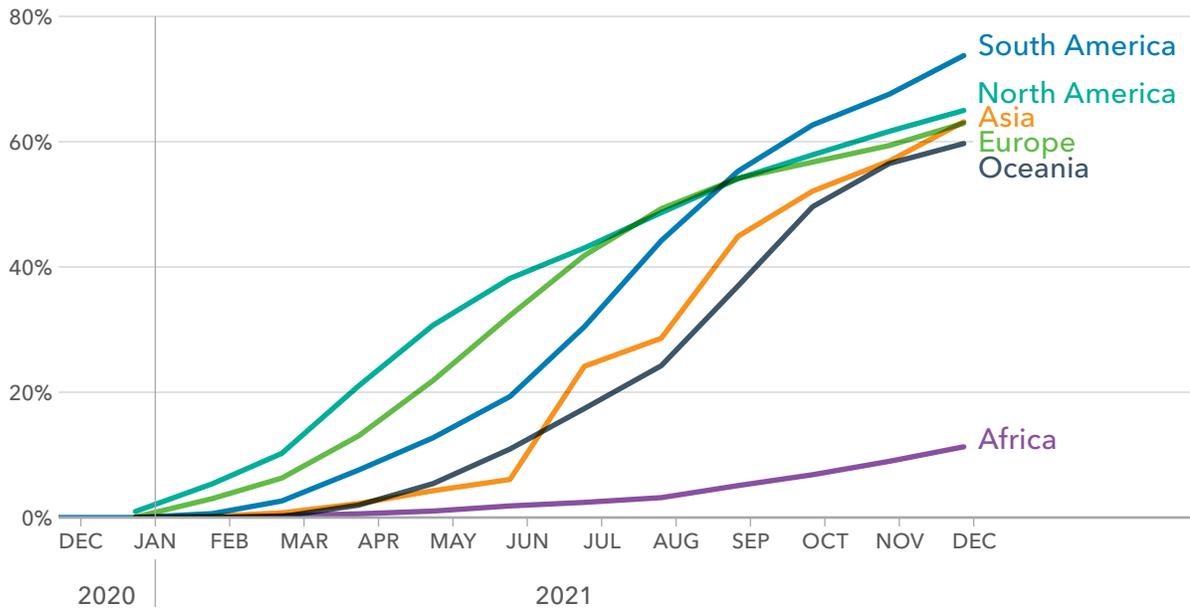
exponential nature of transmission as outbreaks shift to different regions and countries. The evolving nature of COVID-19 and lagging rates of vaccination have led to a recognition that the disease will persist, unlike the original SARS that was eliminated in 2003. The current expectation is that we will transition to endemic COVID-19, with ongoing waves and managed mortality and morbidity similar to influenza.

In many countries, one of the major challenges of the evolving pandemic has been that control efforts are retroactively implemented in response to the exponential growth of infections and the deaths that lag two to three weeks behind. Even in many rich countries, health systems have struggled to monitor infections and SARS-CoV-2 variants and to proactively implement disease control measures. In lower-income countries, health systems are much weaker and can be overwhelmed by waves of COVID-19. The difficulty of confirming COVID-19 cases and deaths reflects these challenges. In general, deaths are the easiest health statistic to measure, but counting COVID-19-associated deaths has been complicated. Comparing COVID-19 reported deaths with all deaths in a specific time period is one way to enhance evidence on mortality. “Excess” deaths associated with COVID-19 are estimated to be approximately 3–4 times the reported number of COVID-19 deaths (*Economist* 2021). The largest discrepancies between total deaths and reported deaths come from South Asia and Africa. In South Asia, a very high-mortality wave of COVID-19 overwhelmed health systems in March and April 2021. In remote areas of Africa, confirmation of COVID-19 has been challenging and not all deaths are recorded. Despite underreporting, COVID-19 has been less impactful overall in much of Africa, probably due to younger and less-dense populations.

The most extraordinary technical innovation for controlling COVID-19 has been the rapid production and deployment of several highly efficacious vaccines. Developed at an unprecedented speed, these vaccines provide the main opportunity for effectively managing COVID-19. [Figure 1](#) shows vaccine coverage in different regions of the world over time. Achieving sufficient vaccination coverage for the global population is an enormous challenge of short- to medium-term (and perhaps long-term) scale. In late 2020 and early 2021, the supply and equitable distribution of vaccines to low-income countries was a major global problem. As of December 2021, more than 55 percent of the world’s population had received at least one dose of a COVID-19 vaccine. Israel has already started to provide a fourth dose of the vaccine, a step which many other developed countries are also considering. However, as vaccine supply to low-income countries improves in 2022 and 2023, longstanding challenges of distributing vaccines in communities with constrained cold chains and weak health systems, as well as strong vaccine hesitancy, will persist unless approaches and groups that have supported control measures for other infectious diseases, such as HIV, are mobilized.

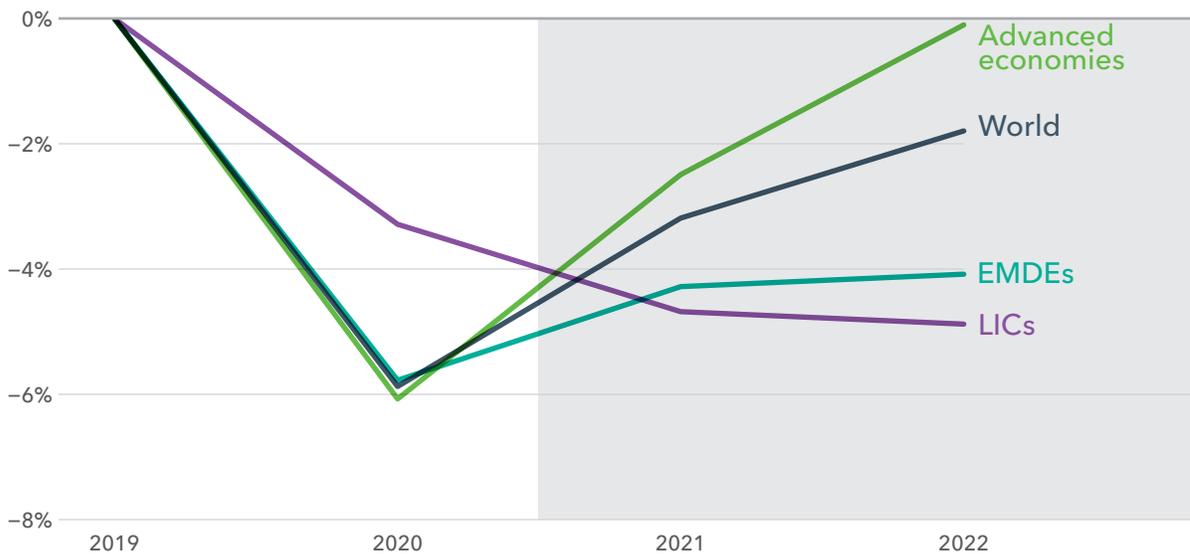
The COVID-19 pandemic has led to social and economic disruptions globally, involving multiple sectors in a manner that is unprecedented in recent times. As noted in our previous volume (Swinnen and McDermott 2020), global GDP initially experienced a dramatic decline that varied across regions. Despite that sharp contraction, the global economy expanded by an estimated 5.9 percent in 2021, based on steady but unequal vaccine coverage (World Bank 2021; IMF 2022). The global recovery remains uneven ([Figure 2](#)), with important medium-term implications. While economic output is forecast to exceed pre-pandemic medium-term projections in advanced economies, persistent output losses are anticipated for the emerging market and developing economy (EMDE) group due to slower vaccine rollouts and less robust policy support (IMF 2021). In many poorer countries, per capita income catch-up with advanced economies is expected to slow or even reverse as a result. The

FIGURE 1 Percent of population that has received at least one vaccine dose



Source: Data from Our World in Data (2021).

FIGURE 2 Deviation of output from pre-pandemic projections



Source: Data from World Bank (2021).

Note: Aggregates are calculated using real US dollar GDP weights at average 2010–2019 prices and market exchange rates. The figure shows percent deviation between the June 2021 and January 2020 baseline levels from World Bank projections. The shaded area indicates forecasts. LICs = low-income countries; EMDEs = emerging market and developing economies.

TABLE 1 World outlook growth projections:
Real GDP, annual percentage change

	2020	2021 (ESTIMATED)	2022 (PROJECTED)
World	-3.1	5.9	4.4
Advanced Economies	-4.5	5.0	3.9
Emerging Market and Developing Economies	-2.1	6.5	4.8

Source: Data from IMF (2022).

global outlook ([Table 1](#)) is optimistic, but remains subject to significant downside risks, which include the possibility of additional COVID-19 waves and financial stress amid high EMDE debt levels (World Bank 2021; IMF 2021).

Research during COVID times

While our previous book focused on the pandemic's many disruptions to food security during the first half of 2020, this book addresses lessons learned in the subsequent 18 months that carry significance for food security and food system resilience.

Since the onset of COVID-19, researchers have rapidly gathered evidence and conducted analyses to determine the impacts of the pandemic and related policies. COVID-19 not only affected the world and the systems studied by IFPRI and colleagues but also the act of conducting research itself. Much of IFPRI's research relies on in-field scientific techniques such as household surveys and field experiments. Obviously these methods of data collection, measurement, and analysis have been constrained by the pandemic. Researchers have had to overcome significant barriers due to public health measures and the risk of infection, which inhibited data collection from in-person surveys and experiments especially.

Researchers have adopted different methodologies for studying the impact of COVID-19 within these constraints, each with its own strengths and weaknesses (Swinnen and Vos 2021). First, a major source of insight has been scenario modeling. This method initially relied heavily on assumptions based on pre-pandemic experiences. Over time, more data have become available, and researchers have been able to improve their results by adjusting their strategies and assumptions. Second, information on policy actions and related data have been easier to collect for analysis than, for example, rural household-level data. For example, the [IFPRI Food Trade Policy Tracker](#), which compiles data on COVID-related trade restrictions, has provided critical macroeconomic insights on food supply. A third approach has been the use of phone surveys to address limitations on researchers in collecting household- and firm-level data. These surveys could be conducted safely and in alignment with social

distancing guidance. However, it is well known that the use of phone survey data poses challenges with sampling and reliability.

Given these strengths and weaknesses, researchers have worked to improve their methodologies and to address specific limitations. Based on increasingly accurate insights and broader coverage of studies, and the combination of different methodologies, this research area has yielded a rich set of insights, on which we draw in this volume.

Organization of the book

In the first section on food security and poverty, we present country-level modeling analyses of food systems, poverty, and diets in 30 countries (Pauw and Thurlow). Adewopo and colleagues show how crowdsourced data can reveal threats to household food security in near real-time. Looking more closely at specific countries, we examine food consumption in Addis Ababa, Ethiopia (de Brauw et al.); demonstrate the impact of falling remittances on Yemen's fragile economy (Elsabbagh et al.); and call for a closer look at food security and nutrition in Guatemala (Ceballos et al.). In Myanmar, Headey and colleagues review evidence on COVID-19's economic impacts, while Ragasa and others examine effects on incomes and livelihoods.

The discussion of agricultural production and value chains begins with an analysis of COVID-19 and food inflation scares from Vos and colleagues. We present a large-scale review of the impacts and actions in agriculture and food supply chains during the pandemic (Place et al.) before discussing resilience-building innovations for supply chains (Reardon et al.). Country-specific chapters focus on the resilience of urban value chains in Ethiopia (Hirvonen et al.); status of India's agrifood supply chains (Narayanan); economic impacts for small and medium enterprises in China (Zhang); effects of the global increase in rice prices for consumers in Papua New Guinea (Schmidt and Dorosh); and varied impacts on Senegal's fruit and vegetable supply chains (Fabry et al.).

In the third section, we discuss the pandemic's effects on nutrition, health, and social programs. Ruel and Headey analyze how the economic crisis created by COVID-19 will adversely impact young children. Country lessons from India assess how to support students and the learning process amid school closures (Pant et al.) and examine disruptions to health and nutrition services in Uttar Pradesh (Nguyen et al.). In Bangladesh, we find that a major food transfer program fell short during the pandemic (Chowdhury et al.). Gilligan and colleagues present lessons on social protection and other specific actions targeted to poor and vulnerable communities in Ethiopia, then Abay and others review how well the country's social safety net limited negative impacts on rural food security. In South Africa, COVID-19 social support programs yielded economic benefits (Gabriel et al.), while in Nigeria, disruptions to school feeding services exacerbated food insecurity (Abay et al.).

The book's final section explores policy responses and implications. McDermott and Reumann present a set of smarter food policy recommendations that are based on the compilation of experiences from the CGIAR COVID-19 Hub over 2020 and 2021. These recommendations are designed to expand coherence with other sectors, consider the needs of vulnerable populations, and strengthen national capacities for policymaking and decisions, particularly those supporting food system resilience. We then review the current state of fiscal and monetary responses to the COVID-19 pandemic

in developing countries, as well as future scenarios (Díaz-Bonilla and Centurion). Andam and Ezekannagha examine country requests for CGIAR support and actions taken in response. Lastly, we examine how trust in science and government plays a crucial role in the pandemic response (Resnick), and discuss how to ensure effective government responses as COVID-19 spreads to rural areas (Kosec and Ragasa).

Impacts of the COVID-19 pandemic on global food security and food systems

As we reflect on the last two years, we find that the experience of the pandemic provides many valuable lessons for food security and the transition to more sustainable, inclusive, and resilient food systems. Some key findings are summarized here, based on the chapters in this book and other new studies.

As was clearly documented in our earlier book – and has since been confirmed by a number of studies – COVID-19 has had significant negative impacts on food security and poverty. However, there is considerable variation among impacts on different social groups. The pandemic disproportionately affected disadvantaged groups such as women, low-skilled workers, and informal workers. The impacts of COVID-19 on income loss differed significantly between sectors and between rural and urban areas. There were more severe employment and income effects for non-agricultural sectors and urban households. However, as rural households are typically poorer than urban households, income loss posed a significant risk for the food security of these households as well. One study estimates the median increase in poverty rates to be between 8 and 9 percentage points, with substantial variation across countries. It suggests that about 65 percent of the increase in poverty has occurred in rural areas (Pauw, Smart, and Thurlow 2021).

The level of disruption to supply chains and trade has varied significantly, depending on the nature of production processes as well as the degree of value chain modernization (Laborde, Martin, and Vos 2020; Ramsey et al. 2021). For example, labor intensity, farm size, and integration of supply chains were found to be critical to the resilience of the food supply (Laborde, Martin, and Vos 2020; Reardon and Vos 2021). Advice to avoid trade restrictions (Glauber et al. 2020) has largely been followed, which has helped to avoid the supply and price crises experienced in 2007–2009, but trade and market restrictions have adversely affected the food supply. Although global markets for staple crops were well stocked prior to COVID-19, trade restrictions and fears of rising prices negatively affected global prices for these foods as well as markets for perishable foods.

Income loss and supply disruptions have also affected dietary choices, increasing global malnutrition (Headey et al. 2020). Low-income and lower-middle-income households have switched to cheaper and less nutritious foods and reduced their consumption of perishable foods, such as fruits and vegetables. In turn, these shifts have limited their dietary diversity and increased the risk of negative health consequences (Laborde, Martin, and Vos 2020; Ceballos, Hernández, and Paz 2021; Abate, de Brauw, and Hirvonen 2020). One study estimates that an additional 141 million individuals from low- and middle-income countries could not afford a healthy diet in 2020 as a result of COVID-19, and projected that an additional 95 million will not be able to afford it in 2021 amid a slow global economic recovery (Laborde et al. 2021).

Timeline of the global COVID-19 outbreak

Chinese authorities first inform WHO of pneumonia cases with unknown cause

Over 100 countries report cases of COVID-19

IMF predicts a 4.4 percent contraction in global GDP for 2020

Global COVID-19 cases surpass 50 million

2019 DEC 2020 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

China reports first death linked to COVID-19

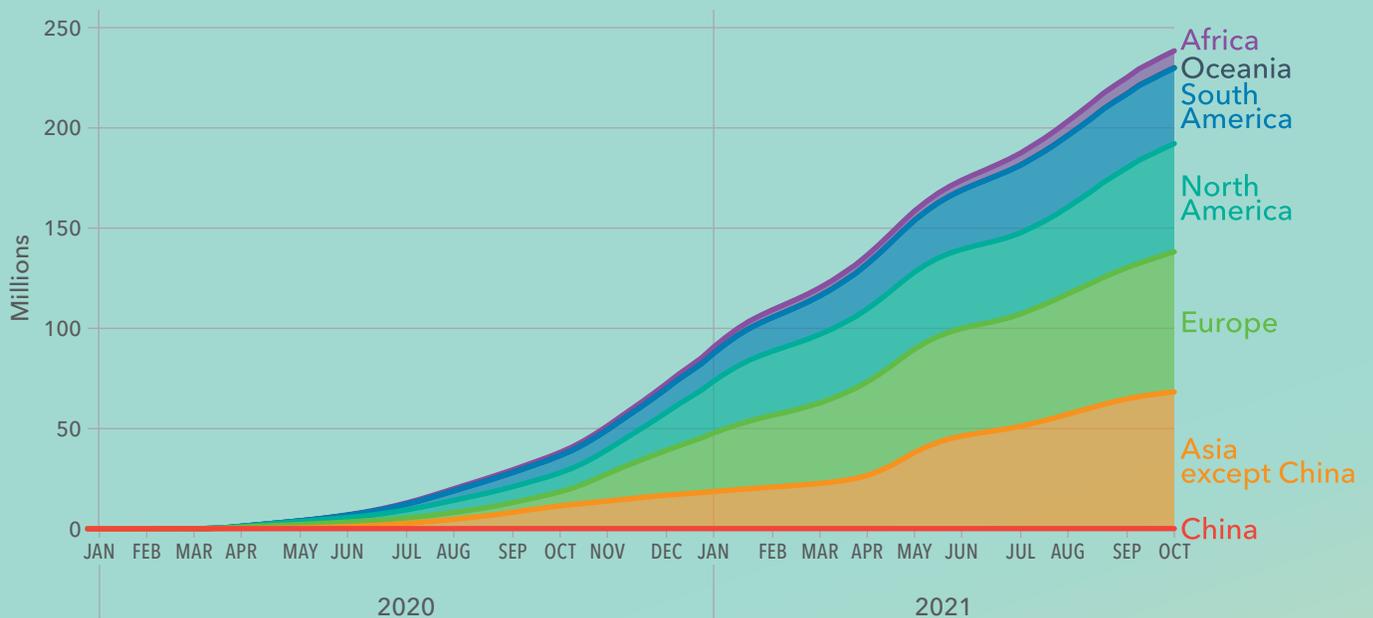
Global COVID-19 death surpasses 500 thousand

Global COVID-19 deaths surpass one million

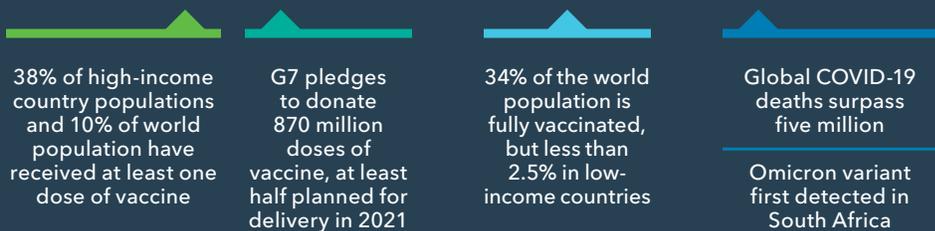
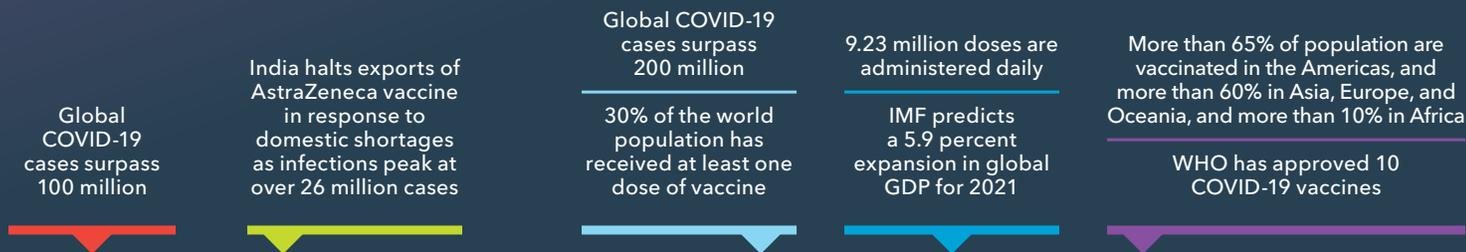
Delta variant first detected in India
WHO issues its first emergency use validation for a COVID-19 vaccine

Total confirmed COVID-19 cases

Limited testing means that the number of confirmed cases is lower than the actual number of cases.

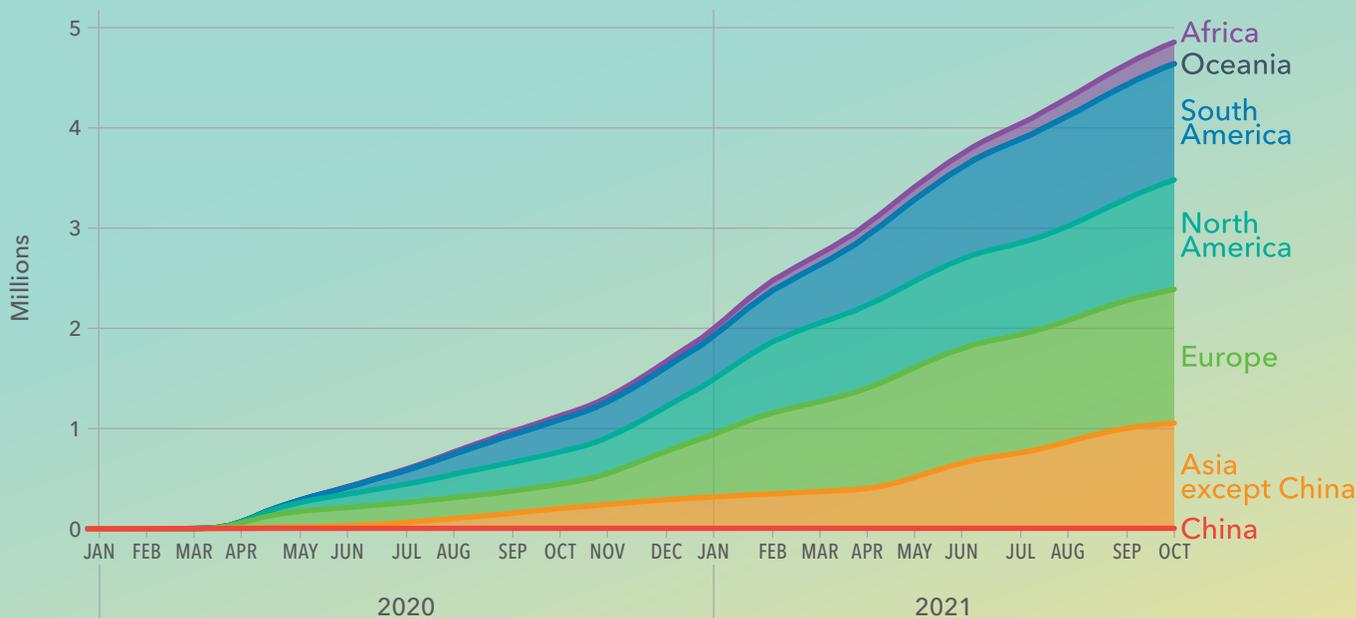


Source: European Centre for Disease Prevention and Control, Situation Update Worldwide, October 2021.



Total confirmed COVID-19 deaths

Limited testing and challenges in the attribution of the cause of death mean that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



Source: European Centre for Disease Prevention and Control, Situation Update Worldwide, October 2021.

Moving forward: Smarter policies for food system resilience

COVID-19 has starkly illustrated the trade-offs between saving lives and supporting livelihoods. Given that increasing food insecurity largely resulted from declines in income, social safety net policies and additional social protection measures should be used to help secure income and access to food. Evidence suggests that cash transfers have important benefits and can induce dietary changes toward more nutritious foods. Due to the limited availability of resources, targeted support is critical to guaranteeing those most in need will benefit. High-income countries and international organizations must provide financial support to poor countries to ensure they can provide adequate safety net programs to their populations.

Disruptions caused by the pandemic have also highlighted the importance of supply chains. As COVID-19 continues to evolve, it is critical that agricultural inputs, food processing, and distribution are not interrupted and can continue with adequate health protocols in place. To protect access to food, incentives and support should be provided to ensure the smooth functioning of food transport and agricultural input markets. In addition, governments should avoid policies that cause further disruption, such as trade restrictions.

The greatest policy successes have resulted from emergency response interventions that build on high-quality existing policies (McDermott, Resnick, and Naylor 2021), highlighting the potential role of existing supportive policy environments for food system resilience. Another major lesson has been the importance of implementing a whole-of-country response – with contributions from a range of public and private sector actors – to address the immediate impacts of the pandemic (see Pauw and Thurlow, in this book). This coordination of food system actors will likewise be needed to foster the resilience of food systems.

The impacts of the pandemic are likely to be felt well into the future, particularly in places where access to health services and vaccination rates are low and new variants are emerging. The pandemic's prolonged and widespread persistence and the continuous evolution of globally important variants such as Delta and Omicron have exposed gaps in our understanding of how to manage longer-term pandemics. The hopeful earlier prediction of linear progress from emergency to recovery and then to resilience-building must be reconsidered. As one critical pivot, countries must address ongoing and emerging development challenges beyond COVID-19 as they seek to manage a transition from epidemic to endemic COVID.

As the world begins to address the broader implications of the pandemic and its coexistence with other challenges – such as environment, climate change, inequity, and conflict – smarter policies and investments will be needed to steer the recovery toward a sustainable, resilient, and inclusive development path. The short-term environmental implications of the pandemic were initially positive and associated with decreased economic activity (OECD 2021). However, longer-term environmental implications of COVID-19 need further monitoring and assessment, as strong linkages exist between socioeconomic and natural systems (OECD 2021; European Environmental Agency 2021). Ensuring environmental health and sustainable development will be critical to minimize the emergence of new diseases and to protect people and economies.

New ways of thinking and behavior will be required going forward. Smart, efficient, and cross-cutting policies that link health, environmental, social, and financial objectives and contribute to food system transformation are central to a revised approach to food system resilience. Food system transformation and resilience-building cannot be considered in isolation, but must instead intersect with policies that foster economic growth, debt sustainability, inclusiveness, gender mainstreaming, the health of humans and animals, and environmental protection. In recognizing the need for a more systemic approach to food systems, the 2021 United Nations Food Systems Summit provided meaningful opportunities for countries to make progress on transformation by applying lessons learned from COVID-19.

Food system resilience must include efforts to prevent and reduce the impacts of future health, climate, and conflict shocks, among others, that can impact the functioning of food systems. Resilience requires the ability to adapt to the rapidly changing contexts within which food systems operate, including increasing urbanization, income changes, complex supply chains, and natural resource and equity constraints. Adaptive food system monitoring systems are also needed as part of the resilience-building pathway.

Both state and non-state actors have a role in building food system resilience. Policies must therefore be inclusive of all actors by enabling and providing them with space to contribute to food system resilience and transformation. Governments need to develop efficient monitoring and response systems, taking advantage of the advances in digital and communication technologies, whose use has accelerated during the pandemic. These developments can enable them to quickly and effectively intervene when future shocks occur. Efforts must also be made to support the capacity of local actors to implement and benefit from such systems. Given the profound impacts of the pandemic on the poor and vulnerable (Kumar et al. 2021), we expect that funders will initially emphasize inclusive approaches to investing in human capabilities through the social development, health, and education sectors. These human capabilities will be critical investments in building future food system resilience.

References

- Abate, G., A. de Brauw, and K. Hirvonen. 2020. "[Food and Nutrition Security in Addis Ababa, Ethiopia during COVID-19 Pandemic.](#)" ESSP Working Paper 145. IFPRI (International Food Policy Research Institute), Washington, DC.
- Ceballos, F., M.A. Hernández, and C. Paz. 2021. "[Assessing the Short-Term Impacts of COVID-19 on Food Security and Nutrition in Rural Areas: Evidence from Guatemala.](#)" *Agricultural Economics* 52 (3): 477-494.
- Economist*. 2021. "[The Pandemic's True Death Toll.](#)" December 14.
- European Environmental Agency. 2020. "[COVID-19 and Europe's Environment.](#)"
- Glauber, J., D. Laborde, W. Martin, and R. Vos. 2020. "[COVID-19: Trade Restrictions are Worst Possible Response to Safeguard Food Security.](#)" In *COVID-19 & Global Food Security*, edited by J. Swinnen and J. McDermott, 66-68. Washington, DC: IFPRI.
- Headey, D., R. Heidkamp, S. Osendarp, M. Ruel, N. Scott, R. Black, M. Shekar, H. Bouis, A. Flory, L. Haddad, and N. Walker. 2020. "[Impacts of COVID-19 on Childhood Malnutrition and Nutrition-related Mortality.](#)" *Lancet* 396 (10250): 519-521.
- IMF (International Monetary Fund). 2021. [World Economic Outlook: Recovery During a Pandemic – Health Concerns, Supply Disruptions, Price Pressures](#). October. Washington, DC.
- IMF. 2022. [World Economic Outlook: Recovery During a Pandemic – Health Concerns, Supply Disruptions, Price Pressures](#). January. Washington, DC.

- Kumar, N., A. Quisumbing, A. Gelli, U. Gentilini, and S. Shapleigh. 2021. "[Toward Inclusive Food Systems: Pandemics, Vulnerable Groups, and the Role of Social Protection](#)." In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, 54–63. Washington, DC: IFPRI.
- Laborde, D., A. Herforth, D. Headey, and S. de Pee. 2021. "[COVID-19 Pandemic Leads to Greater Depth of Unaffordability of Healthy and Nutrient-Adequate Diets in Low- and Middle-income Countries](#)." *Nature Food* 2 (7): 473–475.
- Laborde, D., W. Martin, and R. Vos. 2020. [Estimating the Poverty Impact of COVID-19: The MIRAGRODEP and POVANA Frameworks](#). IFPRI Technical Note. Washington, DC: IFPRI.
- McDermott, J., D. Resnick, and N. Naylor. 2021. "[Resilience: From Policy Responses to Resilient Policy Systems](#)." In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, 24–35. Washington, DC: IFPRI.
- OECD (Organisation for Economic Co-operation and Development). 2021. [The Long-Term Environmental Implications of COVID-19](#). Policy Brief. May 31.
- Our World in Data. 2021. [Coronavirus \(COVID-19\) Vaccinations dataset](#). Accessed December 1, 2021.
- Pauw, K., J. Smart, and J. Thurlow. 2021. [The Short-Run Economic Costs of COVID-19 in Developing Countries in 2020: A Synthesis of Results from a Multi-country Modeling Exercise](#). Project Note. Washington, DC: IFPRI.
- Ramsey, A.F., B. Goodwin, W.F. Hahn, and M.T. Holt. 2021. "[Impacts of COVID-19 and Price Transmission in U.S. Meat Markets](#)." *Agricultural Economics* 52 (3): 441–458.
- Reardon, T., and R. Vos. 2021. "[Food Supply Chains: Business Resilience, Innovation, and Adaptation](#)." In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, 64–73. Washington, DC: IFPRI.
- Swinnen, J., and J. McDermott, eds. 2020. [COVID-19 and Global Food Security](#). Washington, DC: IFPRI.
- Swinnen, J., and R. Vos. 2021. "[COVID-19 and Impacts on Global Food Systems and Household Welfare: Introduction to a Special Issue](#)." *Agricultural Economics* 52 (3): 365–374.
- World Bank. 2021. [Global Economic Prospects, June 2021](#). Washington, DC.



FOOD SECURITY & POVERTY





2. COVID-19 impacts on food systems, poverty, and diets: Lessons learned from country-level analyses

Karl Pauw and James Thurlow

With the outbreak of COVID-19, governments attempted to contain the spread of the virus by limiting the movement and interaction of people through a variety of measures, including restrictions on domestic and international travel, social distancing, and “lockdowns” that temporarily shut down non-essential businesses (IFPRI 2020). While governments had control over these domestic measures, they could do little to shield economies from disruptions to global trade or declines in foreign investment and tourism. Amid uncertainty about how the pandemic would unfold, IFPRI worked with local partners during 2020 to develop economywide models to analyze the impacts of COVID-19 measures on economic growth, food systems, and livelihoods in approximately 30 countries (Pauw, Smart, and Thurlow 2021). Initially, social accounting matrix (SAM) multiplier models were used to trace quarterly and annual shocks during the 2020 calendar year. The real-time analysis provided by these results could potentially be used by policymakers to inform the design of COVID-19 restrictions (for example, in terms of sector targeting or duration) and remedial measures (such as targeted cash transfers or firm subsidies).

As countries emerge from the slowdown in 2020 and 2021 – while dealing with recurring waves of illness and new restrictions – the research emphasis is shifting to modeling the pandemic’s medium-term impacts and the trajectory of recovery using IFPRI’s Rural Investment and Policy Analysis (RIAPA) model. The RIAPA model is calibrated to the same SAMs used in the earlier analysis but relaxes many of the restrictive behavioral assumptions of multiplier models that were more appropriate for lockdowns when domestic markets were disrupted or ceased to function ([Box 1](#)). RIAPA also allows more flexibility in simulation design as well as a consideration of private sector behavioral responses and public sector policy responses to the pandemic. The model’s recursive-dynamic setup further provides a multiyear perspective on the recovery trajectory. This chapter reviews key findings from the multiplier analysis and presents the latest results from the ongoing RIAPA analysis. We show-case our work in three countries: Bangladesh, Kenya, and Nigeria.

COVID-19 had a substantial impact on GDP and livelihoods

IFPRI’s multiplier modeling analyses revealed the considerable socioeconomic impacts of COVID-19 restrictions. Within the set of 18 country studies reviewed by Pauw, Smart, and Thurlow (2021), median GDP losses ranged from 6 percent (under a faster recovery scenario) to 8 percent (slower recovery) in 2020. In-country partners worked with IFPRI to design simulations based on information about local social distancing measures and their enforcement. Along with differences in economic structure, this information explains the varied impacts of COVID-19 across countries. For example, annual GDP losses in 2020, measured as a deviation from a hypothetical no-COVID baseline, were estimated at 7.7, 7.5, and 10 percent in Bangladesh, Kenya, and Nigeria, respectively, under the faster recovery scenario ([Table 1](#)).

BOX 1 Modeling the impacts of the COVID-19 pandemic

Two types of models were used to measure the impacts of the COVID-19 pandemic. Multiplier models track the spillover effects along and across all supply chains in a country, allowing them to measure how downstream disruptions to restaurants, for example, can have implications for farmers upstream. An important assumption in these models is that resource allocations and utilization rates in an economy are not mediated by market and price adjustments, which was the case during the initial period of the pandemic: demand for many products declined irrespective of price responses. Multiplier models are also easy to implement, so long as their core database – a social accounting matrix (SAM) – is available. With support from CGIAR’s Policies, Institutions, and Markets (PIM) program, IFPRI has constructed and maintained SAMs for many developing countries over the last decade, which enabled IFPRI to rapidly respond to governments’ need for COVID-19 analysis. IFPRI’s country programs and its network of in-country part-

ners, especially within governments, made it possible to enlist the support of local researchers and policy-makers within weeks of the initial outbreaks.

Over time, however, the focus of most governments has shifted from anticipating COVID-19 impacts to formulating responses and recovery efforts, and more recently, to reestablishing longer-term policy and investment goals, albeit within the context of persistent COVID-19. As markets resumed traditional functions, the type of model needed to analyze COVID-19’s impacts and related policy priorities also shifted. Computable general equilibrium (CGE) models, such as IFPRI’s RIAPA model, better capture how markets and price adjustments can help economies adapt to persistent shocks like COVID-19. They are also better able to depict a wider range of policy interventions. Long-standing investments in RIAPA by PIM and other donor partners made it possible for IFPRI to continue to engage governments, even as their focus shifted.

TABLE 1 Modeled and official GDP: Deviation from no-COVID baseline and year-on-year growth

	DEVIATION FROM HYPOTHETICAL NO-COVID BASELINE (%)					YEAR-ON-YEAR GDP GROWTH RATES (%)	
	Q1	Q2	Q3	Q4	YR	Pre-COVID projection	Growth outturn
Bangladesh							
Simulated	-2.5	-23.7 to -27.5	-4.7 to -8.6	0.0 to -5.7	-7.7 to -11.1		-1.1 to -4.7
Official	n/a	n/a	n/a	n/a	-3.4	7.2	3.5
Kenya							
Simulated	-4.0	-18.6 to -19.8	-5.0 to -13.1	-1.8 to -2.8	-7.5 to -10.0		-1.9 to -4.6
Official	-0.8	-10.8	-7.6	-4.5	-5.9	6.0	-0.3
Nigeria							
Simulated	-0.5	-32.5 to -36.6	-6.9 to -19.2	-1.3 to -5.2	-10.0 to -15.2		-8.1 to -13.4
Official	-0.1	-8.0	-5.1	-2.0	-3.8	2.1	-1.8

Source: SAM multiplier model results and World Bank (2020b; 2021a).

Note: Simulated results show the range estimated under faster and slower recovery scenarios. The 3.5 percent reported GDP growth for Bangladesh is for the financial year ending June 2021. Adjusting our results to the financial year would imply growth of 0.2 percent rather than -1.1 percent for the calendar year.

Compared to the pre-COVID growth projections of 7.2, 6.0, and 2.1 percent in Bangladesh, Kenya, and Nigeria (World Bank 2020b), the multiplier model results translated into year-on-year GDP growth rates of -1.1, -1.9, and -8.1 percent under the faster recovery scenario. National accounts data released over the last year now reveal a more positive growth outturn of 3.5, -0.3, and -1.8 percent (World Bank 2021a). In Kenya and Nigeria, where GDP results are reported quarterly, it is evident that the multiplier models especially overstated losses in the second quarter ([Table 1](#)).

Why were losses apparently overstated?

First, the simulations assumed that restrictive measures would be implemented as they were designed. Many countries adapted their policy responses over time (for example, to deal with localized outbreaks) or failed to fully enforce policies in rural areas or informal settings, for instance. Second, the extent to which employers would adapt to restrictions was uncertain. Even though the pandemic has persisted longer than the simulations anticipated, many businesses seemingly adapted more quickly than expected to virtual work environments, switching, for example, to home delivery and internet-based services. Although the private sector has not been equally resilient across all countries, its adaptability is a potentially important driver of the recovery that has not been fully explored. Third, the simulations considered only the adverse effects of restrictive measures, not the counteracting effects of mitigative measures introduced by governments (many of which were still being developed at the time the analysis was being undertaken). Mitigative measures injected billions of dollars into the economies of Bangladesh (Islam et al. 2020), Kenya (McDade et al. 2020), and Nigeria (Andam et al. 2020) in the form of financial stimulus packages, loan facilities, cash transfers, or food aid.

Fourth, the external shocks factored into the multiplier model simulations were generally less severe than initially anticipated. The World Bank (2020a) projected declines in remittance inflows of more than 20 percent for sub-Saharan Africa (SSA) and South Asia. However, revised estimates show that remittances declined only 12.5 percent in SSA and grew by 5.2 percent in South Asia (World Bank 2021b). Although the 34.7 percent decline in global foreign direct investment (FDI) in 2020 (UNCTAD 2021) was consistent with initial expectations (UNCTAD 2020), the decline was heavily skewed toward developed economies: FDI in SSA declined only 11.7 percent, while FDI in South Asia grew 20.1 percent. Initial tourism projections, on the other hand, were accurate. Tourist numbers declined 63 percent in SSA and 70 percent in South Asia (UNWTO 2021), which was within the range of early projections (58-78 percent) (UNWTO 2020).

Fifth, economic accounting practices may differ between countries, especially in accounting for labor productivity losses associated with work-from-home measures, among others. School closures, for example, would render teachers unproductive if online learning were not possible. In principle, this should have been recorded as a decline in value added – as was done in the multiplier analysis – but if teachers' wages continued to be paid, national accountants may have decided to record this as value added, with no reported loss in GDP. National accounts data from our case study countries reveal interesting differences, even though all three countries closed schools in March 2020. Nigeria reported a 56.2 percent year-on-year decline in education GDP in the second quarter (NBS 2021) and Kenya reported a 24.1 percent decline (KNBS 2021). In contrast, Bangladesh reported growth of more than 5 percent for the calendar year (quarterly results are not reported) (BBS 2021). These results are

not correlated with the internet penetration rates of 34, 23, and 13 percent in Nigeria, Kenya, and Bangladesh, respectively (World Bank 2021c), which serve as a good proxy for how easily countries can shift to online learning. A reasonable deduction is that accounting of value addition indeed differs between these countries.

Agrifood system resilience proved to be important

Although overall losses were likely overstated, IFPRI multiplier analysis offered two important insights critical to shaping the early narrative around COVID-19 impacts. The first relates to the careful accounting of relative sectoral impacts. The multiplier models consistently showed that wholesale and retail trade, transport, and hospitality sectors would be affected most by the pandemic. Given their size, these sectors also contributed most to overall GDP losses. However, the agrifood system (AFS), which consists of primary agriculture, agro-processing, food trade and transport, and food services (such as hotels and restaurants), was relatively less affected (Table 2). This reflects the fact that agricultural production and food processing were generally exempted from COVID-19 restrictions, even though disruptions to food supply chains (due to restrictions on movement of people and goods, for example) and restrictions on the hospitality sector did have some direct or indirect effects on the AFS (Pauw, Smart, and Thurlow 2021). Findings on the relative sectoral impacts of COVID-19 have largely been validated by national accounts data so far (BBS 2021; KNBS 2021; NBS 2021).

Table 2 presents multiplier model results from the fast recovery scenario. The AFS accounts for approximately 30 percent of GDP in Bangladesh and Nigeria, and almost 50 percent in Kenya. AFS losses range from –1.8 percent in Bangladesh to –3.8 percent in Kenya and –4.4 percent in Nigeria. These losses contribute as little as 7.1 percent to overall GDP losses in Bangladesh but 24.7 percent in Kenya, where the sector is relatively larger. These results imply that concerns around food security during the pandemic were more directly linked to the loss of household income than to the availability of food. The AFS proved to be not only more resilient than nonfood sectors during the COVID-19 pandemic, but also an important safety net for the overall economy and population.

TABLE 2 Agrifood system impacts: Deviation from no-COVID baseline and contribution to overall GDP losses (faster recovery scenario)

	BANGLADESH			KENYA			NIGERIA		
	Initial GDP share	Dev. from base	Contr. to change	Initial share	Dev. from base	Contr. to change	Initial share	Dev. from base	Contr. to change
Agrifood system	29.9	–1.8	7.1	49.0	–3.8	24.7	32.6	–4.4	14.4
Agriculture	14.1	–0.8	1.5	37.2	–3.0	15.1	21.0	–3.3	6.9
Agro-processing	2.4	–3.2	1.0	3.7	–1.7	0.9	4.0	–7.4	3.0
Food trade & transport	12.2	–1.8	2.9	7.3	–6.5	6.4	6.7	–4.5	3.0
Food services	1.0	–12.2	1.7	0.8	–21.5	2.4	0.9	–17.5	1.5

Source: SAM multiplier model results.

Note: All figures in percentages; dev. = deviation; contr. = contribution.

Rural (and poor) households were less exposed to shocks

The second important insight relates to poverty and the distributional effects of COVID-19. The pandemic had a significant impact on household livelihoods, with incomes falling by roughly the same magnitude as GDP losses. However, in most countries, COVID-19 policy design and enforcement meant that rural and poor households' incomes were less affected than the incomes of urban and nonpoor households. In Kenya, for example, income losses among rural households were only 48.4 percent that of urban households (Table 3). Despite lower income losses, however, between 41.9 and 69.3 percent of people pushed into poverty during the second quarter of 2020 in these three countries live in rural areas. Across the 18 countries surveyed by Pauw, Smart, and Thurlow (2021), between 42 and 93 percent (67 percent average) of people pushed into poverty were in rural areas. Kenya and Nigeria are therefore at the lower end of the range.

In short, the COVID-19 pandemic made all households worse off, but it narrowed the income gap between urban and rural and between poor and nonpoor households, resulting in lower inequality. However, this finding does not justify excluding rural households from government support measures during the recovery phase. In most countries – Kenya and Nigeria being exceptions – most people who became poor during the pandemic are rural, which highlights the increased vulnerability of rural households to shocks. It may also take much longer for poor and/or rural households to recover from shocks.

Medium-term impacts and recovery

Whereas the multiplier analysis proved useful for analyzing the structural and distributional effects of COVID-19 in the short term, the RIAPA model is now being used to analyze medium-term impacts, the economic recovery, and outcomes under alternative policy and investment scenarios. Since the RIAPA model relaxes some of the most restrictive assumptions of multiplier models – most notably the assumption of fixed relative prices – the implications of COVID-19 for poverty and diet outcomes can be studied more carefully.

TABLE 3 Household income and poverty effects (faster recovery scenario)

	RATIO OF RURAL TO URBAN INCOME LOSS (%)	RATIO OF POOR TO NON-POOR INCOME LOSS (%)	POVERTY RATE PRE-COVID (%)			CHANGE IN POVERTY (Q2 2020) (PERCENTAGE POINTS)			RURAL SHARE OF POOR (PRE-COVID)	RURAL SHARE OF NEWLY POOR
			All	Urban	Rural	All	Urban	Rural		
Bangladesh	81.9	89.1	24.7	19.1	26.8	8.5	9.5	8.1	79.0	69.3
Kenya	48.4	59.7	36.1	29.1	40.1	5.8	9.1	3.8	71.1	41.9
Nigeria	69.1	66.0	53.4	29.6	66.6	4.5	6.8	3.3	80.2	47.1

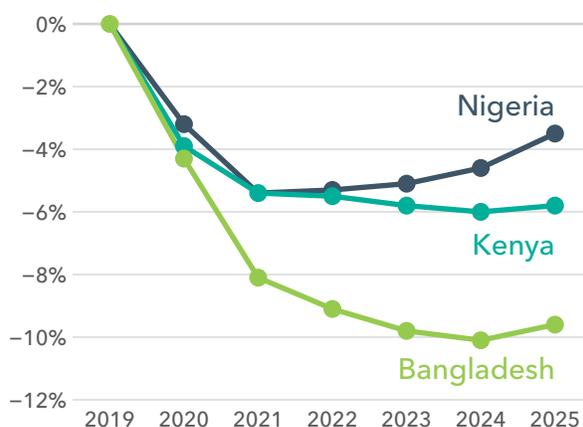
Source: SAM multiplier model results.

Note: Poverty changes reported are for the second quarter of 2020 when COVID-19 restrictions were at their most stringent. These poverty results have been adjusted to account for the overestimation of GDP losses in the multiplier model (see Table 1).

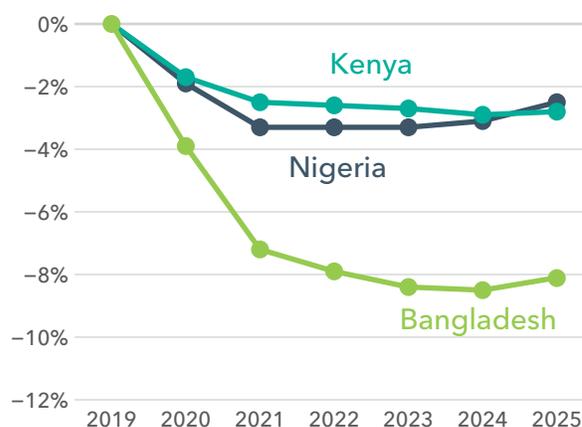
As with the multiplier analysis, simulation results are compared against a hypothetical no-COVID baseline. [Figure 1](#) presents preliminary results for Bangladesh, Kenya, and Nigeria. The COVID-19 scenario is based on the World Bank (2021a) GDP results for 2020 and projections for 2021 onward, released in June 2021. A further adjustment is made for the negative impact of the SARS-CoV-2 Delta variant, which had not yet been factored into the World Bank projections at the time.

FIGURE 1 Selected results from RIAPA COVID-19 modeling: GDP, agrifood system GDP, poverty, and diet deprivation

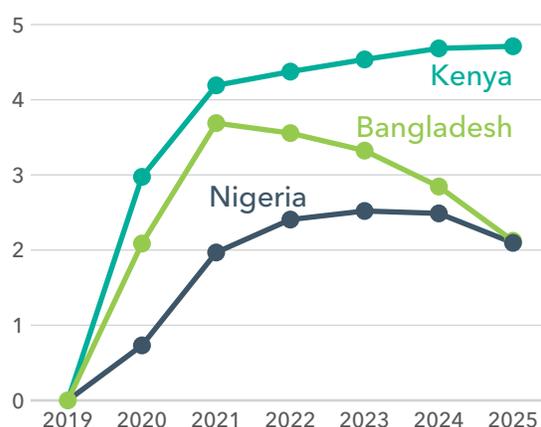
(a) Cumulative GDP growth difference between COVID scenario and baseline (%)



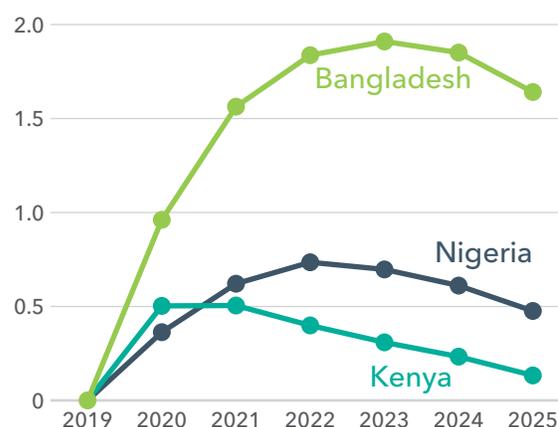
(b) Cumulative AFS GDP growth difference between COVID scenario and baseline (%)



(c) Deviation in national poverty rate from no-COVID baseline (%-pt)



(d) Deviation in diet deprivation index (ReDD) from no-COVID baseline (%-pt)



Source: RIAPA model results.

Panels (a) and (b) in Figure 1 present cumulative differences in the year-on-year growth rates in GDP and AFS GDP between the COVID-19 scenario and the no-COVID baseline. Although differences in growth rates are similar in 2020 across the three countries, the World Bank (2021a) projects a much quicker recovery for Kenya and Nigeria from 2021 onward, resulting in much higher cumulative losses in Bangladesh over the 2020–2025 analysis period relative to the baseline. Consistent with earlier SAM multiplier results, AFS GDP losses are smaller than national GDP losses.

Panel (c) presents deviations in poverty rates. Although the modeling shows that poverty rates start recovering after their peak in 2020, the gap between baseline and COVID-19 poverty rates continues to grow in 2021, and beyond that in Kenya and Nigeria. This reflects the lasting impact of large income losses in 2020 on current investment and hence the future earnings potential of households.

Panel (d) presents changes in the Reference Diet Deprivation (ReDD) index, a multidimensional indicator of consumption gaps across main food groups (staples, fruits, vegetables, dairy, protein foods, and added fats) (Pauw, Ekert, et al. 2021). An increase in ReDD indicates deteriorating diet quality. ReDD is influenced by changes in disposable income and relative food prices, which affect the real cost of a healthy diet. Decomposition of RIAPA results reveals that while COVID-19 generally causes the price of foods to decline relative to non-foods – due to the food sector’s exemption from restrictions – household income losses dominate and cause diet quality to worsen relative to the no-COVID baseline.

Future analysis

RIAPA results presented here are preliminary and subject to change as new information becomes available about domestic and global impacts. The model is also designed to easily incorporate the effects of new waves of the pandemic, such as the new SARS-CoV-2 Omicron variant. The focus of future work will also be on the economic recovery. Here the interest is in both the “private” and “public” drivers of recovery. The adaptability of the private sector to new business and policy environments is a potentially important driver of the recovery. Understanding the endogenous behavioral responses of businesses and exploring how these can be better captured in RIAPA will be an important focus of future work.

Future analysis will also be geared toward informing government policy and investment options that can help shape the pace and nature of the recovery, while recognizing that government ambitions in this regard may be severely curbed by high levels of post-pandemic debt and revenue shortfalls. Even though results consistently highlight that the AFS has been relatively less affected by COVID-19 restrictions, the sector has played an important role in providing a safety net for the overall economy and population. As such, investments in the AFS should continue to be prioritized as a cornerstone of the recovery strategy.

References

- Andam, K., H. Edeh, V. Oboh, K. Pauw, and J. Thurlow. 2020. "[Impacts of COVID-19 on Food Systems and Poverty in Nigeria.](#)" *Advances in Food Security and Sustainability* 5: 145-173.
- BBS (Bangladesh Bureau of Statistics). 2021. "Gross Domestic Product (GDP) of Bangladesh 2020-2021." www.bbs.gov.bd
- IFPRI (International Food Policy Research Institute). 2020. [COVID-19 Policy Response \(CPR\) Portal](#). Accessed June 8, 2020.
- Islam, T., A. Talukder, N. Siddiqui, and T. Islam. 2020. "[Tackling the COVID-19 Pandemic: The Bangladesh Perspective.](#)" *Journal of Public Health Research* 9 (4): 1794.
- KNBS (Kenya National Bureau of Statistics). 2021. [Economic Survey 2021](#). Nairobi.
- McDade, K, D. Ogira, J. Onyango, J. Ojal, G. Kokwaro, W. Mao, and G. Yamey. 2020. [Kenya's Policy Response to COVID-19](#). Policy Report. Durham, NC: Center for Policy Impact in Global Health.
- NBS (National Bureau of Statistics). 2021. [Nigerian Gross Domestic Product Report: 2020](#). Abuja.
- Pauw, K., O. Ecker, J. Thurlow, and A. Comstock. 2021. "[Costing Healthy Diets and Measuring Deprivation: New Indicators and Modeling Approaches.](#)" IFPRI Discussion Paper 2073. IFPRI, Washington, DC.
- Pauw, K., J. Smart, and J. Thurlow. 2021. [The Short-Run Economic Costs of COVID-19 in Developing Countries in 2020: A Synthesis of Results from a Multi-country Modeling Exercise](#). Project Note. Washington, DC: IFPRI.
- UNCTAD (United Nations Conference on Trade and Development). 2020. [Impact of the COVID-19 Pandemic on Global FDI and GVCs. Updated Analysis](#). Investment Trends Monitor, March 2020 (Special Issue). Geneva.
- UNCTAD. 2021. [World Investment Report 2021: Investing in Sustainable Recovery](#). Geneva.
- UNWTO (United Nations World Tourism Organization). 2020. [World Tourism Barometer](#). Volume 18, Issue 2. Madrid.
- UNWTO. 2021. "[International Tourism and COVID-19.](#)" Accessed November 4, 2021. www.unwto.org
- World Bank. 2020a. [COVID-19 Crisis Through a Migration Lens](#). Migration and Development Brief 32. Washington, DC: KNOMAD, World Bank.
- World Bank. 2020b. [Global Economic Prospects, January 2020: Slow Growth, Policy Challenges](#). Washington, DC.
- World Bank. 2021a. [Global Economic Prospects, June 2021](#). Washington, DC.
- World Bank. 2021b. [Resilience: COVID-19 Crisis Through a Migration Lens](#). Migration and Development Brief 34. Washington, DC: KNOMAD, World Bank.
- World Bank. 2021c. [World Bank Development Indicators](#). Accessed November 10, 2021.

3. Impacts of COVID-19 on global poverty and food security: What more do we know now?

David Laborde, Will Martin, and Rob Vos

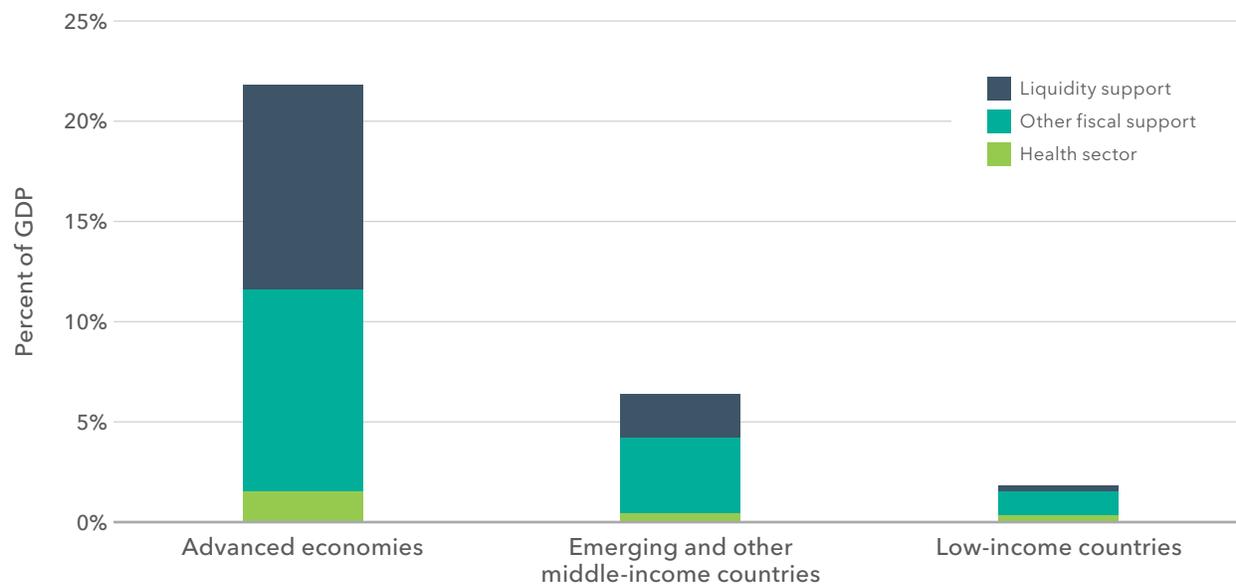
The [death toll](#) of the COVID-19 pandemic reached near 6 million by early February 2022, two years into the pandemic. With waves of coronavirus variants still raging and the risk of new variants emerging, the human toll will undoubtedly rise further. The socioeconomic impacts of the pandemic are believed to be vast. Yet we still know very little about the true economic costs and the full impacts on poverty, food security, educational attainment, and other social outcomes, and much less about the potentially lasting effects and setbacks to human development.

In a [blog](#) and a [chapter](#) in the first IFPRI volume on COVID-19 and food security (Swinnen and McDermott 2020), we assessed the potential impacts of the pandemic on global poverty based on early indications of the possible economic impacts as of April 2020 (Laborde, Martin, and Vos 2020). We estimated that extreme poverty¹ could increase “dramatically,” possibly by as many as 150 million people worldwide, and particularly affect vulnerable people in sub-Saharan Africa and South Asia. This estimate, derived using IFPRI’s global model, MIRAGRODEP, was based on an assessment of the likely global recession that would result from the disease and the public health measures to contain its spread. The scenario assumptions took account of what was known at the time about the demand and supply shocks that were caused by the mobility-constraining measures imposed by governments across the globe. These measures led to supply chain disruptions, causing production and income losses, and provoking a global recession much deeper than that of the global financial crisis of 2008–2009 (IMF 2021; Laborde, Martin, and Vos 2021). The pandemic-induced loss of jobs and income translated into greater food insecurity at the household level, disproportionately affecting low-skilled and informal sector workers (ILO 2021; Bundervoet et al. 2021). At the time these forecasts were made, the timing and effectiveness of vaccines was unknown, as were the longer-term dynamics of the pandemic, and particularly the emergence of new variants.

Decomposition of our early assessment of the pandemic’s impact on the world economy through different channels showed that the economic fallout in the initial epicenters of the pandemic (China, Europe, and the United States) hurt developing countries more severely than those epicenters – most significantly through declines in trade volumes and commodity prices, higher freight costs, and lower remittance incomes. For poorer nations, the economic costs of these international effects exceeded the cost of their own COVID-19 related restrictions on movements of people and economic activity (Laborde, Martin, and Vos 2021).

¹ Extreme poverty is measured against the international poverty line of \$1.90 per person per day at 2011 purchasing power parity (PPP) prices.

FIGURE 1 Fiscal and monetary support in response to COVID-19, as of January 2021



Source: Data from IMF (2021), Fiscal Monitor, [Database of Country Fiscal Measures in Response to the COVID-19 Pandemic](#).

During 2020 and 2021, many restrictions on mobility were lifted, with some reinstated again when new waves and new variants emerged and even as vaccination coverage expanded in 2021. As the “stop-and-go” of full and partial lockdowns continued to hamper the global economic recovery, economic observers made frequent revisions to their measures and forecasts of key macroeconomic indicators (IMF 2022). Many governments, especially in developed countries, responded to the crisis by enacting massive fiscal and monetary stimulus programs to mitigate its worst impacts. The capacity to do so differed starkly across countries. High-income countries provided fiscal stimulus to the tune of 12.5 percent of GDP on average; this was 3 times more in relative terms than emerging economies and other middle-income countries were able to provide and almost 10 times more than that provided by governments in low-income countries (van der Hoeven and Vos 2021; Figure 1). This divergence in government support mimicked that of the vaccine rollout, which is still lagging far behind in developing countries.

The precise impacts of the varied government support programs and rollout of vaccination programs on the recovery from the COVID-19 global recession are still unclear. However, it is evident that these efforts have muted the pandemic’s adverse economic impacts in high-income countries, while – as we discuss below – impacts were not only much more severe in low- and middle-income countries (LMICs) during 2020 and 2021, but also seem to augur much lower growth trajectories for those countries for the remainder of the decade.

Inflation became an issue in 2021, with food prices in international markets surging to levels seen only at the heights of the 2007/08 and 2010/11 global food price crises, further endangering food access for the poor, especially in food import-dependent low-income countries (Chapter 10 in this volume). Amid this uncertainty about the precise economic trajectories of LMICs, the degree to which global poverty and hunger have increased because of COVID-19 also remains an open question.

Assessments of the pandemic's impact on poverty are all based on projections and model-based scenarios and have been adjusted as more economic data becomes available. Our own assessment of April 2020 was that globally, extreme poverty could increase by as much as 20 percent during 2020, with the largest impact in Africa (Laborde, Martin, and Vos 2020). In September 2020, we updated our model-based scenario ([Table 1](#)) and still estimated that the global rise was about 20 percent, but with the burden mainly falling on people in South Asia (especially India). This shift in the impact reflected greater economic fallout in South Asia than originally projected, while impacts in Africa appeared less severe than initially expected (Laborde, Martin, and Vos 2021). Under this scenario, in an assessment for *The State of Food Security and Nutrition* (FAO et al. 2021), it was estimated that some 118 million more people (mid-range estimate) faced hunger in 2020 than in 2019, mainly as a consequence of the economic impacts of the pandemic. According to those estimates, there were 46 million more undernourished people in Africa and 57 million more in Asia than before the pandemic.

In a more recent scenario analysis (October 2021), we used information about actual GDP growth and other key macroeconomic variables, as estimated by the International Monetary Fund (IMF 2021). These observed macroeconomic outcomes have further sharpened our estimates of the pandemic's impact on poverty and food security. For this update, we used the dynamic version of IFPRI's MIRAGRODEP model to assess the pandemic's short- and long-term impacts over the 2020–2030 period. The impacts are assessed against a baseline scenario with growth trajectories based on past trends and without the shocks to labor mobility, supply chains, and demand, as well as without the fiscal and monetary policy responses enacted by governments across the world. The results, of course, are an approximation of the true impact of the pandemic, as the scenario analysis picks up not only the impacts of COVID-19-related restrictions on economic activity, but also the economic policy responses and adjustments in private sector behavior, as well as other factors not directly related to COVID-19 that affected economies during 2020 and 2021. Nevertheless, the pandemic caused a shock so big and policy responses of such magnitude (at least in advanced economies) that we can safely argue that most of the simulated impacts are pandemic related.

The trajectories of recovery from the global COVID-19 recession differ greatly across countries ([Table 1](#)). Broadly speaking, thanks in good part to their strong fiscal response, the recession has been less severe in high-income countries, whose aggregate incomes are projected to return by 2025 not only to pre-pandemic levels, but even above what would be the growth trajectory in the absence of the pandemic. Economic activity in developing countries and especially in low-income countries, in contrast, is projected to remain well below the pre-pandemic growth trajectory.

Agrifood sectors suffered less than other economic sectors, and even continued to expand in most countries in 2020, in large part because governments declared these sectors “essential” and exempted them from most restrictions (as we had assumed in the early April 2020 scenario). The relatively strong performance in agriculture helped mitigate the poverty impacts of the pandemic, especially in countries in sub-Saharan Africa that are highly dependent on agriculture. This gain is

TABLE 1 Short- and long-term impacts of COVID-19 on GDP per capita, agrifood value added, poverty and hunger (values represent differences between COVID and No-COVID scenarios)

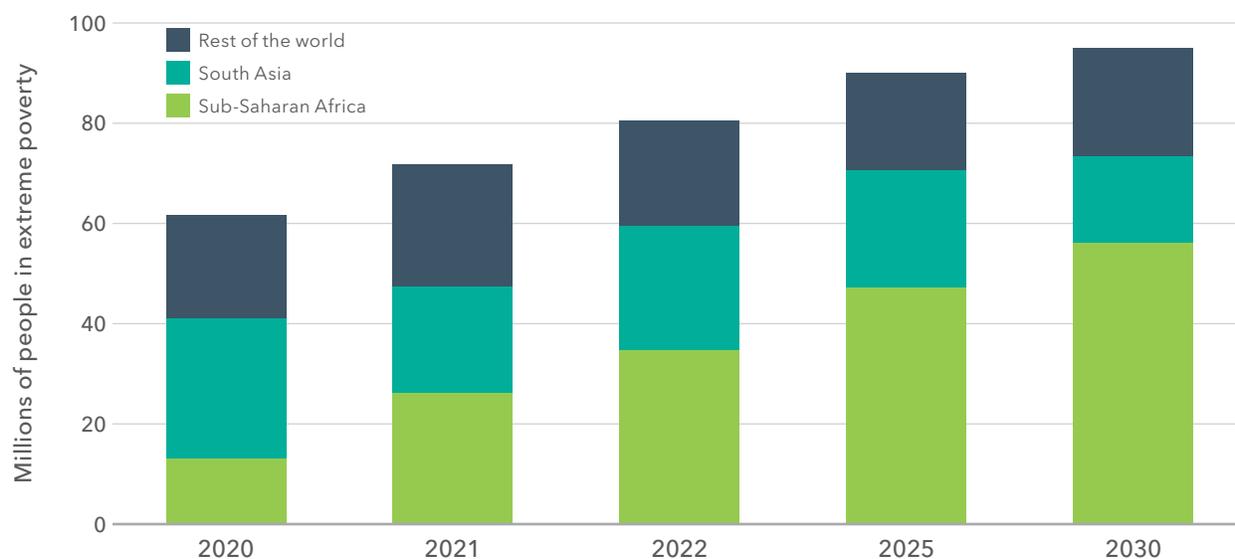
	MIRAGRODEP COVID-19 SCENARIOS (COVID IMPACT)					
	Apr-20	Sep-20	Oct-21			
	2020	2020	2020	2021	2025	2030
IMPACT ON REAL GDP (% CHANGE)						
World	-5.1	-7.1	-5.6	5.2	-1.1	-1.4
High-income countries	-6.2	-8.2	-5.6	-2.3	1.2	1.1
Low-income countries	-3.6	-5.5	-7.3	-9.2	-9.0	-11.2
Sub-Saharan Africa	-8.9	-5.8	-5.1	-5.0	-6.2	-8.0
South Asia	-5.0	-12.9	-11.6	-10.9	-10.6	-10.9
IMPACT ON AGRIFOOD REAL VALUE ADDED (% CHANGE)						
World	-1.8	2.5	3.3	-1.8	-2.0	-2.4
Low-income countries	0.1	2.3	-0.3	-5.5	-5.8	-6.8
Sub-Saharan Africa	3.9	2.0	4.2	-2.4	-4.0	-4.9
South Asia	-2.0	0.1	1.9	-3.5	-5.7	-5.9
IMPACT ON NUMBER OF PEOPLE IN EXTREME POVERTY (INCREASE IN MILLIONS)						
World	147.5	149.7	61.7	71.7	90.0	95.0
Sub-Saharan Africa	79.4	50.5	12.9	26.2	47.1	56.1
South Asia	42.1	72.5	28.1	21.1	23.6	17.3
IMPACT ON NUMBER OF UNDERNOURISHED PEOPLE (INCREASE IN MILLIONS)						
World	n.a.	118	123.7	99.4	100.7	87.8
Sub-Saharan Africa	n.a.	46	25.3	26.4	34.2	37.2
South Asia	n.a.	57	55.7	34.8	36.0	23.9

Source: Authors based on MIRAGRODEP simulations.

Note: "Impacts" are estimated in terms of difference between outcomes for the COVID scenarios and the baseline projection (No-COVID). n.a. = not available.

reflected in the lower estimate for the pandemic's impact on poverty and food insecurity in 2020 (Table 1). However, the picture changes in 2021 and beyond. The higher costs that are driving the surge in food prices during 2021 and 2022 appear to be hurting many producers in agrifood sectors despite increases in food prices. Profit margins have narrowed substantially in livestock production and food processing. Slowing and even declining growth in agrifood sectors is having a significant impact on overall economic growth in low-income countries, where these sectors represent a large share of the economy, and on incomes derived from agrifood activity, which are critical to the livelihoods of many of the world's poor.

FIGURE 2 Impacts on global poverty: COVID-19 scenario (Oct. 2021)
(change from baseline)



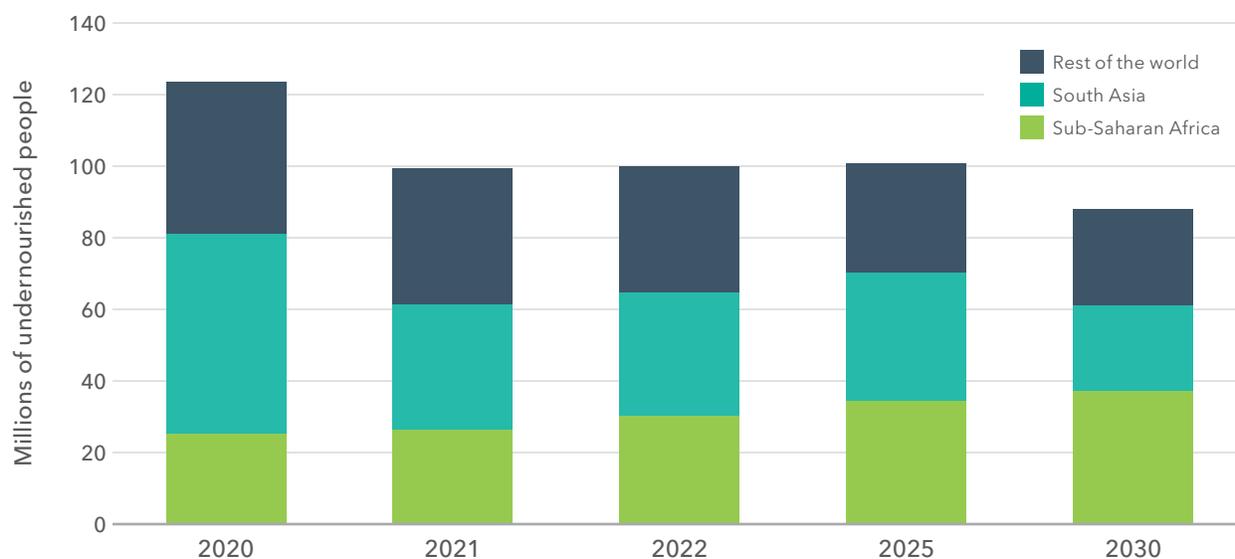
Note: "Impacts" are estimated in terms of difference between outcomes for the COVID scenarios and those of the baseline projection (No-COVID).

Source: Authors based on MIRAGRODEP simulations.

Under our recently revised scenario, we observe a much less severe impact on extreme poverty than in our earlier projections. We now estimate a 2020 global increase of 62 million people in poverty (well below the almost 150 million from our first estimate), largely explained by the stronger-than-previously-projected performance of the agrifood sector in sub-Saharan Africa and especially in South Asia (Table 1). With the subsequent weaker performance of the sector (as compared with the projected no-pandemic growth trajectory), we project increasing numbers of vulnerable people to fall into extreme poverty as compared with the no-pandemic scenario from 2021 onward: 72 million more in 2021, 81 million in 2022, and 95 million more by 2030 (Figure 2). While in 2020 most of the poverty increase is estimated to take place in South Asia, subsequent increases are increasingly concentrated in sub-Saharan Africa, where we see the gap widening between the pandemic and non-pandemic economic growth trajectories.

We see a similar pattern emerging for people at risk of hunger, with the largest increase in the number of undernourished people in South Asia (56 million) in 2020, but smaller and decreasing numbers in the region in subsequent years. In sub-Saharan Africa, in contrast, the COVID-19-related increase in the number of undernourished people would reach 37 million in 2030, up from 25 million in 2020 (Figure 3).

FIGURE 3 Impacts on global hunger: COVID-19 scenario (Oct. 2021)
(change from baseline)



Source: Authors based on MIRAGRODEP simulations.

Note: "Impacts" are estimated in terms of difference between outcomes for the COVID scenarios and the baseline projection (No-COVID).

The assessment presented here, like others of this kind, is necessarily based on projections and model-based scenarios, which have been refined as more economic data have become available. This type of analysis is not designed to measure the precise impact of the pandemic, but rather to gain better insight into how the pandemic is transmitting economic repercussions across sectors, between countries, and to household welfare. Nevertheless, our projections suggest two related, concerning trends. First, COVID-19 may well have long-lasting impacts, setting back progress in reducing global poverty and hunger for a decade or more. Second, the pandemic appears to have put the world's goals of ending poverty and hunger by 2030 out of reach.

References

- Bundervoet, T., M.E. Davalos, and N. Garcia. 2021. "[The Short-Term Impacts of COVID-19 on Households in Developing Countries: An Overview Based on a Harmonized Data Set of High-Frequency Surveys](#)." Working Paper No. 9582, World Bank, Washington, DC.
- FAO (Food and Agriculture Organization of the United Nations), IFAD (International Fund for Agricultural Development), UNICEF, WFP (World Food Programme), and WHO (World Health Organization). 2021. [The State of Food Security and Nutrition in the World 2021: Transforming Food Systems for Food Security, Improved Nutrition and Affordable Healthy Diets for All](#). Rome: FAO.
- ILO (International Labour Organization). 2021. [ILO Monitor: COVID-19 and the World of Work](#). Seventh edition updated estimates and analysis. Geneva.
- IMF (International Monetary Fund). 2021. [World Economic Outlook](#). October 2021. Washington, DC.
- IMF. 2022. [World Economic Outlook. Update January 2022](#). Washington, DC.
- Laborde, D., W. Martin, J. Swinnen, and R. Vos. 2020. "[COVID-19 Risks to Global Food Security](#)." *Science* 369 (6503): 500–502.
- Laborde, D., W. Martin, and R. Vos. 2020. "[Poverty and Food Insecurity Could Grow Dramatically as COVID-19 Spreads](#)." In *COVID-19 & Global Food Security*, edited by J. Swinnen and J. McDermott. Washington, DC: International Food Policy Research Institute (IFPRI).
- Laborde, D., W. Martin, and R. Vos. 2021. "[Impacts of COVID-19 on Global Poverty, Food Security, and Diets: Insights from Global Model Scenario Analysis](#)." *Agricultural Economics* 52 (3): 375–90.
- Swinnen, J., and J. McDermott, eds. 2020. [COVID-19 and Global Food Security](#). Washington, DC: IFPRI.
- van der Hoeven, R., and R. Vos. 2022. "Reforming the International Financial and Fiscal System for Better COVID-19 and Post-Pandemic Crisis Responsiveness." In *COVID-19 and International Development*, edited by E. Papayrakis, 9–28. Berlin: Springer Nature.
- Vos, R., W. Martin, and D. Laborde. 2020. "[How Much Will Global Poverty Increase Because of COVID-19?](#)" *IFPRI COVID-19 Blog*. March 20.

4. Despite COVID-19, food consumption remains steady in Addis Ababa, Ethiopia

Alan de Brauw, Kalle Hirvonen, and Gashaw Tadesse Abate

There is substantial concern that global [food insecurity is increasing](#) as a result of the COVID-19 pandemic. Organizations such as the Food and Agriculture Organization of the United Nations ([FAO](#)), World Food Programme ([WFP](#)), and [CGIAR](#) are trying to get a clear picture of the growing challenges people may be facing, but the nature of the pandemic makes data on food security and daily living hard to obtain. Because face-to-face surveys have largely not been possible during the pandemic, much of what we know about actual changes in food security status comes from phone surveys. These surveys suggest large proportions of respondents are facing falling incomes; the [World Bank](#) reports declines in incomes and food security where they have conducted phone surveys.

These reported income changes suggest the pandemic has affected a large proportion of the world's population and that the poor in particular face the threat of significant food insecurity. However, phone surveys typically do not allow us to quantify respondents' changes in income. In other words, we know they perceive their incomes declining, but we do not know how much they have actually declined. As a result, analysts must make assumptions about the severity of income changes.

A series of surveys we have been conducting in Addis Ababa, Ethiopia, suggests there may be reason to be cautious about such assumptions. While a majority of people have reported lower incomes in recent months, overall food consumption in our most recent survey (conducted in early August 2020) was comparable to pre-pandemic levels, though with shifts in dietary composition. These results, detailed in [our discussion paper](#), indicate that it is easy to read too much into survey questions regarding subjective changes in incomes in the pandemic, and also that many food value chains in Ethiopia have continued to function relatively well in the crisis.

To understand how information on income changes corresponds to changes in food consumption, we have tracked a panel of households in Addis Ababa since 2019. Panel households were initially surveyed in person about their food consumption in August and September 2019, and were tracked during the COVID-19 pandemic through phone surveys in [May](#), [June](#), and [July](#) 2020. The August 2020 food consumption survey allows us to directly compare consumption during the pandemic with consumption at the same time of year in 2019, six months before the pandemic began in Ethiopia.

Collectively, the surveys suggest that even if incomes have declined among a majority of the city population, the value of food consumption has not. The August survey this year found that overall food consumption was similar to pre-pandemic levels. The distributions of values are nearly on top of one another, suggesting the food budget is about the same among households across income groups – even among poorer households. Moreover, we do not find a decline in food consumption among households that had reported an income decline or a lost job in the previous (July) phone survey, implying that the subjective question about an income loss does not predict changes in food security levels.

Although this finding is good news, we do find a shift in the distribution of expenditures between categories of foods ([Table 1](#) and [Table 2](#)). Specifically, grain and staple consumption has risen on average,

TABLE 1 Mean weekly per capita consumption in birr, by food group

FOOD GROUP	SEPTEMBER 2019	AUGUST 2020	DIFFERENCE IN PERCENT
Staples	81.48	90.80	11%
Legumes and nuts	21.38	18.00	-16%
Vegetables	57.39	46.32	-19%
Fruit	17.33	19.45	12%
Meat and eggs	60.37	67.65	12%
Dairy products	12.08	10.33	-14%
All other foods	35.31	37.42	6%
Total	285.34	289.97	2%

TABLE 2 Mean daily per capita calorie consumption, by food group

FOOD GROUP	SEPTEMBER 2019	AUGUST 2020	DIFFERENCE IN PERCENT
Staples	1,025.9	1,263.6	23%
Legumes and nuts	160.5	130.4	-19%
Vegetables	114.7	85.3	-26%
Fruit	33.2	39.8	20%
Meat and eggs	51.0	54.4	7%
Dairy products	33.1	37.9	15%
All other foods	410.0	387.1	-6%
Total	1,828.4	1,998.5	9%

in both value and calorie terms, while vegetable consumption and calories consumed among “all other foods,” including oils, have fallen. Although the decline in consumption of vegetables, which are high in micronutrients, is potentially concerning, consumption of other micronutrient-dense foods, such as fruits and animal-source foods, has remained steady on average.

Taken together, these results have two important implications. The first result casts some doubt on the usefulness of the types of questions being asked about subjective changes in incomes, at least in studying changes in household well-being during the pandemic. Note that even in our July survey, 64 percent of households reported an income decline relative to normal levels at that time of year. However, the questions we and others typically ask do not allow us to quantify the income loss. Our results suggest that simply reporting the proportion of households that say their incomes have declined is misleading in terms of welfare and poverty impacts, and may lead some to seriously over-exaggerate the welfare and poverty impacts of the ongoing pandemic.

The shift in consumption patterns within the overall budget, meanwhile, suggests that food prices and/or the availability of certain foods may have played an important role in changing these patterns. As overall consumption was mostly unchanged year-over-year, it is clear that food is available and many food value chains have either been or become quite resilient to the economic shock associated with the COVID-19 pandemic in Ethiopia.

For these value chains, the pandemic may have caused a temporary shock – given initial disruptions in supplies, people had to figure out new ways of interacting to exchange foods and food products as food moved from producers to consumers. In the initial phases of the crisis, our [May survey](#) showed declines in fruit, meat, and dairy consumption. We surmise that there were initially issues with the supply chain for those foods. Once those issues were resolved, overall consumption could proceed largely as it had before the pandemic. It is also worth mentioning that Ethiopia never imposed a full lockdown that severely restricted movements, which may have played a role in the resilience of some value chains or their ability to bounce back relatively quickly. Experiences might differ in countries that imposed more complete lockdowns.

However, the decline in consumption of some food categories suggests that not all value chains have been equally resilient. To the extent that these foods may play an important role in micronutrient consumption, understanding what is happening with those value chains and how to help them recover is crucial. A first step would be to analyze price data as they become available. Learning where prices have risen fastest during the crisis might help us better understand factors that could lead some value chains to break during a crisis while others continue to function.

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5. Crowdsourced data reveal threats to household food security in near real-time during COVID-19 pandemic

Julius Adewopo, Gloria Solano Hermosilla, Fabio Micale, and Liesbeth Colen

The COVID-19 pandemic and related lockdown measures have disrupted food systems globally, leading to fluctuations in the prices of some food commodities, from local to national levels. Yet detailed data-driven evidence of the extent, timing, and localization of the impact on food security are rarely available quickly enough or with sufficient granularity to guide policy responses.

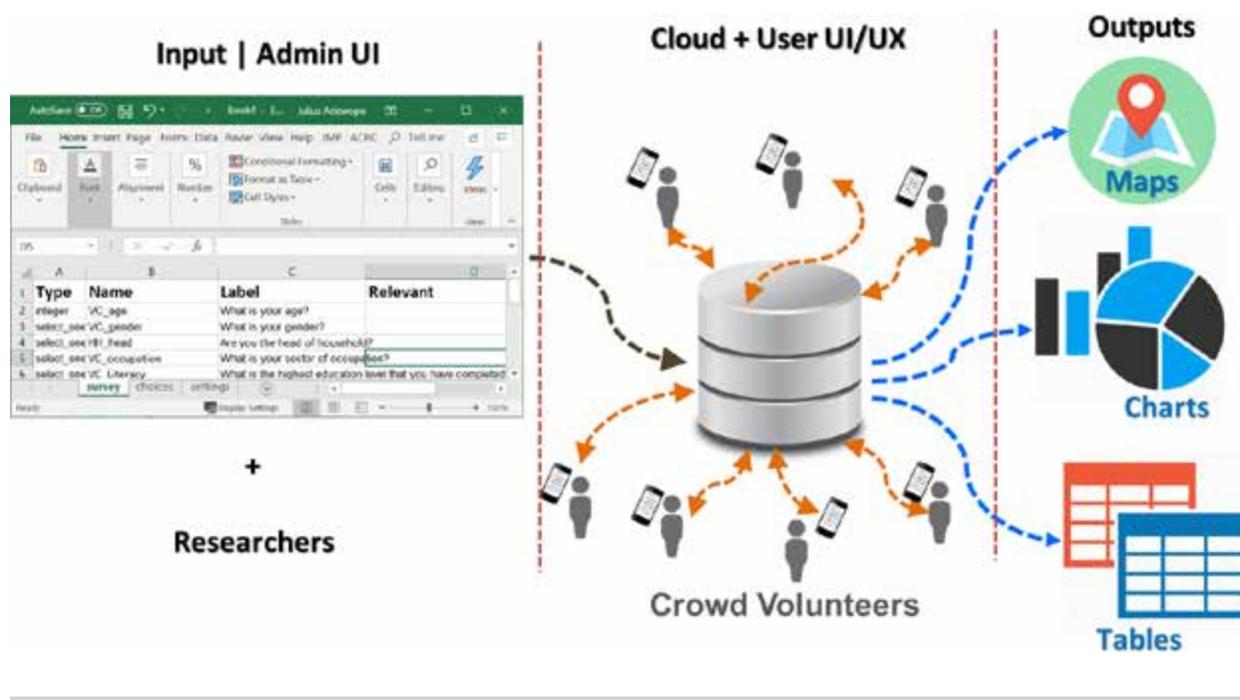
Several institutions regularly collect information on commodity prices in low- and middle-income countries (including [FAO GIEWS-FPMA](#), World Food Programme Vulnerability Analysis and Monitoring [[WFP-VAM](#)], and the [IFPRI Food Security Portal](#)). But they are often unable to generate actionable data on sudden food system disruptions, and the time lag from data acquisition to sharing of data-driven intelligence erodes the potential for rapid response. Further, available price data are often limited in scope because they are monitored at specific markets and at highly coarse spatiotemporal scales (that is, monthly and at the [sub]national level). Therefore, they do not provide sufficient information to monitor and contextualize local (and extreme) changes in food prices or the impact on local livelihoods. Without consistent and concise data on food prices and market performance at local levels, policies, interventions, and responses to emergencies or shocks (such as COVID-19) are likely to be skewed, mostly to the disadvantage of poor rural and remote communities.

Innovating for actionable food price data

The proliferation of mobile phones and internet access in recent years has catalyzed the emergence of innovative data gathering techniques that show great promise in addressing these problems. Citizen participation via digital tools and platforms has the potential to provide near real-time monitoring of food prices, while empowering citizens as both providers and users of information. Our Food Price Crowdsourcing in Africa ([FPCA](#)) initiative was piloted and validated shortly before the onset of the COVID-19 pandemic, mainly in northern Nigeria, by the European Commission's Joint Research Centre (JRC), the International Institute of Tropical Agriculture (IITA), and Wageningen University and Research (WUR). The crowdsourcing system was set up with bespoke digital tools (including an open-data-kit app, bulk SMS app, Google Site, and Ona server platform) ([Figure 1](#)).

Various approaches to crowdsourcing real-time food price data collection have been tested over the past decade in developing countries (Seid and Fonteneau 2017; Zeug et al. 2017). Most of these initiatives faced difficulties in achieving meaningful crowd participation, in including enough commodities, or in setting up efficient data-processing methods to generate or share accurate and representative information.

FIGURE 1 Simplified schema of the FPCA tool, as piloted in Nigeria

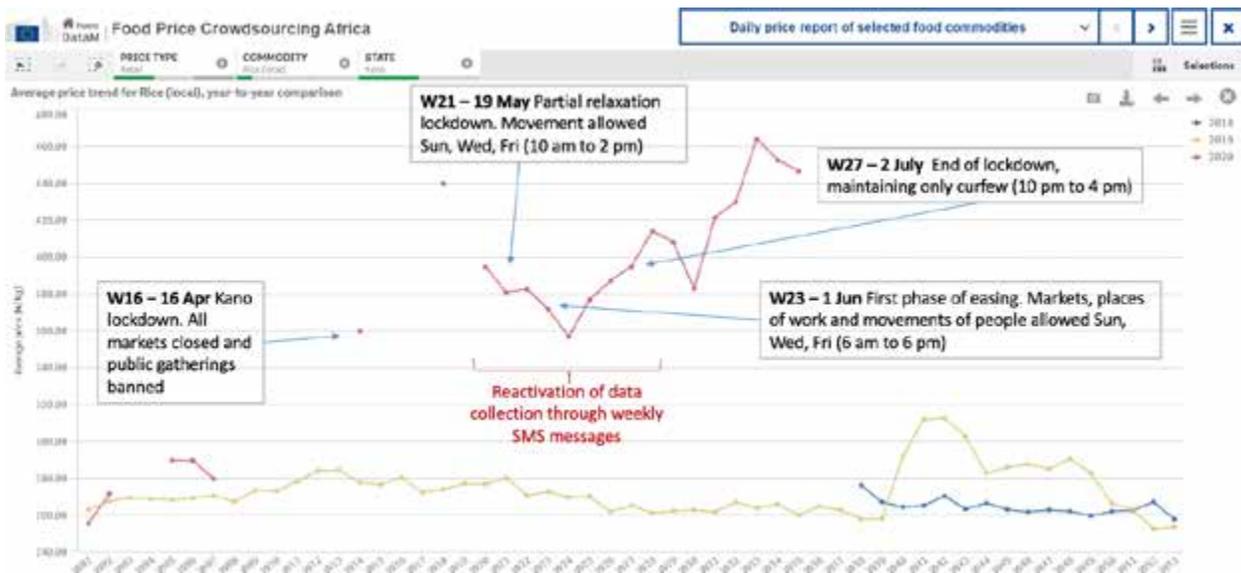


The FPCA project team developed, deployed, and tested the system (and process) for crowdsourcing daily prices for six staple food commodities, georeferenced through the mobile phones of volunteers. Aware of the challenges faced by earlier crowdsourcing initiatives, we used several approaches for forming a sufficiently large and motivated crowd, and developed a new method for automated quality control and data validation. To encourage participation, the project employed information leaflets and radio advertisements, nudges (text messages including social norms and information sharing), and micro-rewards (small monetary incentives).

To ensure that the most reliable data are shared with the public, a rigorous statistical algorithm was developed to automate quality control and check the validity of each submitted datapoint before aggregating the data over time and across locations (mainly at the level of local government areas – LGAs). In the first step, submitted data were spatiotemporally validated (using the auto-recorded time and geo-location) based on the assumption that prices should be similar at closer points (in time and space) for specific market segments in the value chain. In a second step, the data were reweighted to ensure reliability, resembling a formal spatial sampling design (see Solano-Hermosilla et al. 2020 for details). Then the quality-checked data series were disseminated to the public in real time through the web dashboard (Figure 2).

After an initial testing period (September 2018–September 2019), the raw crowdsourced data and auto-checked data were validated. The average weekly crowdsourced prices were comparable with those collected from specific markets by FEWSNET, and monthly by the National Bureau of Statistics (see Arbia et al. 2020). Further, a recent (June–September 2021) validation of crowdsourced data

FIGURE 2 Snapshot of the FPCA web dashboard for FPCA tool



Source: FPCA [web dashboard](#) and [Kano State government](#).

Note: Image of web dashboard showing data visualization for unweighted retail prices of local rice (naira/kg) in Kano state. COVID-related measures and post-lockdown measures implemented by Kano state are indicated for the corresponding weeks.

relative to coordinated ground-truthed data collection from markets within the focal geographies showed similar positive results ([Figure 3](#)).

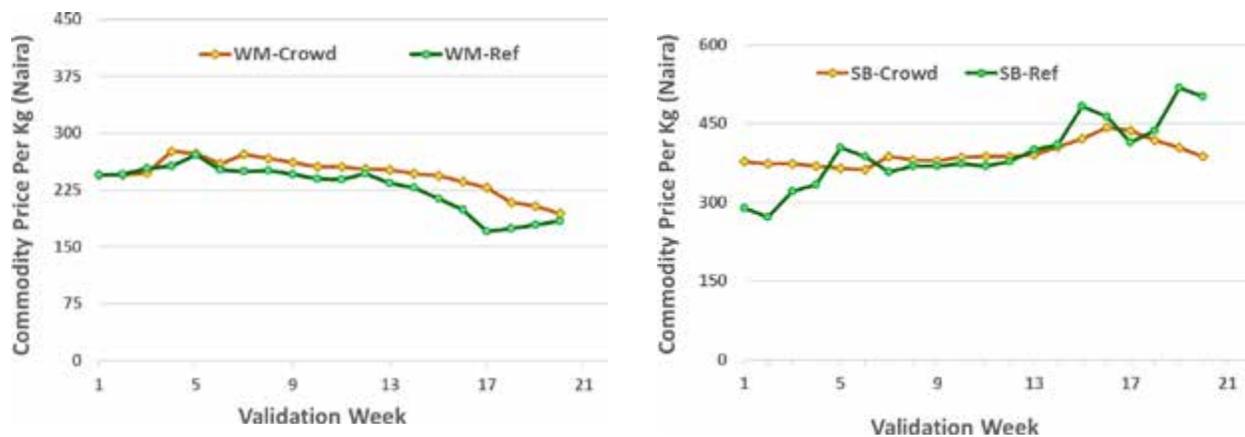
The pandemic, and the associated need to gather evidence for action, justified further scaling-up and validation of the price crowdsourcing system. The system was reactivated during the COVID-19 lockdown of May–June 2020, and in 2021, the pilot was expanded from two states to four, and the number of crowd volunteers was increased from 738 to 1,200, and additional commodities and market types were added. Expansion of FPCA's geographic coverage, volunteer participation, and data flow confirmed the scalability of this approach.

Data-driven insights on commodity prices and COVID-related impact

Reactivation of the FPCA data system from May 12–June 16, 2020, coincided with the period when lockdown measures severely disrupted the food system in northern Nigeria and elsewhere. Motivational text messages were sent to volunteers weekly, triggering an immediate resurgence of data submissions. The platform provided timely and accurate information on trends of food prices at various locations, demonstrating its potential to support policy or humanitarian responses to cushion the impacts on food security and livelihoods (Adewopo et al. 2021).

The crowdsourced data showed a step increase in food prices, trailing the lockdown timeline ([Figure 3](#)). Maize and rice prices increased on average by 26 percent and 44 percent, respectively,

FIGURE 3 Comparison of data submitted by FPCA crowd volunteers with ground-referenced data, weekly averaged data (June–Sept. 2021)



Note: WM-Crowd = white maize crowd data; WM-Ref = white maize ground-referenced data; SB-Crowd = soybean crowd data; WM-Ref = soybean ground-referenced data; FPCA = Food Price Crowdsourcing in Africa program.

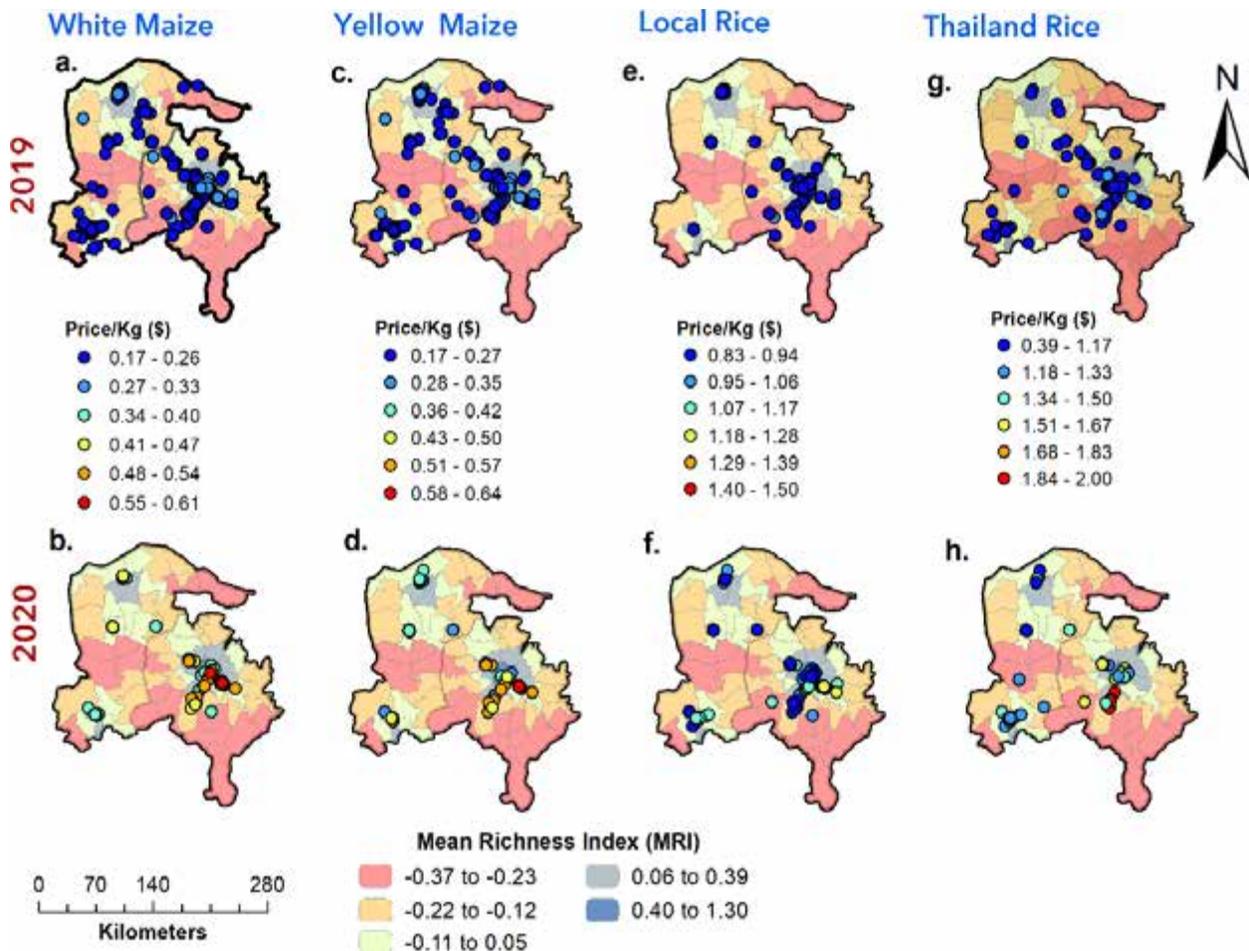
compared with the same period in 2019. Price increases were slightly higher in urban than in rural areas. Notably, the data also showed that prices continued to rise after the lockdown measures were relaxed. For instance, local rice continued to be sold at prices about 50 percent higher than in 2019.

Generally, Nigeria’s National Bureau of Statistics (NBS) reported slightly lower average price increases compared to the crowdsourced data; however, these price reports are published about two weeks after observation, and are available as monthly averages only by state (not LGAs). In contrast, the geo-referencing of each crowdsourced price data submission can support scaling-up of the data and mapping of price hotspots at village, ward, city, LGA, state, and national levels.

These hotspots were mainly observed in urban areas during COVID-19 lockdowns. Combining the price data with a spatial richness index grid (Figure 4) shows higher prices in May–June 2020 in richer and mostly urbanized areas. But rural areas, where poverty rates exceed 70 percent, were hard-hit as well, with average price increases of 22 percent for maize and 42 percent for rice posing a threat to food security.

The picture in urban areas is complex. The average level of richness is higher, suggesting that urban households may be better positioned to absorb the steep price increases, for example, by reducing nonfood expenditures or altering consumption patterns (see findings from Ethiopia). But Nigeria’s urban areas are also characterized by high income inequality with a narrow middle-income class and many living below the poverty line (World Bank 2019). Thus, substantial price spikes (rice prices, for example, increased by more than 50 percent in several urban areas) in combination with job and income losses (NBS-World Bank 2020) indicate that the COVID-19 crisis threatens food security for low- and middle-income earners in urban areas in addition to the rural poor (ElKahdi et al. 2020).

FIGURE 4 Mapping crowdsourced commodity prices and richness, Kano and Katsina states



Lessons and prospects

The successful set-up and implementation of the FPCA system illustrates the potential of engaging citizens through a mobile app to crowdsource spatially and temporally rich data in near real time. In addition, the ease of activating the tool remotely for price monitoring in an emergency showcases its potential to generate timely evidence to guide responses to sudden food system shocks.

However, some caveats should guide aspirations for food price crowdsourcing systems. These include the possibility that volunteer data contributors are not fully representative of the focal region's population. For instance, educated males living in urban areas were overrepresented in the Nigeria project. On one hand, this may be inconsequential if the volunteers exercise due diligence in submitting data across all market segments. On the other, such "elite" and "patriarchal" dominance may

skew the market representation, such that fewer datasets are submitted from markets that are patronized by less-educated and economically disadvantaged groups, including women. Additional efforts are needed to boost the participation of more vulnerable populations, and improve the coverage of remote, less populated, and often highly food-insecure areas. Also, sustaining data contributions over time may be challenging if nudges and/or micro-rewards are no longer available to incentivize volunteers. Although the pilot FPCA showed that the crowd volunteers can be activated easily and successfully and at relatively low cost, the effect of the initial nudge can easily wane with time, and periodic nurturing of volunteers is indispensable. Similarly, a regular or continuous renewal of the cohort of volunteers may also be helpful to sustain robust data submission.

Overall, our findings suggest that smartphone-based, citizen-driven price data collection can complement traditional price data collection systems in terms of timeliness, spatial granularity, and responsiveness to market disruptions – not only caused by the COVID-19 pandemic but also other problems, including conflicts, climate shocks, and policy shifts. At scale, this approach can also support longer-term monitoring of vulnerable regions to catch incipient price spikes. Finally, this initiative can inspire national systems and policymakers to further explore entry points for integration of rapid and localized data into their planning and responses for food security. Globally, as governments and other stakeholders grapple with uncertainties and rapid system changes, crowdsourcing approaches and other emerging tools will be increasingly necessary to provide timely, well-targeted policy responses.

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References

- Adewopo J.B., G. Solano-Hermosilla, L. Colen, and F. Micale. 2021. "[Using Crowd-Sourced Data for Real-Time Monitoring of Food Prices during the COVID-19 Pandemic: Insights from a Pilot Project in Northern Nigeria.](#)" *Global Food Security* 29 (June): 100523.
- ElKadhi, Z., D. Elsabbagh, A. Frija, T. Lakoud, M. Wiebelt, and C. Breisinger. 2020. *The Impact of COVID-19 on Tunisia's Economy, Agriculture System, and Households*. Middle East and North Africa Regional Policy Program Note 05. Washington, DC: International Food and Policy Research Institute.
- NBS (Nigeria National Bureau of Statistics)-World Bank. 2020. COVID-19 Impact Monitoring, Nigeria, Round 3 (July). <https://www.nigerianstat.gov.ng/>
- Seid, Y., and F. Fonteneau. 2017. "Leveraging Crowdsourcing Techniques and Technologies to Generate Better Agricultural Information: Three Case Studies—Indonesia, Nigeria, and the Philippines." Rome: Food and Agriculture Organization of the United Nations.
- Solano-Hermosilla, G., J. Adewopo, H. Peter, G. Arbia, V. Nardelli, and J. Barreiro-Hurle. 2020. "[A Quality Approach to Real-Time Smartphone and Citizen-Driven Food Market Price Data: The Case of Food Price Crowdsourcing Africa \(FPCA\) in Nigeria.](#)" JRC Technical Report. Luxembourg: European Union.
- Zeug, H., G. Zeug, C. Bielski, G. Solano Hermosilla, and R. M'barek. 2017. "[Innovative Food Price Collection in Developing Countries, Focus on Crowdsourcing in Africa.](#)" JRC Science for Policy Report. Luxembourg: European Union.

6. Waves of disease, waves of poverty: New evidence on the economic impacts of COVID-19 and political instability in Myanmar

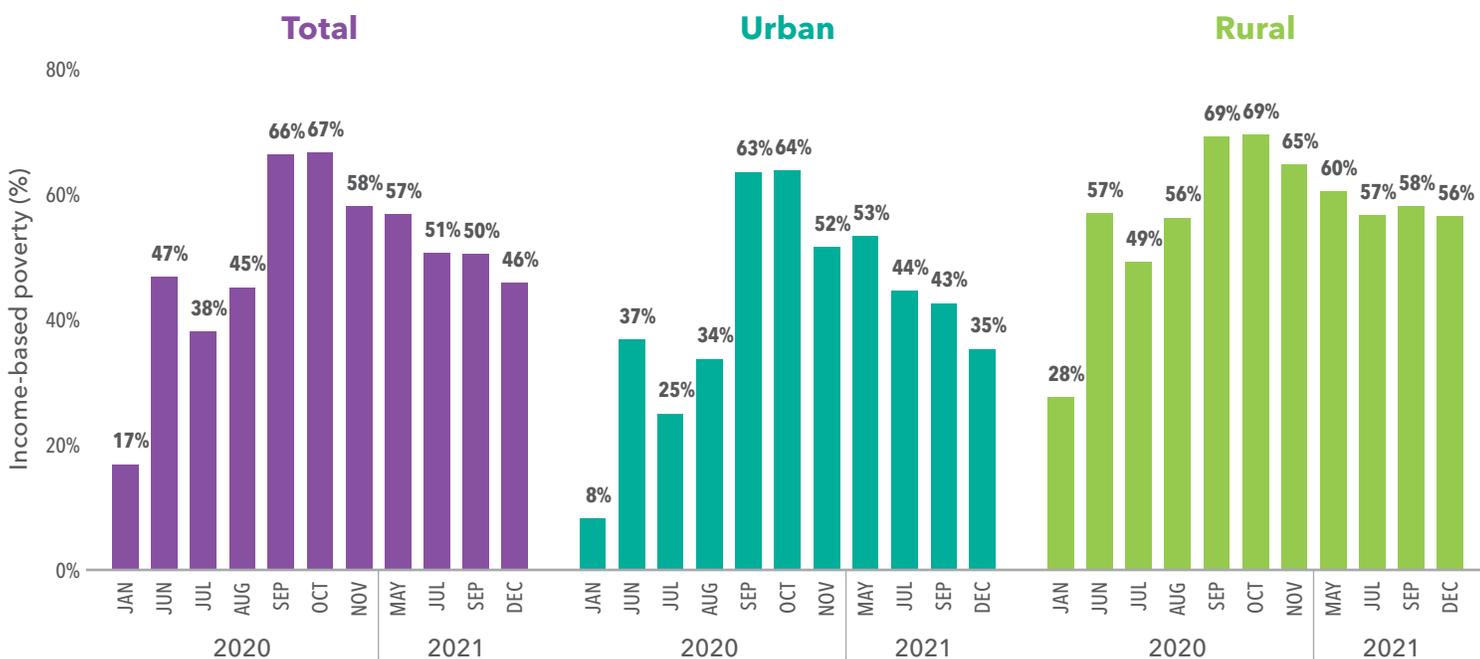
Derek Headey, Ame Cho, Kristi Mahrt, Xinshen Diao, and Isabel Lambrecht

COVID-19-related trade disruptions hit several sectors in Myanmar as early as January 2020, but it was the appearance of the country's first cases in March 2020 and the subsequent lockdown in April that really hurt the economy. Nonessential businesses shut down, workers and traders could not leave home, and demand for labor dried up. The initial COVID-19 prevention measures worked well – resulting in only a few hundred infections in a country of over 50 million by June – but led to a sharp spike in poverty rates followed by a modest economic recovery in mid-2020. However, by September 2020, the country had faced a second, far worse phase of the crisis, with another wave of infections emerging in Rakhine in August 2020 and quickly spreading out of control to Yangon and other regions. Myanmar went from a few hundred confirmed cases in early August to more than 80,000 by late November (though this was surely a large underestimate, given low testing rates), despite widespread lockdown measures starting in mid-September. Then, just as the economy was showing signs of recovery in early 2021, the military took control of the government on February 1, 2021, sparking wide-scale protests and strikes, withdrawal of major foreign investments, crippling financial instability, and a collapse of economic confidence. To make matters worse, mid-2021 saw the Delta wave sweep through Myanmar, producing even higher rates of infection.

Updated results from 10 rounds of a high-frequency IFPRI survey show the severity of these four distinct shocks and their aborted recoveries. In addition, simulation results suggest that lockdowns have especially disastrous impacts on poverty and should be accompanied by larger and better-targeted cash transfers if Myanmar is to successfully contain the economic destruction wreaked by COVID-19. However, social protection – along with so many other essential government services – has also collapsed, leaving the impoverished population of Myanmar to rely largely on their own coping mechanisms, even as international donors and local nongovernmental institutions help as best they can.

The study, from IFPRI's Myanmar Agricultural Policy Support Activity ([MAPSA](#)), used both surveys and simulations to understand the multifaceted disruptions of COVID-19 in Myanmar. From June 2020 onward, we surveyed 1,000 mothers in urban Yangon (Myanmar's largest city and commercial center), and 1,000 mothers in the rural dry zone (a major agricultural production center to the northwest of Yangon). The COVID-19 Rural and Urban Food Security Survey ([C19-RUFSS](#)) covered a wide range of welfare measures in addition to access to COVID-19 emergency response interventions, and continued to track respondents by phone (despite some attrition), even when they migrated away from their original townships. Strikingly, around 14.3 percent of the sample have migrated away from their original dwelling, both permanently (8.5 percent) and temporarily (5.8 percent).

FIGURE 1 Trends in income-based poverty prevalence, January 2020 to December 2021, at the US\$1.90/day poverty line



Source: COVID-19 Rural and Urban Food Security Survey.

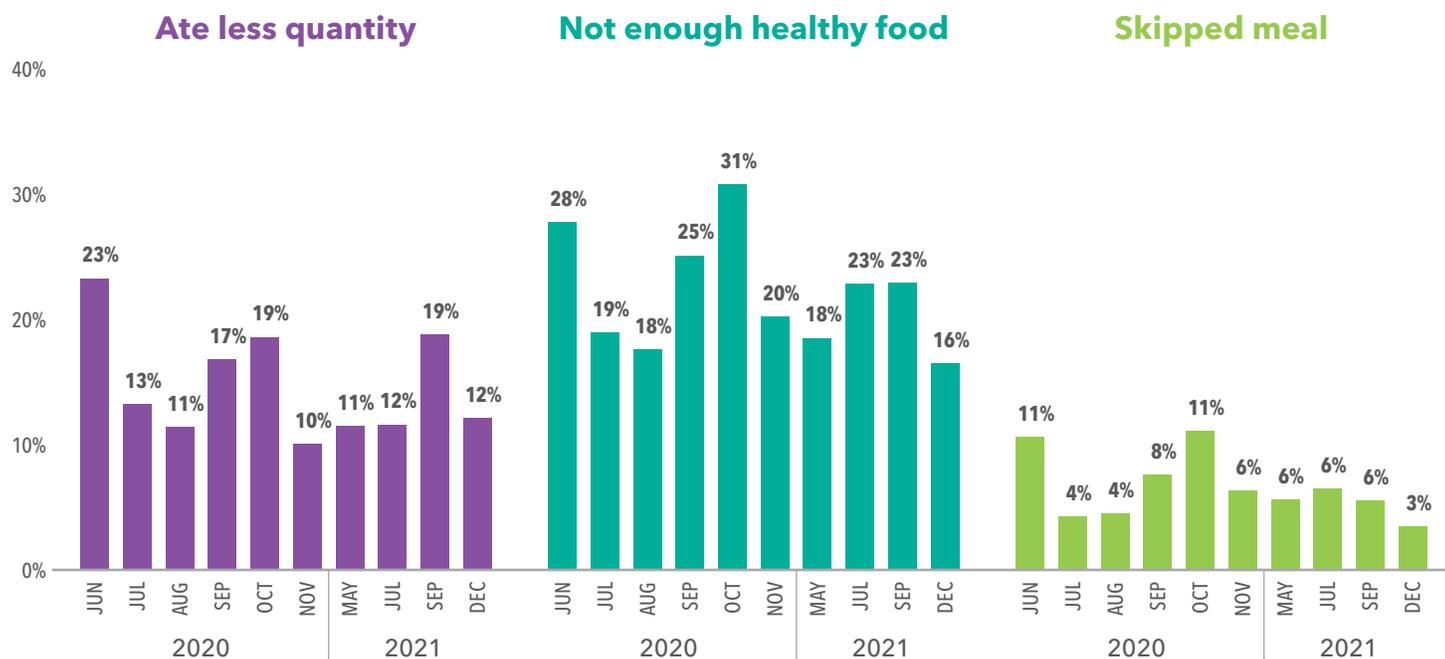
Note: January 2020 estimates of monthly income are based on recalled income responses. All other monthly estimates are based on recalled income in the month prior to the survey.

However, the geographic and demographic limitations of this survey prompted us to also use a micro-simulation analysis of a nationally representative household survey from 2015, in which pre-COVID-19 livelihoods were negatively shocked with lockdowns and trade and remittances disruptions, but also positively shocked with different levels of household cash transfers. Hence the phone survey tells us what is happening on the ground in 2020 and 2021, while the simulations illustrate potential impacts on poverty under more hypothetical but realistic lockdown scenarios, and under different hypothetical economic and social protection scenarios.

Survey-based evidence on poverty in Myanmar in 2020

The monthly phone survey suggests that income-based poverty (at the US\$1.90/day poverty line) soared between January and June 2020 during the first wave of COVID-19 disruptions (Figure 1), especially in Yangon where only 8 percent of surveyed households were poor in January, but 37 percent were poor in June. In the rural sample, pre-COVID poverty was higher than in Yangon (28 percent in January) and also increased dramatically, to 57 percent in June 2020. Both rural and urban samples saw some improvement in mid-2020, but when the second wave of COVID-19 broke out in August 2020, poverty started to rise again. By October 2020, with infections peaking and stringent COVID-19 measures again

FIGURE 2 Trends in food insecurity experiences and poor maternal dietary diversity in urban and peri-urban Yangon, June 2020 to December 2021



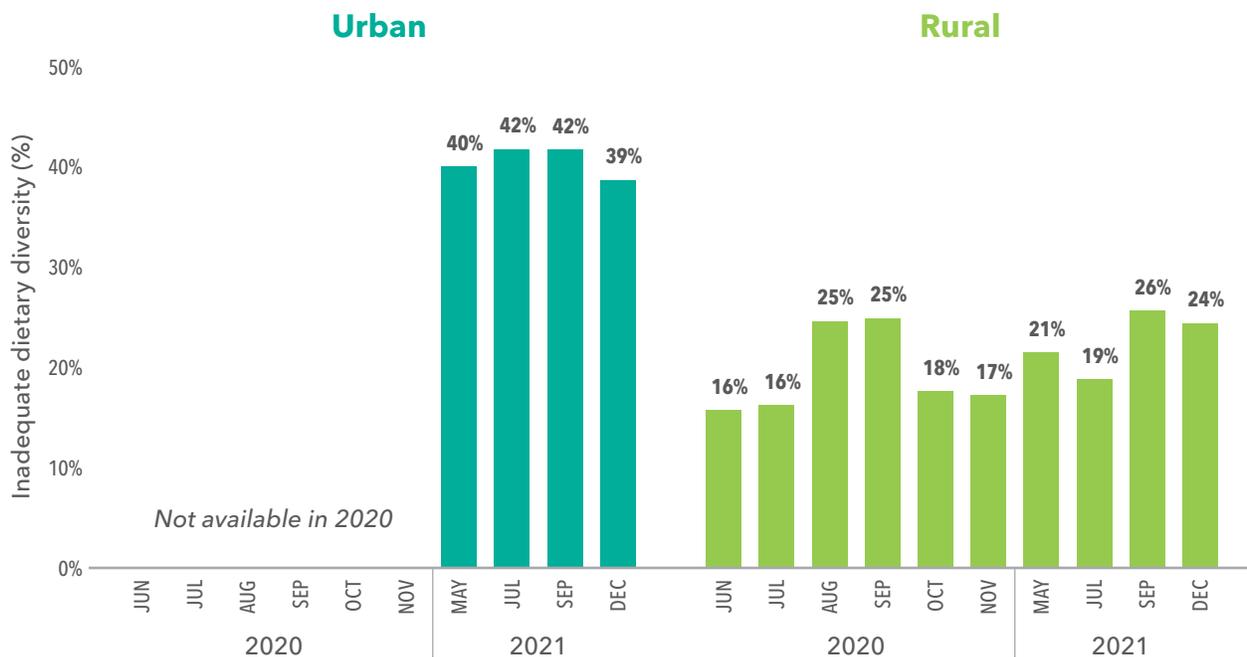
Source: COVID-19 Rural and Urban Food Security Survey.

being implemented, income-based poverty was as high as 69 percent in the rural sample and 64 percent in the urban sample. By November, poverty rates were starting to fall, and the economy continued to improve into early 2021. However, the February 1 military takeover caused another economic crisis. When we surveyed households again in May 2020, poverty was still 60 percent in the rural sample and 53 percent in the urban sample. Since then, poverty has remained disturbingly high in the rural sample, but fallen to 35 percent in the urban sample (still five times the level prior to COVID-19).

These poverty trends are also mirrored by rising rates of food insecurity ([Figure 2](#)) and poor maternal dietary diversity ([Figure 3](#)), especially in Yangon ([Figure 2](#)). In the wake of the first wave, 23 percent of mothers reported eating lower quantities of food and 28 percent reported not eating enough healthy food, while 11 percent skipped meals. We saw numbers fall in mid-2020 but rise again in late 2020 as the second wave of infection hit and in September 2021 when the third wave peaked, although we also note some lean season effects in the rural sample.

In [Figure 3](#), we also see some signs of lean season effects in the rural sample, with inadequate dietary diversity among mothers always higher in August and September. However, the most striking result is that maternal dietary diversity is much poorer in the Yangon sample, with around 40 percent of mothers having poor diets in 2021 (the indicator is not available in 2020 in the urban sample).

FIGURE 3 Inadequate dietary diversity among mothers by urban and rural areas, June 2020 to December 2021



Source: COVID-19 Rural and Urban Food Security Survey.

Simulation-based evidence on poverty in Myanmar in 2021

With poverty rates still so high in the wake of multiple shocks, what can be done reduce poverty in the near future? [Microsimulations](#) can shed light on how poverty reacts to different degrees of COVID-19 disruption and different doses of accurately targeted cash transfers. The greater challenge, given the political situation in Myanmar, is for donors to find the funds and program modalities to effectively deliver social protection to a sufficient number of impoverished people.

The simulations use an expenditure-based poverty measure at \$2.50/day. Consistent with the survey evidence, this measure rises dramatically during lockdowns, especially in urban areas. Nationally, under this measurement, extreme poverty was 9.8 percent prior to COVID-19, but the simulation shows it rising to 31.6 percent, and urban poverty rising from just 2.7 percent to 24.7 percent during strict lockdowns.

To address the economic impacts of the lockdowns, the previous democratically elected government had provided several rounds of cash transfers of steadily increasing amounts, with around 20,000 kyat (about \$15.50) given to households in September. Our phone survey evidence suggests just under half of all households received these transfers in September 2020, so perfect targeting in

the simulations is an unrealistic scenario. Nevertheless, the microsimulation evidence shows that perfectly targeted 20,000 kyat transfers have only a moderate impact on extreme poverty, which falls by 18 percent – from 31.6 to 25.9 percent. It takes a 60,000 kyat transfer to halve poverty during a lockdown. Once a lockdown ends, however, the evidence suggests the situation is quite different – even 20,000 kyat transfers help bring extreme poverty much closer to pre-COVID poverty rates in those circumstances.

What are the implications for social protection in Myanmar?

While Myanmar has already experienced several waves of COVID-19, it may yet experience further waves, particularly with the Omicron variant spreading. Moreover, economic recovery has clearly been stalled by the dire political situation and related economic turmoil. International agencies need to aid recovery in the medium to longer term, but they also must help build up resilience in the shorter term and scale up emergency assistance for the most impoverished and food insecure populations. Should further COVID-19 shocks strike, agencies should aim to give larger cash transfers during lockdowns, both because so many households earn zero income when stay-at-home orders are in place and because more generous transfers might also improve adherence to the restrictions, thus curbing spread of the disease. These agencies should also provide extra protection to nutritionally vulnerable households with pregnant women or young children.

Our research indicates that Myanmar is in a dire economic situation that will require dramatic changes in the way the polity and economy is managed. On the social protection front, the most important task for donors is to scale up social protection, then to identify the most effective and innovative delivery mechanisms given the challenges of military rule. Closer monitoring and evaluation is also essential to ensure interventions deliver desired results. Without these urgent steps, Myanmar's repeated waves of disease, poverty, and political instability could well be a tsunami of untold misery.

This work was undertaken as part of the Myanmar Agricultural Policy Support Activity (MAPSA) led by the International Food Policy Research Institute (IFPRI) in partnership with Michigan State University (MSU). Funding support for this study was provided by the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by IFPRI, the United States Agency of International Development (USAID), and the Livelihoods and Food Security Fund (LIFT). Additional funding for this survey was also provided by the CGIAR COVID-19 Hub, which is supported by contributors to the CGIAR Trust Fund.

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7. Impact of falling remittances amid COVID-19 on Yemen's war-torn economy

Dalia Elsabbagh, Sikandra Kurdi, and Manfred Wiebelt

Even before the COVID-19 pandemic battered economies across the world, Yemen had already experienced a half decade of civil war, resulting in a loss of approximately 45 percent of its real GDP by the end of 2019, according to the Yemeni Ministry of Planning. As the conflict continued, remittances from Yemenis working outside the country kept many households afloat and became an increasingly important source of income, estimated at \$3.77 billion in 2019 – around 13 percent of GDP.

But with the spread of COVID-19 in 2020, the flow of remittances dramatically shrank. The incomes of Yemenis working in the Gulf states, the United Kingdom, and the United States plummeted due to low oil prices, lockdowns, and other social distancing measures in host countries. Transfers into Yemen through one major remittance service, Alkuraimi Islamic Bank, reportedly dropped by 70 percent in March 2020. Data collected from interviews with foreign exchange agents in late 2020 confirm remittances remained low through the year.

How has this major income loss affected Yemen's beleaguered economy? We [modeled](#) the impacts using a social accounting matrix (SAM) multiplier model approach, showing that the falloff in remittances led to significant declines in household income that hit the poor the hardest, as well as significant indirect effects on production, food systems, and employment.

Impact on household income

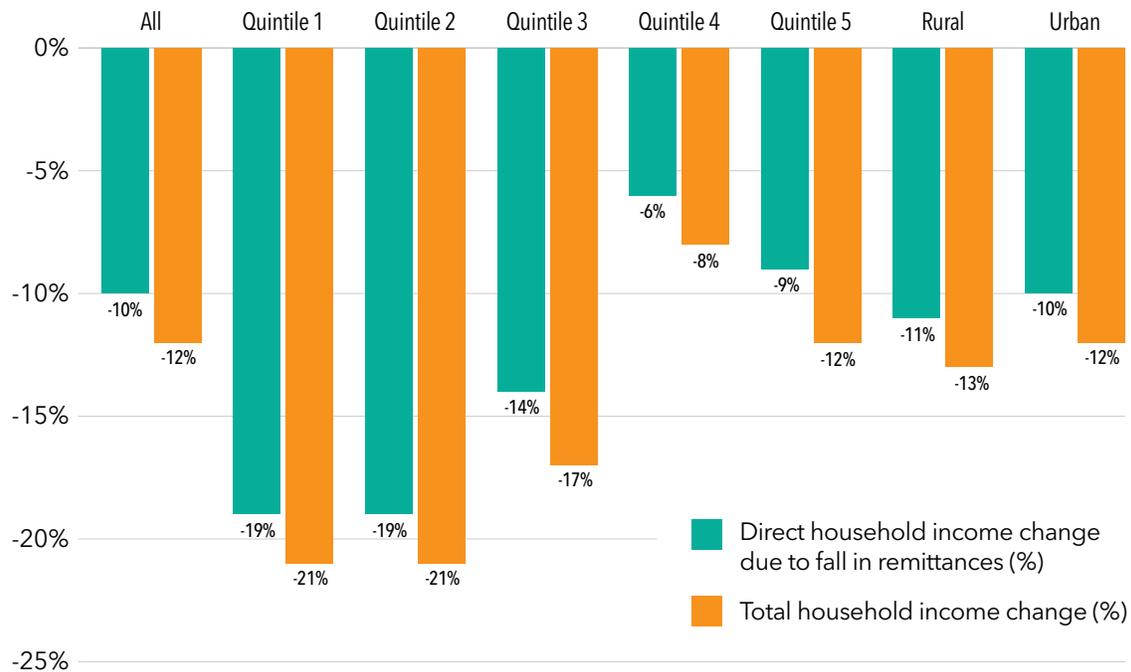
While the model shows all Yemeni households experiencing an income loss in 2020 due to COVID-19, the impacts are regressive, with poorer households experiencing proportionally larger declines.

Overall, the model shows the poorest households, represented by quintiles 1 and 2, suffering a severe income loss of approximately 21 percent over the year 2020 ([Figure 1](#)), due mainly to their high income dependency on remittances. Higher income quintiles experience a less significant share of income loss, while absolute income losses are larger.

Rural households experience slightly higher income losses than urban households, as the former are among the poorer segments of Yemeni society, with higher shares of remittance income, as well as having a larger share of earned income from agriculture and services, which were more heavily affected by lower household consumption nationally.

In addition to directly reducing households' disposable income for consumption, the resulting decrease in demand has indirect effects on the wider economy. A comparison of total household income changes with direct changes resulting from remittances ([Figure 1](#)) shows that these indirect

FIGURE 1 Change in household income due to drop in remittances during 2020, from 2019



Source: COVID-19 Yemen multiplier model.

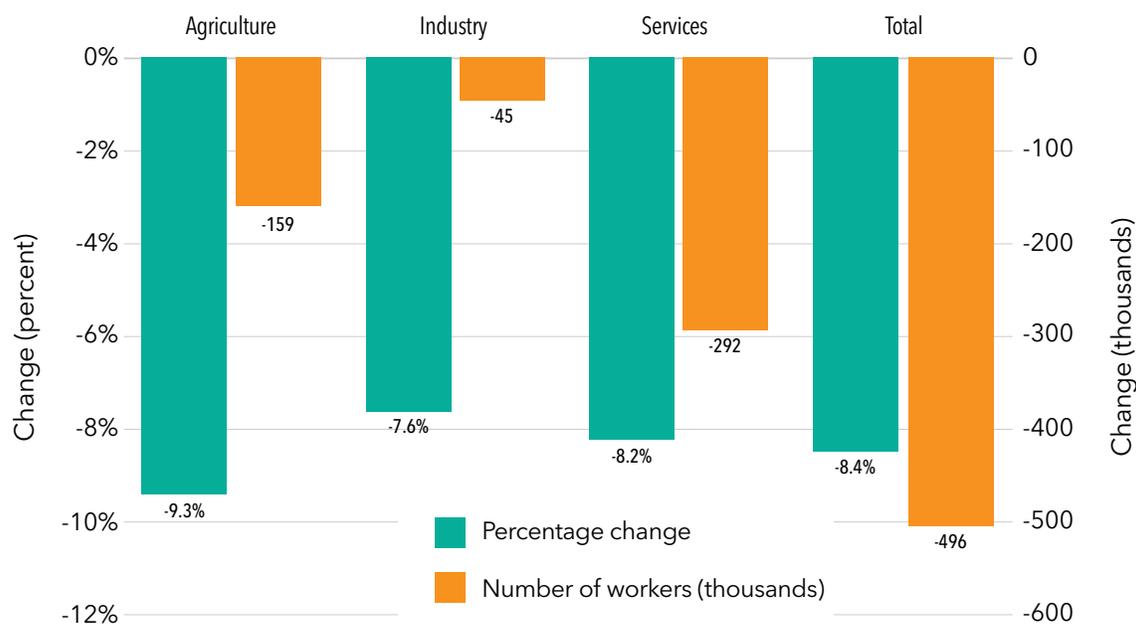
effects generally add another 2 to 3 percentage points to income losses – resulting from the contraction of the agriculture, industry, and service sectors.

Impacts on GDP by sector

At the country level, the model estimates the drop in remittances caused a decline of 8.5 percent in Yemen’s real GDP for 2020. The impacts on the economy are fairly evenly distributed across sectors: Agriculture is estimated to decline by more than 9 percent and the industry and service sectors by more than 8 percent. The agriculture sector, industry, and service sectors represent 19, 20, and 61 percent of Yemeni GDP in 2019, respectively. So, while the agriculture sector is the most affected in percentage terms, the largest absolute decline appears in the service sector.

The agrifood system as a whole declines by 9.5 percent. While all food sectors are affected, the greatest economic damage occurs in food processing, including grain milling and coffee processing, with estimated losses of 9.7 percent, explained by lower household demand.

FIGURE 2 Estimates of change in employment during 2020, absolute and percent change from 2019, by sector



Source: COVID-19 Yemen multiplier model.

Impact on employment

The impact of the pandemic-induced decline in remittances on employment is mainly driven by job losses in the service sector, which employs 60 percent of all workers (according to the SAM), followed by agriculture, which experiences the largest relative decline (Figure 2). Within the service sector, trade and transport experience a sharp fall in demand caused by the contraction in almost all value chains. Decreased demand for business and health services and real estate activities, for household workers, and in construction and agriculture also contribute significantly to the decline in employment.

As the war continued through 2020, Yemen implemented few direct large-scale pandemic mitigation measures. Clearly, however, our SAM multiplier modeling results show a sizable adverse short-term impact on economic output and household welfare from lost remittances that even robust pandemic responses from the Yemeni government would do little to address. The longer-term economic impact will depend on the pandemic responses of neighboring Gulf countries – allowing remittances to recover – and on maintaining or increasing foreign aid flows that serve as the other key source of crisis support to Yemeni household incomes, during a time when foreign aid budgets face unusual pandemic-related pressures.

Funding for this study was provided by the International Fund for Agricultural Development (IFAD) under the Agriculture Investment Data Analyzer (AIDA) project and the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by IFPRI.

Originally published March 4, 2021.

8. Short-term impacts of COVID-19 in rural Guatemala: Call for a closer, continuous look at the food security and nutritional patterns of vulnerable families

Francisco Ceballos, Manuel Hernandez, and Cynthia Paz

In early 2020, Guatemala reacted swiftly to the unfolding COVID-19 pandemic. It was one of the first countries in Latin America to impose strict measures to contain the spread of infection, including travel restrictions and a six-month nationwide lockdown beginning March 21 (eight days after its first reported case), comprising a temporary halt of activities in the private and public sectors, suspension of public transportation, and mobility restrictions, with a strict curfew from 6 p.m. to 5 a.m. According to the Oxford COVID-19 Government Response Tracker ([OxCGRT](#)), the country's measures were among the top five in Latin America in terms of stringency.

In a country where, according to pre-pandemic statistics, nearly 6 out of 10 people live in poverty and half of children under 5 are stunted, the economic and social consequences of COVID-19 and corresponding control measures deserve close attention. Moreover, Guatemala's existing structural inequalities along cultural and geographic lines, institutional and public service deficiencies, and vulnerability to climate shocks (as shown by the devastating Eta and Iota hurricanes in November 2020), all fan the flames of this crisis and call for continuous monitoring and rapid and innovative responses.

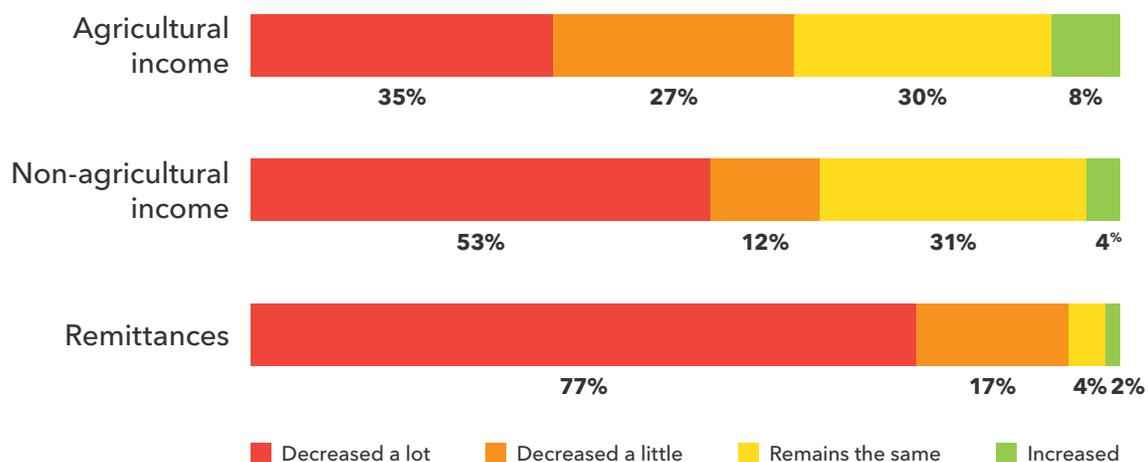
Our [recent study](#) closely examines the short-term effects of the COVID-19 lockdown on food security and nutrition among rural households in Guatemala's Western Highlands – possibly the country's most vulnerable region, with the highest poverty and stunting rates and characterized by smallholder farming, low agricultural productivity, and reduced market access. The results indicate that incomes fell, food insecurity doubled, and dietary diversity declined.

The analysis relies on a comprehensive panel dataset of 1,824 small agricultural households located in the departments of Huehuetenango, Quiché, and San Marcos, collected pre- and post-lockdown during November–December 2019 and May–June 2020. Post-lockdown data gathering was conducted exclusively by phone, using numbers collected during the first round, and relying on community leaders to contact households that did not answer repeated phone calls, as some of them had lost or changed their numbers (a common practice in rural Guatemala).

Key findings

The lockdown's direct economic consequences are evident at first glance: Almost two-thirds of the interviewed households reported a decrease in agricultural and non-agricultural income (the latter

FIGURE 1 Reported changes in income sources in Guatemala’s Western Highlands



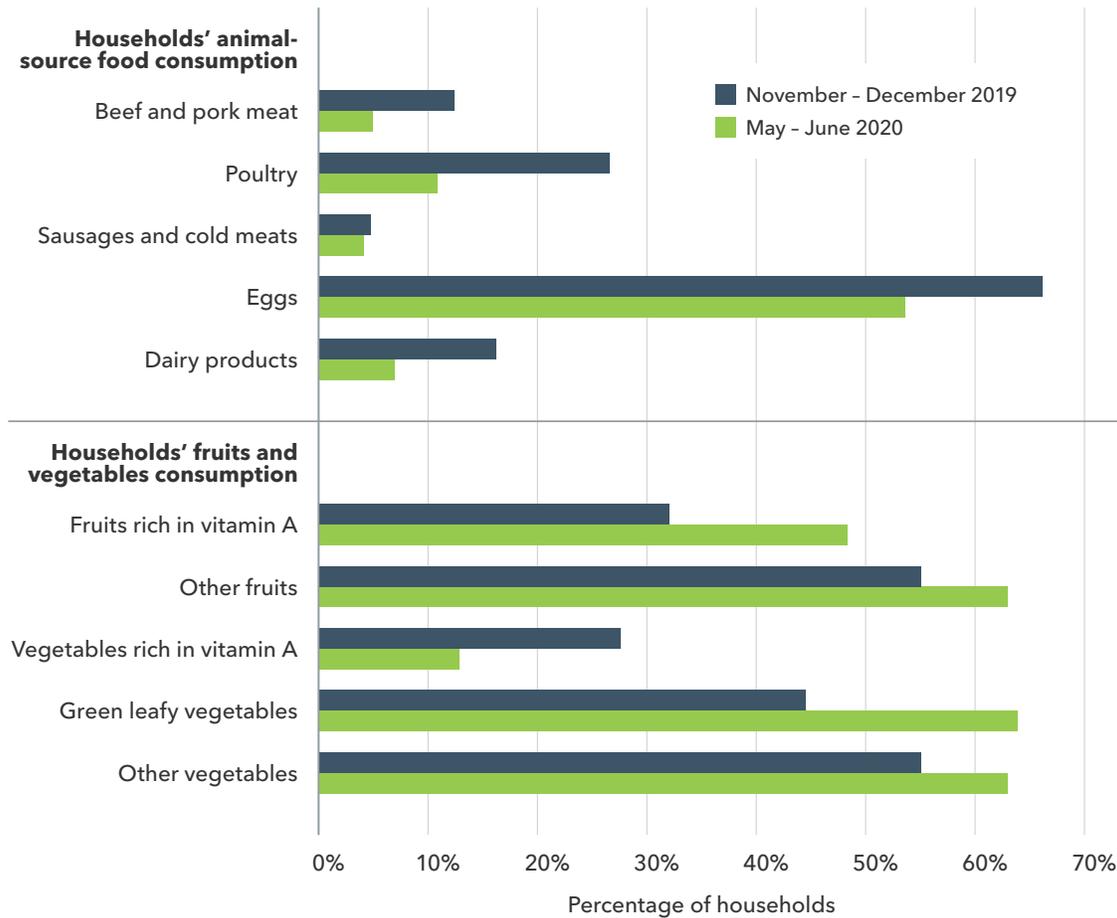
being sharper), while the large majority (94 percent) reported decreased receipt of remittances, consistent with national reports during the first months after the outbreak. In aggregate, roughly three out of every four households reported an unambiguous decrease in income (Figure 1).

Despite the relatively quick rollout of government support programs, the study finds that poor households mostly relied on limited coping mechanisms to deal with these income reductions. This, together with reported reduced food availability and higher food prices in local markets (a result of disruptions in trade and logistics and labor shortages, despite the agriculture sector’s official exemption from lockdown restrictions), appears to have reduced households’ food security and dietary diversity.

The prevalence of food insecurity roughly doubled between the end of 2019 and mid-2020, the survey indicates. This pattern was observed consistently across all forms of food insecurity: mild (having eaten only a few kinds of foods because of a lack of money or other resources), moderate (having eaten less than they thought they should), and severe (not having eaten despite feeling hungry).

In addition, households’ dietary diversity fell overall, as indicated by a small but statistically significant decrease from 6.9 to 6.4 in the Household Dietary Diversity Score (HDSS), defined as the number of food groups consumed – ranging from 0 to 12 – in the 24 hours preceding the interview. Households seemed to switch away from consumption of animal-source foods toward greater consumption of fruits and vegetables, with no significant changes observed in other food groups, such as cereals and grains or legumes and nuts (Figure 2). Unfortunately, the data did not permit us to determine net changes in nutrient intake brought about by this dietary switch, as quantities consumed were not collected during the surveys.

FIGURE 2 Household consumption before and after COVID-19



At the individual level, dietary diversity among women ages 15–49 remained unchanged at around 4.5 (on a range of 0–9 food groups) and increased among children ages 6–23 months from 3.3 to 3.9 (on a range of 0–7 food groups). This points toward potential changes in intrahousehold allocation of foods in response to a shock, where young children may have been prioritized.

Interestingly, the study indicates that higher-income households reduced their dietary diversity more than lower-income ones, and were also more prone to report a decrease in income. The lockdown may thus have had relatively greater impacts on higher-income versus lower-income households, which tend to depend more on subsistence farming and other small-scale, locally oriented activities less affected by the restrictions. Nonetheless, the latter could still have been worse off in absolute terms, and exhibit additional vulnerabilities along several dimensions – acute malnutrition, for example, more than doubled in Guatemala over the months after the start of the pandemic compared to same period in 2019. Households located in communities that imposed additional access restrictions during the lockdown (over 75 percent of those sampled) also showed a larger decrease in their dietary diversity compared with those in communities that did not.

Policy responses and looking forward

Starting in April 2020, the government of Guatemala scaled up programs to contain the negative effects of the crisis on livelihoods and food security. These included greater support for micro, small, and medium enterprises, subsidies for public services, and price controls on foods included in the basic food basket. Two COVID-19 programs provide direct assistance to vulnerable rural and urban families: the Programa de Apoyo Alimentario (Food Support Program) distributes rations, prioritizing the procurement of basic grains from smallholder farmers; the Bono Familia provides an emergency supplementary monthly income of around US\$130. Despite these efforts, the study shows the assistance may not be reaching many of its intended recipients. While 6 out of every 10 communities received some form of public or private aid (as reported by community leaders), only 2 out of every 10 households reported receiving aid. This suggests the need to intensify efforts to reach a larger share of rural households affected by COVID-19.

Overall, the study suggests a complex array of impacts from the COVID-19 pandemic and related control measures in the nutritionally compromised context of Guatemala's Western Highlands – including decreases in household food security and overall dietary diversity following reported reductions in income, price increases, and lower food availability at local markets. While the pandemic impacts continue to evolve and present ongoing challenges, our findings call for a closer and continuous look at the conditions rural families in the region face, together with their responses. A second follow-up survey implemented in May–June 2021, which is part of an ongoing study, indicates that the pandemic has continued to affect the incomes, food security, and dietary patterns of surveyed households. Despite slight improvements across most dimensions compared to the 2020 survey, study households still report lower agricultural and non-agricultural income and remittances, more food insecurity experiences, and a decrease in dietary diversity compared to pre-pandemic levels. Similarly, given the prolonged nature of the COVID-19 pandemic, households reporting an unambiguous income decrease have shifted to more costly coping mechanisms (toward borrowing and away from using savings or relying on friends and relatives). Moreover, households that reported a decrease in income and dietary diversity in 2020 were found to be more prone to report a decrease in 2021, pointing to persisting economic and nutritional effects of the pandemic on specific population groups. A third, follow-up survey in 2022 will permit us to assess longer-term variations on food security and nutritional patterns.

The [paper discussed here](#) is part of a COVID-19 [special issue of *Agricultural Economics*](#) edited by IFPRI's Johan Swinnen and Rob Vos. The study was funded by the U.S. Agency for International Development (USAID).

Originally published May 13, 2021, and updated January 4, 2022.

9. COVID-19 undermines incomes, livelihoods in rural Myanmar

Catherine Ragasa, Isabel Lambrecht, Kristi Mahrt, Zin Wai Aung, and Michael Wang

As the COVID-19 pandemic unfolded in early 2020, Myanmar avoided an early wave of infections. However, even before its first cases were confirmed, the country faced a related economic crisis. Border closures, movement restrictions, and reduced international demand for Myanmar's goods and services severely affected the nation's forecasted economic growth. In late 2020, Myanmar also experienced two waves of COVID-19 infections and lockdown measures, followed by a political crisis beginning in February 2021. This combination of widespread COVID-19 and political turmoil has had substantial negative impacts on the nation's population.

The fallout hit rural areas particularly hard, according to a series of phone surveys with farming communities in the Central Dry Zone, a region comprising 23 percent of Myanmar's total population and a third of the country's grain cropping area. [An analysis](#) of survey results from June 2020, published in *Agricultural Economics*, shows that the first months of the pandemic crisis had persistent negative economic impacts that depressed rural household incomes.

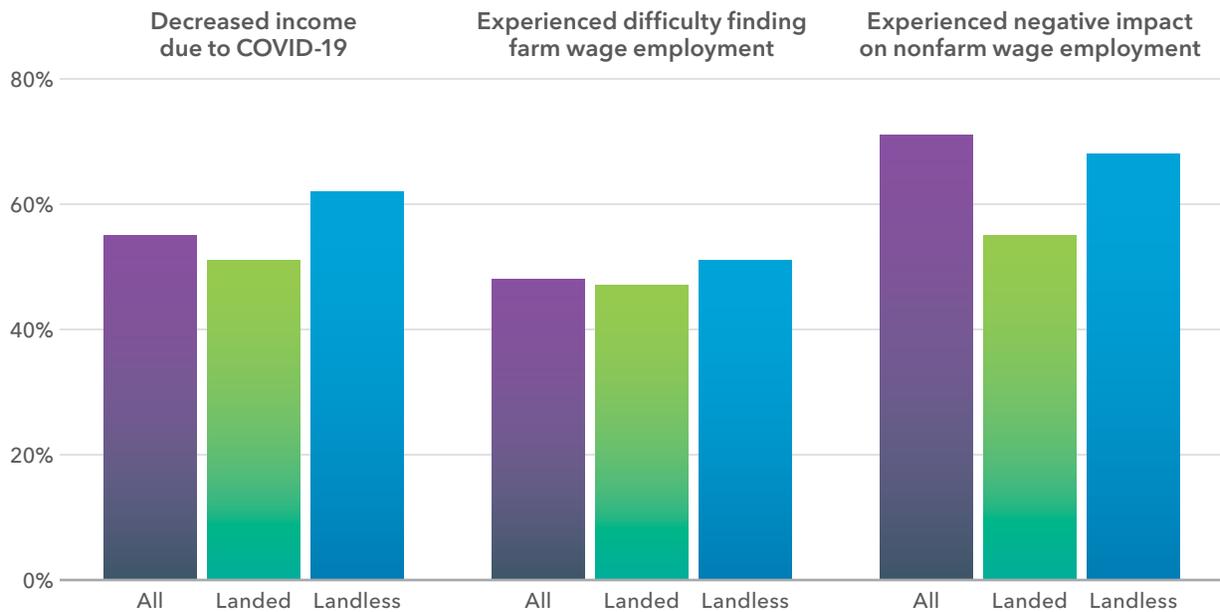
From June 2020 to June 2021, researchers with IFPRI's [Feed the Future Myanmar Agricultural Policy Support Activity](#) surveyed 1,072 women and men every two to four months about COVID-19's effects on agricultural production and rural livelihoods. The *Agricultural Economics* paper focuses on the June 2021 survey results, though our further analysis compares responses from the six following pandemic phone surveys (June, August, October, and December 2020, as well as March and June 2021).

Though input access and agricultural production were largely unaffected during the first months of the crisis, a large proportion of respondents reported negative impacts in other areas, including crop marketing, nonfarm business and employment, and remittances. A total of 56 percent of households in the survey area experienced income loss from disruptions to various livelihood activities between February and May 2020. In following months, the share of households reporting income loss mainly increased. Impacts persisted between February and May 2021, during which 68 percent of households reported their incomes to be lower than in the same period in 2020.

Farm incomes are mainly affected by challenges in crop marketing

At the start of the crisis, two-thirds of households in the surveyed communities were growing crops, and in its early months the pandemic affected crop production only to a limited degree. Farmers did not alter their planting times or cropping areas, though about 17 percent of respondents experienced difficulties purchasing agricultural inputs and machinery services. However, problems arose for farm

FIGURE 1 Change in incomes, livelihoods in rural Myanmar, Feb.-May 2020



households trying to sell their produce. Nearly two-thirds of farmers experienced difficulties selling their harvest, mainly due to lower prices, closed markets, low demand, and movement restrictions. Difficulties in selling eased in the remainder of 2020, though roughly one-third of farmers continued to report problems. The double burden of the political crisis and pandemic further hampered crop marketing, with 46 percent of farmers reporting difficulties between February and May 2021.

Nonfarm rural incomes are strongly affected

Aside from farming, both landed and landless households in the surveyed communities typically rely on other sources of income such as nonfarm enterprises, wage or salary employment, and remittances. These income sources were also hit hard by the pandemic.

Between February and May 2020, 68 percent of the nonfarm enterprises of landed and landless households were impacted by the pandemic. Of those usually employed in farm wage labor, 47 percent of respondents in landed households and 55 percent of respondents in landless households experienced challenges in finding farm work during the crisis due to less work available than usual, lower pay, and temporary movement restrictions. Additionally, 51 percent of respondents in landed households and 68 percent of respondents in landless households that normally rely on nonfarm wage employment experienced negative impacts on work availability and wages during the

crisis. Impacts on nonfarm enterprises and employment persisted in the following months, with the most severe impacts occurring between October and November 2020, when 81 percent of households experienced difficulties in their nonfarm enterprises, and between December 2020 and January 2021, when almost all households experienced difficulties in their farm or nonfarm employment. Both female and male wage labor in these households were affected, although we observe more women in landless households losing their nonfarm wage employment.

Households relying on remittances from family members working elsewhere also suffered significant reductions in income. In the January 2020 survey, about a third of landed and landless households received remittances. In the first few months of the pandemic, the average amount of remittances fell by 30 percent compared to previous year. This negative impact persisted in the succeeding months, with about 20 percent of the sample households reporting remittances at least 20 percent below the previous year. Average remittances received in February–May 2021 were 35 percent lower than in February–May 2020.

Coping with income loss

To cope with the loss in income, both landed and landless households reported using savings, reducing food expenditures, borrowing, and selling assets. However, a much larger share of landless households experienced income loss, and they more often reported reducing food expenditures and selling assets.

What actions can help Myanmar farmers sustain their livelihoods through the pandemic?

The combined effects of the COVID-19 and political crises on rural household incomes are alarming. Though Myanmar's COVID-19 economic recovery programs successfully reached most households with cash transfers and other livelihood support, this support ended with the start of the political turmoil in February 2021. The households surveyed are continuing to experience economic difficulties and are offsetting income losses by depleting savings, reducing food expenditures, borrowing, and selling major assets. These actions can have significant long-term consequences for household members, including jeopardizing future investment opportunities and endangering health and well-being.

Our research in Myanmar's Central Dry Zone acknowledges the urgent need to ensure that the agriculture sector, which is critical to the country's livelihood and food and nutrition security, can function safely and optimally. How can the problems be addressed? The main disruption for farming households involves the marketing of their produce. To overcome this obstacle, collective and innovative marketing arrangements and distribution systems can be promoted in the short term, along with assistance in storage and processing practices. In the medium and long terms, strategies should be developed to further mobilize demand and expand market opportunities, including promoting agricultural value chains with increased demand during the crisis. Initiatives such as cash-for-work schemes and accessible and affordable credit for rural businesses and employment will also be key for income generation and a faster economic recovery. Additionally, survey results show that access to information on agriculture, markets, nutrition, and health through phone and radio improved in

2020, and [innovative delivery of nutrition education](#) proved effective in maintaining or improving dietary diversity and quality during crisis. These strategies should continue to be promoted where phone and internet access and information provision allows.

The COVID-19 crisis in Myanmar is far from over. In 2021, the combination of the ongoing pandemic and political crises further damaging livelihoods. Despite severe difficulties, it is essential to continue monitoring the heterogenous impacts of COVID-19 on Myanmar's vulnerable communities and to seek ways to mitigate impacts of the pandemic and the political turmoil on rural livelihoods and food security.

The [paper discussed here](#) is part of a COVID-19 special issue of Agricultural Economics edited by IFPRI's Johan Swinnen and Rob Vos. The work was undertaken as part of the Feed the Future Myanmar Agricultural Policy Support Activity (MAPSA) led by the International Food Policy Research Institute (IFPRI) in partnership with Michigan State University (MSU). This study was made possible by the support of the American people through the United States Agency of International Development (USAID). Additional funding support for this study was provided by the CGIAR Research Program on Policies, Institutions, and Markets (PIM) and the Livelihoods and Food Security Fund (LIFT).

Originally published May 14, 2021, and updated January 14, 2022.

AGRICULTURAL PRODUCTION & VALUE CHAINS

A photograph of a banana market stall. In the foreground, several bunches of ripe yellow bananas are displayed on a table. Behind the table, there are cardboard boxes, some of which are filled with more bananas. One box has the word 'Lemon' written on it in red. A person is standing behind the stall, partially obscured by the fruit. The background shows the metal structure of a market building. The entire image is overlaid with a semi-transparent purple and blue gradient.



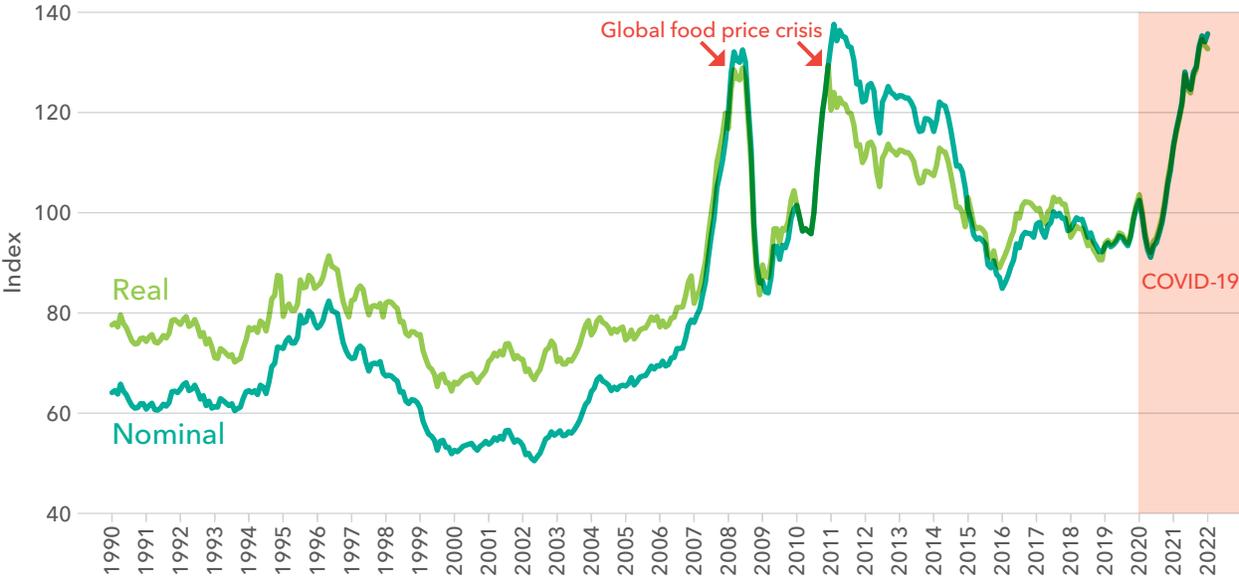
10. COVID-19 and food inflation scares

Rob Vos, Joseph Glauber, Manuel Hernández, and David Laborde

Rising food prices during 2021 caused concern worldwide. In January, international prices for major food items climbed to a level near the heights of the global food price crises of 2007–2008 and 2010–2011, according to the [FAO Food Price Index](#) (Figure 1). International prices declined in the first months of the pandemic, following the initial lockdown measures that were imposed to contain the pandemic, but by October 2021, prices in international markets had risen by about 30 percent over March 2020 levels. In many countries, consumer prices for food also surged, generating fear that this could lead to rising food insecurity (see, for example, Gerard 2021).

Is the world witnessing a new global food price crisis, with sharp rises in the cost of food and high volatility? Many feared such a crisis at the start of the pandemic, following supply disruptions in many countries and restrictions on food trade imposed by some countries. Those early concerns proved unwarranted, as food supply chains showed resilience, aided in part by governments declaring food sectors to be “essential” and largely exempt from lockdown restrictions (Laborde et al. 2020). Trade restrictions also turned out to be short-lived amid international pressure and early warnings that such measures would be counterproductive (Glauber et al. 2020; Laborde, Mamun, and Parent 2020).

FIGURE 1 FAO monthly food price index in real and nominal terms, January 1990–January 2022



Source: Data from FAO, [Food Prices Index](#), accessed Feb. 4, 2022.

So, should we be more concerned now? The short answer is both no and yes. Food markets are in better shape now than during the crisis that occurred a decade ago, with reasonable-to-good harvest prospects and abundant stocks for key staple crops. The 2021 surge in food prices is largely associated with the recovery in food demand from the global COVID-19 recession and temporary disruptions in logistics, rather than with severe food supply disruptions or continued trade restrictions. The surge in international food prices therefore need not last. However, even a relatively short-lived surge will affect food security for poor and vulnerable people, and the significant inflation of domestic food prices in many low-income countries is thus a concern.

In this chapter, we identify the main drivers of the recent food price surge in international and domestic markets, including the extent to which COVID-19 is a factor, and assess the implications for food security.

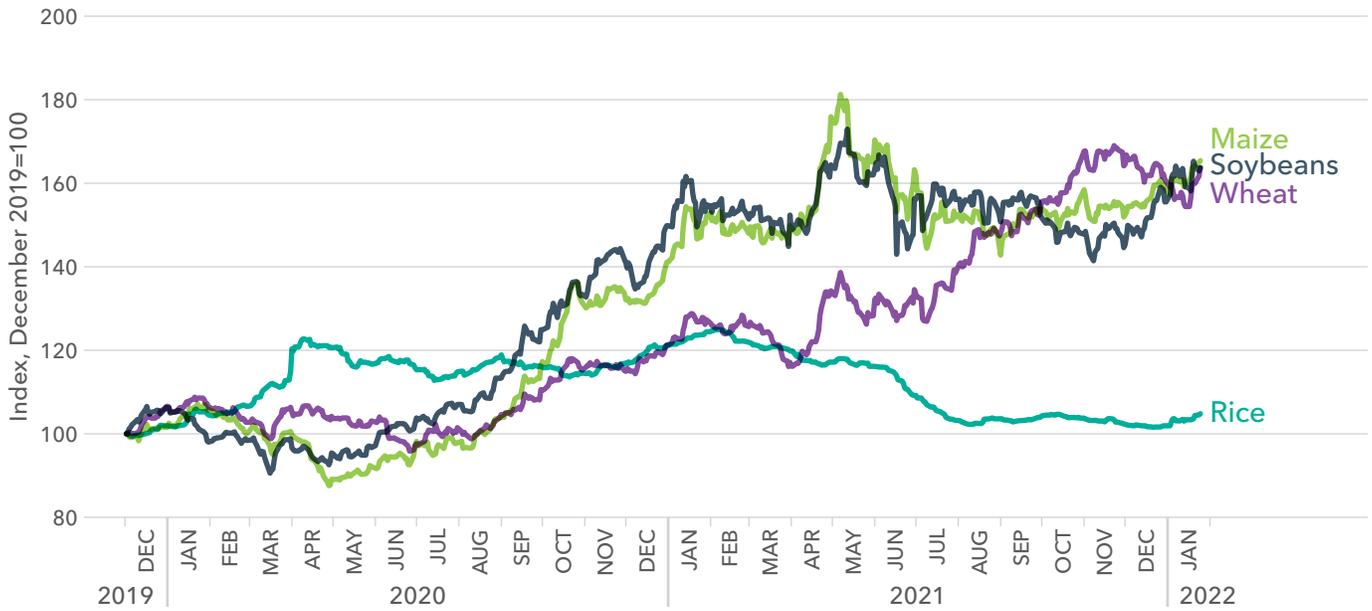
Trends in international agrifood commodity prices

A detailed examination of the trends in global prices can help explain the ramifications of their surge during 2021. First, the drastic year-on-year change in international commodity prices observed in 2021 partly reflects a “base effect,” meaning a rebound from the 10-year low seen in May 2020, shortly after COVID-19-related restrictions on social mobility were introduced in most of the world (Gustafson et al. 2021).

Second, while the composite index for world market prices of staple crops has risen to the peaks of a decade ago, trends vary starkly by crop ([Figure 2](#)).

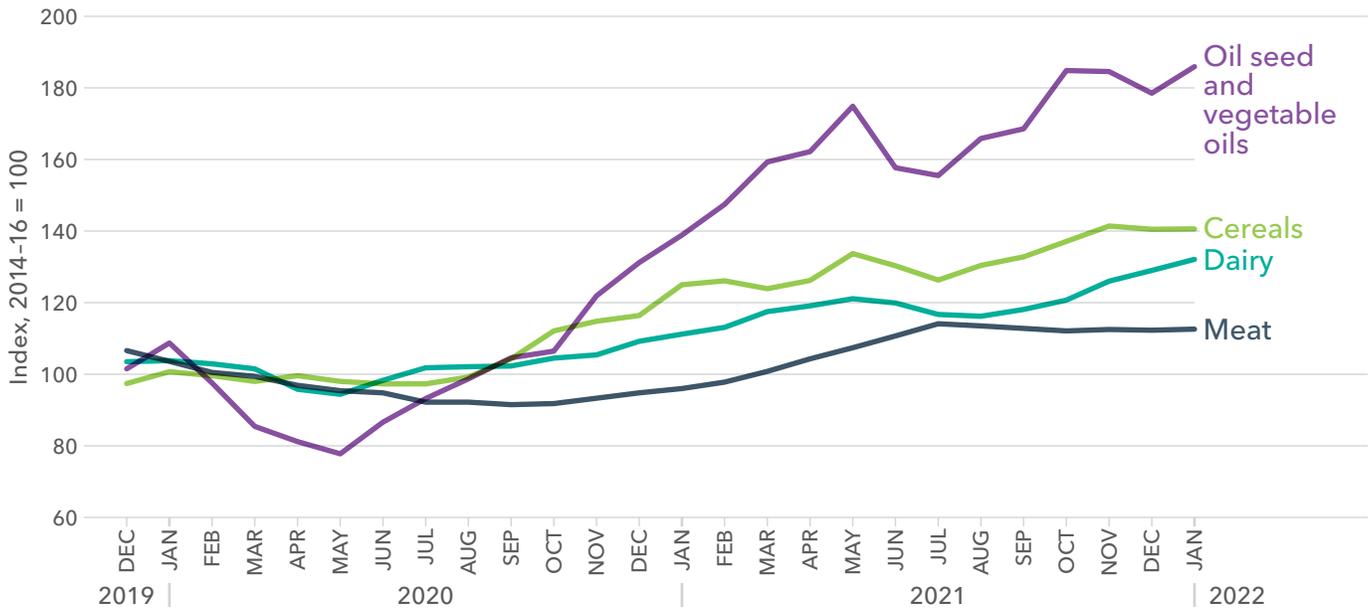
- Prices for **rice** increased before the start of the pandemic-related lockdowns in early 2020, but then declined in subsequent months as the recession began and some rice-producing countries phased out their export bans. Toward the end of 2020, rice prices partially bounced back as the global economy started to recover and demand rose, but international prices for rice have now fallen back to pre-COVID-19 levels, reflecting positive harvest and production prospects.
- In contrast, prices for **wheat, maize, and soybeans** fell in the first half of 2020 before subsequently recovering during the second half of the year. This price rebound, as well as a rebound in prices for nonfood commodities, was due to recovery of demand from China and, in the case of wheat, lower production levels following droughts in several major production areas (the United States, Canada, European Union, Turkey, and Iran). However, the surge in maize and soybean prices ended in the second half of 2021, following what are expected to be record production levels for maize in the United States and Brazil and greater soybean yields in the United States. Additionally, demand for animal feed declined in China as the country’s economic recovery started to falter. Despite these recent declines, prices for maize and soybeans are still well above pre-COVID-19 levels. On average, prices for cereals in November 2021 had risen by around 30 percent from pre-COVID-19 levels ([Figure 3](#)).
- Among other key food items, **vegetable oils** experienced the starkest increase in prices, rising by more than 80 percent from pre-pandemic levels. Prices for all types of oils (palm, soy, sunflower, and rapeseed) have undergone sharp increases due to the recovery in global import demand and the surge in crude oil prices, which is increasing demand for biofuels. Palm oil prices also

FIGURE 2 World market prices for cereals and soybeans, December 2019–January 2022



Source: Data from International Grains Council, [World Market Prices](#), accessed Jan. 25, 2022.

FIGURE 3 World market prices for cereals, vegetable oils, meat and dairy, December 2019–January 2022



Source: Data from FAO, [Food Price Watch](#), accessed Feb. 1, 2022.

experienced upward pressure from lower production in Malaysia, a major producer, due to ongoing migrant labor shortages (AMIS 2021).

- International prices for **dairy** and **meat** products also increased during 2021, but less starkly, remaining below the FAO Food Price Index average (Figure 3). Dairy and meat prices trended upward with the global economic recovery. More recent trends are showing downward pressure on meat prices. In China, for instance, pork prices dropped by as much as 48 percent from last year's levels due to the recovery of the hog population, which had been reduced in recent years by African swine fever (NBS 2021).

The recovery of global demand has been a key driver of the surge in international agricultural commodity prices. In particular, markets have tightened as a result of stronger-than-usual demand for animal feed and agricultural products for industrial use. China has been a major influence: with the recovery of its economy and its livestock sector from African swine fever, the country's need for wheat, maize and other feed grains, and soybeans has risen significantly as a result of demand for feed. Growth prospects for China's economy appear less rosy, however, which should soften these pressures on global food prices. Supply disruptions, which have been more closely related to weather conditions than to the pandemic, have had less influence on price surges. Although trade restrictions played a key role in exacerbating the global inflation of food prices during 2007-2008 and 2010-2011, they proved short-lived during the current crisis. Several wheat- and rice-exporting countries imposed export bans in the first months of the COVID-19 crisis, but these were phased out by mid-2020 (Glauber et al. 2020; Laborde et al. 2020). The recent food price rise, however, could tempt governments to impose new trade restrictions, as is already happening, for example, in the case of Russia (wheat), Argentina (beef), Indonesia (palm oil), and China (fertilizers). If not contained, we could see shades of the food price crisis of a decade ago.

Three additional factors influenced upward trends in international food prices during 2021.

- **Exchange rates:** From the start of the pandemic to mid-2021, the US dollar depreciated between 10 and 15 percent against other major currencies. Since most commodity trade is in US dollars, traders demand higher prices to compensate for the exchange loss, which then leads to higher world market prices. The weaker dollar has thus contributed to both stronger trade and rising prices. Toward the end of 2021, however, the dollar strengthened again, lessening the impact on global commodity prices.
- **International freight prices:** The cost of bulk freight reached an all-time high in early October 2021. The Baltic Dry Index, a composite index of international bulk shipping rates (including those for grains), increased by more than 400 percent between January and October 2021 (Figure 4). Freight costs initially declined in early 2020 before slowly trending upward again from mid-2020 onward as international trade recovered from the COVID-19 recession. During 2021, however, supply bottlenecks emerged as consumer demand for manufactured goods surged, and manufacturing industries and container shipping encountered logistical bottlenecks and labor shortages while trying to handle the increase in demand. At times, economists also use freight costs as an indicator for inflationary pressures. Since freight costs declined significantly (by 50 percent) between mid-October and the end of November 2021, commodity and food price inflation should likely soften substantially by the end of 2021.

FIGURE 4 Baltic Dry Index of international bulk shipping costs, December 2019–November 2021



Source: Data from [The Baltic Exchange](https://www.balticexchange.com/), accessed Dec. 1, 2021.

Note: The Baltic Dry Index (BDI) is an index of average prices paid for the transport of dry bulk materials across more than 20 routes.

- **Fertilizer prices:** Fertilizer prices have spiked recently, primarily as a result of stronger demand and higher energy costs. In anticipation of greater revenue amid rising agricultural commodity prices, farmers increased their use of fertilizer early in 2021. This increase further tightened fertilizer markets, which were already affected by recent supply disruptions, and drove up prices. Rising prices in global energy markets have also increased the cost of producing fertilizers, to the point where many plants have decided to reduce production or even close down. By November 2020, natural gas prices were double those of the previous year. From maize producers in Brazil to wheat farmers in France, concern abounds that the global fertilizer supply will not be sufficient for the 2021/22 planting season (AMIS 2021).

In brief, the pandemic created many uncertainties about global food market trends, from production to distribution and consumption. During 2021, prices kept climbing and reached record highs for some crops, making food inflation a major concern even in developed countries. Overall, however, markets stayed resilient, with global supplies remaining adequate and logistical bottlenecks proving short-lived.

Domestic food prices in low-income countries

Domestic food prices are directly related to global agricultural commodity prices, but the impact of a commodity price increase varies by country and depends on how closely domestic markets are tied

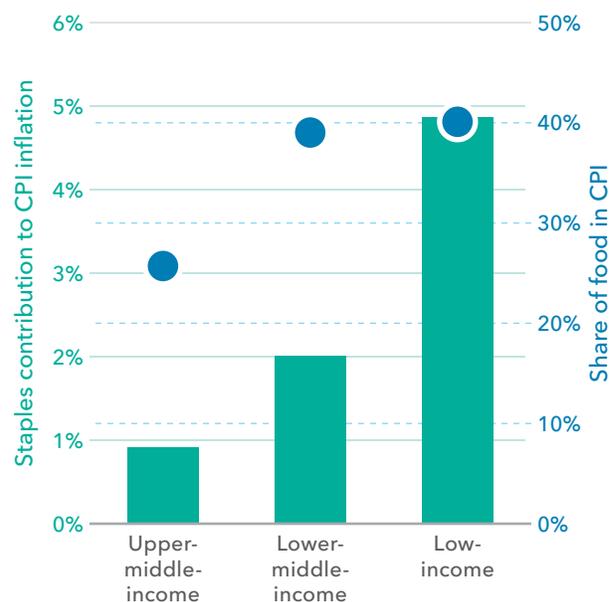
to global markets through trade and how much consumer prices are affected by non-commodity costs like distribution, storage, and processing. In a developed country such as the United States, the farm or import value of a product purchased in a grocery store may be quite low. In a developing country that is highly dependent on imported cereals, the impacts may be much larger.

As a result, low-income countries have been the most affected by the rise in international food prices. In these countries, food accounts for about half of consumption baskets and 20 percent of imports. The rise in international prices for food staples explains about 40 percent of overall consumer price increases in low-income countries during the first quarter of 2021, which were much higher than in middle-income countries (Figure 5). The global recession resulting from the COVID-19 pandemic has hit low-income countries hard, driving down demand for their exports, causing their exchange rates to depreciate amid insufficient access to contingency finance, and further driving up the cost of imported food.

The extent to which international prices are passed through to domestic markets (pass-through effects) varies by country, however, depending in part on food import dependency, but also on other country-specific factors. As a result, rates of domestic food price inflation also vary significantly among low-income countries (Map 1). For example, during 2021, food prices increased by well over 10 percent (year-on-year) in Ethiopia, Gambia, Guinea, Haiti, Malawi, Mozambique, Sierra Leone, and South Sudan, but remained low or even declined in Rwanda, Somalia, and Uganda.

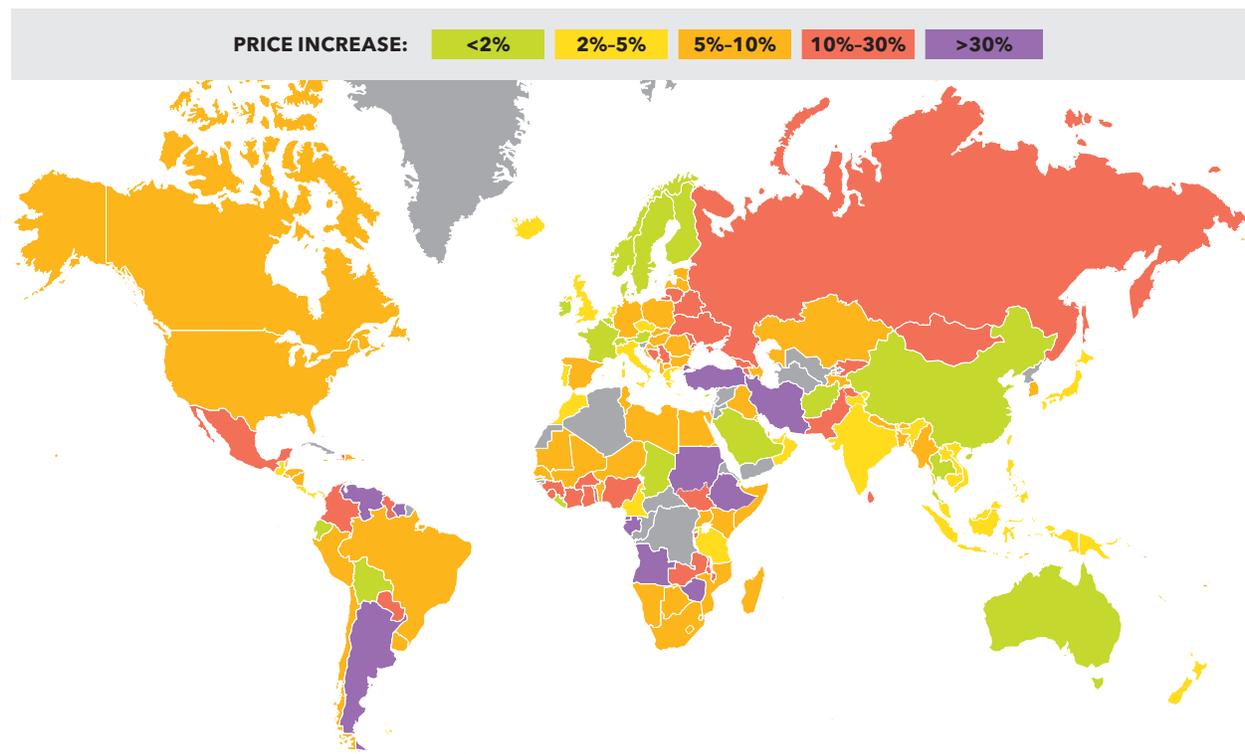
The combination of higher retail prices and reduced incomes has led increasing numbers of households to reduce the quantity and quality of food consumed. Rising food prices have a greater impact on low-income households, since they spend a large share of their income on food. The surge in consumer food prices in many low-income countries partly explains the recent rise in global food insecurity (FAO et al. 2021). Additional evidence shows that the pandemic has been – and still is – detrimental to the quality of diets. The recession caused by COVID-19-related restrictions on economic activity has driven households, especially poorer ones, to shift to cheaper, more calorie-rich staple foods at the expense of costlier, nutrient-dense foods like fruits, vegetables, and animal-source foods (Laborde et al. 2020; Laborde, Martin, and Vos 2021; Laborde et al. 2021). The rise in prices of more nutrient-rich foods, which has been far steeper than that of cereals, likely exacerbated this shift (see Bai et al. forthcoming; Figure 6).

FIGURE 5 Contribution of staple food prices to consumer price inflation (CPI) by developing-country groups (2020 Q1 to 2021 Q2)



Source: Data from IMF, [World Economic Outlook, October 2021](#), based on FAOSTAT and FAO GIEWS.

MAP 1 Food price inflation (% year-over-year change in consumer food price index)



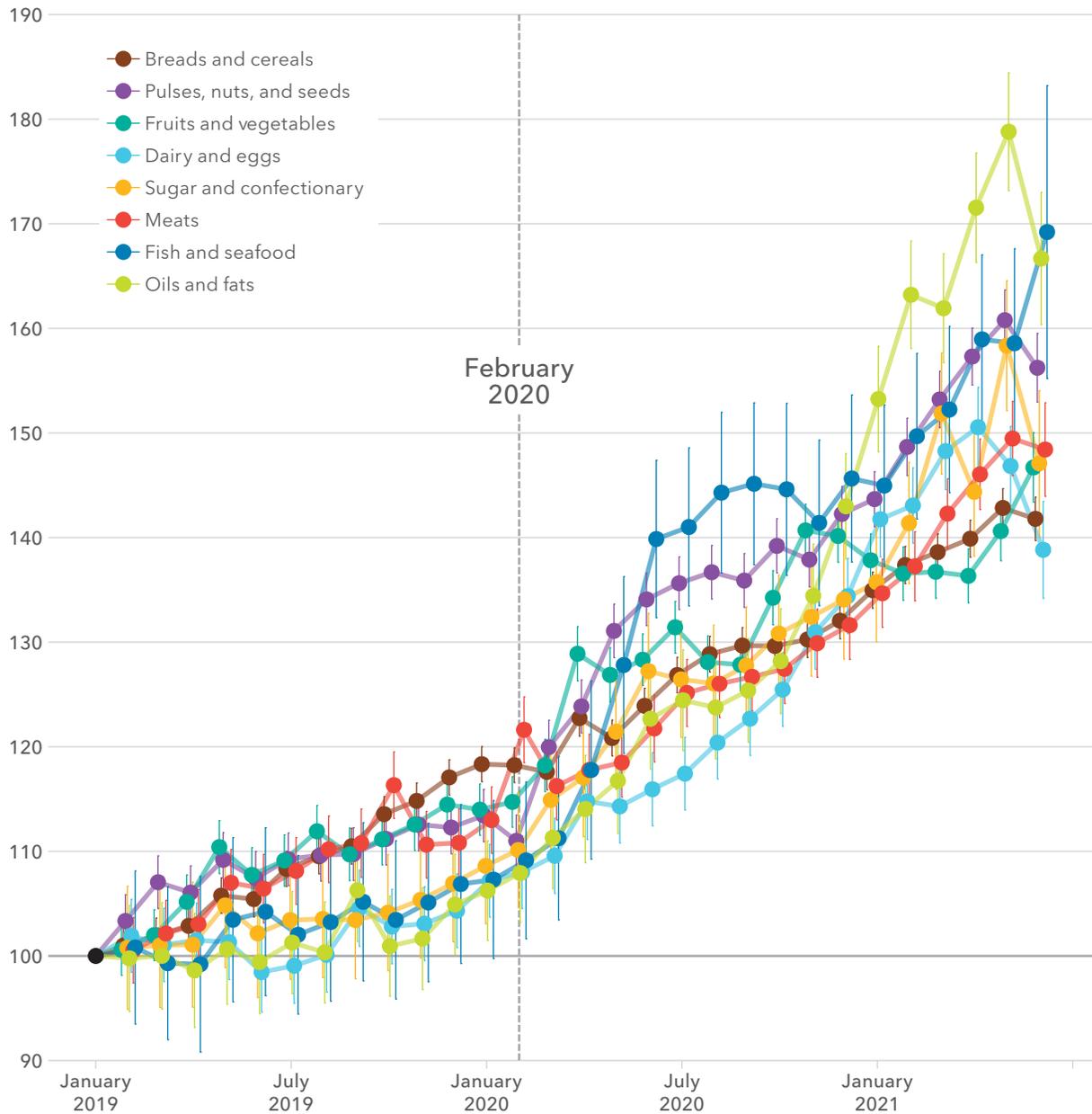
Source: [IMF Database of Consumer Price Indices](#); and [Trading Economics](#). Accessed Feb. 4, 2022.

Reason for concern, but not for panic

These trends are clearly concerning, yet there is no reason to panic over the possibility of another global food price crisis. Production prospects for staple crops look favorable for the 2021/22 season, and global demand is weakening as the economic recovery in China and other major economies has slowed. Markets for staple crops have tightened over the past two years; global stock levels for rice remain comfortable, although those for wheat and maize were still tight at the end of 2021 ([Figure 7](#)). These conditions should be expected to lessen inflationary pressures in international commodity markets in 2022. Many uncertainties continue to undermine such optimism, of course, including the geopolitical tensions related to Ukraine and a possible return to trade protectionist measures.

Even the more promising prospects may not provide solace to many poor people, as the global recovery is also slowing as the world faces new waves of COVID-19 cases. Poor farmers may earn higher incomes from increasing food prices, but most of them are also net consumers of food. Thus, the vast majority of people in low-income countries are highly vulnerable to food price inflation, and their governments have limited fiscal capacity to protect the purchasing power of low-income families and prevent further food insecurity and deterioration of diets. Given the global ramifications of food price inflation, strengthening this capacity through additional financial assistance should be an immediate priority for the international community.

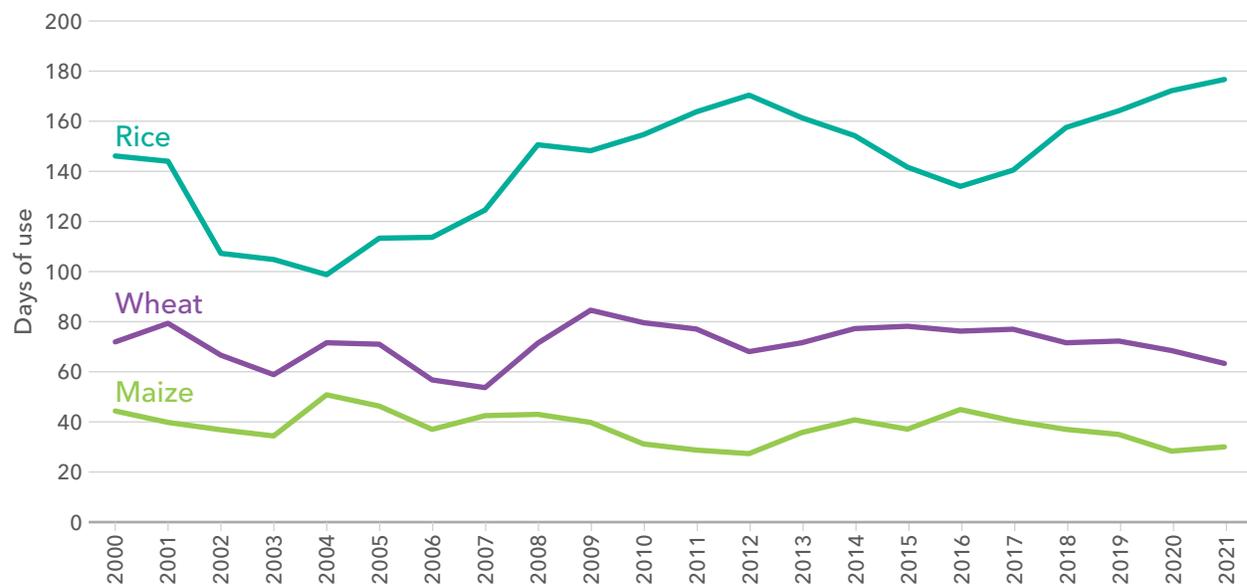
FIGURE 6 Average prices by food group, January 2019–June 2021



Source: Bai et al. (preprint).

Note: The graph shows the global mean of weighted indices and 95% confidence intervals for each month, covering 1,344 food items from up to 88 countries. Indices by food item were estimated from a total of 369,088 price observations, each normalized to 100 in January 2019. A total of 87 countries report prices for breads and cereals; 55 for fruits and vegetables; 51 for pulses, nuts, and seeds; 50 for meats; 46 for oils and fats; 41 for sugar and confectionary; 30 for dairy and eggs; and 24 for fish and seafood. Tubers, such as potatoes and sweet potatoes, are categorized as fruits and vegetables in the graph.

FIGURE 7 Global stocks of cereals not including China (expressed as days of use), 2000–2021



Source: Data from US Department of Agriculture, Foreign Agricultural Service, [PSD Online database](#).

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References

- AMIS (Agricultural Market Information System). 2021. [AMIS Market Monitor](#). No. 93 (November). Rome.
- Bai, Y., L. Costlow, A. Ebel, S. Laves, Y. Ueda, N. Volin, M. Zamek, and W.A. Masters. Preprint. "Food Prices in a Pandemic: Global Data Show Higher Costs for Nutritious Food Groups." *Nature Food*.
- FAO (Food and Agriculture Organization of the United Nations), IFAD (International Fund for Agricultural Development), UNICEF, WFP (World Food Programme), and WHO (World Health Organization). 2021. [The State of Food Security and Nutrition in the World 2021. Transforming Food Systems for Food Security, Improved Nutrition, and Affordable Healthy Diets for All](#). Rome: FAO.
- Gerard, M. 2021. "[La flambée des prix alimentaires fait craindre une aggravation de la faim dans le monde](#)." *Le Monde* (online). November 19.
- Glauber, J., D. Laborde, W. Martin, and R. Vos. 2020. "[COVID-19: Trade Restrictions Are Worst Possible Response to Safeguard Food Security](#)." *IFPRI Blog*. March 27.
- Gustafson, S., J. Glauber, M. Hernández, D. Laborde, and R. Vos. 2021. "[Rising Food Prices Are a Concern but No Reason for Panic Yet](#)." *Food Security Portal Blog*, IFPRI. June 18.
- Laborde, D., A. Herforth, D. Headey, and S. de Pee. 2021. "[COVID-19 Pandemic Leads to Greater Depth of Unaffordability of Healthy and Nutrient-Adequate Diets in Low- and Middle-Income Countries](#)." *Nature Food* 2: 473–475.
- Laborde, D., A. Mamun, and M. Parent. 2020. [COVID-19 Food Trade Policy Tracker](#) [dataset]. Washington, DC: IFPRI. Accessed December 1, 2021.
- Laborde, D., W. Martin, J. Swinnen, and R. Vos. "[2020 COVID-19 Risks to Global Food Security](#)." *Science* 369 (6503): 500–502.
- Laborde, D., W. Martin, and R. Vos. 2021. "[Impacts of COVID-19 on Global Poverty, Food Security and Diets](#)." *Agricultural Economics* 52 (3): 375–390.
- NBS (National Bureau of Statistics of China). 2021. "[Consumer Prices for September 2021](#)." Press release, Oct. 15.

11. COVID-19, agricultural production, and food value chains

Frank Place, Dietmar Stoian, and Nick Minot

Over the course of the pandemic, research on how COVID-19 has affected agricultural production and food value chains has evolved: as coronavirus infection rates rose and fell and governments instituted a range of responses, the research focus shifted from projecting what might happen to reflecting on what did happen. Early studies focused on the immediate effects of the lockdowns and other restrictions on food supplies. Later studies began to delve more deeply into the diverse private and public countervailing responses – as governments sought to offset the negative impacts of lockdowns – and their effectiveness in maintaining food supply and demand. The growing number of relatively high-quality studies on agriculture and food supply chains allows for some assessment of factors that appear to have diminished or aggravated the impacts of the pandemic. The analytical framework and the methodology used to develop our findings are summarized in [Box 1](#).

A [summary of value chain studies](#) undertaken in low- and middle-income countries during the pandemic (Stoian et al. 2021) categorized them geographically and by topic. Studies of Asian and Pacific countries were most common, followed by Africa, while Latin America and the Caribbean received the least attention. About 80 percent of the publications give significant emphasis to production effects and responses, while less than half emphasize other value chain segments, such as input vendors, traders, processors, and consumers. Studies focusing on Africa are largely oriented to production effects, whereas slightly more than 60 percent of the studies that directly interviewed midstream companies are from Asia. There was good balance across different commodity types, with significant numbers of publications focused on staples, fruits and vegetables, livestock, and fish, but many fewer related to forest and tree crop products. Over time, more studies were conducted on the mitigative responses taken by the public and private sector, but these largely look at what was implemented rather than the effectiveness of such responses. Surprisingly little documentation exists on responses by civil society organizations, despite their prominent role in emergency relief and service delivery for developing country agrifood value chains.

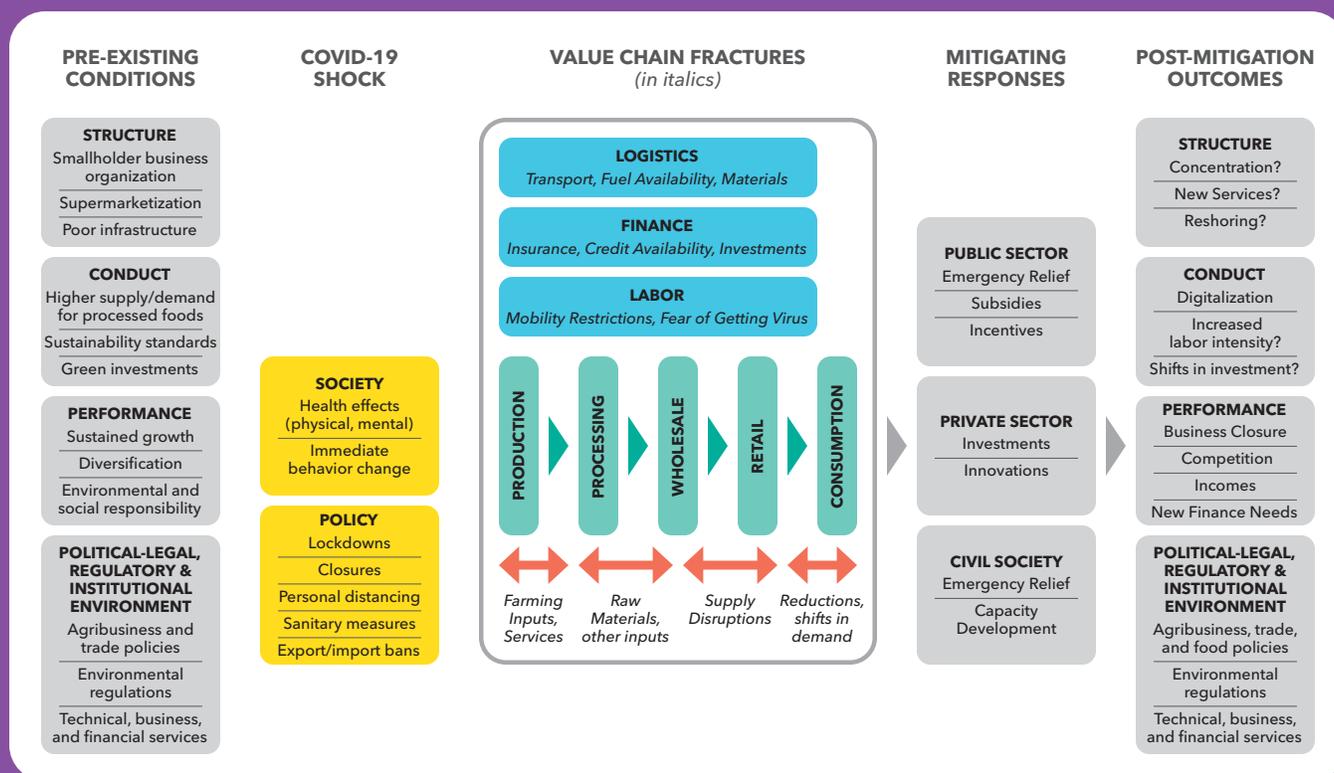
Our review of these studies highlights seven key findings about the impact of the pandemic and pandemic responses on agricultural value chains. The remainder of this chapter is organized around these messages.

1. In most of the cases studied, agricultural production was affected primarily by restrictions on movement affecting labor, availability or costs of inputs, and viability of existing marketing channels.

Reduced access to and higher costs of labor and agricultural inputs are mentioned as important negative effects of the restrictions put in place by governments to reduce the spread of the coronavirus. Labor constraints or high costs were noted by Ethiopian vegetable producers (Minten et al. 2020), Rwandan potato farmers (WCDI 2020), bean farmers in southern Africa (Nchanji, Lutomia, and Karanja

BOX 1 Analytical Framework and Methodology

The methodology behind this synthesis begins with an analytical framework developed by the Value Chain Fractures working group of the CGIAR COVID-19 Hub. The framework is used to develop hypotheses about how pre-existing conditions, along with health-related measures taken by governments, may have shaped the immediate effects of the COVID-19 pandemic; how these effects played out along the different segments of agrifood value chains; and, in turn, how mitigative measures resulted in changes in value chain structures and performance, conduct of chain actors, and adaptations of the enabling environment, as reflected in the framework below:



The hypotheses in the analytical framework and relationships depicted in the diagram informed a template that was used to identify what types of measures and which value chain segments and actors were subjected to study. The template also included information about the studies, such as location, commodity, target markets, mitigating responses, and key findings. Searches were conducted using Google Scholar to identify potential studies for inclusion in the review. These were then screened on criteria such as peer review, use of empirical data, sample design and size, and clarity of methods used in order to remove studies of low methodological robustness. Robust studies were then fully screened and major findings noted in relation to value chain segment and for government interventions and private sector responses, which then permitted the synthesis and development of lessons presented in this chapter.

2021), and Indian farmers of various products (Mahajan et al. 2021). Difficulty in acquiring inputs was mentioned particularly in studies of fish, poultry, and livestock products in several countries, including fish in several countries (Belton et al. 2021) and fodder for livestock production in China (Dai et al. 2020). In Nepal, agrodealers faced shortages of fertilizer which, in turn, affected various value chains (Pradhan 2020). Problems with existing market outlets were another commonly reported difficulty. Local open-air markets, such as cattle markets in northern Kenya, were closed (Wamwere-Njoroge et al. 2021), transportation challenges affected the flow of food from farms to markets, as was the case for bananas in Ecuador, Ghana, and India (Chase and Roux 2020), and some international marketing opportunities were diminished, such as for fish from Peru (Bassett et al. 2021).

2. Smallholder farmers, particularly those who were not organized into cooperatives or farmer associations, had limited ability to overcome the new constraints, and their responses were insufficient to maintain previous levels of productivity or profit.

Studies show that smallholder farmers had little ability to avoid negative consequences from the increased challenges noted above. For example, in many cases, farm production fell as a result of lower productivity or reduced area planted, including in Myanmar (Boughton et al. 2021), Nigeria (Balana et al. 2020), and India (NIAP 2020). However, farmers were able to limit their losses by substituting certain inputs for others, for example family labor was used more and hired labor less, as happened in India (Ceballos, Kannan, and Kramer 2020). Some Ethiopian dairy producers converted raw milk into more durable butter when raw milk sales plummeted (Tesfaye, Habte, and Minten 2020), and fisheries had some success in increasing sales in domestic markets when international markets collapsed (Bassett et al. 2021). In addition, drops in production levels, low farm-gate prices, and uncertainties about local retail markets led some farmers to retain more of their production, as happened in Kenya (Odhiambo et al. 2021).

Pre-existing agricultural practices, organizational structures, and services affected farmers' options and outcomes. For example, tractor hire services could not be deployed easily in areas where they did not already exist, but they were found to be helpful in regions where they were commonly used, as shown in a study of 20 Asian countries (Dixon et al. 2021) and a comparative study of two states in India (Ceballos, Kannan, and Kramer 2020). In Latin America, in cases where smallholders were organized into cooperatives or other collectively owned enterprises, social capital and collective action helped mitigate some of the pandemic's effects, for example, by developing alternative marketing channels for foods (Tittonell et al. 2021). However, overall demand and the price and volume signals received by farmers ultimately dictated the extent to which farmers invested in agricultural production, regardless of pre-existing conditions.

3. Demand shocks have been the most disruptive force.

High-value commodities such as fruits and vegetables, dairy, and other animal products were particularly affected. Unemployment and lower incomes during the pandemic reduced demand for these products, putting downward pressure on their prices. Price fluctuations for all commodities

depended on the effects of lockdown and mitigative measures, as well as the effects of reduced income on demand and reduced liquidity on supply. These pandemic-induced effects were weakening by the end of 2020; however, prices for high-value products took longer to recover.

Almost all studies indicate that prices paid to farmers changed as compared to pre-pandemic prices. Interestingly, there are cases of both higher and lower prices. Lower prices were caused by decreased demand for some foods, particularly high-value commodities. Market closures due to lockdowns in production zones also reduced demand and depressed prices, as in the case of some aquatic food markets (Belton et al. 2021). In addition, export restrictions intended to ensure food supplies sometimes resulted in excess domestic supply and thus, lower prices. Finally, movement restrictions that disrupted domestic food trade depressed prices in production zones but increased them in urban areas. Examples include rice in several Asian countries (Bhandari et al. 2020) and several producer prices in Myanmar (Boughton et al. 2021) as well as livestock in Kenya, milk in Tunisia, and maize in producing areas of Malawi and Zambia.

However, in other cases, prices reportedly rose as a result of higher input costs and as the uncertainty created by the pandemic led to some panic buying and hoarding. Examples include steep rises in cereal prices in Sudan (FAO 2021) and the effects of hoarding on rice prices in Bangladesh (FAO 2020b). Transport disruptions caused by border closures slowed down the movement of goods, inducing supply shortages and resulting price hikes. In other cases, such as urban Yangon (Myanmar), higher input and transport costs led to price spikes during the lockdown, but food vendors did not report significant reductions in food supplies (Boughton et al. 2021). In the fish sector, a study across five countries found that retail prices fell due to lower demand while costs of manufactured fish feeds increased, compelling fish businesses to cut other costs (Belton et al. 2021).

In several countries, no marked fluctuations of producer or consumer food prices were observed or, where fluctuations did occur, they were mostly short-lived. Even in a fragile context such as Somalia, the lockdown-induced increase in rice prices was considered brief (FAO 2021b). Studies covering multiple phases of the pandemic found that prices tended to return to pre-pandemic levels, but the pace and level at which that took place varied by commodity-specific demand and supply conditions. The few studies that examined prices across different segments of the value chain showed that the percentage price changes of commodities at retail levels were less than those at farm level, demonstrating the ability of value chains to absorb some of the price variability, as was the case for vegetable value chains in Ethiopia (Hirvonen et al. 2020).

4. Value chain midstream actors, such as traders and processors, faced numerous constraints in accessing commodities from farmers and in maintaining marketing channels and revenues.

Several types of midstream food value chain actors reported challenges during the pandemic. Those involved in handling or processing of agricultural outputs faced reduced supplies of commodities from producers, due to lower marketed output or difficulties in accessing the supplies. At the same time, decreased demand from consumers also forced midstream actors to make adjustments, including immediately reducing their procurement of some commodities, and to consider other adaptations in the short to medium term (see no. 5 below). In addition, although

the food sector was largely spared from the strictest lockdown measures imposed by governments, some still faced operating restrictions, such as wholesalers in Nigeria (Liverpool-Tasie, Reardon, and Belton 2021) and agrodealers in Nepal (Pradhan 2020).

Food sector companies were also affected by the restrictions in logistic sectors such as transport and packaging. The high cost and limited availability of transport was cited as a significant constraint in numerous studies, including in Ethiopia's vegetable sector (Minten, Mohammed, and Tamru 2020) and among rice millers in Myanmar (Goeb et al. 2020). Labor-intensive formal (or semiformal) companies faced more severe disruptions where movement restrictions were tight and in cases where people moved back to their native villages, as was reported for Ethiopia's vegetable sector (Minten, Mohammed, and Tamru 2020). In Nigeria, the percentage of women employed in fish businesses decreased from 20 percent in February to 2 percent in April 2020 (Liverpool-Tasie, Reardon, and Belton 2021). Food sector companies noted that access to affordable finance was also an issue.

Companies supplying inputs, equipment, or services to farmers also reported drop-offs in business. The reduction in farmers' use of commercial seed and inputs affected the profits of agrodealers. Seed multiplication schemes were similarly affected, as reported for three African countries in one study – Ethiopia, Nigeria, and Uganda (de Boef et al. 2021). Several studies looked at impacts on mechanization services, which reported that usage generally declined in Bangladesh, Ethiopia, and Myanmar in 2020 compared with 2019 (for example, Minten, Mohammed, and Tamru 2020).

At the retail level, formal food stores were largely allowed to remain open if they followed health safety measures, but there were reports that informal vendors, including those selling in wet markets, were subject to closures and other restrictions (see, for example, Burkina Faso, Ghana, and Malawi in IFPRI's [COVID-19 Policy Response Portal](#)). Despite these challenges, informal markets continued to play an important role in providing food to consumers, as they did in Southeast Asian countries (Espino et al. 2021). In addition, the food hospitality sector, which includes restaurants and hotels, faced heavy restrictions and reduced demand, which continued even after restrictions were lifted, for example in the Philippines (FAO 2021c).

5. Value chain midstream actors reported use of innovations to try and maintain typical volumes and profits.

Food buyers, handlers, and processors reported adaptations that included reducing production costs, using alternative inputs and introducing flexible labor arrangements, employing alternative product procurement and marketing strategies, relying on informal networks and a range of communication methods, and using digital services (Intini et al. 2020; de Boef et al. 2021; Azra et al. 2021). In addition, companies were forced to piece together different revenue streams, government supports, and strategic borrowing to make ends meet. Use of digital platform services, for example for identifying customers, generally increased, but uptake varied with the development of the sector, and thus differed considerably across countries. Use of these platforms was greater in Asia and Latin America, and especially among larger firms (Apedo-Amah et al. 2020). However, despite advances with online platforms, there is little evidence that they are cost effective for food sector businesses.

6. Governments almost always mitigated the health-based restrictions on movement and gatherings with exemptions granted to the food sector and specific programs to support food supply and demand.

Following early recognition that the initial health-related movement restrictions negatively affected the general economy and could lead to severe consequences for the food system, all governments took additional, countervailing actions to minimize impacts on food availability and access (see IFPRI's COVID-19 Policy Response Portal). First, many low- and middle-income countries did not mandate or enforce lockdowns to the degree that wealthier countries did. Where restrictions were imposed, the agriculture and food sectors were almost always declared “essential” and therefore exempt from lockdowns and many other business restrictions. This appears to have been most effective in protecting segments such as production, wholesale, and formal retail outlets, but it did not cushion the food system as a whole – logistics providers, food service companies, and informal markets often faced disruptive restrictions.

The other major mitigation measures taken by governments were the expansion of existing social protection programs and new economic stimulus packages intended to overcome household income losses. Social protection programs appear to have been successful in reaching many poor consumers and farmers, for example in India (Varshney, Kumar et al. 2020), and in Ethiopia, where the primary social protection program reduced severe food insecurity among poor rural households (Abay et al. 2020).

Governments took many measures to support agricultural production, including reducing import duties on inputs, developing programs to procure critical inputs domestically or from abroad, expanding input subsidies (and use of e-vouchers), providing affordable credit to farmers and food sector companies, and implementing price and market supports (such as procurement programs). In India, for example, wheat prices spiked but recovered quickly due to government procurement support; however, tomato prices remained below the year-on-year average during some of the lockdown months, partly because government marketing regulation was removed for tomatoes (Varshney, Roy, and Meenakshi 2020). These types of government mitigative measures were commonly found in studies in all regions. In many instances, governments undertook several measures in combination, including in Kenya (FAO 2020a) and Myanmar (FAO 2020c).

To protect the value chain midstream, governments also undertook multiple measures, such as providing financial relief and credit, investing in digital infrastructure and platforms, and providing stimulus packages for certain food value chains, such as fruits and vegetables in Burkina Faso (Andrieu et al. 2021) and fish producers in India (Kumaran et al. 2021). Easing of import restrictions benefited both agricultural input companies and farmers. Some governments invested in new physical market structures that could enable food markets to function while meeting new social distancing measures, as they did in Burkina Faso (Andrieu et al. 2021).

7. Notwithstanding the disruptions and large loss of incomes caused by COVID-19 and the resulting lockdown measures, disruptions in agrifood value chains did not lead to significant food shortages in most countries, due in part to mitigative actions undertaken by public and private actors.

These actions varied in scope and scale of investment. Where countries were able to provide significant direct income support to households to bolster demand, economic outcomes were significantly improved over earlier projections ([Chapter 2](#)). Worst-case scenarios involving a collapse of whole food systems and resulting famines have not materialized. The interplay between private sector response, public policy and, in some cases, support from civil society organizations has prevented a massive downturn in agricultural production, mounting food losses and waste due to logistical restrictions, and major disruptions at the retail level. This is shown at the global level ([Chapter 10](#)) and in a few national studies. In India, for example, the agriculture sector has done remarkably well, although the pandemic resulted in decline of about 24 percent in GDP during the second quarter of 2020 (Varshney, Roy, and Meenakshi 2020).

Nevertheless, agrifood value chains remain vulnerable, especially in low-income countries and where pre-existing business conditions and shortcomings in political-legal frameworks continue to hamper value chain development. But value chain actors, service providers, and political decision-makers can now draw on diverse experiences and insights to inform mitigative measures and private sector responses in future pandemics. Critical next steps are (1) to better analyze the effects of specific interventions and integrated actions in the agriculture and food sectors on food supply chains and (2) to address known shortcomings in regulatory frameworks and public investments that can bolster resilience.

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References

- Abay, K., G. Berhane, J. Hoddinott, and K.T. Hirrfrot. 2020. "[COVID-19 and Food Security in Ethiopia: Do Social Protection Programs Protect?](#)" Policy Research Working Paper Number WPS9475. World Bank Group, Washington, DC.
- Andrieu, N., L. Hossard, N. Graveline, P. Dugué, P. Guerra, and N. Chirinda. 2021. "[Covid-19 Management by Farmers and Policymakers in Burkina Faso, Colombia and France: Lessons for Climate Action.](#)" *Agricultural Systems* 190: 103092.
- Apedo-Amah, M.C., B. Avdiu, X. Cirera, et al. 2020. "[Unmasking the Impact of COVID-19 on Businesses: Firm Level Evidence from Across the World.](#)" Policy Research Working Paper No. 9434, World Bank, Washington, DC.
- Azra, M.N., N.A. Kasan, R. Othman, G.A.G.R. Noor, S. Mazelan, Z.B. Jamari, G. Sara, and M. Ikhwanuddin. 2021. "[Impact of COVID-19 on Aquaculture Sector in Malaysia: Findings from the First National Survey.](#)" *Aquaculture Reports* 19: 100568.
- Balana, B.B., M.A. Oyeyemi, A.I. Ogunniyi, A. Fasoranti, H. Edeh, J. Aiki, and K.S. Andam. 2020. "[The Effects of COVID-19 Policies on Livelihoods and Food Security of Smallholder Farm Households in Nigeria: Descriptive Results from a Phone Survey.](#)" IFPRI Discussion Paper No. 1979, International Food Policy Research Institute (IFPRI), Washington, DC.
- Bassett, H.R., J. Lau, C. Giordano, S.K. Suri, S. Advani, and S. Sharan. 2021. "[Preliminary Lessons from COVID-19 Disruptions of Small-Scale Fishery Supply Chains.](#)" *World Development* 143: 105473.
- Belton B., L. Rosen, L. Middleton, et al. 2021. "[COVID-19 Impacts and Adaptations in Asia and Africa's Aquatic Food Value Chains.](#)" Working Paper FISH-2021-02. CGIAR Research Program on Fish Agri-Food Systems, Penang, Malaysia.
- Bhandari, H., J. Balie, V. Pede, and N. Meah. 2020. "[Impact of COVID-19 on the Rice Value Chain \(RVC\) in Asia.](#)" IRRI Policy Brief. Manila: International Rice Research Institute.
- Boughton, D., J. Goeb, I. Lambrecht, et al. 2021. "[Impacts of COVID-19 on Agricultural Production and Food Systems in Late Transforming Southeast Asia: The Case of Myanmar.](#)" *Agricultural Systems* 188: 103026.
- Ceballos, F., S. Kannan, and B. Kramer. 2020. "[Impacts of a National Lockdown on Smallholder Farmers' Income and Food Security: Empirical Evidence from Two States in India.](#)" *World Development* 136: 105069.
- Chase, R., and N. Roux. 2020. "[How COVID-19 is Impacting Banana-Producing Countries.](#)" *Alliance of Bioversity International and CIAT Blog*, June 30.
- Dai, R., H. Feng, J. Hu, Q. Jin, H. Li, R. Wang, R. Wang, L. Xu, and X. Zhang. 2020. "[The Impact of COVID-19 on Small and Medium-Sized Enterprises: Evidence from Two-Wave Phone Surveys in China.](#)" CGD Working Paper 549, Center for Global Development, Washington, DC.
- de Boef, W.S., G.D. Borman, A. Gupta, et al. 2021. "[Rapid Assessments of the Impact of COVID-19 on the Availability of Quality Seed to Farmers: Advocating Immediate Practical, Remedial and Preventative Action.](#)" *Agricultural Systems* 188: 103037.
- Dixon, J.M., J. Weerahewa, J. Hellin, et al. 2021. "[Response and Resilience of Asian Agrifood Systems to COVID-19: An Assessment across Twenty-Five Countries and Four Regional Farming and Food Systems.](#)" *Agricultural Systems* 193: 103168.
- Espino, A., K. Itliong, C.D. Ruba, O. Thy, W.J. Barbon, E. Monville-Oro, S. Gummadi, and J. Gonsalves. 2021. "[COVID-19 Impact on Local Agri-food System in Cambodia, Myanmar, and the Philippines: Findings from a Rapid Assessment.](#)" CCAFS Working Paper No. 357, CGIAR Research Program on Climate Change, Agriculture and Food Security, Wageningen, the Netherlands.
- FAO (Food and Agricultural Organization of the United Nations). 2020a. "[National Agrifood Systems and COVID-19 in Kenya: Effects, Policy Responses, and Long-Term Implications.](#)" Policy Brief. Rome.
- FAO. 2020b. "[Second Rapid Assessment of Food and Nutrition Security in the Context of COVID-19 in Bangladesh: May-July 2020.](#)" Rome.
- FAO. 2020c. "[National Agrifood Systems and COVID-19 in Myanmar. Effects, Policy Responses and Long-Term Implications.](#)" Policy Brief. Rome.
- FAO. 2021a. "[The Sudan | Food Supply, Agricultural Livelihoods and Food Security in the Context of COVID-19: Monitoring Report, January 2021.](#)" Rome.
- FAO. 2021b. "[Somalia - Agricultural Livelihoods and Food Security in the Context of COVID-19: Monitoring Report.](#)" Rome.
- FAO. 2021c. "[Rapid Assessment of the Impact of COVID-19 on Food Supply Chains in the Philippines. Manila.](#)" Rome.
- Goeb, J., N.L.K. Synt, P.P. Zone, and Y. Tang. 2020. "[Monitoring the Impact of COVID-19 in Myanmar: Rice Millers-October 2020 Survey Round.](#)" Myanmar Strategy Support Program Policy Note 41. Washington, DC: IFPRI.
- Hirvonen, K., B. Mohammed, B. Minten, and S. Tamru. 2020. "[Food Marketing Margins during the COVID-19 Pandemic: Evidence from Vegetables in Ethiopia.](#)" ESSP Working Paper 150, IFPRI, Washington, DC.
- IFPRI (International Food Policy Research Institute). 2020. "[COVID-19 Policy Response Portal.](#)" Accessed November 20, 2021.
- Intini, J., W. Belik, A. Cunha, and J. Torres. 2020. "[The Role of Wholesalers Markets in the Pandemic: Challenges and Opportunities.](#)" The Agrifood System and the Challenges of COVID-19 No. 5, FAO, Santiago.

- Kumaran, M., R. Geetha, J. Antony, et al. 2021. "[Prospective Impact of Corona Virus Disease \(COVID-19\) Related Lockdown on Shrimp Aquaculture Sector in India: A Sectoral Assessment](#)." *Aquaculture* 531: 735922.
- Liverpool-Tasie, L.S.O., T. Reardon, and B. Belton. 2021. "[Essential Non-essentials: COVID-19 Policy Missteps in Nigeria Rooted in Persistent Myths about African Food Supply Chains](#)." *Applied Economic Perspectives and Policy* 43 (1): 205-224.
- Mahajan, K., and S. Tomar. 2021. "[COVID-19 and Supply Chain Disruption: Evidence from Food Markets in India](#)." *American Journal of Agricultural Economics* 103 (1): 35-52.
- Minten, B., B. Mohammed, and S. Tamru. 2020. "[Emerging Medium-Scale Tenant Farming, Gig Economies, and the COVID-19 Disruption: The Case of Commercial Vegetable Clusters in Ethiopia](#)." *European Journal of Development Research* 32 (5): 1402-1429.
- Nchanji, E., C.K. Lutomia, and D. Karanja. 2021. "[Immediate Impacts of COVID-19 Measures on Bean Production, Distribution, and Food Security in Eastern Africa](#)." *Journal of Agriculture, Food Systems, and Community Development* 10 (2): 259-263.
- NIAP (National Institute for Agricultural Economics and Policy). 2020. "[COVID-19 Lockdown and Indian Agriculture: Options to Reduce the Impact](#)." Working Paper, National Institute for Agricultural Economics and Policy, Indian Council of Agricultural Research, New Delhi.
- Odhiambo, K., J. Lewis, N. Tefera, A. Thomas, M. Meroni, M. Dimou, and F. Rembold. 2021. [Impacts of COVID-19 and Desert Locusts on Smallholder Farmers Food Systems and Value Chains in Kenya](#). Luxembourg: European Union.
- Pradhan, B. 2020. "[Gauging the Impact of COVID-19 Lockdown on Farming Communities and Agribusinesses in Nepal](#)." *CIMMYT Blog*, July 8.
- Stoian, D., P. Marenja, J. Donovan, and G. Pamerneckyte. 2021. "[Fractures and Resilience of Agri-food Value Chain in the Context of COVID-19: A Review of Recent Evidence](#)." CIFOR-ICRAF Working Paper 2. CIFOR, Bogor, Indonesia, and World Agroforestry, Nairobi, Kenya.
- Tesfaye, A., Y. Habte, and B. Minten. 2020. "[COVID-19 Is Shifting Consumption and Disrupting Dairy Value Chains in Ethiopia](#)." In *COVID-19 and Global Food Security*, edited by J. Swinnen and J. McDermott, 42-45. Washington, DC: IFPRI.
- Tittonell, P., M. Fernandez, V.E. El Mujtar, et al. 2021. "[Emerging Responses to the COVID-19 Crisis from Family Farming and the Agroecology Movement in Latin America: A Rediscovery of Food, Farmers and Collective Action](#)." *Agricultural Systems* 190: 103098.
- Varshney, D., D. Roy, and J.V. Meenakshi. 2020. "[Impact of COVID-19 on Agricultural Markets: Assessing the Roles of Commodity Characteristics, Disease Caseload and Market Reforms](#)." *Indian Economic Review* 55 (1): 83-103.
- Varshney, D., A. Kumar, A. Mishra, S. Rashid, and P.K. Joshi. 2020. "[Could Pradhan Mantri Garib Kalyan Yojana \(PM-GKY\) Mitigate COVID-19 Shocks in the Agricultural Sector](#)." IFPRI Discussion Paper 1990, IFPRI, Washington, DC.
- Varshney, D., A. Kumar, A.K. Mishra, S. Rashid, and P.K. Joshi. 2021. "[COVID-19, Government Transfer Payments, and Investment Decisions in Farming Business: Evidence from Northern India](#)." *Applied Economic Perspectives and Policy* 43 (1): 248-269.
- WCDI (Wageningen Centre for Development Innovation). 2020. [Potato Alert: Rwanda, Number 1](#). Wageningen, Netherlands: Wageningen University and Research and SNV Netherlands Development Organisation.
- Wamwere-Njoroge, G., J.M. Makau, E. Rutsimba, et al. 2021. [Feed the Future Accelerated Value Chain Development \(AVCD\) Program: Effect of COVID-19 on Livestock Value Chain Actors and Food Systems in Northern Kenya](#). 2021. Nairobi: International Livestock Research Institute.

12. Resilience of urban value chains during the COVID-19 pandemic: Evidence from dairy and vegetable chains in Ethiopia

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At the beginning of the COVID-19 pandemic, many researchers and international organizations voiced concerns about the resilience of food value chains amid lockdowns and border closures, particularly in low- and middle-income countries (Laborde et al. 2020; Reardon, Bellemare, and Zilberman 2020; Resnick 2020). This chapter explores the pandemic's effects on dairy and vegetable value chains in Ethiopia's capital through mid-2021. Despite early fears about the pandemic's impacts, survey data show that these urban value chains quickly rebounded after an initial period of fragility, demonstrating resilience over the research period. Amid tremendous uncertainty and market volatility, most value chain actors also indicated that the pandemic had not negatively affected their business activities.

In Ethiopia, the first detected COVID-19 case was confirmed on March 13, 2020. Just three days later, schools were closed, public gatherings and sporting activities were banned, and bars were shuttered. The government encouraged physical distancing and began major public awareness campaigns across the country. A federal state of emergency was declared on April 8, 2020. Land borders were closed, except for the transport of cargo. Facemasks were made compulsory. The government declared restrictions on local and long-distance public transportation, which included halving transport capacity. Early on, the government pledged to protect the most economically vulnerable segments of the population, and therefore lockdowns that severely restricted movement were not imposed (France-24 2020). Some administrative regions adopted stricter measures by closing restaurants and limiting movement between rural and urban areas. The state of emergency was lifted on September 6, 2020: transportation restrictions were repealed, bars reopened, and facemasks were no longer compulsory. Schools reopened on October 19, 2020.

To understand how major dairy and vegetable value chains in Ethiopia functioned amid the pandemic, we combined in-person survey data collected before the pandemic with periodic phone survey data collected during 2020 and 2021. With a focus on the main dairy and vegetable value chains connecting farmers in major production zones to consumers in Addis Ababa, we applied cascading survey approaches in which we collected data at all levels of the value chain (including farmers, wholesalers, and urban retailers). Pre-pandemic interviews with vegetable value chain actors were conducted in person in February 2020 and with dairy value chain actors in February 2018. Follow-up phone surveys for the vegetable value chain took place in May 2020, March 2021, and August 2021, while follow-up phone surveys for the dairy value chain were conducted in June and September 2021.

Between March and May 2020, we also conducted informal and non-representative rapid assessments of the situation in both value chains by interviewing key stakeholders, including small-scale farmers, large-scale investors, brokers, processors, agro-input dealers, and extension agents.

Signs of fragility at the onset of the pandemic

Our [rapid assessment](#) with the vegetable value chain actors in the first weeks of the pandemic revealed worrisome signs of disruption (Tamru, Hirvonen, and Minten 2020). Demand for fruit and vegetables in Addis Ababa was declining, partly driven by a fear that COVID-19 infections were linked to the consumption of raw vegetables. Because of confusion around the imposed travel restrictions and fears of contracting the virus, traders were less willing to travel to production areas. At the farm level, producer prices were declining but farm inputs were unavailable, or their prices were on the rise, indicating a double blow for the vegetable farmers. In the [dairy value chain](#), the apparent negative impacts of the pandemic were more moderate (Tesfaye, Habte, and Minten 2020), possibly because the rapid assessment took place somewhat later, about two months into the pandemic. As with the demand for fruits and vegetables, urban demand for liquid milk declined, in part because of the misperception that milk consumption was associated with an increased risk of COVID-19 infection. Retailers reported an increase in powdered milk sales as consumers believed that the processed product was less risky than liquid milk.

Signs of rebound a few months into the pandemic

Our [vegetable value chain survey](#) in May 2020 focused on changes in prices and marketing margins since February 2020 (Hirvonen, Mohammed, Minten, and Tamru 2021).¹ During this period, we documented large and heterogeneous changes in retail prices for different vegetables. For most vegetables, these changes were driven by fluctuations in farmgate prices, leading to winners and losers among local vegetable farmers due to pandemic-related international and regional trade disruptions. While traders and retailers reported substantial hurdles in domestic trade, increases in marketing margins or transportation costs were not the major contributors to overall changes in retail prices. In fact, the marketing margins declined for half of the vegetables that we studied. In contrast to the widespread fears at the onset of the pandemic, these findings indicated relatively high short-term resilience for domestic value chains during the early months of the pandemic in Ethiopia.

One year into the pandemic: Resilience amid high uncertainty

Data from our extensive phone survey, which was conducted more than one year after Ethiopia's first recorded COVID-19 case, suggest that the disruption caused by the pandemic had minimal impacts on the urban (Addis Ababa) vegetable and dairy value chains in Ethiopia (Hirvonen, Habate et al. 2021; Hirvonen, Mohammed, Tamru et al. 2021).

¹ No assessment of the short-term impacts of the dairy value chain was done. We therefore limit our discussion to the vegetable value chain.

In the vegetable value chain, access to credit, labor, and extension services did not markedly change for vegetable farmers between February 2020 and March 2021. The main concern for vegetable farmers was the soaring price of key inputs, with prices of fertilizers and agrochemicals increasing by more than 40 percent in just 12 months.

Among many other pandemic-related policy adjustments, the wholesale vegetable market was relocated from a crowded area in the center of Addis Ababa to the city's outskirts to reduce spread of the virus. Most wholesale traders felt that while the pandemic itself had a limited effect on their business activity, the relocation of the wholesale market had a considerably larger negative impact. Most wholesale traders reported trading fewer vegetables and having fewer clients than in February 2020. Nearly all wholesale traders blamed the decline in sales and clientele on the relocation of the wholesale vegetable market. Many of the urban vegetable retailers reported also being negatively affected by the relocation of the wholesale market. In March 2021, nearly two-thirds of retailers reported that there were fewer transport choices from wholesale markets than in February 2020. Nearly 80 percent of retailers who reported a decrease in transport availability said that the change was due to the relocation of the wholesale market, while 19 percent said it was due to the COVID-19 pandemic.

Using three rounds of vegetable price data collected at all levels of the value chain, we further document considerable volatility in vegetable prices and marketing margins. For instance, onion prices soared during the first months of the pandemic when imports from other regions of Ethiopia and from Sudan were halted. Encouraged by these price increases, many farmers began allocating more land to onions. This, together with the closure of major markets due to instability and conflict in some parts of the country, led to a considerable oversupply of onions in Addis Ababa. In turn, this oversupply resulted in a sizable decline in farmgate and final consumer prices between May 2020 and February 2021. Combined with increasing input costs, the decline in onion prices likely led to considerable losses among farmers.

In the case of the dairy value chain, sales patterns and sales destinations (farms, collection centers, markets, and others) among dairy farmers remained similar between 2018 and 2021. Evidence suggests modest declines in credit availability and access to extension services. The availability of daily workers also decreased, although hiring external help is relatively uncommon among dairy farmers. The main concern for dairy farmers was the soaring price of feed, which nearly doubled between February 2020 and June 2021.

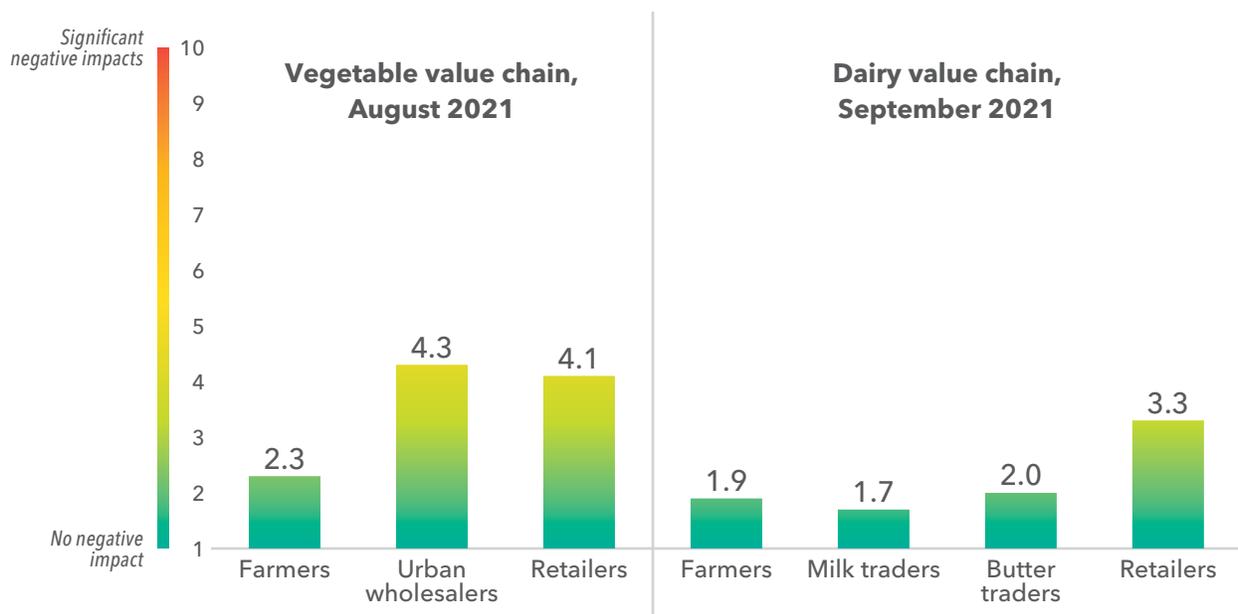
At the wholesale level, there were no dramatic changes in dairy procurement and sales destinations between 2018 and 2021. Traders reported that competition in their sector had increased since February 2020. The availability of labor at the midstream segment of the value chain remained the same over the 2018–2021 period. A comparison of the data collected in 2018 and 2021 reveals that the quantities traded in the dairy retail sector increased. However, when traders were asked to compare their current situation to the period just before the pandemic began, most reported selling less and having fewer clients. There is little change in labor use at the retail level across the survey period.

In line with high general inflation in Ethiopia over the last three years, prices of liquid milk increased considerably during this time. However, when expressed in US dollars, prices of milk have remained surprisingly stable (US\$0.92 /liter in 2018 and US\$0.91/liter in 2021). A comparison of the farmgate and retail prices reveals that the farm share (that is, the share of the final retail price received by the

farmer) increased slightly between 2018 and 2021. Compared to 2018, there is more quality testing of milk along the value chain. However, there is no evidence that quality testing has increased post-harvest losses. The physical quantities wasted appear to be very low, in line with the analysis conducted by Minten, Tamru, and Reardon (2020). If anything, losses at the wholesale and retail levels have declined during the pandemic. However, it is important to note that we did not assess losses in terms of value or quality. It is an encouraging sign that the testing of milk quality with lactometers and alcohol tests has become more common since 2018, particularly in the mid- and downstream segments of the dairy value chain.

Overall, it is unclear whether the changes documented in both value chains are linked to the pandemic. For example, our qualitative interviews with key stakeholders in the vegetable value chain in 2019 revealed that the industry was characterized by considerable volatility before the pandemic. Moreover, when value chain actors were asked in 2021 to rate the seriousness of the COVID-19 pandemic for their businesses on a scale of 1 to 10 (with “1” indicating no negative effect and “10” indicating significant negative effects), actors from both chains responded with an average rating of less than 5, with farmers being the least concerned about the pandemic (Figure 1). However, value chains may have been indirectly affected by pandemic-related changes, such as through the relocation of market centers and disruptions in regional and international trade due to COVID-19, with the latter contributing to observed increases in input costs (Baffes and Koh 2021).

FIGURE 1 Negative effects of the COVID-19 pandemic on farming and trading activities, as reported by value chain actors



Note: Respondents were asked to report, on a scale of 1 to 10 (“1” indicating no negative impact and “10” indicating significant negative impacts), how much the COVID-19 pandemic was currently affecting their farming or trading activities.

Conclusions

The disruptions caused by the COVID-19 pandemic in these important food value chains in Ethiopia were relatively short-term. By May 2020, the main vegetable value chain supplying consumers in Addis Ababa was already functioning relatively well. In mid-2021, the impacts of the pandemic on both dairy and vegetable value chains were minimal. These findings are corroborated by results from a representative longitudinal survey conducted by IFPRI in Addis Ababa before and during the pandemic. This [study](#) did not document any negative changes in levels of household food consumption and indicators of dietary diversity (Hirvonen, de Brauw, and Abate 2021), indicating that food value chains in urban Ethiopia have been remarkably resilient to the pandemic.

References

- Baffes, J., and W.C. Koh. 2021. "[Fertilizer Prices Expected to Stay High over the Remainder of 2021.](#)" World Bank Data Blog. June 8.
- France-24. 2020. "['Starve or Get Sick': Africa's Lockdown Dilemma.](#)" April 14.
- Hirvonen, K., A. de Brauw, and G.T. Abate. 2021. "[Food Consumption and Food Security during the COVID-19 Pandemic in Addis Ababa.](#)" *American Journal of Agricultural Economics* 103 (3): 772-789.
- Hirvonen, K., Y. Habte, B. Mohammed, S. Tamru, G.T. Abate, and B. Minten. 2021. "[Dairy Value Chains During the COVID-19 Pandemic in Ethiopia: Evidence from Cascading Value Chain Surveys Before and During the Pandemic.](#)" IFPRI-ESSP Working Paper 160, International Food Policy Research Institute (IFPRI), Washington, DC.
- Hirvonen, K., B. Mohammed, B. Minten, and S. Tamru. 2021. "[Food Prices, Marketing Margins, and Shocks: Evidence from Vegetables and the COVID-19 Pandemic in Ethiopia.](#)" *Agricultural Economics* 52 (3): 407-421.
- Hirvonen, K., B. Mohammed, S. Tamru, G.T. Abate, and B. Minten. 2021. "[Vegetable Value Chains During the COVID-19 Pandemic in Ethiopia: Evidence from Cascading Value Chain Surveys Before and During the Pandemic.](#)" IFPRI-ESSP Working Paper 159, IFPRI, Washington, DC.
- Laborde, D., W. Martin, J. Swinnen, and R. Vos. 2020. "[COVID-19 Risks to Global Food Security.](#)" *Science* 369 (6503): 500-502.
- Minten, B., S. Tamru, and T. Reardon. 2020. "[Post-Harvest Losses in Rural-Urban Value Chains: Evidence from Ethiopia.](#)" *Food Policy* 98: 101860.
- Reardon, T., M.F. Bellemare, and D. Zilberman. 2020. "[How COVID-19 May Disrupt Food Supply Chains in Developing Countries.](#)" In *COVID-19 & Global Food Security*, edited by J. Swinnen and J. McDermott, 78-80. Washington, DC: IFPRI.
- Resnick, D. 2020. "[COVID-19 Lockdowns Threaten Africa's Vital Informal Urban Food Trade.](#)" In *COVID-19 & Global Food Security*, edited by J. Swinnen and J. McDermott, 73-74. Washington, DC: IFPRI.
- Tamru, S., K. Hirvonen, and B. Minten. 2020. "[Impacts of the COVID-19 Crisis on Vegetable Value Chains in Ethiopia.](#)" IFPRI blog, April 13.
- Tesfaye, A., Y. Habte, and B. Minten. 2020. "[COVID-19 Is Shifting Consumption and Disrupting Dairy Value Chains in Ethiopia.](#)" In *COVID-19 & Global Food Security*, edited by J. Swinnen and J. McDermott, 42-45. Washington, DC: IFPRI.

13. COVID-19 and resilience innovations in food supply chains: Two years later

Thomas Reardon, Johan Swinnen, and Rob Vos

Two years after the start of the COVID-19 pandemic, food value chains have undergone some remarkable adjustments, evolving to meet rapidly changing conditions. Their capacity to make these adjustments has depended on public investments in the logistics infrastructure and wholesale markets that form the structure of food systems, as well as public policies that facilitate efficient exchange and private sector innovations, the flow of food systems.

Looking back, we can see that the initial food supply chain disruptions in low- and middle-income countries (LMICs) were primarily caused by three COVID-19 responses:

- Lockdowns limited the movement of consumers who use retailer and food service outlets, logistics firms that deliver to wholesalers, wholesalers that supply food retailers and farm input retailers, and workers at firms and farms.
- Sudden demand surges occurred as consumers panicked and stocked up on staples (such as runs on maize meal in South Africa [Meyer et al. 2021]), emptying stores and straining suppliers.
- Internationally, the “roller coaster” of cargo demand surges and supply plunges disrupted exports and imports, fouling up container inventories for processed foods and farm inputs. These disruptions were exacerbated by port lockdowns and slowdowns caused by a lack of workers to load and deliver products.

In the second year of the pandemic, these factors evolved. First, disruptions associated with the lockdowns faded or became more scattered. The harbors of major trading countries were open, but mandatory quarantines and testing continued to slow the movement of goods (Fresh Plaza 2022). Moreover, to some extent, consumers continued new behaviors adopted during the lockdowns – such as relying more on food e-commerce and delivery than in pre-pandemic days, including in LMICs such as China and India (Reardon, Heiman et al. 2021). Second, demand surged as consumer incomes recovered from 2020. Third, disruptions of cargo shipping, container inventories, and ports, initially perceived as a short-term problem, continued into the medium term. This continued disruption especially affected international commerce (which constitutes some 10 percent of LMIC food economies), with a particularly large impact on major exporters of nonstaples, such as Chile. Trade of staple foods (such as grains) was less affected because these products are shipped in bulk and from ports outside of the main maritime highways.

In 2021, the supply chain changes were reinforced by powerful weather-related shocks such as La Niña, which caused droughts in South America and stronger-than-normal hurricanes in Central America and Southeast Asia. Such shocks in themselves are “business as usual” for domestic

and international food supply chains, but climate change has made them more intense and less predictable.

In the eyes of food industry operators, these waves of disruptions were sudden in their intensity and confluence – but not unusual in their nature.

Shocks that induce substantial adaptations in supply chains are not new. Supply chain actors have faced and adapted to continuous disruptions in recent decades. Before COVID-19 (SARS2), supply chains had already weathered SARS1 in 2003, as well as waves of devastating animal and plant disease epidemics in the 2000s and 2010s. They have also had to cope with many extreme weather events.

LMIC food systems are rapidly transforming, making them both more vulnerable and more innovative in the face of these shocks. Food supply chains have expanded and lengthened immensely in the past four decades to serve rapidly growing cities and to meet demand for purchased food from rural areas. This lengthening makes them more vulnerable to shocks than traditional local food economies. But their transformation has also entailed rapid development in logistics, processing, and wholesale practices, with firms of all sizes innovating in supply chains to address transaction costs and innovating in developing resilience strategies to protect their investments.

The key point is that supply chains were clearly shocked by the COVID-19 pandemic, but already had substantial experience and innovation capacity in dealing with shocks. As a consequence, they have shown a remarkable capability to adapt and innovate.

During the main lockdowns of 2020, sales of many LMIC supply chains showed a V shape, first plummeting for three to four months, and then bouncing back to normal or near normal (Belton et al. 2021; Liverpool-Tasie et al. 2022). However, many smaller and asset-poor firms operating in structurally poor business conditions, such as those with inadequate infrastructure, were unable to recover. But a growing body of evidence shows that the great majority were able to survive (Dejene et al. forthcoming).

Despite these strong signs of recovery, many studies and news reports in LMICs have focused on the bottom of the V, that is, when firms suffered from low sales, and on supply disruptions, suggesting that the pandemic has caused a crisis in our food systems. Much less attention has been given to the righthand side of the V, that is the upturn and resumption of business sales, and why and how it has occurred. We believe this may reflect insufficient understanding of the dynamics and adaptive capacity of food supply chains. Building on our previous blogs and studies, we focus on three key “pivots” that firms successfully made in sales, production, and procurement to adjust to the supply and demand shocks (Reardon, Heiman et al. 2021; Reardon and Swinnen 2020; Reardon and Vos 2021).

Sales pivot to e-commerce and delivery

Food e-commerce began developing in the 2000s and especially the 2010s, expanding most rapidly in Asia and Latin America, among developing regions, where related logistics and infrastructure were more developed, transaction costs lower, and more consumers connected online and

by smart phone. Shocks played a role in the early emergence of e-commerce in LMICs: for example, in 2003, China's Alibaba added business-to-consumer e-commerce as a response to the SARS lockdown.

COVID-19 greatly accelerated the expansion of e-commerce, and served as a key resilience strategy for retailers and food service firms in 2020 and 2021, especially in Asia and Latin America. Because of high transaction costs, the expansion before and even during the pandemic was more limited in Africa, as illustrated by the difficulties Africa's Jumia has encountered in trying to build its e-commerce business (Reardon, Belton et al. 2021.).

Adversity sparked innovation in e-commerce and delivery services, as enterprises of all sizes learned to spot opportunities and expand into them. In particular, during the past two years, e-commerce in LMICs has innovated and differentiated to enable participation by retailers of different sizes and by different strata of consumers.

- Digitally based delivery options expanded into hyper-local and hyper-rapid service. For example, Getir (started in Turkey in 2021) expanded into Western Europe and North Africa.
- E-commerce "broadened" to serve small and medium enterprises (SMEs), including wet-market stall owners; for example, Getir started Getirçarşı, a division delivering only for SME retailers. In India, Swiggy delivers for food service SMEs and Jiomart (a division of Reliance) provides e-commerce platforms for small retail shops.
- E-commerce "stretched" into social media. For example, multichannel network companies like TikTok and Kuaishou in China helped e-commerce firms promote their food products, and wholesale markets such as Xinfadi in Beijing provided venues and equipment to support this.

New ways of doing business lead to new challenges. The shift to digitalization and business in cyberspace has brought vulnerability to cyber-attacks. This became dramatically clear in 2021 when the network of JBS, the world's largest meat firm, was hacked, operations disrupted, and a ransom paid. Such attacks are a major threat to the global food system, including in LMICs, as the digitalization of food markets as well as of internal operations of firms and farms increases exponentially.

Production pivots toward technologies that save labor and increase flexibility

Production technology strategies entail choices among factors of production (for example, types of labor and capital). In 2020 and 2021, many LMIC food industry firms faced a shortage of available (healthy) workers. This challenge was exacerbated by the need for many workers to take on new tasks, such as driving delivery vehicles and staffing fast-turnover warehouses that serve e-commerce.

During the lockdowns of 2020, many local workers stayed home, rural migrant workers went back to their villages, and international migrants went back to their home countries while new migrants were denied entry. To attract workers, firms had to invest in reconfigured workspaces for social distancing

and in health protection gear. In 2021, food firms still faced severe labor shortages, but with a new twist (especially in developed countries) – despite the lifting of lockdowns, many workers did not return to work. This labor shortage will likely remain a major challenge in 2022.

Firms have been responding in two ways:

- Firms have tried to encourage labor participation with better pay and working conditions and, for migrant workers, governments have loosened visa requirements. For example, citrus packing plants in South Africa have provided incentives and training for local workers to replace migrant workers (Meyer et al. 2021).
- Firms with the financial capacity to invest in new machinery have reduced their need for labor by automating parts of their operations and supply chains. Food firms in developed countries are accelerating such investments, such as in warehousing and logistics in the United States and Western Europe. The same is occurring in LMICs. For example, China opened the world’s first fully automated port in Shandong in October 2021. Brazil’s pork processor Frimesa invested in automation of its plants in 2020 as did Marel with poultry processing in 2021.

This response to the labor supply shock brings societal challenges. As firms (and farms) become more capital-intensive, and need less labor, over time they will likely employ fewer nonskilled workers, despite the pressing need for jobs for the burgeoning “youth bulge” in the poorer LMICs.

Procurement pivots to increase diversification, flexibility, and redundancy of sourcing, from “just in time” to “just in case”

As food industry firms in LMICs (and developed countries) were slammed by supply chain logjams in both international and domestic markets, first in 2020 and then in 2021–2022, buyers and sellers pivoted to diversify and pursue flexibility.

The procurement of citrus products in South Africa illustrates diversification, flexibility, and the value of years of preparation for crises (Meyer et al. 2021). In 2020, citrus retailers and wholesalers in Asia switched to sourcing more from South Africa when lockdowns caused supply constraints among traditional providers. South Africa’s government and its citrus industry were prepared, having already obtained market entry and certifications to sell to Asia in 2018 and 2019. When Europe locked down ports in 2020, South African citrus traders were able to redirect exports to Asia. Moreover, South African citrus supply chains were “trained” in flexibility, as they had been forced to adapt rapidly to waves of new European phytosanitary regulations over the decade preceding COVID-19. Supply-chain resilience had also been strengthened through investments in improving ports and phytosanitary protocols.

Many food industry firms have found that redundancy of suppliers and assets was crucial for pivoting as well as for absorbing shocks. When one factory or port was locked down or short on labor or materials, others in that firm’s supply chain could pick up the work. This strategy is valuable before and after COVID-19. A shift is occurring away from a focus solely on tight supply chains for efficiency, such as maintaining minimal inventories (called “just in time”), toward a “just in case” strategy, which

emphasizes maintaining a degree of redundancy, flexibility, and diversification rather than strict efficiency (Masters and Edgecliffe-Johnson). Examples include:

- The Thai multinational Charoen Pokphand built a series of ports on the river they use for exports, so that if one is washed out by a hurricane another can be activated (Reardon and Zilberman 2018).
- When consumers in South Africa rushed to stock up on maize meal, they put a sudden, tremendous strain on maize mills. The industry had lamented under-utilization of capacity before 2020, but was able to easily meet the demand surge by moving to full utilization, turning the slack into an asset during the pandemic (Meyer et al. 2021).

These strategies pose a societal challenge as they are likely to accelerate food industry concentration in both LMICs and developed countries. For firms, it is expensive to make the typically substantial threshold investments necessary to maintain options for sourcing and selling, such as Charoen Pokphand's multiple ports. Large enterprises have an advantage, given their greater financial capacity and broader geographic spread of procurement and marketing. SMEs are dependent on smaller supply and marketing geographies and usually cannot afford to make investments in extra facilities or leave capacity unused.

Policy lessons: Invest in the food system's "blood and bones" to strengthen firm resilience

Governments should embrace actions to enable private sector entrepreneurs, large and small, to pivot as a resilience strategy through innovations in marketing, sourcing, and technology. To facilitate such pivots, governments need to strengthen the support system for food systems – their blood and bones.

- Investing in roads, wholesale markets, and other infrastructure (the "bones") is crucial to reducing transaction costs that firms face and thus their flexibility and ability to pivot in sourcing and marketing. Where the bones are strong, such as the South African port system, firms can pivot quickly. Where the bones are inadequate and transaction costs are high, firms are held back as noted in the African case of Jumia above.
- Facilitating logistics, wholesale sectors, and efficient exchange and innovations (the "blood") is key to the resilience of the whole system. Governments must get the enabling business environment right – facilitating business flexibility by implementing regulations designed to ease doing business, limiting concentration, setting transparent safety standards, reducing cybersecurity risks, and supporting access to finance, especially for SMEs.

These recommendations are critical to ensure resilience, innovation, and flexibility in our food supply chains as new waves of COVID-19 or new shocks arise.

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References

- Belton, B., L. Rosen, L. Middleton, S. Gazali, A.A. Mamun, et al. 2021. "COVID-19 Impacts and Adaptations in Asia and Africa's Aquatic Food Value Chains." *Marine Policy* 129: 104523.
- Dejene, S., R. Kabir, N. Minot, L. Nabwire, S. Harayanan, B. Rice, B. Van Campenhout, and R.Vos. Forthcoming. Impact of COVID-19 on food value chains in Bangladesh, Burkina Faso, and Uganda. Results of surveys of farmers, traders, and processors. IFPRI Working Paper. IFPRI, Washington, DC.
- Fresh Plaza. 2022. "[No Relief for China's Overstretched Supply Chains](#)." January 26.
- Liverpool-Tasie, L.S.O., B. Belton, O. Tasie, W. Osawe, C. Parkhi, et al. 2022. "[Pivoting in Nigeria's Fish and Poultry Value Chains in Response to COVID-19 Policies and Impacts](#)." NAPA Research Report No.1. Michigan State University and IFPRI, East Lansing, MI.
- Masters, B., and A. Edgecliffe-Johnson. 2021. "[Supply Chains: Companies Shift from 'Just in Time' to 'Just in Case'](#)." *Financial Times*, December 20.
- Meyer, F., T. Reardon, T. Davids, M. van der Merwe, D. Jordaan, M. Delpont, and G. van der Burgh. 2021. "[Hotspots of Vulnerability: Analysis of Food Value Chain Disruptions by COVID-19 Policies in South Africa](#)." *Agrekon* 60 (4): published online December 24.
- Reardon, T., and D. Zilberman. 2018. "Climate Smart Food Supply Chains in Developing Countries in an Era of Rapid Dual Change in Agrifood Systems and the Climate." In *Climate Smart Agriculture: Building Resilience to Climate Change*, edited by L. Lipper, N. McCarthy, D. Zilberman, S. Asfaw, and G. Branca, 335-351. Cham, Switzerland: FAO and Springer.
- Reardon, T., and J. Swinnen. 2020. "[COVID-19 and Resilience Innovations in Food Supply Chains](#)." *IFPRI Blog*, July 6.
- Reardon, T., B. Belton, L.S.O. Liverpool-Tasie, L. Lu, C.S.R. Nuthalapati, O. Tasie, and D. Zilberman. 2021. "[E-Commerce's Fast-Tracking Diffusion and Adaptation in Developing Countries](#)." *Applied Economic Perspectives and Policy* 43 (4): 1243-1259.
- Reardon, T., A. Heiman, L. Lu, C.S.R. Nuthalapati, R. Vos, and D. Zilberman. 2021. "['Pivoting' by Food Industry Firms to Cope with COVID-19 in Developing Regions: E-commerce and 'Co-pivoting' Delivery-Intermediaries](#)." *Agricultural Economics* 52 (3): 459-475.
- Reardon, T., and R. Vos. 2021. "[Food Supply Chains: Business Resilience, Innovation, and Adaptation](#)." In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, Chapter 6, 64-73. Washington, DC: International Food Policy Research Institute.

14. How India's agrifood supply chains fared during the COVID-19 lockdown, from farm to fork

Sudha Narayanan

In response to the COVID-19 pandemic, the Indian government imposed a stringent national lockdown from March 24 to May 31, 2020, which caused [severe disruptions](#) across [agrifood supply chains](#) from "farm to fork." The government was consistently one step behind in terms of preventing these problems ([Narayanan and Saha 2020b](#)).

The lack of labor and machinery disrupted harvests and brought warehouse operations to a virtual standstill. Regulated markets where farmers sell produce were intermittently closed and village traders and merchants did not show up to make purchases. Our survey of around 370 farmers across nine Indian states found that among those who had harvested some produce this season, 29 percent were still holding on to it; 13 percent had sold the harvests at throwaway prices and about 7 percent reported that they had to let the produce go to waste.

Lockdown-related problems also made it extremely difficult for many retailers to secure fresh and processed foods and to conduct business ([Narayanan and Saha 2020a](#)).

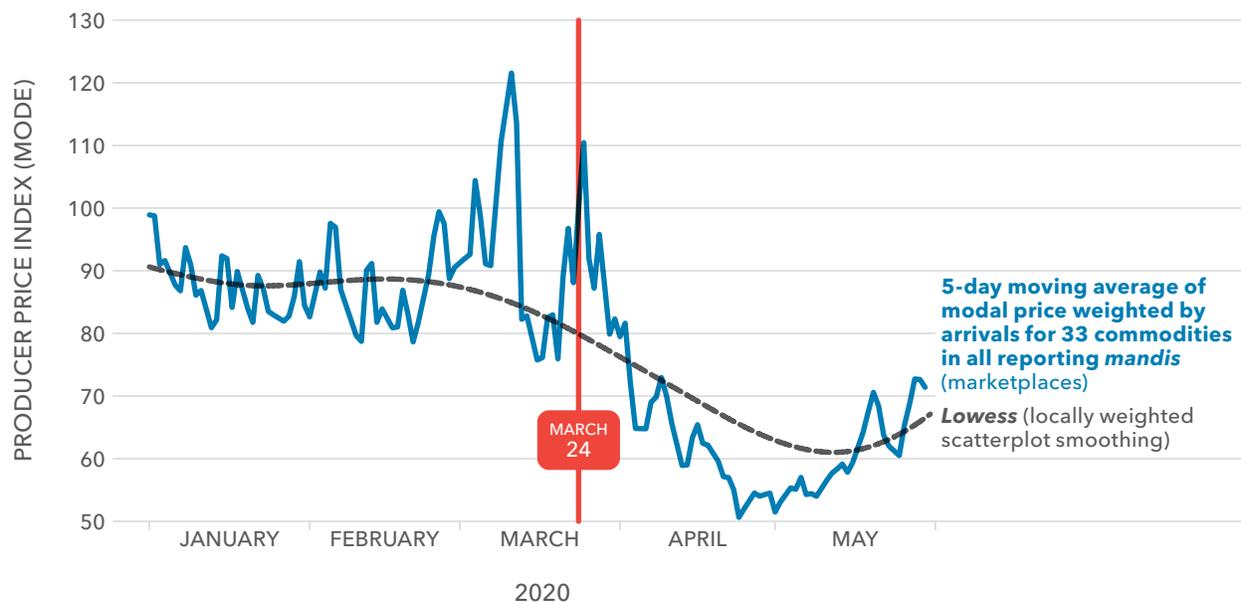
Food markets in India, both in urban and rural areas, constitute a mosaic of diverse actors and tend to be highly fragmented. How did this complex system cope in the wake of lockdown? Despite the early confusion, anxiety, and disruptions, there is now widespread consensus in India that the agrifood system has been surprisingly resilient. Nevertheless, the lockdown's impacts continue, and their dynamics deserve attention from policymakers and organizations working on ways to protect food security. This post outlines five key features of the lockdown's consequences for the Indian agrifood system, noting that these are broad patterns that mask large variations.

Consumer prices rose on average while producer prices crashed

Two broad impacts on prices are evident from existing data. It appears that the overall decline in demand, especially in cities – driven in part by the fall in hotel, restaurant, and catering demand and in part by the large exodus of migrants – has flowed upstream, leading to a substantial fall in producer prices. One producer price index suggests that after a brief rise, prices crashed to almost a third of the pre-lockdown prices by the end of May 2020 ([Figure 1](#)). This is consistent with findings from farmer telephone surveys as well, where many reported a dramatic collapse in prices, especially for perishables.

At the same time, consumer food prices in most urban areas have risen, driven by increased frictions in the supply chain in the form of limited availability of labor, higher transport costs (in some cases,

FIGURE 1 Prices farmers receive have collapsed



Source: Narayanan and Saha (forthcoming), "Coping with Covid19 in Rural India: Results from a Farmers' Survey."

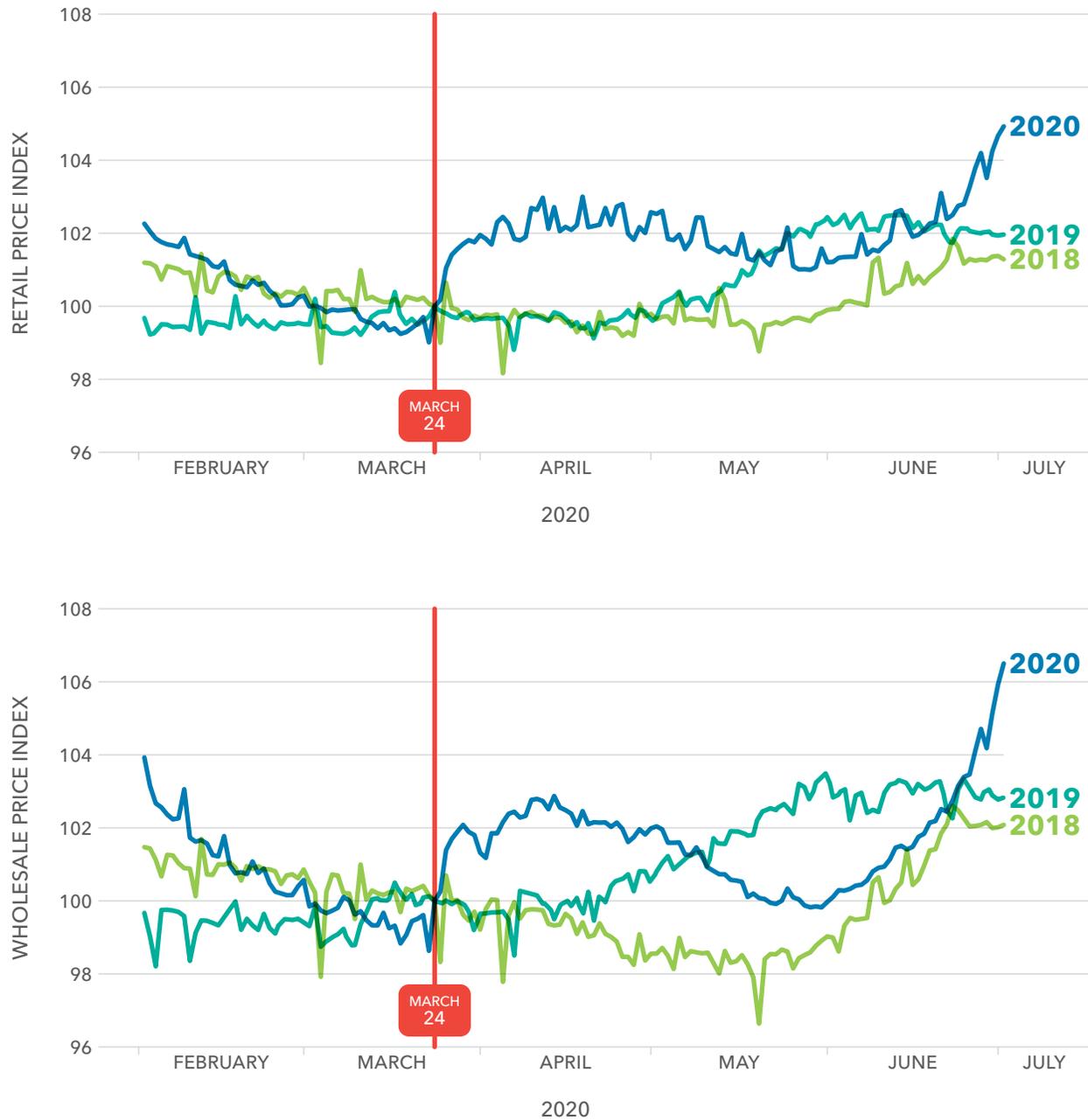
double pre-lockdown costs), and uncertainties around logistics (Figure 2). This gap between wholesale and retail prices increased sharply during the first phase of the lockdown (March 24 to April 14) and remains wide (Narayanan and Saha 2020a).

Heterogeneity of impacts and some improvements over time

These disruptions fragmented markets across rural and urban areas. In some large cities, average retail prices did fall, with increases for just a few commodities; but in smaller cities and towns for which data are available, retail prices rose an average of more than 20 percent in the two months following the lockdown. In addition, the range of prices across urban centers increased significantly during the lockdown, signifying a lack of spatial integration; wide variations persist even after two months, suggesting continuing challenges.

The price trends of different commodities have varied as well. Producer prices for perishables collapsed, and retail prices for fruits and vegetables have fluctuated widely over time and space – increasing substantially in some areas, declining in others; and rising since the lockdown in some cities. In contrast, producer prices have stayed high for major cereals, likely because of active government procurement, and retail prices in urban markets did not rise – due to the Public Distribution System (PDS) that supplies grains to consumers and also likely because of large-scale grain distributions to vulnerable populations by civil society organizations. Retail prices for pulses and edible oils, and for processed goods such as biscuits and flour, however, rose sharply.

FIGURE 2 Consumer retail and wholesale prices increased on average



Source: [Narayanan and Saha 2020b](#).

The role of traditional retailers has been instrumental

Up to 90 percent of the Indian market is served by small-scale mom-and-pop/corner stores (called *kirana*) and other informal players such as pushcart and street vendors; about 8 percent by supermarkets and other modern outlets; and 2 percent by online merchants.

It is *kirana* stores and informal street retailers that have most successfully [negotiated the challenges](#) of the lockdown. Informal retailers, commentators note, have “[embraced technology](#),” receiving assistance at the back end from B2B (business-to-business) retailing supply chain management firms.

While these retailers also rely on hired workers, most depend heavily on family labor and were therefore less affected by labor shortages than modern retailers. Street vendors of fresh produce have also kept supply chains functioning. Findings from a survey of over 50 retailers in 14 locations across India suggest that some people who lost jobs in cities and could not return to their home villages, or had shops closed due to lockdown restrictions, switched to vending fresh produce and groceries. In Porvorim, Goa, for example, one fruit vendor said that around 30 people in his neighborhood, including a car mechanic, opened up fruit and vegetable shops because they were out of work and could not return home. The low entry barriers to informal retail led to an expansion in the number of informal retailers of food during the lockdown.

Some thought modern organized retailers, with their strong back-end investments, would be best placed to operate during the crisis – however, limited labor availability and movement restrictions severely hampered their operations. While online prepared/restaurant food delivery orders (referred to as “foodtech”) dropped by 75 percent in April compared to January (and overall e-commerce fell by 83 percent over this period), e-grocery demand in contrast rose by 27 percent. Yet despite sophisticated procurement and stocking systems, only a fraction of online orders were fulfilled due to distribution challenges, including labor availability. Most online food retailers halted operations; several continue to struggle to meet the surge in consumer demand. Modern format retail stores, meanwhile, many located in shopping malls, remained shut for most of the lockdown.

The roles of government procurement and private innovation

Producer prices held up for crops that have seen large-scale government procurement. For example, as of June 20, 2020, the government had procured 38.83 million tons of wheat from 10 wheat-producing states. Many state governments had also arranged to facilitate local procurement of milk and horticultural products for direct distribution.

The lockdown also prompted a number of important private sector innovations. For example, during this period many farmers began [delivering produce directly](#) using WhatsApp to secure aggregated orders in housing cooperatives in nearby cities. As many farmers’ markets shut down, meanwhile, some farmers traveled to cities to set up shop at roadsides. Consumer-led groups on Twitter, Facebook, and WhatsApp organized with farmer producer organizations to find ways of bringing food to markets (Narayanan and Saha 2020a). In general, as [Reardon et al. \(2020\)](#) anticipated, large-scale processing firms were able to continue functioning, most at lower capacity. Even these larger firms had to cope with distributional challenges by leveraging online delivery platforms that were previously servicing restaurants. Many restaurants in large cities too pivoted to selling groceries and produce via online delivery platforms.

Food insecurity remains high

Under the national lockdown, people in urban areas were likely more vulnerable to food insecurity than those in rural areas, especially those dependent on wage employment. In [one survey](#) of 11,159 workers conducted during the lockdown, an estimated 96 percent said they were not receiving rations from the government due to eligibility or implementation problems, 72 percent said that their rations would run out in two days, and 90 percent were not receiving wages. In rural areas, meanwhile, the collapse in producer prices and farmers' difficulty selling their produce imply lower prices and greater availability of a variety of foods. Yet, in many regions, food insecurity remains high, mainly because of a large loss in incomes, according to several telephone surveys of rural workers and farmers ([Singh et al. 2020](#); [Seth and Vishwanathan 2020](#)).

Conclusion

The COVID-19 lockdown offers a teachable moment for Indian policymakers – that while their country's people are largely vulnerable, the food system is resilient. When and where need exists, in other words, intervening at key points in food systems and providing direct assistance can prevent widespread economic and food insecurity. While the Indian government has [turned its attention to agricultural policy reform](#), the immediate [focus should be on relief](#). The government has already implemented modest cash transfers to farmers and other vulnerable populations, revised loan repayment schedules, expanded the grain entitlements under the PDS, and added allocations for the Mahatma Gandhi National Rural Employment Guarantee Act ([MGNREGA](#)). Yet recent reports suggest that despite these actions, many people continue to be excluded from benefits due to eligibility restrictions or implementation issues. Universalizing the PDS and employment guarantee, along with other food-based schemes such as maternity and child entitlements, and providing more effective implementation, should be top priorities.

In rural areas, especially those underserved by markets, providing decentralized public procurement and distribution of fresh produce, in addition to cereals, pulses, and oilseeds, is crucial to moderating producer prices and ensuring availability and affordability of foods locally. In cities, urban governments need to facilitate the free functioning of supply chain actors. Many states have introduced urban employment guarantee schemes to protect people from job and income losses. Other state governments have organized door delivery of groceries, along with canteens that provide cooked meals at affordable rates. Such measures are especially crucial until supply chains are fully restored.

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References

- Narayanan, S., and S. Saha. 2020a. "[Urban Food Markets and the Lockdown in India](#)." SSRN (May 12).
- Narayanan, S., and S. Saha. 2020b. "[One Step Behind: The Government of India and Agricultural Policy During the Covid-19 Lockdown](#)." *Review of Agrarian Studies* 10, 1.
- Reardon, T., A. Mishra, C.S.R. Nuthalapati, M.F. Bellemare, and D. Zilberman. 2020. "[COVID-19's Disruption of India's Transformed Food Supply Chains](#)." *Economic & Political Weekly* 55, 18 (May 2).
- Singh Modak, T., S. Baksi, and D. Johnson. 2020. "[Impact of Covid-19 on Indian Villages](#)." *Review of Agrarian Studies* 10, 1.
- Seth, A., and V. Vishwanathan. 2020. "[What Covid-19 Means to Us: Voices from the Indian Hinterland](#)." *The India Forum* (April 2020).

15. China's small and medium-sized enterprises rebounded after COVID-19 lockdown, but economic problems linger

Xiaobo Zhang

Following the initial COVID-19 outbreak in Hubei Province in late 2019, starting in late January 2020 the Chinese government imposed draconian lockdown measures across the country to control the spread of the disease ([Fang, Wang, and Yang 2020](#)). Most small and medium-sized enterprises (SMEs) suspended operations. Then, as the pandemic eased in April, China began lifting the restrictions.

To understand the impact of the lockdown on China's SMEs and the extent of their recovery, the Enterprise Survey for Innovation and Entrepreneurship in China ([ESIEC](#)) project team led by Peking University conducted [two rounds of telephone interviews](#) in February and May 2020 with enterprises that had been surveyed over the previous three years.

In general, the survey shows that the vast majority of SMEs were able to reopen and rehire workers once restrictions were lifted, exhibiting a V-shaped recovery. Yet a substantial number of mostly smaller enterprises closed permanently, leaving many unemployed, particularly in rural areas.

The survey probed SMEs' work resumption and production situation, the main difficulties they faced, their efforts to adapt, demands for appropriate assistance policies, and the reach of lockdown-related business assistance programs. Below are four major findings.

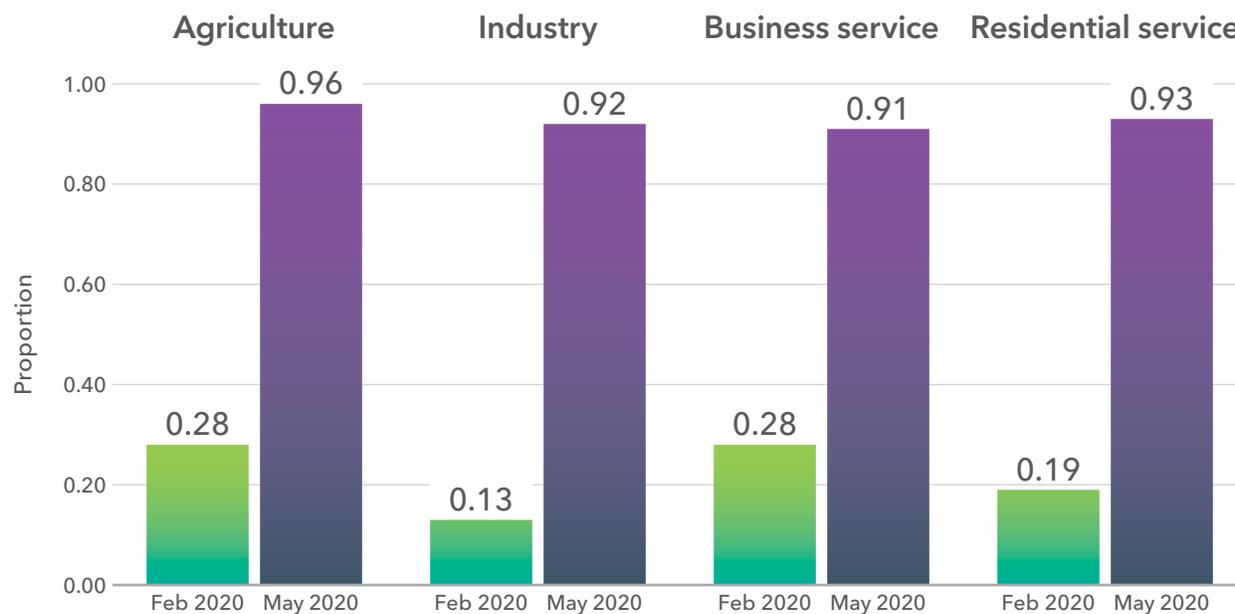
1. SMEs experienced a V-shaped recovery

China's February lockdowns to stop the spread of COVID-19 initially hit SMEs hard, as I examined in [an earlier piece](#). By May, economic conditions had greatly improved. As shown in [Figure 1](#), most businesses had reopened. Among those firms, employment reached an average of 86.4 percent of its pre-shock level. This is clearly a V-shaped recovery. Overall, smaller firms reopened at a lower rate in May across all sectors.

The V-shaped pattern can also be seen in firm entry data. As shown in [Dai, Feng, et al. \(2020\)](#), the number of firm entries plummeted to a nadir in the first week after the Chinese New Year (the first week of lockdown). By the eighth week after the New Year, the number of entries rebounded to the level of previous years. Thanks to greater demand, agricultural SMEs experienced more rapid recovery in production capacity than did SMEs in other sectors (Cheng and Zhang 2020).

Thanks in large part to the rapid recovery, entrepreneurs said they felt much less anxious and were significantly more optimistic in May than in February. Still, some SMEs were hit harder than others, and serious challenges remain for most SMEs.

FIGURE 1 Work resumption rate in February and May 2020



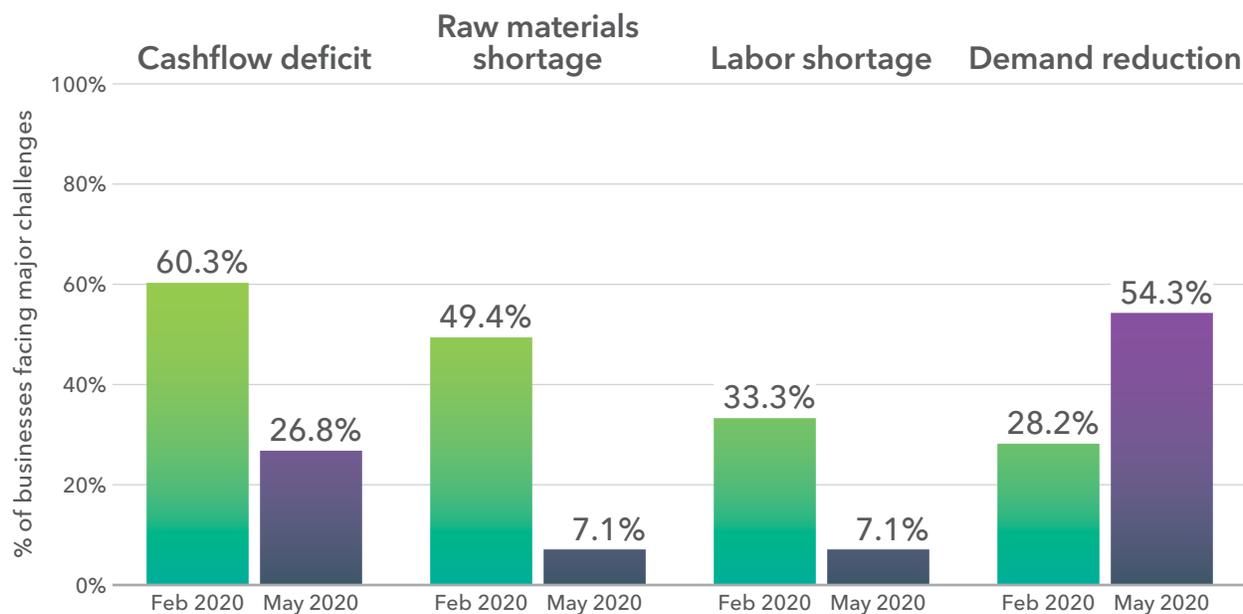
Source: Cheng and Zhang 2020.

2. COVID-19 restrictions took a heavy toll on SMEs and rural residents

Our analysis shows that around 18 percent of SMEs closed for good between the two surveys. Given that SMEs generate 80 percent of employment in China, an 18 percent failure rate would send a shockwave through the labor market, chopping the national employment rate by about 14 percent. Because most employees of SMEs are from rural areas, which account for 57 percent of the country's population, the rural job loss rate may be as high as 25 percent. According to another [recent survey](#), of more than 700 villages (Wang et al. 2021), 26 percent of rural households reported to have at least one family member who lost a job due to the pandemic and one out of six self-employed businesses were closed. Thus, the two different surveys yield consistent results. Clearly, it is rural people who suffered the most from China's COVID-19 restrictions. Heavy job losses undoubtedly would lower rural residents' consumption. Among rural households, 42 percent reported having cut food expenditures, while 9 percent reduced education expenditures.

Residential service firms suffered the highest exit rate. Among the manufacturing enterprises, the failure rate for smaller firms (fewer than eight workers) is 2.5 percentage points higher than larger firms (eight workers or more). Among export firms, smaller ones exited at a rate 4 percentage points higher than relatively larger firms.

FIGURE 2 Major challenges of reopening in the agricultural industry



Source: Dai, Feng, et al. 2020.

3. Major challenges have shifted from the supply side to the demand side

In the recovery, the survey shows, the major challenges facing SMEs have been mostly on the demand side rather than the supply side. In February, logistics breakdowns and labor shortages ranked among the top challenges, in particular for industrial enterprises. In May, more than 70 percent of firms listed the lack of demand as the top challenge, while most supply-side problems, such as raw material shortages and labor shortages, had faded away. Except for agricultural enterprises, smaller firms reported more problems with lack of demand than their bigger counterparts.

In general, agricultural enterprises recovered more rapidly (Figure 2) than the manufacturing, business service, and residential service sectors, which encountered more serious demand problems. Given there are 550 million rural residents (not including migrant workers who transit to urban areas), heavy job losses in rural areas likely explain the reduced demand for consumer goods and residential services – those affected may have cut back on non-essential spending while trying to maintain their food budgets.

In addition, export firms were 10 percentage points more likely to report inadequate demand as their most critical challenge, largely thanks to shrinking international demand as COVID-19 spread to other countries. Despite the high reopening rate, low demand meant that many firms, particularly export firms, were still running at partial capacity.

4. Support policies did not reach a vast number of SMEs

After the lockdown was imposed, the Chinese government launched various policies to help affected SMEs, including rent relief, tax reductions, postponement of social security payments for employees, and direct financial support. Yet these programs often did not reach smaller firms. Most relief measures did not even apply to self-employed businesses, which, for instance, do not pay much in taxes or social security for workers. Despite a commitment of 1.5 trillion yuan (\$223 billion) in financial support for SMEs, on average only 15 percent of SMEs reported accessing some form of government assistance – only 2 percentage points higher than in 2018, when we did our baseline survey. Among self-employed businesses, the coverage rate was as low as 9 percent.

More than 60 percent of SMEs wished to receive reductions in rent and other fees, yet the penetration rate for this form of assistance was below 30 percent. This is because most landlords are private firms or individuals also struggling amid the pandemic. Unemployment insurance, meanwhile, is only provided for workers at big corporations, and most SME workers do not have it. The survey also shows that small firms received less policy support than larger ones. In general, then, SMEs largely relied on themselves through the lockdown.

According to Wang et al. (2021), 98 percent of rural residents had never heard about unemployment insurance. Once SMEs went bankrupt, most of their workers had to return to their home villages, largely unaccounted for in official unemployment statistics.

China's initial COVID-19 lockdowns dealt a heavy blow to SMEs, driving up unemployment in rural areas. But once restrictions were eased, many businesses quickly rebounded – showing the resilience of SMEs and offering some hope for [how recovery can play out in other parts of the world](#) once outbreaks are brought under control. But China's SMEs still faced ongoing post-lockdown problems, with government assistance largely failing to reach a vast number of them, particularly the very small ones, and low demand persisting. Our survey suggests that policies that stimulate domestic demand by targeting consumers, particularly those with low incomes and the vulnerable in rural areas, would indirectly help SMEs and have broader economic benefits.

This paper draws from Dai, Mookherjee, et al. (2020) and Cheng and Zhang (2020).

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References

- Cheng, Z., and X. Zhang. 2020. "V-shaped Recovery of Agricultural SMEs in China from Covid-19 Restrictions." Working paper. Revised and resubmitted to *Agricultural Economics*.
- Dai, R., H. Feng, J. Hu, Q. Jin, H. Li, R. Wang, R. Wang, L. Xu, and X. Zhang. 2020. "[The Impact of COVID-19 on Small and Medium-Sized Enterprises: Evidence from Two-Wave Phone Surveys in China](#)." Working Paper 549 (Sept.), Center for Global Development, Washington, DC.
- Dai, R., D. Mookherjee, Y. Quan, and X. Zhang. 2020. "[Industrial Clusters, Networks and Resilience in the Covid-19 Shock in China](#)." EDI Policy Note (Oct). Economic and Development Institutions, UKaid.
- Fang, H., L. Wang, and Y. Yang. 2020. "[Human Mobility Restrictions and the Spread of the Novel Coronavirus \(2019-nCoV\) in China](#)." *Journal of Public Economics* 191 (Nov.): 104272.
- Wang, H., M. Zhang, R. Li, O. Zhong, H. Johnstone, H. Zhou, H. Xue, S. Sylvia, M. Boswell, P. Loyalka, and S. Rozelle. 2021. "[Tracking the Impact of COVID-19 in Rural China over Time](#)." *International Journal for Equity in Health* 20: 35.

16. Impacts of the COVID-19-driven rise in global rice prices on consumers in Papua New Guinea

Emily Schmidt and Paul Dorosh

During the early months of the COVID-19 pandemic, several major rice exporting countries, grappling with rising economic uncertainties, suspended rice exports to ensure adequate domestic supply. Viet Nam, Cambodia, and Myanmar temporarily halted rice exports, contributing to spikes in rice prices on international markets. By April 2020, rice prices had increased by over 35 percent in Thailand and 20 percent in Viet Nam (important benchmark countries for international rice price monitoring). International rice prices rose an average of 25 percent during March–September 2020 and remained high (on average 36 percent higher in March 2021) compared to pre-COVID-19 levels, despite the loosening of rice export restrictions and quarantine measures in the second half of 2020.¹

Rice import-dependent countries such as [Papua New Guinea](#) (PNG) are particularly vulnerable to such price shocks. Ninety-nine percent of PNG's rice supply is imported, meaning global market shocks can have a large impact on domestic rice prices. With food accounting for more than three-quarters of overall household expenditures in both poor and nonpoor households in PNG, changes in domestic food prices can have an outsized impact on consumption. About 50 percent of all PNG households consume rice, which comprises 30 percent of their minimum daily energy requirement.

To estimate the impact of higher rice prices and domestic lockdown policies on households in PNG, we simulated the potential impact of a 25 percent rise in the world price of rice (equal to the increase in world prices from December 2019 to the average March–September 2020 price) and different scenarios of estimated household income loss due to reduced mobility. [Our results](#), published in *Agricultural Economics*, indicate that households may have reduced rice consumption as much as 15 percent or more, with the urban poor experiencing the greatest losses. However, the model also suggests affected households may have at least partially shifted consumption to several domestic alternatives.

To model the effects of rice price increases and reduced mobility, we used data on regional household rice consumption from the 2009/10 Household Income Expenditure Survey (HIES); on household rice consumption in lowland Momase rural areas from the 2018 IFPRI Rural Survey on Food Systems (PNG-RSFS); and international trade data on imports to estimate household rice consumption for various regions of PNG. Results suggest that even without the additional economic impacts of reduced mobility, a 25 percent increase in the domestic price of rice results in a 14.3 percent decline in overall rice consumption.

¹ International rice prices remained high throughout 2020 until mid-2021. The average price of Thai and Viet Nam rice was still 25 percent above the December 2019 price in May 2021, before dropping to just 5 percent above pre-pandemic price in September 2021.

Using changes in mobility [data reported by Google](#) (2020) to estimate household income losses, we simulated a 25 percent rice price increase with different household income shocks for rural and urban poor and nonpoor households, respectively.

Rural and urban labor (or employment) are characteristically different in PNG, with [rural households largely engaged in own-farm subsistence agriculture](#), while urban employment relies more on place-based activities (offices, factories, and so on). Similarly, employment within urban areas varies depending on whether an individual is able to work from home or is required to go to the workplace to be productive. Considering these differences, we estimate low and high household income loss in rural and urban areas depending on different levels of reduced mobility between January and the average of March–August 2020.

Focusing on the high income loss scenario (20 percent decrease in household income), simulation results suggest rice consumption among the urban poor drops by 20 percent, more steeply than for other household groups (Figure 1). We assume a larger income shock for these households because the urban poor have less flexibility to work remotely. Other household groups also experience significant decreases: Rice consumption of urban nonpoor and rural (poor and nonpoor) households declines by 16 to 17 percent.

The model also indicates likely shifts in consumption driven by the combination of income losses and higher prices. Consumption decreases are slightly smaller in the simulation that includes income losses versus the simulation of a 25 percent increase in the rice price with no income shock. This is likely due to reduced household demand for rice, leading to greater consumption of less expensive domestic alternatives such as sweet potato, taro, or sago.

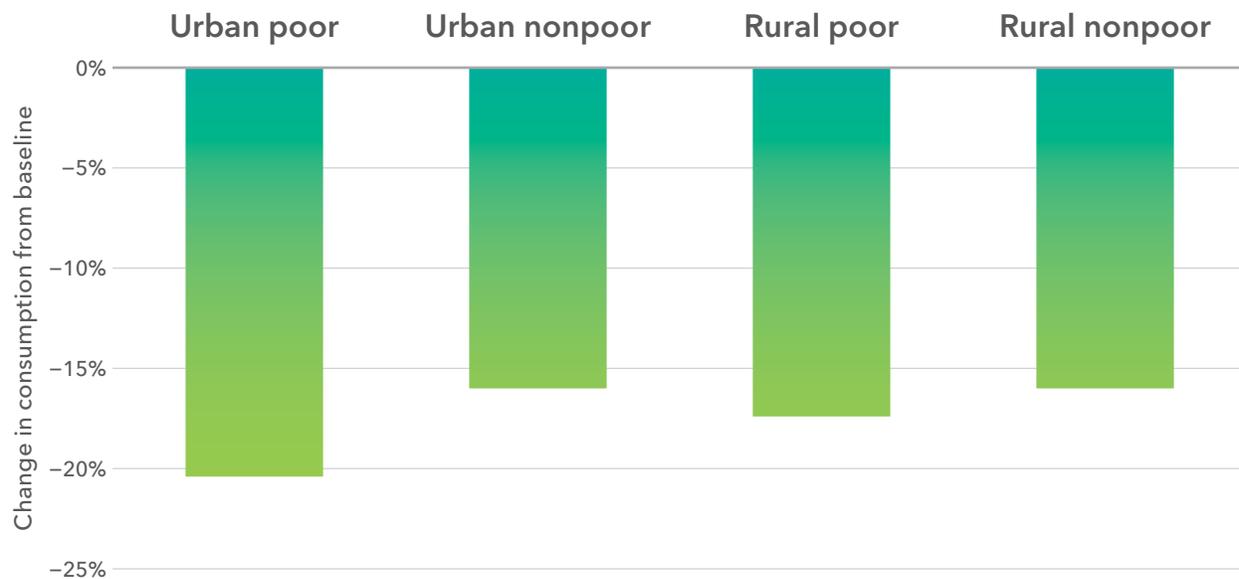
Assuming domestic availability of these staple crops is sufficient to meet this increased demand, households that switch from rice to a different domestic crop due to falling incomes may manage to avoid a potentially much greater drop in total calorie consumption.

Policy implications

This study shows the acute vulnerability of people in rice-importing countries to shocks such as the COVID-19 pandemic. Indeed, PNG remains vulnerable. After successfully avoiding widespread COVID-19 outbreaks for nearly the past year, the country is now seeing a rapid rise in infections and hospitalizations that [threaten to overwhelm the health system](#). Our research demonstrates that PNG may face continuing challenges in maintaining food security in urban and rural areas if international rice prices remain high.

More broadly, the impacts on prices and consumption seen in the model may drive affected countries to seek rice self-sufficiency, as many (including PNG) did [following the global food price shocks of 2007/08](#). Fortunately, the current international rice price increases are considerably less severe than those experienced in 2007/08 when rice export bans were maintained for a long duration. Although COVID-19 has affected the international rice trade across most importing countries, it is important to underscore that large-scale local rice production is not competitive in PNG, where other cash and export crops are financially more attractive for local producers.

FIGURE 1 Projected impacts of COVID-19 on household rice consumption in Papua New Guinea (effect of high-income-loss scenario)



Source: Authors' calculations.

Rather than reaching for a costly and likely unattainable goal of domestic rice self-sufficiency, policy-makers should consider broader, longer-term investments in agriculture to improve food security and resilience to shocks.

Greater investment in rural agricultural extension services and transportation infrastructure can improve production practices and lower marketing costs between farmgate and secondary markets. Improved information systems, including a long-overdue nationally representative Household Income Expenditure Survey, can inform more geographically targeted policies aimed at reducing food insecurity and associated market failures. Finally, more formal safety net programs can improve livelihoods and food security and build resilience to shocks. Such long-term investments can help to offset not only negative impacts of rice market upheavals, but of other varieties of food price shocks going forward.

The [paper discussed here](#) is part of a COVID-19 [special issue of Agricultural Economics](#) edited by IFPRI's Johan Swinnen and Rob Vos. This work was supported by the Australia Department of Foreign Affairs and Trade (DFAT), the Regional Strategic Analysis and Knowledge Support System for Asia (ReSAKSS-Asia) funded by the United States Agency for International Development (USAID), and the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by IFPRI.

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17. COVID-19's varied impacts on fresh fruit and vegetable supply chains in Senegal

Anna Fabry, Kaat Van Hoyweghen, Hendrik Feyaerts, Idrissa Wade, and Miet Maertens

In response to the COVID-19 pandemic, Senegal declared a state of emergency on March 23, 2020, followed by a range of policy measures to prevent the spread of the coronavirus: Transport was significantly restricted, wet markets were closed, and shops were required to limit their hours. These moves disrupted food supply chains, in particular, those for highly perishable products such as fresh fruits and vegetables (FFV).

But these impacts were not evenly felt. Our survey of different actors in Senegal's FFV supply chains, [published in Agricultural Economics](#), found larger agro-industrial companies in modern, capital-intensive supply chains were mostly able to weather the crisis with minimal disruptions, while smaller FFV actors in traditional supply chains faced substantial disruptions to their supplies of labor and inputs, with many smaller producers reducing their area for producing FFV.

The majority of FFV for domestic consumption are produced by smallholder farmers. Disruptions to supply chains dominated by smaller actors can therefore lead to significant impacts on the availability of nutritious food, employment, and poverty. As we look for lessons from the pandemic's early impacts in order to better prepare for future shocks, these findings suggest policymakers should put a special focus on improving the resilience of domestic supply chains through supporting small producers, stimulating innovations, and regulating internal trade.

To understand the implications of COVID-19 containment measures on FFV supply chains in Senegal, we interviewed all relevant actors, including farm and agro-industry workers, smallholder farmers, traders, agro-industrial companies, importers, and consumers – but without arriving at representative samples for all categories. Data were collected between April and June 2020, using phone interviews and self-administered online questionnaires. These primary data were complemented with secondary data on international FFV trade flows. We rely on recall data to compare the situation before and after the state of emergency but cannot completely disentangle COVID-19-related impacts from seasonal variation.

Specific pandemic-related supply chain disruptions depend on the structure and organization of the supply chain in question. It is therefore useful to distinguish between two co-existing FFV supply chains in Senegal:

1. **A modern, vertically coordinated, capital- and labor-intensive supply chain** is organized around a few large capital-intensive agro-industrial companies that produce, process, and distribute produce. These FFV companies mainly focus on supplying export markets.

2. **A more traditional supply chain** is focused on supplying the domestic market, and has a high labor intensity but a lower capital intensity. This chain is dominated by smallholder farmers and small to medium traders and wholesalers, who transport produce from rural production zones to urban wet markets.

The distinction between a modern export chain and a traditional domestic chain should not be interpreted as absolute. Some large-scale agro-industrial export companies recently started to supply the domestic market as well and are selling to domestic traders and local supermarkets. Nevertheless, our results indicate that these broad differences played a role in how the COVID-19 crisis affected modern and traditional FFV supply chains differently.

Impacts on the supply side

On the supply side of Senegal's FFV chains, we find changes in the allocation and productivity of land, labor, and capital inputs in the months after the start of the pandemic and the declaration of the state of emergency.

First, among export-oriented FFV companies, larger companies indicated they did not change their production area, but smaller companies indicated they reduced FFV production area by 50 to 75 percent because of the crisis. Among interviewed smallholders, 25 percent said they left land completely fallow during the hot dry season, for which preparation more or less coincides with the start of the COVID-19 crisis, while only 15 percent said they started a new production cycle of FFV in this season, and mostly on a smaller share of land than under normal circumstances. For the next season, the main rainy season that began at the end of the interview period, only 40 percent of the interviewed farmers indicated an intention to allocate land to FFV, while some farmers intended to switch to groundnuts or staple crops instead of FFV.

Second, smaller agro-industrial companies and smallholder farmers faced important restrictions in hiring workers, because of both mobility restrictions and workers' fear of becoming infected. In contrast, larger agro-industrial companies reported no problems with the supply of labor. These companies invested in protective and sanitary measures, including setting conditions for social distancing between workers in the field and in processing units, and in a larger capacity or more frequent commuter bus service for their workers – a service that many large companies offer to attract workers. Nevertheless, because of reduced activities, the demand for labor in these companies fell by 20 to 90 percent. Only 66 percent of the sampled agro-industry workers were employed both before and after the declaration of the state of emergency, and 45 percent reported working less frequently afterward. We find no changes in wages and contracts of workers.

Third, access to agricultural inputs was a major constraint for smallholder farmers and smaller agro-industrial companies because of mobility restrictions, closed shops, lower availability of vendors, increased input prices, and lack of cash. The largest agro-industrial companies did not experience input-related problems: they had sufficient input stocks, direct buying relations with international input dealers, and could switch between input suppliers in the case of delivery problems.

In short, the variance in impacts on the supply of FFV depends on the size of producers and the type of supply chain in which they operate. Our data reveal that better vertical coordination contributes to more resilient supply chains and that the export-oriented supply chain adapts more easily to the COVID-19 situation through innovations.

Impacts on trade and consumption

In addition to supply-side impacts, we also observed disruptions in other stages of the FFV chains, including drops in domestic and international demand and substantial changes in how FFV were bought and sold. Also in these stages of the FFV chains, we observe a resilient vertically integrated modern export chain, while the domestic chain was much more impacted, with a wide network of heavily affected traders, intermediaries, and retailers.

Conclusion

The pandemic's differential impacts on large versus small producers and the different value chain actors (such as traders or retailers) in Senegal demonstrate the complexity of a shock like COVID-19, suggesting careful and targeted policy attention is required to mitigate the damage among the most affected. Further research is needed to understand the long-term impacts of these supply chain disruptions. However, our early findings point to a severe impact on the availability of nutritious foods, food insecurity, and hunger in the aftermath of the COVID-19 pandemic. To improve domestic value chain resiliency, and prevent disruptions during future crises, policy attention is needed to support vulnerable small-scale producers, enhance value chain coordination, and foster innovation.

*This paper is part of a COVID-19 [special issue](#) of *Agricultural Economics* edited by Johan Swinnen and Rob Vos. The work was supported by the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by IFPRI.*

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NUTRITION, HEALTH & SOCIAL PROGRAMS



18. Uneven recovery and a lingering food crisis during the COVID-19 pandemic for rural safety net transfer recipients in Ethiopia

Daniel O. Gilligan, Guush Berhane, Kalle Hirvonen, Neha Kumar, and Jessica Leight

In the first few months of the COVID-19 pandemic, researchers at IFPRI and elsewhere worked quickly with their partners in government, the private sector, and survey firms to provide evidence on the immediate impacts of the COVID-19 health crisis and related restrictions in low- and middle-income countries (LMICs). However, systematic evidence on the effects of the crisis has been more limited in the ensuing months up to and after the one-year anniversary of the pandemic. Early analysis of economic models of the crisis suggested that its economic effects would be severe in the short run and greatest in Africa south of the Sahara, where the pandemic and related lockdowns were projected to depress incomes of both urban workers and rural households (Laborde, Martin, and Vos 2021). Phone surveys and rapid assessments conducted in the first weeks of the pandemic reported significant job losses in both rural and urban areas (Wieser et al. 2020), disruptions to urban food value chains (Tamru, Hirvonen, and Minten 2020), and declines in household dietary diversity in Addis Ababa (Hirvonen, de Brauw, and Abate 2021). In the time since those initial projections and rapid surveillance surveys were conducted, researchers have revisited the same samples to analyze the medium-term effects of the pandemic. In addition, they have gathered information on households at the economic margins of society and those considered to be less affected by the pandemic by virtue of their sector of employment or remote location.

In this chapter, we draw on evidence from rural Ethiopia to depict the effects of the COVID-19 pandemic at least 6–12 months since its start, with a focus on households that receive food and cash transfers from Ethiopia’s national flagship social protection program, the Productive Safety Net Program (PSNP). The program is targeted to households living with chronic food insecurity; its beneficiaries are among the poorest 10 percent of households in Ethiopia. Evidence on the effects of the pandemic on PSNP households is drawn from two separate research projects in Ethiopia. Each had collected detailed data from rural household surveys one to two years before the pandemic began. The research teams conducted follow-up phone surveys either in the period right after the pandemic began and then again in subsequent months, or roughly one year after the start of the pandemic.

Data from these two studies allow us to track trends in outcomes during the pandemic, in some cases after the most significant restrictions to mobility and economic activity had been lifted. In the days immediately after the start of the pandemic, schools were closed and public gatherings were restricted. A national state of emergency was imposed from early April to early September 2020, but by October, restrictions began to ease and schools reopened. Generally, the restrictions in Ethiopia

were much lighter than elsewhere in Africa. Nonetheless, the pandemic disrupted many dimensions of economic activity. Here, we examine the changes in well-being for vulnerable PSNP households during these events and synthesize this evidence to draw lessons about the extended effects of the pandemic and about effective pandemic responses. We emphasize that with the data we present here, we are only able to show trends in outcomes during the pandemic and cannot conclude that the relationships of these outcomes to pandemic events or participation in the PSNP are causal. Nonetheless, this investigation provides several lessons about the pandemic and the effectiveness of the response.

In the first study profiled here, Leight and colleagues interviewed PSNP participant households three months and six months after the start of the pandemic to assess food security and livelihood effects. The surveys documented food shortages, income loss, and travel restrictions during the first three months of the pandemic, followed by additional coping strategies and some reduction in severity of pandemic effects in the subsequent three months.

In the second study, Berhane and colleagues compared how PSNP participant and non-participant households experienced the effects of the pandemic, including their changing food security and coping strategies. Additional analysis estimates how access to the PSNP was associated with lower household food insecurity and shorter hunger gap duration one year after the start of the pandemic.

STUDY 1 The effect of the COVID-19 pandemic on PSNP beneficiaries in Ethiopia in 2020: Evidence from phone surveys

Jessica Leight, Harold Alderman, Daniel O. Gilligan, Melissa Hidrobo, Alemayehu Seyoum Taffesse, and Heleene Tabet

The COVID-19 pandemic has had profound implications for poverty and food security around the globe. Although many of the most obvious initial effects occurred in urban areas, which were more exposed to international travel and trade and where denser patterns of economic activity led to more intense lockdowns, it is critical to understand the effects of the pandemic on rural households characterized by a lower level of economic integration *ex ante*. Here, we seek to provide an overview of the real-time consequences of the onset of the COVID-19 pandemic on the livelihoods and food security of extremely poor households in rural Ethiopia by drawing on data from two phone surveys conducted in the early phase of the pandemic in 2020.

Survey and data

We conducted two phone surveys with a subsample of respondents from a large-scale panel survey of households as part of the Strengthening PSNP4 Institutions and Resilience (SPIR) evaluation in rural areas of the Amhara and Oromia regions. All households participate in Ethiopia's Productive Safety Net Program, and thus correspond approximately to the poorest 10 percent of households in Ethiopia.

We conducted the first phone survey between June 1 and 14, 2020, and the second survey between August 20 and September 2, 2020. The target sample included 1,326 households who reported ownership of a phone in the previous midline survey in 2019, and the realized sample included around 1,200 households in both rounds, for a response rate of about 90 percent.

In the first round, our objective was to collect data on the immediate effects of the pandemic's onset and associated restrictions. Accordingly, we posed questions to households about the impact of shocks experienced since the beginning of Lent (February 24, 2020), a date that was both salient and proximate to the beginning of the pandemic. In the second round, questions were framed with reference to the period since the previous survey round. In both cases, the effective recall period was around three months. We present results by region in order to highlight whether experiences with the pandemic varied by location.

Key findings

In general, our findings suggest that rural households in Ethiopia experienced meaningful disruptions to their livelihoods due to the onset of the COVID-19 pandemic. When asked about the most significant effects of the pandemic on their household, respondents reported food shortages, income losses, and travel restrictions, as summarized in [Figure 1](#). In both regions, there was a significant increase between rounds in the percentage of respondents who reported food shortages as the greatest negative impact and a decrease in those who reported travel restrictions. This shift suggests that households encountered increased challenges in maintaining adequate food supplies as economic disruptions persisted.

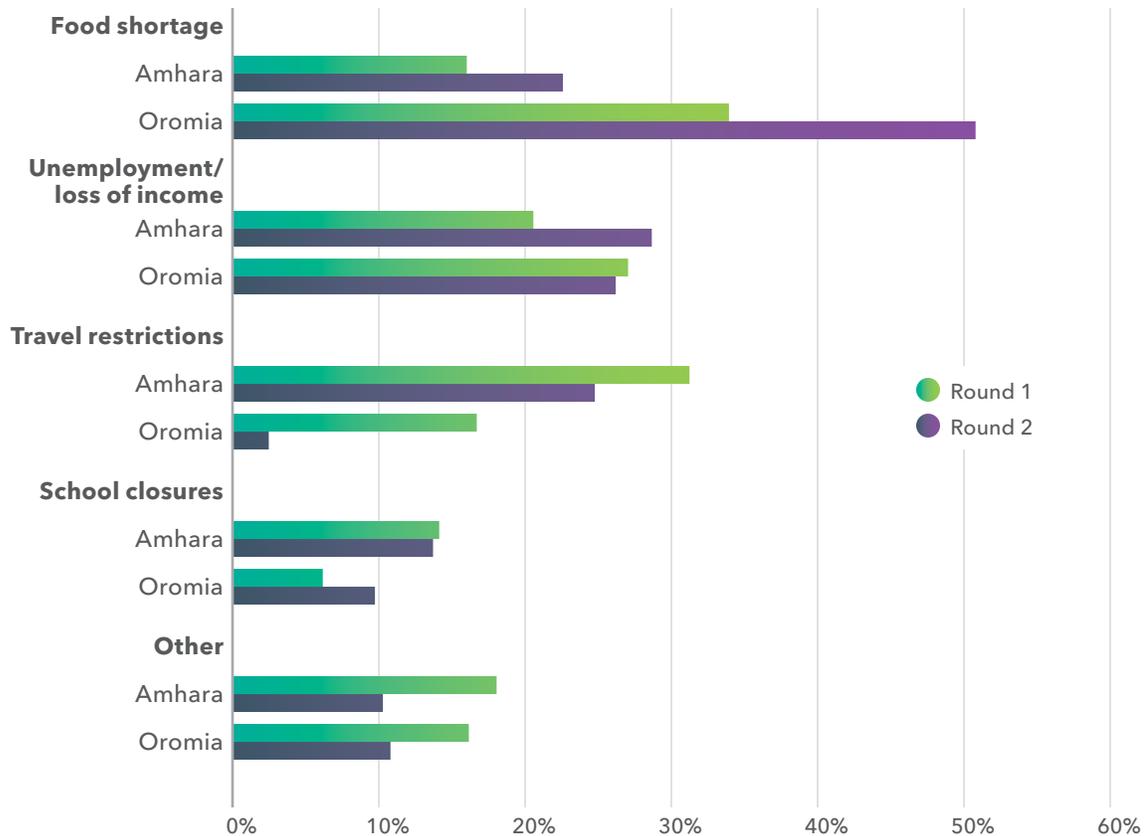
We also assessed households' self-reported shifts in income over the previous three months, and in the second survey round, we probed further about shifts in various sources of income. In the first round, the majority of households reported income loss (including more than 80 percent of households in Oromia), but by the second round of the survey, incomes were stable or slightly higher for around one-third of households. Adverse effects were concentrated among households reporting non-agricultural income: around half of households reported that their agricultural income was stable, but among those households with a non-agricultural household business (a sample that was only 30 percent of those surveyed), 70 percent reported that their income from this business decreased.

To manage these shocks, between 30 and 40 percent of households in both rounds reported selling assets, and 20–30 percent reported decreasing consumption. Households were more likely to report declines in consumption in August, suggesting challenges in managing the pandemic's effects as disruptions continued. More than 60 percent of households reported moderate or high food insecurity in both rounds.

Policy implications and conclusion

The evidence presented here suggests that poor, rural households in Ethiopia experienced meaningful shocks linked to the pandemic. However, our findings also suggest the most acute effects were observed for households with non-agricultural businesses. This result is also consistent with other

FIGURE 1 Aspect of COVID-19 pandemic that most affected households, by region



Source: SPIR phone surveys, June and August 2020.

Note: Four most popular answers across regions and rounds: in Oromia, fear of getting sick/fear of dying (6.4%) was more prevalent than travel restrictions (2.5%) at Round 2.

evidence from Africa south of the Sahara (Mahmud and Riley 2021). In this sample, only a minority of households were engaged in non-agricultural activities, while the majority were concentrated in subsistence agricultural production. The latter group arguably had somewhat less to lose. The full-scale endline survey conducted in person in 2021 showed no substantial shifts in consumption relative to the baseline survey: households in this sample generally did not exit poverty (perhaps in part because of COVID-19-related shocks), but neither is there any evidence of meaningful declines in consumption over time.

In 2021, Ethiopia was also increasingly affected by violent conflict. As in other contexts, tracking the long-term effects of the pandemic requires understanding the complex effects of multiple shocks. Building resilience to these shocks remains a crucially important policy goal.

STUDY 2 Ethiopia’s Productive Safety Net Program: Perceived effects of the pandemic, coping strategies, and the program’s role in protecting food security

Guush Berhane, Neha Kumar, Daniel O. Gilligan, John Hoddinott, Alemayehu Seyoum Taffesse, Sara Shapleigh, Haleluya Tesfaye Gebru, Giang Thai, and Abenezer Wondwosen

Social safety nets, including cash transfers, have been prominently used to support the most vulnerable throughout the global COVID-19 pandemic (Kumar et al. 2021). Ethiopia’s Productive Safety Net Program (PSNP) is one of the largest and longest-running social protection programs in Africa. To better understand the effects of the pandemic on PSNP participants and neighboring households, we conducted a phone survey one year after the start of the pandemic that explored respondents’ awareness of the pandemic, behavioral changes in response to the crisis, food security, and coping strategies. Here, we provide an overview of the key findings from this research, as well as a discussion of the impacts of the pandemic and other shocks, the role of social protection programs like PSNP in responding to crises, and the limitations of survey-based research.

Survey and data

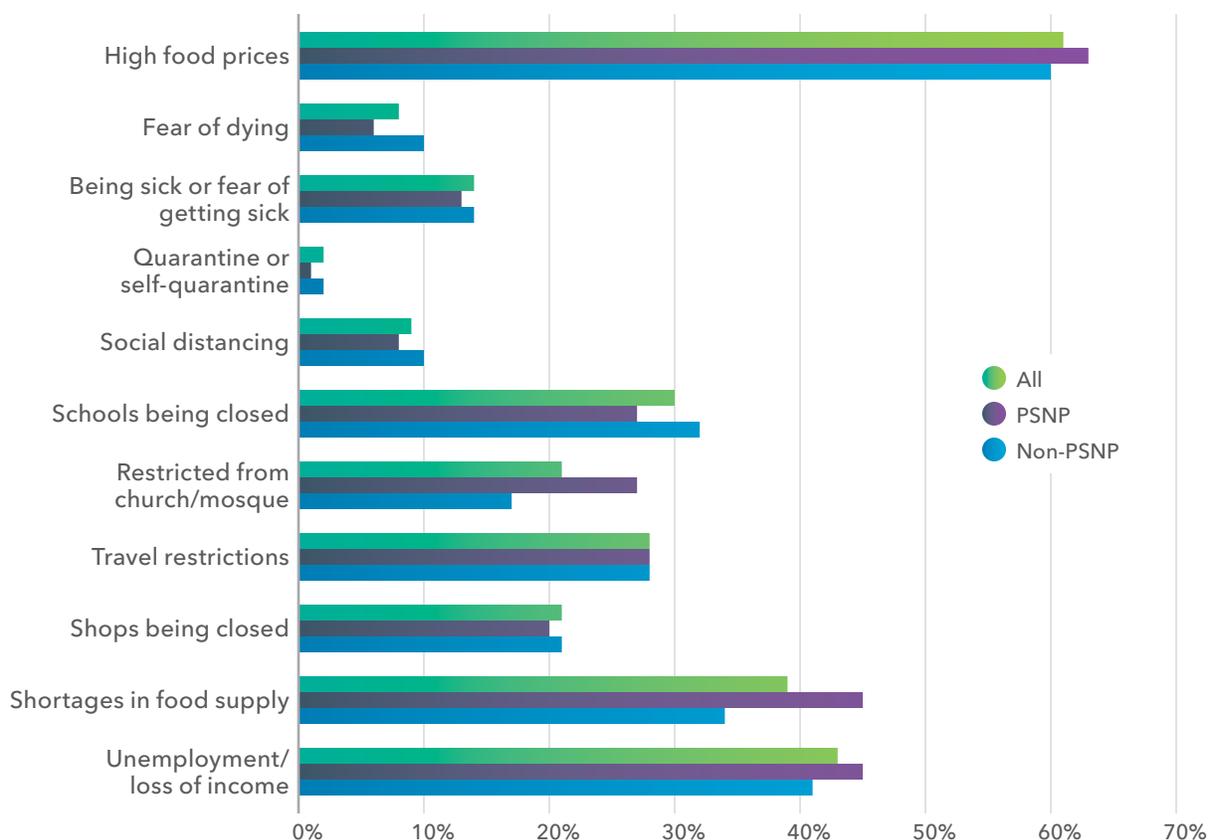
From April to May 2021, we conducted a phone survey of 1,318 PSNP and non-PSNP households drawn as a subsample from two recent in-person surveys across five regions of Ethiopia (Berhane et al. 2021). The phone survey addressed several research questions, including whether households were aware of the pandemic and had changed practices around health, social interaction, and mobility in response. It explored whether levels of household food insecurity had changed and what coping strategies were being used by households. The survey also addressed how levels of food security compared between PSNP households and non-PSNP households, and whether there were differences in these households’ coping strategies.

Key findings

With regard to overall pandemic awareness and behavioral responses, nearly all of the respondents could identify at least five COVID-19 safety practices, including wearing a mask (83 percent) and avoiding shaking hands (68 percent). Only 5 percent of all respondents did not take any measures when leaving their household. Households adjusted their practices to comply with travel restrictions. Although 69 percent of respondents had left their household in the past seven days, the majority (62–69 percent) stayed within their community.

Households experienced a range of impacts from the pandemic. On average, almost half (43 percent) of all households experienced an income loss, with slightly fewer households reporting food supply shortages (39 percent), disruptions from school closures (30 percent), and being impacted by travel restrictions (28 percent) ([Figure 2](#)).

FIGURE 2 Aspect of COVID-19 pandemic that most affected households, by PSNP status



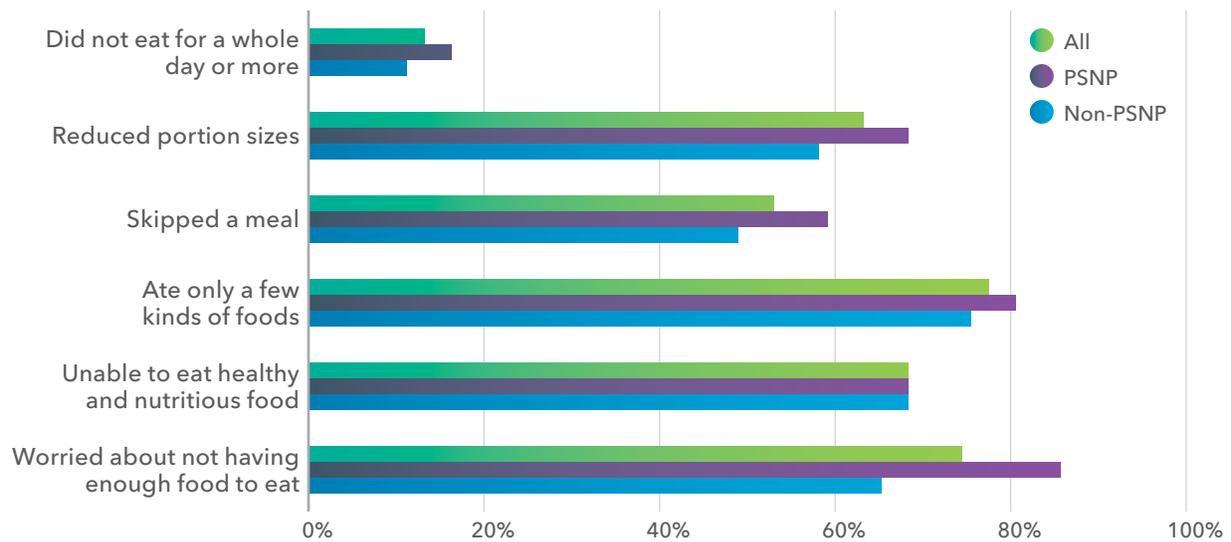
Source: PSNP Phone Survey (2021).

Note: Difference in means are statistically significant at 10 percent or lower for “fear of dying,” “quarantine or self-quarantine,” “restricted from church/mosque,” and “shortages in food supply.”

To mitigate these negative effects, households employed a variety of coping strategies. More than half of all households sold productive assets or means of transport and nearly half borrowed money to buy food, reduced spending on essential nonfood purchases, and reduced spending on agricultural or livestock inputs. Households reported that their strategies to mitigate lost income in the last 30 days were similar to those used since the pandemic started. The reported approaches varied significantly between PSNP and non-PSNP households, with a higher percentage of PSNP households borrowing money to buy food, selling productive assets or means of transport, and reducing their expenditures on agriculture or livestock inputs. PSNP households were also more likely to report spending their savings since the start of the pandemic as compared to non-PSNP households.

Findings on household food security showed that the likelihood of becoming food insecure increased by 37 percentage points on average since the start of the pandemic and the food gap – the number

FIGURE 3 Food security in the last 30 days, by PSNP status, April/May 2021



Source: PSNP Phone Survey (2021).

Note: Differences are statistically significant at 5 percent or lower for all items except “unable to eat healthy and nutritious food” and “ate only a few kinds of food.”

of months that households were unable to meet food needs over the last year – increased by one month. Survey responses suggested this was partly due to high food prices, the most commonly reported problem during the pandemic (60 percent). PSNP households were significantly more concerned about their food security (64 percent) than non-PSNP households (43 percent). PSNP households reported more instances of having to skip a meal, reduce portion size, or endure a day without eating. Among all households, 73 percent worried about not having enough food to eat, 67 percent reported not being able to eat healthy and nutritious food, and 76 percent reported consuming only a few kinds of foods (Figure 3).

An econometric analysis compared food security for PSNP and non-PSNP households, controlling for differences between these households. Despite the challenges posed by the pandemic, the analysis found that the PSNP was significantly associated with reducing the likelihood of food insecurity by about 20 percentage points and the size of the food gap by about 0.83 months (about 25 days a year).

Discussion

The pandemic is a simmering food crisis

These interviews demonstrate the experience of the pandemic for rural households, many of which were participants in the PSNP. Households in the PSNP receive monthly transfers through public works or direct support for the first 6 months of each year. These households are at the margins economically, have limited assets, and are vulnerable to extreme deprivation in the face of significant

economic or weather shocks. In phone surveys conducted 3 to 12 months after the pandemic's onset, these households reported that food shortages were the most significant effect of the pandemic. This result is remarkably consistent across the two studies presented here. In addition, many households reported facing substantial increases in food prices, which are part of a trend of general price inflation that began before the pandemic. Given that these households were already food insecure at the start of the pandemic, the protracted food shortages indicate that these households remained vulnerable to worsening food security as a result of the pandemic.

Social protection systems: A key response tool, but flexibility is needed

Social protection programs like the PSNP play an important role in the pandemic response by providing the infrastructure to target and deliver transfers, which allows the government to increase transfers to households that were vulnerable before the pandemic began. Indeed, the capacity of existing social protection programs to provide additional assistance to current beneficiaries during a crisis is often an important secondary objective beyond the main objective of providing regularly scheduled consumption support. In Ethiopia, *woreda* (district) officials used the PSNP payment mechanism to provide accelerated payments (two months at one time) to beneficiaries in many districts. These payments expedited the delivery of transfers, but did not increase PSNP entitlements.

At the start of the pandemic, the government also provided temporary humanitarian food assistance (HFA) transfers to households to address their exposure to shocks. Unlike the PSNP, which primarily targets chronically food-insecure households, the HFA targets households that are acutely vulnerable (Sabates-Wheeler et al. 2021). By using both the PSNP and HFA, the Ethiopian government was able to protect chronically food-insecure households from the effects of the economic shock and also respond to the shock by targeting transfers to those most directly affected. As part of the government's humanitarian response, HFA transfers are temporary, which helps ensure that the fiscal effects of the response are temporary as well.

A multitude of shocks

Many of the poor households in these surveys faced other devastating shocks in 2020–2021, including disruptions from pest infestations and conflict. In the survey in June 2020, 25 percent of respondents in Oromia reported damage to crops and 28 percent reported damage to vegetation on their grazing land due to desert locusts in the previous three months. By the endline survey in March–April 2021, nearly 60 percent of households in the same region reported losing at least some crops to fall armyworm, another pest, in the last *mehr* season (the main agricultural season). Although more households were affected by fall armyworm, the damage from desert locusts was worse, with 28 percent of those affected saying that desert locust caused a total or near total crop failure on their land. Households that experienced locust damage had an additional 0.4 months of food insecurity on average, as measured by the food gap. The ongoing conflict in Ethiopia also affected many households in the communities where surveys were conducted. We emphasize that the relative contribution of COVID-19 and these other shocks to reported food insecurity and other effects cannot be fully assessed.

Poverty, uncertainty, and mental health

Recent literature has explored how poverty contributes to mental health challenges, showing that poverty-induced stress interferes with decision-making and can contribute to a mental-health-induced poverty trap (Ong, Theseira, and Ng 2019). Related evidence shows that the prevalence of many mental health problems is greater among the poor and that positive income shocks reduce depression (Christian, Hansel, and Roth 2019). These effects of stress are likely to be accentuated in periods of greater uncertainty, such as the pandemic. In the survey of PSNP participants conducted six months into the pandemic, respondents' average reported level of stress was 8 out of 10, and 45 percent of households reported the highest possible stress level, a 10 out of 10. Given the protracted nature of the COVID-19 crisis, it is likely that the accompanying mental health challenges will linger as well. Our surveys have also confirmed that there is little access to mental health services in the districts where the PSNP operates.

Lessons on phone survey methods and the need for caution in interpreting phone survey evidence

In the absence of timely and representative data on economic well-being, food security, and health during the pandemic, phone surveys have offered a valuable source of surveillance on the situation facing the most vulnerable households in Ethiopia. However, the methodology used for these surveys has important limitations that must be considered when interpreting findings. These include lack of representativeness of phone-owning households (see Ambel, McGee, and Tsegay 2021; Brubaker, Kilic, and Wollburg 2021), gaps in understanding of questions asked by phone, and differences in survey fatigue between phone and in-person interviews. Concerning representativeness, for example, the sample of PSNP households interviewed by phone three and six months after the start of the pandemic was generally better off than other households in the sample, with 13.8 percent of phone survey households severely food insecure¹ compared to 19.8 for the sample overall.

In our projects, household survey data collected before and during the pandemic showed that the apparent effects of the pandemic sometimes varied by indicator and suggested that respondents may react differently to some questions administered by phone rather than in-person. In-person surveys conducted one year after the start of the pandemic indicate that PSNP beneficiaries are no worse off in terms of household consumption than they were before the pandemic, but they continue to report heightened food insecurity on subjective measures collected by phone. This pattern may be consistent if, during the pandemic, households shifted the composition of their diets and paid more for food, adding to food insecurity while leaving the value of consumption unchanged. However, it is also possible that households are more likely to report a heightened sense of food insecurity during phone surveys.

Recent surveys conducted in Ethiopia have begun to quantify the severity of these methodological limitations. For example, Hirvonen, de Brauw, and Abate (2021) exploit a rich set of monthly phone survey data collected soon after the start of the pandemic. This data set is based on a sample of

1 Based on the FAO's Food Insecurity Experience Scale.

households in Addis Ababa for which detailed data on household well-being was collected through in-person surveys before the pandemic. The researchers took the unusual step of collecting detailed data on household consumption expenditures in their phone surveys to triangulate this measure of household well-being with the subjective measures of income changes and the rapid food security measures more typically used in phone surveillance surveys.² They find that food security is mostly unchanged in Addis Ababa when measured by consumption expenditure modules, while the subjective income measures indicate a worsening situation, suggesting bias in these subjective measures. In a follow-up study conducted by the same research team, Abate and colleagues (2021) split the sample randomly into either an in-person or phone interview in which households respond to questions about their food and nonfood consumption in a specific recall period. Strikingly, phone survey respondents report consumption levels that are 23 percent lower than those of the otherwise identical in-person survey respondents, effectively doubling the poverty rate. Both survey modes result in similar estimates when diet-based food security is measured, suggesting that the phone survey method works well for questions that are less cognitively demanding. Even when focusing on simpler indicators, however, it seems important to keep the phone interviews short. Using data from phone surveys of mothers with young children from PSNP localities, Abay and colleagues (2021) show that when the timing of a dietary diversity module in the interview is delayed by 15 minutes, mothers report considerably fewer foods consumed and thus lower dietary diversity and heightened food insecurity.

Policy implications and conclusion

The body of evidence presented here confirms that social protection programs play an important role in the pandemic response by supporting the delivery of transfers to households that were vulnerable before the pandemic. As in Ethiopia, the targeting and delivery structures from already-established safety nets can also assist with humanitarian responses to a crisis like the pandemic by targeting resources to newly vulnerable households.

Government should prioritize the provision of additional pandemic-related assistance to households that are also affected by other shocks (like pests in Ethiopia), as there is evidence that households facing multiple contemporaneous shocks are more likely to resort to distressed asset sales and that this coping strategy has long-term welfare implications.

Phone surveys used for surveillance during a pandemic, when in-person interviews are not feasible, often rely on subjective indicators of well-being that require less time to collect but may not be as accurate as other more objective measures. Therefore, this evidence should be triangulated with other data sources, when possible, to avoid misinterpreting crisis effects.

The two studies profiled in this chapter illustrate how the COVID-19 pandemic has affected the food security, livelihoods, and well-being of poor, rural households in Ethiopia. Leight and colleagues show

² The subjective measures of income ask, for example, whether incomes were “much lower,” “somewhat lower,” “the same,” “higher,” or “much higher.” The proxy for household food security used is the household dietary diversity score (HDDS), a count of the number of food groups (out of 12) in which the household consumed any food.

that while meaningful shocks were experienced by all households under observation, the most acute effects were experienced by those with non-agricultural businesses. Berhane and colleagues find that, for rural PSNP beneficiaries, food shortages and food price increases were reported as the worst effects of the pandemic.

Many months into the pandemic, the effects of the crisis continued to be felt unevenly. Some households were relatively unaffected economically while others reported persistent effects, particularly in terms of food insecurity. At times, the apparent effects of the pandemic varied by indicator and survey method. It is unclear whether these discrepancies were the result of conducting interviews by phone or genuine heightened stress and uncertainty on subjective measures of food insecurity. A pervasive effect of the pandemic was a heightened sense of uncertainty about the future and vulnerability to a worsening situation, with more households reporting high levels of stress than reporting directly pandemic-related effects on food shortages or travel restrictions.

While the COVID-19 pandemic presents a challenge to poor, rural households in Ethiopia, it was only one of many shocks in 2020 and 2021. Many households experienced significant losses to crops or grazing lands due to pest infestations. After conflict began in northern Ethiopia in November 2020, it expanded to other regions in 2021, leading to devastating effects for many communities and displacing millions of people. Multiple contemporaneous shocks like these generate complex effects and long-term implications for welfare, which require greater attention and understanding to fully assess the impacts of the pandemic and ultimately build the resilience of vulnerable populations.

References

- Abate, G.T., A. de Brauw, K. Hirvonen, and A. Wolle. 2021. "[Measuring Consumption over the Phone: Evidence from a Survey Experiment in Urban Ethiopia](#)." Discussion Paper 2087, IFPRI, Washington, DC.
- Abay, K.A., G. Berhane, J.F. Hoddinott, and K. Tafere. 2021. "[Assessing Response Fatigue in Phone Surveys: Experimental Evidence on Dietary Diversity in Ethiopia](#)." Discussion Paper 2017, International Food Policy Research Institute (IFPRI), Washington, DC.
- Ambel, A., K. McGee, and A. Tsegay. 2021. "[Reducing Bias in Phone Survey Samples: Effectiveness of Reweighting Techniques Using Face-to-Face Surveys as Frames in Four African Countries](#)." Policy Research Working Paper 9676, World Bank, Washington, DC.
- Berhane, G., N. Kumar, D. Gilligan, J. Hoddinott, A.S. Taffesse, H. Tesfaye, G. Thai, and A. Wondwosen. 2021. *Understanding the Effects of COVID-19 on Food Security in Rural Ethiopia: Telephone Survey Report*. Washington, DC: IFPRI.
- Brubaker, J., T. Kilic, and P. Wollburg. 2021. "[Representativeness of Individual-Level Data in COVID-19 Phone Surveys](#)." Policy Research Working Paper 9660, World Bank, Washington, DC.
- Christian, C., L. Hensel, and C. Roth. 2019. "[Income Shocks and Suicides: Causal Evidence from Indonesia](#)." *Review of Economics and Statistics* 101 (5): 905-920.
- Hirvonen, K., G.T. Abate, and A. de Brauw. 2021. "[Survey Suggests Rising Risk of Food and Nutrition Insecurity in Addis Ababa, Ethiopia, as COVID-19 Restrictions Continue](#)." In *COVID-19 and Global Food Security*, edited by J. Swinnen and J. McDermott, 46-50. Washington, DC: IFPRI.
- Hirvonen, K., A. de Brauw, and G.T. Abate. 2021. "[Food Consumption and Food Security during the COVID-19 Pandemic in Addis Ababa](#)." *American Journal of Agricultural Economics* 103 (3): 772-789.
- Kumar, N., A.R. Quisumbing, A. Gelli, U. Gentilini, and S. Shapleigh. 2021. "[Toward Inclusive Food Systems: Pandemics, Vulnerable Groups, and the Role of Social Protection](#)." In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, 54-63. Washington, DC: IFPRI.
- Laborde, D., W. Martin, and R. Vos. 2021. "[Poverty and Food Insecurity Could Grow Dramatically as COVID-19 Spreads](#)." In *COVID-19 and Global Food Security*, edited by J. Swinnen and J. McDermott, 16-19. Washington, DC: IFPRI.
- Mahmud, M., and E. Riley. 2021. "[Household Response to an Extreme Shock: Evidence on the Immediate Impact of the Covid-19 Lockdown on Economic Outcomes and Well-Being in Rural Uganda](#)." *World Development* 140: 105318.

- Ong, Q., W. Theseira, and I.Y.H. Ng. 2019. "[Reducing Debt Improves Psychological Functioning and Changes Decision-Making in the Poor.](#)" *Proceedings of the National Academy of Sciences* 116 (15): 7244-7249.
- Sabates-Wheeler, R., K. Hirvonen, J. Lind, and J.F. Hoddinott. 2021. "[Expanding Social Protection Coverage with Humanitarian Aid: Lessons on Targeting and Transfer Values from Ethiopia.](#)" ESSP Working Paper, IFPRI, Addis Ababa, Ethiopia.
- Tamru, S., K. Hirvonen, and B. Minten. 2021. "[Impacts of the COVID-19 Crisis on Vegetable Value Chains in Ethiopia.](#)" In *COVID-19 and Global Food Security*, edited by J. Swinnen and J. McDermott, 81-83. Washington, DC: IFPRI.
- Wieser, C., A.A. Ambel, T. Bundervoet, and A. H. Tsegay. 2020. [Monitoring COVID 19 Impacts on Households in Ethiopia: Results from a High-Frequency Phone Survey of Households.](#) Washington DC: World Bank.

19. COVID-19 will mostly spare young children; the economic crisis will not

Marie Ruel and Derek Headey

In a pair of commentaries published in *The Lancet* in August 2020, [we and our colleagues](#) in the [Standing Together for Nutrition Consortium](#) (STfN) and [the leaders of four UN agencies](#) called for immediate action to address the escalating problems of child malnutrition and excess mortality triggered by the COVID-19 pandemic (Fore et al. 2020; Headey et al. 2020). Although child mortality from the virus itself is low compared to other age groups, the social, economic, and health systems crises it has prompted pose a serious threat to young children's nutrition, health, and survival in low- and middle-income countries (LMICs).

As disruptions to economies and food and health systems continue, their negative impacts are multiplying: [World Bank](#) estimates from February 2021 suggest that an additional 150 million people fell into extreme poverty in 2020, while [The State of Food Security and Nutrition in the World \(SOFI\) 2021 report](#) estimated that over 300 million more people faced food insecurity that year compared with 2019. At the household level, this means that incomes have plummeted, food security has deteriorated, and nutritious diets have grown increasingly out of reach for the most vulnerable populations in LMICs. Making matters worse are the pandemic-induced interruptions to health, nutrition, and social protection services. [The World Health Organization's Pulse Survey on Continuity of Essential Health Services During the COVID-19 Pandemic](#) found that over half of the 105 surveyed countries had experienced disruptions in antenatal care, sick child services, and management of malnutrition in 2020, as well as disruptions to routine vaccinations. Similarly, in early 2021, [UNICEF](#) estimated that provision of essential nutrition services such as micronutrient supplementation and school feeding programs had fallen by 30 percent. Although social protection programs, including cash and food transfers, have been modified or scaled up in many countries, they have struggled to meet the skyrocketing demand resulting from job and income losses.

The combination of increased poverty and food insecurity and gaps in essential health and nutrition services means that the number of children suffering from malnutrition, especially wasting (thinness, a form of acute malnutrition), will rise and, along with it, the risk of mortality from infectious diseases. Before the pandemic, some 47 million children under age 5, mostly in Africa and South Asia, were moderately or severely wasted.

How many additional children could become malnourished or die as a result of the COVID-19-related health and economic crises?

To stimulate a rapid response to protect nutrition and prevent dramatic rises in child wasting and mortality, we and our colleagues at STfN planned a set of analyses to assess the scope and depth of

the problem. We took a multipronged approach to model the combined effects of the COVID-19-triggered health and economic crises on child wasting and mortality. We used the MIRAGRODEP computable general equilibrium model, Lives Saved Tool (LiST), and Optimal Nutrition Model to assess how the types of GNI (gross national income) shocks due to COVID-19 economic disruptions would affect child stunting, wasting, and mortality in 118 LMICs under optimistic, moderate, and pessimistic scenarios. We further approximated the cost of six possible interventions to address child stunting and mortality.

The results were grim. [Under the moderate scenario](#), we found that COVID-19-related disruptions could lead to an additional 9.3 million wasted children, 2.6 million stunted children, and 168,000 child deaths by 2022 (Osendarp 2021). Similarly, we found that 2.1 million additional women could suffer from anemia and 2.1 million children could be born to mothers with low BMI (body mass index), indicating that child malnutrition may continue to increase after 2022. Together, these effects could lead to over US\$29 billion in future productivity losses mostly in South Asia and sub-Saharan Africa.

In contrast, we estimate that countries will need to spend between \$762 million and \$1.7 billion per year on nutrition interventions to successfully combat the increased malnutrition brought on by the pandemic. This is in addition to the \$7 billion per year estimated in 2017 that would be needed to reach nutrition targets. Currently, the amount of funding provided has fallen far short of these goals, even though the returns on investment from this spending would likely be substantial.

It is important to note that the dramatic increases in severe wasting and associated mortality tell only part of the story. The children who survive may suffer from long-lasting and largely irreversible impacts – ranging from repeated infections to impaired cognition and even blindness (from severe vitamin A deficiency) – that will affect them, their families, and their societies for decades.

The road ahead

After almost two years, it is clear that COVID-19 will continue to threaten the health, nutrition, and livelihoods of people around the world for the foreseeable future. While highly effective vaccines have been developed, large populations are still unable or unwilling to be vaccinated and virus mutations continue to pose additional risks to public health. It is crucial for policymakers to adapt to this new reality by addressing health and nutrition concerns while also dealing with COVID-19. Researchers must continue analyzing the implications of this combination of public health challenges to anticipate future obstacles and improve interventions.

The [Call to Action](#) signed by four UN institutions urges national governments to adopt five actions across health, food, and social protection systems to prevent COVID-19 from triggering an intergenerational hunger and malnutrition crisis.

1. Safeguard and promote access to nutritious, safe, and affordable diets.
2. Invest in improving maternal and child nutrition through pregnancy, infancy, and early childhood.
3. Reactivate and scale-up services for the early detection and treatment of child wasting and maintain and expand other nutrition services.

4. Maintain the provision of nutritious and safe school meals for vulnerable children.
5. Expand social protection to safeguard access to nutritious diets and essential services.

The challenges ahead are immense. But we do know that by acting now, we can reduce the impact on young children and perhaps spare them from lifelong consequences that could cripple their ability to learn, leave them vulnerable to chronic diseases, and prevent them from realizing their full physical, cognitive, health, and productive potential.

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References

- Fore, H. H., Q. Dongyu, D.M. Beasley, and T.A. Ghebreyesus. 2020. "[Child Malnutrition and COVID-19: The Time To Act Is Now.](#)" *Lancet* 396 (10250): 517-518.
- Headey, D., R. Heidkamp, S. Osendarp, M. Ruel, N. Scott, R. Black, M. Shekar et al. 2020. "[Impacts of COVID-19 on Childhood Malnutrition and Nutrition-Related Mortality.](#)" *Lancet* 396 (10250): 519-521.
- Osendarp, S., J.K. Akuaoku, R. Black, D. Headey, M. Ruel, N. Scott, M. Shekar, et al. 2021. "[The COVID-19 Crisis Will Exacerbate Maternal and Child Undernutrition and Child Mortality in Low- and Middle-Income Countries.](#)" *Nature Food* 2: 476-484.



20. How to support students and the learning process during India's COVID-19 school closures

Anjali Pant, Samuel Scott, and Phuong Hong Nguyen

The COVID-19 pandemic has affected [1.6 billion learners worldwide](#), and school closures could lead to a loss of 0.3-0.9 years of schooling, according to [World Bank](#) estimates; a global shutdown of five months could result in lost earnings of \$10 trillion over students' lifetimes. The pandemic's economic shocks are likely to [increase school drop-out rates](#). Evidence suggests that the poor, girls, and other marginalized groups disproportionately suffer the consequences of school closures.

Given its large population and the poor pre-pandemic state of its education system, India is likely to feel these impacts acutely. The government shut all schools in March. In October, it allowed states to begin reopening some schools, but many remain closed. The lockdown has forced more than [320 million children out of school](#).

To get insights on this, [we studied](#) learning skills among 20,000 adolescents ages 10 to 19 in India's two most populated and poor states, [Uttar Pradesh and Bihar](#). Data were taken from the Population Council's Understanding the Lives of Adolescents and Young Adults (UDAYA) survey from 2015/16. Reading and math proficiency were measured as [ability to read at story level \(standard 2 level text\)](#) and ability to [solve at least two subtraction problems](#), respectively, using the Annual Status of Education Report (ASER) methodology. We found that nearly one in three adolescents could not read age-appropriate text and 30-42 percent could not solve basic subtraction problems. In the last decade, the grim state of learning has remained unchanged in these states, despite sustained government efforts in the form of [free distribution of uniforms, bicycles, textbooks](#), and [meals](#), among other things.

COVID-19 is making things worse. Several actions are needed to improve adolescents' learning, both at home and in school, that can support education during school closings – and going forward post-lockdown.

Policy opportunities for enhancing adolescent learning

Most of the factors that we found to be associated with reading and math ability among adolescents can be improved through targeted interventions, including school attendance, wealth, sanitation, communication with parents, and gender attitudes.

The strongest predictor of learning outcomes was attending school, with an added advantage of attending a private over government school. Attending school has multiple benefits: interacting with

teachers and peers, accessing free food, and exposure to a structured curriculum. In India, private schools have better [teacher accountability and a lower pupil-teacher ratio](#). Compared to those out of school, adolescents in school were around five (government school) and eight (private school) times more likely to be proficient in reading and math.

With most adolescents now out of school, parents have taken on an increasingly important role in ensuring their well-being. [The pandemic has led parents to spend more time with their children](#); this is an opportunity for parents to foster closer and more open relationships with their adolescent children. In our study, we found that an interactive relationship between the adolescent and her/his parents was predictive of better learning outcomes: those with a high parental support score were about 20 percent more likely to exhibit age-appropriate reading and math skills compared to those with a low parental support score. Further, those with a gender-equal attitude – that is, an outlook that boys and girls should be treated the same – were twice as likely to have age-appropriate learning outcomes.

Of course, not all family dynamics have a positive outcome on learning outcomes, and the national lockdown has altered family relations in many households. In several states, cases of [domestic violence](#) have increased, which could disrupt adolescents' ability to learn. In our study, substance abuse by family members, ever witnessing parental violence, and ever experiencing sexual abuse were all predictive of poorer learning outcomes among adolescents. Adolescents with these negative experiences were around 20–30 percent less likely to be able to read a story and solve subtraction problems compared with those without these negative experiences.

Being out of school and staying at home under lockdowns therefore may create divergent outcomes for students, with those in supportive family environments building upon their learning and development, and those in households experiencing economic stress, abuse, or domestic violence falling further behind. During school closures and lockdowns, parental attitudes and family relationships are likely to have an even greater impact on students' learning and social-emotional development.

The way forward

India's recently launched [New Education Policy 2020](#) (NEP 2020) acknowledges the urgent need to strengthen foundational learning skills in India. The policy aims to reduce school dropout rates through infrastructure support and constant learning evaluation, engage parents to promote children's development, integrate essential capacities such as gender sensitivity, promote inclusive and equitable education, and build synergy across private and public schools.

While some schools have reopened, e-learning may be the preferred mode of learning for many adolescents in the coming months. NEP 2020 promotes the extensive use of technology in education but does not account for the substantial inequity that exists in access to technology, especially in rural areas. Given the digital divide and the dismal learning situation in India, an immediate policy priority should be to make online learning more inclusive and tailored to avoid further setbacks among adolescents with limited connectivity.

To achieve better adolescent learning outcomes in the medium to long term, our findings from Uttar Pradesh and Bihar suggest that, beyond ensuring adolescents enroll and stay in school, policies should broadly aim to build household wealth and strengthen family support systems. Parents can help their children learn at home by having open conversations and building an environment that promotes social-emotional well-being, among [other strategies recently recommended by UNICEF](#). [Digital parenting resources](#) may play an important role, though limited accessibility in remote areas remains a challenge. Schools should also strive to include parents in their children's learning experience once students are back in person.

Within the next decade, today's generation of adolescents will enter the workforce and pass knowledge, practices, skills, and values to their own children. It is essential to devote resources to protecting and promoting adolescents' ability to learn during the pandemic – to avert far-reaching consequences for students and for India's economy and society – and to continue to build on such efforts afterward.

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21. Ethiopia's social safety net effective in limiting COVID-19 impacts on rural food insecurity

Kibrom A. Abay, Guush Berhane, John Hoddinott, and Kibrom Tafere

The COVID-19 pandemic is undermining food and nutrition security on a global scale. IFPRI estimates show that globally, 80-140 million people were at risk of falling into extreme poverty in 2020, more than half in Africa south of the Sahara. The World Food Programme estimated that globally, the number of people facing acute food insecurity could double in the same period. These impacts – stemming from lost incomes due to lockdowns, fear of exposure, and medical expenses, as well as disruptions in food markets and value chains – are severely testing social protection systems in many countries. How effective are those systems in blunting these effects?

Ethiopia offers one encouraging test case that may provide lessons for designing more effective policies and interventions. In a recent [paper](#), we outline evidence on the role of Ethiopia's flagship social protection program, the Productive Safety Net Program (PSNP), in protecting household food security in rural areas during the pandemic – finding that the program offset virtually all adverse pandemic-related impacts for participating households. These results demonstrate the value of having social protection programs in place prior to the onset of shocks in order to protect the food security of poor households.

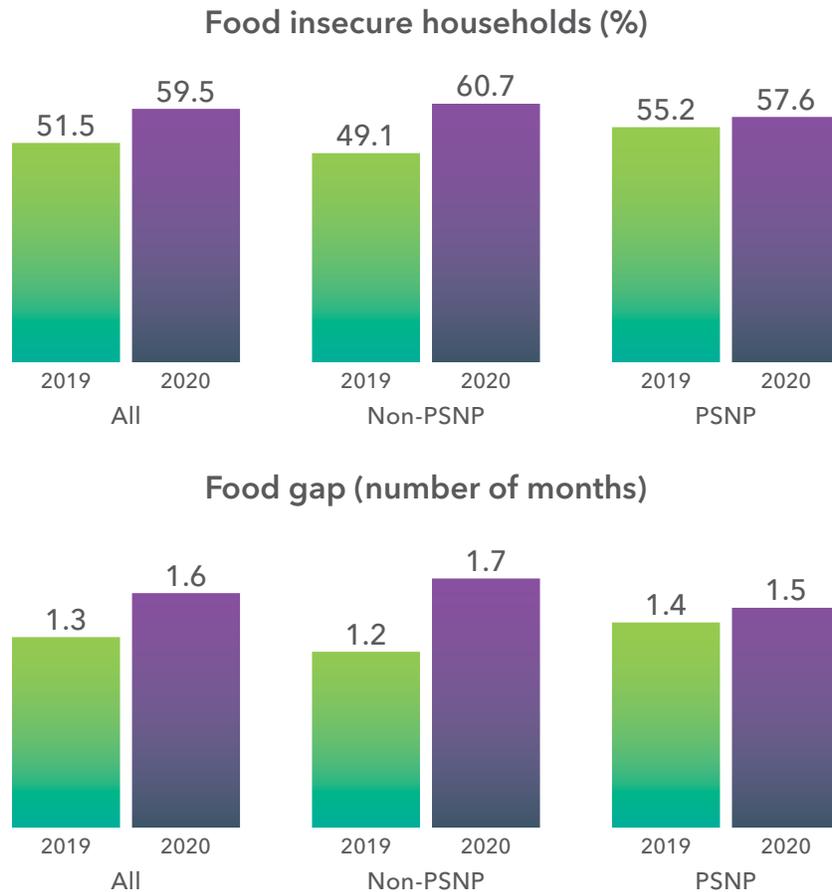
In August 2019, we conducted face-to-face surveys with mothers of children under the age of 24 months to assess how access to the PSNP had affected their food security and nutritional status. In June 2020, we re-interviewed these mothers – approximately 1,500 in total – by phone. Thus, we were able to assess the extent to which household food security and diets of individual household members changed following the start of the pandemic in Ethiopia.

In evaluating the PSNP's impacts, household food security is measured using a self-reported indicator called the food gap – the number of months the household was not able to satisfy its food needs.

Our regression results indicate that among non-PSNP households, food insecurity increased by 11.7 percentage points and the size of the food gap increased by 0.47 months after the pandemic hit. Participation in the PSNP, however, offsets virtually all these adverse effects; the likelihood of becoming food insecure increased by only 2.4 percentage points for PSNP households and the duration of the food gap increased by only 0.13 months.

Our data are representative of PSNP operations in the highlands, spanning Ethiopia's four main highland regions. The longitudinal nature of the data, together with a sample that included both PSNP and non-PSNP households, allows us to combine a difference-in-difference approach with a household fixed effect estimator, allowing us to control for a wide range of confounding factors.

FIGURE 1 Social protection lowers COVID-19's impact on hunger in Ethiopia



Source: K.A. Abay et al., “COVID-19 and Food Security in Ethiopia: Do Social Protection Programs Protect?” IFPRI Discussion Paper 1972, IFPRI, Washington, DC.

Note: PSNP = Ethiopia’s Productive Safety Net Program

Our respondents were reasonably well-informed about COVID-19. Virtually all (99.8 percent) had heard of the virus and 93 percent could identify at least one symptom. On average, respondents reported taking multiple actions to reduce the likelihood that they or someone in their household would contract COVID-19. These include washing hands for 20 seconds or more (82 percent), and conditional on going out, avoiding shaking hands or kissing when greeting others (77 percent) or avoiding large gatherings or queues (66 percent). Market closures, fear of being infected, high food prices, and loss of income were the pandemic’s most important effects on livelihoods. Two-thirds of our respondents reported that their incomes had fallen after the pandemic began.

We asked respondents about their ability to satisfy their food needs in the three months preceding the June 2020 survey compared to the same months the previous year. About half reported that their food insecurity status had worsened, while the rest reported that it remained about the same.

Households reporting that their food security situation worsened were concentrated in zones with high numbers of COVID-19 cases.

In August 2019, just over 50 percent reported experiencing food insecurity in the last six months, and the average household reported a food gap of 1.3 months during the same period. In June 2020, this reported food insecurity rose to about 60 percent, while the food gap grew to 1.6 months – largely driven by the sharp increase in food insecurity among non-PSNP households ([Figure 1](#)).

The protective role of the PSNP is greater for poorer households and those living in remote areas. Results are robust to definitions of PSNP participation, different estimators, and how we account for the non-randomness of mobile-phone ownership. PSNP households were less likely to reduce expenditures on health and education by 7.7 percentage points and less likely to reduce expenditures on agricultural inputs by 13 percentage points. In addition, mothers' and children's diets changed little, despite some changes in the composition of diets, with consumption of animal-source foods declining significantly.

Our findings show that investing in social protection programs can have far-reaching implications for mitigating the effects of shocks such as COVID-19. The PSNP program has been implemented for more than a decade and previous studies have shown its effectiveness in supporting poor households in improving food security and reducing poverty. Our research shows that additional COVID-19-related impacts on food security and poverty can be mitigated quickly by adapting existing programs such as PSNP – a clear example of the utility of leveraging existing programs to address the pandemic.

Social safety nets are expensive to design and implement, especially at scale, and prior to the pandemic they faced a degree of donor fatigue. The COVID-19 crisis has reignited interest in social protection policies as instruments to enhance the resilience of the poor against catastrophic shocks. Our findings lend empirical support to the idea of maintaining social safety net programs with the capability of expanding or scaling to mitigate the adverse impacts of emergencies like the pandemic. Future research may focus on whether the protective role of social protection programs can be sustained in periods of shock, given pandemic impacts are likely to persist in areas that they typically serve.

This study was funded by the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by IFPRI; the World Bank; the Bill & Melinda Gates Foundation; the Partnership for Economic Policy (PEP), financed by the UK Foreign, Commonwealth & Development Office (FCDO); and the International Development Research Centre (IDRC) of Canada.

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22. A major food transfer program in Bangladesh fell short during the COVID-19 pandemic

Shyamal Chowdhury, Nahian Bin Khaled, Kalyani Raghunathan, Shahidur Rashid, and Honor Dearlove

Public food transfer programs serve as an important safety net for those facing hunger and food insecurity in both low- and high-income countries around the world. During the COVID-19 pandemic, these programs have become even more crucial, as food insecurity and poverty rates have soared. But lockdowns and other public health restrictions can also disrupt food distribution operations and thus limit their effectiveness.

Along with a broad set of social protection schemes, Bangladesh has in place several overlapping food transfer programs. The largest of these, the Food Friendly Program (FFP), provides 30 kg of rice per month per eligible family in the lean season months of March–April and September–November, reaching roughly 27.5 million people annually. Eligible households are those that are poor, functionally landless, and where the household head works as a day-laborer; special consideration is given to households with additional vulnerabilities, such as elderly, disabled, or female-headed households. FFP recipients, therefore, are among the most vulnerable sections of the population. In response to COVID-19, the government of Bangladesh expanded the FFP, making available an additional month of transfers to existing beneficiaries in May 2020. However, [our research](#) shows that the program did not deliver the full allotments of rice to recipients, complicating efforts to alleviate severe economic impacts.

In 2018, IFPRI [conducted a study](#) to evaluate the performance of the FFP and found the program to be functioning well. The 2018 study was based on a nationally representative sample of 4,526 FFP recipient households, along with other actors – dealers, *upazila* (sub-district-level) food controllers, and local administrators such as union chairmen – involved in the program. As concerns began growing about the impact of the pandemic and the countrywide lockdown imposed from March 26–May 31, 2020 (referred to as a “general holiday”), we decided to conduct phone interviews of the same households from the 2018 study to better understand how the program fared in addressing the pandemic-induced challenges of food insecurities, job losses, and reduced incomes. This follow-up survey was completed in August 2020 and surveyors were able to interview 2,800 out of the original sample of 4,526 households. Our analysis shows that key household- and *upazila*-level characteristics are similar for both survey rounds, indicating the two samples are comparable. Characteristics are also broadly similar between those that remained in the sample and those that dropped out between rounds.

The 2020 survey results highlight the particularly severe impacts of the pandemic on the poor, with more than half the respondents reporting that the primary income-earning member of their household had lost their job, and 90 percent reporting that their July 2020 income was less than their pre-pandemic income. Food insecurity, measured using FAO's [Global Food Insecurity Experience](#)

[Scale](#), was very high. More than 80 percent of the sample reported being worried about not having enough food to eat, being unable to eat healthy and nutritious food, eating only a few kinds of food, and eating less than they should. Close to two-thirds said their household had run out of food at some point since the imposition of the “general holiday.” Food insecurity was markedly higher among those households that experienced job losses.

Faced with rising food insecurity, households were forced to resort to a variety of coping strategies to meet basic needs, including reducing expenditures on health (62 percent) and nonfood items like clothes and education (90 percent), and spending from their savings (76 percent). Fewer than 5 percent of respondents were able to access credit from formal institutions, and most relied on borrowing from within their informal networks of friends and family.

As COVID-19 exacerbated existing food insecurity and poverty, food transfer programs became more important than ever as a means to meet basic food needs. But our survey results show the FFP program fell short. Just 64 percent of respondents reported receiving their full entitlement of 60 kg of rice in March–April, and 58 percent reported receiving less than 10 kg of the promised 30 kg in May. This substantial shortfall highlights the failure of the FFP to function effectively while facing a crisis such as a pandemic. In addition, while the average per kilogram price of the rice remained roughly the same, the proportion of households who reported having to pay bribes to receive their entitlement rose from 4 percent in 2018 to 10 percent in 2020.

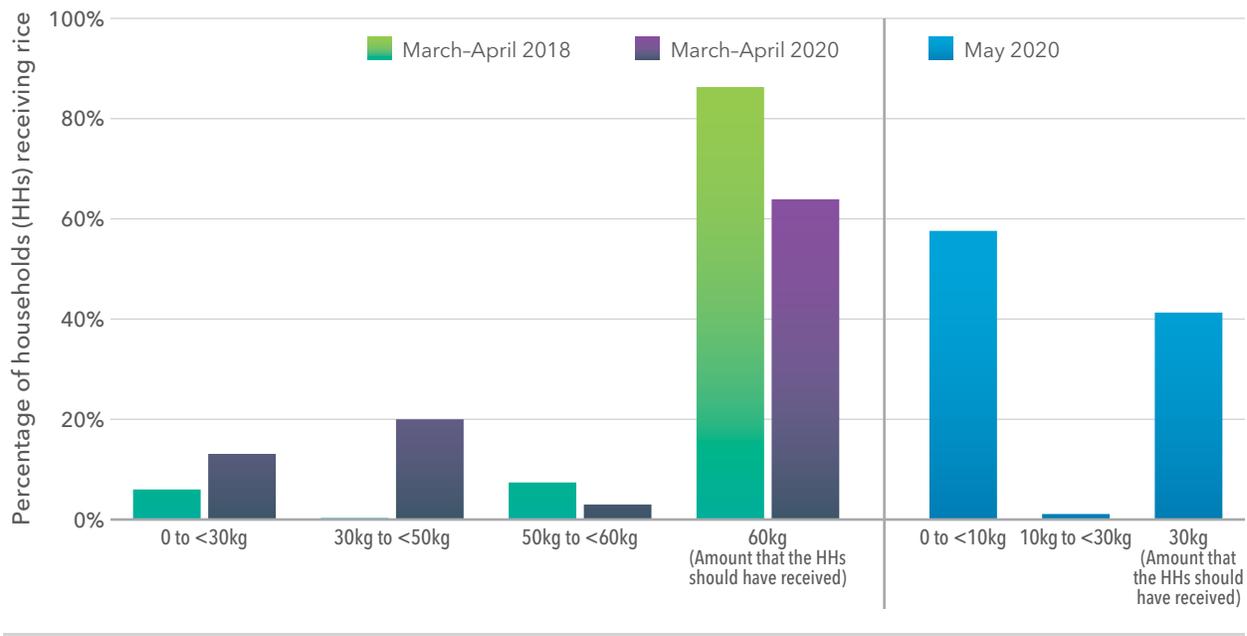
Several factors could have caused the FFP to falter, including supply disruptions and restrictions on movement, as well as lack of proper information about household eligibility conditions. For example, of the households who had been removed from the program in 2020, 36.7 percent did not know the reason why, 23 percent thought they had been removed without valid justification, and about 13 percent thought they were excluded because of disagreements with local officials.

The partial failure of well-established safety net programs such as the FFP to adequately adapt to unanticipated shocks like COVID-19 has real financial and human costs. While other modalities of social protection, such as cash transfers, are employed globally, food transfer programs remain the preferred modality in Bangladesh, making them an essential tool for mitigating the impact of major shocks. The importance of the FFP as an existing safety net is highlighted by our finding that other newly (and relatively hurriedly) introduced cash and in-kind transfer schemes reached less than a quarter of the households in our sample.

Thus, there is a need to regularly assess the costs of these programs, evaluate their effectiveness, and devise strategies to both broaden and deepen their reach. Our primary policy recommendation going forward is to set up routine monitoring mechanisms for FFP and similar safety net programs using digitally enabled small-sample phone surveys. That would allow the government to identify and address distribution challenges quickly, helping to avert spikes in food insecurity and hunger.

In addition to increasing research and monitoring, there is a need for more dynamic targeting to identify those pushed into poverty because of economic shocks and ensure that they are also covered by social safety nets. Bangladesh did not broaden the FFP to include additional beneficiaries during the pandemic, meaning that people who did not qualify for this public food transfer program pre-pandemic were not eligible for any support.

FIGURE 1 Food Friendly Program: Monthly receipt of rice, 2018 and 2020



The need for dynamic and frequent data collection is underscored by [recent research](#) that demonstrates how food insecurity patterns can change over time. Using multiple rounds of nationally representative panel data post-COVID, the authors show that after an initial spike, moderate and severe food insecurity prevalence had returned to pre-pandemic levels by January 2021. However, mild food insecurity prevalence rose and remained elevated at almost 20 percentage points above pre-COVID levels. Eighteen months after the pandemic, a distressing 68 percent of rural households reported some form of food insecurity.

The COVID-19 pandemic has highlighted both the vulnerabilities of our economic systems and the potential of technology-based solutions such as phone surveys to overcome some of the logistical challenges that unanticipated shocks can present to effectively implementing, monitoring, and evaluating safety-net programs. Harnessing such technology and applying dynamic targeting criteria can help safety net programs adapt to sudden shocks and further enhance their impact on hunger, poverty, and the overall economy.

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23. COVID-19-induced disruptions of school feeding services exacerbate food insecurity in Nigeria

Kibrom A. Abay, Mulubrhan Amare, Luca Tiberti, Kwaw S. Andam, and Michael Wang

The COVID-19 pandemic and associated lockdown policies have disrupted education, health, and nutrition services globally, with severe implications for children's well-being. As the pandemic spread, more than 190 countries implemented countrywide school closures, affecting 1.6 billion children around the world. In addition to the direct effects on learning, these closures affect household food security by interrupting school feeding services.

In Nigeria, abrupt nationwide school closures beginning in March 2020 left more than 9 million students without regular school meals. Despite anecdotal evidence and speculative hypotheses, we lack rigorous empirical studies on the impacts of these closures, particularly on household food security and children's overall welfare. Furthermore, understanding the overall and differential impacts of disruptions to school feeding services is critical for designing post-COVID-19 recovery policies. With these needs in mind, [in a recent paper in the Journal of Nutrition](#), we quantify the impacts of disruptions to school feeding services on Nigeria's household food security and contribute new insights from the latest on-the-ground research.

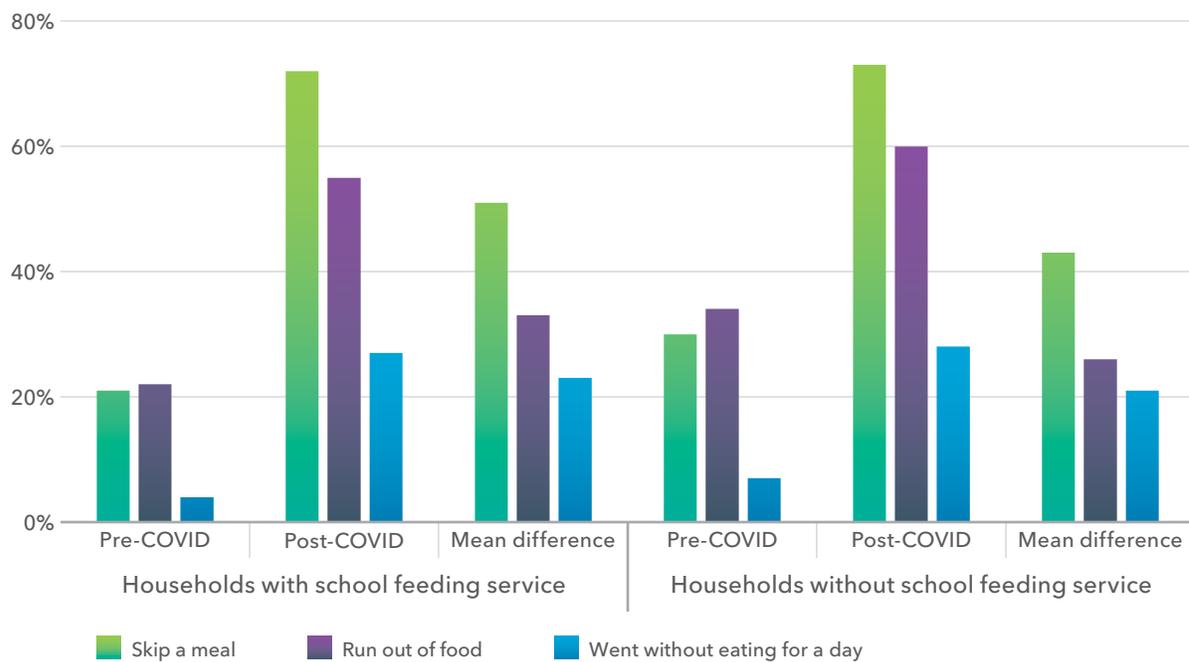
We focused on identifying the differential impacts of the pandemic and its associated disruptions to school feeding services on various household types in Nigeria. In our analysis, we utilized two rounds of longitudinal household surveys: one pre-COVID-19 in-person survey conducted in January/February 2019, and one post-COVID-19 phone survey in April/May 2020, both coming from the Nigeria's Living Standards Measurement Study-Integrated Survey on Agriculture (LSMS-ISA). Out of the total sample of 4,976 households from the 2019 survey, we completed interviews with 1,906 households for the post-COVID-19 round.

In evaluating household access to and disruption of school feeding services, we combined sub-district-level (that is, local government area or LGA) information on access to such services from the Federal Ministry of Humanitarian Affairs with the longitudinal household survey data from LSMS-ISA. We then employed a [difference-in-differences](#) approach and examined temporal trends in the food security of households with and without access to school feeding services before and after the COVID-19 outbreak.

In January 2020, immediately before the start of the pandemic, 314 of 368 LGAs in our sample (85 percent) were running school feeding services. Almost half (47 percent) of households had at least one primary school age child (age 6–9) and school-going children. About 83 percent of the sampled households lived in LGAs with school feeding programs.¹ After the start of the pandemic, these services were disrupted.

¹ In our difference-in-differences estimations, LGAs administering school feeding services before the outbreak of the pandemic assume a value of 1 and LGAs not providing these services assume a value of 0.

FIGURE 1 Differences in food security indicators across households with and without access to school feeding



We employed three indicators for food insecurity experiences (incidence of skipping a meal, running out of food, and going without eating in the last 30 days)² and a fourth, an aggregate index constructed using these indicators, all of which come from the LSMS-ISA. Using the difference-in-differences approach, we then examined temporal trends in the food security of households with and without access to school feeding services.

Our results indicate that on average Nigerian households experienced a substantial increase in food insecurity in the post-COVID-19 survey round. The share of all households skipping a meal, running out of food, and going without eating increased by 47, 32, and 20 percent, respectively. These findings can be attributed to the spread of the pandemic and the associated government restrictions on livelihood activities. Disruptions to school feeding services further increased the food insecurity experiences of households with primary school children, that is, the beneficiaries of such services.

The disruption of school feeding services increased the probability that a household skipped a meal in the last 30 days by 9 percentage points (see [Figure 1](#)). Similarly, these disruptions were associated

² The first indicator asks if a household head or any other adult in the household had to skip a meal because there was not enough money or other resources to get food. The second indicator measures whether the household has run out of food and takes a value of 1 if the household ran out of food due to a lack of money or other resources for food. The third indicator takes a value of 1 if the household or any other adult in the household went without eating for a whole day due to a lack of money or other resources.

with a 0.2 SD increase in the food insecurity index. That is, households with primary-school-going children were more likely to experience further deterioration in food security due to the disruption of school feeding services. As Figure 1 indicates, before COVID-19, households with access to school feeding services reported significantly lower levels of food insecurity than those without access. However, the onset of the pandemic and the disruption to school feeding services not only resulted in significant increases in food insecurity for both households with and without access to services but also eliminated any advantage previously gained by households with access.

Our findings also show that the disruption to school feeding programs had heterogeneous impacts. Single mothers and poorer households were 8 percent and 11 percent more likely to report a higher probability of skipping a meal, respectively, as these households are more likely to rely on school feeding services for accessing nutritious diets and are likely to be disproportionately affected by the closure of such services.

These findings clearly show that COVID-19-related disruptions to education and nutritional services have endangered household food security in Nigeria over and above the impacts of lockdowns and other social distancing measures. The heterogeneous impacts of the disruptions also corroborate evolving studies arguing that the pandemic has increased existing gender and income inequalities.

These findings can help inform immediate and medium-term policy responses to address continuing elevated levels of food insecurity, including the design of alternative social protection policies and nutritional services to mitigate longer-term adverse economic and welfare impacts. The findings also highlight the important role school feeding services programs provide to vulnerable households even in normal times, and the major negative impact of their loss during a crisis. This shows the importance of building the resilience of vulnerable households to shocks, in Nigeria and in other low- and middle-income countries. Our findings can inform future investment options and nutrition-sensitive interventions to facilitate and ensure sustainable recovery.

This project is funded by the United States Agency for International Development under the Feed the Future Nigeria Agricultural Policy Project, and the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by IFPRI. Originally published August 5, 2021, and updated January 19, 2022.

24. Extraordinary COVID-19 social support programs in South Africa yield economic benefits during the pandemic period

Sherwin Gabriel, Dirk van Seventer, Channing Arndt, Robert J. Davies, Laurence Harris, Sherman Robinson, and Jenna Wilf

Since the onset of economic downturns caused by the COVID-19 pandemic, many countries have struggled with uneven recoveries across sectors, as some types of workers and industries were better able to resume their activities than others. Even in the best-case scenarios, recovery would have been precarious, but the spread of new virus variants has cast doubt on the hopes for rapid reopening and recovery, especially for low- and middle-income countries with low vaccination rates.

South Africa experienced a third wave of COVID-19 infections in mid-2021, driven by the Delta variant's strong transmissibility. This was accompanied by renewed restrictions on movement and economic activity. In addition to the third wave, civil unrest in July 2021 further disrupted recovery. Coping with these challenges and encouraging a strong recovery will require policies that support vulnerable populations.

In a recent [discussion paper](#), we outline the results of a detailed social accounting matrix (SAM) modeling exercise on the near-term economic impacts of extending social support programs in South Africa – finding such action can lead to greater GDP growth, among other outcomes.

South Africa's economic growth was sluggish, and unemployment and poverty were high, even before the pandemic. Following extensive restrictions to contain the spread of COVID-19, GDP fell by 17.8 percent year-on-year in the second quarter of 2020. Economic activity improved in subsequent quarters as lockdowns were eased.

While improved from 2020, South Africa remains in a deep recession by historical standards. The Delta variant-driven third wave that began in June 2021 prompted the government to reintroduce restrictions at a higher alert level. This situation, alongside civil unrest in two major provinces, led to some backsliding, with GDP in the third quarter of 2021 still around 3 percent lower than at the beginning of the pandemic. By the end of 2021, less than 40 percent of adults were fully vaccinated.

As part of its pandemic response, the government implemented aggressive intervention policies to support the incomes of vulnerable groups such as children, the elderly, and disabled people. It increased the levels of existing social grants and introduced a temporary Social Relief of Distress (SRD) fund to support unemployed people not covered by other social grants or unemployment

insurance. The government was able to do this relatively quickly, as the infrastructure for disbursing grants was already in place. However, top-ups to existing grants ended in October 2020, while the SRD grants were discontinued in April 2021. Thus, vulnerable households entered the new lockdown with a smaller safety net. Almost [one-fifth of households](#) in South Africa report social grants to be their main source of income. Household-level surveys (the [NIDS-CRAM](#) studies) show that household and child hunger remain elevated a year after the pandemic started. The SRD grant was reinstated for eight months, from August 2021 to March 2022, to help mitigate food insecurity and poverty.

We analyze the impact of extending income support to vulnerable households through the third quarter of 2021, focusing our analysis on two alternative interventions. In the first, we consider a continuation of SRD support and COVID-19 supplements to social grants for a full year through September 2021 (full intervention). In the second, we consider a continuation of SRD support alone (reduced intervention). We also consider three funding mechanisms: an increase in government debt; increasing taxes on high-income households; and reallocating funds from regular government spending.

Our SAM multiplier model for South Africa uses a starting point that captures the impacts of the economic fallout during the first six months of the pandemic. The method captures transactions of various commodities by different types of users, such as industry and households, along with other factors. The detail included in the data is comprehensive at both broad industry and household decile levels, allowing some distributional analysis.

As shown in [Figure 1](#), the full intervention, funded by increasing government debt, adds 2 percent to GDP. Sectors in food and clothing supply chains benefit more, given the propensity for poorer households to spend on these items. When the full intervention is financed by raising taxes for the top 10 percent of households, a 0.7 percent increase in GDP is achieved. This comes as higher taxes erode some purchasing power from wealthier households. Still, the net effect on in-year GDP is positive. When funds are redirected to priorities other than current spending, however, the net impact on GDP is a decline of 0.2 percent. A similar impact, albeit smaller, is observed when the reduced intervention is considered. Thus, how income support is financed matters.

Because of the policy focus on supporting lower-income households, these interventions are pro-poor. More than half of SRD grant recipients are in the lowest four deciles, and close to 60 percent of child support grant disbursements go to households in these deciles. Thus, the Palma index, a measure of income distribution – calculated as the ratio of income earned by the top 10 percent to that of the bottom 40 percent – is lower in all scenarios, regardless of financing method ([Figure 2](#)). In another scenario, in which income support is targeted toward semi-skilled and unskilled workers instead of lower-income households (wage support), the decline in the Palma index is less sharp. This is because most primary- and middle-school-educated workers fall in the middle of the income distribution.

Notably, we estimate that the anticipated increase in government debt is more than offset by improvements in broader economic activity in most scenarios (the exception is where reducing other government spending is used to offset increases in income support). Thus, in these scenarios, government debt-to-GDP ratios ease slightly, at least over the short term.

FIGURE 1 Net impact on GDP based on two alternative interventions

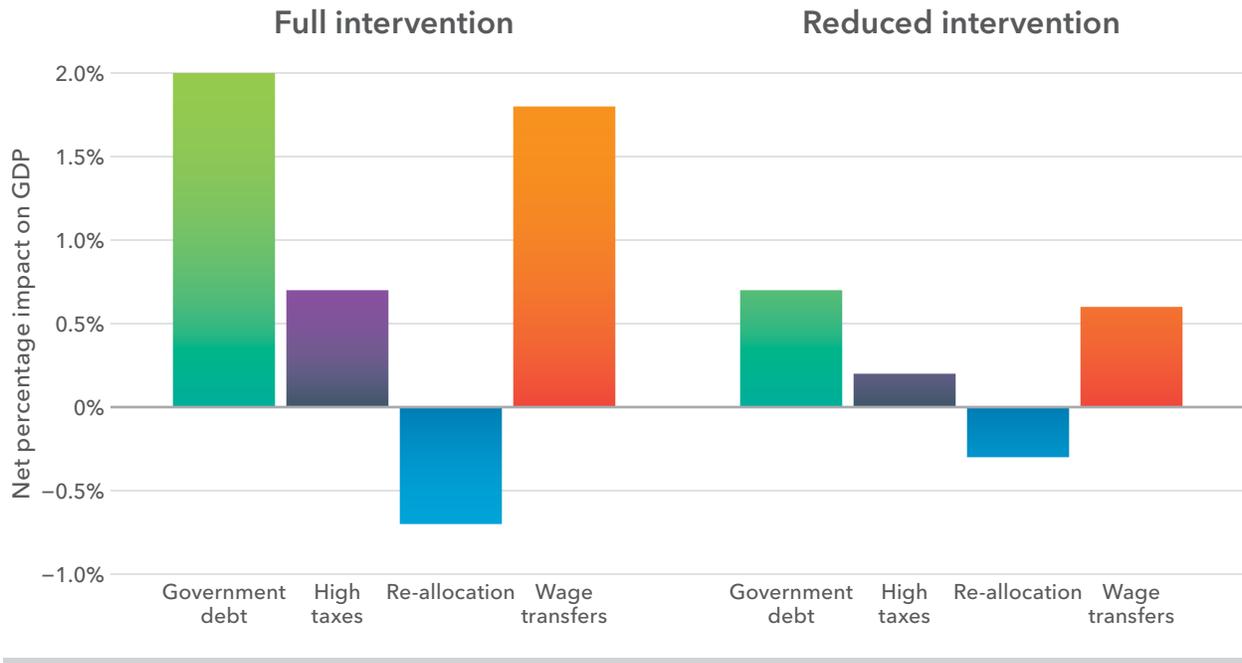
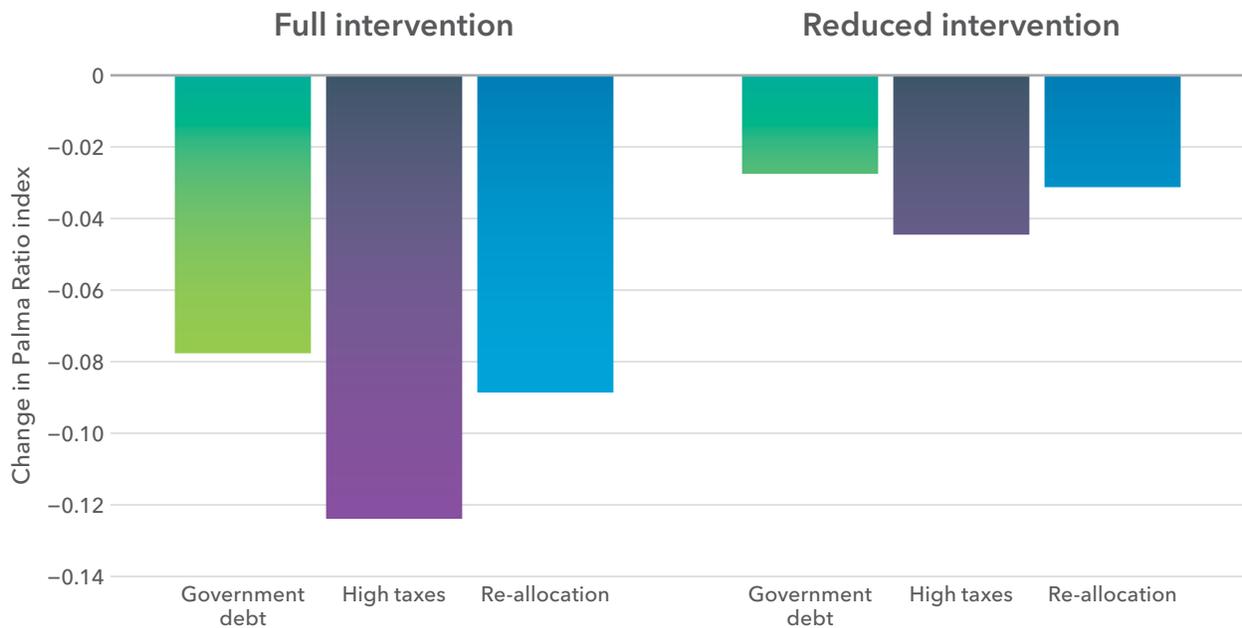


FIGURE 2 Change in Palma Ratio Index based on two alternative interventions



Note: The Palma Ratio is a measure of income inequality, calculated as the ratio of income earned by the top 10 percent to that earned by the bottom 40 percent.

The government's response to the COVID-19 pandemic constrained economic activity and imposed enormous hardship on lower-income households. These results argue strongly for substantial support targeted at these households as a temporary and extraordinary measure during the pandemic period. Although the Omicron variant has been more transmissible than Delta, hospitalization and mortality rates have not been as severe in South Africa. Thus, the government did not increase its restriction level during the fourth wave of infections. With continued strong efforts to vaccinate the population and a bit of luck (for example, no further new variants that fully evade the vaccine), pandemic restrictions on economic activity should loosen considerably in 2022. This should be the approximate duration of any additional extraordinary support to households.

Looking further ahead, South Africa's policy focus should shift from temporary support for households toward facilitating fairer and more sustainable long-term economic growth with fewer structural impediments. This requires different analytic approaches and different policy solutions. Further analysis, including longer-run perspectives, international perspectives, and further details to the work presented above, can be found on this interactive [site](#).

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25. COVID-19 disruptions to health and nutrition services in Uttar Pradesh, India

Phuong Hong Nguyen, Shivani Kachwaha, Rasmi Avula, Purnima Menon, and Michael Wang

The COVID-19 pandemic has led to major disruptions in preventive health and nutrition services around the world, posing particular risks for vulnerable groups such as young children and pregnant women. [Early estimates](#) suggest that these disruptions could lead to more than 1 million additional child deaths and more than 56,000 additional maternal deaths worldwide.

Problems exist in both supply and demand of health and nutrition services. In India, supply disruptions, travel restrictions, and reduced health worker mobilization have exacerbated these risks. On the demand side, households have faced their own obstacles to accessing such services as they confront the pandemic's negative impacts on livelihoods, employment, food security, and health. To respond to these dire circumstances, the Indian government has taken several measures to ensure the continued delivery of essential services during the pandemic. Thus far, however, very few rigorous empirical investigations have evaluated the impacts of the COVID-19 pandemic in India on public health and nutrition services.

In [a recent paper in the Journal of Nutrition](#), we quantify these effects in Uttar Pradesh, a populous state with over 200 million people. We found that the pandemic caused disruptions to both the supply of and demand for health services that persisted past the lifting of lockdown measures. A particular problem was beneficiaries failing to use available program offerings. Despite frontline health workers' many efforts to adapt services to pandemic conditions, beneficiaries remained fearful of COVID-19 infection and used those services at significantly lower rates than before the pandemic. This suggests that investments should be targeted at encouraging beneficiary populations, along with putting in place adequate safety measures to inspire confidence in them to return to health and nutrition services.

This study is based on a survey of frontline health workers and mothers conducted in three critical time periods – before the start of COVID-19 in December 2019, during India's nationwide lockdown in April 2020, and after the lockdown was lifted in July 2020. To confirm the trends from our survey data, we used longitudinal administrative health data and conducted in-depth interviews with key government staff at the sub-district level.

During the lockdown, almost all services ceased. Only 4 percent of frontline health workers provided services at community health and nutrition events, 29 percent conducted home visits, 1 percent continued antenatal care, and 5 percent monitored child growth, corresponding to reductions in the provision of these services ranging from 50 to 99 percentage points. These substantial declines stemmed partly from the challenges that frontline workers encountered during the pandemic, with 42 percent

reporting having to walk long distances, 29 percent reporting a lack of transportation, and 26 percent reporting a lack of personal protective equipment (PPE). By July 2020 (post-lockdown), most services had resumed, but their availability was still lower than during the pre-pandemic period.

At the onset of the pandemic, frontline health workers adapted their services in a number of ways, including delivering food and micronutrient supplements to homes, ensuring social distancing, using PPE for both workers and beneficiaries, and using phones to coordinate services. In addition, interviews with government staff showed that a key adaptation strategy was prioritizing the most vulnerable beneficiaries.

In contrast to other studies suggesting that a lack of training limited frontline health workers' ability to perform duties during the pandemic, most frontline workers in our study were well-trained and had adequate knowledge of COVID-19. However, many reported receiving inadequate supplies of PPE and little overtime or hazard pay, hindering their work. Other factors contributing to service disruption included labor and supply shortages, increased workloads among frontline workers, lack of transportation, and poor cooperation from beneficiaries.

On the demand side, the study found a substantial reduction of between 40 and 80 percentage points in household use of these services during the lockdown – without much improvement after it ended. Respondents cited fear of infection, resistance to meeting frontline workers, and lack of available services or providers as key reasons. The only service with increased utilization was food rations, which points to the importance of social protection programs during the pandemic.

These results show the importance of stimulating demand for health and nutrition services as the pandemic continues and social distancing measures evolve. While countries and communities continue their efforts to find ways to alleviate pandemic-induced economic shocks and job losses, which have indirect implications for health and nutrition outcomes, it is imperative to continue to strengthen delivery of routine health and nutrition services and to support communities to use them.

This work was supported by the Bill & Melinda Gates Foundation through the IFPRI-led Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (POSHAN).

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POLICY RESPONSES & IMPLICATIONS



26. Smarter policies for enhanced food security and food system outcomes

John McDermott and Laura Allison-Reumann

The COVID-19 pandemic has emphasized a multitude of development challenges and opportunities, some of which are new and some ongoing. The disruptions caused by the pandemic have highlighted the interconnections among almost all aspects of society, including the important linkages between food systems and other sectors that are sometimes separately governed and managed. Achieving the desired food system outcomes of health, sustainability, inclusion, resilience, and efficiency (IFPRI 2021) will require alignment and coordination with other sectors such as health, industry, and social development.

For low- and middle-income countries (LMICs), the scope and persistence of COVID-19 is especially challenging. Waves of COVID-19 will persist without much greater vaccination coverage, but, even as vaccine availability increases, distribution will take time and investment to achieve. Public investments will be critical to rebuilding but constrained by limited fiscal capacity (Díaz-Bonilla 2020). Populations in both urban and rural areas will need support to recover from the pandemic: while urban households experienced greater declines in income, approximately two-thirds of people pushed into poverty in select countries reside in rural areas (Pauw and Thurlow, in this book). Food systems represent a significant share of LMIC economies, and governments must address the need for their transformation while simultaneously managing COVID-19 and other important challenges, such as climate.

The experience of the COVID-19 pandemic has exacerbated inequality, demonstrating that we must provide more comprehensive support to poor and vulnerable communities (Sanchez-Paramo et al. 2021; Kumar et al. 2021). These populations face major challenges in meeting basic needs such as short-term food security and income, safe food and water, and, in the longer term, nutrition, health, education, and other social services (McDermott et al. 2021). In addition to direct impacts, measures to control the pandemic were also especially harmful to these populations: beneficiaries of public assistance, laborers, traders, and other workers in the informal sector were disproportionately affected by lockdowns and movement restrictions (Swinnen and McDermott 2020; Kumar et al. 2021). Pandemic-associated disruptions also affected health clinics (Nguyen et al., in this book), schools (Abay et al. on Nigeria school feeding, in this book), and other local social service platforms. As we move toward recovery from COVID-19, stalled and reversed gains for nutrition and health, education, and women's empowerment will carry long-term implications (Swinnen et al. 2021; Kumar et al. 2021).

Responding to these complex challenges will require smarter food policies and system interventions that link different food system components, consider and enhance synergies, and manage trade-offs across the food system. This approach serves as a necessary next step to build on component-specific food system policies and actions undertaken during the pandemic. The need for a more systemic approach to food systems has been increasingly recognized, with considerable international

and national efforts supported by the United Nations (UN) Food Systems Summit process in 2021. In the longer term, strategies must also include resilience measures to make food systems more efficient, inclusive, sustainable, and healthy. Vulnerability, which is associated with the ineffective rule of law, economic or political marginalization of particular groups, gender inequity, and “invisibility” of the informal sector, must be addressed to strengthen resilience, and the most vulnerable communities must be considered in policy design and implementation (Béné et al. 2021; IFPRI 2021).

The pandemic has also exposed current problems with cross-sectoral competition in government and other organizations. The importance of cross-sectoral engagement is widely recognized, yet responses tend to broaden the sectoral perspective rather than foster cross-sectoral collaboration. Amid the COVID-19 pandemic, many governments have taken measures to enhance cross-sectoral coordination, but national coordination can prove challenging (McDermott et al. 2021).

In this chapter, we bring together policy lessons and recommendations from across the [CGIAR COVID-19 Hub](#), which was coordinated by the CGIAR Research Program on Agriculture for Nutrition and Health and the System Office from June 2020 to December 2021. The COVID-19 Hub coordinated major streams of research, engagement, and communications across CGIAR and its key partners. The Hub consisted of four research working groups, three of which were thematic – value-chain fractures, One Health, and food systems resilience – and one that supported national responses in five focal countries (Bangladesh, Ethiopia, Malawi, Myanmar, and Nigeria).

We consider four major food policy recommendations that address lessons learned, as well as future challenges and opportunities. These recommendations build on existing policy actions, which we regard as good current practices that will need to be adapted and improved upon as the COVID-19 pandemic evolves and coalesces with other urgent, longer-term food security and system transformation priorities.

Policy recommendations for greater food system resilience

1. In response to crises, increase coordination that considers cross-sectoral synergies and all segments and actors throughout the food system.

The COVID-19 pandemic has amplified the major policy challenges presented by complex systems. In response, feasible and meaningful policy actions that minimize unintended harm are needed (McDermott and Allison-Reumann 2022). While we acknowledge that governments cannot and should not be solely responsible for all coordination, the following section presents key policy recommendations that can provide critical alignment and/or coordination to address important challenges.

Government coordination bodies

In recognition of the interconnected nature of pandemics and crises more generally, national governments have established coordination bodies with the aim of assembling a wide range of sectors to establish and implement preparedness and response plans for times of crisis. The [COVID-19 Policy Response Portal](#) (IFPRI 2020a) showed that numerous countries established committees and task forces in which health ministries worked with other sectors, including commerce, industry, foreign affairs, and urban development. Multiple agriculture policies were implemented, but agriculture ministries were rarely included in coordination bodies (Resnick 2020). Without their inclusion, COVID-19 responses for other sectors may fail to consider possible impacts on agriculture and food systems (Resnick 2020). The potential risks resulting from this missed opportunity to include agriculture – a sector that is key to food security and food system resilience – must be avoided in future crises.

A One Health approach

For many years, public and veterinary health agencies have recognized the importance of the One Health approach, which coordinates human, animal, and environmental health, in preventing and controlling infectious diseases. However, the COVID-19 pandemic has highlighted the ongoing weaknesses in coordination across these domains, with pandemic preparedness representing the obvious challenge. Many emerging diseases in human populations come from animals and have clear links to food systems. The spillover of infections from wildlife to humans, often occurring through domestic animals, is a long-neglected issue that is central to future pandemic preparedness (UNEP-ILRI 2021). [Box 1](#) further outlines issues related to the management of pandemic risks associated with wildlife.

Improving surveillance systems for zoonotic diseases arising from animals used in the food chain, including in live and wet markets, is also essential to avoid future health crises (Naguib et al. 2021). A broader framework for cohesive policy responses that encompasses environmental protection, sustainable and equitable food systems, sanitary protection measures, and targeted efforts to prevent zoonoses is required to address the multifaceted impacts of the current pandemic and other crises (UNEP-ILRI 2020). In many transitioning food systems, food safety is a particular concern for all fresh foods, including foods from animals and fruits and vegetables. Two high-priority food safety issues involve reducing risks to microbial pathogens in fresh foods and managing antimicrobial resistance in food chains (ILRI 2021).

Policy trade-offs and minimizing harm

Due to the interconnected nature of the food system, some of the emergency response policies implemented to protect certain sectors or actors caused harm to others within the system (IFPRI 2021). As policies are enacted to protect one sector, segment of the food system, or particular population group, associated trade-offs must be identified and, where feasible, offsetting measures implemented. Even with the best intentions to minimize harm and find an optimal balance between economic, health, and social trade-offs, however, limited funds, capacity, and the unprecedented nature of the pandemic have made this an immense challenge for LMICs in particular.

BOX 1 Pandemic risks: Wildlife and bushmeat

Recent disease emergences have highlighted the potential of pathogens to cross from wildlife to humans, sometimes through domestic animal hosts (Bett et al. 2021). The zoonotic capacity of SARS-COV-2 to transmit disease across multiple wild and domestic animal species (Fischhoff et al. 2021) illustrates the important epidemic risks of spillovers and the need for smarter policies and actions.

Recent studies in Africa and Asia (Staal et al. forthcoming) provide insights into the nature of wildlife value chains and bushmeat marketing and trade. In Africa, bushmeat primarily provides food but is also a source of income for approximately 40 percent of households living at the forest margins. In Asia, wildlife value chains are more organized, providing meat and other products (such as bat guano). Compared to Africa, Asian wildlife value chains are more formal, and some wild species are commercially farmed.

The COVID-19 pandemic has naturally raised awareness of epidemic risks for

humans, but as with other risk mitigation measures, there is great danger that policies and actions for wildlife will increase rather than decrease zoonotic risk (UNEP-ILRI 2021) by pushing people to clandestine activities. Two lessons from other epidemic diseases of humans and animals are relevant for policymakers. First, there is a need to work closely with communities and institutions involved in wildlife markets and trade on mitigation measures that are feasible and address both community welfare and disease risk (Booth et al. 2021). Second, smarter monitoring and decision-making tools should be developed for wildlife and their environments that incorporate the spillover risks of pathogens and link to the multiple social and economic benefits of wildlife – from conservation and ecology to livelihoods and the economy. As we have seen with HIV/AIDs and the eradication of rinderpest in pastoral communities, effective solutions require engaging communities. Not doing so would be harmful to communities and the achievement of risk reduction.

The strict lockdowns implemented to control the spread of the virus are one such example of a well-meaning policy that had unintended consequences. For the world's poor and vulnerable, particularly those who rely on labor for their livelihoods, the impacts of these lockdowns were especially severe (McDermott et al. 2021). Urban food trade was also significantly affected by these restrictions, which included curfews (Liverpool-Tasie et al. 2021), the introduction of permits, the relocation of city markets to less densely populated areas, and, in some cases, the closure of markets for extended periods, as in Burkina Faso, Nigeria, Uganda, and other countries (IFPRI 2020a; Mutua et al. 2021). Movement restrictions affected supply to markets as well. In Addis Ababa, for example, reduced trading at vegetable wholesale markets was likely linked to a decline in trucks entering the city as a result of travel bans and decreased demand due to

restaurant closures, among other factors (Tamru et al. 2020). These measures impacted people's livelihoods and their access to food, which then led to the sudden contraction of demand and wastage of perishable foods, such as dairy products and vegetables (Place et al., in this book).

Individual policy actions for components of the food system were effective in a broader food system context. The expansion of input subsidies (for example, in Kenya and Uganda), food procurement (as in India), and mechanization programs (for instance, in Bangladesh) had favorable effects on production, while improved credit access and terms and investment in digital infrastructure provided support to food value chain companies (for example, in Malaysia). Yet the effectiveness of these expanded or enhanced programs required that enabling policy conditions existed prior to the pandemic (McDermott and Allison-Reumann 2022).

There is little information on unintended consequences for other food system actors beyond the target group and only general information on who benefits from specific policy actions and food system transformation pathways. Impact pathway analysis may contribute to a deeper understanding of unintended consequences. Analyses conducted during the pandemic demonstrate how policy responses that embrace a systems perspective and acknowledge the existence of multiple impact pathways and their differing impact intensities are more likely to be targeted and prioritized in an appropriate way, and thus have a greater chance of being effective and avoiding unintended harm (Béné et al 2021). A systems perspective also allows for the consideration of impacts beyond the target group.

2. Invest in policy responses that strengthen and protect the food system in the short and long term.

Food system interventions need to reflect the rapid and dynamic changes in food systems in LMICs, recognizing increasing shocks such as COVID-19 and other human diseases, as well as plant and animal epidemics, droughts, floods, storms, and conflicts. These shocks must be managed to accelerate systems transformation linking technical and institutional innovations. The pandemic has highlighted many opportunities for systems interventions that strengthen and protect food systems in the short term and hold implications for long-term outcomes. We focus on three lessons: the bundling of technical, institutional, and policy innovations; collaboration to leverage synergies between public and private sectors; and the application of digital technologies and systems to transform food systems.

Bundling technical, institutional, and policy innovations

There is extensive evidence, reinforced by the pandemic, that successful food system innovations require combinations of technical, institutional, and policy elements. These elements are particularly important in transitioning food systems in LMICs where smallholders require institutional and policy support for technical inputs, knowledge management, and marketing (McCullough et al. 2008). As the demands of food systems expand and evolve, so too will the complexity of linking combinations of components into an innovation pathway. [Box 2](#) illustrates how bundling can be applied to achieve a priority food system outcome.

BOX 2 Socio-technical bundles for food system innovation

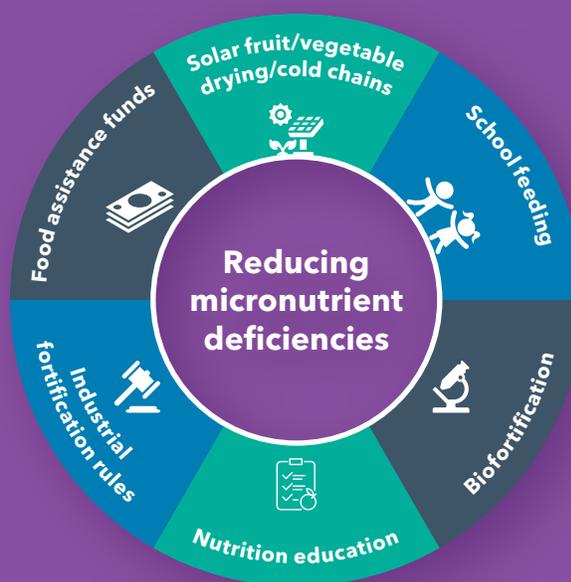
Numerous technological and policy innovations exist to address food system challenges. These innovations include new applications for digital technologies, improved genetic editing, innovative finance, social protection, and civic engagement. To overcome adversity and maximize positive outcomes, technical and policy innovations must be combined into mutually reinforcing socio-technical bundles. These should be fit to context, creating an enabling environment to scale up existing solutions.

To be successful, however, at least as much time and effort must be devoted to building bundles as to creating their component parts. When implementing sociotechnical bundles, stakeholders must monitor key performance measures and anticipate the need for adaptations to address spillover effects. Bundles also need to include incentives and constraints to steer the actions of independent actors toward mutually beneficial outcomes. Inclusivity and equity among actors is critical to successful coordination, which in turn is important for establishing shared responsibility and a collective action agenda.

As COVID-19 persists and merges with other challenges, innovations for basic food and nutrition security will be needed in rural areas. Barrett and colleagues (2020) describe a bundle designed to reduce micronutrient deficiencies. In this context, a combination of technical innovations may be needed, such as

biofortified crops and solar-powered refrigeration technology. These can be complimented by regulations for food processing, such as mandatory iodization of manufactured salt. Social support payments, school feeding programs, and nutrition education would further expand access to healthy foods in addition to promoting healthy behavior change. By combining different solutions, policy-makers can address the multifaceted challenge of micronutrient deficiency, and subsequently apply or adapt these solutions in appropriate ways during times of crisis.

FIGURE 1 Example of a socio-technical innovation bundle



Source: Based on Barrett et al. 2020.

Public-private collaboration

Public-private collaboration across the food system is needed to build future food system resilience. The adaptability of the private sector to new business and policy environments is a potentially important driver of the recovery from COVID-19 (IFPRI 2021).

Throughout the pandemic, the food system has proved to be both susceptible and resilient to disruptions (Vos et al., in this book), but innovations from the private and public sectors have helped to lessen negative impacts. Early in the pandemic, for example, China's Ministries of Agriculture and Rural Affairs (MARA), Transport, and Public Security protected the transport of agricultural inputs and outputs by prohibiting unauthorized interceptions, roadblocks, and other disruptions. MARA also prohibited disruptions to the delivery of animal feed, breeding animals, meat, dairy products, and seafood, and it provided incentive measures to support livestock farming (AGFEP 2021; Chen et al. 2020). To ensure the flow of agricultural products and inputs, China opened a "green channel" to distribute fresh agricultural products (Chen et al. 2020). Across countries, large private firms accelerated innovations in response to the disruptions caused by public health control measures (see Liverpool-Tasie et al. 2021; IFPRI 2020a; Mutua et al. 2021; Reardon and Vos 2021). In India, for example, public and private innovations helped the country's large and varied downstream food sector withstand pandemic-related disruptions ([Box 3](#)).

While the policy-enabling measures associated with the pandemic have been critical, there has also been demand for the strengthening of existing technical and institutional innovations. For rice supply chains, for example, there has been interest in regulatory frameworks for contract farming, which can facilitate the procurement of outputs (such as high-quality paddies) by mid-stream actors (such as millers), reduce the number of intermediaries, reduce reliance on informal markets, and encourage the adoption of sustainable production standards (Arouna et al. 2020; Quilloy et al. 2021).

The public sector can play a major enabling role by supporting open access to global, regional, and domestic food markets. The 2007/08 food price crisis showed that export bans from producing countries led to upward pressure on food prices. During the COVID-19 pandemic, many countries followed the advice from IFPRI and other international agencies not to impose export bans (Glauber et al. 2020; Vos et al., in this book), thus helping to avoid significant food shortages and price increases for major traded foods (Laborde et al. 2020). However, some market and trade restrictions have caused food supply disruptions, as shown by border restrictions (Bouet and Laborde 2020) and urban restrictions on fresh food markets in Africa (Resnick 2020).

Digital innovations

Digital innovations in market transactions, business processes, and data gathering (Oldekop et al. 2020) have been facilitated by increased internet access in urban and rural areas. Given the improvements in access to markets during the pandemic, especially through digital services, these efforts should be built upon and accelerated (Reardon, Swinnen, and Vos, in this book). A review of the resilience of agricultural production systems during the pandemic recognized the potential for digital extension and knowledge to support the productivity and incomes of farmers

BOX 3 Food enterprise impacts and responses in India

India has 21 million food enterprises, which generated US\$227 billion and employed 25 million men and 10 million women in 2015–2016. The 2020 Periodic Labor Force Surveys (released in 2021) identified the pandemic’s impacts on food enterprises in the country, finding that small, micro, and informal enterprises experienced decreased sales as well as reduced access to inputs, including labor, and depletion of working capital.

Among all food enterprises, the food services sector was the most adversely impacted, with year-on-year comparisons showing that earnings declined almost 37 percent and employment contracted 13 percent in urban areas and 15 percent in rural areas. Women’s employment declined by more than 38 percent. A report released by the National Restaurant Association of India estimated that the food services industry contracted by more than 50 percent in the 2021 financial year (*Hindu Business Line* 2021). For food manufacturing, the impacts were higher in urban locations. The food retail sector, on the other hand, emerged as a “surge” sector, expanding by more than 60 percent in urban areas, with no measurable negative effects in rural areas. By type of employment, own account (self-employed or family labor) enterprises and casual labor were the most adversely affected by COVID-19.

Notwithstanding these large shocks, food enterprises have also experienced positive organizational changes and innovations. Most importantly, for the first time, food

enterprises have come to the forefront of policy as policymakers acknowledge the importance of their role in economic growth and recovery. The COVID-19 policy response package for food enterprises emphasized a cluster approach that developed commodity-specific policy clusters for product supply chains such as *makhanas* (fox nuts) from Bihar, *kesar* (saffron) from Kashmir, and tapioca from Tamil Nadu. The government also launched a central scheme to formalize food processing micro-enterprises. These enterprises were provided with credit-linked capital subsidies and some seed capital through self-help groups and farmer organizations to develop labs, warehouses, cold storage facilities, and packaging and incubation centers. Support for marketing and branding was also part of the COVID-19 recovery plan. The Operation Greens Scheme, which protects tomato, onion, and potato growers from distress sales (through transport and storage subsidies), was extended to all horticulture.

The use of e-commerce for food supply, which was already growing fast before the pandemic, has experienced the most dramatic changes. Examples of e-commerce suppliers include Jio Mart for grocery delivery and Walmart-Flipkart for wholesale and retail supply chains. While consumers strongly preferred home-cooked food early in the pandemic, online food deliveries rebounded over time to surpass pre-pandemic levels. Indeed, the online food delivery system Zomato had one of the largest initial public offerings when it went public in 2021 (Govindarajan and Srivastava 2021).

(Dixon et al. 2021). However, such knowledge services will require more data, some of which can be collected remotely (Amjath-Babu et al. 2020).

Large firms have mostly been able to adjust their supply chains by accelerating the use of digital tools and other approaches (see Reardon, Swinnen, and Vos, in this book). E-commerce has also greatly expanded during the pandemic (Box 3). There are possibilities for digital innovation from small and medium enterprises (SMEs) as well, particularly in countries with good digital ecosystems, such as Kenya. One such example for fresh foods is Twiga Foods, a business-to-business platform that links farmers, input suppliers, food companies, and vendors (Box 4). Given that in African countries, between 75 and 90 percent of consumed food relies on domestic markets served by SMEs, such platforms and networks can be critical to improving supply chain performance through innovation.

3. Develop and strengthen policies that support the basic needs of vulnerable groups.

In many countries, social protection programs were implemented as critical elements of emergency responses, along with other policy actions providing support to many households. However, as the pandemic persisted, additional challenges and opportunities to provide more effective support have been identified (Gentilini 2021). In LMICs, limited administrative and fiscal capacity to implement policies are constraints that must be addressed (Díaz-Bonilla and Centurion, in this book; McDermott et al. 2021). This section discusses two important policy system levers for inclusive development: (1) establishing and adapting robust public programs to support vulnerable populations and (2) building capacity for meeting basic needs through smarter investments and better implementation.

Establishing robust public programs

Throughout the pandemic, vulnerable populations have been supported by a range of public programs that include cash transfers, food distribution, and the provision of water, health, and other essential services. Many countries either expanded social protection programs, provided

BOX 4 Business-to-business platforms for food system innovation

In Kenya, Twiga Foods provides a business-to-business platform that connects farmers and food manufacturers with vendors (Twiga Foods 2021). Twiga Foods has used mobile technology to gather five years of data on the market demand for 17 fruit and vegetable crops from more than 20,000 farmers and 12,000 small-scale vendors. These data are currently being analyzed to identify inefficiencies in fresh fruit and vegetable production and distribution. These data and analyses will also assist policymakers in identifying sustainable ways to provide healthy, safe, and affordable food to a growing urban population in Nairobi and beyond (CGIAR Platform for Big Data 2021).

larger benefits, or extended them to include more beneficiaries, such as informal workers and the urban poor (McDermott et al. 2021). In South Africa, for example, the government implemented policies to support vulnerable groups such as children, the elderly, and disabled people, because the infrastructure for disbursing grants was already in place. The government increased the levels of existing social grants and introduced a temporary Social Relief of Distress fund to support unemployed people not covered by other social grants or unemployment insurance. Targeting support to lower-income households as a temporary and extraordinary measure during the pandemic led to other benefits as well. A modeling exercise on the near-term economic impacts of extending these social support programs found that this would also lead to greater GDP growth in the country (Gabriel et al. 2021).

In some countries, governments developed innovative programs to assist populations that are frequently marginalized and excluded from public programs, such as informal food system workers in urban areas. In Burkina Faso, one public program established a US\$9 million fund to help informal sector workers, especially women, relaunch fruit and vegetable sales, while in Malawi, the government provided US\$46 per month for six months for up to 172,000 households working in food markets in major cities. In India, a credit program enabled 5 million street food vendors to access loans of up to US\$135 (Resnick 2019; IFPRI 2020a; Kennedy and Resnick 2020).

The pandemic further exposed the gender inequalities and vulnerabilities faced by women (see, for example, Alvi et al. 2021), but the social protection response in most countries has not been gender sensitive. A review of 212 countries showed that fewer than 30 programs across 25 countries included gender-sensitive components, representing only 2 percent of all measures undertaken across the countries studied (Kumar et al. 2021). Complementary programs focused on gender-based violence, mental health, and maternal and reproductive health should be considered in the design of social protection programs – not just in response to shocks but also to foster long-term change that can prevent future financial and health-related crises (Kumar et al. 2021).

Disparities are also reflected in the capacity to provide social protection payments. Social protection cash transfers worldwide doubled relative to pre-pandemic levels, and the number of beneficiaries increased by 240 percent. However, no low-income country reached more than one-third of their population with cash transfers (Kumar et al. 2021). Digital technologies, such as electronic transfers of social protection payments, showed promise during the pandemic but also highlighted the digital divide between low- and high-income households and countries. With many support services being contingent on digital connectivity, they have often been unavailable, particularly to the rural poor who lack digital access (Kumar et al. 2021).

Fiscal support

In the first year of the pandemic, international funds were quickly deployed to poor countries to expand social protection and market functioning (Díaz-Bonilla and Centurion, in this book). Such programs are generally useful for addressing multiple shocks, including those associated with climate, conflict, and other disruptions (Díaz-Bonilla 2020). Ongoing efforts aim to support LMICs with international funds through the use of innovative financing arrangements that involve governments and the private sector, as described by Díaz-Bonilla and Centurion in this book.

As a result of dramatic losses in income during the pandemic, food demand and access experienced the greatest shocks within the value chain (Place et al., in this book). To support demand and address food supply disruptions, social programs provided access to credit facilities that could help buyers, producers, and suppliers access labor, equipment, and inputs to maintain production and business operations. Governments also took actions to support food production and distribution by reducing import duties on inputs, facilitating their procurement through e-vouchers and other innovative credit arrangements, and implementing price and market support through procurement programs (Place et al., in this book). Place and colleagues also describe measures for midstream food supply actors that include grants and credit, investments in new market structures and digital infrastructure, and stimulus packages for fresh foods, including fruits and vegetables in Burkina Faso and fish in India.

4. Use evidence gathered during the COVID-19 pandemic to support information sharing, cross-country learning, and knowledge management that informs decision- and policymaking.

Obtaining information and evidence for decision-making has been a major challenge during the COVID-19 pandemic. Multiple approaches have been used to estimate the impacts of the pandemic and assess the outcomes of interventions. These approaches include model-based scenario analyses, surveys of households and groups of food system actors (often by telephone), and case studies of supply chains and policy indicators (see Vos et al. forthcoming), but basic information is often lacking in some countries (such as deaths and case rates attributed to COVID-19).

The pandemic's many disruptions have demonstrated the need for monitoring that provides robust and reliable information at appropriate spatial levels and time intervals. Countries are also recognizing the importance of information about key food sector components for policy and investment decisions. Such evidence-based policymaking has been integrated into most country transformation pathways developed as part of the [UN Food Systems Summit process in 2021](#).

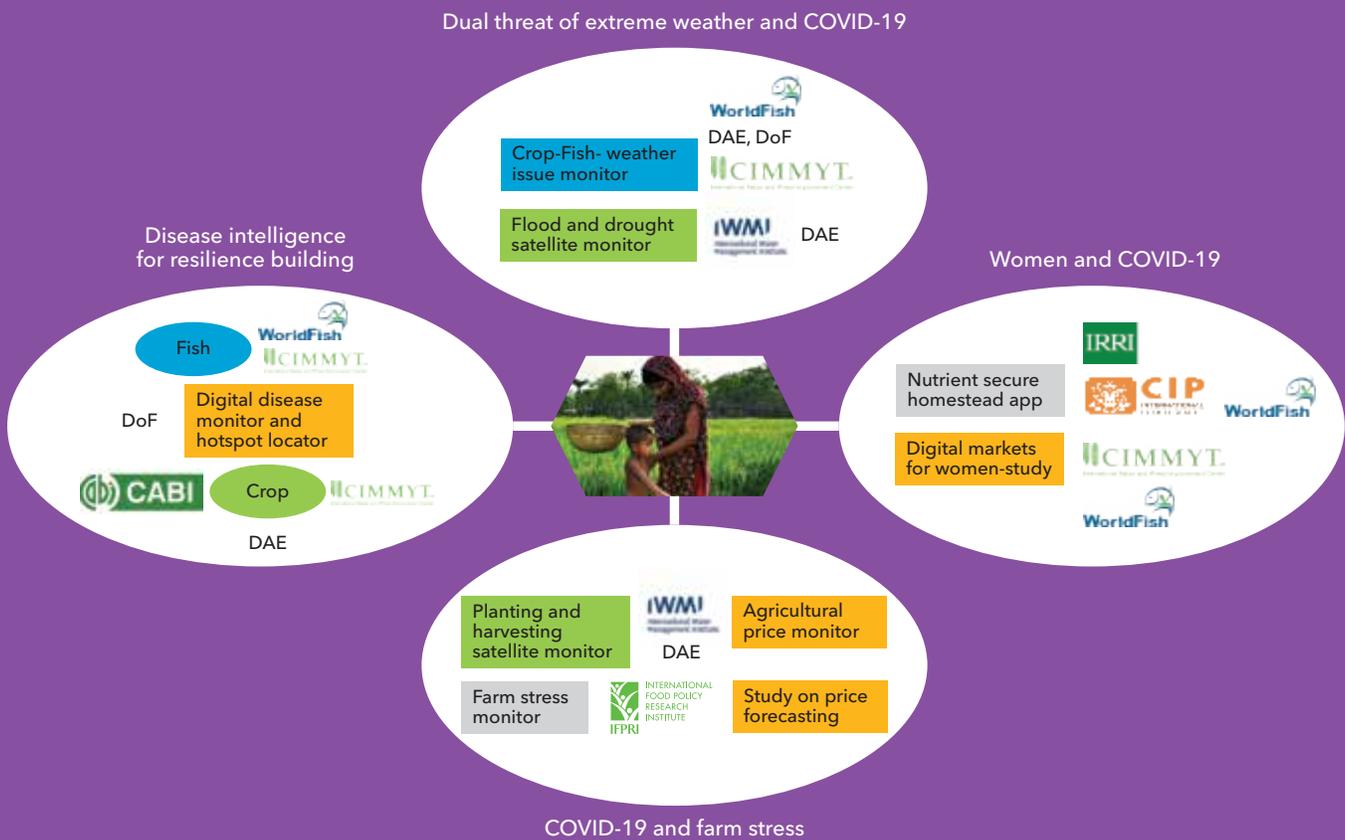
Lessons on data

Capturing representative and robust information has been a central challenge for information and evidence-gathering during the pandemic. Many studies conducted in response to the pandemic built on existing datasets; while efficient and beneficial, this approach cannot replace the need for novel studies. Studies built on existing data should instead be used to complement novel research. While valuable, modeling did not always provide accurate predictions and needed to be revisited as the pandemic became a prolonged crisis (Pauw and Thurlow, in this book). Much of the new data on impacts from COVID-19 was collected through phone surveys, which allowed adherence to social distancing. However, these surveys had high attrition rates and raised concerns about data accuracy (Swinnen and Vos 2021; Gilligan et al., in this book). Many countries have gathered national-level data during the crisis, and numerous international organizations and research institutes have made efforts to collect relevant real-time cross-country and regional data ([Box 5](#)) (Pauw, Smart, and Thurlow 2021). This wealth of information should be optimized and used to inform policy- and decision-making at all levels.

BOX 5 Food system monitoring in Bangladesh

In Bangladesh, national food system monitoring was started during the pandemic at the government's request and implemented with national partners, CGIAR, and the Food and Agriculture Organization of the United Nations (FAO) (Amjath-Babu et al. 2020). This monitoring regime will be used in the longer term for climate shocks as well. The regime uses spatial and temporal data on internal farm factors; crop and animal health indicators detected through satellites; external input supply; weather variables; the availability of agricultural services; and processing and market conditions, including price data (Figure 2) (Amjath-Babu et al. 2020). Monitoring consumer data and demand fluctuations are also important to make sure that supply chains are resilient and functional.

FIGURE 2 Bangladesh's food system monitoring regime



Source: CGIAR COVID-19 Hub.

Note: DoF = Department of Fisheries; DAE = Department of Agricultural Extension.

Engaging actors at multiple levels

In many countries, national data and statistical agencies can coordinate the alignment of food system monitoring data across health, food, and economic sectors. These agencies facilitate the valuable exchange of information, personnel, and tools and approaches, all of which enable capacity building and knowledge transfer (OECD 2021). Support to these agencies is critical, as is support for their engagement with similar agencies in other countries. Engaging local stakeholder groups and strengthening the capacity of national and subnational actors through investments in food systems research can lead to a better understanding of interconnections. This research should include a focus on building resilience at multiple levels from productive landscapes to value chains, with the aim of avoiding negative consequences for food security and nutrition in times of crisis.

Given the cross-border implications for food system transformation pathways, a primary aim of information and data gathering should be to identify how successful policies and initiatives can be replicated and scaled across countries, with consideration for local specificities and conditions. Although public expenditure decisions may focus on context-specific responses at the national and subnational levels, international cooperation is also critical due to the complexity of value chains, the global nature of many crises, and transborder environmental challenges, among others. When coordinated actions are undertaken quickly to manage issues detected by monitoring systems, they can foster resilience to complex shocks that affect the food system through multiple pathways (Béné et al. 2021). International governance bodies and international organizations can play a major role in collecting and analyzing data, as well as coordinating and facilitating information sharing and learning. For example, the [COVID-19 Policy Response Portal](#) (IFPRI 2020a) and [COVID-19 Food Price Monitor](#) (IFPRI 2020b), as well as ongoing analyses of the causes, impacts, and responses to the pandemic by countries and the international community, continue to inform future policy decisions.

Real-time monitoring of key food system components is essential for the future resilience of food systems (Fanzo et al. 2021). Recognizing the need for this monitoring, IFPRI worked with local partners during 2020 to develop economywide models that analyze real-time COVID-19 impacts on economic growth, food systems, and livelihoods in approximately 30 countries (Pauw and Thurlow, in this book; Pauw, Smart, and Thurlow 2021). At the request of the Government of Bangladesh, CGIAR, FAO, and others also supported the monitoring of food production value chains during the pandemic (Amjath-Babu et al. 2020). Such monitoring systems, which inform local and national decision-making, also align with the [country transformation pathways](#) developed as part of the UN Food Systems Summit process (UNFSS 2021).

Conclusion

As the COVID-19 pandemic continues to evolve, it will hold lasting implications for food security and other food system outcomes, and overlap with other challenges stemming from climate change, conflict, and the economy. In this chapter, we have proposed four important policy adaptations that arise from lessons learned throughout the pandemic to date. Food systems have been relatively resilient during this time, but as we move forward toward recovery and transformation, practical policies and actions will be needed that correspond to relevant national contexts.

Food policy must be coordinated and linked with other important sectors in order to recognize trade-offs, unintended consequences, and synergies. While coordination across all sectors is not possible, One Health represents an important framework for bridging sectors and, from a pandemic preparedness perspective, it is a neglected area for coordination. The transformation pathways and actions resulting from the 2021 UN Food Systems Summit process provide a meaningful opportunity for countries to use lessons from COVID-19 to strengthen food transformation strategies and actions. Smarter policies and programs must also consider the basic needs of the poor and vulnerable, who suffered the most severe impacts of the pandemic. Neglecting these needs in the short-term will cause severe repercussions for human development in the long term.

While COVID-19 has raised many new complications, it has also presented opportunities for more evidence-based policymaking. Decision-makers need real-time and spatially instructive data to inform their policies, regulations, and investments from macro to micro levels. As novel methods for combining different data-capture and analysis methods evolve, they must be further developed and implemented, and linked to strengthened and inclusive digital infrastructure and approaches.

Despite initial hopes that COVID-19 would be eliminated rapidly, as SARS was in 2003, it seems increasingly likely that the disease will transition to an endemic form with ongoing waves. The persistence of COVID-19 requires changed thinking and efforts that place an integrated focus on the pandemic and climate, conflict, and other challenges. As we mark the second anniversary of the pandemic's start and consider the future, these four food policy domains represent a useful starting place for smarter policies that build the resilience of global food systems.

References

- Abay, K.A., M. Amare, L. Tiberti, K.S. Andam, and M. Wang. 2022. "COVID-19-Induced Disruptions of School Feeding Services Exacerbate Food Insecurity in Nigeria." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: International Food Policy Research Institute (IFPRI).
- Academy of Global Food Economics and Policy (AGFEP), China Academy of Rural Development (CARD), Centre for International Food and Agricultural Economics (CIFAE), Institute of Agricultural Economics and Development (IAED), and IFPRI. 2021. [2021 China and Global Food Policy Report](#). Beijing: AGFEP and IAED; Hangzhou, China: CARD; Nanjing, China: CIFAE; Washington, DC: IFPRI.
- Alvi, M.F., P. Barooah, S. Gupta, and S. Saini. 2021. "[Women's Access to Agriculture Extension amidst COVID-19: Insights from Gujarat, India and Dang, Nepal](#)." *Agricultural Systems* 188: 103035.
- Amjath-Babu, T.S., T.J. Krupnik, S.H. Thilsted, and A.J. McDonald. 2020. "[Key Indicators for Monitoring Food System Disruptions Caused by the COVID-19 Pandemic: Insights from Bangladesh towards Effective Response](#)." *Food Security* 12 (4): 761-768.
- Arouna, A., G. Soullier, P. Mendez del Villar, and M. Demont. 2020. "[Policy Options for Mitigating Impacts of COVID-19 on Domestic Rice Value Chains and Food Security in West Africa](#)." *Global Food Security* 26: 100405.
- Barrett, C.B., T.G. Benton, J. Fanzo, M. Herrero, R.J. Nelson, et al. 2020. [Socio-technical Innovation Bundles for Agri-food Systems Transformation, Report of the International Expert Panel on Innovations to Build Sustainable, Equitable, Inclusive Food Value Chains](#). Ithaca, NY: Cornell Atkinson Center for Sustainability; London: Springer Nature.
- Baudron, F., and F. Liégeois. 2020. "Fixing Our Global Agricultural System to Prevent the Next COVID-19." *Outlook on Agriculture* 49 (2): 111-118.
- Béné, C., D. Bakker, M.J. Chavarro, B. Even, J. Melo, and A. Sonneveld. 2021. [Impact of COVID-19 on People's Food Security: Foundations for a More Resilient Food System](#). Report prepared for the CGIAR COVID-19 Hub Working Group 4. Montpellier, France: CGIAR.

- Bett, B., D. Randolph, and J. McDermott. 2020. "[Africa's Growing Risk of Diseases that Spread from Animals to People.](#)" *IFPRI Blog*, April 7.
- Booth, H., M. Arias, S. Brittain, D.W.S. Challender, M. Khanyari, et al. 2021. "'Saving Lives, Protecting Livelihoods, and Safeguarding Nature': Risk-Based Wildlife Trade Policy for Sustainable Development Outcomes Post-COVID-19." *Frontiers in Ecology Evolution* 9: 639216.
- Bouet, A., and D. Laborde. 2020. "[COVID-19 Border Policies Create Problems for African Trade and Economic Pain for Communities.](#)" In *COVID-19 and Global Food Security*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.
- CGIAR Platform for Big Data in Agriculture. 2021. "[Hungry Cities: Inclusive Food Markets in Africa.](#)"
- Chen, K., Y. Zhang, Y. Zhan, S. Fan, and W. Si. 2020. "[How China Can Address Threats to Food and Nutrition Security from the Coronavirus Outbreak.](#)" *IFPRI Blog*, February 12.
- Díaz-Bonilla, E. 2020. "[Fiscal and Monetary Responses to the COVID-19 Pandemic: Some Thoughts for Developing Countries and the International Community.](#)" In *COVID-19 and Global Food Security*, edited by J. Swinnen and J. McDermott, 98-101. Washington, DC: IFPRI.
- Díaz-Bonilla, E., and M. Centurion. 2022. "Fiscal and Monetary Responses to the COVID-19 Pandemic: Current Conditions and Future Scenarios in Developing Countries." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.
- Dixon, J.M., J. Weerahewa, J. Hellin, M.F. Rola-Rubzen, J. Huang, et al. 2021. "[Response and Resilience of Asian Agrifood Systems to COVID-19: An Assessment across Twenty-Five Countries and Four Regional Farming and Food Systems.](#)" *Agricultural Systems* 193: 103168.
- Fanzo, J., L. Haddad, K.R. Schneider, C. Béné, N.M. Covic, et al. 2021. "[Viewpoint: Rigorous Monitoring is Necessary to Guide Food System Transformation in the Countdown to the 2030 Global Goals.](#)" *Food Policy* 104: 102163.
- Fischhoff, I.R., A.A. Castellanos, P.G.L.M. Rodrigues, A. Varsani, and B. Han. 2021. "[Predicting the Zoonotic Capacity of Mammals to Transmit SARS-CoV-2.](#)" *Proceedings of the Royal Society B* 288 (1963): 20211651.
- Gabriel, S., D.V. Seventer, C. Arndt, R.J. Davies, L. Harris, S. Robinson, and J. Wilf. 2021. "[Extraordinary COVID-19 Social Support Programs in South Africa Yield Economic Benefits during the Pandemic Period.](#)" *IFPRI Blog*, August 30.
- Gentilini, U. 2021. "[A Game Changer for Social Protection? Six Reflections on COVID-19 and the Future of Cash Transfers.](#)" *World Bank Blogs*, January 11.
- Gilligan, D.O., G. Berhane, K. Hirvonen, N. Kumar, and J. Leight. 2022. "Uneven Recovery and a Lingering Food Crisis during the COVID-19 Pandemic for Rural Safety Net Transfer Recipients in Ethiopia." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.
- Glauber, J., D. Laborde, W. Martin, and R. Vos. 2020. "[COVID-19: Trade Restrictions are Worst Possible Response to Safeguard Food Security.](#)" *IFPRI Blog*, March 27.
- Govindarajan, V., and A. Srivastava. 2022. "[What Zomato's \\$12 Billion IPO Says About Tech Companies Today.](#)" *Harvard Business Review*. August 6.
- Hindu Business Line*. 2021. "[Covid Shrinks India's Restaurant Industry by Half: NRAI Report.](#)" October 25.
- IFPRI (International Food Policy Research Institute). 2020a. [COVID-19 Policy Response Portal](#).
- IFPRI. 2020b. [COVID-19 Food Price Monitor](#).
- IFPRI. 2021. [2021 Global Food Policy Report: Transforming Food Systems after COVID-19](#). Washington, DC.
- ILRI (International Livestock Research Institute). 2021. [Managing Antimicrobial Use in Livestock Farming Promotes Human and Animal Health and Supports Livelihoods](#). Livestock Pathways to 2030: One Health Brief No. 3. Nairobi: ILRI.
- Kennedy, A., and D. Resnick. 2020. [Scaling Up and Sustaining Social Protection under COVID-19](#). Project note. Washington, DC: IFPRI.
- Kumar, N., A. Quisumbing, U. Gentilini, and S. Shapleigh. 2021. "[Toward Inclusive Food Systems: Pandemics, Vulnerable Groups, and the Role of Social Protection.](#)" In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, 54-63. Washington, DC: IFPRI.
- Laborde, D., W. Martin, J. Swinnen, and R. Vos. 2020. "[COVID-19 Risks to Global Food Security.](#)" *Science* 369 (6503): 500-502.
- Liverpool-Tasie, L.S.O., T. Reardon, and B. Belton. 2021. "[Essential Non-Essentials: COVID-19 Policy Missteps in Nigeria Rooted in Persistent Myths about African Food Supply Chains.](#)" *Applied Economic Perspectives and Policy* 43 (1): 205-224.
- McCullough, E.B., P.L. Pingali, and K.G. Stamoulis, eds. 2008. *The Transformation of Agri-Food Systems: Globalization, Supply Chains and Smallholder Farmers*. Rome: Food and Agriculture Organization (FAO).
- McDermott, D., and L. Allison-Reumann. 2022. [COVID-19 Lessons for Food System Resilience](#). CGIAR COVID-19 Hub Policy Brief. Washington, DC: IFPRI.

- McDermott, J., D. Resnick, and N. Naylor. 2021. "[Resilience: From Policy Responses to Resilient Policy Systems.](#)" In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, 24–35. Washington, DC: IFPRI.
- Mutua, F., E. Kang'ethe, and D. Grace. 2021. "[The COVID-19 Pandemic and Its Implications for Food Safety in East Africa.](#)" ILRI Discussion Paper 40. Nairobi, Kenya: International Livestock Research Institute.
- Naguib, M.M., R. Li, J. Ling, D. Grace, H. Nguyen-Viet, and J.F. Lindahl. 2021. "[Live and Wet Markets: Food Access versus the Risk of Disease Emergence.](#)" *Trends in Microbiology* 29 (7): 573–581.
- Nguyen, P.H., S. Kachwaha, R. Avula, P. Menon, and M. Wang. 2022. "COVID-19 Disruptions to Health and Nutrition Services in Uttar Pradesh, India." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.
- Oldekop, J.A., R. Horner, D. Hulme, R. Adhikari, B. Agarwal, et al. 2020. "[COVID-19 and the Case for Global Development.](#)" *World Development* 134: 105044.
- Organisation for Economic Co-operation and Development (OECD). 2011. [Strengthening National Statistical Systems to Monitor Global Goals](#). Paris: OECD.
- Pauw, K., J. Smart, and J. Thurlow. 2021. "[The Short-Run Economic Costs of COVID-19 in Developing Countries in 2020: A Synthesis of Results from a Multi-country Modeling Exercise.](#)" IFPRI Project Note. Washington, DC: IFPRI.
- Pauw, K., and J. Thurlow. 2022. "COVID-19 Impacts on Food Systems, Poverty, and Diets: Lessons Learned from Country-Level Analyses." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.
- Place, F., D. Stoian, and N. Minot. 2022. "COVID-19, Agricultural Production, and Food Value Chains." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.
- Quilloy, R., M. Demont, and P. Ricarte. 2021. "Towards Inclusive and Sustainable Contract Farming". *Rural* 21, Nov. 24, 36–37.
- Reardon, T., J. Swinnen, and R. Vos. 2022. "COVID-19 and Resilience Innovations in Food Supply Chains." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.
- Reardon, T., and R. Vos. 2021. "[Food Supply Chains: Business Resilience, Innovation, and Adaptation.](#)" In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, 64–73. Washington, DC: IFPRI.
- Resnick, D. 2019. "[Deepening Decentralization in Zambia Political Economy Constraints and Opportunities for Reform.](#)" IFPRI Discussion Paper 1893. IFPRI, Washington, DC.
- Resnick, D. 2020. "[IFPRI's COVID-19 Policy Response \(CPR\) Portal: Identifying Trends and Implications for Food Systems.](#)" *IFPRI Blog*, May 20.
- Sanchez-Paramo, C., R. Hill, D. Gerszon Mahler, A. Narayan, and N. Yonzan. 2021. "[COVID-19 Leaves a Legacy of Rising Poverty and Widening Inequality.](#)" *World Bank Blogs*, October 7.
- Staal, S et al. Forthcoming.
- Swinnen, J., and J. McDermott, eds. 2020. [COVID-19 and Global Food Security](#). Washington, DC: IFPRI.
- Swinnen, J., and R. Vos. 2021. "[COVID-19 and Impacts on Global Food Systems and Household Welfare: Introduction to a Special Issue.](#)" *Agricultural Economics* 52 (3): 365–374.
- Tamru, S., K. Hirvonen, and B. Minten. 2020. "[Impacts of the COVID-19 Crisis on Vegetable Value Chains in Ethiopia.](#)" In *COVID-19 and Global Food Security*, edited by J. Swinnen and J. McDermott, 81–83. Washington, DC: IFPRI.
- Twiga Foods. 2021. "[Our Story: Solving the Food Security Challenge for Africa.](#)"
- United Nations Environment Programme and International Livestock Research Institute (UNEP and ILRI). 2020. [Preventing the Next Pandemic: Zoonotic Diseases and How to Break the Chain of Transmission](#). Nairobi: UNEP and ILRI.
- United Nations Food Systems Summit (UNFSS). 2021. "[Member State Dialogue Convenors and Pathways.](#)"
- Vos, R., J. Glauber, M. Hernandez, and D. Laborde. 2022. "COVID-19 and Food Inflation Scares." In *COVID-19 and Global Food Security: Two Years Later*, edited by J. McDermott and J. Swinnen. Washington, DC: IFPRI.

27. Fiscal and monetary responses to the COVID-19 pandemic: Current conditions and future scenarios in developing countries

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Our 2020 report on responses to COVID-19 discussed national pandemic response plans in developing countries (Díaz-Bonilla 2020). Those integrated plans, it was argued, would require a centralized crisis-management office led by the president, prime minister, or equivalent, with participation of the relevant public and private sector representatives. A strong fiscal and monetary response was needed to support these plans, including unconventional monetary policies, such as those used by what were labeled “developmental central banks” during the 1960s and 1970s (Díaz-Bonilla 2015). Expansion in money supply during the pandemic would finance the fiscal deficit related to public expenditures on health and non-health programs as well as programs to maintain private sector production. We noted that central banks in developed countries have followed a similar monetary approach, now called “quantitative easing,” since the 2008–2009 financial crisis, an approach they ramped up during the pandemic.

Other recommendations included strong support from the international organizations through capital increases at the International Monetary Fund (IMF) and multilateral development banks (MDBs); an additional allocation of special drawing rights (SDRs¹) (double the amount provided in the 2008–2009 crisis was suggested); establishment of a debt-resolution mechanism for developing countries focused on debt coming due in the next two years; and the use of co-lending by MDBs and private sector banks and investors.

In this chapter, we provide an update on relevant economic developments, and close with a brief discussion of the fiscal and monetary challenges ahead.

Current context

Initially, countries reacted to the emergence of COVID-19 with lockdowns, which helped to slow the virus’s spread but also led to a sharp economic contraction, particularly in those service sectors that require personal contact. World GDP fell in 2020 (–3.1 percent), with advanced economies dropping 4.5 percent and the emerging and developing countries declining 2.1 percent, but with strong differences across regions. To avoid a potentially deeper economic depression while expanding health

1 The SDR is an international reserve asset, created by the IMF to supplement its member countries’ official reserves. It facilitates access, at practically no cost, to the following five currencies: US dollar, euro, Chinese yuan, Japanese yen, and UK pound.

interventions, many countries resorted to strong fiscal and monetary expansions (see Table 1 for 2020 data reported by the IMF).²

Fiscal and monetary responses were strongest in the advanced economies and more restrained in lower-income countries. On the fiscal side, differences have been greater in the non-health components of the fiscal packages, while expenditures on health as a percentage of GDP have been similar. However, in value terms, there are also large differences in health spending; of the US\$1,346 billion spent on health measures, almost 90 percent was spent in the advanced economies (and more than half in the United States alone) (IMF Covid Tracker). On the monetary side, developing countries have less margin for expanding money supply – primarily because of the likely impacts on exchange rates for their currencies – so liquidity expansion in developing countries (and particularly low-income countries) trailed the advanced economies (Table 1). The fiscal expansion increased public debt³ (see Table 2).

While advanced economies significantly increased their debt (as percent of GDP) from levels that were already high, their central banks financed part of that increase, meaning that their *net* debt increase⁴ has been smaller (14.1 percent of GDP, rather than the 15.5 percent shown in Table 2).⁵ Low-income countries, which have implemented smaller fiscal packages, have also experienced relatively lower increases in debt-to-GDP ratios.

TABLE 1 Fiscal and monetary responses, 2020

COUNTRY GROUPS		RESPONSES (PERCENT OF GDP)			
		Fiscal responses (additional spending)			Monetary responses (liquidity support)
		Health	Non-health	Total	
Advanced Economies	Average	1.2	8.7	9.9	8.5
	Median	0.8	6.7	7.8	5.3
Emerging market and middle-income countries	Average	0.9	3.3	3.8	3.3
	Median	0.5	2.7	2.9	1.8
Low-income countries	Average	0.9	1.9	2.9	0.9
	Median	0.7	1.4	2.3	0.6
Global	Average	0.9	4.0	4.7	4.4
	Median	0.6	3.0	3.3	2.4

Source: Data from IMF, [Policy Responses to COVID-19: Policy Tracker](#).

2 The IMF categorizes its members into 39 advanced economies, 96 emerging market and middle-income economies, and 59 low-income developing countries.

3 The private sector in developing countries also increased its debt; here, our focus is on public debt.

4 That is, considering the debit and credit balances within the government as a whole.

5 For instance, in the case of the United States, the Federal Reserve holds about US\$5.6 trillion of the \$28 trillion debt as of October 2021 (<https://www.fiscal.treasury.gov/files/reports-statements/treasury-bulletin/b2021-3.pdf>).

TABLE 2 Debt growth, 2019–2023

	GENERAL GOVERNMENT GROSS DEBT* (PERCENT OF GDP)					
	Actual		Projected			Increase 2019 to 2023 (as percent of GDP)
	2019	2020	2021	2022	2023	
Advanced economies	103.8	122.7	121.6	119.3	119.3	15.5
Selected emerging economies	54.7	64.0	64.3	65.8	67.1	12.4
Selected low-income developing countries	44.2	49.9	50.2	49.8	49.0	4.9
Latin America & Caribbean	68.3	78.1	73.0	73.6	74.2	5.9

Source: Data from [IMF Fiscal Monitor](#).

Note: *Gross debt includes intragovernmental debt.

However, the emerging economies and middle-income countries, which increased spending but did not have the option of strong monetary expansion, are facing greater debt problems. Here it is important to separate China from other developing countries, given its size and particularly large debt increase (projected to jump from 57.1 percent of GDP in 2019 to 74.5 percent in 2023). Among the other developing countries, the greatest debt problems are emerging in Latin America and the Caribbean (LAC), where the IMF projects debt will reach 74.2 percent of GDP in 2023, up from 68.3 percent in 2019.⁶

Several international initiatives have aimed to alleviate the economic impact of the pandemic. Multilateral financial institutions more than doubled annual net financial lending in the first year of the pandemic, from US\$64 billion to almost \$129 billion (World Bank, International Debt Statistics, 2021), which financed part of the increase in spending in all developing countries. In April 2020, the G-20 countries launched the Debt Service Suspension Initiative (DSSI) to assist 73 of the world's poorest and most vulnerable countries. The DSSI instituted a suspension period, allowing countries to temporarily pause debt payments to some international financial organizations falling due from May through December 2020, and later extended to end-December 2021. However, the DSSI is only a temporary remedy and leaves out many middle-income countries, some of which have been hard hit by the pandemic.

⁶ Public debt can be internal or external. Looking at external debt, which can be public or private, World Bank data show that the largest increase in debt-to-GNI (gross national income) in 2020 compared to 2019 also occurred in LAC. However, sub-Saharan Africa and South Asia (excluding India) saw the largest increases in the debt-to-exports ratio (World Bank, International Debt Statistics, 2021).

In addition, the IMF approved the largest-ever emission of SDRs (US\$650 billion), more than double the response to the 2008–2009 crisis (\$250 billion). However, following the rules on allocation of SDRs (which is proportional to country shares in IMF capital), about 60 percent of the new SDRs were allocated to developed countries. Because of that, IMF members are considering ways to reallocate a share of the SDRs from rich countries, which will not use them, to the developing countries that will. Options include expanding the existing Poverty Reduction and Growth Trust,⁷ which would provide highly concessional loans to low-income countries; a possible new Resilience and Sustainability Trust (RST), now being discussed at the IMF, that would finance poor and vulnerable countries facing structural transformation challenges, including climate-related challenges; and supporting multilateral development banks (MDBs) in their direct lending to developing countries.

These initiatives are commendable, but they may not be enough in terms of the scale of funding needs, the coverage of countries, or the activities they are considering.

Some economic developments

The pandemic has affected developing regions' economies very differently. Table 3 shows growth rates in 2020, projections for 2021, and the overall change from 2019.

TABLE 3 Regional economic growth rates, 2019 to 2021

	GDP, CONSTANT PRICES (PERCENT CHANGE)		
	2020	2021 (projected)	Change from 2019 to 2021 (projected)
World	-3.1	5.9	2.6
Advanced economies	-4.5	5.2	0.4
Emerging market and developing economies	-2.1	6.4	4.2
Emerging and developing Asia	-0.9	7.2	6.3
Emerging and developing Europe	-2.0	6.0	3.9
Latin America and the Caribbean	-7.0	6.3	-1.1
Middle East and Central Asia	-2.8	4.1	1.2
Sub-Saharan Africa	-1.7	3.7	2.0

Source: Data from [IMF World Economic Outlook](#) database, October 2021.

⁷ Before the current allocation of SDRs, some developed countries had already assigned about US\$15 billion of those previously owned to the Poverty Reduction and Growth Trust.

Latin America and the Caribbean has been particularly affected. Among developing regions, LAC experienced the deepest economic recession in 2020 and is projected to recover more slowly – it is the only region where 2021 GDP will be lower than 2019 GDP.⁸ Many countries in the region were experiencing economic problems before the pandemic (median growth in 2019 was a meager 1 percent⁹) as a result of the downswing of the commodity cycle (Díaz-Bonilla 2019). But in 2020, the region's decline in economic activity was general: all countries, except Guyana (driven by oil discoveries), experienced negative growth in 2020, with a median rate of almost –9 percent. LAC's economic recession reflects its relatively tough mobility restrictions compared to other (and more rural) developing regions, which were a response to the region's larger health shock. With only about 8 percent of the global population, LAC has suffered about a third of the world's confirmed COVID-19-related deaths as of this writing (Johns Hopkins Database). The health calamity in LAC appears to be related to several regional characteristics, namely high levels of inequality, significant urbanization, and high prevalence of obesity (a risk factor for COVID-19) (Díaz-Bonilla and Piñeiro 2021). Moreover, regional economic stagnation prior to the pandemic had affected investments in health systems, the vitality of LAC's democracies, and people's confidence in governments, making it difficult to manage the political aspects of the pandemic.

In 2021, a global economic recovery is expected: advanced economies are projected to grow at 5.2 percent while developing countries are projected to grow at 6.4 percent (Table 3). Overall, the rebound from the lockdown, advances in controlling the pandemic, and the fiscal and monetary expansion have supported the recovery.¹⁰

In the context of overall economic contraction, agricultural production (with forestry and fishing) generally did better in 2020 than other economic sectors. Table 4 provides World Bank agriculture sector data for 2020: no region saw declines in agricultural GDP, but LAC again underperformed other regions (projections for 2021 are not yet available). The relatively strong global supply performance of the agriculture sector has been due in part to both governments' support to the sector and to the fact that food production and distribution were considered essential activities by most countries and so faced fewer mobility restrictions. However, impacts on the demand for agrifood products were larger, due to declines in incomes and employment (see, for example, Graziano da Silva et al. 2021).

Inflation in general was subdued in 2020, despite the fiscal and monetary stimulus, but projections suggest an acceleration of inflation in 2021, which should be monitored. Figure 1 shows average and median consumer price inflation in 191 countries (IMF, WEO database).¹¹ Still, inflation remains below the values observed during the rebound from the last global price shock in 2011, when the average was 6.5 percent and the median was 4.7 percent; and certainly, it has not reached the levels driven by the shocks of 1970s, when inflation rates were in the double digits, and even triple digits for some countries. The process of

8 It should be noted that in Asia, India also showed a steep decline in 2020 (–7.25%) but is expected to recover strongly in 2021, ending the year about 1.6 percent above the 2019 level.

9 Some countries, including Venezuela and Nicaragua, were in recession even before the pandemic as a result of internal political problems.

10 Regarding the impact of individual economic stimulus packages on the recovery in each developing country, we found a small but positive correlation between the stimulus size (measured as the sum of the GDP percentages of the non-health fiscal expenditures and of the monetary expansion) and GDP growth in 2021 ($p=0.227$).

11 Venezuela, Zimbabwe, Sudan, South Sudan, and Lebanon were excluded as outliers.

TABLE 4 Agriculture sector GDP growth, 2020, by region

AGRICULTURE, FORESTRY, AND FISHING, VALUE ADDED	ANNUAL GROWTH (%)
East Asia and Pacific (excluding high income)	2.4
Europe and Central Asia (excluding high income)	0.9
Latin America and Caribbean	0.5
Middle East and North Africa (excluding high income)	2.6
South Asia	2.9
Sub-Saharan Africa	3.0
Low- and middle-income countries	2.3
World	1.9

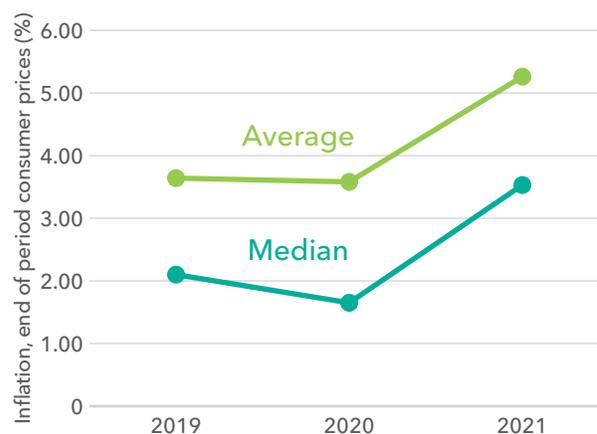
Source: Data from World Bank, [World Development Indicators](#).

withdrawing the current expansionary monetary policies in developed countries will also have a negative impact on many developing countries, if it leads to sustained increases in interest rates.

Looking forward

As we look forward, we are handicapped by our weak understanding of the relationship between health and economic disruptions, responses, and interactions. Initially, countries hoped to eliminate COVID-19, but it now appears that it will become an endemic disease – the world will need to learn to manage it and live with it. This continuing health problem will compound both existing and new challenges arising in low- and middle-income countries.

Key issues we need to understand are why some countries were more severely affected than others, and what policies worked or did not work to address the pandemic. Studies have shown that lockdowns slowed the spread of COVID-19, but their effectiveness differed across continents (Sulyok and Walker 2020) and their impact on employment and incomes was both heavy and unequal. For example, Peru imposed a strict lockdown but has suffered a very high death rate (as of this writing, it is the highest in the world at more than 600 deaths per 100,000 people). Mexico and Brazil, however, which did not impose strict lockdowns, reported fewer deaths per capita (Mexico: 225 deaths per 100,000; Brazil: 287 deaths

FIGURE 1 Inflation rates, 2019–2021

Source: Constructed using data from [IMF World Economic Outlook](#) database, October 2021.

per 100,000). Moreover, Peru pursued a strong fiscal and monetary response to the economic downturn, spending about 18 percent of GDP, but still suffered a deep recession (an 11 percent drop in GDP). Yet in Brazil, where the combined fiscal and monetary stimulus was 14 percent of GDP, and Mexico, where it was less than 2 percent of GDP, the economic declines were smaller, at -4 percent and -8 percent, respectively. Looking across all developing countries, we found no correlation between the percentage of GDP spent on health-related COVID-19 measures and the per capita death rate (the simple correlation between those two variables in 2020 was very small and negative; $p=-0.04$).

While important questions about how best to address the pandemic's impacts remain, the recommendation we made in 2020 still holds true: Countries need to design integrated pandemic recovery programs under a centralized crisis-management office with high-level leadership (Díaz-Bonilla 2020). Those recovery programs will require strong support from the international community, which must encompass not only lower-income countries but also middle-income countries.

To address the ongoing crisis, the first step is for developing countries to accelerate vaccinations, which are progressing slowly, while strengthening their health systems to cope with future epidemics (see Financing the Global Commons 2021). As of late August 2021, almost 60 percent of the population in advanced economies was fully vaccinated, and almost 70 percent by the end of October 2021 (Our World in Data). However, in the developing countries, the vaccination rate had not reached 20 percent by the end of August, with much lower rates in low-income countries. Some African countries had not even reached 10 percent by the end of October 2021. This situation leaves the less-developed countries and their populations particularly vulnerable to more dangerous COVID-19 variants and the economic impacts that threaten already fragile economies.

BOX 1 Proposal for pandemic recovery bonds

Using the Special Drawing Rights (SDRs) emitted during the pandemic to de-risk the issuance of “pandemic recovery bonds” by developing countries could mobilize private investors with broader social goals, while offering an adequate balance of risk and reward. Such recovery bonds, or similar options, could crowd-in the large private liquidity existing in global markets to help finance credible pathways out of the pandemic for developing countries. How would these bonds work? Advanced economies (which collectively are receiving about US\$375 billion in SDRs and which hold about \$180 billion from previous allocations) could assign a percentage (say 10 percent, or about \$55 billion) to establish a Guarantee Trust Fund (GTF) to support the issuance of special pandemic recovery bonds (PRBs). These bonds would be consoles or perpetual bonds;¹ issued in dollars; paying an adjustable rate with a cap (perhaps 5 percent²); and callable, with call protection (for example, until 2050). With a GTF of \$55 billion guaranteeing the interest rate payments on the PRBs, the value

1 Also, 100-year bonds can be considered, with the payment period during the last 20 years or so.

2 The cap considers that the average nominal yield since 1953 for US 10-year bonds has been 5.65% (4.32% since 1990; and 1.37% on average during September 2021); average consumer inflation in the United States has been about 3% since 1913 (2.4% since 1990); and the average real interest rate for the last 200 years has been 2.6%, but it has been declining in the last 100 years (see references in Díaz-Bonilla 2021a and 2021b) The yield for the 10-year inflation-adjusted bond for the period 2003–2021 (mid-October) has been 0.88% and currently is negative, close to -1% (data from the U.S. Federal Reserve; <https://fred.stlouisfed.org/series/DFII10>).

of the bonds that can be issued by developing countries is multiplied several times, depending on how the guarantee is structured. For instance, assuming a maximum interest rate of 5 percent, and maintaining a rolling guarantee of three to five years in interest payments, the total amount of PRBs that can be guaranteed may be between \$220 and \$367 billion (as a comparison, the current allocation of SDRs to developing countries was about \$275 billion). That multiplier effect may be larger, depending on the interest rates assumed; the potential defaults on interest payments (which may be similar to the lower levels of the IMF or the MDBs); and whether the losses in the GFT can be covered by additional international public money.

To ensure the funds are used effectively, middle- and low-income countries would only be eligible to issue the guaranteed bonds if they have a credible and sustainable pandemic recovery program with a multilateral development bank (MDB), encompassing health, social, economic, and environmental components. Part of the issuance of the PRBs may be used to replace the shorter-term and more expensive debt that some countries had to issue during the pandemic, thus helping with debt sustainability. The quota of PRBs by country may be determined by a combination

of indicators such as poverty, health impact of the pandemic (total deaths and deaths as percentage of population), and the depth of the economic recession. This scheme could be especially relevant for LAC countries, perhaps as a component of the program to be agreed at the Summit of the Americas that will take place in mid-2022.

The GFT would also help capital markets by supporting an additional asset with an attractive combination of risk and return, which can help absorb some of the global liquidity while supporting broader humanitarian and developmental objectives. It would also benefit advanced economies by helping to put an earlier end to COVID-19 and its global consequences.

There may be other options for applying the additional SDRs strategically (such as using them to strengthen the lending capabilities of MDBs, as mentioned). And this proposal may not be the best alternative for every low- and middle-income country, some of which will need direct debt relief. Yet, using a share of the SDRs to create a guarantee fund for the type of pandemic recovery bonds outlined here is worth considering as another weapon in the arsenal to defeat the virus and thus improve global health, economic, social, and political conditions.

Source: Díaz-Bonilla 2021a, 2021b.

Getting vaccines to everyone will require additional financing. According to the Rockefeller Foundation (2021), getting shots to half the adult population of the world's lowest-income countries in 2021 will require US\$9.3 billion. That estimate includes 92 nations (representing about 3.8 billion people) that are eligible for vaccine access through Gavi, the Vaccine Alliance, a public-private global health partnership. With that money, the Alliance could purchase 1.8 billion vaccine doses. A recent IMF study estimates the additional cost of vaccinating at least 60 percent of the global population by mid-2022, plus the costs of diagnostics, therapeutics, and personal protective equipment, at \$50 billion (\$35 billion in donor grants and \$15 billion from national sources) (Agarwal and Gopinath 2021). Yet, the additional funding required is far less than the costs that further waves of the virus could impose.

Second, in addition to the vaccination and health interventions, developing countries need additional fiscal and monetary resources to recover from the economic and human costs of the pandemic. Human capital in developing countries has been affected by the gap in education for the current generation of students; the nutritional problems associated with insufficient and less-healthy diets; and the weakening of job abilities due to long unemployment periods. Yet, while needing further financial resources, these countries are already burdened by the pandemic-related increases in debt. They also continue to contend with a host of pre-existing economic and social problems, while tackling the current and future challenges of climate change. Doing all that is a very tall order.

The international community can take some important steps to help ensure fiscal sustainability for these countries, while also helping to normalize monetary policies:

Support debt relief. Several countries will need debt restructurings and write-offs (Díaz-Bonilla 2020), for which speedier and better methods must be designed. It will be important to recognize differences in solvency and liquidity problems among the different developing countries to devise appropriate debt relief programs (Kharas and Dooley 2020).

Increase capital of MDBs. While some MDBs have recently received capital increases (World Bank in 2018; African Development Bank in 2019), others will need similar treatment. At a minimum, all MDBs must optimize their balance sheets, increasing their leverage ratios and negotiating with the rating agencies for more flexible criteria that account for the current market and pandemic conditions.

Leverage global liquidity. Scarce international development funds must be used more strategically to leverage and mobilize the vast liquidity in global private capital markets, orienting those markets toward larger humanitarian and developmental objectives. This is particularly relevant in relation to the debate about more effective use of the IMF's SDRs. The Poverty Reduction and Growth Trust and the proposed Resilience and Sustainability Trust do not seem to have the needed multiplier effect. The option of allocating the SDRs to MDBs may create greater leverage (about \$3-4 of additional financing per dollar of SDRs reallocated). Another option with potential for a greater multiplier effect (from 4 to close to 7) would use a share of the SDRs to create a trust fund to guarantee the emission of "pandemic recovery bonds" (Box 1; Díaz-Bonilla 2021b; also Díaz-Bonilla 2021a; von Braun and Díaz-Bonilla 2021).

Today, the world is still in the midst of the pandemic, with the possibility of new waves and strains of COVID-19. It is imperative to act now to address both the health crisis and the economic crisis.

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References

- Agarwal, R., and G. Gopinath. 2021. "A Proposal to End the COVID-19 Pandemic." IMF Staff Discussion Note. International Monetary Fund, Washington, DC.
- Díaz-Bonilla, E. 2015. *Macroeconomics, Agriculture, and Food Security. A Guide to Policy Making in Developing Countries*. Washington DC: International Food Policy Research Institute (IFPRI).
- Díaz-Bonilla, E. 2019. "Democracy and Commodity Cycles in Latin America and the Caribbean." *IFPRI Blog*, Nov. 25.
- Díaz-Bonilla, E. 2020. "Fiscal and Monetary Responses to the COVID-19 Pandemic: Some Thoughts for Developing Countries and the International Community." In *COVID-19 and Global Food Security*, edited by J. Swinnen and J. McDermott, 98-101. Washington, DC: IFPRI.
- Díaz-Bonilla, E. 2021a. *Financing SGD2 and Ending Hunger*. Food Systems Summit Brief. Bonn: United Nations Food Systems Summit.
- Díaz-Bonilla, E. 2021b. "Using the New IMF Special Drawing Rights for Larger Purposes: Guaranteeing 'Pandemic Recovery Bonds.'" *IFPRI Blog*, October 22.
- Díaz-Bonilla, E., and V. Piñeiro. 2021. "Latin America and the Caribbean." In *2021 Global Food Policy Report: Transforming Food Systems after COVID-19*, Regional Developments, 74-105. Washington, DC: IFPRI.
- Financing the Global Commons for Pandemic Preparedness and Response. 2021. *A Global Deal for Our Pandemic Age*. Report of the G20 High Level Independent Panel. June 2021.
- Graziano da Silva, J., M. Jales, R. Rapallo, E. Díaz-Bonilla, G. Girardi, M. del Grossi, C. Luiselli, O. Sotomayor, et al. 2021. *Food Systems in Latin America and the Caribbean: Challenges in a Post-Pandemic World*. Panama City: FAO and International Centre for Sustainable Development (CIDES).
- Kharas, H., and M. Dooley. 2020. *COVID-19's Legacy of Debt and Debt Service in Developing Countries*. Washington, DC: Brookings Institute.
- IMF. 2021. *Fiscal Monitor Database*. <https://data.imf.org>
- Johns Hopkins University. 2021. Corona Virus Resource Center (database). <https://coronavirus.jhu.edu/>
- Our World in Data. 2021. *Share of the population fully vaccinated against COVID 19* (database). <https://ourworldindata.org>
- Rockefeller Foundation. 2021. *An Updated Action Plan for Global Covid-19 Vaccination*. New York.
- Sulyok, M., and M. Walker. 2020. "Community Movement and COVID-19: A Global Study Using Google's Community Mobility Reports." *Epidemiology and Infection* 148 (e284): 1-9.
- von Braun, J., and E. Díaz-Bonilla. 2021. "Letter: Perpetual Bonds Can Help States Fight Hunger." *Financial Times*. June 6.
- World Bank. 2021. *International Debt Statistics 2022*. Washington, DC.

28. Selected country experiences during the pandemic: Policy responses and CGIAR support

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With the onset of the COVID-19 pandemic, CGIAR pivoted its research planning to better support countries as they responded to the crisis. Despite the unprecedented, highly disruptive nature of the pandemic, CGIAR's collaborative country work has enhanced engagement across the agrifood sector, leveraged existing capacities, and improved awareness of vulnerabilities within value chains. The insights gained from this experience may ultimately prove useful in addressing other longstanding challenges as well. In this chapter, we recount selected country experiences during the pandemic and the response of the international agricultural research system to support these countries. In the section on country experiences, we draw from IFPRI's [COVID-19 Policy Response Portal](#) (CPR) to focus on lockdown policies in Bangladesh, Kenya, and Nigeria.¹ We describe the steps taken by governments in these countries to address challenges in the agrifood sector and provide social protection to the vulnerable.

The COVID-19 crisis forced almost every sector to engage with the policy responses instituted across the developing world, and ministries of agriculture were no exception. Although initially excluded from early decisions in some countries (Resnick 2020), policymakers in agriculture reacted to the crisis – and its supply and demand shock for the agrifood sector – by searching for solutions to the most immediate problems. Urgent problems included the need to keep agricultural inputs flowing to farms and production centers; make the best agricultural technologies available to ensure that local food production could fill gaps caused by border closures and food export bans; guarantee that agricultural products could move from farms to consumers; and ensure that food markets remained functional.

After recounting the country experiences, we focus on the response of the international agricultural research system to the pandemic by highlighting select work led by CGIAR.² We provide brief sketches of CGIAR's responses in Bangladesh, Ethiopia, Malawi, Myanmar, and Nigeria.³ Lastly, we provide some initial lessons learned from the responses that could inform strategies for the international research system to address longstanding shocks such as drought, climate impacts, and conflict and insecurity.

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- 1 We focus on the policy responses in these three countries for which Pauw and Thurlow measure impacts on agrifood GDP, poverty, and diet deprivation in [Chapter 2](#). In this way, this chapter provides additional context for the findings reported in Chapter 2.
 - 2 CGIAR consists of 15 advanced Research Centers working in and for developing countries, and 16 multi-institutional research programs and platforms working in more than 75 countries. More details on the CGIAR COVID-19 response are available in a [report](#) by the CGIAR System Organization (2020).
 - 3 These five countries were the focus of the [CGIAR COVID Hub](#) work in 2021.

Selected country experiences: Lockdowns, agrifood policies, and social protection measures

Bangladesh was one of several economies in South Asia that suffered a major blow during the pandemic. Poverty is estimated to have reached 30 percent in 2020, 7 percentage points higher than projected under a non-COVID-19 scenario. Bangladesh was one of the first countries to implement nationwide closures, starting with all educational institutions (schools, colleges, and universities) on March 16, 2020. In late March 2020, Bangladesh banned all social and cultural gatherings for the rest of the year, including public state events such as the annual Independence Day celebration. The government also ordered all public and private offices to close. This measure was combined with a recommendation from the government to stay home and restrictions on transport, except for vehicles carrying goods or undertaking emergency services. In April 2020, the measures were extended to a nationwide curfew from dusk to dawn. Businesses were allowed to resume operations on May 27, but the curfew remained in place until it was modified on August 3 and finally lifted in September, and school closures continued until December. By mid-March 2021, cases and death rates had started to rise sharply again and, on April 14, another strict one-week lockdown was imposed. This lockdown was repeatedly extended until August 11, 2021, when it was lifted. During this lockdown period, Bangladesh was under various restrictions, including total curfew, which were eased only temporarily for the celebration of Eid al-Adha.

As part of the government's COVID-19 response program, the agriculture sector received lending support of US\$588 million and additional support for the mechanization of farming (more than \$378 million), as well as other subsidies worth \$1.1 billion. In April 2020, the government formulated two main policies to address impacts on the agrifood sector: a farm subsidy allocation of 90 billion Bangladeshi taka (approximately \$1 billion) for fertilizer, irrigation, mechanization, and marketing of products, and a fund of \$500 million for loans to small- and medium-scale farmers producing grains, fruit, flowers, fish, poultry, and dairy. Bangladesh also boosted the agriculture sector by adjusting trade policies, specifically by waiving advance taxes on imports of raw materials such as soybean meal for livestock feed.

Social protection measures were a major part of Bangladesh's response to the economic downturn caused by the pandemic lockdowns. These measures included cash transfers, food subsidies, waivers of fines for late utility bill payments, and unemployment benefits. Bangladesh implemented a large-scale nationwide cash transfer to every family through mobile financial services, as well as support to students and youth.

In **Kenya**, the first COVID-related restrictions were announced by the government in mid-March 2020 and consisted of a nationwide dusk-to-dawn curfew, school and university closures, and the suspension of public gatherings in churches, mosques, and other venues for public gatherings. This curfew lasted until late 2020. International travel was restricted to cases of absolute necessity, and public transport services were limited to 60 percent of vehicle capacity. Instead of a nationwide lockdown, Kenya relied on targeted restrictions in cities that were hotspots for disease transmission. On April 22, 2020, the government implemented a ban on movement in the Nairobi Metropolitan Area, Mombasa County, Kilifi, Kwale, and Mandera County. Lockdowns continued in 2021: on March 26, a 30-day lockdown in the counties of Nairobi, Kajiado, Machakos, Kiambu, and Nakuru was announced. Travel from these areas to other parts of the country was banned.

Kenya provided support to the agrifood sector through farm input subsidies, direct procurement, and price regulations. Farm input subsidies amounting to 3 billion Kenyan shillings (US\$26.5 million) were distributed to 200,000 smallholder farmers through e-vouchers. Due to limitations on air travel, the government also provided approximately \$13 million in support to horticultural farmers in order to facilitate access to international markets.

Nigeria closed all schools and universities in mid-March 2020, and some states and local authorities instituted bans on public and social gatherings. Nigeria initially instituted bans on travel from 13 countries and, by late March, the government had closed its borders to all travelers for an initial period of four weeks and suspended passenger rail services within the country. Like Kenya, Nigeria did not institute a nationwide lockdown, opting instead to implement lockdowns in specific hotspots. On March 29, 2020, President Buhari announced restrictive policies for the Federal Capital Territory (including Abuja) and Lagos and Ogun States, which represent about 14 percent of Nigeria's population. These measures restricted the movement of residents, who had to stay home, led to business closures, and sealed regional borders linking lockdown areas with the rest of the country. Exemptions were provided for medical services, agricultural activities, food manufacturers and retailers, telecommunications, and limited financial services. Passenger air travel was also suspended nationwide.

Nigeria's support for the agrifood sector included input subsidies such as a 10 percent reduction in fertilizer prices (in April 2020), a seed price subsidy for up to 81,000 metric tons of seed, and a grant of US\$41.2 million administered through the Central Bank of Nigeria (CBN) to the Maize Farmers Association of Nigeria to procure fertilizers, seeds, and agrochemicals. The CBN also disbursed loans at zero interest through its Anchor Borrowers Programme and Targeted Credit Facility.

Social protection measures in Nigeria included an innovative approach to the country's Home Grown School Feeding Programme (HGSFP), which, in light of school closures, delivered food to homes in Abuja and Lagos and Ogun States. Along with the movement restrictions imposed in March 2020, the president also introduced some palliative measures, mainly food distribution and a two-month advance payment of conditional cash transfers to vulnerable citizens. In April 2020, the government announced it would pay for two months of electricity for all Nigerians. The government also expanded its social protection coverage during the period, adding 1 million poor and vulnerable households to the existing list of 2.6 million households eligible for immediate assistance (within two weeks) and releasing 70,000 metric tons of food from the national grain reserve for distribution. With the relaxation of lockdowns and other restrictions in late 2020, people working in both farm and non-farm sectors gradually returned to conducting business as before. However, loss of income due to the economic recession and high inflation rates in the wake of the pandemic continue to diminish the purchasing power of many households in Nigeria.

Country engagement through the international agricultural research system

With support from the international network of agricultural research centers, national agricultural research systems helped meet the need for evidence-based policies and technologies to assist countries through the crisis. CGIAR's efforts to respond to COVID-19 challenges were built upon years of previous work. Using past CGIAR investments in economywide tools and social accounting matrices,

CGIAR researchers used multiplier models to assess the short-term impacts of COVID-19 and policy responses on the agrifood system. Initial results suggested that lockdowns would have severe adverse impacts on the agrifood system, despite exemptions for agricultural activities, which led to a demand for research evidence to help governments grappling with these impacts. In the early stages of the pandemic, CGIAR work also included guidance on emergency response measures such as social protection; awareness raising regarding policy impacts on production, consumption, and nutrition; rapid phone surveys of households and value chain actors to identify key risks; and policy tracking to enable comparative analysis across countries.

CGIAR responses and country engagement

When the pandemic first began in early 2020, CGIAR immediately pivoted its research plans for the remainder of 2020 and for 2021. As a first step, COVID-19 was incorporated as an analytic factor in existing lines of research. Second, CGIAR leveraged existing projects focused on technology and institutional strengthening in select countries and regions, and third, CGIAR reallocated resources to COVID-19-related work. Beyond these immediate steps, CGIAR designed a COVID-19 response based on four research pillars: (1) food systems; (2) One Health (recognizing the linkages between human, animal, and environmental health); (3) inclusive public programs for food security and nutrition; and (4) policies and investments for crisis response, economic recovery, and improved future resilience.

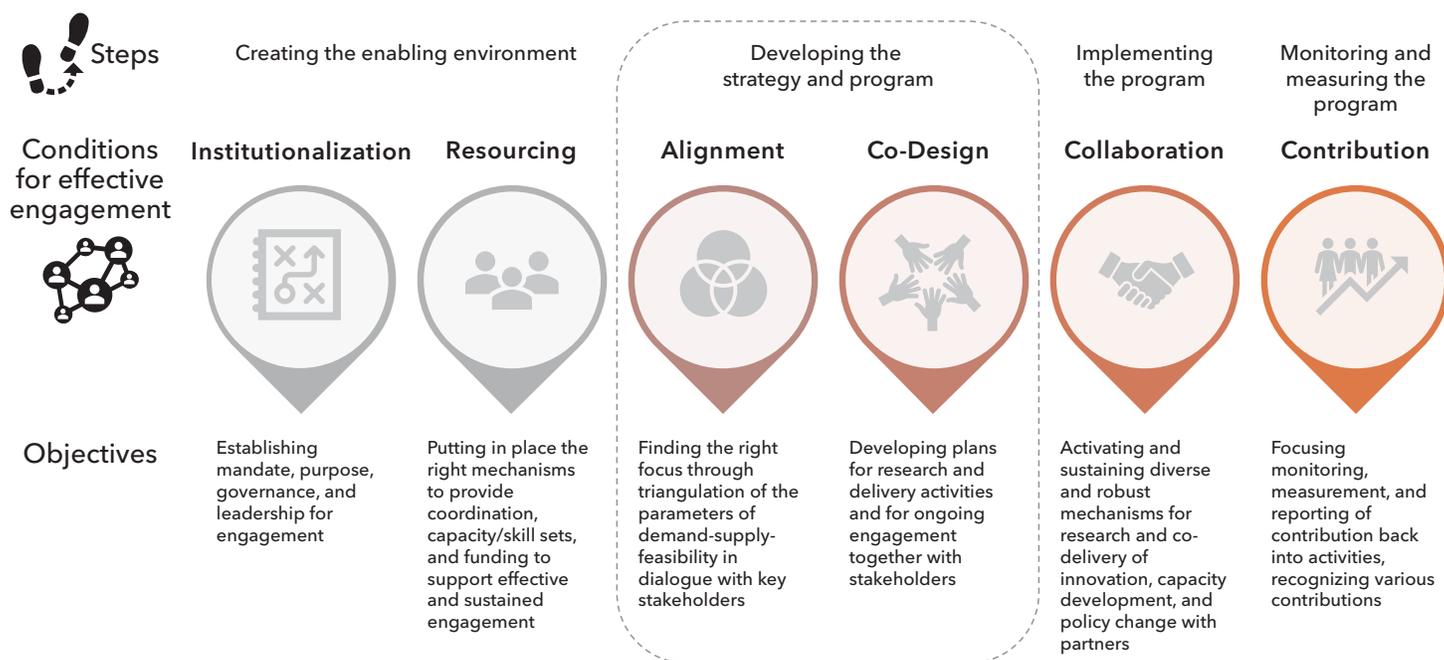
In June 2020, CGIAR launched a [COVID-19 Hub](#) in partnership with the London School of Hygiene & Tropical Medicine (LSHTM) with the aim of working across CGIAR and with key partners to coordinate major streams of relevant research, engagement, and communications. The Hub coordinated work across four areas that mirror the initial CGIAR research pillars:

- Work Area 1: Addressing value chain fractures
- Work Area 2: One Health
- Work Area 3: Supporting country responses
- Work Area 4: Resilient food systems and building back better

The Hub was established to provide high-level coordination in order to ensure that relevant research results, drawn from across the international agricultural research system, would be packaged in appropriate formats for easy access by policymakers and stakeholders. Doing so would ultimately promote uptake of CGIAR innovations by countries most vulnerable to the pandemic's many societal costs.

In its five countries of focus, the Hub has provided timely support to global and country efforts during crisis response and recovery by establishing multidisciplinary research teams at the country level. It has also invested in the highest-priority areas where research results and enhanced coordination are most critical, including surveillance and modeling.

FIGURE 1 COVID-19 Hub country engagement process



Harnessing CGIAR technical capacity and setting country-level priorities

Though the CGIAR COVID-19 Hub had four work areas, this chapter focuses on [Work Area 3](#), which supported countries in their contextual responses to COVID-19. In Work Area 3, the Hub country teams engaged with governments and other national partners to respond to country demands (across different population groups with a focus on the vulnerable) and to design cross-CGIAR interventions targeted to specific country and subnational needs ([Figure 1](#)). CGIAR country teams, which were comprised of CGIAR Center representatives in each country, played a key role in planning and delivering the research outputs under Work Area 3. The coordinated multidisciplinary responses from the various CGIAR research areas were led by the country teams and, in close collaboration with national partners, based on a mapping of country demands to CGIAR capabilities. Country teams played a facilitating role in this process, linking country demand for COVID-19 relevant research with the supply of CGIAR data, knowledge, evidence, innovations, and capacity development. To contribute to these efforts and ensure a multidisciplinary research response, Working Group 3 members with expertise in economic modeling, food production and supply, nutrition, gender, social protection, and One Health provided methodological support and specific research inputs to guide CGIAR work supporting country responses to COVID-19.

Figure 1 depicts the country engagement process that led to setting priorities, engaging in the program of work, and ensuring that findings would be included in the policy response process.

Country case studies of CGIAR responses

Bangladesh

The CGIAR COVID-19 Hub's work in [Bangladesh](#) focuses on digital systems for crop, livestock, and fish health. The information gathered by this work has enabled faster decision-making and intervention by government agencies. The Hub's research priorities in Bangladesh include setting up a dashboard to monitor food systems, developing a nutrient-secure homestead app,⁴ and conducting a feasibility study for digital markets accessible to women. The dashboard also monitors weather for crop and fish production, farm stress, satellite data-based planting/harvesting information, and floods.

Ethiopia

CGIAR's work in [Ethiopia](#) aligns with the Ministry of Agriculture's responses to COVID-19, which have prioritized five key components: business continuity of agricultural services; safe and timely distribution of agricultural inputs; increased production of agricultural products, including grains and vegetables; support for both domestic and export commodity supply chains; and food support to the most vulnerable communities.

The CGIAR COVID-19 Hub has leveraged CGIAR's research capacities in Ethiopia as well as existing partnerships. The urgency of responses to the pandemic has fostered new partnerships and models of collaboration in the country. The active participation of CGIAR scientists and experts in various policy dialogues, platforms, and forums means that the COVID-19 Hub is well-placed to disseminate and support the adoption of research findings.

Malawi

The pandemic has generated new challenges for agricultural production in [Malawi](#), which was already threatened by drought, flooding, and pests such as the fall armyworm. CGIAR's response in Malawi focuses on three main workstreams: updating the economic models used to assess COVID-19 impacts; conducting studies on seed system improvement and related implications for food security and diets; and establishing demonstration plots that use climate-resilient technologies.

Myanmar

The COVID-19 pandemic and the coup d'état on February 1, 2021, dealt a double blow to [Myanmar](#). Interviews conducted from February to July 2020 suggest that demand for production inputs and

4 This application collects household-level information and calculates nutrient demand using the recommended daily allowance of micro- and macronutrients. It can collect household diet data for seven days and calculate nutrient supply. It can also address missing nutrients by comparing demand and supply and suggesting possible crops and fish raised in homesteads to address deficiencies. It is expected to redefine nutritional security from a focus on national balances to household-level nutritional deficits.

consumer goods was substantially affected even after the initial lockdown and movement restrictions were eased. CGIAR's response in Myanmar focuses on three main workstreams: assessing the impacts of COVID-19 on agrifood supply chains; determining the impacts of COVID-19 on women's agribusiness and value chains in the Gulf of Mottama; and outlining policy options to build recovery and resilience in Myanmar's food, land, and water systems. The work of the COVID-19 Hub in Myanmar focuses on generating research findings that can be adopted by local nongovernmental organizations (NGOs) and development partners. Key partners in delivering COVID-19 research include the Department of Fisheries, Myanmar Green Way Apps, the Myanmar Fisheries Federation, and local NGOs.

Nigeria

Key outputs from CGIAR's COVID-19 response in [Nigeria](#) include the production and distribution of agricultural inputs; educational trainings, particularly for women and youth; and research to better understand the impacts of COVID-19. These outputs specifically include the production and distribution of high-yield adapted sorghum and millet breeder seed, distribution of breeder seeds for four climate-resilient rice varieties, and distribution of farmer-preferred chicken breeds. Other outputs include the demonstration of a crusher for increased utilization of crop residues and the identification and training of five decentralized vine multipliers to boost production and supply of commercial orange-fleshed sweet potato vines to households. Training of women and youth focused on agribusiness, with distribution of agribusiness starter packs to trainees and on sorghum and millet processing for household nutrition and income generation. Research outputs include analytical work from phone surveys conducted in July/August 2020 and July/August 2021 to understand the economic impacts of COVID-19. A second-round phone survey was also conducted with fish supply chain actors to assess the impacts of COVID-19 on the availability and price of aquatic foods and production inputs.

Lessons learned from CGIAR responses

Although the COVID-19 pandemic is unique and unprecedented, the lessons learned from the agricultural research system's work in these countries offer a template for addressing longstanding problems such as malnutrition, drought and climate impacts, and conflict and insecurity. The CGIAR COVID-19 Hub ensured that the full range of the CGIAR expertise – including research, technological innovations, and policy support on agrifood system issues – could help decision-makers around the world address the unique challenges of the pandemic. The Hub also created an opportunity for more integrated collaboration and coordination across CGIAR entities.

A few key conclusions emerge from this experience. First, by enhancing coordination across CGIAR, the COVID-19 Hub's structure improved effective engagement with value chain actors in various countries. For example, although CGIAR Centers in Bangladesh and Nigeria had communicated with their respective governments about CGIAR service offerings in early 2020 and were exploring collaborative research options, progress in their coordinated work significantly improved after the COVID-19 Hub was established. Second, given the mobility restrictions and other measures taken in response to COVID-19 and the lack of face-to-face interaction, CGIAR entities would have faced

serious challenges in building new partnerships for their work. By working under the Hub arrangement, researchers were able to build on existing partnerships, with the Hub providing an opportunity for engagement and discussion with more partners. Third, by bringing CGIAR Centers together, the Hub approach helped the Centers gain a better understanding of the vulnerabilities and resilience capacity of food system actors, especially in subsectors outside their particular mandates, which subsequently led to more awareness of the interactions across value chains. There is strong interest in continuing this type of CGIAR collaboration in a coordinated manner and with distributed leadership, and possibly setting up coordination hubs at country, regional, and global levels to be ready at all times for when crises emerge. This is vital for matching country demand and urgent needs with CGIAR supply, especially during crises and emergencies.

References

- CGIAR, Research Program on Agriculture for Nutrition and Health (A4NH). [COVID-19 Hub](#).
- CGIAR System Organization. 2020. [Responding to COVID-19: CGIAR's Contribution to Global Response, Recovery and Resilience](#). Montpellier, France.
- IFPRI (International Food Policy Research Institute). [COVID-19 Policy Response \(CPR\) Portal](#).
- Resnick, D. 2020. "IFPRI's COVID-19 Policy Response Portal: Identifying Trends and Implications for Food Systems." In *COVID-19 & Global Food Security*, eds. J. Swinnen and J. McDermott, 111-114. Washington, DC: International Food Policy Research Institute.

29. Trust in science and in government plays a crucial role in COVID-19 response

Danielle Resnick

In April 2020, Tanzania's prime minister made a [simple plea](#): "Tanzanians should maintain trust in the government. You should continue to trust our experts who are behind every decision we make." A month later, the country's then president, John Magufuli, fired the head of its [national COVID-19 test laboratory](#) and committed to importing an untested herbal tonic from Madagascar that was controversially touted as a cure for the novel coronavirus [despite scientists' worries](#) that it could lead to drug-resistant malaria.¹

Protecting public health in a pandemic depends on citizens' trust in government decisions, and on political leaders' trust in the findings of the scientific community. But as the Tanzania example shows, such trust can be fragile. Breakdowns at these two junctures explain some of the disparate policy responses to COVID-19 and varying citizen compliance around the world. Where and when it occurs, this erosion of trust can put lives at risk and have broad implications for the flow of accurate information and accountability. Two years after the onset of the pandemic, in the wake of multiple coronavirus variants, testing efforts, lockdown policies, and vaccination campaigns, the importance of trust remains an enduring lesson of this unprecedented global health crisis.

What's trust got to do with it?

Trust is a complex phenomenon. Trust in political institutions refers to citizens' relative confidence that their governments are capable, reliable, impartial, and efficient, and is often shaped by partisanship, access to news, and past interactions with government authorities. It can be influenced by [expectations](#) of what one's government should be doing, given its capacities, rather than on a universally accepted notion of good governance or objective performance metrics. Such trust is critical for state legitimacy and can be associated with willingness to pay taxes, respect for property rights, and following the rule of law.

The stresses of COVID-19 have put trust in government to the test in many places – and shown how weak it can be. Early on, the Africa Centers for Disease Control and Prevention (Africa CDC) [warned](#) that if people lacked trust in their government's responses, there was a risk of violent outbreaks in that region. Globally, the [Armed Conflict Location & Event Data Project](#) (ACLED) identified more than 50,000 episodes of violence associated with COVID-19-related restrictions between March 2020 and

¹ A year later, after Magufuli passed away, his successor, Samia Suluhu Hassan, reversed course, acknowledging that COVID-19 was a problem in the country, and initiated the country's vaccination campaign.

December 2021; protests and riots by citizens and under-protected healthcare workers were a common outcome in many countries.

Trust in science, meanwhile, reflects people's confidence in a cumulative body of research findings derived from a [process](#) of data collection, hypothesis testing, and peer review. Such confidence determines whether citizens are willing to change their individual behaviors to promote outcomes that benefit the greater societal good.

Public distrust in science has undermined more concerted international collaboration on [climate change](#), created skepticism about [nutritious diets](#), and discouraged community cooperation during other public health emergencies, from [measles in the United States](#) to [Ebola in the eastern Democratic Republic of Congo](#). Such distrust can be the product of both individuals' own backgrounds as well as [mixed messages](#) from experts and researchers. Indeed, convoluted messaging by regulatory agencies throughout the pandemic – initially about the utility of [face masks](#), then about the efficacy of different vaccines, and more recently the required length of time for COVID-19 patients to isolate – slowly erode public trust over time. Such mixed messages are more likely in crisis periods when the pressure to publish results quickly is particularly intense, policy decisions are often reactive, and cross-national cooperation is paramount even as different societies are willing to accept disparate levels of risk and responsibility.

When we consider these two sources of distrust in tandem, at least two distinct clusters of policy responses to COVID-19 have emerged during the course of the pandemic. On the one hand, governments in some highly polarized environments disparage scientific recommendations. On the other hand, in some countries segments of the public may believe that the advice of scientific experts is being manipulated to advance political gains.

Populism and polarization

Some of the most muddled responses at the outset occurred in countries that have experienced [growing political polarization](#) fueled by a resurgence of both right- and left-wing populism in recent years, including Brazil, Mexico, Nicaragua, the Philippines, and the United States, among others. Populist leaders thrive on unmediated contact with the people they claim to represent and [disdain formal institutions](#), including international bodies like the World Health Organization, that threaten their political maneuvering room. Across the ideological spectrum, these leaders staked their credibility on promises of improved economic opportunities for the forgotten masses – a goal imperiled by shutdowns and business restrictions. Questioning the legitimacy of the rapidly evolving scientific understanding of COVID-19 became a convenient pretext for delaying or reversing actions with economic consequences.

One of the most obstinate has been Brazilian President Jair Bolsonaro, who dismissed the pandemic as “[hysteria](#),” claimed infection rates were inflated, ignored social distancing guidelines when meeting with supporters, and [halted](#) the public release of national COVID-19 statistics. He also vehemently opposed COVID-19 vaccines, raising irresponsible and spurious claims that they were linked to HIV/AIDS, and threatened health officials who approved vaccines for 5- to 11-year-olds. Despite alarms raised by Nicaraguan doctors, Nicaragua's husband and wife populist leaders, President Daniel

Ortega and Vice President Rosario Murillo, called for a “[Love in the Time of COVID-19](#)” mass parade in March 2020 and a [marathon and food festival](#) a few weeks later. In the Philippines, President Rodrigo Duterte initially called worriers about the novel coronavirus “[fools](#)” and violated a “no touch” policy (meaning no one should touch him at public events), hugging and shaking hands with supporters.

Fear of abuse of power and political pandering

In other countries, pandemic advice from the scientific community is not being questioned as intensely, but political distrust has created skepticism about the motivations underlying governments’ policy responses. Some of this is due to previous abuses of power by leaders who quickly invoked states of emergency to respond to the pandemic. Hungarian Prime Minister Viktor Orbán’s ability to rule by decree is a clear example, as his government used pandemic legislation to undermine [gender rights and freedom of the press](#). In [Latin America](#) and [Africa](#), the enforcement of COVID-19 restrictions led to excessive use of police and military force. For some of Africa’s urban poor, including [those living in slums](#) and working in informal trade, authorities’ use of violence to enforce social distancing and lockdowns in mid-2020 eroded confidence in the state. For instance, in [Harare](#), long a stronghold for Zimbabwe’s political opposition, state authorities destroyed stalls and merchandise in multiple open-air markets; in [Uganda](#), police beat up traders who showed up at markets that were closed.

Skepticism toward COVID-19 policies was also pronounced in countries where elections were on the immediate horizon. In April 2020, across many cities of Malawi, informal traders marched in protest over planned lockdowns by then President Peter Mutharika that were subsequently challenged in the High Court. In the wake of a rigged 2019 presidential election scheduled to be re-run in July 2020, [trust in the ruling regime was low](#), symbolized by an unprecedented level of protests in the country that year, and concerns about the politicization of the lockdown were high. In neighboring Zambia, where competitive elections took place in August 2021, masks distributed to the public were [branded](#) with the then-ruling party’s emblem in a blatant conflation of health policy with politics. And in the United States, the November 2020 elections, held in a context of deep party and public polarization, generated widespread contention over using mail-in ballots as a way to mitigate contagion at polling stations.

Misinformation and muddled accountability

Where there is distrust in either government or science, the flow of credible information and accountability are at risk. Some of the world’s more illiberal regimes have sought to limit media dissemination of scientific information about COVID-19 where it could be seen as sowing doubts about their performance in containing the pandemic. In the Philippines, for example, Duterte shut down one of the [main media broadcasters](#). Similarly, in May 2021, the government of then President Edgar Lungu revoked the [broadcasting license](#) of one of Zambia’s few remaining independent television stations when it refused to air the government’s public service announcement about the virus.

In settings where many citizens have low levels of literacy and education, misinformation can have dangerous implications. In [India](#) and [Mexico](#), numerous healthcare workers have been physically attacked in the mistaken belief that they carry the coronavirus, and in [Côte d’Ivoire](#), protesters

ransacked a COVID-19 testing facility. At the same time, several leaders espoused dangerous and unproven theories of COVID-19 cures. These included Madagascar President [Andry Rajoelina](#), who promoted the tonic embraced by Tanzania's late president; the former Nairobi Governor Mike Sonko, who advocated for greater consumption of [cognac](#); and former President Trump, who suggested hydroxychloroquine could ward off COVID-19. The independent website [Africa Check](#) documented dozens of untruths about coronavirus cures circulating in that region alone. Such measures make people more complacent about taking health precautions, as they gamble on a cure with no scientific credibility – and the remedies themselves can be extremely dangerous, as shown by cases of [chloroquine poisoning](#) in Lagos, Nigeria, after that was touted as a cure.

Whom can you trust?

Distrust in national-level authorities in some countries leaves a critical void that imperils efforts to contain COVID-19 and restart moribund economies. However, there are often other actors who retain high levels of public trust and who have played a critical role in disseminating essential information for protecting public health. In some settings, local authorities are viewed as more trustworthy because they live and work in closer [proximity](#) to their constituents – who therefore exercise greater oversight and accountability. In [East Asia](#), this dynamic is particularly strong in democratic regimes, while in [Europe](#), local trust is greater in more decentralized systems. For more than a decade, public opinion [surveys](#) have shown that local government in the United States has been trusted more than the state or federal government, and a similar [pattern](#) emerged regarding trust in handling the coronavirus.

The Africa CDC advocated that authorities steer away from implementing uniform national [public health and social measures](#) and instead tailor interventions to local needs based on feedback from community leaders. This reflects public opinion surveys from [Afrobarometer](#) consistently finding that trust in community leaders, such as religious and traditional authorities, is higher than that for formal state agencies in Africa. In a region with approximately 3,000 local languages, one way of improving compliance with COVID-19 measures has been the use [local language](#) information websites. For instance, in Chad, where more than half of the population lacks access to digital technologies, troubadours were recruited to help spread reliable information about COVID-19 transmission and prevention.

Conclusion

Some skepticism of political and scientific authorities is [healthy](#) because it encourages debate, contributes to policy improvements, and prevents societies from accepting decisions at face value. Yet, in a fast-moving pandemic, trust is critical to large-scale citizen compliance with public health measures. As countries attempt to recover from the pandemic, governments are working to finance health systems, support private businesses, buttress social protection mechanisms, and fine-tune social distancing measures. But they must also invest in open information systems that account for educational and linguistic disparities, bring religious and traditional leaders on board, and provide professional training for security services to avoid human rights abuses. As shown in [South Africa](#) at the beginning of the pandemic, partnering with opposition parties to raise public awareness also helps create a united front and prevent skepticism about political motivations from undermining compliance.

Building greater trust in science requires both politicians and researchers to work together more proactively to identify sources of bias and put suspicions to rest. Scientists should be conscious of the practical implications that their public health advice has for peoples' economic livelihoods. In the case of COVID-19, this requires engaging with community leaders to produce nuanced recommendations for social distancing, contact tracing, and other measures, based on local contexts. More broadly, scientists and regulatory bodies need to [interactively engage](#) with communities to clarify potential misinterpretations of their findings and recommendations. This is critical, given that [large segments of the public](#) may not have a good understanding of the many protocols used to ensure research is credible and legitimate, including peer review, replication, and ethical standards. Actively being transparent about data sources and the scientific motivations for recommendations – and acknowledging when there is [inadequate consensus](#) for action – can also build trust. Politicians, for their part, can bolster citizen trust by affirming the independence and accuracy of respected scientific authorities, as well as personally and publicly following the recommended health practices.

Trust is much harder to generate than funding and equipment. Yet globally, bridging the trust divide between governments, scientists, and citizens is fundamental to recovering from the COVID-19 crisis – and to ensuring societies are resilient enough to cope with the next one.

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30. How to ensure effective government responses as COVID-19 spreads to rural areas

Katrina Kosec and Catherine Ragasa

As COVID-19 began spreading globally in early 2020, it quickly went [beyond major cities](#) to affect rural areas in much of the world. In low-income countries, rural health systems have been overloaded and periodic lockdowns and other restrictions have driven down incomes. Governments have responded to the economic turmoil with an array of [social protection](#) programs, and through public health campaigns pushing both safe behaviors and vaccination and providing treatment. As our [2019 IFPRI Policy Brief](#) shows, ensuring high-quality governance and provision of services in rural areas is critical for livelihoods and economic development – and thus central to COVID-19 policy responses.

Yet researchers and practitioners have [focused](#) mostly on the governance problems that COVID-19 poses in urban areas, given greater exposure [risks](#) for infection there. But COVID-19 severely affects health, livelihoods, and incomes in rural areas, which face a distinct set of pandemic challenges deserving special attention.

In the United States, COVID-19 is killing rural Americans at [twice](#) the rate of people in urban areas, in part because of challenges in reaching such individuals with health services and deploying vaccinations. COVID-19 is similarly a critical threat with unique implications for rural areas in [low- and middle-income countries](#). As of the end of 2021, [only 9 percent](#) of people in Africa had been vaccinated, with [rural areas](#) facing the greatest shortages.

First, logistical and communications obstacles complicate the provision of services, including vital pandemic-related [health](#) and [agricultural services](#) and [other assistance](#). For example, a lack of amenities like high-quality roads, health clinics and hospitals, well-trained health workers, and cold-chain environments (for vaccine storage) can make [reaching rural areas](#) hard or impossible.

Second, rural areas are *especially* reliant on government services. Rural citizens are typically poorer than their urban counterparts, and thus relatively less likely to be able to [afford](#) private services. This same poverty and relatively lower education levels may also reduce demand for vaccines or treatments, furthering COVID-19's spread. COVID-19 is also particularly dangerous for older individuals, and [rural areas](#) generally have higher proportions of older citizens.

Third, rural areas are generally more remote and thus less connected to the central government and its policy response efforts. So-called [urban bias](#), which has resulted in policies that are ill-tailored to rural needs, may similarly affect the quality of COVID-19 policy responses for rural areas. COVID-19 also has the potential to further weaken connections between the central government and rural areas, potentially further undermining the responsiveness of policymakers to rural needs.

Fourth, many migrants are returning to rural areas – possibly spreading disease, straining local labor markets, or triggering conflict. Available [evidence](#) shows that while densely populated urban areas in various countries were the hardest hit in the first half of 2020, the spread of infection was fast to the rural areas and COVID-19 mortality rates increased rapidly – particularly from August 2020 onward.

Lastly, the food system itself critically depends on rural areas, where most food originates; farmers need access to markets not only for their outputs, but also for vital inputs and services. Few current COVID-19 policies, however, focus on sustaining [food production](#). Moreover, in many developing countries, [agriculture ministries](#) are conspicuously absent in national and subnational COVID-19 response committees.

Responding to COVID-19 and ensuring that high-quality services reach the rural poor demands a range of actions by governments, donors, and organizations on the ground. They must provide high-quality information to keep rural citizens informed of vital public health information about the virus and its spread, policy responses, and the availability of vaccines and treatments; stimulate rural enterprises and food production to mitigate disruptions to food supply chains and rural livelihoods; and mobilize citizen monitoring of government to foster two-way communication between governments and rural citizens.

Provide high-quality information on COVID-19, health, and nutrition

Misinformation about COVID-19 comes in many forms, and rural areas are at particularly high risk. Misguided and potentially harmful COVID-19 recommendations include [ingesting disinfectants](#), applying [disinfectant sprays](#), [not using second-hand clothes](#), taking [unproven drugs](#) or [herbal remedies](#), and [avoiding vaccines](#) widely recognized as being safe and effective. Rural areas – with a disproportionately high share of the poor – are least equipped to bear the costs of following such advice, especially amid a severe economic downturn. In many low-income countries, fears of COVID-19 infection have kept people from seeking necessary [healthcare](#) and accessing COVID-19 [vaccines](#), and misinformation about transmission has even reduced [seafood](#) and [meat](#) consumption – possibly posing a missed opportunity for improving rural diet quality and nutrition.

To ensure that rural residents receive – and believe – high-quality information, governments and development practitioners should work with institutions, organizations, or universities that people trust. In urban areas, we have already seen the [benefits](#) of strong communications programs to dispel misinformation. Similar strategies should be employed in rural areas. For example, information dissemination in some African countries has involved [recruiting](#) village leaders, religious figures, traditional healers, and youth to ensure that public health messages reach people and resonate. Further, low-tech solutions such as [Talking Books](#) and [innovative delivery of nutrition education](#) are helping communicate culturally appropriate messages on COVID-19, health, and nutrition in rural areas and establish community feedback channels.

Stimulate rural enterprises and food production

Even as it disrupts the food supply chain, COVID-19 simultaneously presents opportunities for income generation for rural citizens. Some countries have imposed export restrictions to protect domestic food supplies, which can lower food availability and raise prices in low-income countries that [import](#) much of their food. But this is also an opportunity to ramp up local food production, including homestead gardening, to boost food and nutrition security, and for returning migrants and the unemployed to generate income.

Agricultural and food businesses should be kept open. Agricultural inputs should be allowed to freely move to ease supply-side restrictions. Loan programs and temporary waivers on taxes and customs duties can help agricultural input suppliers and service providers. Temporary input packages, cash transfers, or loan programs can help smallholder producers, processors, and traders cope with disruptions. Producers and workers will also need protective gear, free COVID-19 testing, access to safe and effective vaccines, and improved water and sanitation.

To further stimulate local food production during the crisis, [seed distribution](#) and agricultural extension is more essential than ever. Information and communications technologies (ICT) can disseminate information and facilitate payments and logistics – but are often insufficiently available in rural areas. Subsidized data plans and [training on their use](#) may help. Radio programming also remains [central](#) for providing agriculture, nutrition, and health information in many developing countries and has proven effective in times of [crisis](#). There are now numerous examples of support from associations or governments for [innovative agrifood marketing](#), [online sales](#), [shorter and more efficient distribution systems](#), and [diversification to agrifood products](#) with increased demand during the crisis – which have helped in addressing major marketing issues faced by rural producers.

Mobilize citizen monitoring of government

As they respond to COVID-19, governments and organizations need consistent [access to information](#) about citizens' preferences and demands, and about how frontline service providers are performing. In rural areas, which are often out of the media spotlight, and where health-care [providers](#) may be less equipped or face less scrutiny than their urban counterparts, citizen input is extremely important as new health and social protection responses are rolled out.

Addressing COVID-19-related governance problems and responding to citizens' needs requires tracking infections, hospitalizations, and deaths, as well as vaccine deployment. It involves provision of health-related services (including water and sanitation – such as handwashing stations) and vaccines where they are needed most. It also requires knowing where citizens are finding effective treatment and vaccines versus being turned away. Crisis-related tensions and conflicts, including [land disputes](#), in rural areas also need to be monitored. These efforts all require strong and continued communication with rural service providers and citizens.

ICT may facilitate these goals during lockdowns and social distancing measures. Through ICT, rural residents can indicate what needs are or are not being met – providing the government with information and pressuring it to be responsive. ICT can also be used for contact tracing to control

outbreaks, [critical in rural and peri-urban communities](#) that are seeing people moving in from cities. Strong grassroots groups and organizations can also promote effective and inclusive planning, design, and monitoring of government programs, and can contribute to more effective [livelihood support](#) to rural citizens. For example, in Viet Nam, [Rapid Action Teams](#) comprised of community stakeholders, along with the rapid scale-up of telehealth, have proven particularly important for remote rural communities during the pandemic.

Opportunities for transformative change in times of crisis

According to a [United Nations Development Programme study](#), despite the Ebola epidemic occurring at the same time, living standards in Sierra Leone improved faster between 2013 and 2016 than in 70 other poor countries. Huge donor funding permitted increased expenditures in health and nutrition, with substantial benefits. COVID-19 could inspire similar efforts.

Like the Ebola crisis, COVID-19 provides opportunities to reverse longstanding inequalities and biases. But that requires supporting effective and responsive rural service delivery that safeguards the welfare of the poorest citizens while ensuring food security in rural and urban areas alike.

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