

Advance Equitable Livelihoods



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1 Introduction

Food system transformation provides the opportunity to shift current trends in all forms of malnutrition, prioritizing nutritious food availability and affordability for all – from shifting priorities in agricultural production to facilitating improved food systems that favor nutrition and sustainability.

The purpose of the Action Track 4 science group is to provide the scientific basis for the work of the Action Track (AT). Our task as the science group encompasses reviewing both the evidence arising from studies of the nature of the issues and the potential solutions said evidence underpins. It also helps to identify uncertainty and the gaps in our knowledge. The central issue identified by the AT 4 team has been stated as:

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Inequality and power imbalances – at the household, community, national and global levels – are consistently constraining the ability of food systems to deliver poverty reduction and sustainable, equitable livelihoods.



In developing solutions, AT 4 explicitly calls out inequities related to gender, age (both the youth and the elderly), minority status, migrant status, and indigenous people status. These solutions focus on small and medium-size enterprises (SMEs) across the food value chain, but also equitable access to employment and livelihoods for wage earners, extending the concerns of inequality to rural/urban and other social and geographic divides. Efforts to address inequality and power imbalances must build agency, change relations, and transform the structures that underpin this imbalance of power and result in inequalities, as illustrated in the following figure (Figure credit: Action Track 4 Discussion Starter, October 2020):

The most effective way to sustainably eradicate poverty and inequality is to boost the opportunities and capacities of the poor and those living in situations of vulnerability, through the more equitable redistribution of resources (e.g., land, incomes, social protection), assurance of quality education, progressive and not regressive taxation, and state infrastructure investments, among other approaches. Reducing inequalities requires that gains in productivity, production and income be assessed against their positive impact on marginalized groups. Decision-making must also become more participatory and accountable to those who are most negatively affected by our current food systems and their outcomes. Progress in advancing equitable livelihoods and value distribution therefore involves several key areas, including expanding access to assets, infrastructure and services, as well as other required measures to enhance the quality of living spaces. Interventions to produce real change on the ground need to empower the poor and those living in situations of vulnerability.

To fulfill our task as the science group, we need to step back and consider the evidence related to the drivers of inequality and power imbalances as they relate to livelihoods *across* the food system. We use the conceptual framework of food systems developed by the High Level Panel of Experts of the UN Committee on World Food Security in 2017 (HLPE 2017), updated in 2020 (HLPE 2020), and

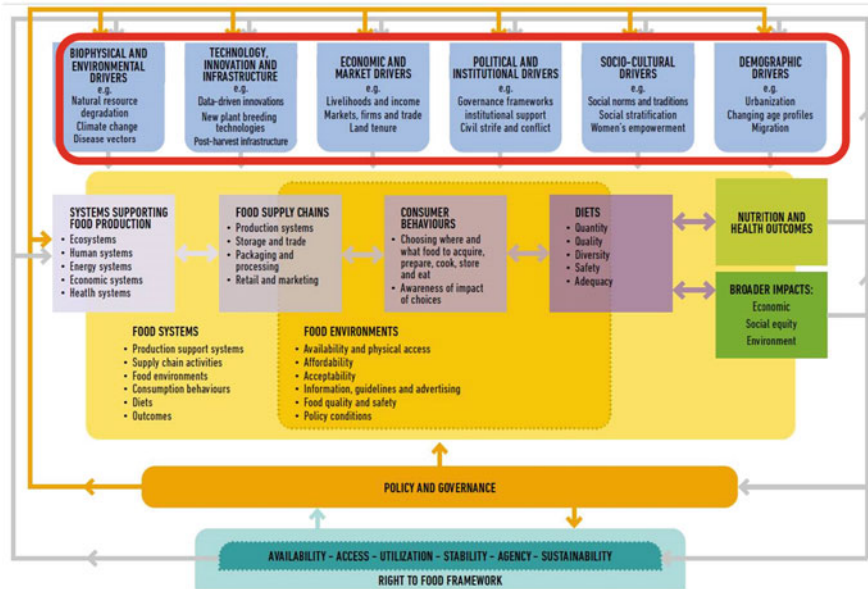


Fig. 1 Conceptual framework of sustainable food systems. (Reduced from HLPE 2020)

structure this review around the six drivers of food systems (as highlighted in the red box in Fig. 1).

Framed around the drivers of sustainable food systems (combining them where the nature of the evidence warrants), the following sections provide an overview of the nature of the issue as it relates to drivers of inequality and power imbalances. Our intent is to explore these drivers as they relate to livelihoods among those living in situations of vulnerability, including consumers and producers and all types of workers across all types of food systems and food system contexts (see von Braun et al. (2021) for definitions and concepts related to food systems). In the final section, we provide examples from the literature that can inform potential solutions to address the issues.

2 Biophysical and Environmental Drivers, Particularly Soil, Water and Climate Change

In the rural areas of many low- and middle-income countries (LMICs), natural resources are an important source of food, both through direct consumption and through providing the basis for income-generating activities (e.g., food and no-food cash crops, forest, and fishery products). Access to natural resources like land, water, forests and fisheries is a key element of livelihood strategies (“natural capital”), together with other elements such as access to employment and/or credit (“financial

capital”). Because of this, measures to improve access to resources are an important element of strategies for the realization of the right to food (see conclusion section below for further discussion) (Cotula 2008). Small and medium-sized producers and people whose livelihoods depend on food systems in rural and urban areas are disproportionately affected by all biophysical and environmental drivers, including soil and water resources. Unequal opportunities for access to all types of resources defer overall production, resilience, and rural transformation, thus directly affecting the livelihoods of all actors across food value chains via diverse pathways.

The number of people whose livelihoods depends on degraded lands has been estimated to be about 1.5 billion worldwide (IPCC 2020). In India, for example, 146.8 million out of the estimated 329 million hectares of total geographical area is reported to be degraded (Sandrasekaran et al. 2017). People living in degraded areas depend directly on natural resources for subsistence, food security and income. Women and youths often have limited options and are especially vulnerable to land degradation and climate change. Land degradation reduces productivity and increases the workload of managing the land, disproportionately affecting women in some regions (OECD 2020a). Land degradation and climate change act as threat multipliers for already precarious livelihoods, with consequences for increased risks of poverty, food insecurity and, in some cases, migration, conflict and the loss of cultural heritage (IPCC 2021). The major anthropogenic drivers of erosion are land use and climate change, in particular, through a more intense hydrological cycle (O’Neal et al. 2005). While much research attention has focused on arable agriculture (Boardman and Poesen 2006), seminatural systems such as water may account for nearly half of global soil erosion (Borrelli et al. 2017). There are many indications that water is becoming an increasingly scarce resource, a point often made over the last 10 years (Molden et al. 2007; Falkenmark 1997). Access to water is now recognized as a prerequisite for poverty reduction (Sullivan and Meigh 2003). However, competition for water from many different sectors can divert attention from its role in the improvement of human livelihoods (Rogers et al. 2017).

Marine ecosystems are increasingly affected by fishing and climate change, including reduced ocean productivity, changes in species distributions, and increased disease, among other effects (Bindoff et al. 2019). These and the other climate-related changes discussed above may be especially challenging for the security and livelihoods of coastal communities, particularly for indigenous people and those in LMICs (Bindoff et al. 2019; FAO 2018).

Climate change is the defining issue of our time, and we are at a defining moment. From shifting weather patterns that threaten food production to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. The adverse effect of climate change and variability has become an environmental and socio-economic problem that is increasingly subjecting people around the world to climate-driven hazards (Scholze et al. 2006). The effects of climate change are likely to be more serious among countries with fewer capacities to respond and adapt and, within these countries, among the poorest and most vulnerable. Climate change serves as a serious inhibitor to the attainment of food security and the fulfillment of major development agendas in

the majority of global economies. Climate change could undermine social welfare, equity, and the sustainability of future development. It is generally believed that LMICs, and disadvantaged groups within all countries, are more vulnerable to the impacts of climate change as a result of limited resources and low adaptive capacity (Munasinghe 2020).

3 Technology, Innovation, and Infrastructure Drivers

For both short and long distance value chains, infrastructure strongly influences the way food is produced, processed, transported, distributed, sold, conserved, and ultimately consumed. Infrastructure is required for food to move long distances and increase food security in areas of shortages, stabilize food prices, and minimize food-borne disease and food waste. Roads, railroads, shipping and cold chain facilities play an essential role. Poorly developed infrastructure impacts all dimensions of livelihoods for urban and rural populations. In particular, it affects the quality and safety of nutritious foods, limits access to them, and exacerbates issues of food loss and waste (HLPE 2014). In South Sudan and Somalia, for example, poor road infrastructure is a major barrier to food access (ACAPS 2017). Infrastructure improvements, technological advances and mechanization in the food value chain may generate positive externalities for production, trading and consumption, with the potential to generate off-farm employment in rural and, potentially, in urban areas. Examples may include factories located near the farm where the technology will be used, technicians and mechanics hired to operate and repair machinery and devices, other business-related employment, such as bookkeepers, sales staff, etc. They may also generate negative externalities.

Innovation, technology and infrastructure improvements have been and will be major drivers for food system transformation (HLPE 2017). Advances in all three have had important impacts on food production and sustainability, transportation and processing along food value chains, marketing, and ultimately diets, including consumption of both nutritious and unhealthy foods (Pingali 2012; Hueston and McLeod 2012). They can also generate risks to human and environmental health and may not yield equitable benefits for farmers or other food system workers (HLPE 2017). This raises questions about targeting technology policies and interventions according to their impact on improving livelihoods among the poor and those living in situations of vulnerability. The need to produce healthier and more accessible food and address SDG 2 and other SDGs through food system transformation will thus require innovative, responsible and targeted efforts by the actors in the world's food supply chains. Nonetheless, many breakthrough technologies spark disputes and sociotechnical controversies (Latour 1987), which increasingly generate dual oppositions and polarized polemics. This may distract from the goal of ensuring that the livelihood and equity impacts from modern biotechnology are widely shared. In some socio-ecological contexts, this requires measures to prevent such technology from resulting in market concentration in the industries that provide inputs to

agriculture, prohibitively high seed prices or reduced farmer participation in breeding (HLPE 2019). It may also be necessary to ensure that the technology does not favor larger farm economic units with the likely accompanying displacement of smallholder farmers (Mascarenhas and Busch 2006; World Bank 2007; Glenna and Cahoy 2009; Heinemann et al. 2014). Whatever the controversial issue, evidence highlights how institutional environments are essential for directing technology and innovation impact. Ultimately, the potential for impact depends not only on characteristics of the technological advancement itself, but on access patterns, arrangements, and governance about who controls it (HLPE 2019).

Innovations in breeding methods, chemical synthetic inputs and food processing have changed the way food is produced, stored, distributed and consumed. Many agricultural innovations have prioritized yield and productivity, often disproportionately favoring high income country food systems, but some notable exceptions exist. Since 2004, HarvestPlus, in collaboration with CGIAR centers, has facilitated the release of 211 crop varieties in 30 countries, varieties that have been bred with increased content of one or more nutrients. An estimated 7.6 million farming households are now growing these crops, estimated to be benefiting some 38 million rural consumers (HarvestPlus 2018). This number will be enhanced as crops are sold in urban markets and used in various processed or pre-prepared foods. Another example promotes the better incorporation of fruit into local food systems, meeting the challenge of seasonal availability. McMullin et al. (2019) developed a methodology based on ‘fruit-tree portfolios,’ which selects, in partnership with farmers, the fruit-tree species for production that are both socio-ecologically suitable and nutrient-rich. Both examples have the dual advantage of potentially improving livelihoods and favoring nutrition outcomes through enhanced production and access to nutritious foods. Modern biotechnology can also improve livelihoods through increased crop production for smallholder farmers. Millions of small farmers in many LMICs (e.g., China and India) have benefited from adoption of Bt cotton since this technology was approved for commercialization in the late 1990s (Areal et al. 2013; Huang et al. 2002; Kathage and Qaim 2012; Qiao et al. 2017). Nonetheless, the impact of such technology on livelihoods, particularly for farmers in situations of vulnerability, is disputed and has been shown to depend on differentiated practices (Vognan and Fok 2019). Among the issues to be resolved in this regard is the ongoing debate related to access to seeds, as well as mechanisms to ensure that commercial interests in seed-line access do not negatively affect producers’ and consumers’ livelihoods (Kloppenborg 2010; Bonny 2017).

According to the CGIAR Research Program on Climate Change, Agriculture and Food Security (Dinesh et al. 2017), some of the most promising innovations in rural agriculture are technology- and service-based. With access to data, markets and financial services, farmers can plant, fertilize, harvest, and sell products more effectively. These approaches are gradually gaining favor as more people in emerging economies connect to mobile networks (Pew Research Center 2016) and applications designed to collect and share agricultural information become increasingly accessible (Qiang et al. 2012). Of course, the mere existence of this technology will not generate better livelihoods. Access to such technology has been highly

constrained and must be resolved before this potential can be realized (World Bank 2016; Deichmann et al. 2016; Saleminck et al. 2017; OECD 2019a) Similarly, tools must meet the needs of the farmers who use them, as well as expectations towards improving livelihood, including addressing power asymmetries. This demands that mobile technologies take into account differences in gender, education, and resource levels among farmers and consumers (Vesper 2021), and that they are responsive to changing circumstances. The impact and success of these tools and programs should be monitored and evaluated (Baumüller 2018), with ineffective approaches being improved or replaced (Samberg 2021). Capacitated endogenous institutions are vital to achieving an inclusive approach.

4 Economic and Political Drivers

Many economic and political factors are essential causes of inequality and power imbalances at the household, community, national and global levels, constraining the ability of food system transformation to deliver poverty reduction and sustainable, equitable livelihoods (International Monetary Fund 2014; Rodríguez-Pose and Ezcurra 2011). Improved education and literacy levels and access to public services and infrastructure, among other factors, help to address the issue (OECD 2019b, 2020b).

Social protection is a menu of policy instruments for addressing poverty and vulnerability, through social assistance, social insurance and efforts at social inclusion, with a eye towards addressing both long-standing and crisis-induced poverty (HLPE 2012). The precarity of the food systems in most countries, and particularly that of food system workers living in situations of vulnerability, is illustrated by the current COVID-19 crisis (Box 1). The lessons and experience from global efforts fighting the COVID-19 pandemic show the importance of developing a strong social network in coping with the fragility of food systems.

Conflicts and crises, usually resulting from an unstable political system and uncertain property rights arrangements, damage trust and social cohesion among the stakeholders throughout food systems, discourage public and private investment, and cause slowdowns in economic growth and less inclusive rural and structural transformations (Putnam 2000; Bourguignon and Dessus 2009). This does harm to vulnerable smallholder farmers, consumers and those engaged in micro enterprises and SMEs along food value chains, particularly those run by and employing youths, women, the disabled, and indigenous peoples.

The inclusive development of food systems is also constrained by lack of representative *leadership*, reflected in inequality in access to productive resources, working opportunities, market participation rights and public services. Studies in almost all LMIC contexts, except for Latin America and the Caribbean, indicate a large proportion of total farmland belongs to small holders (less than 2 ha) (Lowder et al. 2016), and that in these places and for all food system workers, resources and public services are unequally allocated (de Pryck and Termine 2014). Barriers to

active participation in leadership and decision-making must be broken down (Food and Agriculture Organization of the United Nations 2017).

Livelihood inequalities across the food system, including among smallholder farmers, small businesses and workers across the food value chain, can be reduced only if inequalities in *access to land, water, employment*, financial services, infrastructure, technology, markets, and other economic opportunities are resolved. Food system transformation that does not address these inequalities and specific vulnerabilities runs the risk of reinforcing and deepening inequalities into the future and undermining the resilience of food systems. Inequitable economic opportunities are usually caused by rigid institutional arrangements in land, water, credit and labor markets, a lack of information, market segregation/ monopoly, discriminative treatment, and distorted policies, among other things (Food and Agriculture Organization of the United Nations 2017). Subdivision among siblings makes it harder for rural youths to obtain as much land as their parents had; in many contexts, youths have historically been marginalized economically, socially and politically (Jayne et al. 2014). Research shows that respecting/upholding collective forms of land ownership and customary property regimes has important positive implications for livelihood equity (Vandergeten et al. 2016; King 1977). However, the nature of public goods such as water resources makes fair allocation difficult. Removing barriers to employment and other economic opportunities, in addition to various actions for reducing discrimination towards migrant workers, also works to increase income and improve livelihoods (IFPRI 2019).

As pointed out by the HLPE (HLPE 2017), *globalization and trade* have a critical role to play in ensuring food security and nutrition (FSN) and reducing inequalities. Trade can positively and negatively affect all four pillars of FSN (availability, access, utilization, stability). Evidence suggests that globalization and international trade may help to extend the value chain and generate opportunities to create wealth and equitable livelihoods among countries (OECD 2020b; Greenville et al. 2019a; Greenville et al. 2019b) International trade and financial flows are also associated with changes in production and consumption patterns that require taking into account the way livelihood is affected, in particular, through employment access, incomes and wealth distribution. Measures are needed to avoid unwanted outcomes, including increases in income inequality (Feenstra and Hanson 1996; Feenstra and Hanson 2008). While some farmers can improve their livelihoods by tapping into exportable agricultural production, considerable research shows that becoming part of export markets can make farmers, particularly small-scale farmers, more vulnerable to shocks in global commodity markets (González 2021; Oya 2012). These risks can be mitigated through collective action and policy support to soften the impact of such shocks among smallholders and other actors in the food system that lack the capacity to respond adequately.

Stabilizing food prices will help to reduce the risk of all stakeholders along food supply chains and will bring benefits to those small holders who are more vulnerable in the production system and consumers in rural and urban areas. In general, food supply is much more stable at the regional and global levels than it is within a given country (Badiane and Odjo 2016). This is because an efficient market provides the

opportunity to supplement supplies in cases of domestic production shortfall or rapidly expanding demand, and thereby helps prevent sharp price increases that would affect access to food negatively. Inversely, in cases when rising domestic supplies threaten to depress local prices, an appropriate political regulation and management of stocks (in both the national and international dimensions), plus a transparent trade mechanism, would be appropriate.

The informal food processing sector has grown significantly over the last decade, thanks to rapid urbanization and growing middle classes, and has become one of the most dynamic segments of food staple value chains (Reardon 2020). In Africa, it is currently the fastest growing export sector, both for regional and outside markets (Bouët et al. 2020). It is estimated that upward of two-thirds of staple foods consumed in Africa by 2040 will be in processed form (Tschirley et al. 2015). The emerging staple food processing sector is currently characterized by a large and growing number of primarily female-headed small enterprises. Future strategies for promoting equitable livelihoods and value distribution in domestic food systems will need to reverse the current formality and size bias in order to tap into the employment and income opportunities resulting from the rapidly transforming staple food value chains for the benefits of farmers, unskilled workers, and consumers in urban centers and rural towns.

These political and economic factors may cause inequality and imbalances through a complex mechanism, but may also be the consequence of such inequality and imbalance. On the one hand, both political instability and poor economic performance are believed to contribute to rural poverty and inequality of livelihood in rural sectors of many LMICs in all regions (Dutt and Mitra 2008; Alesina 1996). On the other hand, a burgeoning literature illustrates that rapid economic growth is not a sufficient condition for inclusive development (Putnam 2000; Bourguignon and Dessus 2009; Acemoglu and Robinson 2002). In addition, the political and economic drivers may also interact with innovation, technology and infrastructure to influence food systems, as well as inequality and power imbalances affecting women, youths, smallholders and indigenous people. Consequently, the question is not only *whether* but also *how* economic growth and institutional/policy arrangements may affect inequality in access to production, employment and fair share opportunity (OECD 2020a; Losch et al. 2012; Independent Evaluation Group (IEG) 2014; IMF 2015). This calls for considering the way agency conditions or prevents the development of inclusive, equitable livelihoods (UNDESA 2020), in particular, through access to public services, before proper decision-making and agenda-setting could be brought about.

The pace of future improvement in livelihoods will depend on the ability of governments to find ways to maximize the impact of economic growth and investments in social sectors, such as health, education, and social protection towards enhancing capacities among the poor and vulnerable. This calls not only for better coordination of interventions across government, but also for recognition and effective exploitation of the fact that differences in services and how they are bundled produce different impacts on the livelihoods of the poor and those living in vulnerable situations. For instance, the impact of a given dollar amount spent on

educational services on smallholder and low-skilled off-farm and urban labor productivity will depend on the extent to which it targets vocational training and other efforts to upgrade and develop skills in the relevant sectors (Ulimwengu and Badiane 2010). Against the background of the current COVID-19 pandemic, the same concept can be illustrated using the example of health services (Box 1). Furthermore, there is evidence that morbidity has a bigger impact on the productivity of the poor and vulnerable than among better off segments of the population (Badiane and Ulimwengu 2013). It has also been shown that different types of health services have different impacts on disease prevalence and morbidity (Wouterse and Badiane 2019). It is therefore possible to allocate public investment in health services such as to target diseases that have the largest effects on the productivity of smallholders and low-skilled laborers and excluded communities. Allen and co-authors (Allen et al. 2014). show that morbidity not only affects labor availability and productivity, but also the choice of technologies and decisions to return to the use of fertilizers and mechanization. More importantly, different health services have different impacts on disease prevalence, which affects efficiency, and thus livelihoods, differently, even among the poor, those living in vulnerable situations, and across gender (Badiane and Ulimwengu 2013; Quisumbing et al. 2019). The current COVID-19 pandemic illustrates the need and opportunity to rethink the delivery of social services in order to maximize their benefit and impact among the poor and vulnerable (Box 1). This applies equally to social protection policies in which the experience of productive safety nets in Ethiopia offers valuable lessons for designing programs that work for the poor and vulnerable (Knippenberg and Hodinott 2017).

5 Socio-cultural and Demographic Drivers

Vast evidence illustrates that several socio-cultural drivers underpin inequalities among and within societies and constrain the potential for some to benefit from actions to improve livelihoods, particularly women, youths, the disabled, the elderly, and indigenous peoples (Food and Agriculture Organization of the United Nations 2017; International Fund for Agricultural Development 2016; Research Institute (IFPRI) IFP 2019). For example, there are approximately 185 million indigenous women in the world, belonging to more than 5000 different indigenous peoples. Despite the broad international consensus about the important role indigenous women play in eradicating hunger and malnutrition, there are still limitations in the recognition and exercise of their rights (FAO, IFAD, UNICEF, WFP, WHO 2020). Due to the long-term and ongoing impacts of colonialism and environmental degradation, many indigenous peoples, regardless of their geographic location, face high levels of obesity and chronic disease and are disproportionately affected by poverty and food insecurity (Batal and Decelles 2019; Domingo et al. 2020; Vallenggia and Snodgrass 2015; Stephens et al. 2005). Past and present social and environmental injustices have led to the loss of food sovereignty, through dispossessing indigenous peoples from their traditional territories and undermining

the transmission of intergenerational knowledge of cultural practices related to their food systems (Desmarais and Wittman 2014; Vernon 2015), and have been linked, as in the case of the experience of hunger in residential schools in Canada, to the rise of diabetes in these populations (Mosby and Galloway 2017).

Socio-cultural drivers also impact and set the norms for the dynamics of the other drivers, including political and economic drivers, demography, and innovation/technology, among others. As such, structural barriers for several groups, particularly women and youths, affect a number of potentially beneficial aspects of life, including land rights and access to financial services, among others. In addition, inequality of opportunity is an important constraint. Social protection has an important role to play in protecting those living in vulnerable situations and, depending on the nature of that action, seeking to address the underlying causes of poverty and exclusion (Levy 2006). Programs that direct resources to women have shown a greater impact on food security and other household-linked benefits (HLPE 2012). However, social and structural barriers may limit women's access to several types of social protection program, including public works and agricultural input and support (HLPE 2012). In addition to these considerations, language, culture and tradition may influence the willingness to participate and potential to benefit from social protection programs, unless national programs are adequately adapted to such sub-national contexts (Théodore et al. 2019).

Few, if any, economic or social transformations over the past decades can be brought into focus without explicit attention being paid to the demographic transition that is inextricably linked to several socio-cultural drivers. The growth of the urban sector, driven by both natural increase (fertility exceeding mortality) and rural-to-urban migration (Dyson 2011; United Nations 2001), helps to fuel agricultural transformation. The proportion of the population living in rural areas is declining in many countries, yet numbers are increasing in some, particularly in sub-Saharan Africa. Both fertility and mortality have been falling in rural areas, converging from levels higher than those in urban areas towards meeting those urban levels. Pressure and opportunity lead certain parts of growing rural cohorts to migrate to cities or to seek diversified livelihoods within the rural sector. This raises concerns, particularly in sub-Saharan Africa, where urban growth and the economic sectors are not in a position to cope with such a rapid transition and offer employment to rural dwellers, as has occurred historically on other continents (Losch et al. 2012).

Predominantly male migration among youths and young adults over the course of the urban transition may have additional impacts on the gendered nature of economic roles and the overall status of women (Lastarria-Cornhiel 2008; Gray 2009). Increased urbanization means a growing gap between the locations of food production and food consumption. It may also mean a change in lifestyle, including dietary changes. As a result, there is a growing need for food processing, transportation, and transformation beyond the farm level, providing opportunities for jobs and entrepreneurship. In Ethiopia, Malawi, Mozambique, Tanzania, Uganda and Zambia, the transformation of the food systems is forecast to add more jobs by 2025 than any other sector of the economy (Gustafson 2018). This is an opportunity to see that these jobs are also accessible to rural women and youths who may disproportionately

live in vulnerable situations. Nonetheless, evidence suggests that women entrepreneurs face many additional barriers compared to their male counterparts, including lack of mobility, less access to finance, less access to business networks and mentors, limited leadership experience, lower literacy and numeracy, and discriminatory gender norms and stereotypes (Nordhagen and Condes 2020). Experience from other regions also illustrates the risks to nutrition as dietary traditions are lost and reliance on processed, often highly unhealthy food increases (Popkin and Reardon 2018).

Today, there are significant knowledge gaps concerning rural out-migration trends that need to be tackled. This is particularly the case for migration driven by distress, when people come to perceive that there is no other viable livelihood option except to migrate. Reliable data, disaggregated by sex, age, origin and destination, are necessary to understand the socio-economic conditions associated with migration. At the moment, these data are scarce (Carletto et al. 2015).

Box 1: The Unprecedented Range of COVID-19 Disruptions to the Food System and Livelihoods

The breadth and reach of the complex ramifications and disruptions from the COVID-19 pandemic are unprecedented (Bron et al. 2021). The impact from the pandemic parallels or exceeds the impact of major shocks over the past few decades, whether caused by natural disasters, disruption of financial and commodity markets, or conflict and civil strife. More challenging is the fact that, under Covid-19, all of these various shocks happened concurrently and engulfed the entire globe, with no regions left untouched, and thus poised to help fuel a possible recovery (Badiane and Collins 2020). There are therefore important lessons to be learned from the current pandemic as to how to help shape more effective strategies for managing future shocks and their impact on the livelihood of the excluded and marginalized.

The Effects of Covid on Marginalized Communities: Income, Poverty, and Nutrition

Policies of social distancing and other measures adopted by governments to contain the spread of the pandemic have drastically affected food supply chains, with serious repercussions for the poor and vulnerable, particularly in LMICs (Hobbs 2020; Barrett 2020; OECD 2021; Fei et al. 2020; Hatab et al. 2021). There is evidence that disruptions are more serious for the operation of the informal market networks that dominate supply chains for traditional food staples that people living in poverty and situations of vulnerability depend on more heavily (Resnick n.d.) Prices in these markets have reacted sharply to measures undertaken to control the pandemic (Matchaya et al. 2020; Guthiga et al. 2020). Moreover, higher food prices, the closing of informal markets and other disruptions to staple food supply chains have been shown to impact the

(continued)

Box 1 (continued)

micronutrient intake and nutritional status of the poor (Ulimwengu and Magne-Domgho 2020). Finally, the effects of the pandemic on global commodity markets and trading systems are shown to have had a significant impact on economic growth, and thus incomes and poverty levels, likely with a disproportionate burden on the same vulnerable communities in both urban and rural areas (Fofana and Sall 2020). This is almost certain to worsen inequalities, food insecurity and undernutrition, including child wasting (Headey et al. 2020). COVID-19 therefore will likely have substantial implications for the achievement of the Sustainable Development Goals in LMICs, in particular, SDG 2 (End hunger) and SDG 12 (Ensure sustainable consumption and production patterns) (Jribi et al. 2020).

Equity and Policy Responses to Covid and Similar Shocks

The Covid-19 crisis has particularly impacted already-marginalized segments of the population such as indigenous peoples, migrant workers, and informal sector employees (Gamlen 2020; International Labour Organization 2020; Marschke et al. 2021). High vulnerability to changing economic conditions is linked partly to a host of pre-existing barriers ranging from weak legal status to racism to a lack of access to health, social security and educational services, all leading to disproportional impacts of the pandemic among the poor and disadvantaged.

Persistent and chronic vulnerability, a major manifestation of marginalization and exclusion, not only exacerbates the human cost of shocks, but also complicates the search for effective responses. Resistance to confinement, curfews and other mitigation measures reported in the media across the world often arise from the considerable threat to livelihoods among the poorest and those living in situations of vulnerability (Resnick n.d.) Successful strategies for dealing with future shocks require having a better handle on equity and vulnerability before said shocks strike.

Lessons for Managing Future Shocks to Protect Livelihoods

Just like pre-existing conditions among humans raise the risk of serious consequences, chronic vulnerability patterns also raise the risk of exposure and the extent of damage among excluded and marginalized communities in cases of shocks such as Covid-19. Community vulnerability is determined by factors ranging from pre-existing levels of poverty, food insecurity, malnutrition, disease prevalence, poor health and education services to high population density (Ulimwengu and Collins 2020). Investment in the capacity to develop a good understanding of the patterns of vulnerability across various communities is therefore a major requirement for future preparedness, especially among LMICs.

(continued)

Box 1 (continued)

For example, a report from the Indigenous Navigator (IWGIA 2020) highlights the impact of Covid-19 on indigenous communities in 11 countries (Africa and Asia). On the one hand, the report identifies how pre-existing barriers in access to health, social security and education are fueling disproportional impacts of the pandemic on indigenous peoples. It also indicates a rise in food insecurity, related to loss of livelihoods and a lack of access to land and natural resources. On the other hand, it underlines the central role played by communities in building their response and recovery to the global crisis resulting from the pandemic. The emphasis on Covid-19 response and recovery measures springs from the fact that they need to be respectful of the rights of indigenous peoples and support their livelihoods, economies, and resilience.

Equally important is a good understanding of the nature of the operation of local food systems. Control measures that are not aligned with the basic features of food systems along complete value chains are certain to create second generation disruptions, leading to more serious impacts on livelihoods (Liverpool-Tasie et al. 2021).

Finally, boosting preparedness capacities will require investment in a minimum infrastructure for real-time data access and management. New development in remote sensing and machine learning offers real opportunities for better targeting and tracking in order to raise the effectiveness of response and mitigation measures to protect the poor and vulnerable (Ly et al. 2020).

6 Conclusions and Implications for the Development of Game-Changing Solutions That Will Enhance Equitable Livelihoods in Food Systems

The growth of food systems presents enormous employment opportunities (Gustafson 2018), but achievement of equitable livelihoods in food systems resulting from changes in said systems will require that substantial progress be made to address the drivers of inequality. Food system transformation must also find a balance to help create systems that favor and support healthy diets (i.e., those that minimize the risk of both undernutrition and overweight and obesity) (Neufeld et al. 2021), and do so in ways that are sustainable for the planet. We must transform not only the food systems, but also the structures and systems that continue to enable and exacerbate inequities. While we have reviewed and discussed the evidence related to drivers of inequitable livelihoods in relation to food system transformation within their respective categories, they are interconnected, and progress to address one driver will likely require change across several. For example, globalization and trade interact with other powerful drivers, especially technology resource mobilization and demographic trends, which shape food production, distribution and consumption (HLPE 2017).

We believe, therefore, that enhancing equitable livelihoods will require solutions that:

1. ***Are rights-based:*** Solutions must recognize and hold stakeholders to account for human rights, including a living wage and the right to food (UN 1948), and advance the agenda towards the *right to a healthy diet*. Implications include not only a shift in policy and programmatic action, but also an increase in public pressure and the creation of monitoring and accountability mechanisms that hold governments, businesses, and all stakeholders to account to uphold rights.
2. ***Ensure long-term investment for structural changes:*** Dismantling inequitable systems and structures that enable and exacerbate inequalities for food system workers and consumers requires long-term investment, while achieving short term gains. A long-term vision should inform investment priorities in needed structural changes across food systems, including those that will result in:
 - Dismantling barriers to expanded access to resources, technology, infrastructure and productive services among smallholders and other less powerful actors along food systems,
 - Policies and institutions that make sure that markets and trading regimes work for producers and consumers, including by raising agricultural incomes and improving food access,
 - Regulatory and administrative arrangements and other instruments for ensuring equitable access to productive assets.
3. ***Directly inform local and national policy and programs:*** Transformational change towards healthy, sustainable, and equitable food systems will require a breaking down of current policy silos in favor of coordinated policy agendas that permit the mapping and balancing of benefits, harms and trade-offs to human and planetary health, including but not limited to agriculture, trade and food policies that simultaneously foster healthy diets, equitable opportunity and fair pay while also protecting the environment, complemented with strengthened and well-targeted social protection.
4. ***Enhance the development of and equitable deployment of contextually relevant innovation and technology:*** The potential of innovation and technology to do good for human and planetary health is vast, but systems must be strengthened to ensure that it does not exacerbate inequalities and that the balance of potential benefits and harms can be assessed. The research, development and deployment of innovation and technology must meet the needs of both smallholder producers and small businesses across the food value chains and vulnerable consumers. Doing so requires enhanced processes and investments to develop such innovations and technologies, drawing on all forms of scientific evidence along with indigenous, local and contextual knowledge.

In the following section, we provide several general and more specific recommendations that can inform priorities for game-changing solutions, bearing in mind the four criteria above. This list is not intended to be comprehensive, but rather to focus

priorities that surface from the evidence review. Where feasible, we have included specific examples that illustrate the potential gains and pitfalls.

6.1 Alter Power Structures to Enhance Inclusive Decision-Making

- At the global and regional levels, strengthen and enhance the existing institutional architecture to generate recommendations, good practice models, and technical support guidance for enhanced inclusive decision-making processes related to food systems within governments and organizations. Examples of key international organizations include FAO, IFAD, WFP, the World Bank Group, and CGIAR, among others.
- Engage a coalition of local, regional and international research institutions to generate and test a framework and parsimonious set of indicators that can be used to track progress towards inclusive decision-making processes and monitor livelihood improvements within international, national, regional and local governments and organizations.
- Create or build on an existing accountability mechanism with a mandate and resources to track progress towards and hold to account inclusive decision-making related to food system transformations and their impacts within governments and organizations.
- Strengthen producer, vender, market and consumer organizations and other forms of collective action across food systems to enhance effective, non-tokenistic participation in decision-making processes related to rural and food system transformation.
- Through all of these processes, explore demographic, social and cultural aspects that may influence participation in decision-making (Gustafson 2018) (e.g., gender, age, status as indigenous peoples) and ensure that mechanisms are developed to address and track progress responsive to these unique contextual factors.
 - Dimitra Clubs seek to transform gender relations, bringing women and men together to become more aware of gender inequalities in households and communities and work to transform gender relations. The over 3400 clubs that currently exist have reached an estimated two million rural people. Examples of success include fighting malnutrition by challenging dietary taboos, reconciling long-standing political disputes, mobilizing to meet environmental challenges and establishing a credit cooperative so that people can avoid debt (FAO 2021).
 - The model of mutual accountability developed by the African Union as part of its Comprehensive African Agriculture Development Programme (CAADP) is an innovative and effective approach to promoting transparency, participation and accountability for results. It involves two main components:

Country-level joint sector reviews (JSRs) that allow governments, farmer organizations, private sector actors, civil society organizations and development partner organizations, at least once a year, to collectively review policy and program implementation performance, as well as progress towards outcomes for the agricultural sector. The outcome is an action plan to deal with any major issues that emerge.

The continental-level biennial review (BR) based on formally agreed-upon target commitments related to agricultural sector investment, hunger and poverty, gender, youth, intra-African trade, and climate-smart agriculture. Every two years, a report is prepared by each member state and submitted to the African Union Commission, which uses it to rate each country on each of the target commitments. The report is submitted to Heads of State at their January Summit to debate the findings (Ulimwengu et al. 2020).

6.2 Protect the Livelihoods of Those Living in Situations of Vulnerability, While Creating Opportunities

- Expand the effective coverage of well-targeted social protection systems that uphold the livelihoods of those living in situations of vulnerability, using social protection instruments that can alleviate short-term crises, but go beyond sheer poverty reduction to enhance opportunities to build assets and create wealth.
 - One promising model of boosting productivity and improving livelihoods through skill development and advisory services financial transfer is the FOMENTO model from Brazil. Research looking into the impact of its transfer to the African setting has provided solid evidence on its effectiveness to raise assets and increase the earning potential of beneficiary farmers. This idea holds promise as a scalable approach to empowering and equipping the poor and those living in situations of vulnerability to integrate into the higher value segments of the food system value chains (Ambler et al. 2018).
- Using existing or enhanced technology, develop and deploy better models for predicting climate and other agricultural risks and use this data effectively to pre-empt and mitigate the impact of such risks on the production and livelihoods of small-scale agriculture and other producers in situations of vulnerability.
 - Climate Information Services (CIS) involve the production, translation (e.g., advisories, decision support), and communication and use of climate information. Appropriate information enables farmers to understand the role of climate vs. other drivers in perceived productivity changes and manage climate-related risks throughout the agricultural calendar. Econometric studies highlight CIS as one of the most important factors influencing the adaptation

and transformation of farming systems. For example, an analysis across more than 5000 households in East and West Africa, South Asia, and Central America found access to CIS is a positive determinant of adaptation through agricultural diversification, and one of agricultural intensification in Bangladesh and India (Loboguerrero et al. 2019).

6.3 Adapt Institutions and Policies to Favor Equitable Food System Livelihoods

- At the global, national, sub-national and local levels, develop and implement a cohesive set of policy actions that will enable sequential food system transformations that favor the production, distribution and consumption of nutritious over unhealthy foods, produced with territorial approaches that favor planetary health (Caron et al. 2017) and ensure equitable livelihoods for producers and wage earners across the food system.
 - Africa’s Regional Economic Communities (RECs) are key actors working in collaboration with the African Union (AU) to ensure peace and stability in their regions (Adepoju 2002). The RECs have been central to various transformative programs on the continent, including the New Partnership for Africa’s Development (NEPAD) adopted in 2001. RECs have the immense challenge of working with governments, civil society, and the AU Commission in raising the standard of living of the people of Africa and contributing towards the progress and development of the continent through economic growth and social development (Office of the Special Adviser on Africa (OSAA) 2021).
- Adapt institutions and adopt policies that eliminate barriers in access to the fundamental services needed to enable those living in situations of vulnerability to take advantage of opportunities, ensuring, for example, the right to food, shelter and health. Facilitate more and better educational investments that enable and empower youths as part of the productive rural and urban labor force (UNICEF 2019; Menashe-Oren and Stecklov 2018).
 - The German dual training system for agricultural and horticultural professions is a good model for an institutional infrastructure that creates a path to good paying jobs and better livelihoods. It is a country-wide system that offers a mixture of practical, multi-year on-the-job training of apprentices by “master-farmers,” ongoing theoretical training for active and aspiring farmers, and modular, usually short-term courses on specific skills and good practices (Thiele 2021).
- Adapt institutions and adopt policies that eliminate barriers in access to the natural (e.g., land (FAO 2016), water, forests), economic (e.g., credit, business

planning) and technological resources (e.g., digital, appropriate modern biotechnology) needed to enhance and ensure equitable livelihoods for producers and SMEs across the food value chain. Such policy and institutional arrangements should explicitly favor those who have been traditionally excluded, particularly women, youths, and indigenous peoples.

- The Land Matrix Initiative (Land Matrix 2021) is an independent global land monitoring initiative made up of a number of global and regional partners, originally established in 2009 to address the lack of robust data on large scale land acquisitions and investments. The initiative now covers almost 100 countries. It captures intended and failed attempts to acquire land through purchase, lease or concession and demonstrates the complexity and political dimension of land acquisition.
- Enhance the effectiveness of international organizations to facilitate global trade arrangements that promote and protect livelihoods and the right to food. An enhanced role for the World Trade Organization is particularly salient.

6.4 Increase Investment to Realize the Potential of Improved Institutional and Policy Actions

- More coordination among government entities would internalize externalities across sectors and address trade-offs such as to deliver the most impactful and site-adapted interventions for the poor and those living in vulnerable situations (Badiane and Makombe 2015; De Pinto and Ulimwengu 2017; IFPRI 2019). Increasing investment in public infrastructure (e.g., roads, markets, irrigation, etc.) also helps to enhance the livability of communities, while favoring the production, sale and consumption of nutritious food.
- Expand and use innovative financial mechanisms (e.g., impact investment) for small and medium-sized farmers and businesses along the food value chains to expand and intensify their production and improve safety, quality and sustainability, prioritizing nutritious over unhealthy foods.
- There are two models for nurturing and supporting the development of the emerging processing processor and other segments of food system value chains to boost profits and employment for low-skilled workers. The first, with a well-documented impact (Sonobe and Otsuka 2011), is the model of cluster-based industrialization, which provides a critical mass of infrastructure, services and networking opportunities. The second is the Kaizen model from Japan, which has recently been tested in Africa with promising results (Sonobe et al. 2020).

6.5 *Hold Governments, Businesses and Organizations to Account for Ensuring Equitable Livelihoods*

- Engage a coalition of local, regional and international research institutions to generate and test a framework and parsimonious set of indicators and metrics that can be used to track progress towards equitable livelihoods within business, international, national, regional and local governments and organizations.
- Create or build on an existing accountability mechanism with a mandate and resources to track progress towards and hold to account equitable livelihoods in food systems across all businesses, governments and organizations, ensuring data can be and are presented disaggregated for women, youths, indigenous peoples, migrant workers, and others as appropriate.

6.6 *Realize the Potential of Science, Innovation, Technology, and Evidence to Favor Equitable Livelihoods*

- Apply advances in bioscience innovations, including genetic engineering and genome editing, as well as soil, plant and animal husbandry and health technologies and practices, for a successful transformation of food systems. Meeting food system challenges related to raising production, improving efficiency and saving and restoring production resources in the face of a changing climate will require that benefits from advances in these areas are broad-based and inclusive of the poor and marginalized actors in food system value chains. This, in turn, will require investing in adapting technology advances to local conditions for greater accessibility and affordability for, as well as safe utilization by, smallholder farmers.
- Develop and deploy digital innovations to advance the efficiency and inclusiveness of food systems. Both the digital services platform from eCommerce and financial and technology support services help link farmers and rural communities to actors and service providers in domestic and global value chains. Lower income countries can also overcome, at lower cost and within a shorter period of time, a number of institutional, infrastructural and financial obstacles to transforming food systems through the strategic deployment of remote sensing, big data, machine learning, artificial intelligence, robotics, drones and digital technologies for more efficient cropping systems.
- Improve the availability, quality, accessibility and use of data that can map and inform actions to reduce inequalities in food systems.
 - The newly developed food systems dashboard (Food Systems Dashboard - Diets and Nutrition 2021) is an important advance in this regard. The dashboard consolidates existing data from multiple sources, provides useful tools for visualizing and understanding the data, and is developing a set of

diagnostics that will permit the identification of potential policy and program priorities. That said, many data gaps exist, particularly at the national and sub-national levels, and the full potential of such tools will be realized only once such data gaps are filled (Fanzo et al. 2020).

- Assess deployment pathways (e.g., extension services, farmer schools, etc.) and the potential for those traditionally excluded (e.g., women, youths, small holders, indigenous peoples) to benefit when setting priorities for and making investment decisions related to the development of innovations and new technologies for food systems.
 - For example, new technologies are being used to very positive effect to ensure that nutrition does not “exit” the food supply chain (Fanzo et al. 2017). Improving traditional products and processes by reengineering the unit operations can be an efficient way to both generate rural employment in SMEs and incomes for family farmers and increase the safety and nutritional quality of foods while maintaining or improving the organoleptic characteristics of traditional products (Obodai et al. 2015; Pintado et al. 2016). Nonetheless, evaluation has also shown that several “good ideas” may have harmful side effects when a comprehensive approach to understanding all different pathways leading from agricultural interventions towards the nutrition of individuals is insufficiently considered (Dury et al. 2015).
- Develop and use creative approaches to learning, building on, and documenting indigenous knowledge related to food production, processing, consumption, and natural resource management in ways that such knowledge can be shared, adapted, and adopted and tested in new contexts if appropriate, as well as drawn on in the establishment of recommendations, guidance and good practice (Lugo-Morin 2020; Blanchet et al. 2020; Okanagan Nation Alliance 2021). New approaches are instrumental in order to revitalize indigenous food systems and produce, process and consume food in culturally relevant (Cree Hunters and Trappers Income Security Board 2021) and ecologically sustainable ways (Sherwood 2019).
 - Several examples exist illustrating the potential and power of mobilizing available indigenous knowledge for the establishment of policy recommendations (Grey and Patel 2014; Mabhaudhi et al. 2018; Kurashima et al. 2019; Asogwa et al. 2017), guidance (Ministerio de Salud Pública del Ecuador, FAO 2021) and good practice (Sherwood et al. 2017; Deaconu et al. 2019).
 - With the threat of climate change and the need to adapt to its adverse effects, indigenous communities are proving to be an important source of climate history and baseline data and are already playing a valuable role by providing local-scale expertise, monitoring impacts, and implementing adaptive responses at the local level. For example, on-farm conservation of crops is a dynamic process, in which varieties managed by indigenous farmers continue to evolve in response to natural and human selection, leading to crops with better adaptive potential. For instance, “kreb” is a mixture of wild and

cultivated species (such as *Digitaria exilis* or “fonio”) that is traditionally used in the Sahel by pastoralists. The latter harvest these seeds from the open grasslands and manage the wild species to ensure sustainable seed production for human consumption and fodder (Chianese n.d.).

- Rapid dietary change in indigenous peoples worldwide is posing threats to the use of traditional food and the traditional knowledge required for traditional food system maintenance (Kuhnlein and Receveur 1996). Several foods and combinations have illustrated the potential to decrease risk of micronutrient deficiencies (Kuhnlein 2004). Such traditions may be fundamental for slowing the nutrition transition and the accompanying increase in preventable diet-related non-communicable diseases.

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