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Building Resilience to Vulnerabilities, Shocks and Stresses

- a paper on Action Track 5 -

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ACTION TRACK 5 – Building Resilience to Vulnerabilities, Shocks and Stresses

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What do we want to achieve?

The ambition behind Action Track 5 is to ensure that all people within a food system are empowered to prepare for, withstand, and recover from instability and participate in a food system that, despite shocks and stressors, delivers food security, nutrition and equitable livelihoods for all. Resilience at the individual, community, government and global food system level must be built in such a way that the economic, social and environmental bases to generate food security and nutrition for current and future generations are not compromised in all parts of the world. This means that it is equitable (economic resilience), it has broad-based benefits for all people (social resilience), and it minimizes harmful impacts on the natural environment (ecological resilience).

The concept of resilience first emerged in the context of ecological stability theory (Holling 1973). It was directed at understanding the capacity of ecosystems to sustain perturbations persisting in the original state. The resilience concept has evolved to address complex socio-ecological systems and their capacity to adapt while remaining within critical thresholds (Folke 2016). According to the FAO resilience is the ability to prevent disasters and crises and to anticipate, absorb, accommodate or recover from them in a timely, efficient, and sustainable manner (UN FAO 2020). In the context of food systems, resilience has contributed to the foundation of adaptive resource management (Walters 1986) with widespread use in cropping and farming systems (Webber et al. 2014). This concept has also surfaced in the field of economics where it has been linked to 'development resilience' which focuses on the capacity to avoid and escape from poverty in the face of unforeseen external shocks and stressors (Barrett and Constas 2014). This literature explicitly considers issues of risk, dynamics, and ecological feedback.

Food systems are becoming increasingly global, dynamic, and complex. Today, food goes through more complex agri-food supply chains involving networks of farms, production or processing facilities, and storage and distribution channels. With this complexity, new and challenging risks are emerging, including technological accidents, infectious diseases, transportation hazards, cyber-attacks, product contamination, theft, and unexpected shutdowns of key supply chain nodes (Leat and Revoredo-Giha 2013; Manning and Soon 2016). Such disruptions could lead to significant public health and economic consequences. A study by the World Bank finds that the impact of unsafe food costs low- and middle-income economies about US$ 110 billion in lost productivity and medical expenses each year (Jaffee et al. 2019). Yet a large proportion of these costs could be avoided by adopting preventative measures that improve how food is handled from farm to fork. There is significant potential for collaboration and learning using South-South and Triangular cooperation adopted by several UN Organizations, namely FAO, IFAD, and WHO.

Successful management of socio-ecological systems necessitates understanding the contextual factors that drive changes in resource-use patterns and influence societal capacity to adapt in the face of stresses. Schwarz et al., (2011) find that perceptions of risk, preference, belief, knowledge, and experience are key factors determining whether and how adaptation takes place – both at the individual and societal levels. They suggest that elements of good community-level governance such as social cohesion, leadership, or individual support for collective action improve the perception that people have of the resilience of their community. Creation of a food system that delivers broad-based benefits for all people, requires covering all the societal bases of equity and inclusiveness. Developing capacity to improve resilience requires actions at both the individual and societal levels. Capacity building for resilient food systems is a non-static process to develop stronger capacity that enables food systems to be more resilient to future shocks (Babu and Blom 2014).

What are the key trade-offs and synergies?

Over the next decade, food systems will face a complex challenge to deliver sufficient safe and nutritious food for all in a sustainable manner, reducing greenhouse gas emission and preserving ecosystems and biodiversity, while providing equitable livelihoods to all the actors in the food chain and promoting sustainable development. Attainment of these diverse goals gives rise to complex synergies and trade-offs across economic, political, social and environmental dimensions that need to be considered in setting priorities across productivity growth, environmental sustainability and hunger reduction (Béné et al., (2019)).

Some of the most pressing tradeoffs arise between:

- *Immediate and long-term objectives:* From a food security viewpoint, there is a strong imperative to increase agricultural production by expanding crop land area as well as irrigation, fertilizers, and other agriculture inputs. However, such expansion poses sustainability challenges, placing unprecedented pressure on the earth's natural systems and increasing the risk of exceeding planetary boundaries. Such exceedances jeopardize the well-being of future generations (Steffen et al. 2015; Springmann et al. 2018). For food systems to deliver food and nutrition security for present and future generations, all their components need to be sustainable, resilient, and efficient. Unfortunately, short-term vested interests can undermine the needed emphasis on longer term outcomes (Oliver et al., (2018)).
- *Farming communities and others:* Resolution of conflicts at the boundaries of agricultural and other land uses and communities, e.g. forest, urban, diversification and specialization, as well as the need to combine the benefits of diversification with the economy of scale. Conflict frequently arises at the boundary of agriculture and forests where encroachment on natural habitat can lead to conflict, for example between elephants and rural populations (Shaffer et al. 2019). Rural and urban communities also face competition for resources, including land and water. Agriculture accounts for nearly three-quarters of water consumption globally and, as urban and suburban water scarcity emerges, we expect some reallocation of this resource to occur (Molden et al. 2007). The global share of urban populations are expected to increase from 50% today to 70% in 2050 (UN Population Division 2011) and such expansion will contribute to farmland loss and water reallocation towards domestic uses. On the other hand, rural-urban labor mobility can offer an important source of resilience. To identify potential trade-offs and synergies between rural and urban communities, Blay-Palmer et al., (2018) assess the value and utility of the evolving City Region Food Systems approach to improve our insights into flows of resources from rural to peri-urban to urban areas.
- *Contrasting forces and interests at local and global scales*. There is a need to combine local interests for enhanced resilience in food security in the face of global change drivers. Global drivers, including population, income, technology and climate change play an important role in creating local sustainability stresses, and the way local economies and institutions respond to these location-specific stresses can feed back and influence regional and global outcomes (Hertel et al. 2019). The food system contributes significantly to global stresses, including groundwater

drawdown (Wada, Van Beek, and Bierkens 2012), greenhouse gas emissions (IPCC 2014b) and deforestation with ensuing loss of biodiversity (Busch and Ferretti-Gallon 2017). Global trade offers a vehicle for supplying food to water scarce regions in the future (Liu et al. 2014), but this does not address the challenges faced by local producers who may no longer have access to irrigation water and farmland in the face of growing resource scarcity, particularly marginal areas where production systems are severely constrained by the lack of resources.

- *All of these tradeoffs are made more challenging in the context of small farms, operating in marginal environments* Small farmers play a crucial role in fostering rural growth by playing multifunctional roles in development. A large body of empirical research argues that smallholders are still key to global food security and nutrition. Although these farms account for only 12% of the world's farmland, they provide livelihoods for more than 2 billion people and produce about 80% of the food in Sub-Saharan Africa and Asia (Paloma, Riesgo, and Louhichi 2020). Empirical evidence suggests that populations living on less favored agricultural lands in developing countries cope with major poverty-environment traps (Barbier 2010; Barbier and Hochard 2019). These traps arise in the context of severe biophysical constraints and limited market access constrains that limit profitability of production and restrict off-farm employment opportunities (Barbier and Hochard, 2018). Poor people are caught in a vicious downward spiral as they overuse environmental resources to survive from day to day, and the impoverishment of their environmental resources further deprives them, making their survival ever more uncertain and difficult (Gray and Moseley 2005). Since marginality is not a permanent state (Gurung and Kollmair 2005) and those affected by it can be helped with targeted support and appropriate policies in place, there is an opportunity to target the rural poor under marginal conditions who have been overlooked and left behind under previous rural development and agricultural programs.

These tradeoffs notwithstanding, there exist positive synergies which can help in achieving diverse resilience and sustainability goals. For example, moving away from animal-based diets will improve both health and environmental outcomes by reducing the pressure on natural land, water and biogeochemical systems (Springmann et al. 2018). Limiting food waste can moderate food prices in addition to benefitting the environment (Lopez Barrera and Hertel 2020). Reducing post-harvest storage losses can enhance incentives for adoption of new seed technologies (Omotilewa et al. 2018) as well as improving intra-annual food security and moderating resource requirements (Aggarwal, Francis, and Robinson 2018; Kumar and Kalita 2017).

In order to address trade-offs properly, attention is required by:

- *Policy makers*, to strengthen coordination among international actors and across scales, allowing for positive synergies in which governments and NGOs can learn from the successes and failures of other nations and institutions (Wiener and Alemanno 2015).
- *Institutions*, to combine activities at "multilateral", "bilateral" institutions, NGOs and foundations.
- *Coordinated public and private investments* in the food sector (Mushtaq et al., (2020)).

What needs to be done?

To address these resilience challenges, solutions need to be defined around cross cutting levers of joined-up policy reform, coordinated investment, accessible financing, innovation, traditional knowledge, governance, data and evidence, and empowerment. This must begin with strengthening capacity to monitor and analyse vulnerability. Here, the joint FAO-World Food Program Early

Warning System provides analysis of acute food security hotspots plays a key role at the global level (FAO and WFP 2020).

Hunger is increasingly concentrated in conflict zones as well as naturally fragile environments (prone to recurrent natural shocks). Over the past two decades, conflict-plagued countries' share of stunted children grew from 46% to 75% (FAO 2017). The World Food Program has introduced several programs to address food insecurity in conflict zones, such as the Food Assistance for Assets, which aims at addressing the most food-insecure people's immediate food needs with cash, voucher, or food transfers while helping improve their long-term food security and resilience. Within this program, people receive cash or food-based transfers while they boost assets, such as constructing a road or rehabilitating degraded land to improve their livelihoods. The combination of conditional food assistance and asset creation work helps food-insecure communities to shift away from reliance on humanitarian aid to achieve more sustainable food security. (See also Box 1.)

Box 1: A Case Study in Resilience in the Face of Civil Conflict

The crisis in Somalia is the result of rapid shifts from drought to flooding and violence and conflict. The World Food Program (WFP) and the Food and Agriculture Organisation (FAO), and international/local NGOs have joined forces to implement a multi-year, joint resilience program in Burao and Odweine districts of Somaliland. The program allows agencies to pull resources together and implement complementary activities, contributing to effective resource utilization and supporting communities over long periods. Through the partnership, water catchments, vegetable gardens, and nutrition-awareness programs were implemented.

At the regional level, a promising example of actions to promote resilience is offered by the "Cadre Harmonise du Sahel" which provides a set of functions and protocols for the identification and analysis of populations in the Sahel region at risk of food and nutrition insecurity. It seeks to answer questions related to the severity of a given crisis, how many people are affected, when and where intervention should be undertaken, and what are the limiting factors? Stakeholders include national, regional (West Africa-wide) and international entities.

In Ethiopia, an effort is underway aimed at breaking the cycle of dependence on food aid. The Productivity Safety Net Program (PSNP) focuses on the chronically food insecure households, providing cash or food transfers on a predictable basis for five years, along with financial and technical support. Where there are able-bodied beneficiaries, they are required to provide labor in exchange for these transfer payments. The goal is to help these households build assets which can sustain them through future crises, along with contributing to the construction of rural infrastructure.

Development of resilience and sustainable agriculture is being facilitated by the Big Data initiative of the Consultative Group for International Agricultural Research (CGIAR), dubbed INSPIRE, https://bigdata.cgiar.org/inspire/, which seeks to harness recent advances in remote sensing, machine learning and robotics to support agricultural research and innovation in support of sustainable development and food security. These and other new scientific tools including precision biology (cell factories), combined with artificial intelligence offer the prospect of making every element of the food system more efficient https://www.weforum.org/reports/innovation-with-a-purpose-the-role-of-technology-innovation-in-accelerating-food-systems-transformation. There is also an increasing emphasis on integrated systems approaches in which farming practices seek to imitate nature's ecological principles, where not only crops but also varied types of plants, animals, birds, fish, and other aquatic flora and fauna are utilized for production.

Initiatives targeted at policy makers, researchers, agribusinesses need to be aligned with capacity development actions. This should seek to integrate knowledge generation with knowledge sharing in a manner that can effectively inform, and be informed by, action (Virji, (2012)). Farm households' decision-making in the context of risk and resilience challenges is often constrained by a lack of information on weather and market conditions. Many farmers in low income countries rely on informal knowledge of local climates and weather patterns that has been acquired over decades or even centuries. The challenge posed for these households by climate change is that much of this knowledge base is effectively destroyed as it is rendered irrelevant under the new climatology (Quiggin and Horowitz 2003). In this context accurate weather forecasting is of critical importance to the farming community. Indeed, Gine, Townsend and Vickery (Gine, Townsend, and Vickery 2007) found that farmers in India with less access to risk-coping mechanisms invested more in acquiring accurate weather forecasts.

The usefulness of modern climate forecasts will depend on "developing focused knowledge about which forecast information is potentially useful for which recipients, about how these recipients process the information, and about the characteristics of effective information delivery systems and messages for meeting the needs of particular types of recipients" (Stern and Easterling 1999). An example where a close link between research and capacity building has been planned from the beginning is the West African Science Service Centre on Climate Change and Adaptive Land Use (WASCAL, https://wascal.org/) with graduate studies programs comprising 10 graduate schools closely linked to the respective research activities and research institutions. Close links between research activities and capacity building are also considered in other larger research programs such as N2Africa which emphasizes putting nitrogen fixation to work for smallholder farmers in Africa, https://www.n2africa.org/, as well as through the AgMIP (https://agmip.org/) regional studies in Africa, Asia and other parts of the world. While all these programs have achieved good progress, links among these programs are under-developed and they would generate greater impact through coordinated research and funding activities at the national and international scales.

The socio-economic and institutional context in which innovations are introduced is key for advancing equity in farming communities (Bayard, Jolly, and Shannon 2007). However, solutions aiming to enhance agricultural productivity often focus on technological innovations but do not necessarily consider social, economic, and gender disparities. Evidence grows that agriculture innovations can affect women and men differently within households and communities due to differences in power, roles, and access to rights (Doss 2001; Beuchelt 2016). Equity in agri-food systems, including being inclusive and sensitive to gender and social inequalities, can contribute to improving productivity (Beuchelt 2016). Development policies must address challenges and knowledge gaps related to social justice issues, environmental equity, and economic equity for smallholder farmers. Such achievements are possible only in a policy environment that promotes context-specific pro-smallholder value chains with equal access to innovations, capacity building opportunities, and smallholder-friendly financing and investment, as well as policies that support productive social safety nets. The FAO and IFAD are collaborating to strengthen the capacity of the indigenous groups, women and rural youth. Five percent of the world population belongs to indigenous people (FAO 2018) and they are culturally unique and have unique resilience strategies and challenges. IFAD is also working on 4Ps (public-private-producers-partnership) in agricultural sector to provide enabling environment as strategic goal. Some examples for advancing equity in the context of smallholder agriculture including strengthening social protection systems (e.g., food banks, emergency food pantries, nutrition-sensitive cash-transfer programs, etc.), as well as supporting grassroots activities dedicated to providing vulnerable populations with access to healthy and sustainable food.

Other measures include direct use of saline waters for agriculture and food, feed, fiber production, along with efforts to increase productivity for marginal and or subsistence farms. This has the potential to improve the food security of poor households in rural areas by increasing food supply, and by reducing dependence on purchasing food in a context of high food price inflation. The UN Special Rapporteur on the Right to Food, Oliver De Schutter (2011), highlights in his report that marginal and or small-scale ecological farming is already very productive and can do even better. He calls for the use of agro-ecological methods to increase food production where the hungry live. Leveraging agriculture-ecosystem mutualism can improve productivity and may be more accessible and viable for marginalized or smallholder livelihoods than methods reliant on high agrochemical inputs (Seppelt et al. 2020). Eco-farming for food security can be expanded to include the matrix of adjacent wild land, given the importance of landscape complexity for agro-ecological functions such as pest management, pollination, soil and water quality (Tscharntke et al. 2005; Ricketts et al. 2008).

In addition to providing sustainable incomes, the food system must ensure food safety along the entire food chain. For many low- and middle-income countries, rapid demographic and dietary changes, among others, are contributing to broader exposure of populations to foodborne hazards, stretching limited capacity to manage food safety risks. However, food safety receives relatively little policy attention and is under-resourced. Building resilience in such complex agri-food value chains calls for more significant and smarter investments in food safety management capacity, particularly in low- and middle-income countries. Comprehensive national food safety policies require cross-ministerial collaborations, spanning agriculture, industry, public health, domestic and international trade, science, technology and education, in the setting food quality and safety strategies and ensuring their governance. Policy implementation of the food quality and food safety system must include elements of quality control and quality assurance systems, food safety standards, risk analysis, diagnostic technology, and traceability systems. Proactive and effective surveillance and rapid response are also critical aspects of food safety systems' performance to tackle risks (Jaffee et al. 2019). Further, food safety systems are a critical ingredient of successful food export performance. Recognizing this potential barrier, Thailand's food sector has worked closely with the U.S. Food and Drug Administration (FDA) to meet the Preventive Controls for Human Food (PCHF) regulation, thereby avoiding burdensome export restrictions.

In addition to food safety concerns along the supply chain, consumers directly affect the safety of foods through their food handling and preparation practices. Poor hygienic practices in the home are responsible for between 30-40% of food-borne illness. Many countries invest in educating and informing the public about food safety as an important means of reducing food-borne illness. For example, the Bangladesh Food Safety Network developed a range of initiative and Information, Education and Communications (IEC) materials to enhance awareness of food hygiene and safety among targeted groups, household food preparers, school children, and street food vendors. (http://www.fao.org/in-action/food-safety-bangladesh/activities/consumer-awareness/en/). Recently, the FAO has worked with public health and food safety authorities and with consumer bodies to assist in the design of public information/education programs/campaigns, including the monitoring of their effectiveness. In addition, FAO assist in the development of appropriate messages for use in such programs to facilitate behavior, as well as to improve food hygiene practices in food service sector (FAO2020, http://www.fao.org/food/food-safety-quality/capacity-development/public-education-communication/en/).

Policy coordination will be key in enhancing future food system resilience. Schipanski et al., (2016) proposed integrated strategies for fostering food system resilience across scales, including (a) integrating gender equity and social justice into food security research and initiatives, (b) increasing the use of ecological processes rather than external inputs for crop production, (c) fostering regionalized food distribution networks and waste reduction, and (d) linking human nutrition and agricultural production policies. Enhancing social–ecological links and fostering adaptive capacity are essential to cope with short-term volatility and longer-term global change pressures. Pingali et al., (2005) explores the linkages between food security and crisis in different contexts, outlining the policy and institutional conditions needed to manage food security during a crisis and to rebuild the resilience of food systems. In the Sahel, CILSS has emerged as an important vehicle for regional policy coordination on matters of food security (Box 2). In the context of wealthy nations, the Joint Programming Initiative (JPI) in the EU (https://ec.europa.eu/programmes/horizon2020/en/h2020-section/joint-programming-initiatives) has improved the harmonization of research activities across countries of the EU. A prominent example in the domain of the Summit21 is the JPI FACCE (Food Security, Agriculture and Climate Change, https://www.faccejpi.net/en/FACCEJPI.htm) which is presently further developed to also link research to national and EU stakeholders including policy makers to better coordinate research and policies.

Box 2: Coordination of Regional Policies for Food Security in the Sahel

The Permanent Interstates Committee for Drought Control in the Sahel, known as "CILSS," is an international organization established in 1973, consisting of 13 countries in the Sahel of West Africa. The mandate of CILSS is to address desertification and to improve food security in the Sahel. Over the years, CILSS has established itself as its member states' technical arms in the area of Food Security. Subsequently, the Economic Community of West African States (ECOWAS) entrusted CILSS to support member states in developing their National Agriculture Investment Plans. In addition, CILSS created the Sahelian Pesticide Committee, known as the "CSP," a common regulation for the registration of pesticides in CILSS member states to combine the expertise in pesticide evaluation and management to improve pesticide registration. In line with the Rotterdam Convention framework for the regulation of hazardous chemicals and pesticides in international trade. The CSP has the authority to issue full or provisional registrations as well as refusing registration of a specific pesticide product. Besides facilitating the Rotterdam Convention's agenda, this approach has entirely replaced national pesticide registration in individual CILSS member states.

Increasing investments are needed to improve food security and resilience of food systems. Public Private Partnerships (PPP) offer an important opportunity to leverage resources from the private sector. PPPs also bring in new technologies and innovation and they can facilitate risk-sharing. The committee on World Food Security (CFS) established criteria for responsible agricultural investments in 2015. A recent review (Mangeni 2019) on the role played by PPPs in disseminating acceptable technology to farmers, explores the current state of the field, and details approaches and methods for the establishment and promotion of PPPs in sub-Saharan Africa.

These initiatives and programs notwithstanding, individual producers will likely face increasing risks in the future as climate extremes become more frequent and more pronounced. Effective drought risk management requires an early warning system (e.g., FEWS NET), risk assessment, drought preparedness, mitigation and response (Funk and Shukla, 2020). Traditional risk sharing mechanisms within a community have been a key vehicle for protecting against idiosyncratic shocks to income. But these do not perform well when adverse events such as drought affect an entire community. Weather index insurance has been developed specifically for such circumstances (Gine, Townsend, and Vickery 2008). Here, households enroll at the beginning of the season and payouts are made based on (e.g.) rainfall dropping below a trigger level. It is typically provided by the public sector, and can entail relatively low overhead if the triggers are transparent and not subject to manipulation. Nevertheless, experience to date suggests that enrollment rates amongst poorest households tend to be low, as they face credit constraints. Importantly, insurance should enable farmers to take up improved farming and land restoration practices.

Factoring in context specificity

Actions will have differential impacts depending on their agroecological context, cultural aspects, policies and institutional capacities. The determinants of access to safe and nutritious food vary widely, reinforcing the fact that solutions cannot be "one size fits all". An estimated 1.4 billion people live and work in marginal environments (Chen and Ravallion 2004). Vulnerability for safe and nutritious food looms over all agro-ecologies in the face of climate change; but the fragile agroecologies are the most vulnerable. These regions are highly populated and stricken by poverty, food, nutritional and social insecurity. Site specific agroecological solutions, could contribute to economic viability, provide appropriate solutions to many of the environmental challenges and be socially inclusive, addressing rural employment and livelihoods. This is particularly relevant in parts of Africa, South and South East Asia and Latin America countries agriculture still accounts for as much as three-quarters of employment (Roser 2013). The adoption of promising agricultural technologies has been far from universal, and has remained particularly low among the poor (Freebairn 1995). As a result, the Green Revolution may actually have created new sources of food insecurity in marginal areas by targeting high potential areas and a handful of high value crops grown there (wheat, rice, maize) (Pearse 1990; Shiva 1991; P. L. Pingali, Hossain, and Gerpacio 1997). However, Enhancing agricultural development for marginal farmers and smallholders can create strong links to the rest of the rural sector (Koonin 2006), both through hiring of extra local labor at peak farming times and through more-favorable expenditure patterns for promoting growth of the local non-farm economy, including rural towns (IFAD, 2013). (See also Box 3.)

Box 3: A Case Study in Local Innovation and Resilience

Bann Samkha, a small community in northern Thailand, has faced severe drought, leading to food insecurity. They solved this problem through community water resource management, allowing them to attain self-sufficiency in rice production. However, the long distance between rice farms and the commercial rice mill led to high transport costs. To cope with this problem, a compact and highly efficient small-scale rice mill machine has been developed. This user-friendly machine proven highly suitable for rice milling in rural areas, allowing farmers to sell high-value milled rice instead of paddy rice. Furthermore, the community uses the rice straw to produce rice straw paper through an organic process. With local wisdom, the community has now created an 'eatable calendar' wherein each page of the calendar is embedded with seeds of the month that grow into plantlets after being watered. The rice straw paper and the eatable calendar production have brought more income and a sustainable economy to the community. This illustrates the potential for communities to create high-value, circular and sustainable bio-economies (Thangphisityothin 2020).

Many coastal communities and small island states also face difficult economic conditions. However, in many cases the development of tourism can make a valuable contribution. Indeed, coral reef tourism is a critical, undervalued ecosystem service generating $36 billion in global revenue (Spalding et al. 2017). In many cases, local fisherman can convert their boats to tourism and boost their incomes. While coral reefs face an immediate threat from climate change, there is potential to make them more resilient by managing fishing effort (Hughes et al. 2007). More generally, the impacts of climate change and extreme events differ considerably across the planet (IPCC 2014a). Resilience and vulnerability strongly depends on the ability to adapt to climate change which again depends of economic conditions (Wheeler and Braun 2013) with poorer, less diversified regions being more vulnerable (Reidsma and Ewert 2008).

Food System Resilience during the COVID-19 Pandemic

Evidence about the impact of COVID-19 on food system resilience is just beginning to emerge in the peer-reviewed literature. It is clear that, in many places, food insecurity has risen sharply. Ziliak (2020) compares the extent of food hardship in the United States among adults before the Pandemic with that which has arisen subsequently, drawing on real time surveys from the Census Bureau. He finds that food insufficiency increased three-fold compared to 2019. Food insufficiency among black adults is estimated to be two to three times higher than for whites and reached one in five individuals in July of 2020. Low income adults in the United States have also been relying much more heavily on charitable food donations since the onset of the Pandemic.

Food insufficiency captures lack of access to food due to limited resources. This can arise in a Pandemic due to limited availability, high prices or loss of income. Evidence to date shows that the impact of the pandemic on prices and food availability varies widely across commodities and countries. In India, where there was a sudden, unanticipated lockdown put in place for three weeks in late March/early April, the evidence on price impacts is mixed. In a detailed study based on data from just one of the largest online retailers in India, Mahajan and Tomar (2020) find that online prices during the lockdown were largely unaffected. Instead, availability of food was reduced – by 8% in the case of fruits and vegetables and 14% for edible oils. This drop in availability was largest for products being delivered from remote locations. In contrast to these findings, Narayanan and Saha (2020) use publicly available data from the Government of India to analyze urban food prices across a range of markets and suppliers and find evidence of marked price increases during the lockdown – particularly for pulses, oils and vegetables -- ranging from 3.5% to 28%, depending on the commodity in question.

In the United States, the Pandemic disrupted a finely tuned food supply chain that delivers different products to restaurants and institutions, as opposed to retail outlets. This resulted in very significant disruptions, with short run price increases reflecting the ensuing temporary scarcity in retail products such as table eggs. Institutions purchase eggs in liquid form, whereas household purchase them in cartons. The sudden evaporation of institutional demand, coupled with far greater at-home demands translated into a 141% spike in the retail price of table eggs (Malone, Schaefer, and Lusk 2020) (Malone et al., 2020). The US government responded by loosening food safety requirements limiting institutional egg suppliers access to the retail market. When combined with supply-side adjustments, prices have to their pre-COVID levels within two months of the Pandemic onset.

The pandemic has also posed significant challenges for workers in the food system – particularly those working in slaughter houses and other processing facilities at close quarters. In the US, meat processing plants became hotspots for COVID-19 outbreaks. Since the US meat processing industry has become highly concentrated, closure of just a handful of large plants had a dramatic impact on meat supplies. As a consequence of social distancing, marketing spreads (the difference between farm gate and consumer prices) rose dramatically starting a month after the onset of the Pandemic in the Midwestern US (Lusk, Tonsor, and Schulz 2020). However, once again, these have now fallen back to pre-COVID levels, suggesting that the food supply chains have adapted to the new economic environment.

The impacts of the ongoing COVID-19 pandemic are now becoming more evident in Sub Saharan Africa (SSA). Owing to more limited intercontinental mobility, relatively younger populations and aggressive mitigation strategies, many countries in the SSA region were shielded from widespread cases early in the Pandemic. However, it is now in full force on the continent. Limited health care resources, large households and high incidence of co-morbidities leave many countries in SSA highly vulnerable to this pandemic (Walker et al. 2020). Four of the six countries with the highest death rates from COVID-19 are in SSA (Barro, Ursúa, and Weng 2020). When combined with low export prices and adverse labor productivity shocks, this foreshadows an economic crisis for many countries in the region (Mueller et al. 2020).

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