



A STUDY ON FOOD SYSTEM INNOVATIONS FOR SUSTAINABLE FOOD SECURITY IN COVID-19 SITUATIONS

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ABSTRACT

One of the silver linings of any crisis is the innovation it produces. And when it comes to food, COVID-19 is no exception. As consequence of COVID-19, food emerged again as a central element of life, along with health, after decades in which food security was taken for granted in developed countries and also challenging task for major countries. The evidence, anecdotal as it is, shows that lockdowns around the world have had a profound impact on the markets, transport, and labor supply needed to produce, distribute, and sell nutritious foods. The COVID-19 outbreak offered the opportunity for a reflection on the importance of resilience in emergencies. Sustainable and healthy diets for all, was shown, during the pandemic, to depend much more on social and economic conditions than on technical aspects of food production, processing and supply chain. Crisis often necessitates new actions for short-term solutions. Crisis often necessitates new actions and solutions for longer-term problem of malnutrition around the world. Innovations driven by government, business, and communities targeting production, distribution, markets, and consumers have proliferated to enable food to get to people who need it in new ways is essential.

This paper aims to analyse Food System Innovations for Sustainable Food Security in Covid-19 Situations. Digital innovations have been noteworthy in enabling producers to conduct their businesses in new ways in pandemics. In India, the National Informatics Centre created the Kisan Rath mobile app to help farmers and traders find vehicles to move their fruits and vegetables to market. For people going short on food, new methods are likewise being used to supply food, vouchers, food deliveries, community kitchens are some of the food supply Innovations particular note. Government of India ensures food grains especially in poor families, to suffer on account of non-availability of food grains due to disruption in the pandemic situation. 80 crore individuals, i.e, roughly two-thirds of India's population would be covered under PMGKY scheme.

COVID-19 pandemic are enlightening the importance of sustainable food security systems and need to provide from communities, governments, private enterprise, and funders are finding innovations to feed people.

Keywords: Food System Innovations, Food Security, PMGKY scheme

Introduction

Food systems at the global level and in many countries and regions are failing to end hunger, they do not provide adequate nutritious foods for healthy diets, they contribute to obesity and do not assure safety of foods. How we produce and consume food has profound implications for the health of people, animals, plants, and the planet itself. A change in world views in support of a range of actions is needed to re-orient food systems dynamics. A central element of such change is a much greater emphasis on science for innovation to transform food systems towards sustainability and equity.

Evidence about the impact of COVID-19 on food system resilience is just beginning to emerge in the peer-reviewed literature (High Level Panel of Experts 2020), but it is evident that the pandemic is affecting all four pillars of food security (Laborde et al. 2020). Estimates of the increase in food insecurity range from 83-132 million, reflecting and exacerbating many of the existing inequities in the food system (Klassen and Murphy 2020; FAO 2020b). These impacts are not just being felt in the developing world. In the Nations, food insufficiency increased three-fold compared to 2019.

The present paper focus on the key role of food system innovations for sustainable food security in pandemic situations, as they are essential for innovations that accelerate the transformation to healthier, more sustainable, equitable, and resilient food systems.

Consequence of COVID-19, food emerged again as a central element of life, along with health, after decades in which food security was taken for granted in developed countries and also challenging task for major countries. The evidence, anecdotal as it is, shows that lockdowns around the world have had a profound impact on the markets, transport, and labor supply needed to produce, distribute, and sell nutritious foods. The COVID-19 outbreak offered the opportunity for a reflection on the importance of resilience in emergencies. Sustainable and healthy diets for all, was shown, during the pandemic, to depend much more on social and economic conditions than on technical aspects of food production, processing and supply chain.

Impact of zoonotic infectious diseases on food security

i). Direct impacts

Large disease outbreaks disrupt the workforce and supply chain. Both the disease and the measures implemented to combat the COVID-19 pandemic have disabled part of the workforce. Such disruptions in the workforce affect the food supply and in many cases workers' income or the economic viability of businesses in the food system. In addition, restrictions on travel limit the movement of workers, disrupting harvest and processing operations. Similarly, trade restrictions limit the movement of goods, affecting supply and demand.

ii). Indirect impacts

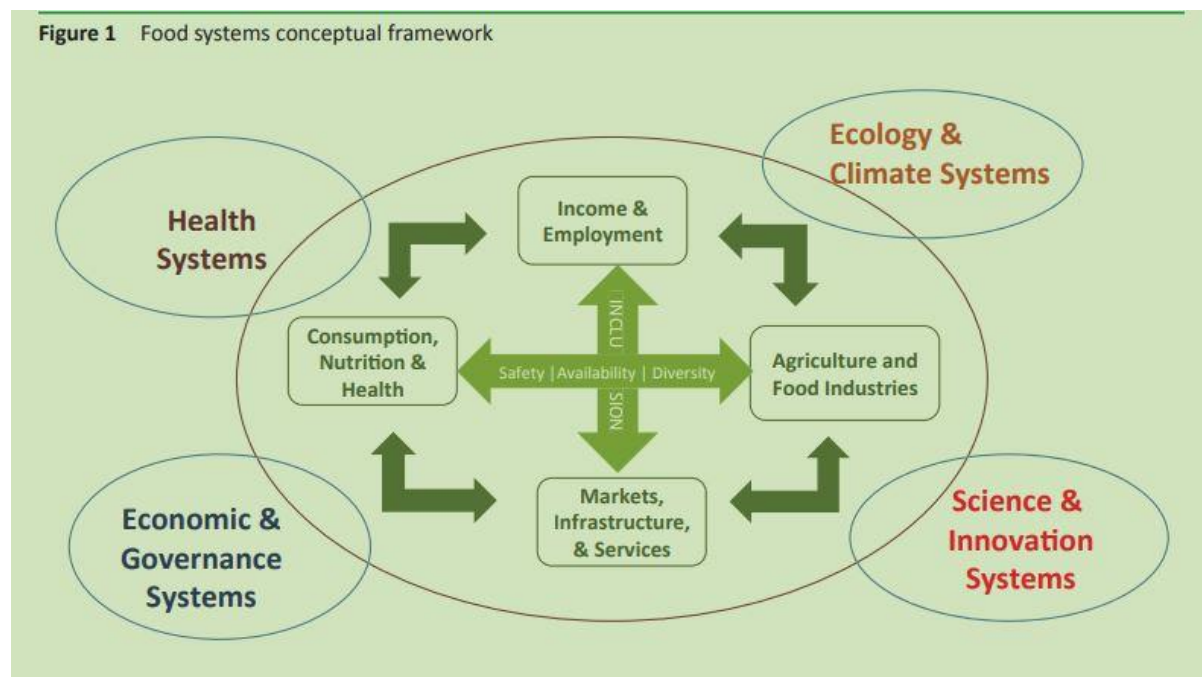
Cascading effects of the pandemic increase price volatility, disrupt food security and the livelihoods of those dependent on the food supply chain. Similar to past influenza outbreaks, for example, COVID-19 has changed consumption patterns. Combined with travel and trade restrictions, this has resulted in, among other things, uncertainties in the food supply chain, that have led to volatility in producer and consumer prices. These disrupted markets most severely affect vulnerable populations, e.g., low-income families, leaving them unable to acquire nutritious food or small farm operations. Furthermore, the COVID-19 pandemic is estimated to have put about a third of the jobs in the food value chain at risk (451 million jobs out of ~1.3 billion), disrupting the livelihoods of ~1 billion people.

iii) Pandemics and value chains

COVID19 is an example of the importance of ONE HEALTH approach as it is a zoonosis (disease transmitted from animals to humans). It is well known that damaging ecological systems might lead to spill overs of zoonotic agents (mainly viruses such as Ebola, SARS, MERS) outside their original environment with dramatic economic and public health consequences and the potential to cause global pandemics. A consequence of the COVID-19 pandemic is the disruption of global, or concentrated value-chain production in terms of affordability and food availability; inversely, many of local value chains have seen increases in production and market shares.

Food Systems Context and Concepts

Conceptualising food systems entails defining systems boundaries and systems building blocks and linkages among them, while simultaneously being connected to neighbouring systems such as health, ecological, economy and governance, and the science and innovation systems (see figure 1).



Source: UN Food Systems Summit Report-2021

Food systems at the global level and in many countries and regions are failing to end hunger, provide adequate nutritious foods for healthy diets, or deliver safe foods. Between 720 million and 811 million people face hunger and are undernourished – that is every tenth person – 150 million children under five years of age are stunted (short for their age), and two billion people are overweight or obese. These numbers have been high and/or growing for a number of years now, and with COVID-19 disproportionately impacting poor and food-insecure populations, they are continuing to rise with an estimated 118 million more people facing hunger in 2020 than in 2019. About 600 million people fall ill each year due to the consumption of contaminated or unsafe foods. We are losing ground on the progress that we have already made, and we face the prospect of severely compromising the achievement of the SDGs and the 2030 Agenda.

Apart from Food Systems is taking place in the midst of the COVID-19 pandemic, which has revealed the close intertwining of food, ecological, and health systems. The pandemic is having a significant impact on the global commodity markets and trading systems, economic growth, incomes, and poverty levels, with disproportionate burdens on vulnerable communities in both urban and rural areas. This is likely to worsen inequalities and under nutrition, including child under nutrition, which can have life-long consequences. Modelling projects that COVID-19 could result in an additional 9.3 million children wasted (low weight

for height) and 2.6 million children stunted (low height for age) by 2022. COVID-19 further increases food insecurity and poverty, which may become much more serious if comprehensive policy responses – especially equal global vaccination coverage – are not implemented in a timely, and evidence-based manner.

Sustainable Food System

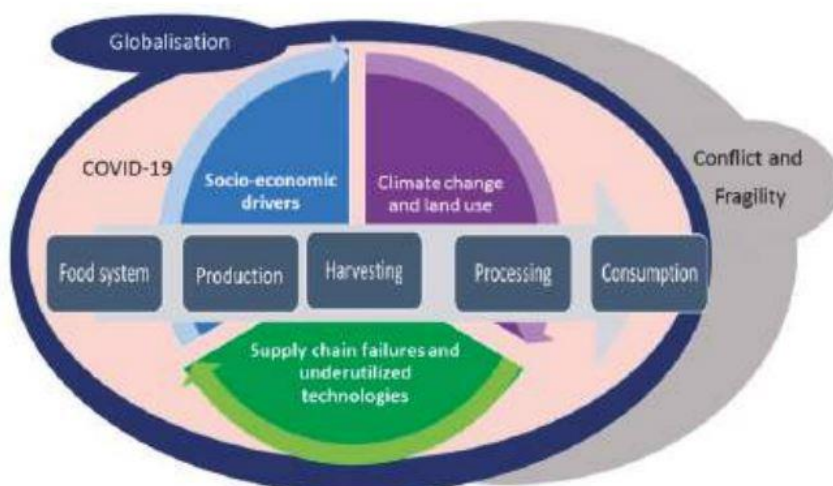
Food systems embrace the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal (loss or waste) of food products that originate from agriculture (including livestock), forestry, fisheries, and food industries, and the broader economic, societal, and natural environments in which they are embedded. A sustainable food system is one that contributes to food security and nutrition for all in such a way that the economic, social, cultural, and environmental bases to generate food security and nutrition for future generations are safeguarded. Its sustainability is not to be realized internally and in isolation with the food systems serving humanity, but depends upon its relationships with nature and ecological systems of which humankind is a part, with its destructive impacts that need to be overcome by food systems transformations.

Food systems are connected to other systems such as health, ecology and climate, economy and governance, and science and innovation. A conceptual framework of food and nutrition systems should capture the delivery of health and well-being while being embedded in the transformation towards a sustainable circular bio-economy.

Interconnected food systems drivers that affect the access to safe and nutritious food for all

Several interconnected socio-economic and biophysical food systems drivers affect access to safe and nutritious food. Nutrition is both a health and food system concern. While some drivers of food systems are global (e.g. trade liberalisation, climate change), others are regional, national and sub-national (e.g. conflicts). At the same time, many are differentiated across geographies (e.g. poverty, demography, technologies, land degradation). A brief overview of the main drivers, depicted in Figure 2. At the centre of the diagram is the food system, driven by socio-economic, supply chain and climate change and land-use drivers (depicted by the segmented circle). The drivers and the food system are influenced by globalisation and the global COVID-19 pandemic. In certain contexts, the drivers and the food system are also affected by conflict and fragility.

Figure 2 Food system context and drivers influenced by COVID-19 pandemic.



Source: UN Food Systems Summit Report-2021

The COVID-19 pandemic lays bare the complex connections between food systems and health. In addition, the pandemic exposes how human health is affected by socio-economic status and how health affects economic and social systems in return. The current pandemic is not the first, nor will it be the last.

Innovations to end hunger and increase the availability and affordability of healthy diets and nutritious foods

More than 3 billion people cannot afford healthy diets, and more than 1.5 billion people cannot even afford a diet that only meets the required levels of essential nutrients. Broadly speaking, the investment opportunities include productivity enhancement, people's skills and empowerment, agricultural research, social protection, nutrition programs, etc. Policy innovations are needed to repurpose subsidies towards related supportive investments that facilitate a sustainable food system.

Innovations to de-risk food systems and strengthen resilience, in particular for negative emission farming and drawing on both advanced science as well as traditional food system knowledge.

As food systems become more global, dynamic, and complex, they also become more vulnerable to new, challenging, and systemic risks, as evidenced by the food price crisis in 2008, the ongoing COVID-19 pandemic, and in armed conflicts. The implementation experiences of triple nexus approaches of the humanitarian-peace-development nexus should be accompanied with evidence-seeking social science. The capacity to understand, monitor, analyse, and communicate vulnerabilities, crises, and risks must be strengthened. Opportunities to expand and improve food security forecasting and monitoring with web-based approaches must be seized. Local meteorological capacities must be expanded as accurate weather forecasting is of critical importance to farming communities. De-risking food systems by solar powered small-scale irrigation and affordable smart phones with location-specific soil and weather data are concrete innovations that can be scaled. Food prices currently show fast upward movements, and increased volatility. Such tendencies on top of the income losses due to COVID-19 add to food security dangers for the poor.

The COVID-19 pandemic has exacerbated malnutrition and highlighted the need for food safety. The pandemic has also exposed the deep inequalities in society and food systems. Nonetheless, future food systems can address many of these failings and ensure safe and nutritious food for all.

Food system innovations

Innovations in distribution have likewise been driven by government, as well as by communities themselves. In India, an amendment to the Agriculture Produce Market Committee Acts now allows farmers to sell their harvests from multiple locations and to any buyer, rather than just in designated markets. In Nepal, communities established "agri-ambulances" to get vegetables from farm to market. In India, the National Informatics Centre created the KISAN RATH mobile app to help farmers and traders find vehicles to move their fruits and vegetables to market. KISAN RATH Mobile App facilitates the farmers and traders across the country for transportation of agri-produce by connecting them with the transporters. The app interfaces with leading transport aggregators and individual transporters for providing a wide range of transport vehicles at required date and place, in a quick and easy way.

Elsewhere, there have been innovations in point-of-sale. In Quito, Ecuador, sales from the city's extensive network of urban and peri-urban agriculture have been diversified to include third-party transactions and basket sales direct from the gardens. In Addis Ababa, Ethiopia, the government has provided a renovated stationary bus as a venue for urban farmers to provide direct market access to local people. For people going short on food, new methods are likewise being used to supply food, vouchers, and meals. Innovations at the urban level are of particular note. For people going short on food, new methods are likewise being used to supply food, vouchers, and meals. Innovations at the urban level are of particular

note. From the food deliveries in Lima, Peru, to the community kitchens in Freetown, Sierra Leone, and Masiphumelele, South Africa, communities, governments, private enterprise, and funders are finding new ways to feed people.

Government of India ensures food grains especially in poor families, to suffer on account of non-availability of food grains due to disruption in the pandemic situation. 80 crore individuals, i.e, roughly two-thirds of India's population would be covered under Pradhan Mantri Garib Kalyan Yojana scheme.

The World Bank reports that as of June 12, 2020, 173 countries had enacted 621 new social protection measures, including cash transfers and in-kind food and voucher schemes - a vital lifeline to enable people in poverty to afford nutritious foods.

Comprehensive food systems innovations are elaborated

- Innovations to end hunger and increase the availability and affordability of healthy diets and nutritious foods.
- To overcome inefficient and unfair land, credit, labor, and natural resource use arrangements, and facilitate the inclusion, empowerment and rights of women and youth, and Indigenous Peoples.
- Innovations to keep – and where needed, regenerate – productive soils, water and landscapes, and protect diversity of the agricultural genetic base and biodiversity.
- Innovations for sustainable fisheries, aquaculture, and protection of coastal areas and oceans.

Innovations show the way forward to sustainable food security

In the scenario of SDG-2030 food system innovation are most important to reach the SDG goal -2 and its interrelations between “No poverty” and “Good health and well-being” is central for food security and can unlock many additional benefits across the SDGs. These goals need to be jointly addressed to succeed on “Zero hunger”. SDG2 integrates four ambitious objectives – adequate food, no malnutrition, in increased incomes for smallholders, greater sustainability – that will require careful implementation to be conducted in synergy. The compatibility of these objectives will depend on the interplay of future food demand drivers and the contribution of productivity gains across the food system, and it will be more adequate for vulnerable in pandemic circumstances.

Food systems solutions to ensure the right kind of food gets to those most vulnerable are possible. During COVID-19, the bureaucratic, financial, logistical, and technological reasons that always seemed to make actions impossible or improbable have fallen away.

Three C's like concerted, creative, and cross-sectoral intervention is needed to get food systems working for better diets. It's not something that can simply be left to happen without a clear plan. Important as government is in these interventions, innovation also needs to involve communities, businesses, and partnerships. Creative thinking is needed to find the right solution from the diversity of possible innovations. COVID-19 has provided a real-life innovation lab, a testing ground for big ideas. Test, fail, succeed, learn, change. A next step should be to assess what can be learned about what works (and what does not) and which innovations show most promise in effecting food systems change at different levels. COVID-19 has disrupted food systems everywhere. But it has also provided an unprecedented opportunity for innovation, a space in time when immediate needs have spurred responses never seen before, a base on which to redesign food systems for the better.

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