

Article

# The Impact of COVID-19 Disease on Agriculture

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## I N F O

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## A B S T R A C T

The different pandemics that humanity has experienced, like the Spanish Flu, Asian Flu, Hong Kong Flu, HIV/AIDS, SARS, Ebola, and swine influenza, have had an excellent impact on the economy, the environment, and any act, like livestock, agriculture, tourism, transport, education, health, fishing, mining, industrial, commerce, etc. Currently, humanity is facing another pandemic, the infection of the new coronavirus (2019-nCoV) that generates the disease known as COVID-19. The objective of this document is to analyze and discuss the effects in agriculture of events related to the disease of COVID-19. For this analysis, data from the Food Agriculture Organization (FAO), the planet Health Organization (WHO) and scientific and technical documents are used. There is sufficient evidence to affirm that the pandemic caused by the COVID-19 disease has a crucial effect on agriculture and therefore the food supply chain, mainly affecting food demand and consequently food security, with a great impact on the most vulnerable population.

**Keywords:** Impact, Food Demand, Food Security

## Introduction

In Wuhan, China, on New Year's Eve, 2019 the primary cases of infection of a replacement coronavirus (2019-nCoV) are reported (WHO, 2020a), which generates the disease that is now referred to as COVID-19 different from SARS-CoV and MERS-CoV. Since that time, the report of confirmed cases of infection with this new virus has had an alarming growth (Figure 1), now being the main global health problem, which is affecting the traditional development of society and everyone its components.

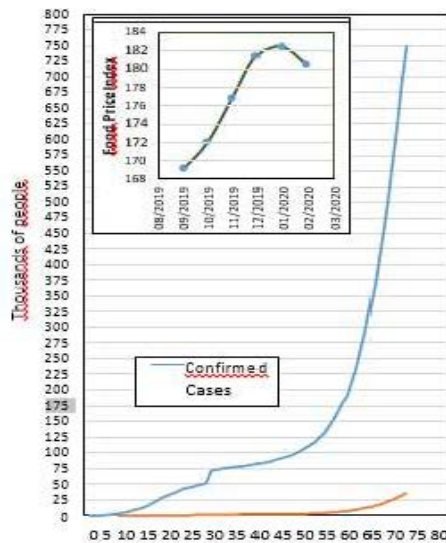
There is always a risk of developing a new infectious disease (Burnet and White, 1972), from the Spanish flu of 1918 to AIDS that still has no definitive cure (Table 1).

From past pandemics that the planet has experienced, it has been shown that quarantine times and panic have an impression on human activities and economic growth (Hanashima and to mobe, 2012; Bermejo, 2004; Arndt and Lewis, 2001); but the effect also occurs in agricultural

Table 1. Virus with Death Rate

Name	Time period	Type	Death toll	Reference
Spanish Flu	1918-1919	H1N1	More than 50M	Farmer (2019)
Asian Flu	1957-1958	H2N2 virus	1.15M	Du et al. (2009)
Hong Kong	1968-1970	H3N2 virus	700,000 and 1M	Wang-Shick (2017)
HIV/AIDS	1981-present	Virus	32M (estimate, March 2020)	WHO (2020b)
COVID-19	2019-Present	Coron virus	36,405 (31 March 2020)	WHO (2020c)

activities. When there is an outbreak of an infectious disease, there is also an increase in hunger and malnutritations. The situation worsens as the disease progresses, making movement restrictions more and more stringent, causing labor shortages for the harvest, or difficulties for farmers to bring their products to market. Agriculture is one important sector in human development and is related to food security (Abdelhedi and Zouari, 2020; Kogo et al., 2020; Lopez-Ridaura et al., 2019); hence, the Main pandemics from the 20th century objective of this research is to analyze the relationships between agricultures and food security and how these relationships are being affected by events related to the diseases of COVID-(Table 1).



**Figure 1. Days after the first COVID-19 report**

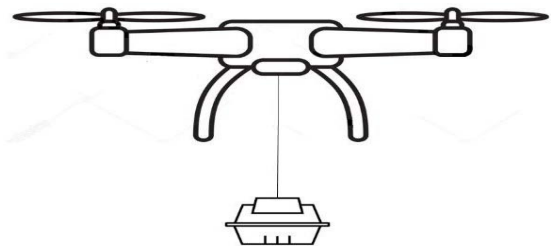
Confirmed cases, deaths, and Food Price Index effect of COVID-19. Graph in Figure 1. constructed with data from WHO (2020c), for cases and deaths (updated to March 31, 2020, day 71), and FAO (2020c) for Food Price Index.

### Impact of COVID-19 on Agriculture

The Food and Agriculture Organization (FAO, 2020a) states that COVID-2019 affects agriculture in two significant aspects: the availability and demand for food. These two aspects are causally related to food security, so the food security is also at risks. With Figure 3, you can understand the relationships between these elements, as well as the impact of COVID-19.

A The food inventory network is an organization that associates an agrarian framework (the ranch) with the purchaser's table, including cycles like assembling, bundling, conveyance and capacity (Chen et al., 2020). At first, the declarations of social seclusion caused individuals to go to the accessibility habitats and create a deficiency of certain items, notwithstanding this, the food supply has balanced out, on the grounds that it is one of the frameworks that should be kept up to guarantee food

security. One of FAO's jobs is to advance that food esteem chains are not hindered and keep on working (FAO, 2020b). Subsequently, regardless of the limitations that legislatures have forced on the versatility of work in horticultural frameworks, even though for certain issues, the accessibility of fundamental necessities is for the most part guaranteed. The circumstance is distinctive when it includes products that are imported or sent out; on account of the conclusion of lines, global exchange was intruded, albeit after having characterized security conventions to stay away from the spread of the infection, exchange settled. This might be transitory; it relies upon how nations deal with forestall the spread of the infection.

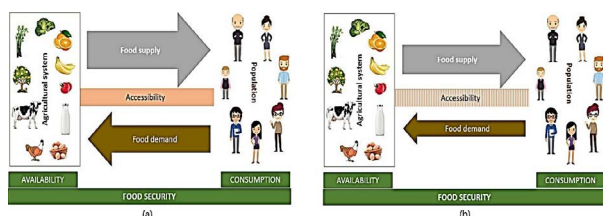


**Figure 2. Drone-based system for non-contact food delivery**

Figure 2. Part of the food supply system are the social programs that some countries, mainly Latin America, need to feed many families and youngsters with limited economic resources. This supply system is being served in different ways: a. Delivery of food rations of necessities (for example, Indonesia and Taiwan). b. Economic allocation equivalent to the cost of food rations of necessity (for example, Peru, Japan and Singapore). Interruptions to food transfer are minimal therefore the food supply remains stable; although observing China's experience during this pandemic, there is a greater impact on the livestock sector due to difficulties in accessing animal feed and on the opposite hand, the shortage of labor (Zhang, 2020). Prices have remained stable, therefore, no spikes within the prices of necessities are expected, although it is more likely to occur for high-value products, especially meat and perishables. One of the indices that measures the variation of the price worldwide is the FAO Food Price Index (FFPI), a measure of the monthly variation of the international prices of a basket of food products. According to the FAO (2020c), the FFPI of February 2020 had a mean of 180.5 points, that is, 1.9 points (1.0%) but in January, constituting the primary month-on-month decrease after four months consecutive increases (Figure 1).

Both market interest is influenced, albeit a more prominent impact on request, on account of the pass capacity limitations that influence availability. Accessibility and utilization remain practically steady. The horticultural framework incorporates makers, crude materials, agrarian apparatus and data sources, handling plant, and ranch and

industrialized food. Utilization incorporates, individuals and the diverse promoting frameworks. This was because of a sharp fall inside the fare costs of vegetable oils and, less significantly inside the costs of meat and grain, which counterbalance the proceeding with ascends in the costs of dairy items and sugar Figure 3.



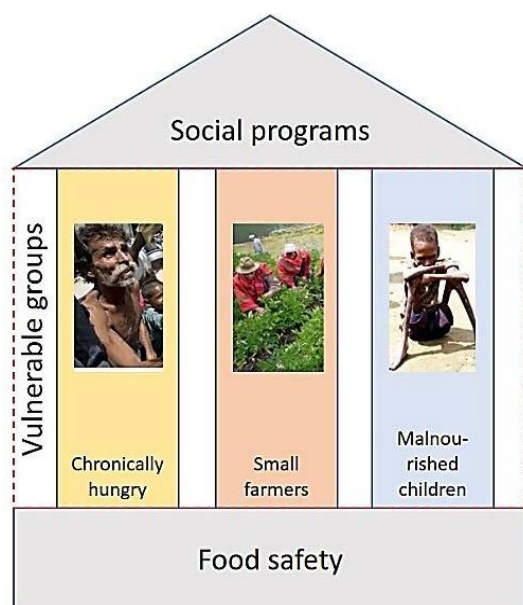
**Figure 3. Food security systems**  
**(a) without COVID-19 and (b) with COVID-19**

## Food Demand

Demand implies the willingness and skill of consumers to pay money for a specific good or service, during any period of your time (Gottheil, 2013).

The demand for food has decreased thanks to uncertainty and therefore the reduction of people's spending capacity, although this decrease remains slight; things could worsen if the pandemic continues for an extended time, thanks to reduced income and job losses (FAO, 2020b).

Since China represents a crucial market in world trade and where the COVID-19 disease started, his experience shows a rise in online demand within the food and beverage sector, thanks to quarantine policies (FAO, 2020a). In situations like these, where an epidemic spread on contact, contactless delivery services become preferred by consumers. for instance, those that use drones for product delivery (Figure 3).



**Figure 4. Groups vulnerable to a food crisis**

## Food Security

Not taking quick action implies an imminent food crisis, with a greater effect on the foremost vulnerable population (Figure 4). Measures should specialize in keeping global food supply chains active and mitigating the impacts of the pandemic across the food framework. Social projects go about as an umbrella that limits the impact of transient emergencies. The primary weak gathering are individuals who experience persistent yearning and do not burn-through enough caloric energy to carry on with a typical life, which presently number around 820 million individuals (FAO, 2020a). This gathering of people cannot bear the cost of any conceivable interference of their occupations or admittance to food that a circumstance with COVID-19 could bring. If the infection spreads in nations where such individuals reside, with wellbeing frameworks with restricted limit, the outcomes may be not kidding. A second weak gathering are little ranchers, who might be kept from dealing with their property and getting to business sectors to sell their items or purchase seeds and other fundamental information sources.

The third weak gathering are youngsters from low-pay families, who are predominantly fed by food given by friendly projects; the suspension of these projects because of the pandemic puts food security and sustenance in danger, and as an outcome the presence of kids with restricted limit to cope with diseases (FAO, 2020d). Thus, each country must direct its actions to maintain social food programs, taking the necessary precautions to avoid transmission of the virus.

## Conclusion

The pandemic called COVID-19 disease features a great impact on the actions and activities of humanity, agriculture is not outside this impact. Food demand and thus food security are greatly affected due to mobility restrictions, reduced purchasing power, and with a greater impact on the most vulnerable population groups. As cases of contagion increase, governments take more drastic measures to prevent the spread of the virus, also influencing the worldwide food system. The premise of any measure adopted should be to protect the health and food security of the population, to the detriment of economic growth, although some governments go in the opposite direction.

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