

Research

COVID-19 and its Global Impact on Food and Agriculture

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ABSTRACT

Disease outbreak and global pandemics have been the greatest threat for the sustainability of human existence. Mankind has witnessed many pandemics over the course of human history that killed millions of people and ravaged the global economy and politics. In the current context, the world is facing yet another pandemic as Corona virus disease of 2019 (COVID-19). Realizing the gravity of situation, every country has undertaken special steps to fight against the pandemic mostly with non-pharmaceutical measures involving social distancing and self-isolation. In addition, restriction in travel and trade are done in majority of countries to limit the spread of the virus. All these combat against the pandemic has vastly affected the major economic sectors such as Agriculture. Agriculture serves as the most important economic sector endorsing food security and human development. The review intends to go through every possible impact of global pandemic COVID-19 on Food and Agriculture across the globe. It is important to assess the effect of COVID-19 pandemic on Agricultural sector and Food as it primarily involves the sustainability of human life and secondarily involves the economy. The pandemic protocols and provisions interferes the supply chain of the market with impaired production and distribution accompanied with lack of labor and supply of inputs. This vastly affects the livestock, poultry, fishery as well as dairy production. The planting of spring crops like maize, sunflower, spring wheat, barley, canola and open field vegetable can't be operated amidst pandemic. Thus, the pandemic has seeded a serious impact on the food security due to distortion of the supply chain which is needed to be addressed quickly by the government.

Keywords: COVID-19, Pandemic, Impact, Food security, Agriculture

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INTRODUCTION

Global pandemic is not a new scenario for mankind as there are number of episodes of various pandemic (**Table 1**). Every pandemic have affected the human activities and economic growth of the world [1]. Currently we are facing COVID-19 (corona virus disease of 2019). COVID-19 is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [2]. The first confirmed case of COVID-19 was detected in Wuhan (capital of China's Hubei province) epicenter of corona virus outbreak. Due to novelty of virus strain, the disease is spreading between

people at alarming rate. WHO has declared COVID-19 outbreak as global pandemic on March 11, 2020 [3]. The virus has affected the lives of many people (**Figure 1**). It is estimated that COVID-19 will affect the global economy more than SARS. The Organisation for Economic Co-operation and Development (OCED) has forecasted decrease in economic growth from 2.9% to 2.4% in 2020 and has warned that, economic growth may also reach nearly 1.5% if the pandemic is prolonged [4]. ILO has stated that, "COVID-19 crises: the most severe crisis since the Second World War" [5].

Table 1: Major Pandemics from the 20th century.

Pandemic	Time period (A.D.)	Causative Agent	Death Troll	Reference
Spanish Flu	1918-1919	H1N1 strain of influenza A virus	About 50 million	[6]
Asian Flu	1957-1958	H2N2 strain of influenza A virus	1.1 million	[7]

Hong Kung Flu	1968-1970	H3N2 strain of influenza A virus	1 million	[8]
HIV/AIDS	1981-Present	Human immunodeficiency virus	About 32 million (end 2018)	[9]
COVID-19	2019-Present	SARS-CoV-2	162,956 (21 April 2020)	[10]

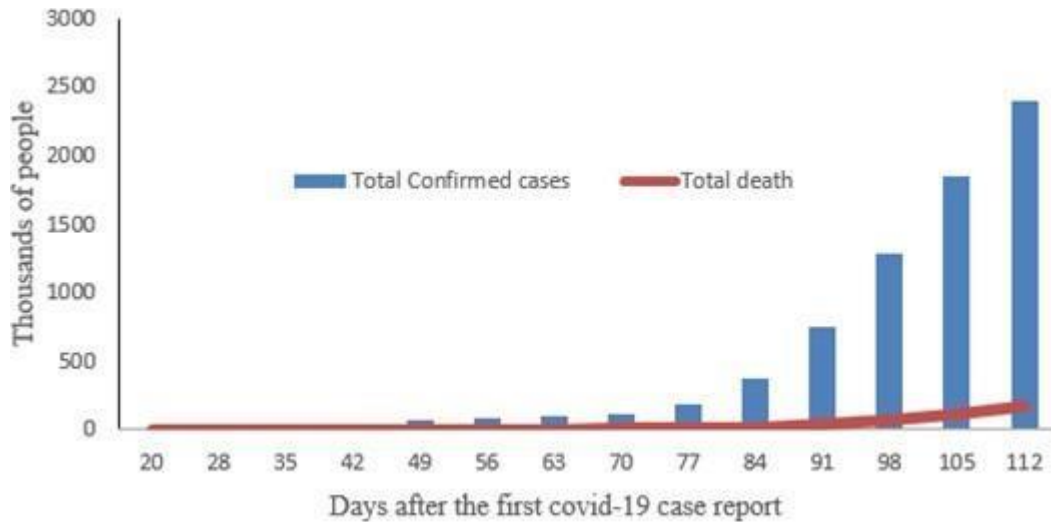


Figure 1: Globally confirmed cases and deaths due to COVID-19. Source: [14].

Agriculture is one of the important sectors for world economy and it is the biggest industry in USA. Agriculture is indispensable to food security and human development [11]. FAO has estimated that more than 60% of the world population relies on agriculture for survival [12]. According to ILO, out of total employer population in 2019, 26.85% of employers are in agricultural sector [13]. In the scenario of ongoing global COVID-19 pandemic, it is important and of immense necessity to investigate the impact of COVID-19 on food and agriculture. Therefore, this paper was prepared to know all the possible impact of COVID-19 on food and agriculture in global context.

IMPACT OF COVID-19 ON FOOD AND AGRICULTURE

COVID-19 has affected all the processes which connect farm production to final consumer. Moreover, it seems to strike the food production system and food value chain. The negative impact of pandemic on supply and demand for food might lead food security at risk [15].

Impact on food production and distribution

Most of the countries have taken measures such as home confinement, travel bans and business closure to control the rate of infection. Such travel restriction had affected every stages of food supply chain with major impact on food distribution (Figure 2). World Merchandise trade is believed

to decline by 13% to 22% due to COVID-19 [16]. Different agricultural sector such as crop, livestock and fishery have been hit hard by pandemic. In china, COVID-19 has caused higher impact on livestock farming due to limited access to animal feed and shortage of labour [17]. Travel ban in many countries has affected delivery of breeding stock of poultry. The International Poultry Council (IPC) has warned that there will be no breeding stock and hatching eggs if such travel restriction prolonged [18]. Fish is an important source of protein and energy and accounts for more than 20% of animal protein for 3 million people [19]. Fishing activities have been reduced in different part of Africa, Asia and Europe due to sanitary measures (physical distancing), limited supply of inputs and labour shortage [20]. Fish farmers are unable to sell their harvest as well as there is difficulty in aquaculture production due to lack of seed and feed. Agriculture produce are mostly perishable in nature, so farmer are compelled to store their unsold produce for longer period of time which leads to reduction in food quality as well as increase in cost of production [20]. The supply of milk and dairy product has been hit hardest by COVID-19. Dairy farmers are compelled to dump milk and milk product after remarkable decrease in supply of milk and closure of milk processing company. Dairy farmers in America estimate that farmers nationwide are dumping nearly four million gallons of milk each day [21]. In Nepal, dairy product of worth NPR 2 billion have been damaged and dairy product in stock of worth NPR 5 billion seems on the verge of deterioration [22].

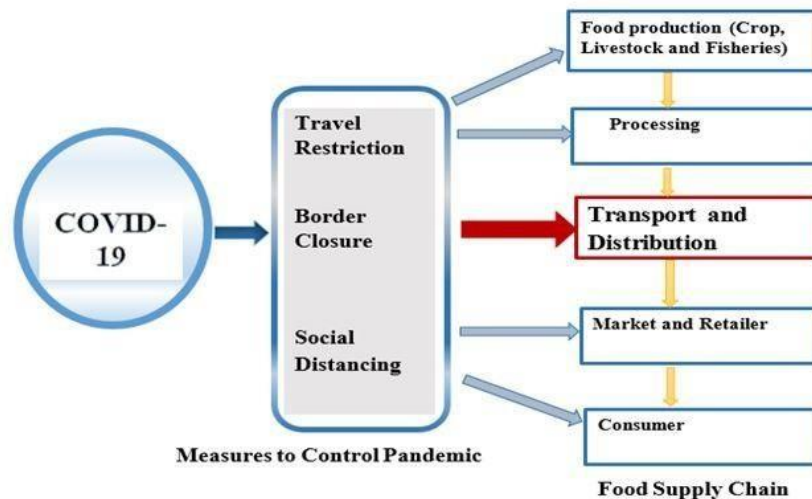


Figure 2: The figure shows COVID-19 affecting every stage of food supply chain with major impact on food transport and distribution.

Due to global trade disturbance, farmers are facing the shortage of agricultural inputs like seed, fertilizer and pesticides. China is one of the major fertilizer producing producer and exporter in the world. The lockdown in China have severely affected the international fertilizer trade [23]. Pandemic have affected the planting of spring crops like maize, sunflower, spring wheat, barley, canola and open field vegetable. According to Singh, India alone need 250 lakh quintals of seed for crop production in kharif season [24]. Therefore, sowing of zaid and kharif season crop might be affected if the pandemic prolonged. Thus import dependent countries seem to be highly affected by pandemic [25]. Regarding the high rate of transmission of COVID-19, workers health and labour shortage have been major issue in agricultural industry. Workers in low and middle income countries lack proper health services and social protection and due to little saving or no saving, many informal workers in agriculture are obligate to work despite the self-isolation protocol during COVID-19 pandemic. Hence, these workers are at high risk of corona virus [5]. Most of the farm producers are facing the manpower shortage. Travel ban have made the shortage of seasonal and informal farm workers [26]. There is rapid increase in employment losses around the world. International Labour Organization (ILO) estimated that COVID-19 has affected the 81% (2.7 billion workers) global work force due to full or partial closure of the work place [27]. To overcome these entire scenarios, many governmental and non-governmental organizations are playing their role to maintain continuous food supply chain. Currently Food and Agriculture Organization (FAO) is working with a main aim to maintain food value chain and keep food supply going [28].

Impact on food demand and food security

Demand refers to consumer’s desire and capacity to purchase goods and services in a given period of time. The demand of food has affected due to reduction in income and purchasing capacity. Panicked Consumers are stock piling the foods which in turn has affected the food availability and price. The price of the commodities however depends on the country and their policy to control pandemic. According to Siche, the

prices of the basic necessities are expected to be stable, while spike in price may occur for high-valued products [15]. In the present scenarios, the consumption of animal protein has been decreased significantly due to misleading perception of animal as a reservoir of virus.

Food security simply refers to availability and accessibility of sufficient amount of nutritious food in consistent manner. Due to decline in international trade, disturbance in food supply chain and food production, food insecurity may arise. FAO had mentioned that, small farmer and fisher may face difficulty in selling their product which in turn cause decrease in their income and purchasing capacity. Food insecurity raised due to COVID-19 will highly affect the poorest and the most vulnerable segments of the population [19]. At present, 820 million people are facing chronic hunger and 113 million are facing acute severe insecurity [29]. Thus, disturbance in food access brought by pandemic affects these groups immediately and severely. Around 10 million children depend upon the school meals to fulfill their nutritional requirement. But due to closing of schools and suspension of school meal programs, these children are no longer receiving daily school meals which may reduce their capacity to cope with diseases [30].

CONCLUSION

Thus, we concluded that food and agriculture are not outside the impact of COVID-19. Crop, Livestock and Fisheries have been affected by this pandemic. Food safety and security are the global concern at present scenario. The supply chain has been hit hardest by COVID-19, which causes food security of most vulnerable segment of population at risk. And also, most of the migrant, informal, seasonal farm workers are losing their jobs which may affect the demand for food. Therefore, the government should enforce the measures to control the pandemic without disturbing the food supply chain and considering the food security of their citizen.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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