



COVID-19's implications on agri-food systems and human health in Bangladesh



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ABSTRACT

The COVID-19 pandemic in Bangladesh has put agri-food systems and resultant human health under serious pressure and this has thus become a priority concern for the country and its development partners. To understand, describe and analyse the impacts of COVID-19 on agri-food systems, human health issues and related SDGs, this study used systematic rapid literature review, analysis of blogs and news and engagement with key informants. The analysis reveals impacts that can be addressed through a set of recommendations for a coordinated effort to minimize the effects of the COVID-19 pandemic on agri-food systems and related health issues in Bangladesh.

1. Introduction

As well as the extraordinary public health intervention challenges sparked by COVID-19, there are also critical challenges to keeping agri-food systems functioning in Bangladesh. Agri-food systems are the basis of the rural economy and have a significant impact on national economic growth, contributing 14% of the country's GDP (BER, 2018) and employing 41% of the labor force (BBS, 2018). The agriculture of Bangladesh is centred on a limited suite of crops with 75% of the total cropped area are used for rice cultivation (BRRI, 2014).

In pre-COVID-19 Bangladesh, agri-food systems and the associated human health outcomes were performing progressively better despite vulnerability to natural calamities, climate change, environmental degradation, agri-food system mismanagement and poor logistical infrastructure. By 2019, Bangladesh ranked 4th in the world in rice production (FAO, 2019) and was making significant improvements in producing vegetables, fish, livestock and poultry (FAO, 2017). These improvements were due to investment in agricultural policy and infrastructure such as the introduction of High Yielding Varieties (HYV) of rice, use of modern inputs

including chemical fertilizers, pesticides, irrigation, storage systems, use of subsidies, micro-credit supports and marketing capacity (Gautam and Faruque, 2016; Bagchi et al., 2019).

Despite the significant progress in managing agri-food systems in Bangladesh, food security and related health issues remain in a fragile state. The country ranked 83rd in the world in the 2019 Global Food Security Index, which takes account of food affordability, availability, quality and safety as well as relevant natural resources and resilience (The Economist, 2019). Across the population, there are differences in availability and access to an adequate, nutritious diet. Fruit and vegetable consumption is inadequate for most Bangladeshis relative to international recommendations. In addition, as the food systems have begun to modernize, challenges related to food safety and perceived food adulteration have begun to emerge (de Brauw et al., 2020). Declining per capita calorie intake (from 2318 kcal/day in 2000 to 2210 kcal/day in 2016) also remains an issue for the development of Bangladesh (HIES, 2016).

In this context, Bangladesh's food security and related health outcomes are significantly affected by the impacts of the COVID-19 pandemic. The following questions arise: How has the COVID-19 pandemic impacted the

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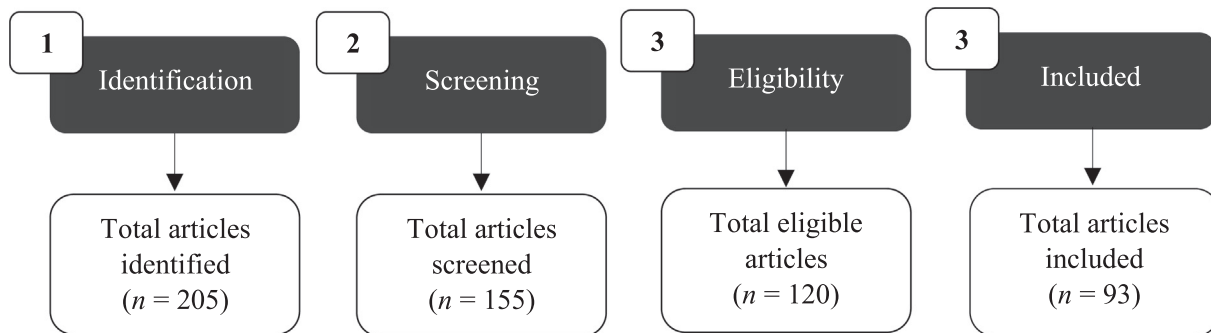


Fig. 1. Steps of systematic literature review (Moher et al., 2009).

agri-food systems of Bangladesh? What are the potential impacts of COVID-19 affected agri-food systems in terms of human health outcomes? What potential interventions can address these implications?

2. Methodology

A rapid systematic literature review was deployed to identify significant literature from peer-reviewed articles, gray literature, blogs and news articles. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) strategic process (Moher et al., 2009) used in this review follows four steps: (i) Identification, (ii) Screening, (iii) Eligibility, and (iv) Included (see Fig. 1). Using both Google search and Google Scholar, a search was conducted to identify relevant materials for the study. From the identified materials, screening was conducted to select the literature related to COVID-19, Bangladesh's agri-food systems, health and interventions to mitigate the impacts of COVID-19 on agri-food systems. After screening, items that strongly focused on COVID-19 and agri-food systems and health impacts were reviewed. Ultimately, 93 documents were selected for review.

Additional key informant interviews were conducted with ten key informants from Bangladesh in order to verify the findings of the literature review. These key informants were university faculty members, researchers, officers of the Ministry of Food, the Ministry of Agriculture, Fisheries, and Livestock and at the Ministry of Health of the Government of Bangladesh and NGO-based advocates.

3. Results

The findings of the review are grouped in two categories: (i) impacts of COVID-19 on agri-food systems and (ii) implications of COVID-19 for agri-food systems-related health issues. These two impacts are discussed below.

Table 1
Impacts of COVID19 on agri-food systems and health at global, regional and national levels.

Agri-food systems disruptions		Health/economic impacts		
		Global	Regional	National
Farm	Supply of agricultural inputs Workforce and availability of human labour	<ul style="list-style-type: none"> Intensify existing hunger and malnutrition of hundreds of millions of poor people 	<ul style="list-style-type: none"> Rising health risks Reduced food consumption leaves vulnerable groups at risk of hunger and malnutrition 	<ul style="list-style-type: none"> Disrupted trade flows for staple foods (i.e., wheat and rice)
Food value chain	Starting points of the value chain (farm-to-market, macroprocesses, logistics) Distribution networks for food, suppliers, and importers and exporters	<ul style="list-style-type: none"> Global food emergency/famine Universal access to safe and nutritious food Hampering of the goal of ending of all forms of malnutrition 	<ul style="list-style-type: none"> Border closures and export restrictions hamper food security 	<ul style="list-style-type: none"> Food security Nutrition security Disrupted household incomes and physical access to food
Market	Rural and agricultural food markets Microeconomic stability and financial markets	<ul style="list-style-type: none"> Kill or debilitate people 		<ul style="list-style-type: none"> Exposed vulnerabilities Food shortages Increased vulnerability to hunger and malnutrition

Source: Based on Aday and Aday, 2020; Adhikari et al., 2021; Arouna et al., 2020; de Paulo Farias and de Araújo, 2020; Devereux et al., 2020; Dihel and Rizwa, 2020; Erokhin and Gao, 2020; FAO, 2020c; FAO, 2020d; FAO, 2020f, FSIN, 2020; Headey et al., 2020; HLPE, 2020a; HLPE, 2020b; Huizar et al., 2020; Huss et al., 2021; Kim et al., 2020; Laborde et al., 2020; Moseley and Battersby, 2020; Niles et al., 2020; Pereira and Oliveira, 2020; Swinnen and McDermott, 2020; Udmale et al., 2020; UN, 2020, UNICEF, 2020a; WFP, 2020; Workie et al., 2020; UNSCN, 2021.

purchasing power and thus demand for fresh produce, fish, poultry and livestock products (for example, see Pictures A & B), affecting producers and suppliers. Now and into the future, reduced food consumption will hamper food production and increase food waste and loss (FAO et al., 2018). These difficulties are causing significant economic loss for farmers, especially small and marginalized ones, and internal migrant workers as well as small scale traders/vendors. As a result, their agri-food systems-based livelihoods are in critical condition in 2021 (Poathan, 2020). The crisis may lead many producers to shut down production, which will have a negative impact on long-term food availability (NAWGB, 2020), leading to increased food insecurity and poverty (Pereira and Oliveira, 2020).

In country and cross border travel restrictions have particularly disrupted the supply chain of perishable items (NAWGB, 2020). In addition, border closures due to COVID-19 have caused significant interruptions of informal trade flows between Bangladesh and India adding to increased food security in both countries, particularly for the poor (Dihel and Rizwa, 2020).



Picture [A]: A vendor in Dhaka waits for buyers in the early stage of lockdown (Heifer International, 2020). Picture [B]: A empty buyers fish market just after lockdown (CGIAR, 2020). These two pictures indicate that at a formerly busy time there are few customers which is the evidence of the diminishing demand for perishable foods from vendors in the early stage of lockdown in Bangladesh that prevented farmers from selling their products to the vendors.

Bangladesh has recently faced a shortage of labor throughout the entire agri-food system (Zhang et al., 2014) due to growth of employment in the industrial and service sectors, but COVID-19 has made the situation worse as travel restrictions constrain the movement of seasonal labour into the agricultural regions. This causes reduced or halted rice harvesting across the country and has caused economic loss for the poor farmer as well as lost day-wages for vulnerable farm labourers. These farm labourers represent the major sub-group of the 21.8% of Bangladeshis who are living below the national poverty level (ADB, 2020) and who are the most food-insecure population even under normal circumstances.

Travel restrictions and lack of mobility also reduced farmers' access to agricultural inputs (such as fertilizer, seeds, pesticides, farm equipment), which has seriously hampered agricultural productivity and subsequently farmers' livelihoods (NAWGB, 2020). Agri-food systems-based rural economies support 63% of the total population of Bangladesh (WB, 2020a) and are essential to poverty alleviation strategies (Irz et al., 2001). A recent survey by the Bangladesh Rural Advancement Committee (BRAC) revealed a 60% increase in extreme poverty across the country since the onset of the COVID-19 pandemic (WB, 2020b).

Most poor Bangladeshis live in rural and urban slum areas (WB, 2014). Day-labourers, poor farmers, vendors, retailers and shop-owners in these areas constitute a majority of these poor; they have faced huge losses due to supply chain disruptions and job losses during lockdown that have made them poorer and more food-insecure (NAWGB, 2020; Pereira and

Oliveira, 2020). COVID-19 has reduced food access for the urban poor as staple food prices have increased about 25% (FAO, 2020b). Furthermore, people in vulnerable areas such Chittagong Hill Tracts lack access to diversified food as their food supply is dependant on supply from other parts of the country (FAO, 2020b). Other vulnerable areas such as the saline intrusion prone areas of coastal Bangladesh are also facing less accessibility of sufficient, diverse and nutritious food.

3.2. Implications of COVID-19 for agri-food systems-related health issues

Beyond food supply and availability issues, COVID-19 has impacted the agri-food-related health of vulnerable groups at global, regional and national levels (see Table 1). UNICEF (2020a) reported a 30% worldwide decrease of vital nutrition services coverage during the pandemic. The effects of the COVID-19 pandemic on agri-food systems in Bangladesh likewise bring a set of health-related impacts, as illustrated in Fig. 2. Because

COVID-19 creates food insecurity through food supply chain disruption, loss of income and purchasing power, and increases in many food prices, there are profound health implications as the vulnerable groups face diminishing access to diversified healthy food diets (i.e., vegetables, fish, milk, meat and fruits etc.).

Consumption of diversified food is essential since it fights against malnutrition by providing essential nutrition and is key to building immunity, protecting against illness and infection and supporting recovery from illness (Webb et al., 2018; EAT, 2019; Calder and Jackson, 2000; UNSCN, 2021). Weak immune systems are more susceptible to infectious (e.g., COVID-19, diarrhea malaria, dengue) and chronic (e.g., diabetes and cardiovascular) disease (Bagatini et al., 2018; Sompayrac, 2019). Consuming sufficient calories is vital to growth, and maintenance of good health. The increase in grain prices during COVID-19 (USDA and GAIN, 2020) can lead to long-term insufficient caloric intake (dietary energy) which will hamper the normal activity of children and negatively affect their growth and development (Bhattacharya et al., 2004). Thorne-Lyman et al. (2010) found that in Bangladesh grain price and prevalence of child underweight are positively associated whereas grain price is inversely associated with non-grain food expenditures of households. Low dietary diversity are causes of micronutrient deficiencies among children of Bangladesh.

Economists and nutritionists warn that a higher incidence of poverty can lead to falling food consumption and malnutrition among some groups of people (Heltberg, 2009). Reduced food security and reduced access to health services may lead to worse nutritional status, leading to an increase in the number of children with severe acute malnutrition along with maternal and child mortality. Bangladesh already has a 30.8% prevalence of growth stunting because of poor nutrition and reduced caloric intake among children under 5 years of age, a 14.7% prevalence of undernourishment of children under 5 years of age, and a 8.4% prevalence of wasting among children under 5 years of age (ADB, 2020). In addition, 41.8% of

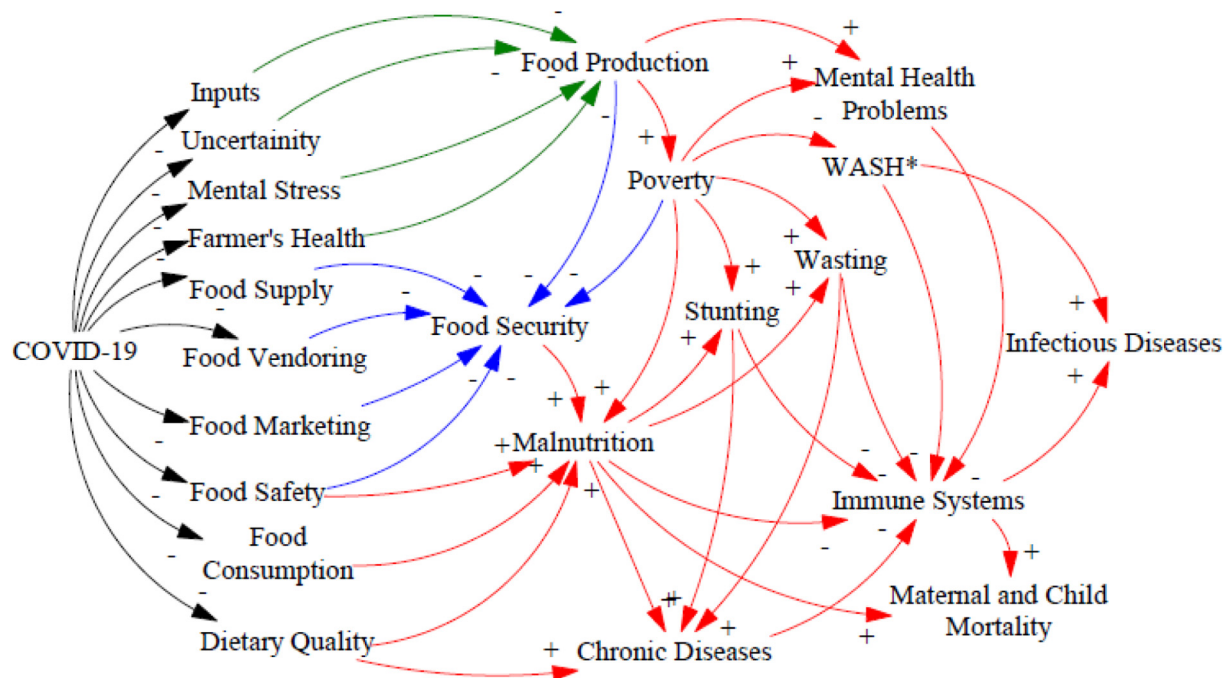


Fig. 2. COVID-19's impacts on agri-food systems and related health issues. Note: Black arrows indicate impacts on agri-food systems from COVID-19, green arrows indicate decrease of food production due to impacts of COVID-19, blue arrows indicate impacts on food security due to COVID-19 and red arrows indicate health impacts of COVID-19 from impacts on agri-food systems. "+" indicates an increasing impact and "-" indicates a decreasing impact. WASH* = Water and Sanitation for Health. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

women are anemic (Rahman et al., 2021). These baseline health measures will likely deteriorate further due to the impacts of COVID-19 on agri-food systems. In the short- to medium-term, micronutrient deficiencies, child wasting and stunting are all expected to surge, stemming the tide of recent

progress toward achieving the World Health Organization's Global Nutrition Targets for 2025 (WHO, 2020).

In addition to these nutrition related health impacts, poor nutrition due to COVID-19 agri-food system impacts can (i) jeopardize cognitive

Table 2
Effects of COVID-19 on food-related important targets within SDGs: 1, 2, 3, 4, 5, 8, 10 & 12.

SDGs	Target indicator	Impacts		
		S.B.C.	S.A.C.	I.O.C.
SDG 1: No Poverty	1.1.1 Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)	21.8% ¹	40% ²	-18.2%
SDG 2: Zero Hunger	2.1.1 Prevalence of undernourishment	14.7% ³	↓	↓
	2.1.2 Prevalence of severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)	10.2% ³	↓	↓
	2.2.1 Prevalence of stunting (height for age < -2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age	28.0% ³	↓	↓
SDG 3: Good Health and Well-being for People	2.2.2 Prevalence of malnutrition (weight for height > +2 or < -2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting)	Wasting: 9.8% ³	↓	↓
	3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, noncommunicable diseases and service capacity and access, among the general and the most disadvantaged population)	54 ³	↓	↓
SDG 4: Quality Education	4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	(a) Grade 2/3 (Reading Bangla-25.9%, Math - 13.0%) ³	↓	↓
SDG 5: Gender Equality	5.5.2 Proportion of women in managerial positions	10.7% ³	↓	↓
SDG 8: Decent Work and Economic Growth	8.1.1 Annual growth rate of real GDP per capita	6.91% ³	↓	↓
	8.3.1 Proportion of informal employment in non agriculture employment, by sex	By sex (Male: 3.1%; Female: 6.7%) ³	↓	↓
	8.5.2 Unemployment rate, by sex, age and persons with disabilities		↓	↓
SDG 10: Reducing Inequalities	10.2.1 Proportion of people living below 50% of median income, by sex, age and persons with disabilities	15.98% ³	↓	↓
SDG 12: Responsible Consumption and Production	12.3.1 (a) Food loss index and (b) food waste index	(b) Food waste:68.3% ⁴	↓	↓

Source¹:ADB, 2020²;Anas and Kuronuma, 2020³;GED, 2020⁴;Ananno et al., 2020; Note: S.B.C. = Status before COVID-19, S.A.C. = Status after COVID-19, I.O.C. = Impact of COVID-19. "↓" indicates indicator will go down but data are not yet available. "↓" indicates indicator will have negative impacts due to COVID-19.

development and generally healthier living in vulnerable children; (ii) hamper children's concentration and learning ability; and (iii) have a disproportionately larger impact for girls, women and the children of the vulnerable groups which will negatively affect progress in target school proficiencies, and gender equality efforts; and (iv) because of poor health status, lead to decreased economic productivity and increased health care costs (FAO et al., 2018).

Bangladesh is among the top 10 countries with the highest rates of projected age-standardized mortality among selected low- and middle-income countries due to chronic diseases, particularly cardiovascular diseases and diabetes (Ali et al., 2019). While in isolation due to the pandemic, people may rely more on carbohydrates instead of procuring diversified food, a factor that may exacerbate chronic disease.

The deterioration of coordinated efforts to maintain the food supply chain can mean reduced access to food and lead to mental stress, anxiety, uncertainty and fear of famine among the people of Bangladesh. Paul et al. (2020) found that due to livelihood disruptions in Bangladesh, farmers are more stressed than in comparable pre-Covid periods. This, as well as self isolation, social distancing, public health lock down measures such as restricted local, regional and national mobility and travel, and the decreased of income of poor farmers and other vulnerable groups due to disruption of the agri-food system, will lead to restricted access to healthcare services, and to safe water, sanitation and possibly hygiene practices.

4. Discussion

The COVID-19 pandemic has caused food insecurity (Mishra and Rampal, 2020) and other damage to social and economic systems (WWF, 2020) and will continue to negatively impact Bangladesh's agri-food systems and Bangladeshis' food-related health outcomes (as shown in Fig. 2). As such it will have long-term implications for the future sustainable development of the country.

Undisrupted agriculture is vital to achieve many of the United Nations' Sustainable Development Goals (SDGs) (see Table 2) including ending poverty, promoting zero hunger, sustainable consumption and production practices, and combating climate change (FAO, 2016). The COVID-19 pandemic has had negative impacts on the vulnerable agri-food systems of Bangladesh, and impede Bangladesh from achieving agri-food-related

SDG indicators, through increasing undernourishment, decreasing average income of small-scale food producers, decreasing the proportion of agricultural areas under productive and sustainable agriculture, lowering government expenditures on agriculture, increasing food pricing anomalies and resulting in food loss (FAO, 2020a). These impacts will aggravate poverty and health outcomes and undoubtedly negatively affect Bangladesh's efforts to achieve the SDGs by 2030, as well as other development initiatives and goals (Shammi et al., 2020; Workie et al., 2020).

Considering that nutrition is a central feature of the 2030 SDG Agenda (FAO et al., 2018), COVID-19 will have impacts on SDG 1: No Poverty, SDG 2: Zero Hunger, SDG 3: Good Health and Well-being for People, SDG 4: Quality Education, SDG 5: Gender Equality, SDG 8: Decent Work and Economic Growth, SDG 10: Reducing Inequalities and SDG 12: Responsible Consumption and Production in Bangladesh (See Table 2). Key target indicators of these SDGs related to food and agricultural systems will all be impacted. Even in the early stages of the COVID-19 situation, the "proportion of population below the national poverty line" target indicator has increased to 40% in 2020 (Anas and Kuronuma, 2020) from 21.8% in 2018 (ADB, 2020). The overall negative impact of this target indicator is 18.2%. This will have a massive impact on nutritional security in Bangladesh. The "Prevalence of Undernourishment" target indicator will also be very substantially impacted since it has been projected that the number of cases of wasting could increase from 1.7 million in 2019 to 1.9 million in 2020 (UNICEF, 2020b).

Spatial distribution of food insecurity varies in Bangladesh (see Fig. 3 [A]). Food insecurity is strongly associated with poverty, which also varies spatially across the country (see Fig. 3[B]), and food insecurity and poverty are especially prominent across vulnerable zones, including coastal and urban areas, and char (island) and hilly regions (see Fig. 3[C]). From the three maps in Fig. 3, it is clear that vulnerable and poverty-prone areas are more food-insecure under normal conditions. With the impacts of COVID 19 on agri-food systems, food insecurity in these regions is very likely to increase substantively as people in vulnerable zones are mainly farmers and daily wage workers whose income continues to fall (Dhaka Tribune, 2020; Mottaleb et al., 2020; WB, 2020c). For example, the average income of day labourers (rickshaw-pullers, tea-stallers, CNG auto-rickshaw drivers, housemaids, small business owners, mass-transport workers, street hawkers and garment workers) in Dhaka city has dropped with lockdown measures (Sakamoto et al., 2020). Reduced income means that these

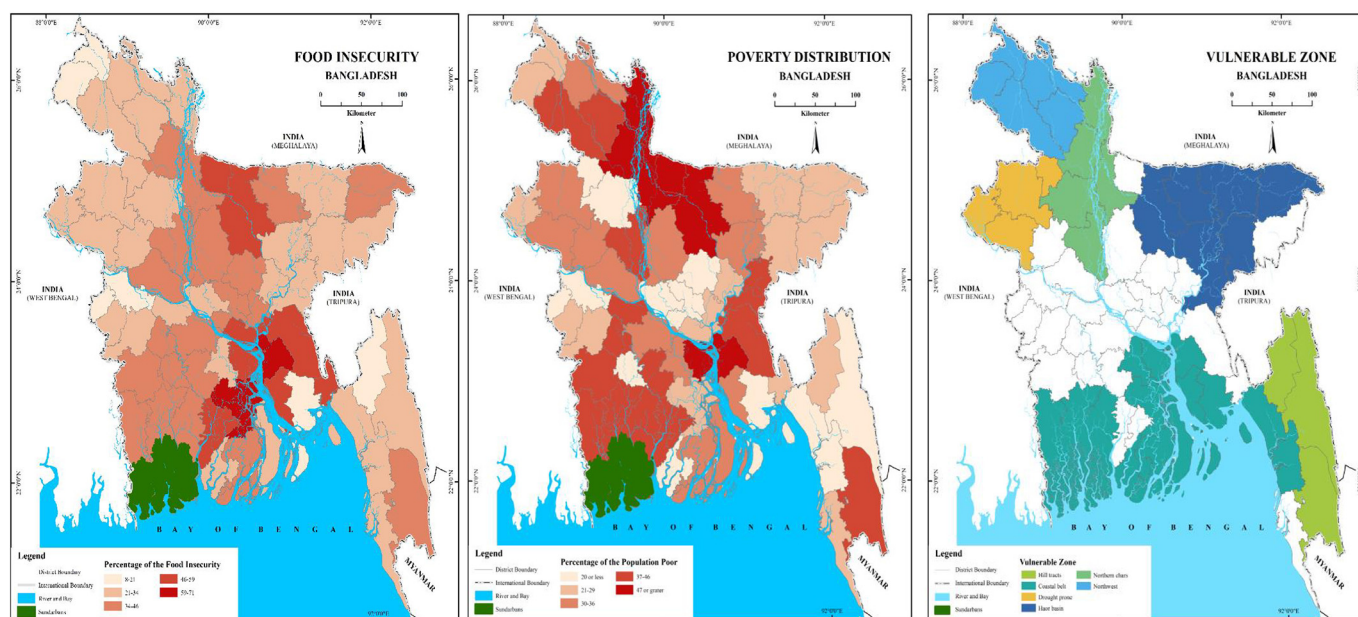


Fig. 3. [A] Spatial Distribution of Food Insecurity in Bangladesh based on Hossain et al. (2020) [B] Poverty distribution in Bangladesh based on WB and WFP (2010) [C] Vulnerable zone in Bangladesh based on Haque et al. (2017) and WB (2019).

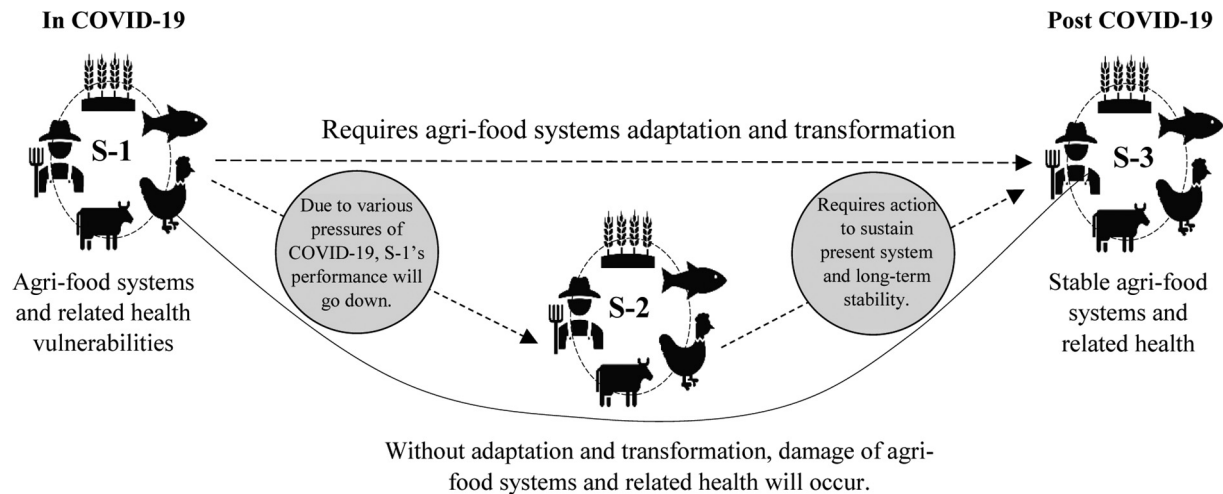


Fig. 4. A cognitive explanation of the impacts of COVID-19 on agri-food systems and related health and the way to transform these systems. COVID-19 exposed present agri-food system and related health vulnerabilities as shown in Stage-1 (S-1). Without any adaptation and transformation measures, agri-food systems and related health will collapse (Stage-2 (S-2)). It will require a tremendous effort to move to Stage-3 (S-3) post COVID-19. However, if timely and appropriate adaptation and transformation measures are taken, agri-food systems and related health can return to a stable condition as shown in Stage-3 (S-3).

vulnerable groups have less purchasing power and therefore access to food (Concern [Worldwide, 2020](#)). Furthermore, while income has gone down, food prices have increased in Bangladesh ([Dhaka Tribune, 2020](#); [FAO, 2020e](#)).

The present state of the agri-food systems of Bangladesh and a way forward are portrayed in a conceptual illustration in [Fig. 4](#). Before COVID-19, Bangladesh's agri-food systems were in a stable condition that was adequate for providing food to most of the population. With the stress/shocks resulting from the pandemic, however, the vulnerabilities of the agri-food system have been exposed and food production and distribution have been significantly compromised. Appropriate interventions are needed to stabilize these systems to prevent their vulnerabilities from getting worse.

Agri-food system stability is vital for maintaining the health of the people of Bangladesh. While COVID-19 is having a profound impact on the agri-food system within Bangladesh, the country will also have to be cautious about the disrupting impacts of international food assistance ([Cardwell and Ghazalian, 2020](#)). Therefore, interventions to enhance the adaptive capacity of food producers and distributors and other agri-food system stakeholders to address COVID-19-related impacts are crucial. In this respect, good governance and democratic accountability are essential parts of building adaptive, resilient and stable agri-food systems ([Swanson et al., 2009](#); [USAID, 2012](#); [Bhavani and Gopinath, 2020](#)).

5. Conclusion and recommendations

Bangladesh's agri-food systems are adapting and coping with the impacts of climate change through several infrastructural-technological initiatives ([Mondal et al., 2019](#)) such as income source expansion by introducing diversified cropping practices and introducing ICT (Information and Communications Technology) in sectors of the agri-food system. The lessons learned could be a platform on which a strategy can be formulated to also adapt and cope with the impacts of COVID-19 and future crises in agri-food systems and related health impacts. To this end, Bangladesh needs support from its development partners including from international agencies.

Taking proactive measures to increase economic resilience, enhancing capacity to deal with the impacts described here and reducing the vulnerability of farming communities will go far in sustaining food security and socioeconomic development. To avoid disruptions to agri-food systems and related exacerbations of human health issues, Bangladesh may consider the following measures:

1. Maintain the function and viability of domestic food supply value chains and enhance their resilience through coordinated efforts of different government ministries (including finance, agriculture, fisheries and livestock, planning, local government, rural development and co-operatives, disaster management and health) in utilizing natural, social, financial, human and physical capitals. Ensure government assistance (financial and technological) for food processing, transport and marketing.
2. Take all necessary measures to ensure the normal flow of agricultural inputs (seeds, fertilizer, pesticide, insecticide, medicine, feed, etc.), making use of credit, subsidies and government-managed distribution as needed. Quick procurement and inputs distribution systems should be introduced at the farm level. Labour shortage during rice harvest is an issue for the agricultural sectors of Bangladesh. It should be addressed by ensuring the viability of agricultural labour throughout the country during harvest season, through for example targeted vaccination programs.
3. Agroecology, climate-smart agriculture, circular agriculture and regenerative agriculture could play vital roles in the post-COVID-19 recovery. These approaches can support diversified agricultural systems. Therefore, these should be tested as part of the agricultural extension work.
4. Strong agriculture-based internal markets should be designed and enabled to support all stakeholders.
5. Access to appropriate analytical tools such as simulation models can support informed policy choices for risk reduction in the agriculture sector. Hence, data on agricultural systems such as inputs, food production, prices, trade, market access and nutrition should be collected to allow for better analysis and simulations.
6. Improve the present storage systems capacity by providing mechanization and appropriate technology. Improvement in storage capacities for grains, fruits and vegetables greatly helps in mitigating food security-related vulnerabilities by ensuring regular supply to all sectors of society. The present grain procurement by the government, distribution to the impoverished sections of the society, central storage capacities and cold storage facilities are not efficient.
7. Application of ITC in agricultural sectors of Bangladesh has just been introduced and is gaining support from government and development partners. Digitized agri-food systems under appropriate policy frameworks and using appropriate technology to support farmers in growing and marketing food in sustainable ways can be very effective for ensuring the resilience of agri-food systems and reduced health impacts in the face of present and future risks.

COVID-19 has changed and threatens to continue to change the agri-food systems of Bangladesh. Ensuring food-related human health, and the productivity and efficiency of the agri-food systems and effective food distribution have become top policy priorities in Bangladesh. Multiple levels of government have moved to address these issues. While the Government of Bangladesh has announced a stimulus package of 59 million USD for small and medium sized farmers aimed at keeping businesses running (The Daily Star, 2020), it is not enough relative to the size and support needs of the agricultural sector of Bangladesh. While economic stimulation is important, the success of agri-food systems and related human health outcomes during the pandemic and beyond will be determined by the abilities of food providers and distributors to maintain productivity and to make efficient use of expert-guided planning, community support and government assistance. Bangladesh must continue to reorient and stabilize its agri-food systems to mitigate agri-food system impacts, and the health impacts of COVID-19.

Declaration of Competing Interest

The authors declare no conflict of interest.

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