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## SOCIOLOGY | RESEARCH ARTICLE

# Covid-19 impact on Zimbabwean agricultural supply chains and markets: A sustainable livelihoods perspective

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**Abstract:** The purpose of the article is to analyse the impact of COVID-19 on the agricultural supply chains and markets in Zimbabwe and subsequent effect on livelihoods. The research methodology that was applied is a systematic literature survey anchored on inductive research approach. This article is based on the systematic review of secondary data sources, such as journals, policy reports, as well as reports from national and international organizations. The review involved a predetermined and comprehensive approach of searching, analyzing and synthesizing extant literature on agricultural supply chains. In general, the pandemic has affected the whole supply chain from the food production systems and input supply, the storage and distribution, processing and packaging as well as the retail and marketing aspect. The research showed that the COVID-19 pandemic severely threatens an already critical food security situation arising mainly from the prevailing poor macroeconomic conditions and consecutive years of drought in Zimbabwe. This has led to a higher than previously anticipated food insecure population, especially in urban centers. Over 70% of the workers are self-employed and a vast majority operate in the informal sector. The informally employed represent a significant breadwinner constituency, whose dependents comprise

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### PUBLIC INTEREST STATEMENT

The research showed that the COVID-19 pandemic severely threatens an already critical food security situation arising mainly from the prevailing poor macroeconomic conditions and consecutive years of drought in Zimbabwe. This has led to a higher than previously anticipated food insecure population, especially in urban centres. Over 70% of the workers are self-employed and a vast majority operate in the informal sector. The informally employed represent a significant breadwinner constituency, whose dependents comprise vulnerable sections of the populace. The restrictions on mobility and the closure of borders meant immediate loss of employment and income.

vulnerable sections of the populace. The restrictions on mobility and the closure of borders meant immediate loss of employment and income. The study revisited the previous viruses such as Ebola to extrapolate though marginally, the implications of the COVID-19 pandemic. Using secondary sources and the general agriculture supply chain to guide understanding, the findings show that unless measures are put in place to safeguard farmers especially smallholder activities in Zimbabwe, COVID-19 has the potential to reproduce the same catastrophic implications created by Ebola in West Africa countries where peasant food systems were shattered and livelihoods strategies maimed.

**Subjects: Agriculture and Food; Population & Development; Rural Development; Economics and Development; Business, Management and Accounting; Production, Operations & Information Management**

**Keywords: COVID 19; agri-business; human activity; food demand; export restrictions; disrupted supply chain**

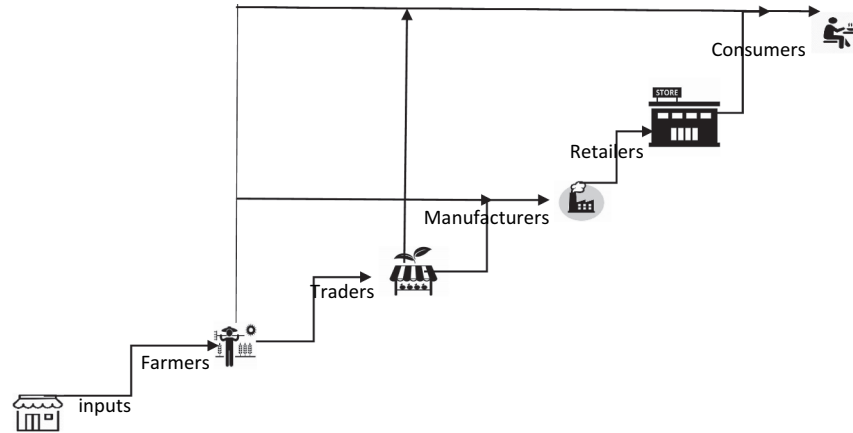
**JEL Classifications: E2; E31; M310; M39**

## 1. Introduction

In late 2019, infection with a previously unidentified betacoronavirus was reported in people who had been exposed to a seafood market in Wuhan, China, where live animals were sold (Wu et al., 2020). It was discovered that the illness was caused by SARS-CoV-2 and had a range of clinical manifestations, including cough, fever, malaise, myalgias, gastrointestinal symptoms, and anosmia (Gandhi et al., 2020). The disease was formally named the coronavirus disease 2019 (COVID-19) on the 11th of February 2020 by the World Health Organization (WHO) (Guo et al., 2020). The disease has quickly become a global pandemic, with far-reaching consequences that are unprecedented in the modern era. On 30 January 2020, WHO declared COVID-19 a public health emergency of international concern and called on the world to take it seriously. Since the first case of the disease was reported in China in December 2019, more than 11 million infections had been recorded and 534,162 deaths by the end of June 2020. Currently, there is no definite treatment for COVID-19 although some drugs are under investigation (Wu et al., 2020). The world has already witnessed similar epidemics like Spanish Flu (Severe Acute Respiratory Syndrome), (MERS) Middle East Respiratory Syndrome and Ebola [Figure 1 and 2](#).

COVID-19 has not only been a health crisis but also an economic one, the impact of the pandemic is being felt globally across operations in ways that are difficult to model and assess. As concerns on the outbreak continue to grow, it is not only wreaking havoc on the stock market but also causing a substantial downturn in the general economy for most countries (FAO, 2020). In general, SARS-CoV-2 is primarily spread from person to person through respiratory droplets, which are typically released when an infected person coughs or sneezes. Because droplets usually fall within a few meters, the likelihood of transmission is decreased if people remain at least 2 m apart (Gandhi et al., 2020). This led to many countries introducing lockdown measures to minimise human contact and reduce the risk of transmission. The introduction of lockdown measures brought with it various challenges, including disruption of supply chains across the globe. The situation is exacerbated further by the fact that the most hard hit regions are at the heart of many global supply chains for example, China and the United States of America (Seric et al., 2020). Though the pandemic is a global crisis affecting livelihoods, global food trade and food supply chains, according to a report by FAO (2020), countries with existing humanitarian crises are particularly exposed to the effects of the COVID-19 pandemic. The pandemic is, for all practical purposes, still evolving and a fact that renders a conclusive assessment of its possible impact problematic. However, on the basis of recent developments and observable trends, as well as government and private sector responses, there are certain discernable impacts that merit

**Figure 1. A generic supply chain of agriculture produce in the context of a complete supply-chain network.**



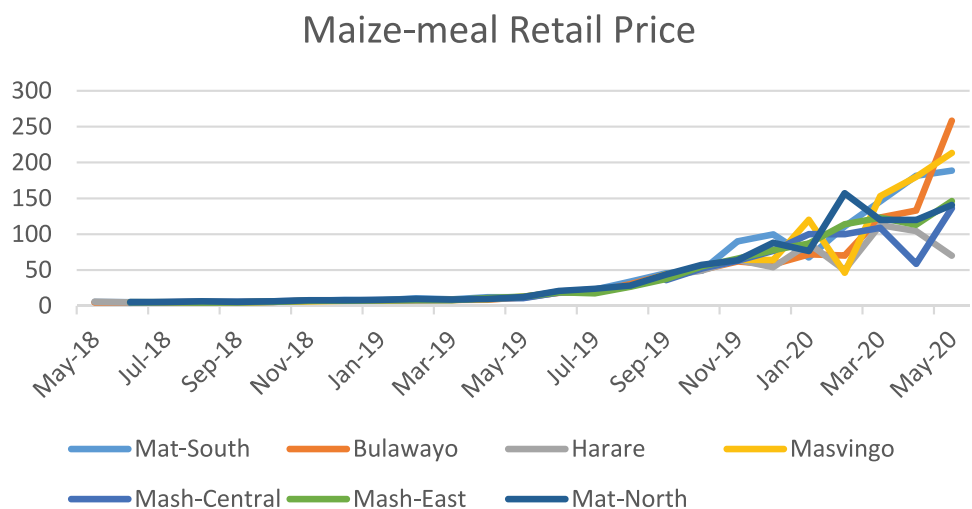
highlighting at this early stage. In an attempt to understand the potential impact of the pandemic on Zimbabwe, it is instructive to note that although it is primarily a health crisis, it nonetheless has far-reaching public governance, socio-political and economic ramifications. This paper zeroes in on the impact that the pandemic is having and is expected to have on the agriculture supply chains.

**2. The agricultural supply chain**

A supply chain in general is a sequence of flows aimed at meeting final customer requirements that take place within and between different stages along a continuum, from production to final consumption (Felea & Albastroiu, 2013). The supply chain not only includes the producer and suppliers but also, depending on the logistic flows, includes transporters, warehouses, retailers, and the consumers themselves (Opara, 2003). In a broader context, a supply chain also includes new product development, marketing, operations, distribution, finance and customer service. The real measure of supply chain success is how well activities coordinate across the supply chain to create value for consumers, while increasing the profitability of every link in the supply chain. An agriculture supply chain thus comprises organizations that are responsible for the production as well as the distribution of agricultural produce, such as vegetables, fruits, cereals, pulses and animal-based products until they reach the end user, the consumer (Denis et al., 2020). In general, there are two distinct types of agriculture supply chains;

**Figure 2. Retail price for maize-meal.**

Source: (Food Price Monitoring and Analysis (FPMA)—Food Price Monitoring and Analysis (FPMA)—FAO, 2020)



Agriculture food supply chains for fresh agricultural products (such as fresh vegetables, flowers and fruit). In general, these chains may comprise growers, auctions, wholesalers, importers and exporters, retailers and specialty shops and their input and service suppliers (Arora, 2017). Their defining characteristic here is that all of these stages basically leave the intrinsic characteristics of the product grown or produced untouched. The main processes are the handling, conditioned storing, packing, transportation and trading of these goods.

Agriculture food supply chains for processed food products (such as portioned meats, snacks, juices, desserts, canned food products). In these chains, agricultural products are used as raw materials for producing consumer products with higher added value (Arora, 2017). In most cases, conservation and conditioning processes extend the shelf-life of the products.

### 3. Research methodology

This article is based on the systematic review of secondary data sources, mainly newspaper articles. It also benefits from a few journals and some policy reports, as well as reports from national and international organizations. The process involves a predetermined and comprehensive approach of searching, analyzing and synthesizing extant literature (Muposhi et al., 2021) on the implications of the COVID-19 to agricultural supply chains and markets in Zimbabwe. The purpose being to draw conclusions and identify the research gaps. Usually, systematic literature review is used as it is recommended for replicability (Denyer & Tranfield, 2009) in public policy studies (Muposhi et al., 2021; Saunders et al., 2012). Initial stages of the review process involved the refining and definition of the research objectives, which were in line with the COVID-19 to agricultural supply chains and markets. After this was done, we conducted database selection, where there was need to check on the databases which published peer reviewed articles, reports, practitioner viewpoints and proceedings on the topic under study. The databases used include Taylor & Francis, Scopus, ProQuest, Google Scholar, Emerald Insight, Science Direct, EBSCO Host and Web of Science. Due to validity and reliability considerations, we avoided the inclusion of sources of literature from some online and newspapers. In line with this, second, we identified the key terms meant for optimizing the search process. These included COVID-19, agri-business, human activity, food demand, export restrictions, disrupted supply chain, markets, value chain, Zimbabwe, etc. Succeeding to this stage was article search. We manually searched the articles from the selected databases. A total of 142 probable articles emerged from the search process. Compatibility was conducted to check on how suitable the selected articles were during the evaluation process. We checked the search terms in the titles, the keywords, abstracts and full texts of the identified articles. Alignment to the research objectives was made to make sure that there was a concise approach to the whole process. During the process, a total of 43 articles were dropped due to duplication, irrelevancy and inappropriateness. The remainder articles were further evaluated by other independent researchers for methodological quality using the Oxford Quality Scale (Muposhi et al., 2021). A minimum threshold of three out five was required to include the article in the research study. Lastly, data extraction and population were done in line with the provisions of content analysis procedure (Nyagadza, Kadembo et al., 2019; Nyagadza, 2020a; Nyagadza et al., 2020b, 2020c, 2020d, p. 2021). The population procedure was executed by comparing, integrating and summarizing themes that emerged from the systematic review process. All the four researchers independently confirmed the credibility and rigour of the research study findings. Since COVID-19 literature is only evolving, marginal reference was made to the Ebola virus outbreak and its implications on food security to extrapolate the implications of the COVID-19 to agricultural supply chains and markets in Zimbabwe. We are, however, cognisant that these viruses differ greatly in terms of genetics transmission pathways, and severity and also that Zimbabwe has had no Ebola cases. The discussion of possible implications is structured according to the four-phase supply chain.

### 4. Results

#### 4.1. The Zimbabwean perspective

The COVID-19 pandemic poses a severe threat to an already critical food security situation arising mainly from the prevailing poor macroeconomic conditions and consecutive years of drought in

Zimbabwe. Over the last decade, Zimbabwe has experienced a number of unprecedented economic, environmental and political shocks, which have negatively affected its economy. By the end of 2019, 62.6 % of Zimbabweans were living below the poverty line (World Bank, 2019). Extreme poverty is estimated to have risen from 29% in 2018 to 34% in 2019, an increase from 4.7 to 5.7 million people (World Bank, 2019). Consecutive poor agricultural seasons due to El Nino-induced droughts have further undermined the agricultural sector, with dire consequences as 80% of the population derives a significant proportion of their livelihoods from rain-fed agriculture and livestock production (FAO, 2020). Additionally, Cyclone Idai which ravaged the country in 2019 worsened the situation as the three most affected provinces typically accounted for 30% of agricultural output (World Bank, 2019). As such, the onset of the COVID-19 pandemic brought with it a new set of challenges to a country that was already crippled by hyper-inflation, health system deficiencies, production stagnation, crop failure, mass unemployment and basic service delivery failures.

Despite the already challenging economic situation, the country had to align with the guidelines set by WHO to fight the ongoing COVID-19 global pandemic. As such, on the 27th of March 2020, the Zimbabwean government announced the beginning of a 21-day lockdown starting on the 30th of the same month. The government mandated a national lockdown, which closed non-essential business and stated that all citizens should remain in their homes for 21 days, began on 30 March 2020, 48 hours after the statute was announced (Mackworth-Young et al., 2020). The measures included an immediate ban on gatherings around nightclubs, bars, beer halls, movie houses, swimming pools, gymnasiums and sporting activities. This was done under the Statutory Instrument 83 of 2020. Upon the announcement of the lockdown, all the country's borders were closed for all non-essential travel for both in-bound and out-bound traffic with immediate effect. In his speech announcing the lockdown measures the President of the Republic of Zimbabwe alluded to the importance however of borders to remain open to essential traffic, for example, movement of cargo, both in the interest of the economy and that of the corresponding economies of the region. The ban on non-essential human traffic excluded returning residents. The returning residents would be subjected to strict screening procedures, including rigorous enforcement of the 21-day self-quarantine. As for travelling within the country, the government banned unnecessary travel within the country including unnecessary movements within communities unless one is an essential services worker.

The lockdown measures introduced in the beginning of March 2020 were set to be eased in phases; the phases started from phase 5, which had the strictest measures, and as the virus began to be more controllable, the country was expected to end at 1. As of June 2020, the country was in phase 2 lockdown. Under phase 2, some movement was allowed and formal businesses were allowed to operate but with strict monitoring. All businesses were expected to sanitize customers and ensure all customers were wearing masks. The first case of the virus was recorded in March and, by mid-July, the country had recorded 885 cases, of which 206 had recovered and 9 had died. This led to talks to move back to stricter lockdown measures.

As governments across the globe continue to mete out lockdown measures with varying degrees of severity, in countries like Zimbabwe the health gains from the lockdowns are eroded by the economic losses. Low-income countries experience a different reality: in Zimbabwe, over 70% of workers are self-employed and a vast majority operate in the informal sector. The informally employed represent a significant breadwinner constituency, whose dependents comprise vulnerable sections of the populace (Nyagadza, 2019a). The restrictions on mobility and the closure of borders meant immediate loss of employment and income. Many bottom-of-the-pyramid households eat with the money they earn every day. Within this context, when a lockdown restricts their day-to-day activities their livelihoods are endangered. According to the projections of the United Nations Economic Commission for Africa (UNECA), Africa's GDP growth is set to slow down and is likely to drop from 3.2% to 1.8%. This confirms the likelihood that, as a result of the pandemic, we shall witness a very real and heartbreaking increase in the number of people living in extreme poverty and hunger in Africa in general and Zimbabwe in particular.



#### **4.2. COVID-19 pandemic implications on agricultural supply chains in Zimbabwe**

The fight against the global COVID-19 pandemic is causing unprecedented uncertainties in the global food supply chains, with impending bottlenecks in the labour markets, input industries, agriculture production, food processing, transport and logistics, as well as notable shifts in demand for food and food services (Commercial Farmers Union of Zimbabwe, 2020). In the short term, the economic and social impacts of the pandemic have interrupted the generally positive medium-term outlook for global agricultural production and food consumption. Governments face the challenge to create balanced policies that address immediate needs, such as labour shortages and create durable conditions for the agricultural sector. In Zimbabwe, the government classified the agriculture sector as an essential service sector in the promotion of food security in the country during and after the lockdown (The Herald, 2020). This sector is of strategic importance to the country's economy given its massive contribution to employment, strategic linkages to other industries and the country's Gross Domestic Product. Despite being designated as an essential services sector, there is no doubt that the coronavirus has brought disruptions within the sector among large-scale farmers, smallholder farmers, communal farmers, farm workers and the community at large.

Given the importance of the agricultural sector in Zimbabwe, the GoZ through the Ministry of Lands, Agriculture, Water and Rural Resettlement on the 8th of April 2020 unveiled new guidelines for the resilient food supply chain system during and after the lockdown. The guidelines recognize the importance of the food supply chain in guaranteeing national food and nutritional security during and after the lockdown. This is meant to avoid food supply shocks which may be caused by the lockdown in order to guarantee every Zimbabwean an uninterrupted food supply during and after the lockdown period. They also recognised the need to put in place mitigatory measures and strict hygiene requirements throughout the food supply chain given the pronouncement by the President that all farmers and traders must continue to deliver produce to food markets, including those markets that supply our cities, towns, and growth points (Zimbabwe Environmental Law Association (ZELA), 2020). The food supply chains in Zimbabwe provide a lot of jobs on different levels of the chain including transport services and traders who purchase from farm gate and sell to retailers in towns and cities. Though the full impact of these guidelines is yet to be seen, there is evidence on how the supply chain has been affected since the onset of the pandemic as well as after the lockdown measures were put in place in March 2020 to date. It is also important to note that these guidelines will be functioning against an already challenging context. The supply chains of different agricultural commodities in Zimbabwe, are fraught with challenges stemming from the inherent problems of the agriculture sector. The agri-supply chain system of the country is determined by different sartorial issues like dominance of small/marginal farmers, fragmented supply chains, absence of scale economies, low level of processing/value addition, inadequacy of marketing infrastructure, etc. This chapter will give an update on a mix of developments, responses, compliance levels, and impacts of COVID-19 on the agricultural sector with an emphasis on the impact on agriculture supply chains. However, it is by no means an exhaustive narrative of developments in the sector as the pandemic is still ongoing.

#### **4.3. Impact on agricultural production and incomes**

The agriculture sector in Zimbabwe comprises of large-scale farmers as well as smallholder farmers. Smallholder farmers have long been recognized as an integral part of the food supply chain, with small family farms providing as much as 80% of the food consumed in Africa and Asia (ActionAid, 2020). According to report by FAO (2020), in Zimbabwe, smallholder farmers play a critical role in food and nutrition security, with their production accounting for the bulk of the country's food. These farmers are mainly situated in the country's rural areas. With respect to the current global COVID-19 pandemic, as is the case when it comes to a highly contagious disease, being in a rural area sounds better than being in a busy city. However, this is not the case in Zimbabwe, farmers are often older than average and hence more vulnerable to the virus, and they have less access to health services. The lack of adequate health facilities has a negative impact on labour availability and thus production. Furthermore, restrictions on movement will also limit the availability of labour. For instance, the ongoing restrictions on movement across borders are already contributing to labour shortages for agricultural sectors in many countries, particularly

those characterized by periods of peak seasonal labour demand or labour-intensive production (Organisation for Economic Co-operation and Development (OECD), 2020). The impact of reduced availability of workforce is already being felt in the fruit and vegetable sector in a number of European countries as result of the newly implemented travel bans within the European Union, as well as the closure of the Schengen Area. The harvesting season is imminent for many products in the northern hemisphere, and a shortage of labour could lead to production losses and shortages in the market (Organisation for Economic Co-operation and Development (OECD), 2020).

In the Zimbabwean context, most of the farmers are smallholder farmers and rely on family labour and locally sourced hired labour thus have their own unique challenges due to the pandemic. According to the Zimbabwe Farmers Union (ZFU), the need to social distance implies that farmers must limit the number of labour force carrying out an activity at a given time. That means activity turnaround time is prolonged, thereby increasing the production cost and putting pressure on cash flows. According to a study by Zimbabwe Environmental Law Association (ZELA) (2020), the same challenge has also been noted for fish farmers in Kenya who attested to a decrease in production because social distancing measures only allow for two people in a boat at a given time. According to the ZFU, with smallholders highly depending on household labour in Zimbabwe, the infection of household members has the potential to disrupt farm activities which could lead to food insecurity and stunted livelihoods. Farming is a labour-intensive activity, and thus, requires the participation of the strong and dynamic. COVID-19, however, is affecting all categories of society, although different age groups have different risks of getting severe symptoms that require hospitalisation or intensive care. The chances of deaths also vary across age groups, with kids and young adults likely to be fine, but the risk is more severe for the elderly with the 80 years and above category contributing 20% of the total deaths (European Centre for Disease Prevention and Control 2020). Given both global and national trends, COVID-19 has the potential to reproduce the same catastrophic implications for Zimbabwe farmers unless if measures are put in place to safeguard crop production activities.

Most importantly, the most critical threat of COVID-19 is its impact on the health of women. According to the United Nations Conference on Trade and Development (UNCTAD), it is estimated that 70% of the food produced in Africa is directly produced by women. In various countries in southern Africa, particularly Zimbabwe, rural women are the primary food crop producers, while, on the other hand, men are more involved in animal husbandry or off the farm labour. The worrying aspect is that women are mostly responsible for the care of children, the sick and elderly (UNCTAD, 2020). This implies that they could be exposed to the virus contract which will have a direct impact on the production of food and food security. Though most of these impacts are being felt on a global scale, quite peculiar to Zimbabwe is the impact that the pandemic has on land security and thus production. The pandemic has the potential to render smallholders vulnerable to the emerging neoliberal regime in Zimbabwe, which increasingly requires smallholders to demonstrate their merit through production or else risk losing the land to other productive citizens.

The COVID-19 pandemic may also affect the availability of key intermediate inputs for farmers due to additional restrictions on the movement of people and goods. For example, the production of pesticides declined sharply and only resumed gradually after production plants were shut down following the outbreak (Organisation for Economic Co-operation and Development (OECD), 2020). Low availability and/or high prices of inputs such as pesticides could weigh on yields and crop production in 2020 and 2021, particularly in developing countries. Closing borders or slowing down the transboundary movement of seeds could potentially hamper seed supply chains and on-time delivery of seeds with negative impacts on agriculture, feed and food production over the next season and further into the future. In the Zimbabwean context, most of the fertilizers and pesticides are imported, restrictions on the movement of goods across borders is already affecting the availability of inputs and agricultural markets (Nyagadza, 2019b). In the case of inputs that are manufactured locally, farmers still face challenges as movement is also restricted locally and some retailers of agro-supplies are still not operating at full scale. This is already hampering preparations for winter production and is likely to lead to a decrease in the winter season harvests.



#### **4.4. Impact on transport systems**

The COVID-19 pandemic has interrupted all aspects of the food supply chain, including the logistics related to food handling and distribution. Logistics is a key aspect of food value chains and comprises of all necessary activities that enable the flow of agriculture inputs, outputs, and agriculture-related services, such as transportation, warehousing, procurement, packaging and inventory management. Challenges in logistics and transport can negatively impact on the quality of food, freshness, its safety, and can delay access to markets and affordability (FAO, 2020). A major impediment to food security is limited distribution options (Ndungu, 2020). Even when food supplies are available, there are barriers for it reaching consumers, most especially due to movement restrictions imposed to reduce the spread of the virus (Ndungu, 2020). The restrictions or closure of ports and borders by countries in the region and abroad translates to the lock out and disruption of many businesses in trade and transport and logistics, those working on transport systems through which supply chains pass through, thereby threatening the livelihood of workers in these industries (Zimbabwe Congress of Trade Unions (ZCTU), 2020). The national lockdowns in many southern African countries and the infection aversion measures put into place by governments, both local and national, have caused trading to decline in the agriculture sector as well.

In times of crisis like COVID-19, where hard cash is needed for accessing medication, trade becomes an important activity for most agro-producers. However, the movement measures that have come with COVID-19 have eroded the ability of these farmers to trade. A combination of logistical issues stemming from restricted movement has all but put a stop to trading (Blanke, 2020). The closure of roads across the country in response to COVID-19 could further constrain livelihoods development of farmers. The haulage sector has been seriously affected by the curfews there by hindering domestic trade. In the poultry sector, they recorded a 13% drop in output after producing an average of 16.95 million-day-old chicks in the first quarter of 2020 according to a report by the Zimbabwe Poultry Association. As a result of the imposition of movement restrictions and lack of transport, by April 2020, chick uptake had plummeted by 4.1 million. As a direct result of small and medium producers not being able to access transport or being denied permission to collect feed and other inputs from agro-dealers located in central business districts of urban areas, 1,4 million chicks were also destroyed in April (NewsDay, 2020). A disruption at the producer level leads to a disruption of the whole agro-supply chain.

Catastrophic consequences of such actions were witnessed when Ebola-hit West Africa. There was a drastic drop in the customer base for farmers as a direct result of a weakened transport system and the disruptions were felt along the whole supply chain leading to shortages and increased prices of agro-products (FAO, 2014). According to the study by FAO, quarantines, road-blocks, and the shutting down of markets almost universally inflated market prices. In Zimbabwe, the impact of COVID-19 on the road network is not only creating a situation where people cannot move from one area to the other but also constraining them from engaging in activities that can ensure food availability within households. This will further negatively impact on all the other categories of livelihood capitals required for productive farming in resettled areas.

#### **4.5. Impact on access to agricultural markets**

Before the onset of the global COVID-19 pandemic, farmers in Zimbabwe were already facing difficulties in accessing markets because of inadequate infrastructure, low productivity levels, inconsistencies in supply and low quality due to poor post-harvest practices. The onset of the pandemic has exacerbated an already challenging situation with restrictions on movement curbing farmers' access to markets to buy inputs and sell products. Fresh produce is accumulating at farms, resulting in food loss as most informal markets are banned under the lockdown measures from operating. In a country that has according to a study by the International Monetary Fund (IMF), the second largest informal sector in the world, closure of informal markets has far-reaching consequences (Medina & Schneider, 2018). According to the study, more than 60% of the Zimbabwean economy is informal and the only other country with a larger informal sector is South American Bolivia (Medina & Schneider, 2018). In addition, the local government ministry used the first lockdown phase as a smokescreen behind which to demolish, without consultation,

the vending cabins and stalls of informal traders (Mashingaidze, 2020). Three days into the lockdown, the police raided the informal food traders at Sakubva Musika market in Mutare city. Despite the majority struggling with access to food, the police confiscated and destroyed tonnes of fresh fruit and vegetables. The dangers of restricting informal trade in such a scenario were witnessed during the Ebola outbreak in 2014, which disrupted the agricultural market chains in the informal sector in West Africa, leading to shortages of food and price increases. The already frail rural-urban food network was negatively affected as fewer middlemen moved into farming communities to buy. This is evidenced by the drastic reduction in the number of fresh food retailers as well as reduction of vendors in the designated market areas.

From a report by Zimbabwe Environmental Law Association (ZELA), the limited access to markets has resulted in massive loss of jobs for farmworkers, with women being mostly affected (Zimbabwe Environmental Law Association (ZELA), 2020). The report by ZELA cited an incidence at RD Flower Farm because of the limited access to markets and the limited availability of disposal income, 150 employees were placed on indefinite unpaid leave. Fixed-term contracts in a number of farms have also not been renewed, harsh operating conditions being cited. Women form the bulk of workers on most farms, especially at the lower-level paying jobs along most value chains. The casualization of labour in the agriculture sector means that there are no wages accruing and that the burden of limited access to markets had been weighing heavily on farmworkers. The unequal distribution of the huge benefits of the agriculture sector being enjoyed by farmers when it is thriving and how the brunt of devastating consequences of the pandemic falls on the workers points to a need to revisit employee benefit schemes in the agriculture sector so they get a fair share. Further down the supply chain, because of lack of market access, most retailers have cut down on demand, causing surpluses to accumulate, putting a strain on storage facilities and for highly perishables and increasing food losses. For some products, supply side disruptions are being compounded by demand side reductions (in particular, foods typically eaten away from home, and luxury items). The decision to close down restaurants, hotels, and other local eateries has also massively reduced the bulk purchase of fresh food.

#### **4.6. Impact on agro-processing**

Agro-processing can be defined as a set of techno economic activities carried out on an agricultural commodity for the purposes of making it usable as food, feed, fiber, fuel or industrial raw material. The agro-processing value chain encompasses all subsequent operations after the stage of harvest till the produce reaches the final consumer in the desired form, packaging, quantity, quality and price (Mhazo et al., 2012). Agro-processing is divided into two distinct categories: primary and secondary processing operations. Primary processing operations involve activities such as crop drying, shelling/threshing, cleaning, grading, and packaging. These activities are mainly carried out at the farm and only transform the commodity into a slightly different form prior to storage, marketing or further processing (Nyagadza, 2021a,b). Secondary processing operations entail increasing nutritional or market value of the commodity and the physical form or appearance of the commodity is often totally changed from the original. Some examples of secondary processing include but not limited to milling grain into flour, grinding groundnuts into peanut butter and making cheese out of milk.

The outbreak of the COVID-19 has disrupted food processing industries globally through challenges associated with rules on social distancing, by labour shortages due to sickness, and by lockdown measures to contain the spread of the virus. In confined spaces, such as packing plants for fruits and vegetables or meat processing facilities, necessary social distancing measures have reduced the efficiency of operations as there is an overriding need to ensure adequate protections for employees. Many firms have also reported high rates of worker absences; for example, staff availability was reduced by up to 30% in French meat processing facilities in the country's COVID-19 hotspots. The manufacturing industry in Zimbabwe has not been spared from the impact of the pandemic. Presenting his mid-term fiscal policy to the Zimbabwean parliament on the 16th of July 2020, the Finance Minister Professor Mthuli Ncube highlighted the impact of the COVID-19 pandemic on the manufacturing industry including those industries that rely on agriculture for raw

**Table 1. Volume of manufacturing index**

Manufacturing	2019	2020 Budget	2020 Revised Budget	2020 vs 2019
Foodstuffs	109.4	105.0	87.5	-22%
Drinks, Tobacco and Beverages	76.6	83.0	68.9	-15%
Textiles and Ginning	90.6	63.0	91.5	1.0%
Clothing and Footwear	26.8	96.0	25.4	-5%
Wood and Furniture	214.4	93.4	203.7	-5%
Paper, Printing and Publishing	90.1	98.0	72.1	-20%
Chemical and Petroleum products	76.3	75.0	83.9	10%
Non-metallic mineral Products	130.2	93.0	104.2	-20%
Metals and Metal products	59.7	82.0	53.7	-10%
Transport, Equipment	56.6	68.0	50.9	-10%
Other manufactured goods	95.2	69.0	85.7	-10%
Manufacturing Index	87.4	87.7	77.0	-12%
Growth Rate	-8.7	1.9	-10.8	

Source: (Ncube, 2020)

materials (Ncube, 2020). There was a general reduction the volume for all industries with the highest reduction of 22% being witnessed in the manufacturing of food stuffs (Ncube, 2020). In such a scenario, the impact is felt by all players along the whole supply chain, starting from the producers of the raw materials, that is farmers (according to data from the Food and Agriculture Organisation (FAO), agricultural activities in Zimbabwe supply 60% of the raw materials required by the industrial sector), up to the consumers. Table 1 shows the Volume of Manufacturing Index.

#### 4.7. Impact on local pricing systems

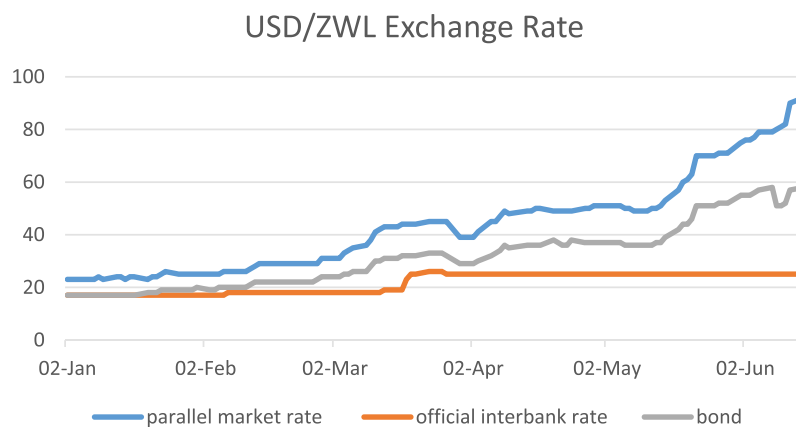
There is a marked increase in the price of food beyond the reach of many during this era of the COVID-19 pandemic. The announcement of the initial 21-day national lockdown resulted in panic buying and hoarding of basic commodities, such as sugar, cooking oil and bread, as well as sanitizers across Zimbabwe (Zimbabwe Congress of Trade Unions (ZCTU), 2020). Resultantly, shortages ensued whilst some supermarkets reacted by increasing prices of basic goods, for instance, by as much as 50% for example, a 2 kg packet of sugar cost ZWL 44 in March 2020 but was up to ZWL 210 by end of June. Shortages of some basic commodities on the markets have continued, especially for maize meal with desperate households spending hours in long lines to purchase scarce subsidized maize meal. Subsidized maize meal sells at 70 ZWL/kg at supermarkets and some retail shops. On the parallel market, maize meal prices are up to 4 to 5 times higher and are unaffordable to many poor households. Shortages are also being fuelled by the movement restrictions as most businesses rely on imports, mainly from South Africa (Zimbabwe Congress of Trade Unions (ZCTU), 2020). The Zimbabwe National Statistics Agency (ZIMSTAT) reported annual inflation for March at over 675%, up from 540% in February. Independent analysts estimate inflation is almost double those rates. ZIMSTAT also reported a 13% increase in the food poverty datum line for March compared to February and a 21% increase in the total consumption poverty line for the same period. In late April, the government announced a price freeze on basic food commodities to the March 25 levels. Despite this, prices for most commodities have not reduced but continue to increase in

response to the inflationary environment. At a time when wages and salaries remain stagnant, such a scenario leaves the majority of workers stranded.

The inflation is also creeping into the USD pricing system, for instance, a 20-l bucket of mopane worms was USD50 by end of May 2020 as compared to the USD45 before the lockdown in March of the same year. In early April 2020, the government allowed the use of the US Dollar again for local transactions after having banned it in 2019 using Statutory Instrument 142 of 2019. The reintroduction of the USD has led to an increase in the already high parallel market US Dollar to Zimbabwe Dollar (USD/ZWL) market exchange rate (Figure 3 and 4). To curb this challenge, the government introduced the interbank rate. The introduction of the interbank market instead of eliminating the parallel market, led to a two-tier exchange rate, the interbank rate and the parallel market rate. Furthermore, businesses complain of failing to access foreign currency on the interbank and end up benchmarking their goods and services using the parallel market rate thus inflating the prices (Mhlanga, 2020). Most goods and services have increasingly been charged in USD, yet most incomes are still in ZWL. Cash, mobile money, and electronic transfer prices in local currency are priced above prevailing parallel market rates taking advantage of the COVID-19 pandemic. There is a lot of profiteering among businesses such that when the exchange rate goes down, prices do not go down. Most incomes are very low for poor households to exchange ZWL to USD at the galloping parallel market rates to purchase enough basic food in USD to meet their needs.

**Figure 3. Market exchange rate (USD/ZWL).**

Source: (Famine Early Warning Systems Network (FEWS NET), 2020)



**Figure 4. Zimbabwe major exports destinations.**

Source: (Global Trade Statistics, 2019)



A combination of sustained currency weakness and low domestic supplies have exerted strong upward pressure on food prices since the second half of 2019, causing abrupt increases and sustaining high levels. Despite modest declines in December 2019 and January 2020, reflecting the implementation of price subsidies and improved market supplies, prices continued to rise sharply since February (ZimStat, 2020). The annual inflation rate in May was estimated at nearly 800% (Mhlanga, 2020). The increases in recent months have also been underpinned by the effects of the COVID-19 pandemic. As a direct result of the movement restrictions, shortages of have led to an increase in price as a response to decreased supply. A case in point is the decrease in maize supply and a subsequent shortage in mealie meal, resulting in increased prices. All in all, the price hikes in the midst of a global pandemic where most breadwinners are not going to work has led to a dire food insecurity situation with over 7.7 million households requiring food aid according to a report by WFP. The numbers are set to increase as the COVID-19 pandemic affects more vulnerable sections of the country. The spreading COVID-19 virus has left both lives and livelihoods at risk following severe back-to-back droughts in the SADC region. Based on available information, the COVID-19 pandemic is likely to continue in the near to medium term, and an increasing number of positive cases are likely due to both the spread of the virus. While it is difficult to predict how long the pandemic will prevail and its severity, it is anticipated that the effects on food prices and income sources will persist through at least the end of the year.

#### **4.8. Impact on international trade**

The World Trade Organisation (2020) states that the COVID-19 pandemic represents an unprecedented disruption to the global economy and world trade, as production and consumption are scaled back across the globe. A lot of countries in Sub-Saharan Africa rely heavily on imported food to meet their demand and these nations are likely to face a disproportionate risk from supply chain failures, especially in the face of border-crossing closures due to Covid-19 pandemic (FAO, 2020). The Organisation for Economic Co-operation and Development (OECD) interim economic outlook report of March 2020 projected a decline in the world's economic growth from 2.9% to 2.4% (Organisation for Economic Co-operation and Development (OECD), 2020).

For Zimbabwe, exports of goods, mainly primary commodities, which accounted for an estimated 22% of GDP in 2018 are expected to be adversely affected by direct and indirect linkages with the global economy, mainly China and European Union (EU) countries (UNDP, 2020). Zimbabwe's links with China have been extensive given the Look East Policy that was adopted by the previous administration. China remains an important destination for Zimbabwean exports, especially tobacco, which is likely to be adversely affected by the economic slowdown in that country. The outbreak and spread of COVID-19 coincided with the country's 2020 tobacco marketing and trading season. Tobacco is one of the country's major foreign currency earners, with export earnings reaching US\$142, 2 million for the 2019 season, an increase of 122% from US\$63, 5 million recorded in the comparative period in 2018 (Global Trade Statistics, 2019). Sadly, the major importers of flue-cured tobacco, namely China, South Africa, and selected European countries, among others are among the hardest hit by COVID-19. Thus, depressed demand and slow recovery in these countries will likely have an impact on the Zimbabwe's export earnings. The same uncertainties also apply to other agriculture exports, particularly, horticulture exports, whose main markets are in Europe. Furthermore, China is also an important source of intermediate goods for South Africa and Zimbabwe's main trading partner and, thus, any slowdown in economic activity in China will also affect the country indirectly via reduced trade with South Africa (Nyangadza, Kabonga et al., 2021; UNDP, 2020).

Apart from its effects on exports of farmers, COVID-19 will have a huge impact on the imports, especially the prices of inputs. In countries like Zimbabwe where farmers depend more on the inputs from other countries, COVID-19 will have a huge impact on the cost of imported inputs, and therefore, production. The UNCTAD (2020) also reported that many African countries are net importers of food, with the continent spending about 65 USD billion on food imports in 2017. Though there is no documented evidence of COVID-19 on food imports, its existence is presenting a threat in this direction. Another anticipated risk associated with the COVID-19 pandemic, as far as international trade is concerned, is trading with countries where health systems are not

functional and where strong measures to reduce this pandemic are not taken. For instance, products from countries where COVID-19 is not dealt with adequately will not find their way to other countries as these countries will not be able to accept the products in fear of the pandemic. This will have a strong impact on countries such as Zimbabwe and most third world countries where there is no clarity on the measures which are being taken to combat this virus. This poses a long-term threat to international trade and policies.

#### **4.9. Impact on consumer livelihoods**

The COVID-19 pandemic severely threatens an already critical food security situation arising mainly from the prevailing poor macroeconomic conditions and consecutive years of drought in Zimbabwe. The movement restrictions associated with COVID-19 have significantly impacted businesses and urban and rural livelihoods, further limiting household incomes. This has led to a higher than previously anticipated food insecure population, especially in urban centers. Humanitarian food assistance currently is preventing more severe food security outcomes. The problem is a combination of drought and constrained funding. According to the UN fact sheet, more than 7 million Zimbabweans (almost half the population) are food insecure. Only 10% of them got government support in the past 6 months (Ncube, 2020).

The government declared an extension of the initial 21-day national lockdown, which started on 30 March, by 2 weeks through 3 May and then further extended on the 3 May indefinitely. Most livelihood activities in urban and rural areas, both formal and informal, have been severely affected. The economy is set for a 4.5% contraction from an initial projected 3% growth (Ncube, 2020). A Zimbabwe Vulnerability Assessment Committee (ZimVAC) analysis of the 21-day Zimbabwe Covid-19 lockdown revealed that people in urban areas are likely to face food insecurities due to rapid price hikes of basic commodities. The report analysis chronicled that, in urban areas, the most important sources of income are formal salaries and wages, which constitute 38.23% of the total households. Prices of basic commodities have shot up significantly owing to shortages on the market and profiteering. The government has since ordered price controls to prevent people from being ripped off by greedy retailers. In general, the well-being of ordinary Zimbabweans has taken a nose dive as a result of the pandemic, with the majority of the population in dire need of food aid.

#### **5. Conclusion and recommendations**

Covid-19 has disrupted supply chains and thrown the global food economy into disarray. As border closures, production stoppages, and export restrictions limit supply—demand has surged inflating prices and impacting the world's poorest and most marginalized people, Zimbabwe is no exception. This article investigated the impact of the COVID-19 on the agriculture supply chains in Zimbabwe. The study revisited previous viruses, such as Ebola, to extrapolate, though marginally, the implications of the COVID-19 pandemic. Using secondary sources and the general agriculture supply chain to guide understanding, the findings show that unless measures are put in place to safeguard farmers especially smallholder activities in Zimbabwe, COVID-19 has the potential to reproduce the same catastrophic implications created by Ebola in West Africa countries where peasant food systems were shattered and livelihoods strategies maimed. The extrapolation of the possible implications of COVID-19 was discussed in subsections that mirror the agro-supply chain, namely producers, transporters, manufacturers, retailers and consumers. The study went further to analyse the impact of the pandemic and subsequent lockdown measures on the pricing system in Zimbabwe as well as the impact on Zimbabwe's export and import situation. Supply chain shocks by COVID-19 have disrupted flows of production and trade as has already been noted in the country. This has subsequently led to unstable market effects and implications on both food prices and agri-food-based incomes.

First and foremost, as a result of lockdown measures put in place to fight the pandemic, agricultural production has been negatively affected. The impact varied from inability to access inputs as a result of movement restrictions to unavailability of adequate labour due to social distancing requirements. For the produced goods, farmers are facing challenges accessing markets. They are faced with various challenges, including lack of transport as most transporters are not allowed to travel under the lockdown



guidelines. The ban on all public transport (except for essential services and staff) affected most livelihood activities with little free to no free movement within the country, even within communities. Additionally, some illegal structures belonging to small and medium enterprises and informal traders have been destroyed across the country as the government is trying to organize this sector. In Zimbabwe, the informal sector contributes significantly to the development of the Zimbabwean economy (estimated over 60% of GDP and 85% of jobs) (Ruzvidzo et al., 2020). Understandably vendors need to take to the streets for their livelihood, farmers need to make sure their product moves on a daily basis and Zimbabwean citizens rely on both these supply groups for goods as a more affordable alternative. This is likely to have long-term impacts on the informal sector and the ability for populations reliant on this income source to access it. Moreover, local and international remittance flows have decreased across the country. Incomes from the agriculture sector are also below average and limited across much of the country. All this has led to a decreased customer base for the farmers.

Manufacturing industries have also been affected, with the country witnessing an overall reduction in the manufacturing volume index. The sector has been affected by transport logistics issues as well as having to adhere to lockdown measures that require that their staff stay at home to avoid transmission of the disease. The retail sector has also faced a number of challenges as a result of the pandemic. Some sections of the formal sector laid off staff or closed business completely. The Confederation of Zimbabwe Industries reported that over 80% of local businesses cannot afford paying staff if the lockdown is extended further. All these factors combined have led to general reduction of the well-being of consumers. The agriculture supply chains in Zimbabwe provide a lot of jobs on different levels of the chain, and a disruption of the supply chain will most likely have an impact on the well-being of the consumers and the economy at large. Not only will vulnerable producers experience greater difficulties accessing enough food for survival and adequate nutrition due to COVID-19 but also many individuals and whole communities that rely on them for food production.

The article recommends that with the unavoidable impact of COVID-19 on farmers, the government must increase its support towards farmers, especially smallholders, as well as all the vulnerable households that directly depend on the land and agriculture-related activities, both for livelihood development and incomes. The government should expand the fiscal space and offer subsidies to farmers either in the form of loans or inputs and equipment. This can help in stimulating and sustaining farm operations, and ensure that production does not halt as this is the heart of the whole agriculture supply chain. When farmers are given the necessary financial support in terms of affordable loans, they can resiliently respond to the threats posed by COVID-19. Secondly, there is need to establish collection centers closer to producers to reduce the need for mobility. However, this requires an improvement of storage facilities so as to reduce post-harvest crop losses along the supply chain. This will solve both the logistical challenges and the market access challenges for the producers. This also allows the manufacturers to continue their operations as they will have a central point of collection for either raw materials or produce for value addition. Lastly, farmers in Zimbabwe are lagging behind as far as technology advancement is concerned. There is a need to accelerate the development of e-commerce for farmers to limit the need for in-person transactions, especially in this era of social distancing and movement restrictions.

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