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Archipelago on Lockdown: An Assessment of the Effects of the COVID-19 Pandemic on Philippines' Micro, Small, and Medium Enterprises (MSMEs) Across the Food Value Chain

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ABSTRACT

The paper examined the effects of COVID-19 pandemic on the Philippines' MSMEs across the food value chain and the strategies that food-based MSMEs employed to cope with disruptions. A food value chain framework was used to analyze the food-based MSMEs, focusing on the input and service provision, production/farming, processing, transport and storage, retailing, and consumption. Results revealed the following: (1) different quarantine protocols across provincial and local boundaries contributed to the complexity of transporting inputs and products; (2) limited mobility of manpower contributed to the challenges of continuing business operations; (3) there was an observed increase in new financing programs and training efforts both from government and private institutions to support MSMEs; and (4) limited mobility spurred the demand for e-commerce and the use of digital technology to address supply chain constraints. Strategies that could improve system-wide adaptiveness and viability during disruptions across the food value chain were also recommended.

Keywords: *agribusiness, MSMEs, food value chain, COVID-19 pandemic*

Introduction

The shock brought about by a growing number of COVID-19 cases pushed the Philippine government to enforce the Enhanced Community Quarantine (ECQ) protocols over the entire region of Luzon, where most of the cases occurred and continued to grow in number from March 2020 through June 2020. As time progressed, the pandemic caused disruptions not only in the country's healthcare industry but also to a chain reaction of issues in the agribusiness sector. Micro, Small, and Medium Enterprises (MSMEs) across the food value chain (also referred as "food-based MSMEs") were among those severely impacted by restricted movements during the past few months. Unfortunately, these enterprises were ill-equipped to deal with a prolonged period of limited operations and production stoppages.

In 2018, the Department of Trade and Industry (DTI) reported that more than one million enterprises were operating in the country. Of these enterprises, 99.52% are

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considered MSMEs, which also employ roughly 5.7 million Filipinos. About 47% of these MSMEs are in the food products and beverages industries. During the pandemic, these MSMEs constantly faced the threat of being closed down and having their workers laid off as their financial losses grew. One economist estimated that as of mid-June (2020), 4.9 million Filipinos had already lost their jobs, and unemployment was at an all-time high of 17.7%. Further, it is estimated that at least 40% of MSMEs in the Philippines would not survive the quarantine and its aftermath (Masigan 2020). To complicate matters, the food supply chain was disrupted by the strict implementation of the ECQ protocols across various agricultural producing provinces. Newly established checkpoints disallowed agricultural inputs and products to cross borders, thereby threatening food security, especially in Metro Manila, the capital and most densely populated metropolis of the country.

With all the compounding issues that the food-based MSME sector faced during the early months of the pandemic, it is, thus, imperative that the effects of the COVID-19 pandemic on the food value chain of MSMEs be explored.

This paper aims to: (1) enumerate the challenges and constraints experienced by food-based MSMEs in the Philippines; (2) assess the effects of these COVID-19 related challenges and constraints for each player in the value chain; (3) identify the coping strategies of MSMEs to the disruptions in the food value chain; and (4) recommend strategies to help food-based MSMEs cope with and mitigate the effects of COVID-19.

This study focused on the events that transpired related to the pandemic in the Philippines between December 2019 to August 2020, and the effects that such events have caused on food based MSMEs in the country.

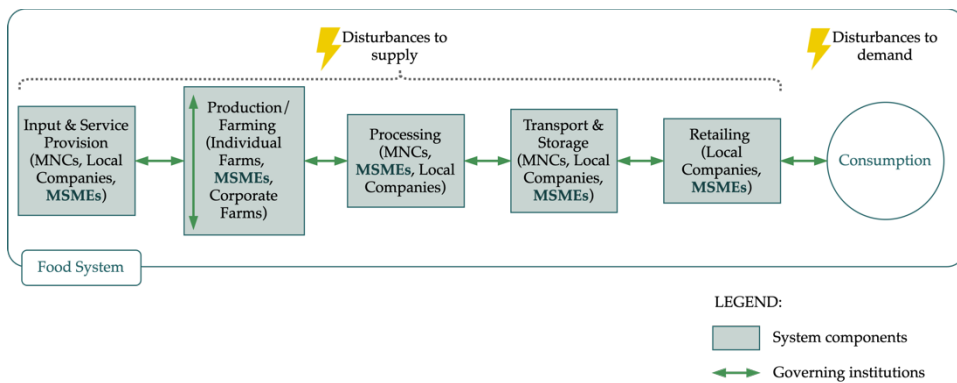
Framework

Food-based MSMEs are MSMEs that produce, process, buy, and sell food and beverage-based products and services. This paper examined the effects of the pandemic on food-based MSMEs and the possible measures government, private sector, and other stakeholders can implement to mitigate the impacts of COVID-19 on this sector. To guide the researchers in their assessment, a food value chain framework (see Figure 1) based on the work of Vroegindewey and Hobdod (2018) was used. In this framework, the food value chain was viewed as a system reliant on interdependent components from the input providers to the consumers. The following discussion elaborates on its components:

- 1) The input and service MSMEs make available the necessary materials that the production and processing component needs. It is dominated by big multinational companies (MNCs) in terms of the production of agricultural and processing inputs. However, MSMEs are very much present, especially in the production of organic agricultural inputs needed for food production.
- 2) The production/farming cooperatives/MSMEs, in turn, produce the raw agricultural products that the processing sector (or Agri processors) manufacture into finished goods. This subsector is dominated by individual farmers. However, some farmers sometimes organize themselves into cooperatives and farmers associations which become governing institutions within the subsector. Such cooperatives act as vertical governing structures and are represented by the vertical line in Figure 1.
- 3) The transport and storage component distributes the finished goods to the retailing sector. This subsector is dominated by big forwarding companies but there are MSMEs present that cater to the more remote areas of the country. These MSMEs play a crucial role in transporting food products from small farmers to the trading centers in the municipalities/provinces.

- 4) The retailing component includes the marketers of both raw and processed products and are those directly linked to the final consumers. Majority of the retailers in the Philippines are food based MSMEs.
- 5) Lastly, the support services component (represented in the framework by the blue arrows) consists of government agencies, private institutions, industry associations, financing institutions, and educational/research institutions who work together to provide the enabling environment for the whole system to work.

There have been disturbances to food supply and demand because of the pandemic. In this paper, the issues experienced by each component will be examined as well as the interventions initiated by governing institutions. From the issues and current interventions, gaps were identified, and recommendations were made for the improvement of programs and policies to enhance the adaptiveness and viability of the Philippines’ food value chain not only during the pandemic but also during the future disruptions.



Source: Adapted and modified from Vroegindewey and Hodbod (2018)

Figure 1. Food value chain framework

Methodology

This paper used secondary data to present the effects of the COVID-19 pandemic on the Philippine food value chain. Secondary data were collected from policy papers and briefs of different local and international organizations, government published data, and business and trade press. Anecdotal evidence was also gathered from food based MSME owners from video news reports and virtual panel discussions conducted in 2020. Observations on digital platform usage related to activities by food based MSME owners were also performed. Recent developments brought about by the pandemic were reviewed using the systems approach, wherein individual sectors that make up the food value chain were examined along with the interrelationships and interdependence between and among these players.

The value chain disruptions and the consequences of these disruptions to food based MSMEs were also analyzed and discussed, revealing the constraints, challenges, and opportunities along the supply chain. Recommendations that will hopefully redound to the food-based MSMEs’ resilience against and adaptiveness towards disruptions of the whole Philippine agricultural value chain were also presented. These recommendations cover each component of the food value chain.

Results and Discussion

Timeline of Quarantine Protocols in the Philippines

From the initial reports of a new virus, a day before 2020 entered, the first confirmed case of COVID-19 in the Philippines was recorded on January 20, 2020 (World Health Organization [WHO] 2020). With the seen contagious progression of the virus infecting several individuals, the government, through the COVID Inter-Agency Task Force (IATF), implemented various levels of community quarantines among various key locations in the country.

Various levels of community quarantine were implemented corresponding to the evolving needs of the health situation starting March 15, 2020 (IATF 2020a). Throughout the months being enacted, four categories (see Table 1) were devised reflecting various restrictions and conditions in mobility, flow of goods, transportation, and workforce activities.

Table 1. Categories of quarantine protocols in the Philippines

	ECQ Enhanced Community Quarantine	MECQ Modified Enhanced Community Quarantine	GCQ General Community Quarantine	MGCQ Modified General Community Quarantine
People Mobility	No Movement	Limited Movement Allowed for Essential Work & Services	Limited Movement Allowed for Essential Work & Services	Permissive Socio- Economic Activities Allowed
Transportation	No Transportation	Limited Transportation for Essential Goods & Services	Limited Transportation for Government Support & Services & Private Operations	Limited Private and Public Transportation
Public Transportation	None	None	Allowed With Social Distancing	Limited Private and Public Transportation
Workforce and Economic Activity	Essential Services Allowed	Selected Establishment (Manufacturing & Processing) Allowed with 50% of workforce	Selected Establishment Allowed with 75% of workforce. Government offices Opened	Selected Establishment Allowed with 100% of workforce

Source: Presidential Communications (2020) and Kamalayan (2020)

The archipelagic nature of the country, and various density of economic and social activities in the country also allowed the government to assign different levels of quarantine on specific cities and regions as summarized in Table 2.

Table 2. Timeline of quarantine protocols implemented from March 15, 2021 to June 15, 2021

	Mar-15	Apr-01	Apr-15	May-01	May-15	Jun-01	Jun-15
KEY CITIES							
NCR	ECQ	ECQ	ECQ	ECQ	MECQ	GCQ	MGCQ
Baguio	ECQ	ECQ	ECQ	ECQ	MECQ	MGCQ	MGCQ
Iloilo		ECQ	ECQ	ECQ	GCQ	MGCQ	MGCQ
Cebu City		ECQ	ECQ	ECQ	ECQ	GCQ	GCQ
Davao City		ECQ	ECQ	ECQ	GCQ	GCQ	GCQ
REGIONS							
Ilocos Region	ECQ	ECQ	ECQ	GCQ	GCQ	MGCQ	MGCQ
Cagayan Valley	ECQ	ECQ	ECQ	GCQ	GCQ	GCQ	GCQ
CAR	ECQ	ECQ	ECQ	GCQ	MECQ	MGCQ	MGCQ
Central Luzon	ECQ	ECQ	ECQ	ECQ	MECQ	GCQ	GCQ
CALABARZON	ECQ	ECQ	ECQ	ECQ	MECQ	GCQ	GCQ
MIMAROPA	ECQ	ECQ	ECQ	GCQ	GCQ	MGCQ	MGCQ

Table 2. Continued...

Bicol Region	ECQ	ECQ	ECQ	GCQ	GCQ	MGCQ	MGCQ
Western Visayas				GCQ	GCQ	MGCQ	MGCQ
Central Visayas				ECQ	ECQ	GCQ	GCQ
Eastern Visayas				GCQ	GCQ	MGCQ	MGCQ
Zamboanga				GCQ	GCQ	MGCQ	MGCQ
Northern Mindanao				GCQ	GCQ	MGCQ	MGCQ
Davao				GCQ	GCQ	MGCQ	MGCQ
Socskargen				GCQ	GCQ	MGCQ	MGCQ
Caraga				GCQ	GCQ	MGCQ	MGCQ
BARMM				GCQ	GCQ	MGCQ	MGCQ

Source: Department of Health. Inter-Agency Task Force for the Management of Emerging Infectious Diseases Resolution Nos. 13 (IATF 2020a), 29 (IATF 2020b), 37 (IATF 2020c), 40 (IATF 2020d), and 41 (IATF 2020e)

Input and Service Provision

Under the era of COVID-19, disruptions have taken place in the supply of inputs (e.g., fertilizers, pesticides, feeds, seeds, extension and advisory services, and food processing raw materials and ingredients) for production, processing, and distribution. Additional disruptions that affected input and service provision were production stoppages in supplier-countries, movement restrictions imposed on vehicles delivering supplies to quarantine areas, and the inability of importers to get import permits, phytosanitary certificates, and customs clearance, among others.

Decrease and delays in supply of animal feeds and veterinary products. The disruption of supply routes delayed the transport of feed supply (Food and Agriculture Organization [FAO] 2020a). This, in turn, strained the Philippine companies which sell finished animal pharmaceuticals or source ingredients from China.

Lack of access to seeds and breeder stocks. Business World (2020) reported that drivers of vehicles carrying local farm inputs such as rice, corn, and vegetable seeds were told to return their cargoes to their points of origin. Meanwhile, problems at the global seed trade front were documented by the Asia Pacific Seed Association (APSA 2020) survey. Such problems included finding freight solutions, reductions in new export orders, and difficulties distributing seeds in the destination countries. There were also problems related to getting export and import permits, phytosanitary certificates, and customs clearance due to unreliable courier services (Asian Seed 2020). In relation to breeder stocks, movement restrictions and disruption of national and international trade routes have restrained farmer access to breeding materials and replacement stocks (e.g., day-old chicks and semen).

Lack of extension and advisory services due to travel restrictions. Extension agents have been hampered in carrying out their agricultural advisory activities in the production season because of travel restrictions and social distancing measures. Hence, farmers were unable to receive guidance to deal with agricultural risks and projection of production (Affognon *et al.* 2020).

Delays and reduction in supply of processing inputs. The longer lead times caused by restrictions imposed on global distribution systems (Poole *et al.* 2020) delayed input supplies to reach processing facilities. Reported reductions in the volume of inputs have negatively affected processing enterprises.

There is empirical evidence of the negative effect on the supply of inputs brought about by the pandemic and the quarantine. The farmers were not able to do their farming activities because: (1) the farmers did not have the farm inputs as some local government units (LGUs) blocked the movement of seeds and agricultural inputs because these were not considered as essential goods; (2) many agricultural supply stores were not allowed to operate;

and (3) farmers did not have vehicles of their own and relied on public transportation, which were not allowed to operate, thereby preventing them from buying the inputs they needed.¹

Meanwhile, in Marawi, some small fisherfolk reported difficulty in obtaining fishing nets and other fishing supplies due to temporary closure of some shops. Furthermore, there were reports from smallholder farmers in Basilan that they had difficulty obtaining fertilizers. It was also noted by an aquaculture specialist that there was a lack of hatchery fry for milkfish which was normally imported from Indonesia. In terms of extension services, a hog raiser in Ifugao noted an absence of insemination services during the ECQ (FAO 2021).

The Dream Coffee company shared that they were unable to ship the coffee beans from T’boli, South Cotabato to Manila during the ECQ in March 2020 because of the closure of airports.² Due to shortage of stocks, they were forced to temporarily halt their operations on March 17, 2020. On the other hand, Zagana.com, an online platform which directly sources out fresh agricultural produce from the farmers and delivers to consumers around Metro Manila, shared that due to restrictions brought about by the ECQ, the shipments of agricultural products from farms to Manila became inadequate³. The company also emphasized that there was a spike in the demand for their products during the ECQ. In effect, they experienced several backlogs and, consequently, had to cancel multiple orders from clients.

Production

The lack of transportation due to quarantine and implementation of restrictions made it difficult for farmers to access essential inputs for production and market their produce. Closures in the food service industry also reduced the market for agricultural produce. Subsequently, the prices of fresh produce and demand have become unstable. The mobility and border restrictions also resulted in labor shortage in agricultural farms and wastage of fresh produce, leading to loss of income most especially among smallholder farmers.

Lockdowns coincided with productive months of the fruits and vegetables sector. The period between March and May is usually a high production season for a lot of fruit and vegetables farmers. However, the pandemic outbreak has made it difficult for these farmers to sell their products. Lockdowns have disrupted deliveries of vegetables from North Luzon to Manila and other regions. Some areas were able to manage, as their harvests were purchased by the LGUs, private sector, and non-government organizations for relief distribution. In addition, some farmers have turned to social media to look for buyers for their harvest and in some instances, have resorted to giving away vegetables for free rather than allowing them to rot (Oxford Business Group 2020).

New sanitary requirements hurting fisheries and aquaculture. The number of fishing activities has also been reduced due to the implementation of sanitary measures, limited supply of inputs, and labor shortage. Under the ECQ, fisherfolk were not able to sell fish to other communities because of the lack of transportation. They sometimes bartered fish for other goods. Fish sellers and fisherfolk also incurred huge losses from fish spoilage due to the closure of some ice plants, apart from logistic problems and long checkpoint queues (Novio 2020).

Health risks facing agricultural workers during the pandemic. Workers in low and middle-income countries, such as the Philippines, have not been provided with proper health services and social protection. Due to limited savings or none at all, many informal workers in

¹ Mary Ann Sayoc, President of the Philippine Seed Industry Association, cited in an ANC interview in April 2020

² Cited by Larissa Josen, owner of The Dream Coffee company, during the College of Economics and Management (CEM) Webinar Series entitled “Agribusiness Innovations in the Time of COVID-19” held last August 11, 2020.

³ Cited by Joshua Aragon, owner of Zagana.com, during the College of Economics and Management (CEM) Webinar Series entitled “Agribusiness Innovations in the Time of COVID-19” held last August 11, 2020.

agriculture are left without a choice but to work despite the self-isolation protocol during the COVID-19 pandemic (Poudel *et al.* 2020).

A farmer who owned a 2-hectare pepper and tomato farm in Nueva Ecija in the Northern Philippines claimed that due to the lockdown, he had to take his produce to the buyers who were the ones who dictated the price⁴. It was also reported that farmers who were desperate to sell their vegetables had to queue for space at makeshift trading posts. Those who were unable to sell their produce just took back their vegetables to their farms and left them to rot. Some farmers did not even want to harvest their produce anymore.

Processing

The ripple effects of lockdowns and community quarantine regulations are also strongly felt by the processing subsystem of the food value chain. Such impacts include reduction in access to markets and processing plants, delays and reduction in input supplies of processing plants, reduced processing capacities, decline in workers' efficiency, modification of product demand, closure of processing plants, compromised storage and conservation, and increased biosecurity regulation.

Additional Sanitary and Phytosanitary (SPS) measures and technical measures contributed to disruptions in food value chains. An added challenge to the food value chain during the pandemic was ensuring that appropriate biosecurity arrangements were in order, which consequently affected how food was being produced in addition to how it was being consumed and distributed (Organisation for Economic Co-operation and Development [OECD] 2020).

Reduced access to markets and processing plants. The disruption in logistical channels poses difficulty in accessing slaughterhouses and meat processing plants. In turn, farmers need to keep their stocks longer and thus, they are burdened with higher post production costs. On the other hand, farmers also incur significant losses, especially those who have no choice but to dump their produce due to lack of available processing facilities.

Reduction in worker efficiency. In the case of industrial feed enterprises that remained operational during the pandemic, the implementation of physical distancing and requirements for additional personal protective equipment hampered their efficiency (FAO 2020a).

The exporters in the Philippines were strictly required to comply with the government regulations both in the Philippines and in the countries where they are exporting⁵. After the pandemic, it is expected that there would be stricter health and sanitary certifications that would be required of exporters. Qatar, for example, requires certification that the products that 1Export Trade and Services, Inc. ships are COVID 19-free.

Transport and Storage

Long-standing logistical issues in the country (Arvis *et al.*, 2018 and Galang *et al.*, 2019) have been put in the spotlight during the lockdown. According to the Supply Chain Management Association of the Philippines, the pre-pandemic logistical challenges remain the same across the archipelago (Almonte 2020). In the PhilExport General Membership Meeting, Pardiñas (2020), as cited by Almonte (2020), listed the current logistical issues as follows: (1) manpower shortage due to lockdown restrictions and lack of public transportation; (2) transport issues due to unavailability of trucks and drivers; (3) increased traffic due to checkpoints; (4) supply issues due to delays, under-deliveries, and non-deliveries; (5) product

⁴ Featured in a 2020 Al Jazeera news video

⁵ Cited by Anna Melissa Nava, CEO and Founder IExport, Inc. during the CEM Webinar Series held last August 11, 2020.

issues related to reduced quality assurance measures; (6) warehouse capacity constraints; (7) data inaccuracy; and (8) high logistics costs.

According to FAO (2021), some agricultural produce, which were usually transported via cargo hold of passenger ships, had to be moved to regular cargo ships, which caused additional strain on an already stretched transport mode. It was reported that shipments from Mindanao (especially Region X) to Metro Cebu and Metro Manila were affected. Moreover, highland vegetables from CAR and crossing the Visayan Sea were also affected by the loss of passenger shipping. There were delays in shipping cargo bound for Visayas or Mindanao as the agricultural produce had to be consolidated first. Such delays caused a decline in its quality and its price because it could only be sold as second class, rather than first class, by the time it reached Iloilo.

There has been an increase in demand for cold storage space in the case of large meat producers, most especially for chicken, due to the problem of low demand. A meat supplier operating nationwide estimated cold storage costs to be PHP 1 million a month (FAO 2021).

Warehousing issues were evident across the many new checkpoints in the country. The Dream Coffee company also shared that, when restrictions were eased, they shipped coffee beans from Mindanao to Manila via sea freight instead of air freight². They also had to work with big traders to ship the coffee beans from General Santos to a warehouse in Laguna and had to wait for about two weeks until the restrictions were eased before they were eventually able to transport their coffee beans to Manila. The 1Export Trade and Services, Inc. also mentioned that DHL charged the company an additional USD 10 as an emergency fee⁵.

Retailing

The food retail sector in the Philippines was poised for continued growth throughout 2020: a growing economy and changing lifestyles have not only led to increased sales but also increased e-commerce activity (United States Department of Agriculture [USDA] 2019). Yet, despite the slowdown during the pandemic, the direct-to-consumer business model has gained traction in the country through the help of digital tools, the private sector, and other non-government organizations.

Community quarantine regulations have imposed a variety of curfew restrictions, adding another retailing hurdle for MSMEs. In Metro Manila wet markets, retailers were forced to deal with scheduling conflicts as they were only allowed to purchase from wholesalers during limited hours and to sell their produce also during fixed periods throughout the day (Lalu 2020). In the Bicol Region, farmers and traders who are considered key partners and suppliers of MSMEs, were restricted to conduct business only once or twice per week, where buyers have begun requesting to pay by installment rather than in full upfront (Conde 2020). FAO (2021) reported that a large market in Quezon City was operating at 100 percent capacity (over 1,400 stalls). However, during ECQ, around 120 to 150 stalls selling only essential goods were allowed to operate. Since March 27, 2020, the city LGU had imposed a maximum of 300 persons only in the market during operating hours.

Consumption

The pandemic has affected consumption patterns and behavior. As highlighted FAO (2020b), as food demand in poorer countries is more linked to income, loss of income-earning opportunities resulting from the pandemic could impact consumption. However, among higher-income families, food demand is generally inelastic and therefore, the effect of an increase in food prices on overall consumption had limited impacts on consumption. There has been an observed increase in both staple food and ready-to-eat food that can be stored, and a strong increase in e-commerce activity.

The fear of contagion and a heightened concern for safety and cleanliness have also resulted in reduced visits to food markets, restaurants, fast food chains, and street food outlets. A corresponding increase in e-commerce deliveries and a rise in number of consumers to eat and make their own food at home have been noted.

Based on a consumer behavior survey of 127 online shoppers amid the pandemic by Salavante (2021), results revealed that food delivery, followed by online groceries, were the top expenditure items of the respondents during the lockdown. Most of the respondents ordered food several times a week and grocery products, either once a week or several times a month. The most common platform used for food delivery and grocery products was GrabFood. Further, PLDT Enterprise data, as cited by Basilio (2020), indicates that the number of Filipino online shoppers increased from 37.75 million in 2018 to 49 million in 2020. Further, the most preferred mode of payment in 2020 was through e-payment (74%) followed by cash on delivery (47%) and bank transfer (42%).

Food-based MSMEs' Coping Mechanisms

Various MSMEs employed digital marketing strategies to cope to deal with the mobility restrictions during the pandemic. Food enterprises have seen the value of digitization and being present in the virtual marketplace as their lifeline for their businesses to survive.

Digital Marketplace

The digital space served as the immediate refuge of the majority of the industries including food based MSMEs. Processed foods have become visible in shopping sites such as Lazada and Shopee. Various enterprises also created social media pages dedicated to becoming digital gondolas of their products. Facebook also served as the primary platform of MSMEs due to its familiarity among entrepreneurs while allowing them to reach the large Filipino user base of the platform. In addition, a few digital marketplaces, such as Zagana and e-Kadiwa, focused on agricultural products. However, with perishability as a concern, some agribusinesses have struggled in making their products accessible online.

Hyperlocal Marketing

The trend in hyperlocal marketing has been observed to emerge among businesses that sell agricultural products driven mainly by their perishability and the travel distance between farm and customer. The popularity of Facebook Marketplace allowed MSMEs to offer their fresh produce specifically within their hyperlocal premises. Consumers were able to browse vegetables, fruits, meat, and other produce on the internet on social media. Typical wet market finds can be easily searched among digital listings. The digital platform has enabled MSMEs to reach their customers and filter out markets which they can serve. The geolocation features common to social media sites also allowed MSMEs to ensure that they can deliver their fresh produce only to the area they have capability.

Delivery Services

Delivery services have also allowed food-based MSMEs to continue their operations. A few food enterprises have onboarded various platforms such as Food Panda, Lalamove, GrabFood, and other local counterparts in the market. With the list continuously growing, these delivery services have helped food based MSMEs to be afloat even during these disruptions.

Product Form Tweaks

Aside from implementing promotion and channel strategies, various food based MSMEs have resorted to offering their products in new forms. Fast food services offered ready-to-cook meals instead of ready-to-eat versions of their products. This strategy allowed consumers to have control over the food they were consuming in the safety of their own

homes. This strategy also reduced the price of the products, as well as higher inventory turnover for the business owners due to high customer demand.

Customers as Partners

To address unemployment concerns, MSMEs have established partnerships among their own customers to increase their market reach. Business packages have been available for those who wish to resell the MSMEs' products in their own specific localities. This strategy allowed MSMEs to reach more customers and increase sales, capitalizing on their customer's motivation and need to earn additional income caused by economic constraints attributed to the pandemic.

With these strategies directly capitalizing on digital marketing, private and public organizations have provided capacity-building efforts to help MSMEs take advantage of the surge in demand for e-commerce. DTI and DA have conducted several training-seminars to help entrepreneurs and business owners gain basic conceptual and strategic skills in this new normal marketing.

Moreover, the use of digital technologies to address supply chain constraints can lead to improved efficiency in terms of reduction in wastage and cost reduction during disruptions. The use of digital technologies can help facilitate a more efficient linkage among suppliers (e.g., farmers), consolidators, and the market (e.g., institutional buyers and end consumers) by eliminating the need for in-person interactions and replacing them with virtual interactions. Digital technologies also decentralize information as information asymmetry (i.e., one party possesses more information than the party they are dealing with) was seen as a common barrier among food chain actors. Players who now have more exposure, awareness, and access to data reduce the concentration of market power to a few significant players and make collaborations and supply chain management more efficient. This decentralization also allows the food chain to be more adaptive to disruptions as more players and linkages are established. Eventually, if MSMEs continue to adopt digital technology, recurring problems on wastage incurred due to the difficulty experienced by farmers to look for a market can be addressed.

Support Services by the Government, NGOs, and Private Sector

Provisions for the Input and Processing Subsystems

Impacts in the processing subsystem include reduction in access to markets and processing plants, delays and reduction in input supplies of processing plants, reduced processing capacities, decline in workers' efficiency, modification of product demand, closure of processing plants, compromised storage and conservation, and increased biosecurity regulation. To address, in part, some of the issues of this subsystem, the public sector, through the Department of Agriculture, has provided around Php 31 Billion worth of agricultural inputs and support among households and farmer-producers as their immediate response to the pandemic (Oxford Business Group 2020). And, to encourage farming at the household level, the Bureau of Plant Industry has made seeds of common crops in the Filipino diet available for free (Quieta 2020 and HortiDaily 2020).

When a large number of businesses closed temporarily, and a number of people became unemployed, various assistance programs of the government in providing inputs were implemented. Vegetable seeds and live poultry were also distributed among affected families for them to grow their own food and be food secured (Ruedas 2020). The program aims to encourage families to practice agriculture and learn agribusiness during this quarantine period. DA also laid out a plan to build a processing facility in Benguet to address multiple instances of fruits and vegetables being dumped due to the value chain disruption (Rodriguez 2020).

Loans, Grants, and Cash Assistance

Because of disruptions in the business environment, various programs related to financing have been provided both by the government and the private sector through loans, cash assistance, and grants for businesses and farmers. The following loan programs shown in Table 3 were launched in 2020 by various government agencies:

Table 3. Loan programs launched by various institutions in 2020 for MSMEs.

Name of loan program	Institution	Description	Reference
COVID-19 Assistance to Restart Enterprises (CARES)	SBCorp and DTI	PHP 1 billion worth of discounted loans from SBCorp and DTI	SB Corporation (n.d.); Conoza (2020); Department of Trade and Industry (2020); Nicolas (2020)
Survival and Recovery (SURE)	DTI and the Department of Agriculture - Agricultural Credit Policy Council	Zero-percent loans specifically for farmers and fishers	Villanueva (2020) and Department of Trade and Industry (2020)
Agri-Negosyo (ANYO)	Department of Agriculture - Agricultural Credit Policy Council	Loan for MSMEs	Dela Cruz (2020)
Kapital Access for Young Entrepreneurs (KAYA)	Department of Agriculture - Agricultural Credit Policy Council	Loan for start-up agripreneurs	Dela Cruz (2020)
Interim Rehabilitation Support to Cushion Unfavorably-affected Enterprises by Covid 19 (I-RESCUE)	Land Bank of the Philippines	Provided by the Land Bank of the Philippines to help MSMEs, microfinance institutions, and cooperatives provide more accessible funds	Land Bank of the Philippines (2020)

Alternative Livelihood Opportunities

In May, the *Balik Probinsya Program* or BP2 was signed as Executive Order 114. This program, which aims to decongest highly urbanized cities by relocating informal dwellers, offers livelihood opportunities such as agriculture-based activities (Office of the President 2020). Based on the most recent data available, around 33,000 dwellers from the National Capital Region have enlisted and expressed their intent to join the program (Gonzales 2020). Though promising, the program is still in its infancy, and the local government partners tasked to house those who joined the program have raised concerns of being unprepared amid the many pandemic-related problems that have been taking place.

Similar to *Balik Probinsya*, DA also provides opportunities for returning OFWs to venture into agriculture and agribusiness. The program includes not only financial assistance but also technical training in agriculture and livelihood development (Dela Cruz 2020).

Because of the recession brought about by the COVID-19 pandemic, 1Export Trade and Services, Inc. has started helping OFWs to be business owners through its “Caravan” Platform (Reverse Balikbayan Box from Philippines to USA) wherein the company ships US-Compliant MSME products in smaller quantities (25 cases maximum) to overseas Filipinos,

who, in turn, are able to sell these products in different online platforms in the US. In case OFWs would like to order other products apart from those provided in the Caravan Platform, they can include those in their wish list and 1Export Trade and Services, Inc. would be the one to source out and consolidate those products from MSMEs in the Philippines.

Remote Learning Opportunities

For interested individuals, free webinars that aimed to equip individuals with practical knowledge and skills in urban agriculture were made available. With more people being concerned about the safety of their food and spending more time indoors, the Agricultural Training Institute (ATI) saw an opportunity to further promote its 4-year-old website-based online learning platform, called *E-Learning for Agriculture and Fisheries*, to promote household food production. The platform teaches urban gardening, pest and disease management, crop production, and processing of potential viable agricultural products. ATI also uses Facebook to provide real-time online seminars and on-demand video tutorials.

Development of Logistics Management Tool

To assist in addressing the growing challenges of the transportation and logistics sector, NEDA launched SCAN or Supply Chain Analytics available in dashboard form (available only after an approved registration) and a reporter version (available for use by the public). SCAN aims to record and report supply chain issues, which could then be used in crafting strategies and interventions in the chain. The SCAN reporter application, which crowdsources real-time information from actual players in the supply chain sector, utilizes collective data that provides a snapshot of the entire Philippine supply chain and logistics network. This helps in improved planning amid the pandemic as data can be updated in real time, thereby making solutions more relevant for actual players out in the field (NEDA 2020). The SCAN dashboard is also an application that operates on the same technology as the SCAN reporter. However, it offers limited access only to key policy makers in government on information about the country's supply chain networks.

With the disruption of the value chain due to restrictions in mobility, supply of agricultural products among dependent provinces has become a challenge, but then, an opportunity has arisen with the KADIWA program of the Department of Agriculture. KADIWA or *Katuwang sa Dima at Gawa para sa Masaganang Ani at Mataas na Kita* is a market intervention which links farmers and consumers directly through channels such as trade shows, market-on-wheels, and online platforms. This is proof that mutual benefits can be reaped from government intervention and digital presence (DA AFID 2020; Philippine Star 2020) using business model innovation. Only one month after the start of the pandemic, the program has reportedly benefited 12,000 farmers, value chain actors, and consumers (DA Communications Group 2020). Customers enjoy lower costs, farmers reap higher profits, and food supply was secured with these programs. Overall, farmers and consumers enjoy better welfare in this market mechanism (Taclino 2020; Panay News 2020; Manabat 2020; Magcamit 2020)

Zagana.com has partnered with farmers in sourcing out fresh agricultural produce, which are brought to consolidation hubs and micro fulfillment centers to cater to consumer demands all over Metro Manila³. The company has also partnered with Grab, which made it possible for them to deliver the products to the clients in 30 minutes. In addition, they sought presence in various online platforms such as Grab Mart, Food Panda, Lazada and Shopee. The company has also collaborated with some government agencies such as DA via its e-Kadiwa platform, and DTI with its Bagsakan Project for MSMEs. Moreover, the company also worked with 1Export Trade and Services, Inc. for exporting agricultural produce. Through these partnerships, they were also able to fix logistical issues especially on the demand side.

Farmers Link to Consumers Through Social Enterprises

Social enterprises focusing on providing e-commerce platforms for agricultural products have also been beneficial for farmers and MSMEs. Some of these agriculture-based e-commerce enterprises are Bukid Fresh, Fresh Deals Philippines, Real Food, The Murang Gulay Shop, SunReese Organics, BayTown's Produce, EchoStore, Farm-to-Table, and Online Palengke (BusinessWorld 2020). Two examples of social enterprises that have stepped up to directly link farmers to consumers are Agrea and iFarms, Inc.

Agrea has helped the disrupted logistics by asking truck owners to ship foods to their end users⁶. The company also utilized their digital platform to secure buyers of farmers' harvest (Broom 2020). The iFarms, Inc., has also been successful in linking the farmers directly to the market through Umá, a digital local food supply chain that is also data-driven (Gomez 2020). According to Gomez (2020), the owner of the company mentioned that "The heart of the platform is actually sold before harvest." The owner's business model ensures that there is less waste and that the farmers produce from Mindanao are delivered at the right specifications and at the right time. Though some of these channels were available since before the pandemic, such innovations can help reduce the impacts of shocks in the value chain and help farmers ensure continuous operations.

Summary and Conclusion

It can be gleaned from the paper that huge disruptions, such as the COVID-19 pandemic, can lead to a chain reaction across the whole food value chain. The key findings of the study can be summarized as follows: (1) different quarantine protocols across provincial and local boundaries contributed to the complexity of transporting inputs, products; (2) limited mobility of manpower contributed to the challenges of continuing business operations; (3) an observed increase in new financing programs and training efforts both from government and private institutions to support MSMEs; and (4) limited mobility spurred the demand for e-commerce and the use of digital technology to address supply chain constraints.

A slowdown in the physical distribution of food products, for example, significantly affects the operations of every component along the food value chain: from the input suppliers to target consumers. In relation to the demand side of the value chain, fear of contagion and a heightened concern for safety and cleanliness has resulted in reduced visits to food markets, restaurants, fast food chains and street food outlets. A major implication of this is the reduction in sales from in-person transactions, thereby catching off-guard enterprises that have little or no capacity to transition into using digital payments and deliveries so they may continue gaining sales revenues.

It was also reported that there was an increase in e-commerce deliveries, a rise in eating at home, and consumers making their own food (Basilio 2020). Lastly, long-standing logistical issues, which have been present even well before the pandemic began, only worsened the problems that food suppliers have encountered amid the variety of implemented ECQ protocols.

These disruptions have aggravated and called attention to the current inefficiencies in the operations among value chain players. COVID-19 has also corroborated the perception that food-based MSMEs lack adaptive business strategies, and it can be gleaned from the sources cited in this paper that MSMEs might be prepared for disturbances but are not fully equipped for disruptions in the market. Yet, despite the disruptions caused by the pandemic, food-based MSMEs have found ways to cope by taking advantage of digital technologies in their business operations and marketing efforts. Digitalization has become the lifeline of

⁶ Cited by Cherry Atilano

MSMEs to stay afloat. As customers have stayed indoors and have moved online, food MSMEs have adapted to the times by using a variety of online platforms to sell their products directly to their customers.

Reports also showed that government agencies and other private institutions developed credit mechanisms to support food-based MSMEs. Aside from this, development of trainings both from government and private institutions to support MSMEs were also implemented. In addition, the limited mobility due to the pandemic spurred the demand for the use of digital technology to address supply chain constraints. An example of a digital tool that was developed to address such issues was the Supply Chain Analytics Dashboard and Incident Reporter launched by National Economic and Development Authority.

Thus, holistic mitigating strategies should be put in place to make the food system viable and more resistant to current and future disruptions. Innovative agribusiness models can also be explored to make chains more efficient even through major disturbances brought by unforeseen events.

Recommendations

A proposed initiative under one component of the food value chain will require counterpart initiatives in each of the other components. For example, if an agricultural production model, such as urban gardening, will be promoted to help ensure food security during the pandemic, there should be corresponding support mechanisms to store, transport, and market the produce if they are to be sold. New policies would also have to be developed in order to protect actors in each component including the consumers. The mechanisms needing improvements for better adaptiveness during disruptions involve: seed, fertilizer and other agricultural supplies (under the Input and Service component); equipment, facilities and other resources (under the Processing component); logistics (under the Transportation and Storage component); marketing and distribution of produce (under the Retailing component); and LGU policies, community mobilization, technical and business mentoring, financial aid and other forms of assistance (under the Support Services component).

System-wide Recommendations

The pandemic has drawn our attention to various pressing and long-standing challenges that urgently need to be addressed. And these challenges cut across all the components of the food value chain. The following integrative recommendations are being prescribed with the aim of making the country's food value chain more resistant to shocks during and beyond the COVID-19 pandemic:

- 1) Conduct studies on the pre-pandemic status specific to each subsystem in the food value chain to determine the variations in impact caused by value chain disruptions during the pandemic. Such studies can help uncover coping strategies that MSMEs can employ in the future during systemwide disruptions. These studies can also focus on determining the levels of disruptions as well as the development of measures and indicators to better gauge the magnitude of the effects caused by the pandemic.
- 2) Intensify marketing efforts to promote the usage of digital platforms and accelerate data collection. Data gathered through these platforms should be made available to research institutions to help modernize all subsystems of the food value chain. This can potentially lead to more efficient operations and processes that are able to adapt to potential disruptions across the food value chain.
- 3) Strengthen efforts to modernize the country's logistics and transportation infrastructure, which requires both physical and digital transformations. Studies have shown that the Philippines is behind many of its Asian neighbors when it comes to

making advancements in product movement (Arvis *et al.*, 2018). The rising demand in e-commerce, a trend which began pre-pandemic and was spurred by recent shifts in consumer behavior, should be matched with policy-making and accelerated modernization to improve the Philippines' supply chain system.

- 4) Review trade policies to improve the flow of goods across national and international borders especially with mobility restrictions amid the pandemic. Trade policies and their likely impacts should be reviewed to modernize and create a more favorable and enabling environment for food trade especially during wide-ranging disruptive events such as the pandemic.
- 5) Prioritize skills development to enable the adaptation to new business challenges introduced by the pandemic but consider equitable access to learning resources. Additional platforms should be made available as alternatives to offline channels as they may also benefit from these resources. It would be a great challenge to involve stakeholders who currently have limited access to technology and ways to improve their digital literacy. The unequal access to modern-day digital technologies risk propagating the “digital divide” that currently exists in the country.
- 6) Enhance financial literacy and knowledge through training. Beyond simply expanding access to financial programs catered to food-based MSMEs, financial literacy and advisory services should also be developed by government agencies.
- 7) Promote the adoption of innovative and integrative agribusiness models. Community-Supported Agriculture and One Island Economy are just some of the effective agribusiness models that are already being implemented in different provinces in the country. Building community-based agribusiness models that do not rely heavily on logistics and distribution and this makes them more resistant towards outside disturbances. The integration of agribusiness models, innovations, an understanding of complex systems, and strong community support is integral to the implementation of these models.

Component-level Recommendations

The following subsections discuss recommendations for each component of the Philippine food value chain. The holistic implementation of these recommendations can potentially lead to the whole value chain becoming more capable of withstanding future disruptions.

Input and Service Provision

- 1) Promote the use of organic and microbial-based fertilizers, the integrated pest management (IPM) technology, and natural alternatives to pesticides and antibiotics for livestock to minimize the use of imported agrochemicals.
- 2) Utilize ICT to extend agricultural extension and advisory services (EAS).
- 3) Revisit and enhance existing trade policies and conduct regular price monitoring of agricultural inputs and agricultural production capacities.

Production

- 1) Harmonize and implement interprovince guidelines for the unhampered movement of essential goods and supplies as well as of the agricultural workforce.
- 2) Make available further assistance to smallholder producers through input subsidies, capacity building, and market access.
- 3) Ensure the health and safety of agricultural workers through the provision of PPEs, health checks and medical facilities.

Processing

- 1) Establish the provision of personal protective gear to employees as a requirement among MSMEs to ensure a safe workplace and food safety as well.
- 2) Provide grants or subsidies to improve food processing and storage facilities to provide buffers during supply chain disruptions and to avoid contamination.
- 3) Require processors to implement the most efficient processes to provide maximum inventory levels to bridge gaps along the supply chain and meet consumer demand.
- 4) Require the implementation of food safety measures.

Transport and Storage

- 1) Establish localized and clustered supply chains around the country to shorten and decentralize the national supply chain.
- 2) Provide storage facilities and other low-cost value addition technologies.
- 3) Strengthen marketing efforts to increase the usage of NEDA's SCAN platform.

Retailing

- 1) Encourage retail channels to align their marketing mix with the current shopping behaviors of consumers.
- 2) Assist farmers in finding a market for their produce and to learn new ways to sell.
- 3) Intensify efforts to increase the knowledge and improve the adaptability of retailers under the new normal.

Consumption

- 1) Increase food procurement directly from smallholder producers via shorter supply chains.
- 2) Make available more mobile food vans (e.g., KADIWA stores and other mobile stores) which could sell the produce of smallholder farmers/farms.
- 3) Expand social protection programs (e.g., feeding centers, cash assistance, and livelihood assistance) to ensure food access.

JEMAD's Non-Participation Declaration

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