An Evaluation of the Impact of Covid-19 on Performance of the Agro-Processing Firms in Zimbabwe

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Abstract

This study examined the impact of the COVID-19 pandemic on the performance of the agro-processing sector. The study was guided by the positivism research philosophy. The explanatory research design was adopted. Data was collected through a survey and it was analysed using regression and correlation data analysis frameworks. The findings of the study were that the COVID-19 pandemic affected production, supply of raw material, demand for agro-products, profitability and the viability of the sector. The study concluded that the COVID-19 pandemic had a devastating effect on the agro-processing sector in view of its negative effects on production capacity, supply of raw materials, demand profile and profitability. In view of this, the study recommends that intervention strategies and policies be adopted to revive the sector given its value to the GDP, employment and poverty. It is recommended that firms in the sector invest more resources in the development of strong and intense learning, and innovative capabilities, invest in technology and build strong and sustainable network with the supply chain stakeholders. As well, the government must provide recovery bail out for most of the firms in the agro-processing sector.

Key words: Agro-processing, COVID-19 pandemic

Introduction

One of the greatest threats to the attainment of higher agricultural productivity and production has been the COVID-19 (corona virus disease of 2019) (Poudel1, Poudel1, Phuyal1, Tiwari1, Bashyal1and Bashya, 2020; WHO, 2019). The pandemic has affected the lives of many people and the entire global economy more than SARS. For instance, in many countries across the globe, the virus has affected major economic sectors such as agriculture, manufacturing, tourism, mining and the financial sector.

In Africa, agriculture is a key pillar of sustainable socio - economic development and is vital in view of its contribution to the Gross Domestic Product (GDP) (FAO, 2003). Therefore, the need to promote the agro-processing sector is based on the role the sector can play in promoting economic development in upstream and downstream subsectors, job creation potential, promoting food security, export earnings and rural development. Despite the potential to achieve these socio-economic goals, agro-processing has lagged behind in most African countries, with significant slow agriculture production and sharp annual fluctuations in

agriculture output (FAO, 2003). The declining agriculture productivity and production has contributed to its small role in promoting GDP.

The available literature indicates that the emergence of COVID-19 could have devastating effects on the fragile agro-processing sector. Therefore, the study to be undertaken seeks to explore the impact of the pandemic on the agro-processing sector. Since the agro-processing sector is significant for socio - economic development of countries, it is important to assess the effect of the COVID-19 pandemic on the sector. The various pandemic protocols, regulations, practices and provisions may interfere with the supply chain of the agro-processing, funding of the sector, labour supply, marketing practices, yield, size of agricultural land, demand profiles of agriculture output and supply of inputs (Siche, 2020). There are greater predictions and indications that the COVID-19 pandemic has emerged as the greatest risk to the agro-processing sector. This has therefore motivated the need to explore the impact of the pandemic on the agro-processing sector.

In Zimbabwe, for instance, the COVID-19 pandemic emerged against the backdrop of a difficult macro-economic environment, climatic shocks, fragile agricultural sector and this has become a great risk to the agro-processing sector. The effect of COVID-19 pandemic on Zimbabwe's agro-processing sector is therefore a top priority in view of the collapse of the agriculture sector following years of natural disasters in the form of perpetual droughts.

As developing countries accelerate their growth in socio – economic development, the agro-industry which is the post-harvest activities involved in the transformation, preservation, and preparation of agricultural production for intermediate or final consumption, typically grows in importance relative to agriculture and takes a dominant position in manufacturing. The agro industry includes, i) food and drinks; ii) tobacco goods; iii) paper and wood products; iv) textiles, footwear and apparel; v) leather products; and vi) rubber products, according to the International Standard Industrial Classification (ISIC). All of these sub-sectors are included in our overall analysis of agro-industrial production and value addition, GDP participation, and the manufacturing sector.

As the novel coronavirus SARS-nCoV-2 rapidly spread the COVID-19 disease to six continents, numerous governments around the world declared a health emergency. The pandemic was proclaimed on March 11, 2020, by the World Health Organisation (WHO), which urged countries to prepare for it by following the Global Strategic Preparedness and Response Plan (GSPRP) (WHO, 2020a; Vasavada, 2020). A coronavirus pandemic has never been seen before, according to WHO, and this disease was the first caused by a coronavirus. There have been five pandemics in the last century, with the most recent being COVID-19, which is the latest of these. The previous four were caused by influenza viruses (H1N1, H2N2, H3N2, and H1N1), and resulted in the deaths of 50 million people each (Liu et al., 2020). According to the WHO, this outbreak was more than just a public health catastrophe; it will have ramifications across the board.

Consequently, this fight requires participation from all sectors and all individuals (WHO, 2020c). It is estimated that the pandemic will have devastating effects on various sectors of the economy. (WHO, 2020b).

The COVID-19 pandemic has been the greatest threat to the attainment of higher agricultural productivity and production (Poudel1, Poudel1, Phuyal1, Tiwari1, Bashyal1and Bashya (2020), WHO, 2019). The pandemic has affected the lives of many people and it is believed

that it affected the entire global economy more than SARS. More so, the pandemic has affected major economic sectors such as Agriculture, manufacturing, tourism, mining and the financial sector.

The World Health Organisation's 'Strategic preparedness and response plan' includes the health measures that all countries were required to take in order to prepare for and respond to the pandemic. This plan covers what we have learned so far about the virus and aims to turn this knowledge into strategic action that will guide all national and international partners while developing national and regional operational plans

The various measures and regulations adopted to reduce the spread of the pandemic had devastating effects on the agro processing sector across the globe. As well, the measures and regulations adopted to reduce the spread of the pandemic resulted in the closure of workplaces and educational institutions, as well as temporary restrictions on travel and social gatherings. Working from home and holding online meetings became standard practices. People in the agro-processing industry, on the other hand, do not have the option of working from home, so they must adhere to their typical office routines (Alon, Kim, Lagakos & VanVuren. 2020, FAO, 2020, WHO, 2020).

As a result of the COVID-19 crisis, workers' response plans were developed to provide guidance for the continuity of operations in food processing facilities and to manage coronavirus in the agro-processing industry. The plans included a hierarchy of control requirements for cleaning, sanitation, and disinfection of facilities, screening and monitoring of workers for COVID-19, managing sick employees, and education programmes for workers and supervisors to prevent coronavirus transmission (Andersen, Hansen, Johannesen & Sheridan, 2020).

Every industry in the world is waiting to see how the COVID-19 outbreak will affect the manufacturing industry, and the agro-processing industry is no exception. The agro-processing industry, however, differs from other industries in that it produces products that are necessary for daily life. Everyone understands that if one factory closes, a certain number of people who work at these factories may go hungry; however, if processors and distributors become infected, all people are at risk (Andersen et al, 2020). Furthermore, the agro-processing industry is a very important economic sector.

During a pandemic, the food sector faces different challenges than other sectors that are not critical to daily life, such as tourism and aviation. A pandemic could cost the aviation industry US$113 billion and the tourism industry US$80 billion (Aubrecht, Essink, Kovac & Vandenberghe, 2020). Some food companies are facing various challenges as a result of a drop in income, whereas others are working hard to meet retailers' growing demand. During the current COVID-19 outbreak, some difficult decisions were made, including the temporary closure of various businesses. The fact is that this pandemic clearly demonstrated that different companies from various industries are inextricably linked all over the world (Aum, Lee & Shin 2020).

Available literature largely focuses on the epidemiology (Poudel, Wu, Mao, Wang, Sun, Rozelle and Zhou, 2020), causes, clinical signs, diagnosis, prevention and control of the virus (Aum et al, 2020; Poudel, Mao, Wang, Sylvia, Rozelle and Zhou, 2020). However, as the COVID-19 virus is still evolving, to ascertain its exact impact on the agro-processing sector is still limited. An assessment of its impact on the agro-processing sector in Zimbabwe could,

therefore, be significant as it may guide interventions and strategies that may be adopted to limit the impact of the pandemic on the sector.

The existing literature on global pandemics such as Ebola, Severe Acute Respiratory Syndrome (SARS), and Middle East Respiratory Syndrome (MERS) all had severe implications on the agro-processing sector and therefore can be used to extrapolate the consequences of COVID-19 on the sector. When Ebola hit Liberia, Guinea and Sierra Leon in 2014, the prices of domestic raw agriculture materials soared by 30 percent, which in turn affected the viability and competitiveness of the firms in the agro-processing sector (FAO 2014; World Bank 2014). On the other hand, in Sierra Leone, the Ebola epidemic and the response strategies used by the state and individuals disrupted the food chain thereby leading to a declining performance of the firms in the agro processing sector. Capacity unitisation declined, production declined and firms faced viability challenges (UNDP, 2014). The UNDP Regl Bureau for Africa (2014) also reveals that as government policies restricted the movement of people through road blockages and community quarantines in West Africa as a response to Ebola, markets were disrupted, leading to shortages of agriculture raw materials to the agro-processing sector which in turn led to production disruptions and viability challenges. In China, the emergence of SARS resulted in the decline in the production capacities of firms in the agro-processing sector (Chen, 2020).

In 2014, the Ebola epidemic resulted in huge tracts of abandoned agricultural lands and reduced fertiliser use in West Africa (FAO, 2014). This affected agricultural production and productivity which in turn affected capacity utilisation in the agro-processing sector. The restrictions also affected labour availability which in turn directly affected production and capacity utilisation.

Beltrami (2020) asserts that, while the food and agricultural sectors were expected to be less affected by the pandemic than other sectors, illness-related labour shortages, transportation disruptions, quarantine restrictions on farm activities, as well as access to markets and supply chains, will exacerbate food insecurity. Danley (2020) argues that as businesses across all industries, including agriculture, prohibit employee travel and implement work-from-home programmes, a dilemma arises for farmers and their workers who must be on the farm to produce. However, the International Food Policy Research Institute (2020) believes that the virus cannot pose a threat to food security because sufficient stocks of staple cereals exist.

On the demand side, a loss of purchasing power as a result of the sickness may affect eating habits, resulting in low demand for agro-processed products. This may affect the viability of the firms in the sector. Panic food purchases following the news of movement restrictions might disrupt the supply chain and result in localised price increases in nations such as the United States, South Africa and many others (Chen, 2020; Nkanjeni, 2020). In developed countries such as the United States, it is argued that farmers growing more specialzsed crops may be more affected than others, and thus there are unlikely to be a significant decline in the performance of firms in the agro-processing sector. Additionally, these farmers are claimed to be able to function with little interruption because the majority of them who raise grain crops use mechanised instruments that already restrict human-to-human contact and adhere to the standards for reducing viral transmission (Charles, 2020).

The disruption is the supply of raw materials and processed product affect the profitability of firms in the agro-processing sector. This in turn may affect capacity utilisation and growth of firms.

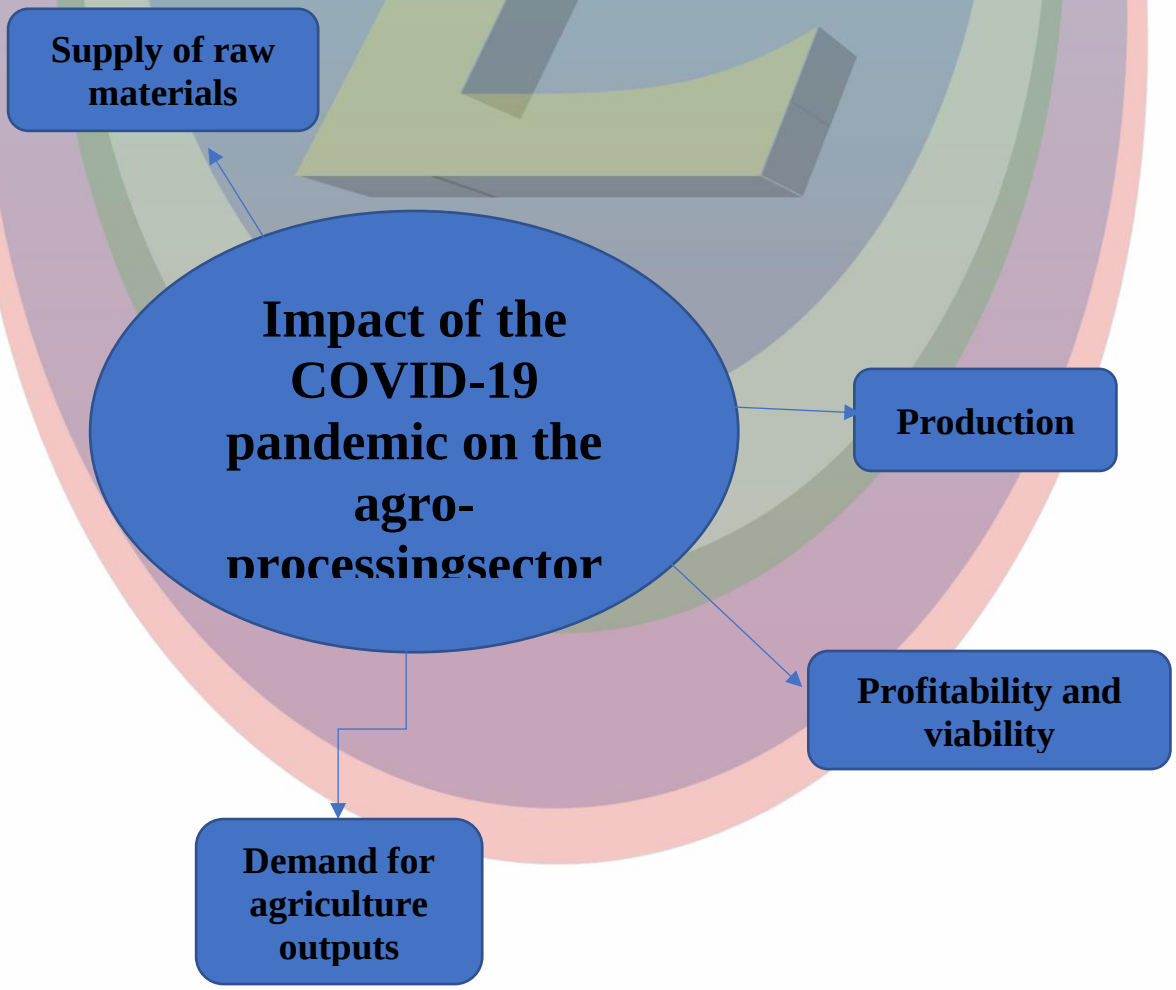
According to FAO (2020) and WHO (2020), measures put in place to manage the spread of pandemics usually lead to supply chain disruptions as well as distribution chains leading to production disruptions.

The reviewed literature shows that the previous pandemics had a devastating effect on the performance of firms in the agro-processing sector. In view of limited literature on the impact of COVID-19 on various sectors in developing countries, this study focused on how the pandemic has affected the agro-processing sector.

The main objective of this study was to examine the impact of the COVID-19 pandemic on the agro-processing sector. The study specifically sought to answer the following questions:

- How has the COVID-19 pandemic affected the agro-processing sector's production?
- To what extent was the agro-processing sector's supply chain affected by the COVID-19 pandemic?
- How has the COVID-19 pandemic affected the agro-processing sector's profitability and viability?
- To what extent was the agro-processing sector's demand profile affected by the COVID-19 pandemic?

The study was guided by the conceptual framework below.



Methodology

The study was guided by the positivist research philosophy and hence the survey data collection method was used. A structured questionnaire was used to collect data from managers and supervisors drawn from five agro-processing firms. Data was analysed using the regression and correlation analysis.

The population of study consisted of all managers and supervisors of firms in the agro-processing sector which are operational and based-in Harare. Therefore, the total population which was targeted comprised of 160 respondents.

Results and discussions

Reliability test

Cronbach's alpha was used to test whether the instrument had internal consistency. The Cronbach's alpha for the variables ranged from 0.557 to 0.763 which indicates that there is internal consistency for questions within each variable. It also shows that the instruments measured the constructs in a consistent way given that the values are greater than 0.5.

Table 1: Reliability test values

Variable	**Corbach alpha**
Impact of COVID-19 on production	0.654
Impact of COVID-19 on supply of raw materials	0.732
Impact of COVID-19 on demand for products	0.667
Impact of COVID-19 on profitablity and viablity	0.557

Impact of COVID-19 on productivity of agro-processing firms

Correlation results in Table 2 show that there was a very strong negative correlation between COVID-19 and organisational production with a correlation coefficient of -0.819. In addition, the result in the table shows that COVID-19 had a negative and significant relationship with production of firms in the agro-processing sector crisis because $p=0.000<0.05$. This shows that COVID-19 had a negative effect on the production of firms.

Table 2: Correlation between COVID-19 and organisational production

		COVID-19	Organisational production
Organisational production	Pearson Correlation	1	-.819**
	Sig. (2-tailed)		.000
	N	160	160
Organisational production	Pearson Correlation	.819**	1
	Sig. (2-tailed)	.000	
	N	160	160
**. Correlation is significant at the 0.01 level (2-tailed).			

***Source**: Survey data (2022)*

Table 3 also shows that the COVID-19 pandemic had a significant and negative influence on the productivity of firms in the agro-processing sector. This result implies that the COVID-19 pandemic disrupted the productivity of firms used in this study.

Table 3 Regression analysis of the relationship between COVID-19 pandemic and productivity

Model	**Standardized error**		**Standardised Coefficients**		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	3.336	2.254		3.001	
Productivity	.45	3.167	-5.112	2.453	.000

***Source**: Survey data (2022)*

Impact of COVID-19 on supply of raw materials to the agro-processing firms

Table 4 results show that there was a strong and negative correlation between the COVID-19 and the supply of raw materials to the firms in the agro-processing sector because r=-0.556. In addition, the results show that there was a strong but negative relationship between COVID-19 and the supply of raw materials to firms in the agro-processing sector because p=0.000 and this is <0.05. This means that the COVID-19 negatively affected the smooth flow of inputs and raw materials to the firms in the agro-processing sector.

Table 4: Correlation between COVID-19 and supply of raw materials

		COVID-19	Supply of raw materials
Supply of raw materials	Pearson Correlation	1	-.556**
	Sig. (2-tailed)		.000
	N	160	160
Supply of raw materials	Pearson Correlation	-.556**	1
	Sig. (2-tailed)	.0231	
	N	160	160
**. Correlation is significant at the 0.05 level (2-tailed).			

***Source**: Survey data (2022)*

According to Table 5 the value of p=0.000 and it is therefore less than 0.005. This result shows that the COVID-19 pandemic had a significant and negative influence on the supply of inputs and raw materials of firms in the agro-processing sector because the (b =-2.776). This result implies that the COVID-19 pandemic disrupted the supply of inputs and raw materials of firms used in this study. This had a negative effect on productivity of firms.

Table 5 Regression analysis of the relationship between COVID-19 pandemic and supply of raw materials

Model	**Standardized error**		**Standardised Coefficients**		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	2.211	1.432		2.431	
Supply	.34	2.276	-2.776	1.321	.000

***Source**: Survey data (2022)*

Impact of COVID-19 on demand for agro-processed products

According to the correlation statistics indicated in Table 6, there was a strong and negative correlation between COVID-19 and demand for agro-processed products because r=-0.561. In addition, the result shows negative positive and significant relationship between COVID-19 and the demand for ago-processed products because p=.000<0.05). It can be inferred that the COVID-19 led to slump in the demand for agro-processed products

Table 6: Correlation between COVID-19 and demand for agro-processed products

		COVID-19	Demand for agro-processed products
Demand for agro-processed products	Pearson Correlation	1	-0.561**
	Sig. (2-tailed)		.000
	N	160	160
Demand for agro-processed products	Pearson Correlation	-0.561**	1
	Sig. (2-tailed)	.000	
	N	160	160
**. Correlation is significant at the 0.01 level (2-tailed).			

***Source**: Survey data (2022)*

According to Table 7 the value of p=0.000 and it is less than 0.005. This result shows that the COVID-19 pandemic had a significant and negative influence on the demand for agro-processed goods because the (b =-3.678). This result implies that the COVID-19 pandemic affected the viability of firms given the slump in the demand for goods.

Table 7: Regression analysis of the relationship between COVID-19 pandemic and demand for agro-processed products

Model	**Standardized error**		**Standardised Coefficients**		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	4.556	2.643		3.451	
Demand	.55	1.989	-3.678	2.221	.000

***Source**: Survey data (2022)*

Impact of COVID-19 on profitability and viability of firms in the agro-processing sector

Results in Table 8 shows that there was a strong and negative correlation between COVID-19 and profitability of agro-processing firms because r=-0.754. In addition, the regression result shows that the negative relationship was significant because p=0.000<0.05. It can therefore be

inferred that covid-19 pandemic negatively affected the profitability of firms in the agro-processing sector. This could be attributed to low demand and the disruption of the supply of raw materials.

Table 8: Correlation between COVID-19 and profitability and viability

		COVID-19	Profitability and viability
Profitability and viability	Pearson Correlation	1	-.754**
	Sig. (2-tailed)		.000
	N	160	160
Profitability and viability	Pearson Correlation	-.754**	1
	Sig. (2-tailed)	.000	
	N	160	160
**. Correlation is significant at the 0.01 level (2-tailed).			

***Source**: Survey data (2022)*

According to Table 9 the value of p=0.000 and it is less than 0.005. This result shows that the COVID-19 pandemic had a significant and negative influence on the profitability of firms in the agro-processing sector because the (b =-3.678). This result implies that the COVID-19 pandemic affected the viability of firms given the negative influence on the profitability of firms

Table 9: Regression analysis of the relationship between COVID-19 pandemic and profitability and viability of agro-processing firms

Model	**Standardized error**		**Standardised Coefficients**		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	4.556	2.643		3.451	
Profitability	.55	1.989	-3.678	2.221	.000

***Source**: Survey data (2022)*

Discussion

This paper examined the impact of COVID-19 on the performance of firms in the agro-processing sector in Zimbabwe. Specifically, the paper examined the impact of COVID-19 on four performance indicators of firms in the agro-processing sector. The focus was to determine how the pandemic affected the overall performance of firms in the agro-processing sector.

The findings of the study indicate that the COVID-19 pandemic led to a slump in the demand for agro-processed products. The findings also indicate that reduced consumer incomes and uncertainty led to a drop in consumption and a change in consumption patterns. This affected the demand for both consumer durables segments (cars, furniture, household appliances, housing, clothing and footwear, for example) and basic products. This finding is in line with views by CCIAP (2020) which argued that the fall in economic activity and other aspects of the business activities resulted in reduced disposable incomes which in turn led to depressed demand patterns.

The study showed that the COVID-19 led to decline and slum in the production capabilities of firms in the agro-processing sector in Zimbabwe. This finding is in line with arguments raised

by Siche (2020) who indicated that COVID-19 led to severe state-mandated lockdowns which affected harvesting activities and hence reduction in the supply of raw materials and other critical inputs in the manufacturing process. This led to a reduction in the manufacturing capacities and hence a severe reduction in the production and capacity utilisation of firms in the agro processing sector. The lockdown measures therefore led to delayed agricultural activities with significant ramifications on productivity. The measures made it difficulty in accessing inputs and supplies and an increase is production costs as well as difficulty accessing markets to buy raw materials and sell goods.

According to this study, the pandemic led to a disruption in the supply of raw materials to most agro-processing firms. This finding is in line with views raised by Poudel1 et al (2020) which indicated that the COVID-19 led to a disruption of most agricultural supply chains because of travel restrictions and reduction on labour for agricultural harvesting. Raat and Zhou (2020) also indicated that the lockdown and subsequent closure of road stalls and bazaars meant that most supplies of raw agricultural materials were delayed and disrupted since farmers were unable to sell their crops to the agro-processing firms.

They study noted that COVID-19 led to a significant fall in the profitability of firms in the agro-processing sector. These findings are supported by views raised by ----- who argued that the COVID- 19 pandemic led to a decline in the viability of most manufacturing firms. This is mainly because of a reduction of household consumption, which is the main growth driver of sales and profitability of firms. A decline in the patterns of household consumption following government´s decision to close shopping centres and restaurants and imposing night curfews led to a fall in sales, revenue and profitability. The high production costs also led to a reduction in profit margins.

Conclusion and Recommendations

The main conclusion that emerged from this study is that the COVID-19 pandemic had devastating effects on the performance indicators of firms in the agro-processing sector. The profitability of firms declined, supply of raw materials was disrupted, production declined and demand for their products declined. These negative effects point to the need for policy intervention and a transformation of strategies by the firms in the sector.

In view of the negative impact of the COVID-19 pandemic on the agro-processing sector, it is recommended that firms in the sector invest more resources in the development of strong and intense learning, and innovative capabilities. It is also recommended that they invest in technology and build strong and sustainable networks with the supply chain stakeholders. The study also recommends that the Government must provide recovery bail out for most of the firms in the agro-processing sector.

Firms' new operational models will rely heavily on digital technologies. First and foremost, this will happen in the advertising, sale, and delivery of goods and services, as well as in interactions with suppliers. Second, firms will need to develop capabilities for acquiring and processing massive amounts of data (big data) in order to make informed decisions (monitoring and adapting to changes in demand, but also redefining supply chains). Finally, industry may be expected to deploy more digital interconnection devices in production processes, as well as more robotics, to boost efficiency, especially given that health security concerns may lead to fewer employees being employed in various stages of production.

This study examined the impact of COVID-19 on the performance of the agro-processing sector and it is recommended that future studies be focused on how the pandemic affected other sectors such as the mining sector.

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