



EDITORIAL

## Impact of COVID-19 Pandemic from Farm to Fork: Hard-won Lessons

Md Parvez Anwar 

Agro Innovation Laboratory, Department of Agronomy, Bangladesh Agricultural University, Mymensingh 2202, Bangladesh

### ARTICLE INFORMATION

#### Article History

Submitted: 25 July 2020

Accepted: 02 Aug 2020

First online: 02 Aug 2020

#### Academic Editor

M Harun Rashid

[mhrashid@bau.edu.bd](mailto:mhrashid@bau.edu.bd)

#### \*Corresponding Author

Md Parvez Anwar

[parvezanwar@bau.edu.bd](mailto:parvezanwar@bau.edu.bd)



### ABSTRACT

As evident from the past, although pandemic is a health issue it could lead to food security and economic crises. Since agriculture accounts for more than 3.3% of global gross domestic product and 60% of the population depends on agriculture for their livelihoods, COVID-19 pandemic impact on agriculture may result in acute hunger and malnutrition, and the deepest global recession in recent history. Agriculture is experiencing a huge challenge in dealing with both supply and demand shocks. Globally, there is sufficient food to feed the people but the challenge is to make food available to everyone due to logistic bottlenecks and high price. The hard-won lessons from this pandemic is that 'feeding the world is always a challenging task' and therefore we should search for a more resilient, sustainable and regenerative food production and supply system to cope with such a crisis. Prompt response and immediate acceleration are needed to support the recovery process and minimize deterioration. Agri-food sector must be reoriented so that it can function more effectively in the post COVID-19 era.

**Keywords:** Agriculture, Covid-19, food security, pandemic, resilience



**Cite this article:** Anwar MP. 2020. Impact of COVID-19 Pandemic from Farm to Fork: Hard-won Lessons. *Fundamental and Applied Agriculture* 5(3): 289–294. doi: 10.5455/faa.111527

**S**INCE the first reported case of COVID-19 disease caused by the virus 2019-nCoV on 31 December 2019 in Wuhan city of Hubei province in China, it has spread over 213 countries and territories so far and been officially declared as a global pandemic by the World Health Organization (WHO, 2020a). As of 1 August 2020, there had been more than 17 million COVID-19 cases and 675060 deaths worldwide (WHO, 2020b). Pandemics are cyclical events (20-to 40-year cycle) in nature and different pandemics (Spanish flu, Asian flu, HIV/AIDS, H1N1, Ebola) have swept away human lives and livelihoods from the prehistoric time. As evident from the daily situation report of WHO, in some countries the spread of pandemic is slowing down while in other countries it is either spreading quickly or resurging. Since the people who are already undernourished and weak are highly vulnerable to COVID-19 disease, it may cause 'crisis within a crisis' when the health crisis will be coupled with a hunger crisis (FAO, 2020a). COVID-19 pandemic may bring

massive socio-economic disruption globally and its impact on agriculture including crop, livestock and fisheries will be tremendous. Lockdown strategy and quarantine to prevent community transmission of virus have negatively impacted food production, supply, demand and food security as the consequence of supply chain and trade (domestic and cross-border) disruption. Since wet market products are sensitive to virus contamination, aquaculture and livestock sectors are highly vulnerable to this situation and there are chances that the fish, meat and dairy enterprises will suffer the most.

Among the few bright spots of pandemics is that it has marked who really work in the agri-food system, and the others who reap its benefit the most. It is essential to let the farmers realize that they are the cornerstones of the agri-food sector, and therefore they must be risk resilient and they should reinvent themselves. The protective measures taken by the government and non-government sectors could aggravate the impact further. Analyzing different dimensions of

the relationships between food production and food security and how these relationships are affected by factors related to a pandemic is very important. No doubt, this pandemic has already delivered a huge global shock. Therefore, proper assessment of the impact of COVID-19 on food production, supply chain and food security are the prerequisites to address the issue. I have identified the following dimensions of COVID-19 pandemic impact on agri-food sector:

**Labor availability** As the consequence of rapid urbanization and industrialization, labor availability in the agriculture sector is an emerging concern, and COVID-19 pandemic has worsened the situation. As a part of quarantine measures restriction on local movement of labors have caused bottlenecks in food production and supply chain as well. Lack of visas and trans-boundary travel restrictions have negatively impacted the agriculture sector of those countries mostly dependent on foreign labors who are in many cases migratory transients. This may have negatively impacted the labor-intensive sectors like horticulture and livestock production. Timely planting, harvesting and post-harvest operations of major field crops (where done manually) may also be vulnerable to labor crisis resulting in disastrous consequences in the food sector. Moreover, agri-food worker shortage might also interfere with the food supply chain. The working environment of food processing and packaging plants/factories is of huge concern from the view point of virus transmission among the workers. To resolve the labor shortage issue, it is very important to ensure safe working conditions (providing masks, hand gloves, personal protective equipment (PPE)) and accommodation (maintaining physical distancing) and formulate safety protocols so that the workers feel safe. Small farms, dependent on domestic/family labors, are found more resilient than large farms which depend mostly on hired labors. Steps also should be taken to extend residency permits of migrant labors and create alternative employment opportunities to support remittance flow of a country/region. Otherwise, food security may not be attained in the foreseeable future in many regions.

**Food production** Disrupted input supply chain and unavailability of labor have hindered the food production system to some extent in many regions. Due to disruption of agricultural value chains, farmers of many countries are experiencing difficulties with getting agricultural inputs like seeds, fertilizers, pesticides, feed, veterinary supplies, spare of agricultural machineries and so on. In many countries (like Bangladesh), the poultry and fish industries may experience feed shortages due to cross-border trade restrictions, as the major feed ingredients are imported. In many Asian countries, winter rice harvesting has been interrupted due to labor shortage, and planting

of monsoon rice is also going to experience the same crisis. The countries which have not yet adopted mechanization in the agriculture sector will suffer a lot due to the labor crisis. There would be a drop in agricultural production in the succeeding seasons if pandemic lasts for a few months due to logistical bottlenecks. It is essential to avoid any distortion in the agricultural supply chain to ensure expected food production in the upcoming season.

**Food demand and supply** Although food demand is generally inelastic, there are chances of reduced food demand due to pandemic and in some cases it is already visible. Food demand is directly linked to the income of the consumers. In a pandemic situation, higher uncertainty, increased precautionary behavior and unemployment/reduced income make people spend less resulting in shrinking demand. Consumer demand has sharply declined due to Stay-at-home order, closure or limited operations of restaurants, hotels, cafes, supermarkets and trade restrictions on business selling of essential goods. Changes in food purchasing ability and food habit, fear of infection from outside food also contributed to reduced food demand. Demand for high value products like organic food has declined due to income losses of many consumers. An early rumor that COVID-19 virus spreads through fresh animal products may have contributed to reduced demand for dairy and poultry products, and fish at the beginning of the pandemic. Changes in delivery channel, shopping frequency, availability, purchasing capability and consumption habit have reduced demand for perishable foods. On the contrary, demand for carbohydrates (rice, wheat flour), legumes (pulses), vegetables like potato and dried fish may have increased. As per FAO prediction (FAO, 2020b), food demand may further decrease due to income reduction and job losses if pandemic lasts for a longer period.

Food supply chain is a complex network that connects the farm (production unit) with the fork (consumer's table) through processing, packaging, transportation/shipping, storage and marketing/distribution. Despite social isolation, labor mobility restriction and transportation ban, food production and supply chains are not too interrupted to threaten food security in most of the regions. Global cereal stock balance is positive so far, and shortage is not yet noticeable. But in few countries, on the other hand, food distribution channels are badly disrupted resulting in huge wastage of milk, fish, fresh vegetables and fruits at the farm level and at the same time price hike of those products at consumer level. Although shortage of food and some other necessary commodities has been noticed in some regions mostly due to international trade ban and /or strict security protocol in the early days of the pandemic, it was temporary. In case of a long lasting pandemic situation,

if producers/entrepreneurs fail to transport their produce from farm to local markets/supermarkets it will negatively impact the food availability at consumers' table. International trade ban may lead to extreme volatility on global food supply chain. For example, Kazakhstan and Vietnam have imposed temporary export ban/limits on wheat and rice, respectively to ensure sufficient domestic supplies to cope with the pandemic crisis.

**Food accessibility** Despite no significant food shortage supply chain disruption has modified the usual food scape resulting in reduced physical and economic accessibility of food and other necessary commodities. Although there is demand in urban areas, availability of wet products like fish, milk, egg, meat, and vegetables and fruits has sharply decreased due to lack of transportation facilities from the point of origin to the city resulting in price hike. Moreover, fruit and vegetables appear less appealing due to lack of freshness resulting in less sell. Panic buying and stockpiling of staples during pandemics lead to artificial crises in many cases. Food accessibility must be ensured either by delivery of food rations or by economic allocation equivalent to the cost of food.

**Alternate forms of shopping** Since the outbreak of COVID-19 market trips have fallen because popular outdoor restaurants, tea shops, street food shops, local and supermarkets are either closed or operating for limited hours. People require to wear a mask and gloves, maintain physical distance and pay closer attention to the surroundings while going to market, therefore they are not visiting the market frequently. Due to quarantine and social distancing policies, some alternate forms of shopping for food, beverage and other essential commodities have been popular. Ordering by telephone or online shopping with doorstep delivery or buying from mobile van/vendors (especially vegetables, fruits, fish, milk, egg and live chicken) are preferred by many consumers. As the virus spreads on contact, contactless delivery services are being preferred by consumers.

For example, Unmanned Aerial/Ground Vehicle (UAV/UGV) for non-contact food delivery are also found in some urban areas.

**Changes in food habit** Dietary patterns of human beings may alter due to varying reasons. Fear of contagion and less opportunity (restriction movement) to visit markets frequently have impacted food choice and consumption and increased eating at home. Changes in food availability, nature of shopping, food price and purchasing power might also resulted in alternate food habits. People now prefer carbohydrates (rice, flour, potato), pulses and preserved foods (dried fish, milk powder, canned fish/meat) to

fresh vegetables, fruits and animal sourced foods like milk, egg, meat etc. Low income people are consuming less while others have reduced the diversity of their consumed foods. In many urban areas, fishes have been replaced by chicken and eggs because of the presence of poultry farms in peri-urban or even urban areas.

**Food price** Food production and supply chain disruption due to domestic and global trade restrictions might have impact on food prices. Complexity of the food value chain could make the food price highly volatile. In many regions/countries, food prices have remained stable due to adoption of effective strategic plan and necessary measures by the government. While in many cases, spike in the prices of food and other necessary commodities is noticed due to failure of taking necessary steps by the authority and malpractices by the dishonest traders. High fluctuations in price of perishables like vegetables and animal products have been noted due to supply-demand dynamics with time. In urban areas, fresh food price is much higher than the pre-COVID one, and in many cases beyond the purchasing capacity of middle-class people. In rural areas, on the other hand, locally produced vegetables, fruits, fish, milk are so cheap due to supply chain disruption. Compared to imported food items, locally produced foods are more affordable. Unfortunately, the increased food price will not be reflected in farmers' earnings; both the producer and consumer will lose. Panic buying and stockpiling of staples during pandemics are also contributing to price hike of food items and other essential commodities. Taking this advantage, unscrupulous traders are creating artificial crises, selling staples at higher prices and thus, cashing in on these pandemic days. But the impact of COVID-19 on food prices is not of concern till now if market monitoring is done properly. As reported by [FAO \(2020c\)](#), the FAO Food Price Index (FFPI) in June 2020 averaged 93.2 points which was 2.2 points or 2.4% higher than in May 2020 and that was the first increase (month-on-month) after the COVID-19 outbreak. Prices of dairy, sugar and vegetable oils rebounded in June after sharp decline in May, while cereals and meat prices are still under download pressure.

**Food and nutritional security** Food security, unrestricted access of food to everyone for healthy life, is of immediate concern during the pandemic days and also in coming days. Pandemics affect both the key elements (economic access and physical access to food) of the food security. It always had a substantial implication on domestic and global food security. Despite less impact of pandemic on food production so far, food and nutritional security of the people across the income spectrum have been disrupted throughout the globe with a strong negative consequence on

the most vulnerable populations. Low income people are struggling to get adequate food and proper nutrition during this pandemic. If pandemic lasts for a longer period, even people having money to spend for food may also suffer from malnutrition due to over-dependence on carbohydrate rich diet and not taking enough vegetables, fruits, fish, milk and meat due to unavailability in urban areas. If COVID-19 cases proliferate at the current pace, millions of people will have to cope with catastrophe levels of food insecurity followed by a public health disaster due to capacity constraints in the health and social protection system. As the consequence of COVID-19-triggered recession, more people are likely to join with the 820 million people currently experiencing hunger (chronic undernourishment) which could lead to a setback to global Zero Hunger effort. Exploring more domestic food sovereignty by many countries has endangered global food security. The United Nations World Food Program has estimated that 265 million people could experience acute food insecurity by the end of 2020 due to reduced income and remittance losses as the consequence of pandemic (WB, 2020a). Cost of a healthy diet will increase in the countries with high food-import dependence resulting in a high undernourishment rate. To ensure food and nutritional security, immediate measures should be taken to keep global food supply chain active and to maintain social food programs with necessary safety measures (to avoid virus transmission) for the vulnerable peoples. Keeping supply chains functioning is very crucial because famine took place mostly due to food supply disruptions not for food shortage in the past. Otherwise, the consequences could lead to a spike in hunger and malnutrition in the long run.

**Fisheries and livestock** The pandemic impact on labor intensive fisheries and livestock sectors is highly variable and more complex compared to the crop sector. Limited operations of fishing vessels due to sanitary concerns can create a domino effect on the value chain of wild-capture fisheries. Culture-fisheries are being affected due to labor and feed shortage. Logistic problems related to transportation restrictions, international trade ban and reduced domestic and commercial (hotels, restaurants, street food outlets) demand have markedly changed the market and price of both wild-capture fisheries and aquaculture. Farmers get very limited time to sell their products due to perishable nature. The negative impact of pandemic on livestock is greater due to labor shortage and less accessibility to animal feed and slaughter houses on one hand, and on the other hand, marketing uncertainty due to the perishable nature of the products and transport restriction from farm to consumers' tables result in increased level of wastage. Closure of tea stalls, confectionary and sweet shops

due to lockdown has already depressed milk sales. This could be minimized through providing storage and processing facilities. Disproportionately larger decline in animal protein (fresh fish and meat) demand in the early days of pandemic might be due to the public perception (although not science based) that viruses spread through animal products (as happened in China). This also might cause price slumps of animal products in many countries as a result dairy and poultry sectors have been badly hit.

**Socio-economic** Not only lives but also livelihoods are at risk from the COVID-19 pandemic. The long term socio-economic impact of COVID-19 pandemic is yet to unfold, but it will definitely be more than anticipated. The poorest, hungriest and marginalized people who live in rural areas are most affected by the COVID-19 pandemic. In the agriculture sector, marginal farmers are highly vulnerable to COVID-19 impacts. Farmers' income will decline obviously. Especially the farmers involved with producing export food items are in huge economic loss. For instance, due to the export ban in Chinese markets Bangladeshi crab industry has been facing significant economic losses. Informal and migrant labors will be hard hit due to lack of job opportunity and reduced income as the consequence of movement restriction and strict protective measures. Many people have lost their jobs while others are earning less than before pandemic time. Poor will be poorer but rich people will somehow manage the crisis. Increasing number of beggars are noticed in many countries. The people highly vulnerable to COVID-19 pandemic may be grouped as (i) people (>800 million across the globe) experiencing chronic hunger due to not consuming enough calorie and nutrition to live a healthy life, (ii) marginal farming community prevented from working on their farms, collecting inputs and accessing markets to sell their products, and (iii) children, women and elderly of low-income families regularly feed through community food programs (Siche, 2020). COVID-19 pandemic will not only impact economic development but also social life. There are good reasons to be pessimistic about the gloomy outlook of the pandemic consequences on socio-economic aspects.

**Global economy** The pandemic is expected to plunge most countries into economic recession, and many emerging and developing economies are already experiencing slow growth. China (where the COVID-19 pandemic started) represents a significant role in world trade. China alone contributes more than 15% of the global economy and hence, any shock to Chinese economy might result in a deflationary shock for the global economy. Forecast is that prolonged and intensive pandemic could even halve the current global economic growth of 2.9% (OECD, 2020). As per World Bank forecast, there will be a

5.2% contraction in global GDP in 2020 due to pandemic. The economic damage which is already evident may result in the largest economic shock the world has ever experienced (WB, 2020b). Devaluation of the exchange rate with respect to the US dollar may significantly affect the economy of import dependent countries. While import-dependent countries are facing food shortage, the countries dependent on food and basic commodity exports are experiencing economic catastrophe due to less demand from importing countries. Countries dependent on foreign remittances (like Bangladesh) will be in great trouble due to the ban/limit on cross-border worker movement and less job opportunity.

## Conclusion and Recommendations

Like other pandemics in the past, COVID-19 is also revealing about our agriculture that there is sufficient global food stock so far but the challenge is to make food available to everyone due to logistic bottlenecks and high prices. If logistic bottlenecks are not removed and the food supply chain is not restored, with or without a second wave, the consequences will be severe and long-lasting. When economy slowdowns, pro-active measures are paramount and cost effective as well to mitigate the risk of food production and food security. Therefore, following recommendations can be made:

- With all precautionary measures, agricultural input supply chain must be kept alive to ensure sufficient food production.
- Movement of agricultural workers must be allowed, their access to personal protective equipment (masks, gloves) should be increased and safety of the working place must be ensured.
- International cooperation and trade must be continued to avoid regional food crises as globally there is enough food.
- Domestic food supply chain should be kept functioning at any cost.
- Social protection programs like food and nutritional support, digital cash transfer should be scaled up and school meals must be adjusted (when schools are shut) for the most vulnerable undernourished group
- Fund injection in all agricultural sectors from government and private sectors and formal financial institutions must be ensured so that marginal farmers can survive and small or medium entrepreneurs can revive their agribusiness activities.
- Imposing any measure that would restrict local trade and mobility of agricultural commodities

should be avoided to ensure food supply to the consumers and reduce food waste.

- Different trade and financial policy options including export ban, import restrictions, import tariff, value added and other taxes, subsidy, stocking restrictions, loan interest, debt payment installments should be reviewed immediately.
- Alternate marketing approaches like home delivery of groceries and wet market products, E-commerce should be promoted.
- Use of digital tools (like 'big data concept' to have a complete database of farms, producers, inputs, products, price, markets etc.) to be introduced for assessment and anticipating problems related to supply, demand, crisis, distribution and delivery of agricultural inputs and products.
- Coordinated cutting edge efforts should be made (involving experts from universities, research institutes, private industries, farming community and other stakeholders) to track unpredicted risks and recognize weaknesses towards developing a more resilient and sustainable agri-food sector to ensure enough quality food for everyone even in a crisis like COVID-19 pandemic in future.
- Agricultural universities, research institutes and agriculture extension department should be equipped with modern facilities/instruments and trained faculties/researchers/staffs so that those can effectively fight against hunger and malnutrition.
- Farmers as the cornerstone of agriculture must be given due priority to access all the agricultural inputs, technological resources, financial assistance, marketing channels and agriculture network.

## References

- FAO. 2020a. COVID-19: Our hungriest, most vulnerable communities face "a crisis within a crisis". Food and Agriculture Organization, Rome, Italy. Available in <http://www.fao.org/news/story/en/item/1269721/icode/> Accessed on 02 August 2020.
- FAO. 2020b. Director-General urges G20 to ensure that food value chains are not disrupted during COVID-19 pandemic. Food and Agriculture Organization, Rome, Italy. Available in <http://www.fao.org/news/story/en/item/1268254/icode/> Accessed on 02 August 2020.

- FAO. 2020c. World Food Situation. Food Price Index. Food and Agriculture Organization, Rome, Italy. Available in <http://www.fao.org/worldfoodsituation/foodpricesindex/en/> Accessed on 02 August 2020.
- OECD. 2020. Coronavirus: the world Economy at risk. The OECD Interim Economic Assessment march 2020. The Organization of Economic Cooperation and Development, Paris, France. Available in <https://www.oecd.org/berlin/publikationen/Interim-Economic-Assessment-2-March-2020.pdf> Accessed on 02 March 2020.
- Siche R. 2020. What is the impact of COVID-19 disease on agriculture? *Scientia Agropecuaria* 11:3–6. doi: [10.17268/sci.agropecu.2020.01.00](https://doi.org/10.17268/sci.agropecu.2020.01.00).
- WB. 2020a. Food Security and COVID-19 (Brief). World Bank, Washington, D.C., USA. Available in <https://www.worldbank.org/en/topic/agriculture/brief/food-security-and-covid-19> Accessed on 08 July 2020.
- WB. 2020b. The Global Economic Outlook during the COVID-19 pandemic: A Changed World (Feature Story). World Bank, Washington, D.C., USA. Available in <https://www.worldbank.org/en/news/feature/2020/06/08/the-global-economic-outlook-during-the-covid-19-pandemic-a-changed-world> Accessed on 08 June 2020.
- WHO. 2020a. Director-General's opening remarks at the media briefing on COVID19 -March 2020. World Health Organization, Geneva, Switzerland.
- WHO. 2020b. Coronavirus disease (COVID-19). Situation report-194. 1 August 2020. 16p. World Health Organization, Geneva, Switzerland. Available in <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/> Accessed on 01 August 2020.



© 2020 by the author(s). This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License



The Official Journal of the  
**Farm to Fork Foundation**  
ISSN: 2518–2021 (print)  
ISSN: 2415–4474 (electronic)  
<http://www.f2ffoundation.org/faa>