IMPLICATIONS OF COVID 19 ON THE FOOD SYSTEMS AND FOOD AID.

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Abstract

The World was facing some challenges in the food systems before the advent of COVID 19. Some of the serious challenges include climate change and some economic instabilities in various countries. These challenges have resulted in some countries facing food crisis that requires food aid. COVID 19 has increased the number of the vulnerable population thereby increasing the number of people in need of food aid. COVID 19 related disruptions of the food systems and food donations have been faced in various parts of the world. COVID 19 has exacerbated food insecurity due to the disruptions of the food systems. The COVID 19 response measures are also negatively affecting the current food systems. This paper explores the current and future implications of COVID 19 on the food systems and food aid. The paper analyses the available literature on food security and COVID 19. The effect of COVID 19 on food security is likely to extend into the post COVID 19 period. The article concludes by saying that COVID 19 has negatively influenced every element of the food system and food aid activities. There is a need for the development of a resilient food system that withstands the current shocks and possible future shocks.

***Keywords**: COVID 19; food systems; food aid; food security*

1. Introduction

The negative implications of disease outbreaks on food security have been experienced before as evidenced by the outbreaks of Ebola and SARS (Campolina et al.,2020). Evidence has shown that an outbreak of an infectious disease results in hunger and malnutrition (Siche,2020). According to Mhlanga and Ndlovu (2020), COVID 19 has possible negative impacts on the human capital, physical capital, natural capital, social capital and financial capital. These implications result in the disruption of smallholder farm household's food production thereby resulting in food insecurity.

Several countries were facing a food crisis due to several challenges before the COVID 19 pandemic. Major drivers of the food crisis for Zimbabwe, Malawi, and Mozambique for 2018 were identified as climate change and economic downturn. Countries like Madagascar, Zambia and Eswatini are mainly affected by the economic slowdown and climate shocks. Household food security in Southern Africa is facing major challenges that are hard to cope with. Climate shocks, economic slowdown and downturn have lowered the resilience of households. According to the food balance sheet Zimbabwe, Zambia and South Africa are among the 53 countries with the highest number of undernourished people (FAO et al.,2019). Before the onset of COVID 19, almost 8.9% of the world's population was undernourished. Projections reflect that the COVID 19 pandemic may result in up to 132 more million people suffering from hunger in 2020 (FAO et al.,2020).

National food systems are or have been disrupted by COVID 19. The food system is defined as elements and activities that are involved in food production, food processing, food distribution, food consumption and food waste disposal (Béné, 2020). This means that food systems include many players namely farmers, processing organisations, retailers, consumers and food waste managers. It is significant to assess the effects of COVID 19 on all the elements of the food system because a negative effect on one of the components of the food system might result in major drawbacks in other components of the food system thereby resulting in food insecurity (Devereux., 2020).

Before the COVID 19 pandemic extreme poor people in the world were 734 million and 74% of these work in agriculture sector.80% of the self-employed agriculture people in developing countries are in the informal sector. Many of these poor individuals in rural areas rely on activities that require human and product movements. COVID 19 restrictions and limited movements result in income shocks to the already vulnerable rural poor (FAO, 2020). The increase in the number of vulnerable households' means that the number of households that need food aid has increased as well. The negative effects of COVID 19 are being experienced even though many nations have exempted the agriculture and agro-processing sector from movement restrictions (Béné, 2020). COVID 19 has brought the resilience of the current food system to emerging shocks to test (Bakalis et al.,2020).

The impact of COVID that is being reported in many research articles is based on estimations and projections thus at this stage, the actual impact is not yet known since this disease is still in place and its effects are still being experienced at this time of writing (FAO et al.,2020). There is limited empirical evidence on the impact of COVID 19 on food systems (Béné, 2020). Food systems contribute to the attainment of food security. Food aid, either in forms of household food donations or school-feeding programs assists households that are food insecure. Therefore, this paper seeks to assess the literature of the studies on the effects of COVID 19 on food systems and food aid.

2. Methodology

Literature was identified and gathered from the internet and printed documents. Documents that were assessed are journal articles, policy briefs, books and newspaper articles. Keywords that were used in the literature search are COVID 19, food security, food systems, food aid, food crisis. Documents were screened based on their relevance on the coverage of food system elements (food production, food processing, food distribution, food consumption and food waste disposal) and food aid. A discussion on the effects of COVID 19 on food security and food aid was made based on the findings from the screened papers.

3. COVID 19, the food system and food aid

1. Food Production

Some of the potential COVID 19 negative effects on smallholder farmers' activities can be drawn from experiences from Sierra Leone, Liberia and Guinea of the 2014 Ebola virus outbreak (Campolina et al., 2020). There has been an assertion of the doubling of global hunger due to the effects of COVID 19. The effects of food insecurity have been predicted to be severe in African countries and poor nations (Zurayk, 2020). Measures to control and prevent COVID 19 have or are unintentionally affecting agricultural production negatively (Amjath-Babu et al., 2020; Pu and Yu Zhong, 2020). Some of the impacts of the current restrictions might be realised on the farming seasons yet to come. In China, there were delays in input provisions that resulted in late planting as a result of the lockdown policy. Agricultural production cycles have been disrupted due to COVID 19 and its associated control and preventative measures (Pu and Yu Zhong, 2020).

Many countries have put restrictions on the movement of people and goods. Difficulties in the importation of agricultural inputs like fertilisers and seeds are due to COVID 19 induced restrictions on transportation and trade. The COVID 19 outbreak has resulted in the disruption of provision of staple food agricultural inputs. In West Africa for example, potash and urea components of fertilisers are mostly imports (Arouna et al.,2020). Restrictions in transportation have not spared the agricultural input producing companies. This is likely to affect the farming seasons due to likely limited availability and accessibility of agrochemicals and seeds (Zurayk, 2020).

COVID 19 resulted in labour shortages due to movement restrictions (Pu and Yu Zhong, 2020). Some farming operations like rice production are labour intensive such that any disruptions in labour due to illnesses or lockdowns results in reduced production of the grain. For some countries, local grain production might continue to decline if COVID 19 persist. The decline will be attributed to COVID 19 induced high input costs, input shortage and reduced labour (due to deaths and illnesses). Agriculture extension services are also likely to be disrupted due to the scaling down or temporary termination of

activities by National agriculture extension agencies and Non-Governmental Organisations (Arouna et al.,2020)

Some farming operations like harvesting of certain crops require intensive labour such that seasonal farmworkers are hired for the harvesting process. Harvesting has been affected by the movement restrictions challenges faced by migrant and seasonal workers in some parts of the world. Losses in harvest result in reduced production capacity in the forthcoming seasons as farmers would have experienced losses of the money that would have been used for the second production cycle. Some of the farmers in China are resorting to off-farm jobs for quick income after having suffered from the negative effects of the pandemic (Pu and Yu Zhong, 2020).

Majority of the farmworkers normally operate close to each other thus some farm operations have been slowed by physical distance measures of employees on farms (Amjath-Babu et al., 2020; Zurayk,2020). Covid-19 is not affecting crop production only as issues of labour and transportation also affect livestock production. Livestock production is also affected by COVID 19 related challenges in stockfeed production (Amjath-Babu et al., 2020). Small scale fishers have also been affected by COVID 19 due to reduced demand for their products as a result of the reduced purchasing power of consumers. Closures of ports and termination in shipping and air freight resulted in challenges in fish exports thereby resulting in a decline in fish sales. Closures of restaurants and hotels also resulted in low demand in fish (Bennet et al.,2020).

2. Food Processing

Even though food processing industry and the agriculture sector have been regarded as essential services by several countries, COVID 19 related challenges have and are being experienced in these sectors (Campolina et al., 2020). It is difficult to come up with clear future implications of COVID 19 to the food supply. Some countries for example Canada have made some temporary changes to its food regulations. These changes include suspension of the standard size of containers for packaged food. Shortage of labour and transportation challenges are some challenges that disrupt the food supply chain. Labour shortages in the food-processing sector and food distribution is likely to continue

occurring because of movement restrictions, self-isolation and illness of workers. Food processing companies that are labour intensive are likely to be the most affected (Hobbs 2020).

Food processing companies might be faced with a need to change their food processing lines to suit the requirements of COVID 19 measures. The set up in some food processing organisations is designed such that workers perform their tasks nearby. These food production organisations have to face costs of making modifications to their plant setup to ensure physical distancing of employees in the food-producing plants. However, this might reduce the capacity of food processors in food production thereby reducing the quantity of food supplied into the market. This scenario will result in food shortages. (Hailu, 2020).

Food product formulations require many ingredients or raw materials some of which might not be locally available in a country (Bakalis et al., 2020; Hailu, 2020). These ingredients would need importation from within the region or outside the region, thus due to restrictions the quality of food products is affected (Bakalis et al., 2020). A shortage of raw materials and packaging material might reduce the quantities and quality of food produced and this has a negative effect on food supply (Hailu, 2020).

Processors for certain food products are faced with declining profits for their business due to reduced purchasing power of consumers (Béné, 2020). Food processing companies are also facing new costs in terms of employee screening, staggering shifts, new safety and sanitation practice. This results in increased production costs. Food processing organisations cannot operate to full capacity as doing so might result in outbreaks of COVID among their workforce which might result in the organisations completely shutting down and that is undesirable (Hailu, 2020). Workers in food processing cannot afford to work from home like workers in other sectors. This means that food supply chain employees must avail themselves at work for effective food production, processing and distribution (de Paulo Farias and dos Santos Gomes, 2020). This, however, poses a challenge in that if some of the workers test positive for the virus it means the operations

have to be temporarily stopped which reduces the amount of food produced for the market.

3. Food distribution

COVID 19 response measures have resulted in the shutting down of many actors in the food supply chain. COVID 19 and its response measures have disrupted operations in the transport sector. Different modes of transport have been affected in different ways. Trucks movements are delayed due to changes that have been implemented by some organisations to minimise the use of multiple drivers on one truck. Long-distance truck drivers have faced challenges in accessing restrooms and restaurants during lockdown periods as many organisations that offer such services closed or adjusted their operating periods (Gray,2020). This is an indication of the disruption of the transporting system brought about by COVID 19.

Food distribution especially for exports is facing a setback due to trade restrictions and control measures on country borders as well as transportation challenges (Farrel et al., 2020). Trade restrictions have been imposed by many food-producing countries that are known to export food to other countries. An example of such countries is Russia, rice-producing India and Thailand. These restrictions have resulted in lowered availability of some basic commodities which in turn has resulted in increasing prices for such. Rice prices have been reported to be higher during this COVID 19 period than any year within a decade (Zurayk,2020).

COVID 19 control and prevention measures implemented by different governments have resulted in the disruption of the transportation system. This has resulted in slow movements of food products to the market. It also resulted in a decline in the access of consumers to their usual markets. (Uddin et al., 2020). Large informal markets or open-air markets have been closed or downsized in many parts of the world because of COVID 19 restrictions (Béné, 2020; Devereux et al.,2020). However, these markets cater to the urban poor who purchase a large portion of their food from these markets (Devereux et

al.,2020). Some of these open-air markets are convenient in terms of price and proximity to a household as compared to the formal retail system (Béné, 2020).

4. Food consumption

COVID 19 induced food shortages can result in the food price increase. A global increase in prices of the food basket between 20% to 50% has been attributed to the emergence of COVID 19 (Zurayk, 2020). Certain food sectors import some ingredients from other countries. Continuation of COVID 19 will result in the sectors facing difficulties in importing thus this will affect negatively on the prices of the processed food (Deaton and Deaton, 2020). The increase in price will result in food products becoming less affordable.

Measures against COVID 19 have resulted in a loss of income for some households. Loss of income has a likelihood of increasing food-insecure households. Issue of social distancing has resulted in some companies closing or altering their operations. This in turn has resulted in reduction or loss of income earned by employees for the companies in question (Deaton and Deaton, 2020). Loss of income for a household will lead to a change in household diets. In an Indian study, 62% of households reported a shift in their diet due to the effects of COVID 19 (Pulighe and Lupia 2020). During times of an epidemic, consumers tend to change their diet because of pandemic induced financial challenges. These households tend to resort to undiversified and unbalanced diets thereby resulting in malnutrition (Campolina et al., 2020). Transition in the diet is experienced as people resort more to staple foods. Fresh produce needs to be purchased frequently, however, COVID 19 measures do not allow frequent movements thus people will resort more on foods that have a longer shelf life (Farrel et al., 2020).

5. Food waste

Delays in the movement of agricultural products have been experienced because of lockdown restrictions on people's movement and physical lockdowns. Experience from China shows that perishable foods deteriorated in quality during transportation. This is ascribed to delays during transportation due to roadblocks. Some of the smallholder

farmers failed to sell their produce, which resulted in loss of the agricultural products (Campolina et al 2020).

Many hotels and restaurants have closed because of the lockdown. Farmers targeting hotels and restaurants had produced some fresh produce. Due to the lockdown, these farmers could not sell their products to their targeted customers and this has resulted in some dumping their produce thereby increasing food wastage (Zurayk,2020). Vegetables and perishable losses have been experienced due to COVID 19 movement restrictions and border restrictions (Pulighe and Lupia 2020). Perishables are most likely to be affected by COVID 19 as compared to staple foods or grains but this will depend mostly on how long the pandemic is going to last. Perishables like vegetables are quick to deteriorate in quality thus if their period of travel to the market is increased far more than expected/ideal they will undergo spoilage resulting in increased food waste (Harris et al.,2020).

COVID 19 has resulted in the loss of sales by vegetable farmers with a study in India indicating that 80% of the farmers had a decline in sales whilst 20% of reported no sales at all during the period from the onset of the pandemic (Pulighe and Lupia 2020). Some perishables that are usually expensive for example fruits, dairy products, meat and some vegetables have experienced declining sales due to the lowered income or formerly employed and informally employed workers. This has resulted in an increase in food waste due to food spoilage on the market (Amjath-Babu et al., 2020). Closure of farmers markets resulted in food wastage due to spoilage of fruits and vegetables (Farrel et al., 2020). Food waste is likely to be increased if restrictions to trade and movement of goods and personnel are prolonged (Harris et al.,2020).

COVID 19 lockdown measures increased the consumption of house cooked food. A study in Tunisia revealed that during the period from COVID 19 inception household food wastes for baked products and vegetables have increased as compared to other food categories. During the COVID 19 lockdown period overbuying, overcooking and too long refrigeration are some of the major reasons that have resulted in increased food wastage through leftovers (Jribi et al., 2020).

6. Food aid

Food aid is defined as “the international sourcing of concessional resources in the form of or for the provision of food” (Barrett and Maxwell, 2005). There are three different types of food aid delivery that is program food aid, project food aid and emergency food aid. School feeding programs and mother-child nutrition feeding are examples of program food aid (Lowder and Raney,2005).

The number of vulnerable households in need of food aid is increasing due to COVID 19 with an estimated rise of 130 million people with acute hunger projected for 2020 globally (Cardwell and Ghazalian, 2020). Donor countries are facing COVID 19 induced economic challenges thus this might affect their donations to the usual recipient countries of food aid. Travelling restrictions have also not spared food aid organisations and their staff. Delays on borders as well as new restrictions concerning the transportation of goods have resulted in the slower delivery of donated food from donor countries into receiving nations (Cardwell and Ghazalian, 2020).

In the United States of America, approximately 35 million children are fed daily through the breakfast programme, national school lunch program and child and adult care food programme (Dunn et al 2020). These programs ensure delivery of nutritious food to children from vulnerable families. School feeding is one of the most common and effective social protection programs in rural areas. A reduction of economic opportunities and school shutdown in the rural poor exacerbates food insecurity (FAO, 2020). COVID 19 has resulted in national school closures in many countries (Dunn et al.,2020; Rundle et al.,2020). It is estimated that as of April 2020 a total of 138 countries had embarked on a nationwide closure of schools (Van Lanker and Parolin, 2020). This closure of schools has a negative effect on food availability to vulnerable school children who are dependent on school meals. Some children cannot afford a daily meal with meat/fish or a protein meat substitute. These children are provided with such meals only at school.

Food insecurity in children even for a short period can have deleterious effects, which include some long-term emotional, physiological and developmental effects (Dunn et al., 2020). Projections that were done for children aged 7 in Philadelphia indicated that just 3

days of closing schools resulted in 405 000 missed meals (Rundle et al.,2020). The closure of schools and child care centres results in a loss of food provision worth $30US per week for a child and this costs now has to be covered by an already vulnerable family (Dunn et al., 2020). In some countries weight gain in schoolkids have been reported to be common during the school closure period. In relation to this, many school kids who experience weight gain are bound to become obese with prolonged school closures due to COVID 19 (Rundle et al.,2020).

The period of closure of schools is not definite. In circumstances where schools are opening it is not clear on whether they will remain open as the majority of the countries are having the first experience of this scenario meaning if challenges are met schools are likely to be closed again. This, therefore, means that COVID 19 has brought serious challenges to school feeding programs beneficiaries' access to food aid.

7. Conclusion

If the COVID 19 situation prolongs factors like transportation, farm financial stability and challenges to international exchange will result in negative effects on the food supply chains. The reduced workforce might result in a decline in agricultural productivity, which in turn affects all the other components of the food system. Shortage of inputs for agriculture and food processing is likely to be a major problem if COVID 19 is prolonged. Transport and trade restrictions are negatively affecting food distribution. Food choices and preferences have been altered by the emergence of COVID 19. A decline in the purchasing power of consumers has resulted in spoilage of perishables thereby increasing food wastes. Food aid has been disrupted by COVID 19 induced economic challenges and transport restrictions. There is a need for all the players in the food system to work towards achieving a resilient food system concerning the current and future pandemics. The food aid systems also need to be addressed so that food aid is resilient even in times of global pandemics like COVID 19.

Declaration of conflicting interests

The author declares no conflict of interest

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