



Special Series on COVID-19

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June 29, 2020

Food Markets During COVID-19

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Besides ill-health and death due to COVID-19, one of the most consequential welfare outcomes arising from disrupted production and lost income could be reduced access to food. The possibility of rising hunger and malnutrition during this pandemic threatens primarily low-income countries but has not left advanced economies unaffected. About a decade ago, the global food price crisis resulted in greater food insecurity for urban households in Africa, led to civil unrest across multiple countries, and was accompanied by policies that may have exacerbated price volatility. Today's context bears both similarities to, as well as critical differences from, that crisis. This note presents an overview of the key issues affecting food markets during COVID-19 and discusses key implications for expenditure policies, which will need to be tailored to country-specific circumstances. It sets out what is known with regard to (1) the food supply at the stage of agricultural production, (2) midstream and downstream components of food supply chains, (3) the demand side, price developments, and food security, (4) trends and policy recommendations with regard to international trade in food products, and (5) existing and proposed policies and interventions to strengthen food access.

I. FOOD SUPPLY—THE AGRICULTURAL PRODUCTION STAGE²

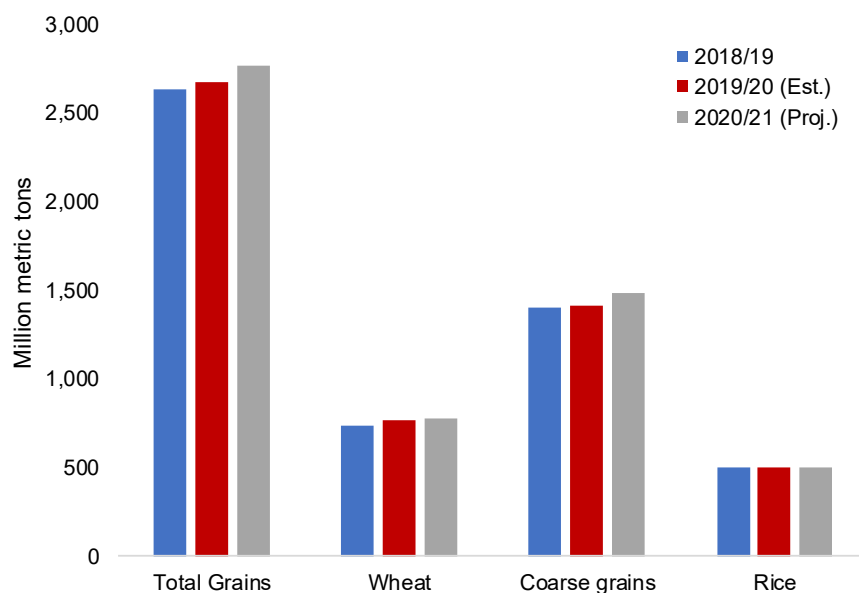
Global agricultural staples production is projected to remain stable. The latest available projections, which account for COVID-19, in fact point to mild increases in global production of agricultural staples in 2020/21 compared to previous years, and prospects for cereals also appear favorable (see Figure 1) (USDA, 2020a; Glauber et al., 2020). Conditions in just a few countries will drive global production. For example, the EU and four countries (Argentina, China, Brazil, and the U.S.) are responsible for three-quarters of worldwide maize

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² This section focuses mostly on crop-agriculture; implications of COVID-19 for animal products are discussed in Section 2, in the context of mid- and downstream food supply chains.

(corn) production (USDA, 2020b). It will thus be particularly important to monitor these countries when projecting global production going forward.³

FIGURE 1. Global Agricultural Production



Source: Author's compilation, based on USDA (2020a).

Note: Total grains include wheat, coarse grains, and rice. Coarse grains include maize, sorghum, barley, oats, rye, millet, and mixed grains. Rice is milled.

For the most part, the current planting season is getting underway before trade disruptions hinder the importation of inputs. Trade disruptions emanating from the pandemic could potentially affect future access to inputs for low-income countries that purchase their fertilizers, chemicals, and improved seeds from abroad. Highly concentrated markets on the input supply side (especially for fertilizers) can, at that point, amplify the risk to input importers (Opazo, Pound and Weber, 2020). However, there is so far no evidence that input shortages will be responsible for widespread and significant reductions in staples production. With the main planting season ranging generally from March to May (albeit with variation across geography and crop) (FAO, 2010) countries have in most cases already procured the needed inputs before the recent signs of trade disruptions due to COVID-19 could have constrained such importation. Among the exceptions are farmers in China, where the health crisis hit weeks and months earlier than elsewhere. A survey of Chinese farmers and enterprises conducted in February found that 60 percent of the farmers encountered a shortage of inputs, with lack of feed leading some farm animals to starve to death (Zhang, 2020).⁴

However, labor shortages from illness could disrupt harvesting in the fall. While staple crop agriculture is highly mechanized in advanced economies and several emerging markets, in lower-income countries harvesting still requires a mix of manual labor, animal power, and capital equipment. So far, the outbreak has not yet resulted in widespread illness in rural areas of these countries. However, they may face labor shortages arising from farmers falling ill by the time that most major crops will need to be harvested (September to November). While these trends may not significantly dent worldwide production, given that the latter is driven by a few major

³ FAOSTAT provides more detailed data on [production](#), which enables an examination of which foods are most important for a given country. Consumption, imports, and exports by country and commodity are given in FAOSTAT's [food balances](#) database. FAO's [country profiles](#) provide more narrative details by country.

⁴ In some regions, COVID-19 is compounding other major natural disasters to more severely impact food production and logistics: The ongoing five-month long locust infestation centered in East Africa is causing large-scale destruction of crops and livestock, and a severe drought in Argentina dried up the main river on which grains are transported to ports for export.

high-income and emerging economies that intensively use mechanization for staple crops, production shortages could be affected in the very countries in which such shortages may spell greater food insecurity.⁵

The harvest of high-value commodities is hampered more by labor shortages than are staple crops.

Illness and lockdowns will not bear down on agricultural activity equally across crop types. Harvesting of high-value commodities, such as fruits and vegetables, is significantly more labor-intensive than that of cereals such as rice, wheat and maize—even in advanced economies. Europe’s produce harvesting cycle is already being hurt, as border closures are preventing seasonal laborers from central and eastern Europe from travelling to other European countries to engage in fruit and vegetable harvesting (ILO, 2020a). This can emerge as a significant constraint to high-value agriculture, especially in high-income countries, where seasonal migrant work makes up a substantive share of total agricultural working hours. There is, however, the potential for domestic urban-rural migration to partially make up for declining agricultural labor supply. This temporary migration has, for example, been observed at a large scale in India,⁶ but also elsewhere.

II. FOOD SUPPLY BEYOND THE FARMGATE—DISRUPTIONS IN THE MID- AND DOWNSTREAM OF AGRIFOOD SUPPLY CHAINS

Downstream stages of the supply chain are experiencing larger disruptions than the production stage.

These post-production stages primarily take place in urban and peri-urban areas with greater population density, and are thus exposed to greater risk of infection, as well as to government measures restricting activity.

Transitional supply chains in particular including informal small and medium food sector enterprises prevalent in Africa and Asia rely more on workers and less on machinery for activities such as processing, transport, and storage. The sustainability of their businesses is thus especially compromised by worker lockdowns (Reardon et al., 2020). Their low logistical and financial capacity to maintain good hygiene and health standards on premises increases their relative vulnerability. Even though many countries treat firms selling, processing or trading food as essential and thus at least partially ease COVID-19 restrictions for them, the small informal businesses that dominate the sector in lower-income countries struggle to cope with losses from the limitations that do remain, such as social distancing rules that cap the number of customers that retailers can serve in a given time period, and the reduced hours per day during which enterprises are allowed to operate.⁷

Even modern supply chains in advanced economies are not spared the disruptions of COVID-19. This has detrimental consequences for farmers and consumers through backward and forward linkages, respectively. For example, among approximately 500,000 employees in 115 meat processing plants in the U.S., over 4,900 positive cases were confirmed in April (Dyal et al., 2020)—a reported case rate (3.3 percent), about 13 times the active case rate in the population at the time (0.2 percent).⁸ This resulted in 40 meat processing and packing plants temporarily shutting down, reducing the supply of beef and pork to retailers by an estimated 25 percent within a span of three weeks. Farmers were initially expected to have to euthanize millions of pigs that they would no longer be able to sell to the meat plants, though government-ordered reopening of plants and other adjustments heavily reduced that figure. Concerns have moreover been raised that where high market concentration in agriculture prevails, the disruptions due to COVID can be exploited by a few large price-setting

⁵ So far, the virus’s presence has been uneven across regions within countries; this heterogenous spread could contain problems of food access if markets and transport systems work well enough to move food from surplus to deficit areas.

⁶ “Desperate to go home, Indian migrant workers face tough choice amid world’s largest lockdown,” March 29, 2020.

⁷ The IMF’s [Policy Tracker](#) provides weekly updates on governments’ key economic responses to COVID-19; for several countries, the information also contains measures related to food markets and access. Laborde et al. (2020a) developed and regularly update a global policy tracker capturing restrictions on international food trade during the pandemic.

⁸ Worldometer reports that there were 808,516 active cases in the U.S. on April 27, which is 0.2 percent of the population, www.worldometers.info/coronavirus/country/us/.

companies to the detriment of farmers and consumers. The disorder in modern supply chains can also originate at the retail/service end, when restaurant closures result in a change in end-consumers' food demand composition. As an example, Belgian farmers faced a potato glut and large-scale wastage as a national potato-dish commonly consumed in restaurants and bars (but typically not at home) was no longer sold. Similar on-farm wastage of high-value and perishable commodities, such as fruits, vegetables, and milk, resulted from the severed demand-link between farms and restaurants in industrialized countries, suggesting a lack of flexibility in supply chains to reorient themselves to the new structure on the retail end.

III. FOOD DEMAND, PRICE INCREASES AND FOOD INSECURITY

COVID-19 induced demand effects from reduced incomes are a more important driver of food insecurity than supply-side challenges. A principal threat to demand is the potential for extensive income losses resulting from the inability to work due to lockdowns or illness, and from waning external demand for a country's exports. COVID-19 is expected to result by end-June 2020 in a 10.5 percent decline in the number of working hours worldwide, compared to the start of the year (ILO, 2020b). Extreme poverty (less than US\$1.90 a day) is projected to rise by 20 percent in 2020 (Laborde et al., 2020b). Driven by these income losses—which are largest among urban households—the global number facing acute food insecurity⁹ may nearly double, from 135 million in 2019 to 265 million, and over 30 countries may face famines by the end of the year (WFP, 2020a).

Supply-side disruptions and hoarding are exerting upward pressure on prices. Upward pressure on consumer prices due to the numerous challenges on the supply side is occurring (see below) at the same time that farmgate prices are falling for some products. For example, meat processing plants having to close reduces the demand for farmers' livestock and creates shortages at retail outlets. Hoarding behavior by end-consumers could further contribute to upward spikes on food prices (Swinnen, 2020). Since, in low-income and emerging economies, individuals with the economic wherewithal to hoard tend to be among the better-off, this behavior may exacerbate food insecurity, but the contribution of hoarding to food insecurity is likely only mild and temporary, given the limited stocking capacity of households. These drivers are accompanied by exchange rate depreciations in low-income countries, many of them net food importers, which consequently face rising prices for their imports. On the other hand, in developing economies, price increases are likely to be somewhat tempered by the income losses. This is because even though food demand has a lower income-elasticity than most other goods, in LICs (where food constitutes a larger share of total household expenditure) food demand is more income-elastic than in advanced economies (Mellor, 1988). Finally, lower oil prices, due in part to a COVID-19 related drop in mobility and industrial activity, will also, all else equal, weigh down on food prices as transporting food becomes cheaper. As seen below, the net effect of all these and other factors on consumer prices remains a distinct increase for most food types.

Nutrient-rich foods are particularly affected by COVID-related shocks—a fact that exacerbates these shocks' impact on malnutrition. Households in LIDCs who stock up on food tend to do so for products— such as cereals, roots and tubers, and pulses— that can be stored for a prolonged period of time (that is, in the absence of refrigeration, which is scarce in lower-income countries). Thus, price increases driven by hoarding are more likely to bear on these commodity groups than on perishable products. Furthermore, the food demand decline arising from income losses will not affect all food types equally; households will tend to substitute away from more expensive calories, like vegetables and fruits,¹⁰ the demand for which is more income-elastic than

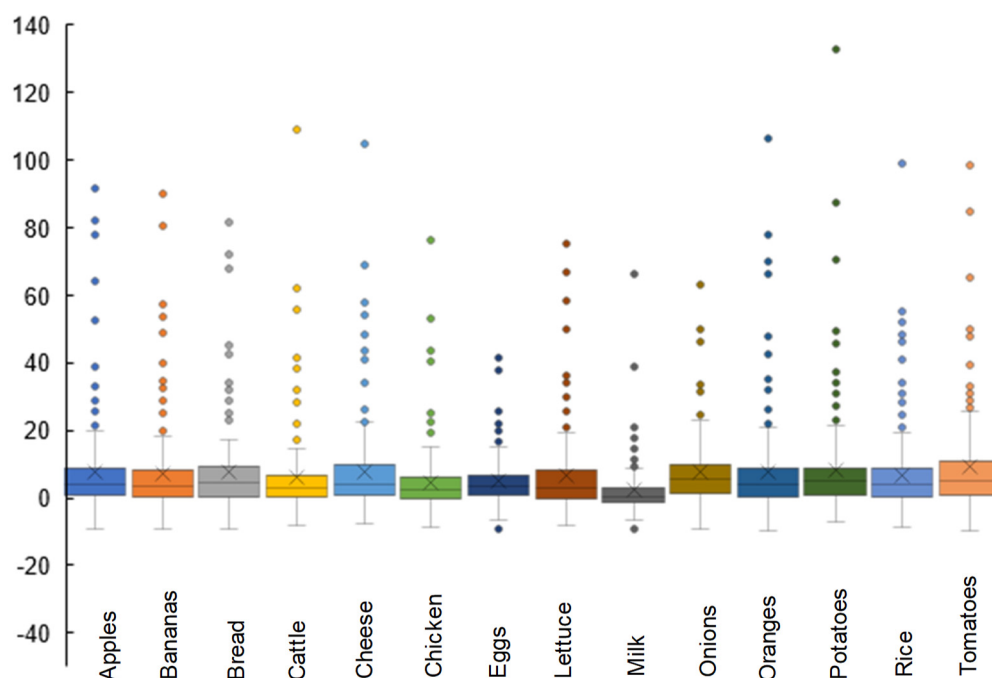
⁹ Acute food insecurity is defined on the basis of the Integrated Food Security Phase Classification's (IPC), Phase 3 or worse. In Phase 3, Households either: (i) have food consumption gaps that are reflected by high or above-usual acute malnutrition; or (ii) are marginally able to meet minimum food needs but only by depleting essential livelihood assets or through crisis-coping strategies.

¹⁰ An example of this phenomenon is seen in a rapid appraisal in Ethiopia (Tamru et al., 2020).

basic foods and staples (Melo et al., 2015). These commodities are also more nutritious than food staples, so that their greater sensitivity to supply- as well as demand-side shocks can be expected to aggravate micronutrient deficiency.

Consumer food prices have shown an appreciable increase in the three months since mid-February, with a moderate average masking wide cross-country variation. It is not a priori clear what the net effect on prices would be of the various countervailing factors (supply chain problems, hoarding, lower consumer incomes, declined oil prices). An empirical examination of recently compiled FAO data shows a distinct increase in prices paid by the end-consumer. In the approximately three months from February 14–May 18, 2020,¹¹ global average prices for a variety of food products increased by 2 to 9 percent, with half of the tracked goods rising by 7 percent or more. Underlying these averages are, however, large variations across countries (see Figure 2). For example, in this three-month period, bread prices went up by 80 percent in Côte d’Ivoire, the price of rice doubled in the Maldives, and potato prices rose by 133 percent in Guyana. Similarly, there appears to be pronounced variability of price changes within countries. Our analysis of a highly detailed food price dataset for select countries (IFPRI, 2020) shows, for example, that in India the coefficient of variation of prices’ percentage changes across markets (for a given day and food commodity) is 13.6 on average.¹²

FIGURE 2. Cross-Country Distribution of Consumer Price Percentage Changes over 3 Months (February 14–May 18, 2020, selected commodities)



Source: Author’s compilation from FAO, Daily Food Prices Monitor. Notes: The horizontal line inside each box corresponds to the median country, while the bottom and top border of each box reflect the 25th and 75th percentile countries, respectively. The “x” is the mean observation. The horizontal lines of the whiskers indicate the upper- and lower adjacent values and are the minimum and maximum values only where there are no dots below (above) the low (high) whisker, respectively. The dots identify countries outside the range of the adjacent values range.

¹¹ The new COVID-19 High-Frequency Data Hub (available to IMF staff) has also recently introduced select consumer prices for food (and other products). Both the IMF and FAO datasets are based on the same underlying source, [Numbeo](#). One of the limitations of this source is that it does not contain prices with a regular periodicity by site/town, which, if available, would strengthen timely analysis of the impact of COVID-19 on food price developments.

¹² That is, in absolute terms the price changes’ standard deviation across markets for the same day and food item is on average more than 13 times larger than the mean price change.

IV. INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS: RE-EMERGING EXPORT RESTRICTIONS

Several countries imposed food export restrictions during the 2008 food price crisis, and some are now re-introducing them. During the global food price crisis over a decade ago, 33 countries resorted to food export restrictions within the span of January 2007 to March 2011, with the goal of insulating their populations from further domestic food price increases (Sharma, 2011). During COVID-19, in less than two months (from March 18 to May 11) 22 countries already initiated export restrictions on one or more food products (Laborde et al., 2020a), and many countries accompanied these measures with reduced food import tariffs in order to lower domestic prices. The export restrictions are particularly significant when they concern staple foods, especially those in which countries imposing the restrictions hold a sizable share of the global market. Such restrictions are most likely to threaten the food security of those countries with both a low food self-sufficiency ratio¹³ and relatively high levels of hunger. Within countries, urban residents rely more on imported products than rural dwellers—even for the same commodity—and will thus be more heavily impacted by food trade controls.¹⁴ Many of the restrictions are effective through June or later but could subsequently be extended beyond their current end date.

Food export restrictions tend to be collectively counterproductive and harmful to global food security.

Anderson et al. (2014) found that changes in trade restrictions from 2006 to 2008 led to international food price increases that, for more than half the sample countries, more than offset the hoped-for benefits of the original price insulation policies; that is, for these countries, eventual domestic prices, while lower than the (risen) international prices, were nonetheless higher than they would have been had no country undertaken the changes in trade restrictions. The Fund advised in 2008 the removal of export bans and taxes (IMF, 2008), and on April 24, 2020, it reiterated, in a joint press release with the WTO, the importance of maintaining open trade policies as part of a suite of measures to counter COVID-19-induced food insecurity (IMF, 2020). In this vein, while countries' efforts to facilitate imports are welcome (for example, by curbing import duties and streamlining customs processes), export prohibitions are not only detrimental to global food security, but may in the long run also hurt the countries imposing restrictions as their lower domestic prices can reduce production incentives, increase incentives for smuggling to countries with higher prices, and trigger an international domino effect resulting in higher prices for other food products that these countries import (WTO, 2020a). A multilateral approach is needed to ensure that all countries embarking on emergency food trade measures are transparent to the international community (for example, by informing the WTO secretariat) with regard to the details of the measures. In such an approach, countries should also commit to exercising restraint so that the measures are, to the extent possible, targeted, temporary, and proportionate (WTO, 2020b).

V. EXISTING AND PROPOSED FISCAL MEASURES TO STRENGTHEN FOOD ACCESS DURING COVID-19¹⁵

Countries should seek to contain the detrimental consequences of COVID-19 measures on the implementation of pre-existing programs that support food and nutrition security. Precisely when food assistance has become even more necessary during COVID-19, a number of policies to provide such assistance have been compromised by the very policies seeking to mitigate the health crisis. For example, with school closures in 197 countries, school feeding programs that reach children of poor households have been

¹³ This ratio at the country level and pertaining to food, is: (production) / (production + imports – exports). See Clapp (2017).

¹⁴ Gyimah-Brempong and Kuku-Shittu (2016) illustrate this in the case of rice in Nigeria.

¹⁵ There are in some cases also certain appropriate non-fiscal policy responses, such as regulatory adjustments, that are briefly alluded to in this section, where applicable.

suspended. The WFP estimates that 368 million children are missing out on school meals as a result (WFP, 2020b). As of March, only 28 countries' governments have instituted compensatory measures, such as providing take-home rations to school children and cash-based transfers to the families of the children. Other governments should also seek alternatives to school feeding, and the WFP is helping to fill this gap in several countries. Interventions to support nutrition security such as micronutrient supplementation should also be protected from falling by the wayside when already strained health care systems divert resources away from other activities.

Food buffer stocks to stabilize prices should not be aggressively accumulated as they carry a large fiscal cost and do not efficiently improve food security. Many countries hold large stocks of food in reserve, with different motivations, including: (i) to release food for targeted distribution to chronically or temporarily food-insecure individuals (such stocks are usually referred to as “strategic grain reserves”, or SGRs), and (ii) to release food whenever prices rise with the goal of maintaining food prices within a set band (commonly referred to as “buffer stocks”). During the 2008 crisis, the second motivation became especially prominent: a number of developing and emerging market economies established new or augmented existing national grain buffer stocks, with the goal of stabilizing domestic prices (FAO et al., 2011). In the early 2010s, the world-average (excluding China) stock-to-use ratio—the ratio of buffer stocks to consumption—was slightly lower than 20 percent, while it was above 70 percent in China (Bobenrieth et al., 2012; OECD-FAO, 2013). The fiscal costs of storage and maintenance have been significant in some countries and were in many cases exacerbated by poor operational practices resulting in physical losses and degraded food quality. The cost of buying the grains escalated as purchases occurred when food prices were high. Buffer stocks' cost-effectiveness in alleviating food insecurity has been poor, given that they reduce prices for all, and are not targeted to vulnerable groups. Price stabilization goals can be achieved through other means, including by promoting cross-border and other international trade (World Bank, 2012).

However, strategic grain reserves can be a useful policy tool, and could be complemented by food vouchers for dietary diversity. In contrast to buffer stocks, SGRs can protect food security at significantly lower cost: SGRs contain grains intended for use in emergency situations, and target disbursement only to food-insecure people, usually at times of shortage (Kalkuhl et al., 2016). This means that while they still entail a fiscal cost, they can be significantly smaller in size than buffer stocks. In turn, however, the existence of economies of scale point to the value of cross-national cooperation to establish regional SGRs, as some regional bodies have done, such as the East Asia Emergency Rice Reserve. Other regional bodies only recently initiated such efforts, for example the Regional Food Security Reserve, which will serve ECOWAS countries. In order to ensure dietary diversity, food transfers made from SGRs, which usually consist of staple foods, should be complemented with provision of fruits, vegetables, and animal-sourced foods. These are key to curbing micronutrient-related malnutrition, which is a greater risk during the pandemic as people substitute away from such foods in the face of reduced incomes (Heady and Ruel, 2020).

More generally, for the goal of mitigating food insecurity, the tradeoffs between direct distribution of food, food provision through vouchers, and cash transfers should be considered. Compared to digital food vouchers or cash assistance,¹⁶ direct food distribution bears a relatively greater risk of propagating the virus, especially if the logistics are not managed carefully and recipients wait in crowded spaces. Poor management and planning can further lead to unrest and stampedes, as was evidenced some areas where the food arrived late and then ran out before all had received their ration (Jerving, 2020). Vietnam and Indonesia initiated an innovative distribution method during COVID that better enables physical distancing, coined “rice ATMs”, from which individuals (in Indonesia, after prior registration and confirmed eligibility) can obtain a certain

¹⁶ For a detailed discussion of digital cash transfers during COVID-19, see Una et al. (2020).

amount of rice from supervised dispensers that are positioned in major cities (Thu, 2020). Given the logistical requirements of transporting and storing bulky products, direct food provision can carry a greater operational cost than the administration of vouchers or cash transfers. Cost was among the considerations that led Sri Lanka to change its food provision scheme into a voucher program as early as 1979 (Alderman et al., 2018).¹⁷ However, food distribution also has potential advantages over cash transfers. First, if food security is the primary or sole goal of the assistance, this goal may be partially diluted when beneficiaries use cash transfers to other (possibly equally deserving) ends. The second advantage of food distribution arises when food prices are highly volatile, since in such contexts the food value of cash transfers could quickly erode. It would thus be important to adjust the amount of cash payments in a timely manner to reflect rapidly increasing food prices. Value-based (as opposed to quantity-based) food vouchers would also need to undergo similar adjustments as cash assistance. Third, in addition to improving access to food, government programs that facilitate direct distribution can also be used to support economic agents in the supply chain and reduce food waste. Such programs often buy suppliers' products that these agents otherwise would have had to destroy (see Section II) and make this available to food banks (e.g. USDA, 2020c).

The design of fiscal measures to support the supply side can benefit from lessons learned during the early stages of the crisis. For example, observations of the extent to which storage at the farmer or community levels led to post-harvest losses due to closure of markets would inform government investments in local storage facilities. With food being an essential good, provision or subsidization of protective gear and training in health-safety practices may be necessary to ensure the continued operation of small and/or informal businesses in the food chains that supply poorer populations. Where the various income support mechanisms already envisaged for firms need to be sequenced (either due to constraints in resources or in organizational capacity), SMEs in the food sector could be prioritized for early support, given the vital nature of their product to people's lives. The efficient, just-in-time food supply chains serving consumers in higher-income countries have also proven to be vulnerable. Here, nonfiscal measures may be key. For example, regulatory flexibility would facilitate redirecting food from restaurants to grocery stores and food donation facilities, to avoid food waste and improve food access. Reducing barriers to immigration for foreign farm workers may be critical in countries where foreigners account for a large percentage of farm labor, and where the majority of this workforce is undocumented (CFR, 2020).

A multi-donor funding vehicle could strengthen the coherence of international support for food security, and warrants a careful evaluation. In response to the previous food price crisis, the G20 launched the Global Agriculture and Food Security Program (GAFSP) in 2010. This program pooled donor resources to fund efforts to reduce hunger and support agriculture in LICs through productive and social investments. It has provided US\$1.3 billion in grants to date, complementing rather than replacing other fiscal support through bilateral and multilateral agencies (GAFSP, 2020). A recent statement by this program reflects a willingness to flexibly adapt resource allocation processes to meet the needs of and alleviate the strains on agriculture and food security under the pandemic. With much of government and other donor resources focused on battling the immediate effects of COVID-19, GAFSP may be well-positioned to leverage support from the G20 to bolster the recovery of food systems from the pandemic in the medium to long term. Given the potentially significant fiscal efforts needed and underway to support food supply chains and food access during COVID-19, a costing exercise, carried out by a research agency with corresponding expertise, would be warranted to estimate public expenditures required for this purpose.

¹⁷ Alderman et al. (2018) provide a useful, in-depth look at the history, operational design, and performance of food distribution systems, vouchers, and food security-oriented cash transfers, with a focus on six case study countries.

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