Food and Agriculture Organization of the United Nations

Rapid assessment of the impact of COVID-19 on food supply chains in the Philippines

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DEPARTMENT OF AGRICULTURE 1898

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Food and Agriculture Organization of the United Nations

Philippines, 2021

Required citation:
FAO. 2021. *Rapid assessment of the impact of COVID-19 on food supply chains in the Philippines*. Manila. https://doi.org/10.4060/cb2622en

ISBN 978-92-5-133791-2

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ACKNOWLEDGEMENTS

The Rapid Assessment of the Impact of COVID-19 on Food Supply Chains in the Philippines Report is a publication prepared by the Food and Agriculture Organization of the United Nations (FAO) with technical support from the International Fund for Agricultural Development (IFAD) and the Department of Agriculture (DA). The study was also supported by the Mindanao Development Authority (MinDA) and the Ministry of Agriculture, Fisheries and Agrarian Reform of the Bangsamoro Autonomous Region in Muslim Mindanao (MAFAR-BARMM)

The FAO report looks at rural livelihood and agricultural market chains as a critical component of the country's food security capacity, and the related effects to it of the community restrictions imposed due to the COVID-19 pandemic. Likewise, the report assesses the impact of COVID-19 on the access of the most vulnerable population that may result in a high rate of malnutrition. The results are expected to provide an information base to aid in local and national decision-making to alleviate the impact of this pandemic and facilitate the production movement, and distribution of goods essential to food security without compromising public health and safety.

An assessment team from FAO Philippines (FAOPH) conducted the study, and Dr. Roehl Briones from IFAD served as the lead investigator. FAO Philippines is composed of Jaime Montesur, Alberto Aduna, Cecile Pastores, Guia Mortel, Kathleen Ramilo, Marikris de Guzman, and Paulo Caparas. Also providing supporting expertise in the study are Tamara Palis-Duran (FAOPH), Ruzella Quilla (FAOPH), Eva Nogales Galvez from FAO Regional Office for Asia and the Pacific (FAORAP), Warren Lee (FAORAP), and Sridhar Dharmapuri (FAORAP). Jeffrey Oliver of FAOPH provided editing and layout support. FAO's Chief Economist Maximo Torero Cullen and colleagues in ESA reviewed and cleared the report.

ABBREVIATIONS AND ACRONYMS

AI	avian influenza
ALALAI	Assistance in Loan Access for Livelihood and Agriculture Industries
ALPAS	*Ahon Lahat, Pagkaing Sapat Kontra* COVID-19
ASEAN	Association of Southeast Asian Nations
ASF	African Swine Fever
BAPTC	Benguet Agri-Pinoy Trading Center
BARMM	Bangsamoro Autonomous Region in Muslim Mindanao
BP2	*Balik-Probinsya, Bagong Pag-Asa* Programme
CAR	Cordillera Administrative Region
COVID-19	Coronavirus Disease 2019
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DILG	Department of Interior and Local Government
DOLE	Department of Labour and Employment
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
ECQ	enhanced community quarantine
FAO	Food and Agriculture Organization of the United Nations
FAW	fall armyworm
FNRI	Food and Nutrition Research Institute
FSRF	Financial Subsidy to Rice Farmers Programme
GPS	Global Positioning System
IDP	internally displaced population
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
IMF	International Monetary Fund
IP	indigenous people
LGU	local government unit
MAFAR	Ministry of Agriculture, Fisheries and Agrarian Reform
MILF	Moro Islamic Liberation Front
MinDA	Mindanao Development Authority
MIMAROPA	Mindoro, Marinduque, Romblon and Palawan Region
MMDA	Metro Manila Development Authority
MSME	micro, small and medium Enterprises
NCR	National Capital Region

NEDA	National Economic Development Authority
NFA	National Food Authority
NNC	National Nutrition Council
OPT	Operation *Timbang* Plus
PNP	Philippine National Police
PSA	Philippine Statistics Authority
RFFA	Rice Farmer Financial Assistance
SFF	small farmers and fisherfolk
SRP	standard retail price
SSFSS	Self-Sustaining Food Supply Strategy
UAP	Urban Agriculture Programme
UNICEF	United Nations Children's Fund
WFP	World Food Program
WHO	World Health Organization
WTO	World Trade Organization

EXECUTIVE SUMMARY

On 8 March 2020, the Philippine government declared the State of Public Health Emergency to address COVID-19. On 13 March 2020, the government imposed enhanced community quarantine (ECQ) over Luzon. Subsequently, similar measures were imposed throughout the country, including in Mindanao, and especially in Bangsamoro Autonomous Region in Muslim Mindanao (BARMM).

Although the COVID-19 epidemic is primarily a public health concern, the necessary measures enacted to contain the spread of the virus, especially the restrictions placed on the movement of people and goods, were likely to have a significant impact on all levels of the agricultural market chain. The Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), the World Food Program (WFP), and the United Nations Children's Fund (UNICEF) decided to conduct a rapid assessment on the impact of the COVID-19 outbreak on food security and nutrition. The results of the impact assessment was envisioned to inform key government agencies in identifying the appropriate measures and programmes that will ultimately help ensure food security for all, at all times.

Given the focus on food security, the team consisting of FAO, IFAD and the Department of Agriculture (DA), concentrated first on the main population centers of the country, which have the largest concentration of households, namely: Metro Manila, Metro Cebu, Metro Davao. Sites in BARMM, Marawi City and Basilan to represent internally displaced population (IDP), and geographically isolated islands, respectively. The supply of 16 site-specific fresh produce: rice, hogs, chicken, chicken eggs, *bangus* (milkfish), *galunggong* (round scad), tilapia, eggplant, squash, tomato, cabbage, carrot, potato, and banana (*Lakatan*), for all regions; and for BARMM: *ampalaya* (bitter gourd) and cassava, were traced back from the demand areas to their respective major trading hubs and supply areas. Secondary government data and key informant interviews from a wide-array of respondents from the government, and the private sector were used to establish the baseline conditions, and acquire information on by the impact of the restrictions, feedback on policies, and outlooks for the next months. Questions on gender and halal were also incorporated.

Baseline information. Consumption and import dependency are highest for cereals and meat; Metro Manila, by far, has the heaviest consumption owing to a large population. Filipinos consume more lowland than highland vegetables. Mindanao centers tend to consume more vegetables per capita. Except for potato, the Philippines is mostly self-sufficient in vegetables. The Philippines requires more than 1.2 million metric tonnes (MMT) of banana per year. Mindanao Centers post a higher per capita consumption of banana; Basilan posts a high per capita consumption of cassava.

Rice, being the staple food in the country, is the biggest contributor to energy intake. Although iron and protein content is not high in rice, surprisingly, it is the top contributor to protein and iron intake, mainly because of high per capita consumption. On the other hand, owing to low per capita consumption, vegetables are only a minor source of micronutrients, except carrots for Vitamin A. Poor nutrient intake leads to widespread undernourishment. Rice and farmed animal products are produced in large quantities in regions adjacent to the key population centers. Vegetables tend to be also produced adjacent to the population centers, except highland vegetables in Luzon. Banana is produced near its key demand centers, except in the National Capital Region (NCR). BARMM appears more than self-sufficient in cassava.

Top provincial production centers in each island group are likely (but not certainly) a key food source for the nearest Metropolitan demand center. Based on past trends, the production

outlook in most of the provincial production centers and key commodities is favourable for long-term food availability in the demand centers. Large demand centers tend to source their food from nearby provinces and nearby key production centers, over major transport routes (mostly by land in the case of Luzon and Mindanao, and by the sea in the case of Metro Cebu.

Within the short run one-year period (2020), several production shocks are expected to introduce deviations between the forecasted normal increase and the actual increase for the year. The shocks are African Swine Fever (ASF), avian influenza (AI), fall armyworm (FAW), and adverse climate events. The short--term production problems plaguing agriculture have been severe enough to impact growth figures for the first quarter of 2020.

Not only have there been problems plaguing agriculture in the short term; there have also been long-standing structural problems affecting the sector, namely:

1. weak growth of agricultural output;
2. low income of producers;
3. declining labour supply;
4. deteriorating resource base;
5. lack of inputs and finance, especially for small farmers and fisherfolk;
6. poor logistics infrastructure;
7. disconnect between small farmers and fisherfolk (SFF) and the value chain;
8. high cost of nutritious food; and
9. dependence on concentrated distribution points (urban areas).

Point 9 is a structural constraint that is not traditionally mentioned as a long--term development constraint; however, it must be mentioned now, as it creates a vulnerability point that was exposed by the COVID-19 pandemic.

The current leadership of the DA has taken full cognizance of the long-- term development constraints confronting the agri-food system and has adopted a New Thinking for Agriculture based on the themes *Ani* (Harvest) and *Kita* (Income). The growth target was set to 2 percent in 2019, rising to 4 percent by 2022. At the same time, adopting *Kita* in the New Thinking signaled that, aside from the usual preoccupation with production targets, DA was placing farmers' welfare and livelihood front and center of the DA strategy. The New Thinking is founded on eight paradigms: Modernization, Industrialization, Export Promotion, Farm Consolidation, Roadmap Development, Infrastructure Development, Budget and Investments, and Legislative Support.

Impact of the COVID-19 pandemic. Since early March, the COVID-19 pandemic has inflicted unprecedented controls on travel and social distancing, with adverse economic consequences still on-going. Public health emergency measures have disrupted both supply and demand sides of agri-food systems worldwide. The COVID-19 pandemic had struck at a time when the agri-food system was facing a healthy outlook, implying that the recurrence of a world food crisis is unlikely.

As with other countries, food production and food markets were classified as an essential sector or activity and were exempted from the severest prohibitions. Food purchases and deliveries were allowed. However, the food supply chain was not left unscathed by the containment measures. The lead national agency for agriculture and food security is DA, which implemented various actions in response to COVID-19.

Impact on food supply chains. Some farmers and fisherfolk reported difficulties in securing inputs owing to the closure of agro-trading shops. The closure of banks and non-operation by

financiers also affected some farmers and fisherfolk. Across the supply chain, workers have had a difficult time reporting to the place of work, owing to local government unit (LGU)-level quarantine regulations together with the suspension of public transport. Some business operators, who themselves were elderly, opted to rather stay at home and not open for business. Employers could not deploy either a full workforce owing to the skeleton workforce restriction and the need to providing shuttling services or staying facilities.

Throughout the supply chain, players who needed to travel as part of their business faced LGU-imposed restrictions, at least in the initial phase of the lockdown. Gradually restrictions eased up over May and June, and complaints about transport restrictions have become less frequent. Both national and local governments imposed other types of restrictions affecting land and sea travel without necessarily stopping movement altogether.

There is widespread agreement that the DA's food pass, together with Department of Trade and Industry (DTI)'s cargo pass, was eventually successful in assuring the movement of goods and agro-inputs. Input and credit support from the government was also cited by farmers as helpful, although some had no information about national programmes (which are focused on rice). The *Kadiwa ni Ani at Kita* programme of the national government, together with procurement for relief goods of LGUs, provided a strong demand boost to fruit and vegetable farmers. Programmes to expand supply must be constantly confronted with the realities of market demand.

Most farmers and assemblers report reduced sales and sales prices. A good exception to this trend is direct online selling to households, which seems to have created opportunities for formal enterprises. After an initial round of panic-induced buying, retailers in wet markets and service establishments report dramatically reduced sales. In contrast, the quarantines had differential effects in the modern retail segment, favoring the top supermarkets. Retail prices in Metro Manila showed a clear pattern of initial volatility in the weeks before and after the ECQ, followed by several weeks of relatively stable prices.

However, the majority of monitored commodities under price control are non-compliant. Measures to contain the COVID-19 pandemic have severely affected livelihoods and the ability of households to purchase food. Some large agribusiness enterprises are making relatively optimistic forecasts about the domestic market for food products. Concerning imports, the self-corrective nature of market forces makes it unnecessary for the government to step into explicitly stop importation, especially as these products are already being heavily protected under high tariff walls (40 percent for meat and 35 percent for Association of Southeast Asian Nations, or ASEAN, rice).

Implications

The COVID-19 pandemic hit an agri-food system already confronting serious short-term and long-term challenges. After an initial period of confusion, supply chain disruptions had been mostly addressed as early as the end of April, partly due to resiliency measures already in place. The crisis has led to a new and persistent problem for the agri-food sector, namely, limited market demand. Crisis response measures tend to meet the challenge of supply disruptions, but not those on the demand side. A promising source of demand boost is conditional cash transfers. Several opportunities for resilience and rebound of agriculture have been noted in this rapid assessment.

Directions for the national food security strategy. This rapid assessment does not include in its scope a detailed and systematic itemization of recommendations. Rather, we have developed

the recommendations into clusters with indicative directions for the national food security strategy, namely:

Transformation towards dispersed food distribution

A direct physical embodiment of a dispersed food distribution system is the "mobile market" as popularized by the *Kadiwa*. However, the realities of urban life detract from the sustainability of this solution (i.e., traffic congestion, lack of utilities). A more sustainable and thereby more promising approach is to shift to e-commerce solutions for the marketing of food producers.

A strong partnership between public and private sector action, with a larger role of the public sector in the initial phase

The partnership does recognize that the public sector, during this phase of economic recession, must perforce play a bigger role (as it is the only institution with sustained purchasing power, although this is also under threat). Public sector programmes (e.g., input and credit support), however, must have a phase-out stage as recovery progresses, and as the private sector picks up on recovery through the public-private sector partnerships developed.

The expanded role of the public sector implies a greater demand for quality data and planning

The big role of the public sector in this period of economic contraction all the more increases the need for quality planning, which in turn is highly dependent on updated, disaggregated, and reliable data. Planning should also be directed to anticipate possible unintended consequences of public sector action. Another unintended consequence of public sector expenditure or investment is crowding out of counterpart initiatives in the private and the SFF sector.

Preparations for the next crisis

Future disasters and emergencies, among which are public health and pandemics, are inevitable. Ensuring that the country can anticipate and counter threats to food security ahead of time is essential to avoid repetitions of food supply disruptions through investments on strengthening the Philippines' monitoring and early warning capacity, and developing effective contingency plans at different levels of the government.

INTRODUCTION AND SCOPE

Background

On 8 March 2020, the Philippine Government declared a State of Public Health Emergency in relation to the COVID-19 pandemic. On 13 March 2020, the government further raised the COVID-19 Alert System to its highest level of Code Red Sub-Level 2, imposing a community quarantine over the NCR. The government as well imposed ECQ over Luzon, suspending classes and school activities, prohibited mass gatherings, instituted home quarantine with movement limited to access necessities, enforced restrictions on land, domestic air and sea travel, and imposed curfews. Subsequently, similar measures were imposed throughout the country, including in Mindanao, and especially in BARMM.

Although the COVID-19 epidemic is primarily a public health concern, the necessary measures enacted to contain the spread of the virus, especially the restrictions placed on the movement of people and goods, are likely to have a significant impact on all levels of the agricultural market chain. The nationwide scope of the measures to contain the coronavirus epidemic has had an immediate impact on the flow of goods and a possible long-term impact on food production as access to agricultural inputs (i.e., feeds, medicine, fertilizer) face disruption. Understanding the impact of the epidemic on the livelihood of rural farmers and other stakeholders in the agricultural market chain is vital to ensure continued food security in the Philippines.

FAO, IFAD, WFP, and UNICEF have decided to conduct a rapid assessment on the impact of the COVID-19 outbreak on food security and nutrition. FAO and IFAD, in particular, with the support of the DA, will look at rural livelihood and agricultural market chains as a component of the country's food security capacity. Likewise, the assessment would also look at the impact of the outbreak on the access to food of the most vulnerable population that may result in a high rate of malnutrition. The results would act as an information base to aid in local and national decision-making in order to alleviate the impact of this epidemic and facilitate the production, movement, and distribution of goods essential to food security without compromising public health and safety.

Objectives

The main objectives of the rapid assessment are as follows:

1. to gauge the impact of COVID-19 restrictions on domestic food security and other thematic areas,
2. to understand the extent of implementation and effectiveness of national circulars or guidelines on food supply at the local level, and
3. to provide a basis for plans of the national government and various actors on response and improved resilience relevant to food and agriculture.

In meeting these objectives, the study:

- assessed the impact of current restrictions at the national and local level on the agricultural food supply and market chain, including disruptions and vulnerability to the disruption that the outbreak (and resulting quarantine restrictions) has brought to the food supply chain and its actors, including international trade;

- identified vital data gaps and areas with limited data visibility;
- identified and assess current support and recovery measures for the impacted sectors, interventions at the government level (from national to local government level); and
- collated possible solutions, interventions, and best practices to aid in facilitating the flow of essential goods and services and alleviating food security disruptions.

The results of the impact assessment are envisioned to inform key government agencies in identifying the appropriate measures and programmes that will ultimately help ensure food security for all, at all times.

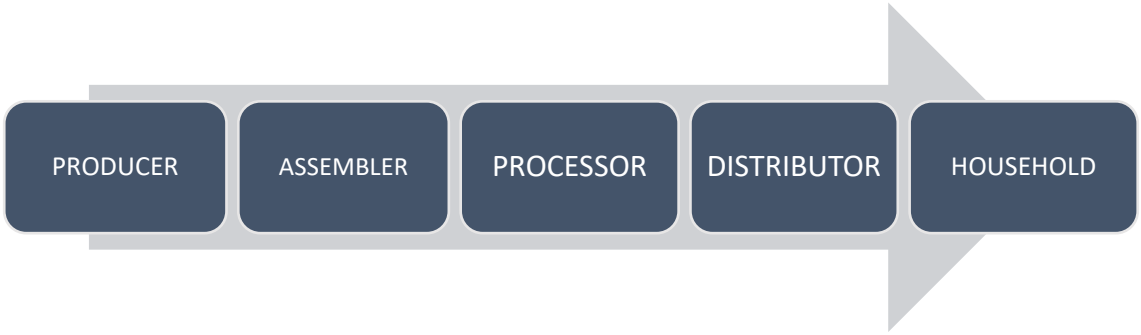
SCOPE AND METHOD OF THE STUDY

Coverage

Supply chain

The study spans the whole supply chain, which is "the system of people and things that are involved in getting a product from the place where it is made to the person who buys it".[1] The same chain, when viewed from the perspective of price and margin build-up, is the "value chain." The parts of the supply chain are shown in Figure 1. The Figure is a stereotypical depiction and may not be universally applicable. For instance, the form in which major food items are more commonly consumed is fresh rather than processed, e.g., fresh vegetables and fruit. If processed at all, the level of processing is basic, i.e., milling for rice, slaughtering for hogs, and dressing for chicken.

Figure 1 | Coverage of the supply chain



The various supply chain players will typically be involved in using inputs, services, and employment, to produce their outputs/services for sale to the next stage in the chain. For instance, producers of crops will need fertilizer; fisherfolk will need fuel, as will assemblers (who own their vehicles); distributors will need utilities at their retail outlets; and so on. Services will include finance (although some players may rely on their working capital).

Lastly, workers will be required at each stage. Agriculture in the Philippines tends to be male-dominated, although female workers are also engaged in various activities such as farm work, livestock raising, and marketing. The rest of the chain, though, covers manufacturing/processing and wholesale and retail trade, which as part of services, will tend to employ similar shares of

[1] Definition from Cambridge Dictionary: https://dictionary.cambridge.org/dictionary/english/supply-chain. Accessed 09 June 2020.

males and females (Briones, 2017). There are, of course, differences across locations and farming systems, as in some indigenous peoples (IP) communities where women are highly involved in farming.

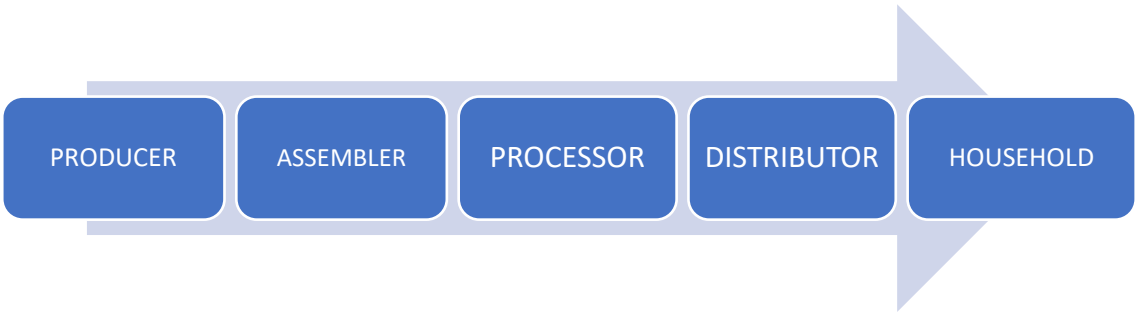
Geographic coverage

Given the focus on food security, we concentrate first on the main population centers of the country, which have the largest concentration of households. These comprise urban areas that require food from extended supply chains, identified for each of the main island groups of the country:

- Luzon: the entire NCR, including Metro Manila;
- Visayas: Metro Cebu, including Cebu City, Lapu-Lapu City and Mandaue City;
- Mindanao: Metro Davao, including Davao City, Digos City and Tagum City; and
- Marawi City and Basilan.

For food security assessment, we also concentrate on vulnerable regions of the country. In Mindanao, the BARMM has the highest level of food insecurity in the country; within BARMM, the hotspots are the island provinces, and Marawi City, which continues to suffer from a large IDPs after the 2017 Marawi Siege. Among the island provinces, Basilan is identified for the rapid assessment, as information gathering is deemed too difficult for the more distant islands of Sulu and Tawi-Tawi.

Figure 2 | Coverage of the supply chain



Commodity coverage

The commodity coverage is shown in Table 1. The leftmost column pertains to the main food groups of a typical Filipino diet. The second column identifies the representative commodity for each main food group: Rice represents cereals (energy foods); pork, chicken, and chicken eggs for meat and dairy (animal protein sources); milkfish, round scad, and tilapia for fish (another animal protein source widely consumed by Filipinos). Note that the vegetable category has been split into lowland and highland, which is essentially a supply-side distinction. Rounding up the list is root crops (another energy food) represented by cassava (widely consumed in Basilan), and fruit, represented by banana (*Lakatan* variety).

The third column states the relevant demand center; for most of the representative items, the relevant demand center is All (Luzon, Visayas, and Mindanao), except for bitter gourd and cassava, which were identified by the Ministry of Agriculture, Fisheries and Agrarian Reform (MAFAR) of BARMM as important commodities in the region.

Table 1 | Scope of commodities for the COVID-19 rapid assessment

FOOD GROUP	COMMODITY		APPLICABLE DEMAND CENTERS
Cereals	Rice		All
Meat and dairy	Pork		Metro Manila, Cebu, Davao
	Chicken		All
	Chicken eggs		All
Fish	Milkfish		All
	Round scad		All
	Tilapia		All
Vegetables	Lowland	Eggplant	All
		Squash	All
		Tomato	All
		Bitter gourd	Basilan, Marawi
	Highland	Cabbage	All
		Carrot	All
		White potato	All
Root crops	Cassava		Basilan
Fruit	Banana (*Lakatan*)		All

Plan of study

The review of the baseline has drawn on existing literature and secondary data, covering the delimited commodities and geographic scope, and the time immediately preceding the COVID-19 crisis. Thematic focus includes dimensions of food security, namely: availability (including imports), accessibility (both financial and physical), and utilization (including contribution to nutrition).

The assessment consists of a literature review, secondary data gathering on relevant areas, and remote qualitative consultation of key individuals. The study conducted multisector representative consultations at all stakeholder levels of the agricultural market chain, including producers, consolidators, processors, sellers, and international traders, among others, as well as from government units responsible for agriculture. The semi-structured interviews were based on a set of guide questions keyed to various stakeholders (Annex 1). Consultations and data gathering was conducted from April to June 2020, which delimits the reference period for the information used in this assessment.

Based on the assessment, the study will be able to identify vital data gaps and areas with limited data visibility. Moreover, the results of the impact assessment are envisioned to inform key government agencies in identifying the appropriate measures and programmes that will ultimately help ensure food security for all, at all times. The rapid assessment will lead to the consolidation of possible solutions, interventions, and best practices to aid in facilitating the flow of essential goods and services and alleviating food security disruptions.

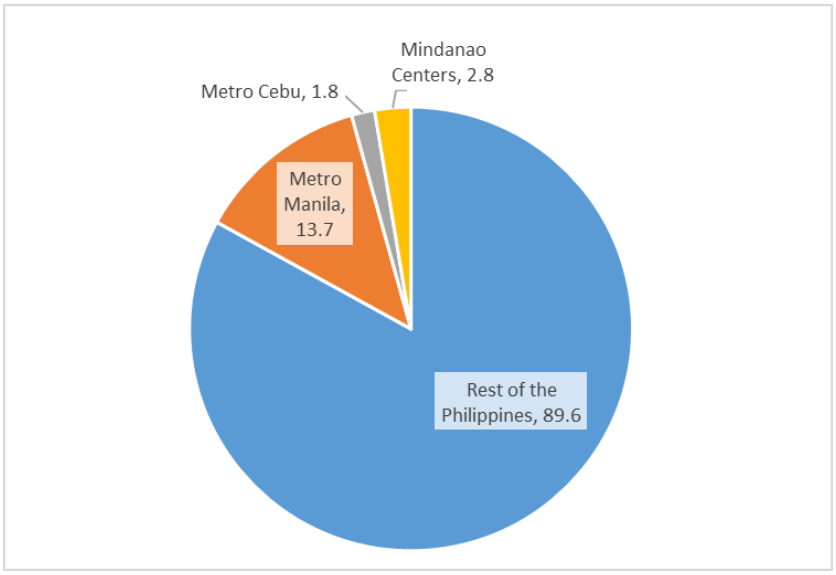
BASELINE CONDITION OF THE AGRI-FOOD SYSTEM OF THE PHILIPPINES

Food consumption

The largest population concentration is found in Metro Manila, followed by Mindanao centers (mostly in Metro Davao) and Metro Cebu.

Among the population centers identified in our study, Metro Manila is by far the largest, with 13.7 million of the country's population of 108 million (Figure 2). Metro Davao accounts for 2.2 million out of the 2.8 million in the Mindanao. Metro Cebu accounts for another 1.8 million.

Figure 3 | Population of the Philippines at the major centers, in millions (2019).



Source: PSA (2020a).

Consumption and import dependency are highest for cereals and meat; Metro Manila, by far, has the heaviest consumption owing to a large population.

The consumption estimate for 2019 is obtained by multiplying per capita consumption by the population. The latter is available for 2019; unfortunately, information on consumption is available only for 2015. In the following tables (2 to 5), per capita consumption for cities in Cebu and Mindanao are proxied by the per capita consumption of urban barangays of the closest province (Cebu province for Metro Cebu, Davao del Norte for Metro Davao, and Lanao del Sur for Marawi).

Table 2 | Consumption indicators, cereal and meat

DEMAND CENTER	PER CAPITA CONSUMPTION IN KG, 2015	TOTAL CONSUMPTION IN MT, 2019	IMPORT SHARE (%), 2019
Rice			
Philippines	109.9	11 868 633	23.2
Metro Manila	98.5	1 348 392	
Metro Cebu	85.7	156 967	

Mindanao centers	128.6	365 865	
Hog			
Philippines	8.9	961 382	9.9
Metro Manila	13.6	186 523	
Metro Cebu	14.5	26 604	
Mindanao centers	8.0	22 630	
Chicken			
Philippines	9.3	1 006 210	33.4
Metro Manila	14.5	198 712	
Metro Cebu	11.2	20 521	
Mindanao Centers	9.3	26 347	
Chicken egg			
Philippines	4.0	431 161	0.0
Metro Manila	5.9	80 212	
Metro Cebu	5.5	10 127	
Mindanao centers	4.8	13 651	

Sources: PSA (2017a; 2017b; 2020b); DOH (2020).

Table 3 | Consumption indicators, fish products

DEMAND CENTER	PER CAPITA CONSUMPTION IN KG, 2015	TOTAL CONSUMPTION IN MT, 2015	IMPORT SHARE (%), 2019
Milkfish			
Philippines	4.5	482 095	0.1
Metro Manila	6.9	94 905	
Metro Cebu	4.4	8 075	
Mindanao Centers	6.8	19 314	
Round scad			
Philippines	5.3	574 669	0.1
Metro Manila	5.3	72 446	
Metro Cebu	8.4	15 400	
Mindanao Centers	6.2	17 544	
Tilapia			
Philippines	4.8	516 554	3.5
Metro Manila	7.5	102 300	
Metro Cebu	0.0	53	
Mindanao Centers	1.9	5 465	

Sources: PSA (2017a; 2017b; 2020b); DOH (2020).

Nationally, the items most heavily consumed by quantity are rice and meat, followed by fish. The population center with the largest consumption of these items, by far, is Metro Manila owing to the sheer size of its population. Per capita-wise, Metro Manila also has the highest consumption of chicken, chicken egg, and tilapia. Metro Cebu has the highest per capita consumption of hog and round scad, but almost no consumption of tilapia). Mindanao centers have the highest per capita consumption of rice. The commodity with the largest market share of imports (at the 4-digit Harmonized System Level) is chicken, followed by rice. There are minimal imports of tilapia and almost no imports of round scad, milkfish, and chicken eggs.

Table 4 | Consumption indicators, lowland vegetables

DEMAND CENTER	PER CAPITA CONSUMPTION IN KG, 2015	TOTAL CONSUMPTION IN MT, 2015	IMPORT SHARE (%), 2019
Eggplant			
Philippines	4.3	460 275	0.6
Metro Manila	3.5	47 658	
Metro Cebu	2.6	4 672	
Mindanao Centers	5.9	16 927	
Squash			
Philippines	2.9	312 287	0.9
Metro Manila	1.6	22 323	
Metro Cebu	3.4	6 206	
Mindanao Centers	5.3	15 001	
Tomato			
Philippines	3.0	320 821	0.0
Metro Manila	3.6	48 890	
Metro Cebu	1.5	2 682	
Mindanao Centers	4.2	12 052	
Bitter gourd			
Philippines	2.4	255 792	1.1
Basilan, Marawi	1.0	590	

Sources: PSA (2017a; 2017b; 2020b); DOH (2020).

Filipinos consume more lowland than highland vegetables. Mindanao centers tend to consume more vegetables per capita. Except for potato, the Philippines is mostly self-sufficient in vegetables.

Per capita consumption of lowland vegetables ranges from 1.0 to 5.9 kg per year, while that of highland vegetables ranges from 0.5 kg to 4.1 kg per year, probably because the former is more widely available to the average consumer. Mindanao centers tend to consume more vegetables per capita than the other regions. Import levels of vegetables are very low, except for white potato, though this is attributed to demand from institutional buyers such as fast-food restaurants.

Table 5 | Consumption indicators, highland vegetables

DEMAND CENTER	PER CAPITA CONSUMPTION IN KG, 2015	TOTAL CONSUMPTION IN MT, 2015	IMPORT SHARE (%), 2019
Cabbage			
Philippines	1.1	121 523	0.5
Metro Manila	2.1	28 376	0.5
Metro Cebu	1.4	2 558	0.5
Mindanao Centers	1.9	5 386	0.5
Carrot			
Philippines	0.5	53 362	0.3
Metro Manila	0.8	10 942	0.3
Metro Cebu	0.7	1 372	0.3
Mindanao Centers	0.7	1 945	0.3
White potato			
Philippines	0.9	97 866	26.7
Metro Manila	1.5	21 090	26.7
Metro Cebu	0.5	879	26.7
Mindanao Centers	4.1	11 591	26.7

Sources: PSA (2017a; 2017b; 2020b); DOH (2020).

The Philippines requires more than 1.2 MMT of banana per year. Mindanao centers post a higher per capita consumption of banana; Basilan posts a high per capita consumption of cassava.

Only with banana do we reach per capita consumption figures within the range of the energy or protein food groups of Table 1. Mindanao centers post a notably higher per capita consumption of banana; Basilan consumes cassava at five times more per capita than the national average.

Table 6 | Consumption indicators, other products

DEMAND CENTER	PER CAPITA CONSUMPTION IN KG, 2015	TOTAL CONSUMPTION IN MT, 2015	IMPORT SHARE (%), 2019
Banana			
Philippines	11.4	1 231 433	0.0
Metro Manila	12.2	167 049	0.0
Metro Cebu	13.4	24 587	0.0
Mindanao Centers	17.0	48 456	0.0
Cassava			
Philippines	2.9	316 716	43.6
Basilan (BARMM)	16.2	6 350	43.6

Note: Per capita consumption data pertains to all types of banana (except Saba)

Sources: PSA (2017a; 2017b; 2020b); DOH (2020).

Nutrition

Rice is by far the biggest contributor to energy intake. While protein and iron content is not high in rice, it appears to be the top contributor to protein and iron intake, mainly because of high per capita consumption.

Table 7 shows the individual level intake contribution on the average Filipino based on sample data from Food and Nutrition Research Institute (FNRI) collected in 2013. Unfortunately, more updated figures disaggregated over space are not available. Note that per capita intake is not directly comparable with Philippine Statistics Authority (PSA) per capita consumption data, which is based on purchases of food.

Table 7 | Contribution to nutrient intake for macro and micronutrients, selected commodities, Philippines, 2013

	PER CAPITA ANNUAL INTAKE (KG)	ENERGY (%)	PROTEIN (%)	IRON (%)	VITAMIN A (%)
Rice	86.9	54.6	35.1	31.7	0.3
Pork	10.4	5.3	8.9	6.1	17.0
Chicken	9.1	1.8	7.2	3.0	8.1
Chicken eggs	4.1	0.9	2.4	2.1	2.4
Jack mackerel	6.0	0.5	3.3	1.1	1.1
Milkfish	2.9	0.5	2.1	0.8	1.0
Tilapia	5.0	0.4	2.3	0.6	0.6
Eggplant	2.2	0.1	0.1	0.2	0.2
Squash	1.8	2.5	0.2	0.3	1.8
Cabbage	0.2	0.0	0.0	0.1	0.1
Carrot	0.8	0.0	0.0	0.0	7.3
Tomato	0.5	0.0	0.0	0.0	0.1
Banana	0.7	0.6	0.6	0.9	0.9
Cassava	5.1	0.2	0.0	0.2	0.0

Note: Per capita annual intake computed by computing the original daily intake by 365

Source: FNRI (2013).

The table shows the overwhelming importance of rice in the Filipino diet. Chicken, combined with eggs, is the second biggest contributor to protein intake; they also account for a tenth of Vitamin A intake. Pork turns out to be the second biggest contributor to protein, and surprisingly, the largest contributor to Vitamin A intake.

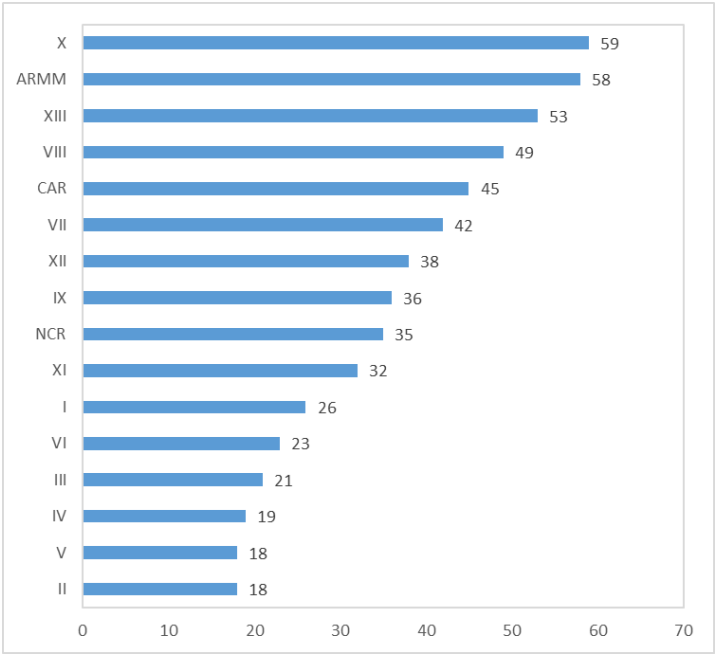
Owing to its low per capita consumption, vegetables are only a minor source of micronutrients, except carrots for Vitamin A.

Altogether, the vegetable items in Table 7 tally up to just 6.2 kg per capita intake. Hence, vegetables are not able to contribute much to micronutrients, let alone the macronutrients, except carrots for Vitamin A. In general, consumption of vegetables in the Philippines is characterized as low (Hall et al., 2009). Whereas the nutritional norm for per capita intake is at

400 gm per day (FAO/WHO, 2004), or 146 kg per year. FNRI (2013) data indicate an annual per capita intake of just 18 kg per year or 88 percent below the nutritional norm.

Lifestyle and habits certainly play a role in the imbalanced diet composition of Filipinos (Angeles-Agdeppa et al., 2019). However, economics is another reason: the cost of a nutritious diet is simply too high relative to the purchasing power of the average Filipino household (WFP, 2018). The 2015 National Nutrition Survey of FNRI was used as the basis for delimiting the set of available foods and prices facing households. With the consumption of staple foods taken as given, the WFP study used linear programming to identify the least cost combination that will meet the minimum recommended intake for protein, fat, and 13 micronutrients for a stereotypical 5-person household (consisting of an adult man, a lactating adult woman, an adolescent girl, a school-age child, and a breastfeeding young child.) The monthly cost of a nutritious diet was then compared with per capita food expenditure figures (reckoned on a monthly basis for a 5-person household). The result is shown in Figure 3. Only one-third of Filipino households will be able to afford a nutritious diet. Among the regions, BARMM (formerly the Autonomous Region in Muslim Mindanao or ARMM) and Central Mindanao are least able to afford a nutritious diet. Even for an affluent region, such as NCR, about 35 percent of households are unable to afford a nutritious diet owing to the high cost of food. NCR and Region VII, together with seven other regions, have at least one-third of households unable to afford a nutritious diet. Regions the most share of households able to afford a nutritious diet are Cagayan Valley and Bicol Region.

Figure 4: Share of households unable to afford a nutritious diet, by region (%), 2018



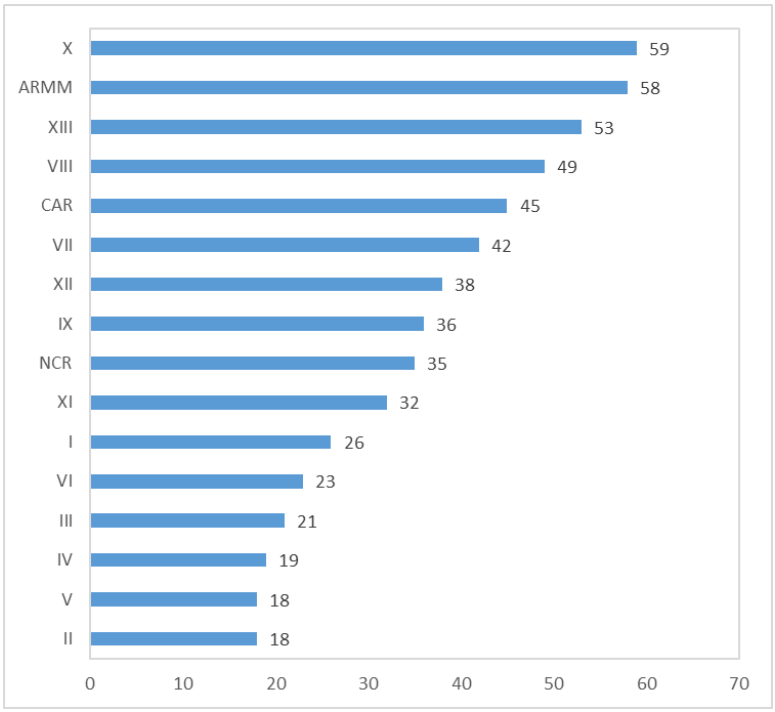
Source: WFP (2018).

Poor nutrient intake leads to widespread undernourishment.

A common indicator of chronic undernutrition is stunting among children 0-59 months (Figure 4). The national figure stands at 30.3 percent as of 2018; this was down from 33.4 percent in 2015. Disaggregation of stunting prevalence by region is available for 2015: Central Visayas exhibits higher than average stunting rates, whereas Davao Region slightly lower than average;

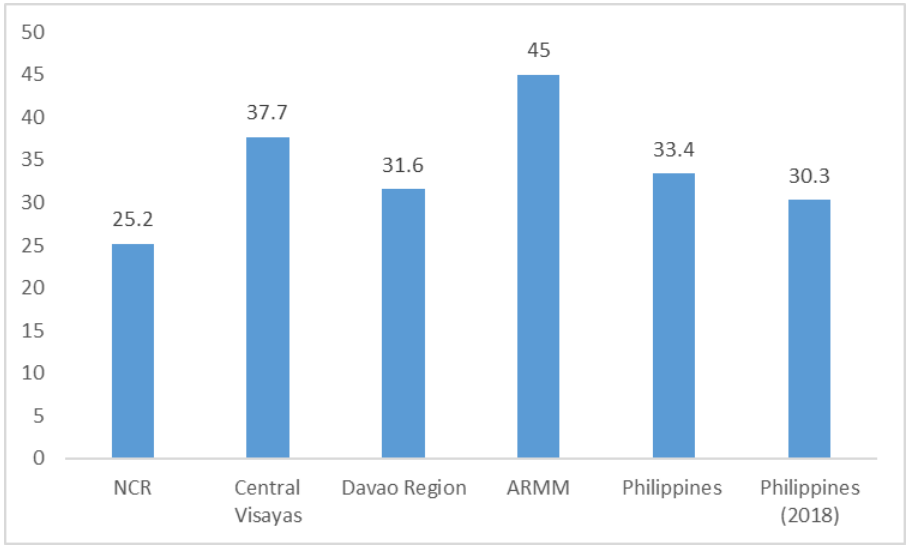
NCR suffers from a quarter of its children aged 0-6 classified as stunted, despite generating by far the highest per capita output among all the regions of the country (three times the average). Note that these FNRI data contrast with those collected by the Operation *Timbang* Plus (OPT) system of the National Nutrition Council (NNC), as discussed in Box 1.

Figure 5: Share of households unable to afford a nutritious diet, by region (%), 2018



Source: WFP (2018).

Figure 6: Prevalence of stunting of children aged 0 – 59 months (%), 2015



Source: FNRI (2015).

Box 1: Data from FNRI and NNC

The NNC website contains stunting prevalence estimates by region reported by the OPT Plus system, collected by Barangay Nutrition Scholars. The figures generated by this system are typically lower than those of FNRI are, which are collected via National Nutrition Surveys. In 2018, the stunting prevalence reported by NNC Central Visayas was just 10.1 percent among children 0-59 months. For NCR, the 2019 estimate of stunting prevalence was only 1.65 percent, down from as high as 7.77 percent in 2015; that same year, FNRI reported a figure of 25.2 percent for NCR.

Sources:

https://www.nnc.gov.ph/regional-offices/luzon/national-capital-region

https://www.nnc.gov.ph/regional-offices/visayas/region-vii-central-visayas

https://www.nnc.gov.ph/regional-offices/mindanao/region-xi-davao-region

https://www.nnc.gov.ph/regional-offices/mindanao/autonomous-region-in-muslim-mindanao

Production

Regional production

Rice and farmed animal products are produced in large quantities in regions adjacent to the key population centers.

Production data by region is shown in Tables 8 – 10. For the main food groups (rice and meat), large producing regions tend to be found adjacent to the key population centers. For Metro Manila, Central Luzon is the key source of Rice, Hog, Chicken, Chicken Eggs, and Milkfish, and Tilapia; another key supplier of farmed animal products is Region 4A CALABARZON. Note that animal products are mostly consumed fresh by Filipino households and are highly perishable, necessitating proximity to the demand center. The placement of rice, though, is a matter of geography; indeed, aside from the Central Luzon plains (which extends into Pangasinan province), the Cagayan Valley is also a major producer of rice; hence Regions I and II are also major sources for rice of Metro Manila. Moreover, milled rice is a perishable commodity. As for round scad, the marine fish is typically captured in various fishing grounds throughout the country, especially in the coastal areas of Region 4B (Mindoro, Marinduque, Romblon, and Palawan, or MIMAROPA Region) and Visayas, although much of the catch may be landed at Navotas and Malabon fish ports of NCR.

Table 8 | Production of rice and farmed animal products by region, Philippines, 2018 ('000 MT)

	RICE	HOG	CHICKEN	CHICKEN EGGS	MILKFISH	TILAPIA	ROUND SCAD
PHILIPPINES	18 815	2 297	1 927	583	410	279	189
NCR	-	-	-	-	10	0	50

CAR	418	27	7	4	-	3	-
Region I	1 851	95	84	20	117	18	3
Region II	2 645	72	55	15	1	9	1
Region III	3 730	418	700	118	67	131	3
Region IV-A	381	396	343	175	53	82	8
Region IV-B	1 195	79	11	7	1	0	11
Region V	1 193	133	55	15	4	10	12
Region VI	2 078	192	117	36	97	4	12
Region VII	223	193	119	54	5	0	6
Region VIII	900	78	62	5	7	1	5
Region IX	677	82	36	16	6	1	33
Region X	761	201	170	49	15	1	6
Region XI	450	156	81	32	13	2	1
Region XII	1 187	125	66	27	2	6	8
Region XIII	449	40	16	8	5	0	2
BARMM	675	11	5	3	5	10	27

Source: PSA (2020b).

Vegetables tend to be also produced adjacent to the population centers, except highland vegetables in Luzon.

The regions that produce lowland vegetables for NCR are Regions I, III, and IVA. For Metro Cebu, the key producer Region VII, itself, while for Metro Davao, it is Region XI itself. For BARMM, the production of lowland vegetables is small compared to that in the adjacent region (Region IX); hence, one may infer the latter to be a major source of vegetables for BARMM. However, the key producer of highland vegetables, CAR, is quite some distance from the capital and metro cities. These commodities must make a longer transit to reach the bulk of consumers.

Table 9 | Production of selected vegetables by region, Philippines, 2018 (in MT)

	HIGHLAND			LOWLAND		
	CABBAGE	CARROTS	POTATO	EGGPLANT	SQUASH	TOMATO
PHILIPPINES	120 656	64 896	117 423	244 838	202 229	220 825
CAR	93 033	57 779	99 201	964	4 699	3 283
Region I	3 126	-	-	93 193	17 400	72 130
Region II	1 476	619	469	18 765	29 547	11 056
Region III	0	0	-	26 988	17 494	27 942
Region IV-A	488	23	-	32 690	34 615	17 323
Region IV-B	27	2	-	5 565	2 985	2 948
Region V	107	13	-	6 820	31 762	3 704
Region VI	528	158	-	17 794	14 640	12 341

Region VII	8 111	2 885	1	9 162	7 481	5 365
Region VIII	79	2	-	2 022	1 934	569
Region IX	774	310	-	4 695	6 090	6 006
Region X	6 959	1 259	6 142	5 193	16 776	47 991
Region XI	4 387	1 323	10 926	6 699	6 521	4 087
Region XII	1 253	521	683	6 848	3 030	5 152
Region XIII	4	1	-	6 685	5 647	493
BARMM	304	-	-	758	1 608	434

Note: NCR production is close to nil and is omitted.

Source: PSA (2020b).

Banana is produced near its key demand centers, except in NCR. BARMM appears more than self-sufficient in cassava.

Table 10 rounds up the data by showing figures for bitter gourd, banana (*Lakatan*), and cassava. *Lakatan* banana is produced in large quantities in Region II and VI-B, which are rather distant from NCR; on the other hand, the production of Banana is large in Region VI itself (nearest Metro Cebu) and Region XI (nearest Metro Davao). Of special interest, for Basilan is cassava consumption, which seems more than amply supplied by Cassava production in BARMM itself; Basilan alone produced more than 285 000 MT of cassava in 2018.

Table 10 | Production of bitter gourd, banana (*Lakatan*), and cassava by region, 2018 (in MT)

	BITTER GOURD	BANANA (*LAKATAN*)	CASSAVA
PHILIPPINES	87 395	929 542	2 723 033
CAR	420	2 737	22 606
Region I	10 005	737	18 840
Region II	5 178	32 400	299 313
Region III	24 514	13 103	21 234
Region IV-A	20 230	7 202	42 190
Region IV-B	1 646	15 862	21 417
Region V	3 002	3 581	87 256
Region VI	3 083	20 443	53 263
Region VII	3 882	19 075	66 237
Region VIII	1 090	11 457	84 829
Region IX	5 239	62 339	86 691
Region X	3 119	171 539	716 914
Region XI	2 821	227 037	21 869
Region XII	1 367	184 150	95 109
Region XIII	1 472	21 834	21 900
BARMM	329	136 046	1 063 364

Source: PSA (2020b).

Provincial production

Top production centers in each island group are likely (but not certainly) a key food source for the nearest metropolitan demand center.

Tables 11 to 15 show the provinces with the largest production figures by island group; these are referred to as top production centers, if only to identify which provinces are most likely to be the sources of supply for the key population centers of Luzon, Visayas, and Mindanao. In the case of rice, the Central Luzon province most responsible for Metro Manila consumption is Nueva Ecija; however, Pangasinan in Region I and Isabela of Cagayan Valley are also top producers. For the Visayas, the dominant producer is Iloilo, although Leyte and Antique also produce significant volumes of *palay* (unmilled paddy rice). For Mindanao, the top producers of *palay* are Maguindanao, Bukidnon, and Cotabato. And so on for the rest of the commodities.

Table 11 | Output by top production centers, by island group, rice and meat products (in MT)

	LUZON		VISAYAS		MINDANAO	
Rice						
	Nueva Ecija	1 955 961	Iloilo	837 837	Maguindanao	480 713
	Isabela	1 369 050	Leyte	463 786	Bukidnon	469 468
	Pangasinan	1 104 392	Antique	312 708	Cotabato	467 737
Hog						
	Bulacan	209 776	Cebu	101 092	Bukidnon	117 901
	Batangas	189 169	Iloilo	78 195	South Cotabato	70 460
	Tarlac	98 628	Negros Occidental	56 396	Davao City	45 213
Chicken						
	Bulacan	220 898	Cebu	68 786	Misamis Oriental	81 831
	Pampanga	188 140	Leyte	55 368	Bukidnon	62 487
	Nueva Ecija	108 175	Iloilo	55 027	South Cotabato	49 815
Chicken egg						
	Batangas	137 963	Cebu	43 815	Bukidnon	32 939
	Pampanga	59 569	Negros Occidental	13 738	South Cotabato	23 333
	Bulacan	28 322	Iloilo	12 532	Davao City	21 553

Source: PSA (2020b).

Table 12 | Output by top production centers, by island group, fish products (in MT)

	LUZON		VISAYAS		MINDANAO	
Milkfish						
	Pangasinan	109 894	Capiz	41 787	Misamis Occidental	8 059
	Pampanga	23 686	Negros Occidental	26 001	Davao Occidental	5 798
	Quezon	23 502	Aklan	15 826	Lanao del Norte	5 006
Round scad						
	Masbate	2 248	Negros Occidental	2 970	Zamboanga City	4 123
	Palawan	1 870	Cebu	2 602	Sulu	2 967
	Ilocos Sur	1 017	Northern Samar	847	Tawi-tawi	2 242
Tilapia						
	Pampanga	113 768	Iloilo	2 162	Maguindanao	9 510
	Batangas	61 977	Negros Occidental	1 535	Sultan Kudarat	2 638
	Laguna	11 765	Leyte	557	South Cotabato	1 733

Source: PSA (2020b).

Table 13 | Output by top production centers, by island group, lowland vegetables (in MT)

	LUZON		VISAYAS		MINDANAO	
Eggplant						
	Pangasinan	76 947	Iloilo	12 810	Agusan del Sur	5 181
	Quezon	25 452	Cebu	5 891	Cotabato	4 970
	Tarlac	10 295	Negros Occidental	3 063	Davao City	3 122
Squash						
	Albay	25 231	Iloilo	6 243	Bukidnon	11 617
	Quezon	20 932	Cebu	5 193	Agusan del Sur	3 265
	Nueva Vizcaya	19 056	Negros Occidental	4 694	Zamboanga City	2 517
Tomato						
	Ilocos Norte	27 426	Iloilo	11 225	Davao del Sur	213 885
	Ilocos Sur	24 440	Cebu	2 494	Bukidnon	40 282
	Pangasinan	17 910	Bohol	1 804	Misamis Oriental	6 394

Source: PSA (2020b).

Table 14 | Output by top production centers, by island group, highland vegetables (in MT)

LUZON		VISAYAS		MINDANAO	
Cabbage					
Benguet	79 010	Cebu	5 961	Bukidnon	5 773
Mt. Province	13 524	Negros Oriental	2 023	Davao del Sur	3 184
Ilocos Sur	2 970	Iloilo	313	Davao City	1 112
Carrot					
Benguet	54 089	Negros Oriental	1 548	Davao del Sur	1 183
Mt. Province	3 201	Cebu	1 338	Bukidnon	1 161
Nueva Vizcaya	600	Negros Occidental	75	Cotabato	268
White potato					
Benguet	89 250	-	-	Davao del Sur	10 910
Mt. Province	9 868	-	-	Bukidnon	6 142
Nueva Vizcaya	465	-	-	South Cotabato	283

Table 15 | Output by top production centers, by island group, banana, cassava, and bitter gourd (in MT)

LUZON		VISAYAS		MINDANAO	
Banana (*Lakatan*)					
Isabela	14 785	Iloilo	16 100	Cotabato	100 772
Oriental Mindoro	11 396	Cebu	10 147	Davao del Sur	99 107
Bulacan	8 680	Negros Oriental	5 209	Maguindanao	90 555
Cassava					
				Lanao del Sur	506 785
				Bukidnon	472 667
				Basilan	285 402
Bitter gourd					
				Zamboanga City	3 969
				Misamis Oriental	1 602
				Agusan del Sur	1 035

Source: PSA (2020b).

Based on past trends, the production outlook in most of the production centers and key commodities is favourable for long-term food availability in the demand centers.

For the same provinces identified as top producers, the study provides production forecasts for 2020 using available annual time series data (namely 1990 – 2018). For each province, a simple time trend regression model was fitted of the following form:

$$\ln(q_t) = \beta_0 + \beta_1 \ln t + \varepsilon_t$$

Parameters were estimated using ordinary least squares; out-of-sample forecasted growth rates are shown in Tables 16 to 20.

Table 16 | Forecasted production growth, top production centers, rice and meat products, 2020 (%)

	LUZON		VISAYAS		MINDANAO	
Rice						
	Nueva Ecija	3.3	Iloilo	2.3	Maguindanao	5.2
	Isabela	2.3	Leyte	3.6	Bukidnon	2.4
	Pangasinan	2.7	Antique	3.9	Cotabato	2.9
Hog						
	Bulacan	1.8	Cebu	3.5	Bukidnon	7.0
	Batangas	6.4	Iloilo	0.0	South Cotabato	2.7
	Tarlac	2.3	Negros Occidental	1.9	City of Davao	1.3
Chicken						
	Bulacan	7.5	Cebu	3.1	Misamis Oriental	2.4
	Pampanga	6.6	Leyte	2.0	Bukidnon	6.3
	Nueva Ecija	0.0	Iloilo	1.5	South Cotabato	8.0
Chicken egg						
	Batangas	9.2	Cebu	3.1	Bukidnon	2.9
	Pampanga	7.9	Negros Occidental	2.0	South Cotabato	2.2
	Bulacan	0.0	Iloilo	1.5	City of Davao	1.9

Source: Author's calculation from PSA (2020b).

Table 17 | Forecasted production growth, top production centers, fish products (%)

	LUZON		VISAYAS		MINDANAO	
Milkfish						
	Pangasinan	9.2	Capiz	6.6	Misamis Occidental	15.5
	Pampanga	5.3	Negros Occidental	2.7	Davao Occidental	0.0
	Quezon	3.5	Aklan	1.9	Lanao del Norte	2.2
Roundscad						
	Masbate	8.4	Negros Occidental	26.3	Zamboanga City	9.1

	Palawan	-8.2	Cebu	-3.1	Sulu	6.3
	Ilocos Sur	14.5	N. Samar	1.4	Tawi-tawi	4.2
Tilapia						
	Pampanga	7.8	Iloilo	13.0	Maguindanao	21.3
	Batangas	6.8	Negros Occ.	10.5	Sultan Kudarat	8.5
	Laguna	4.7	Leyte	9.4	South Cotabato	-2.2

Source: Author's calculation from PSA (2020b).

Table 18 | Forecasted production growth, top production centers, lowland vegetables (%)

LUZON			VISAYAS		MINDANAO	
Eggplant						
	Pangasinan	3.1	Iloilo	1.3	Agusan del Sur	10.9
	Quezon	3.4	Cebu	1.0	Cotabato	10.2
	Tarlac	0.8	Negros Occidental	2.1	Davao City	-0.9
Squash						
	Albay	6.8	Iloilo	0.3	Bukidnon	12.2
	Quezon	5.4	Cebu	5.4	Agusan del Sur	7.6
	Nueva Vizcaya	6.5	Negros Occidental	-1.8	Zamboanga City	7.9
Tomato						
	Ilocos Norte	4.7	Iloilo	-2.1	Davao del Sur	-0.4
	Ilocos Sur	4.7	Cebu	-4.1	Bukidnon	3.9
	Pangasinan	-2.8	Bohol	4.9	Misamis Oriental	5.4

Source: Author's calculation from PSA (2020b).

Table 19 | Forecasted production growth, top production centers, highland vegetables (%)

LUZON			VISAYAS		MINDANAO	
Cabbage						
	Benguet	-0.4	Cebu	1.6	Bukidnon	5.7
	Mt. Province	3.2	Negros Oriental	6.5	Davao del Sur	3.1
	Ilocos Sur	3.6	Iloilo	0.3	City of Davao	-0.8
Carrot						
	Benguet	3.7	Negros Oriental	4.6	Davao del Sur	8.6
	Mt. Province	12.8	Cebu	-5.6	Bukidnon	12.1
	Nueva Vizcaya	4.5	Negros Occidental	16.3	Cotabato	20.5
White potato						
	Benguet	1.1		-	Davao del Sur	6.6

	Mt. Province	5.7		-	Bukidnon	-4.4
	Nueva Vizcaya	8.1		-	South Cotabato	4.2

Source: Author's calculation from PSA (2020b).

Table 20 | Forecasted production growth, top production centers, banana, cassava, and bitter gourd (%)

	LUZON		VISAYAS		MINDANAO	
Banana (*Lakatan*)						
	Isabela	2.7	Iloilo	2.7	Cotabato	2.4
	Oriental Mindoro	-5.8	Cebu	-5.8	Davao del Sur	3.8
	Bulacan	4.6	Negros Oriental	4.6	Maguindanao	5.1
Cassava						
					Lanao del Sur	13.4
					Bukidnon	2.8
					Basilan	10.5
Bitter gourd						
					Zamboanga City	
					Misamis Oriental	-1.3
					Agusan del Sur	9.5

Source: Author's calculation from PSA (2020b).

In most provinces and commodities, growth is forecasted to be positive, which is unsurprising given a long history of upward production trends. In many cases, the positive growth rates exceed the annual growth rate of the national population (about 1.4 percent). The few negative entries are to be found for Cebu province (round scad, tomato, carrot, and *Lakatan* banana); Palawan (round scad); Negros Occidental (squash); Pangasinan (tomato); Iloilo (tomato); and Oriental Mindoro (*Lakatan* banana).

Domestic production flows

Large demand centers tend to source their food from nearby provinces and nearby key production centers, over major transport routes (mostly by land in the case of Luzon and Mindanao, and by the sea in the case of Metro Cebu).

Based on key informant interviews and the identified top provinces in Section 3.3.1, we trace the most likely reverse product flows from the demand center to the originating province (Figures 5 to 9). Food, no less than people/passengers, takes the same major routes from the originating province to the demand center. For instance, rice from Isabela will travel from *palay*-producing municipalities such as Roxas, and transported by truck down the national highway, through to Cabanatuan City, Nueva Ecija, or Bulacan where it is milled, and on to NCR.

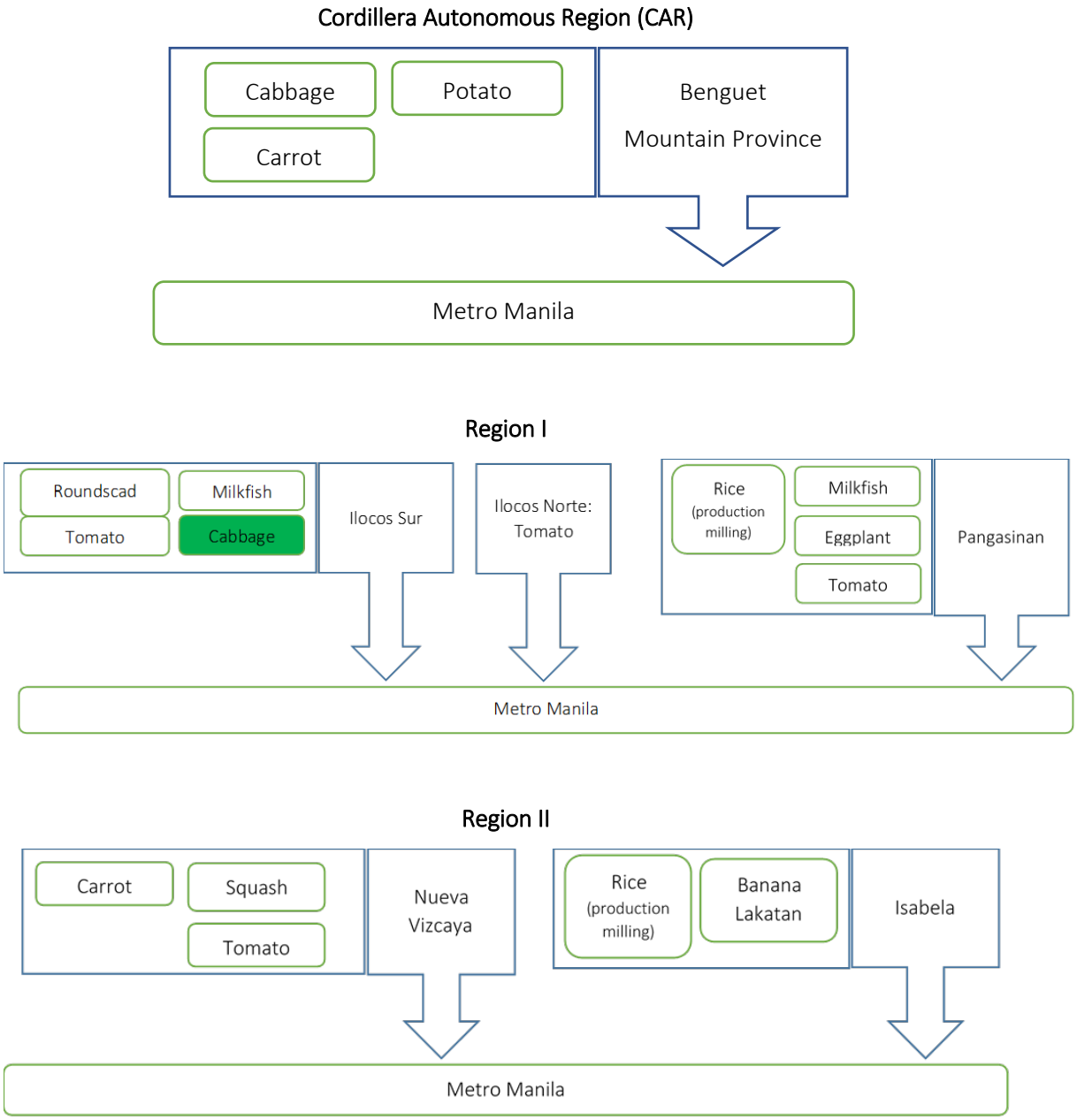
The provinces most responsible for food supply to Metro Manila are Pangasinan, Bulacan, Pampanga, and Batangas; Benguet and Mountain Province supply highland vegetables; lowland vegetables can be sourced from Quezon province, Nueva Vizcaya, and as away far as Ilocos

provinces. Banana is sourced from rather distant provinces (Isabela and Oriental Mindoro), as is Roundscad (Masbate and Palawan).

For Metro Cebu, meanwhile, a key source is the Cebu Province itself, which requires land transport; however, the other main sources are Iloilo and Negros Occidental, which will require sea transport. In general, based on the production data, other provinces of Panay island are also key suppliers for Metro Cebu (namely for rice and milkfish), together with Negros Oriental (hogs). According to MARINA (2020), even after ECQ, 86.4 percent of cargo ships still operated normally. The ECQ severely impacted the operation of passenger ships, of which only 30 percent are still operating normally. For Metro Davao, the key informants all indicate that the main food supply source is around Metro Davao (in Region XI), with the addition of Bukidnon of Region X. Other minor contributors are Lanao del Norte and Agusan del Sur. In the case of Marawi, a similar principle holds that the adjacent provinces are the main food sources (Figure 8), namely: Lanao del Sur itself; Lanao del Norte; Misamis Oriental; and Bukidnon. Key informants did, however, indicate that more distant provinces also feed Marawi City, namely Agusan del Sur, Zamboanga City, Saranggani and Zamboanga del Sur.

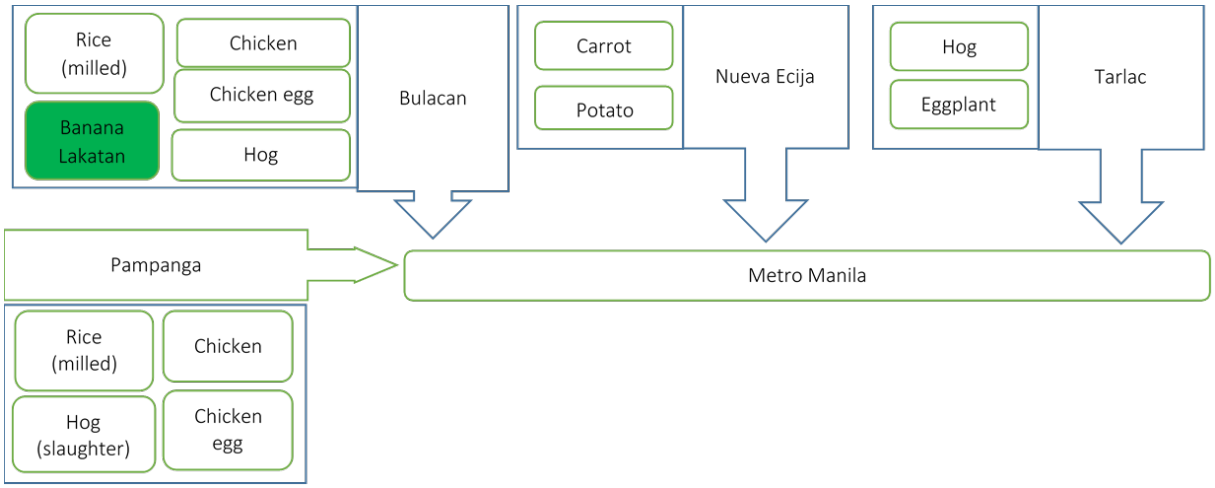
Figure 9 presents product flows to Basilan. Key informants all agree that Basilan provides little of its food, except for cassava and round scad, for which the province is a surplus producer. Rather, the bulk of food requirements of Basilan are shipped through the port of Zamboanga City. The bigger question, though, is from where the food arriving in Zamboanga City originates. The key informants could not be definitive about this. Using the same principle of proximity found in Metro Manila, Metro Cebu, and Metro Davao, the same provinces near Zamboanga City itself, as indicated in the box with dashed lines. Note that based on data presented in Section 3.3.1, Region IX production accounts for at least ten percent of Mindanao output, except for tilapia (3 percent), cabbage (6 percent), carrot (9 percent), and tomato (9 percent). Except for these commodities then, provinces of Region IX are the most likely source of most of the food found in Zamboanga City for trans-shipment to Basilan.

Figure 7 | Product flows to Metro Manila

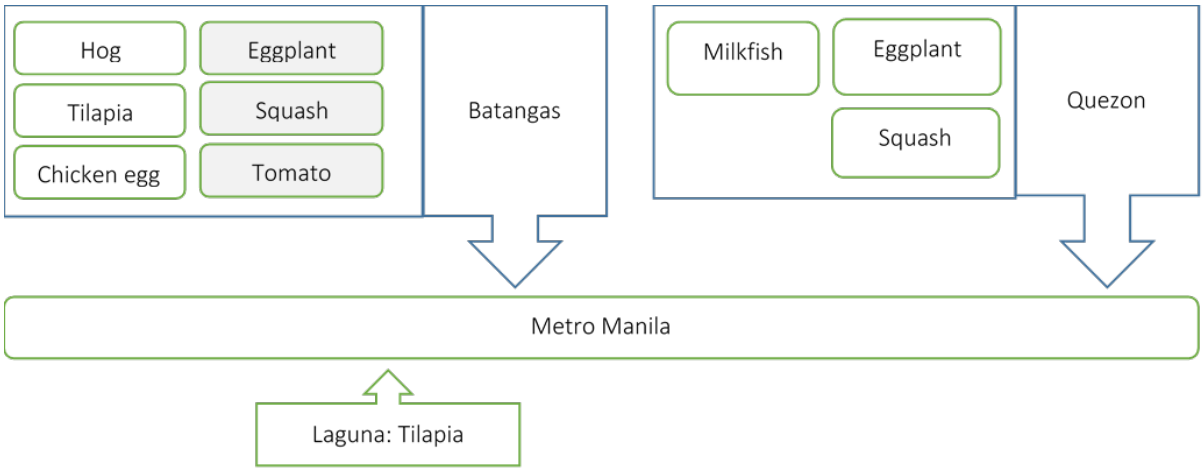


Legend: Green (top producer, but omitted); grey (not a top producer, but included)

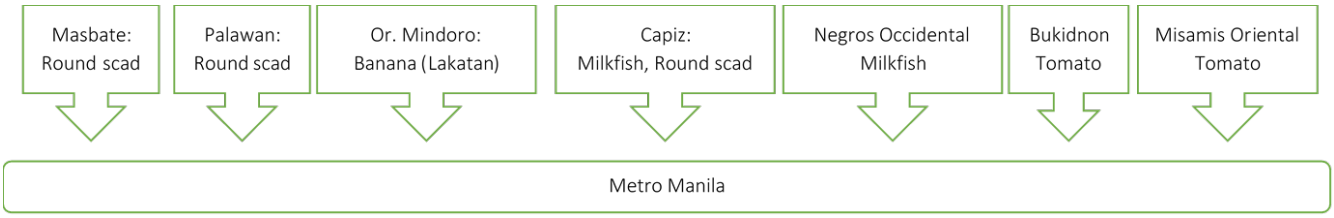
Region III



Region IV-A

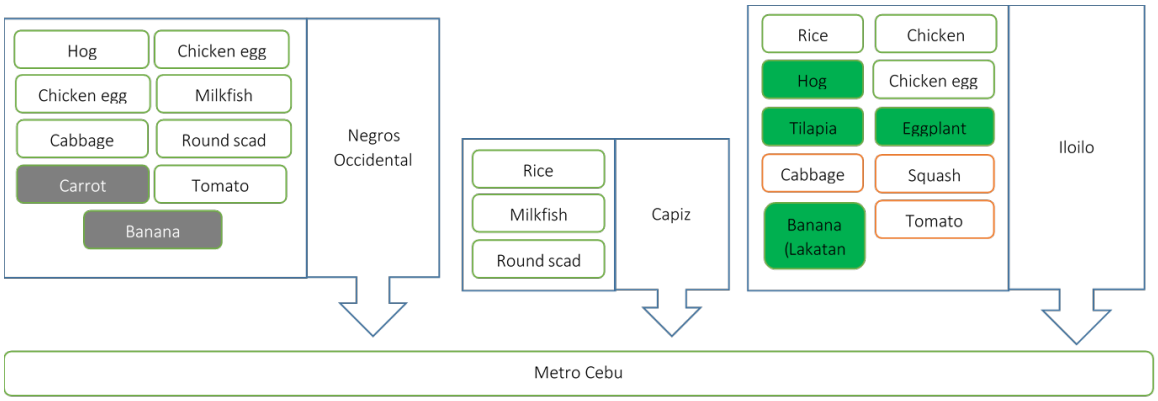


Region IV-B, Region VI, and Region XI

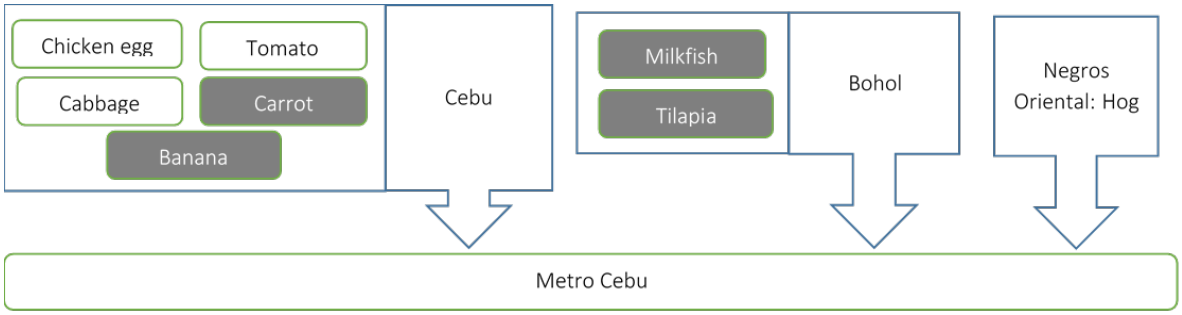


Legend: Green (top producer, but omitted); grey (not a top producer, but included)

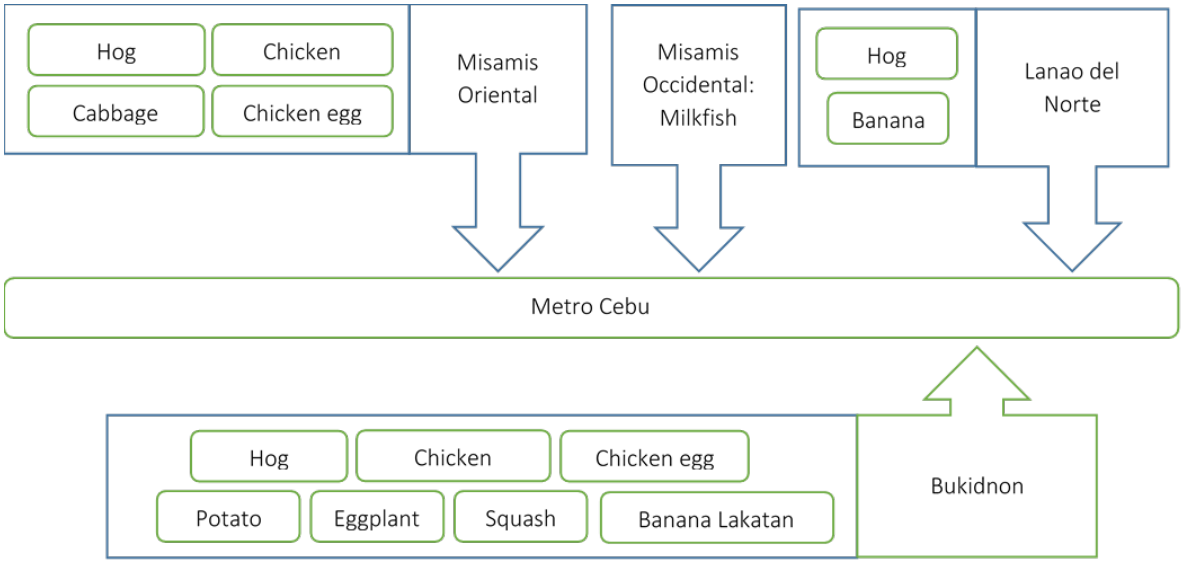
Figure 8 | Product flows to Metro Cebu



Region VII

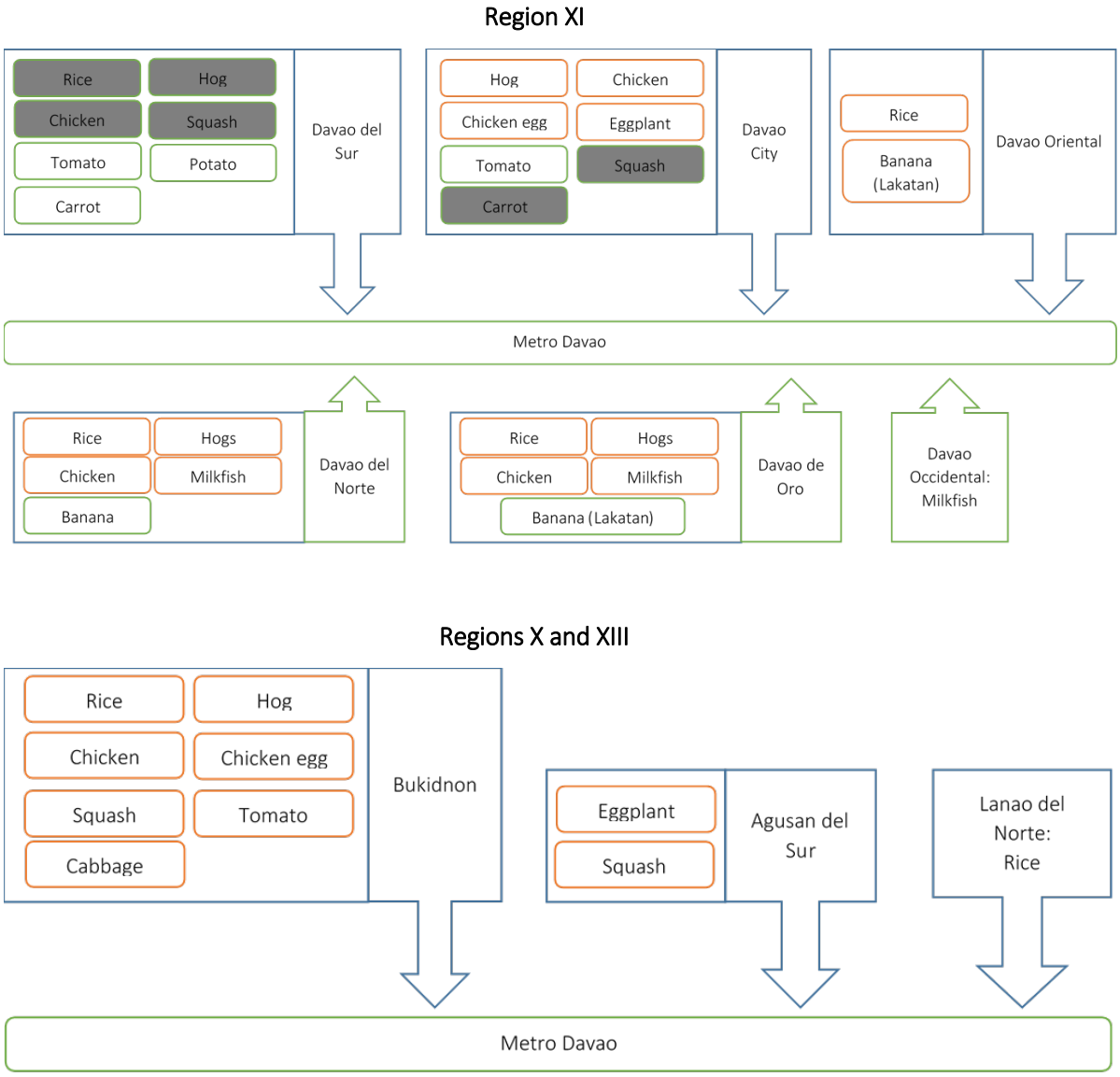


Region X



Legend: Green (top producer, but omitted); grey (not a top producer, but included)

Figure 9 | Product flows to Metro Davao



Legend: Green (top producer, but omitted); grey (not a top producer, but included)

Figure 10 | Product flows to Marawi City

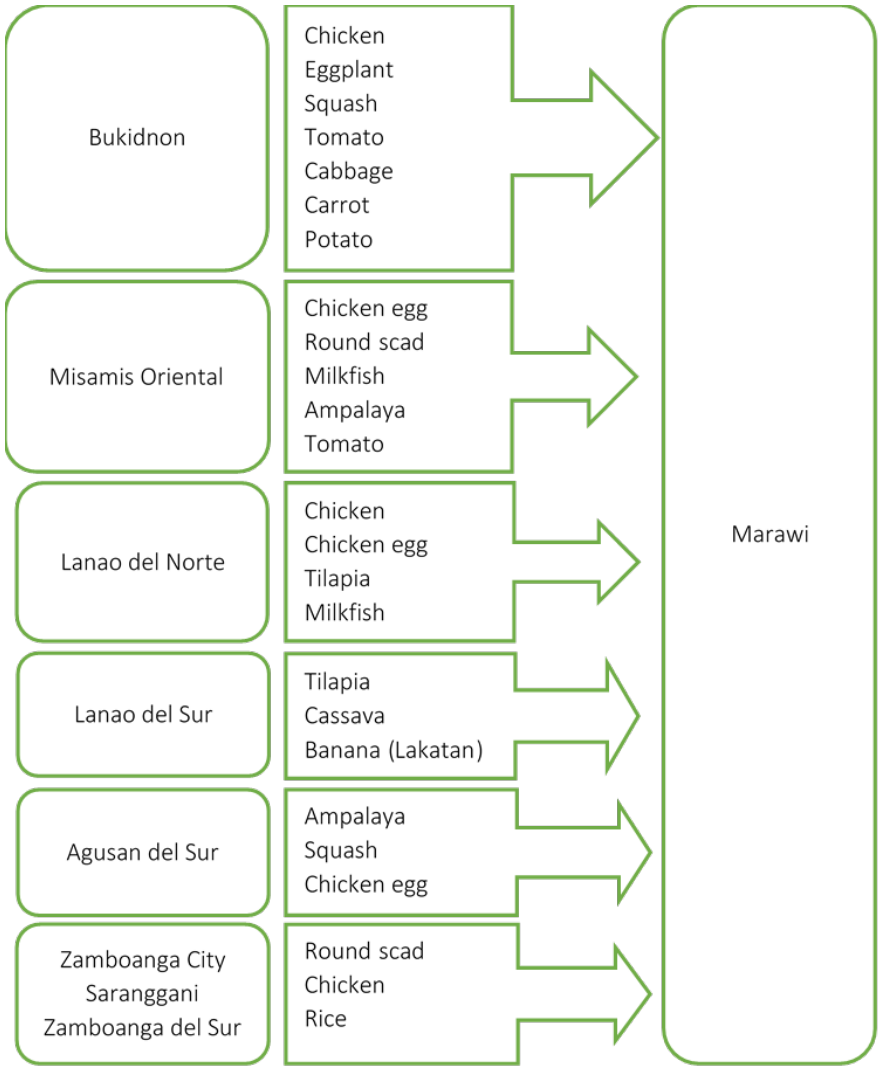
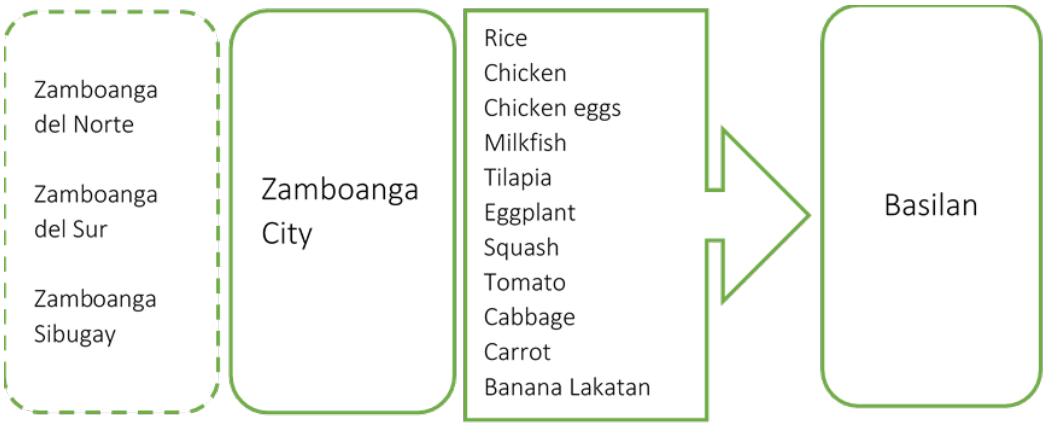


Figure 11: Product flows to Basilan



Development context and strategies

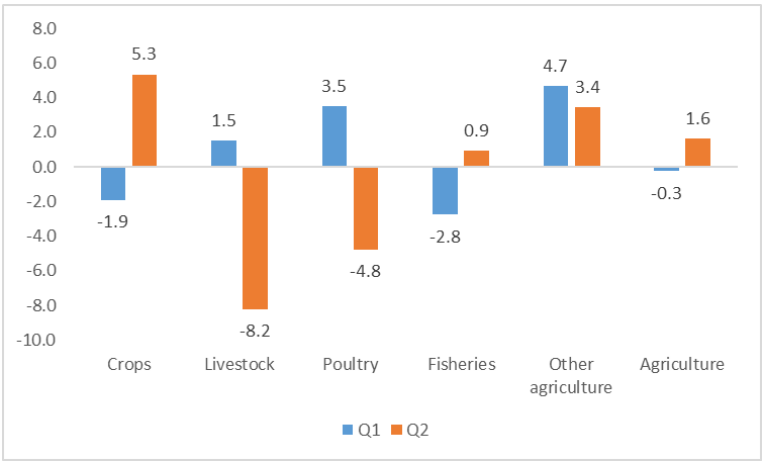
Short-term production shocks

Within the short run one-year period (2020), several production shocks are expected to introduce deviations between the forecasted normal increase and the actual increase for the year. The shocks are:

- African Swine Fever: a severe and highly contagious disease affecting pigs, that can be spread by live or dead animals, domestic or wild, or even by processed pork products, contaminated feed, and fomites (shoe clothes, shoes, vehicles, knives, equipment, owing to resilience of the ASF virus). There is no approved vaccine nor treatment against ASF. In 2019, reported cases covered Luzon (except Ilocos Region and MIMAROPA) and in Mindanao, Davao del Sur.
- Avian influenza – Luzon: first reported in the Philippines in 2017, another incident of bird flu was reported in a quail farm in Nueva Ecija in March 2020 and Pampanga in July 2020.[2]
- Fall armyworm (nationwide): the first report of Fall Armyworm infestation was made in June 2019. By July 2020, it had spread as far as Mindanao (208 municipalities and 47 provinces). The pest had damaged corn crops mostly in Region I, XII, X, and IX. The pest spreads very rapidly and is difficult (but not impossible) to eradicate.[3]
- Climate: for 2020, weather conditions are forecasted to be neutral (except few provinces in June – November 2020 with below normal monthly rainfall expected). The forecast is consistent with the 19 – 20 typhoons that normally make landfall in the country and wreak havoc on the country's farms along the typhoon belt.

The short-term production problems plaguing agriculture have been severe enough to impact growth figures for the first quarter of 2020. Note that COVID-19 health measures came in the latter half of March 2020; hence, the Figure 10 data were likely to have been the result of other events that had transpired from January to March.

Figure 12 | Year-on-year growth rates of agricultural GVA, 2018 prices, first and second quarter 2020 (%)



Source: PSA (2020c).

[2] https://thepoultrysite.com/news/2020/03/philippines-detects-bird-flu-outbreak-in-quail-farm; https://newsinfo.inquirer.net/1313834/bai-confirms-detection-of-bird-flu-in-pampanga-egg-farm

[3] https://pia.gov.ph/press-releases/releases/1047345

Despite ASF, livestock production actually squeaked in a 1.5 percent growth in the first quarter, while poultry (primarily chicken) posted an impressive 3.5 percent expansion. Against this however was a hefty 2.8 percent contraction of fisheries, as well as a 1.9 percent contraction in crops, which set back growth in agriculture as a whole by 1.2 percent.

Figure 10 also presents figures for the 2nd quarter. In fact, agriculture posts a 1.6 percent growth overall, powered by a 5.3 percent expansion of crops, followed by a milder recovery of fisheries (0.9 percent), offsetting the contraction of livestock and poultry (respectively, -8.2 percent and – 4.8 percent.

Long term structural constraints

Not only have there been problems plaguing agriculture in the short term; there have been long-standing structural problems affecting the sector:

1. weak growth of agricultural output;
2. low income of producers;
3. declining labour supply;
4. deteriorating resource base;
5. lack of inputs and finance, especially for SFF;
6. poor logistics infrastructure;
7. disconnect between SFF and the value chain;
8. high cost of nutritious food; and
9. dependence on concentrated distribution points (urban areas).

Most of these problems have been well recognized; Briones (2019) provides an overview of the key issues. Points 8 and 9 deserve further comment. The high cost of nutritious food has already been flagged as an issue (Section 3.2); this, in turn, is related to Point 6 on poor logistics infrastructure, which is a heritage of public underinvestment, as well as legal and regulatory restrictions on private sector logistics investments (including on entry barriers to foreign investors).

Point 9 is a structural constraint that is not traditionally mentioned as a long-term development constraint; however, it must be mentioned now as it creates a vulnerability point that was exposed by the COVID-19 pandemic. In urban areas, the distribution of food is organized into concentration points, namely markets (wet markets or modern retail outlets) and service establishments (especially restaurants and street stalls). When either these establishments were closed or subject to social distancing, a key means of access to food was seriously affected. We shall be returning to this point in the next section on “The COVID-19 pandemic and emergency measures”.

Agricultural development strategies

The current leadership of DA has taken full cognizance of the long-term development constraints confronting the agri-food system and has adopted a New Thinking for Agriculture based on the themes Ani (Harvest) and Kita (Income). The growth target was set to 2 percent in 2019, rising to 4 percent by 2022; at the same time, adopting Kita in the New Thinking signalled that, aside from the usual preoccupation with production targets, DA was placing farmers’ welfare and livelihood front and center of the DA strategy. The New Thinking is founded on eight paradigms, namely Modernization, Industrialization, Export Promotion, Farm Consolidation, Roadmap Development, Infrastructure Development, Budget and Investments, and Legislative Support, elaborated as follows:

- *Modernization must continue* - use of modern technology must also cover all crops, including those with export potential in processed or value-added forms like coffee, cacao, cassava, tropical fruits, and rubber, among others.
- *Industrialization is the key* - Agriculture must be treated as an industry, to industrialize the value chain of every agricultural commodity.
- *Promotion of exports is a necessity* – a systematic and long-term strategy needed in developing and promoting exports of raw and processed agricultural products.
- *Consolidation of small- and medium-size farms* - promote and support farm consolidation arrangements to bring about economies of scale, particularly for crops that require mechanization and massive use of technology.
- *Infrastructure investment should also be critical* - Agricultural areas need infrastructure development and logistics to improve their linkages to the urban/domestic and export markets.
- *Higher budget and investment for agriculture* - The government and the private sector, with the strong and popular support from the citizenry, must provide the necessary budget and investment.
- *Legislative support is needed* - need the help of both the Senate and the House of Representatives for policy and structural reforms that need to be legislated and institutionalized.
- *Roadmap development is paramount* - The government, through the DA, should take the lead in generating the "big ideas" and should solicit inputs from the private sector and other stakeholders.

The DA was well on its way to implement these programmes, even as it was designing responses to on-going production shocks such as ASF and FAW infestation. However, the unexpected COVID-19 pandemic led to a sudden preoccupation with a set of emergency response programmes presented in the next section.

THE COVID-19 PANDEMIC AND EMERGENCY MEASURES

Global context

Since early March, the COVID-19 pandemic has inflicted unprecedented controls on travel and social distancing, with adverse economic consequences still on-going.

On 11 March 2020, the World Health Organization (WHO) classified the SARS Coronavirus 2 infection a "pandemic." To curb the spread of infection, governments worldwide imposed various restrictions and advisories curtailing movement and mass gathering, affecting 58 percent of the population (4.5 billion persons) by 17 April. These restrictions have caused the closure of millions of establishments; some activities classified as "essential" were allowed to continue, though often with limits. By 4 July 2020, close to 11 million cases were reported worldwide, resulting in over 523 000 deaths (WHO, 2020). In most countries of the Americas and Africa, the spread of COVID-19 is classified as *community transmission* (the highest level); in Asia, the spread of the disease is classified as *clusters of cases* or *sporadic cases* except Bangladesh, Indonesia, and the Philippines.

The economic case for the lockdowns has been modelled using optimal control techniques. Bethune and Korinek (2020) estimated that private individuals respond to a cost of an infection equivalent to just a third of the actual social cost (in the USA, this came to around USD 286 000 per infection). In the absence of a strategy to target specifically the infected, an aggressive

approach to minimize infection exposure at the initial stage of an outbreak is still a socially optimal policy. Alvarez et al. (2020) prescribe a severe lockdown covering 60 percent of the population after a month, and gradually withdrawing to 20 percent of the population after three months.

Regardless of the optimality of lockdown measures, full reckoning of the costs of containment is still ongoing. Before the pandemic, the world economy seemed to continue its growth at a pace of 3.4 percent for 2020. According to the International Monetary Fund (IMF), the concern was to sustain rapid growth for the developing world and make it more inclusive (IMF, 2020a). However, global lockdowns led to rapid deterioration in the economic outlook. By mid-2020, IMF was already forecasting a global contraction of -4.9 percent. Unlike previous downturns (such as the Great Recession of 2008), where savings and investment bore the brunt of the contraction, the COVID-19 contraction largely fell on consumption. Furthermore, the current global contraction is unusual in its rapidity and synchronicity (IMF, 2020b).

Part of that synchrony is due to trade interactions. World merchandise trade fell by 3 percent a year in the first quarter of 2020 year-on-year, falling in even deeper by 18.5 percent in the second quarter. In 2020, the World Trade Organization (WTO) expects at best a contraction in global trade by 13 percent and 32 percent as a worst-case (WTO, 2020). Worldwide about 45 – 50 percent of air cargo is flown in passenger airplanes, but numerous flights have been suspended as part of quarantine measures.[4] The 7-day moving average of flights per day fell by 63 percent between February 21 and April 12, 2020.[5] Sea trade has also been affected: global container shipping has experienced 11 percent shipping cancellations in the first six months of 2020.[6]

Movement and gathering restrictions crippled labour markets. The equivalent of 155 million full-time jobs (5.4 percent of global working hours) was lost in the first quarter of 2020 relative to the previous quarter; working hours worldwide fell by another 400 million full-time job equivalents (8.6 percentage points) in the second quarter of 2020 (International Labour Organization (ILO), 2020b). The sectors disproportionately impacted include food services, manufacturing, wholesale and retail trade, and real estate and business activities, which account for nearly 38 percent of the world's workers; millions of them low skilled and low paid. Lockdowns have also shut down huge swathes of the informal sector, the most unprotected and vulnerable segment of the workforce (ILO, 2020a).

The cumulative result of these economic blows is to threaten the historic decline in global poverty from the 1990s onward; the proportion of the world's population living in extreme poverty was about 35.9 percent, falling to only 10 percent by 2015, breaching the Millennium Development Goals targets; by 2019, the estimated incidence of extreme poverty was down to 8.23 percent. At worst, by 2020, the pandemic may push poverty incidence back to 9.18 percent, the first reversal in trend since 1998, and endangering the Sustainable Development Goals target of eradicating extreme poverty by 2030 (World Bank, 2020).

[4] https://www.forbes.com/sites/cathybuyck/2020/03/26/airlines-spot-revenue-opportunity-and-use-their-passenger-aircraft-to-ship-urgent-cargo/#105ddc477c68.
[5] https://www.flightradar24.com/.
[6] https://tinyurl.com/y9sc6423.

Public health emergency measures have disrupted both supply and demand sides of agri-food systems worldwide.

PwC (2020) cited the following instances of disruption to agri-food systems:

- labour shortages, especially in countries that rely heavily on migrant workers;
- delays in cargo transport, for various reasons, such as quarantine measures on truck drivers (for land transport); lack of workers in ports which led to backlogs in moving out containers, including those used to deliver food; and
- closure of dine-in food services has stopped food distribution for many suppliers and processors.

Note that disruption occurs in both the supply side and demand side. On balance, it is unclear which side dominates; if the demand disruption is more severe, then prices will eventually trend downward; conversely, if the supply disruption is more severe, then prices will trend upward. At the extreme, food prices spikes may reach crisis proportions, as what transpired in 2008-2009. Some food-exporting countries, out of fear of supply disruption, have restricted exports, injecting more volatility into the food trading system – Vietnam's export policy being a prime example (Box 2).

The COVID-19 pandemic had struck at a time when the agri-food system was facing a healthy outlook, implying that the recurrence of a world food crisis is unlikely.

Analysis by FAO suggests that fears of a recurrence of something like the 2008-2009 world food crisis are unfounded. The COVID-19 pandemic is unlikely to precipitate a world food price crisis, for the following reasons:

- World cereal stocks are at comfortably high levels.
- Energy prices had collapsed, eliminating competition from biofuel demand, and keeping fertilizer and input prices table.
- Cost of bulk transportation are depressed.
- Policymakers are now more informed of the consequences of export restrictions, as shown in the case of Vietnam.

Table 21 provides estimates on world cereal supply and utilization accounts. From the 2019/20 production figure reaching 2.7 billion tons, the forecast is a 2.6 percent increase in supply to 2.78 billion tons, whereas demand expands more slowly by 2.6 percent. It implies an expansion in global stocks to 927 billion tons; the stock-to-utilization ratio is forecasted to reach 36.3 percent in 2020/21, barely changed from its level in 2019/20.

Among the cereals, a big contributor to the increase is rice. The grain is set to recover in 2020 with an estimated growth of 1.6 percent, following a slump in 2019 from El Niño-induced weather. Likewise, coarse grains stocks are expected to rise in 2020/21 as utilization continues to fall below production; meanwhile, grain inventories for wheat are also expected to increase despite the slight fall in forecasted production, as the pandemic itself dampens global demand.

Unlike for cereals, however, world meat production is expected to decline in 2020. On the supply side, ASF continues to infect swineherds in key producing countries (including China, Vietnam, and the Philippines). On the demand side, disruptions in food services and consumer demand have been keenly felt on the supply side with a subsequent weakening of supply prospects. Trade of meat and fish is forecasted to decline, although that of swine is projected to increase as ASF-affected, countries increasingly resort to imports.

Box 2: The case of Vietnam's rice export ban

In 2019, Vietnam was the 4th largest rice exporter in the world (behind India, Thailand, and Pakistan) at 4.1 million tons. That year, it supplied the bulk of the Philippines import needs (73 percent). Back on March 25, the Vietnamese government suspended rice exports until further notice, as it reviewed its domestic food security situation. In April, the government relaxed the total ban into an export quota. However, the new food security policy prevented exporters from complying with up to 1.3 million tons of export contracts. More than 100 containers of rice were trapped in Vietnam's ports, some of the stocks reportedly deteriorating, and affecting about 100 traders who had to pay as much as USD 14 000 a day in damages, fees, and fines. The government then decided to lifted export restrictions by May. The FAO rice price index showed a spike of 8.4 percent in March to April 2020 but then held steady with almost no change over the next two months.

Sources:

https://www.reuters.com/article/health-coronavirus-vietnam-rice/update-2-vietnam-halts-new-rice-export-contracts-as-it-reviews-stocks-idUSL4N2BI2MT

https://www.bloomberg.com/news/articles/2020-04-22/spoiling-rice-in-vietnam-ports-show-perils-of-food-protectionism

https://www.dof.gov.ph/vietnam-reaffirms-commitment-to-resume-rice-exports-to-phl/

http://www.fao.org/economic/est/publications/rice-publications/the-fao-rice-price-update/en/

Table 21 | World cereal production, utilization, and stock estimates, 2018 – 2021 (in MMT)

	2018/19	2019/20	2020/21 (forecast)	2019/20 vs 2020/21 (%)
Production	2 648.7	2 710.9	2 780.5	2.6
Utilization	2 677.8	2 689.4	2 732.4	1.6
Ending stocks	871.9	882.7	926.8	5.0

Source: FAO (2020)

The COVID-19 pandemic in the Philippines

On 17 January 2020, the Philippines detected its first case of COVID-19. Since then, the number of cases has spiralled to 46 323 cases as of 7 July 2020, with 1 303 deaths (including the world's first outside China) and 12 185 recoveries. At this rate, the number of infections was doubling every eight days. Doubtless, the infection would have spread much faster and would have caused far more fatalities were not stringent public health measures put in place to arrest the spread of the disease and treat its victims.

On 8 March 2020, President Duterte issued Proclamation 922, declaring a State of Public Health Emergency in the Philippines, under the Law on Reporting Communicable Diseases Act (RA 11332). It led to a declaration of community quarantine, first in Metro Manila, on 12 March. Four days later, on 16 March, the Office of the President issued a Memorandum placing NCR and the island of Luzon under enhanced community quarantine (ECQ) effective the following day. Within the same month, various provinces nationwide followed suit. By early April, Caraga Region, Davao Region, Zamboanga Peninsula, and Western Visayas were also under ECQ.

ECQ imposed the following measures:

- suspension of school activities and mass gatherings;
- suspension of mass public transportation; restrictions on land, air, and sea travel;
- stay-at-home order except for essential activities; and
- closure of all private establishments, except:
    - those related to necessities, namely food, and medicine, as well as banks, money transfers, energy, telecommunications.
    - export-oriented establishments, including Business Process Outsourcing, can remain open as long as they can provide stay-in accommodation for their workers.
    - establishments that remain open may maintain only a skeleton workforce and enforce social distancing within their premises.

Cargo, especially of food and foodstuff, was allowed to move unhampered.

The stringent quarantine measures continued for the whole of April. Starting May, ECQ was lowered to General Community Quarantine (GCQ), a less stringent form of CQ, except for NCR, Region III, Region IV-A, and selected cities and provinces. Starting July, GCQ areas were generally lowered to modified GCQ, which is now the norm nationwide, except for remaining GCQ areas (NCR, selected provinces, and cities), and Cebu City, which was raised to ECQ.

Emergency programmes for food supply chains

Overview of COVID-19 response

As with other countries, food production and food markets were classified as an essential sector or activity and were exempted from the severest prohibitions. Food purchases and deliveries were allowed. However, the food supply chain was not left unscathed by the containment measures. The lead national agency for agriculture and food security is DA, which identified the following actions in response to COVID-19:

1. continuity of DA services – skeleton workforce and work-from-home arrangement;
2. creation of COVID-19 Food Resiliency Task Force;
3. issuance of Food Passes;
4. wide-scale implementation of *Kadiwa ni Ani at Kita*;
5. monitoring and enforcement of expanded price freeze;
6. Urban Agriculture Project;
7. Social Amelioration Programme;
8. continuous prepositioning of rice stocks by the National Food Authority (NFA);
9. opening up of a Public Assistance Helpline; and
10. strategic communication.

Items 3 to 7 are explained in greater detail in the following sections.

COVID-19 emergency programmes of the Department of Agriculture

Food Pass. Back in 2018, the DA, Department of Interior and Local Government (DILG), Philippine National Police (PNP), and Metro Manila Development Authority (MMDA) signed a memorandum of agreement for the efficient and seamless delivery of agricultural products. The "food lane project" entails the accreditation of agriculture and fishery suppliers and truckers to be given preferential incentives including:

- exemption from the truck ban;
- ease of passage through checkpoints;
- designation of food lane routes in major thoroughfares in Metro Manila and the regions; and
- immediate assistance during product delivery.

The accreditation covers suppliers and truckers of rice, perishable agricultural commodities, frozen meat, and processed food products, feeds, fertilizers and other agricultural inputs, and fishery commodities.[7]

When the quarantine was imposed, the DA launched an aggressive information campaign aimed at the private sector, government agencies, and LGUs, together with fast-tracked, online issuance of the food lane pass. The requirements of the food lane pass are registration with the appropriate agency business permit; necessary permits from DA-related agencies (e.g., National Meat Inspection Service for meat); and a completed food lane reference form and sworn statement of commitment.

Kadiwa ni Ani at Kita. The *Kadiwa* is another existing programme of DA that was scaled-up in response to the COVID-19 crisis. The programme seeks to directly link SFFs with consumers by coordinating with LGUs to open up market terminals near residential or public areas. DA and the LGU enter a Statement of Partnership where the former identifies sources of suppliers of agri-fishery products from the provinces and facilitates bringing these products to households in the LGU. The latter, in turn, commits to alternative modalities such as *Kadiwa* on Wheels (LGU will coordinate with the concerned barangays/homeowners' association, and ensures security and orderliness of the activity), or *Kadiwa* Online (where LGU orders electronically and pays suppliers on COD (cash-on-delivery) basis.

In turn, the DA requires partner suppliers to sign a Statement of Commitment to engage in selling activities in areas and times as facilitated by LGUs, ensure quality and safe food is sold, keep retail prices 20 percent below the government-prescribed suggested retail price (SRP), freeze prices or maintain prevailing prices in the nearest market, and comply with quarantine protocols.

Price freeze. Under the Price Act, the DA had issued a SRPs for "basic necessities"; the original list (Table 22) is taken from DA Administrative Circular 01. With the proclamation of the State of Public Emergency, an automatic price freeze on the prevailing prices of necessities was automatically imposed for 60 days. The SRP and price freeze was further expanded the following month.[8]

Urban Agriculture Programme (UAP). The guidelines of the UAP states that urban agriculture, "[…] complemented with zero-waste management when properly planned and implemented,

[7] https://www.gmanetwork.com/news/news/nation/603001/da-dilg-pnp-mmda-sign-agreement-on-food-lane/story/

[8] DA Administrative Circular 01 Series of 2020. Suggested Retail Price (SRP) for Basic Agricultural and Fishery Commodities in Metro Manila; and DA Administrative Circular No. 04 (s2020). Amendment to Administrative Circular No. 03, Series of 2020 Titled: Extension of the Suggested Retail Price and Enforcement of Price Freeze of Agricultural and Fishery Commodities in Metro Manila.

becomes an alternative source of food and income for the Metropolis." Incentives provided by UAP include starter inputs, small tools, technical assistance, and cash prizes. Preferred beneficiaries include communities, public schools and universities, and other government offices.

Social Amelioration Programme. The Social Amelioration Programme refers to the Financial Subsidy for Rice Farmers, already funded under the Rice Competitiveness Enhancement Fund of RA 11203, which involves the provision of cash transfer for rice farmers cultivating 1 ha or below, to address the decline in *palay* prices owing to rice industry liberalization.[9] There is also a Rice Farmer Financial Assistance (RFFA), which is a cash transfer of Php 5 000 to rice farmers cultivating 0.5 ha to 2.0 ha.

Table 2 | Original and expanded list of Suggested Retail Price[10]

ORIGINAL LIST			EXPANDED LIST	
Imported rice:				
Special	51.00		Pork (leg or ham cut)	190.00
Premium	42.00		Chicken (dressed)	130.00
Well-milled	40.00		Raw sugar	45.00
Regular	39.00		Refined sugar	50.00
Local rice:			Milkfish (cage-cultured)	162.00
Special	53.00		Tilapia (pond-cultured, fresh-chilled)	120.00
Premium	45.00		Round scad (fresh-frozen, imported)	130.00
Well-milled	40.00		Garlic (imported)	70.00
Regular	33.00		Garlic (local)	120.00
NFA Rice	27.00		Red onion	95.00
Round scad	130.00			
Pork (belly)	225.00			
Chicken egg	6.50			

Source: Department of Agriculture

ALPAS Kontra COVID-19. Funding for the various actions in response to COVID-19 was proposed under the ALPAS *Kontra* COVID-19 programme, originally proposing Php 31 billion (Table 23). Some of the items in ALPAS are already covered in the actions mentioned above, e.g., Upscaling of *Kadiwa*, UAP, Sustained information education and communication, and support to essential frontline services. To date, only the Rice Resiliency Programme (RRP) has been approved for fund release (hence the other actions have been supported using existing DA funds). The aims to complement the existing Rice Competitiveness Enhancement Fund (RCEF) already funded by GAA 2020. The RRP involves: (a) the RCEF-Enhanced component involving the distribution of fertilizers to 947 municipalities not currently covered by RCEF; (b) Expanded Inbred Rice Distribution; and (c) Expanded Hybrid Rice programme aimed at areas suitable for hybrid rice production.[11]

[9] https://pia.gov.ph/news/articles/1039913.
[10] https://www.da.gov.ph/da-sets-srp-for-pork-chicken-fish-sugar-garlic-onions/
[11] https://www.da.gov.ph/rice-farmers-to-receive-free-seeds-fertilizers-for-may-2020-main-season/.

Table 3 | Proposed funding items for ALPAS Kontra COVID-19[12]

	PROPOSED FUNDING (IN BILLION PHP)
Increased NFA Fund for 30-day Buffer stock	8.240
Rice Resiliency Programme	8.500
Corn-livestock integration and corporative farming	1.750
Expanded coconut-based diversification project	1.000
Fisheries Resiliency Project	1.200
Expanded SURE Aid and Recovery Project	3.000
Expanded Agriculture Insurance Programme	3.000
Upscaling of *Kadiwa ni Ani at Kita* Programme	1.000
Expanded Small Ruminants and Poultry Project	1.000
Enhanced White Corn Production for Food Resiliency	0.300
Urban Agriculture Project	0.500
Revitalized Gulayan Project	1.000
Sustained IEC Project	0.050
Logistical support to frontline essential services	0.502
Total	**31.042**

Source: Department of Agriculture

COVID-19 emergency programmes in Mindanao

BARMM Government. BARMM Government is currently implementing a Contingency Plan for COVID-19. The Plan identifies MAFAR as the lead agency to ensure food security amid COVID-19. One of the actions implemented has been the establishment of Survival Gardens in forestlands, targeting members of the Moro Islamic Liberation Front (MILF) who work as forest rangers. MAFAR has also distributed rice and vegetable seeds and other farm inputs to farmers and IDPs from Marawi City.

Mindanao Development Authority (MinDA). To assist SFFs recover from the COVID-19 pandemic, MinDA facilitated the marketing of agricultural products through the MinDATienda Portal/Buy & Sell Portal (www.mindatienda.com). MinDA also supports a programme to facilitate migration outside densely congested population centers by identifying three possible resettlement villages in Zamboanga del Norte and Lanao del Norte under the *Balik-Probinsya, Bagong Pag-Asa* (BP2) Programme. MinDA has also initiated an Assistance in Loan Access for Livelihood and Agriculture Industries (ALALAI), which will provide free facilitation services to SFFs and women who would like to start small industries. MinDA has also officially launched the Self-Sustaining Food Supply Strategy (SSFSS) which will mobilize LGUs and communities in Mindanao to produce their food or collaborate with adjacent political units for a symbiotic sustainable food supply scheme.

[12] Presentation on: Status of Programmes and Initiatives of the DA amid COVID-19. By Sec. William Dar.

IMPACT ON FOOD SUPPLY CHAINS

Inputs and finance

Some SFFs reported difficulties in securing inputs owing to the closure of agro-trading shops. The closure of banks and non-operation by financiers also affected SFFs.

In Marawi, some small fisherfolk report that obtaining fishing nets and other fishing supplies was a problem as some of the shops supplying them had closed (at least temporarily). Some smallholder farmers similarly reported this in Basilan concerning obtaining fertilizers. A Hog raiser in Ifugao has observed an absence of insemination services during the ECQ. An aquaculture specialist noted the absence of hatchery fry for milkfish, which is normally imported by air from Indonesia via passenger planes. The key informant believes that shortage will be felt around August when the season for harvesting domestic, wild-caught fry ends.

Similarly, owing to the closure of banks, or limited hours of operation, some farmers had been unable to secure their usual loans. On the other hand, SFFs, who normally rely on informal financiers (such as traders), are still typically able to secure financing; unfortunately, this sometimes coincided with the loss of livelihood, driving them deeper into debt. The larger formal agribusiness enterprises, whether in farming (crop or animals), fishing, or processing, reported no problems in access to finance or in obtaining inputs.

Employment across the supply chain

Across the supply chain, workers are reported to have had a difficult time reporting to the place of work owing to LGU-level quarantine regulations together with the suspension of public transport.

All over the country, and across the players in the supply chain (farmers, assemblers, processors, and retailers), business operators reported that their workers were having a difficult time reporting for work. In Jolo, Sulu, small fisherfolk reported that, during the quarantine period, the LGU prohibited them from going out to sea.

A key obstacle was local government restriction, which was applied even for workers in essential services or sectors, who need to move across jurisdictions such as barangays or municipalities. Some required health certificates to be secured first before they would allow the passage of workers. It affects migrant workers in farming, personnel of assemblers trying to enter farms, and traders trying to reach buying stations.

Even when restrictions had eased up (1 – 2 months after initial lockdown), the remaining problem was the suspension or limitation on public transport, which workers rely on for mobility and transportation to and from work. Even when public transport was allowed, it remained limited (to enforce social distancing); in some cases, remaining operators demanded higher transport fares. Until July, back riding was remained banned, although two-wheeled public transport is a common transport mode in rural areas.

The limited supply of labour, assuming the same demand, implies a higher wage. One rice farming coop leader in Basilan, whose members are mostly smallholder farmers, reported higher wages for farmworkers in their area. However, the net impact is unclear as the demand of farmers may not be the same (see below).

Some business operators, who were themselves are elderly, opted to just stay at home and not open for business.

Some farmers have reported not going to their field for fear of contracting COVID-19, from as far north as CAR, to as far south as Basilan. Similarly, some senior citizen retailers in Metro Manila opted to close, though otherwise allowed to stay open (such as fresh produce stalls)

Employers also could not deploy a full workforce owing to social distancing restrictions in the workplace, the need to providing shuttling services, or stay-in facilities.

Employers were nevertheless unable to operate at full capacity, as there will be difficulty introducing social distancing requirements in their processing plants. They also had limited difficulty securing transport services for workers unable to travel to work or provide stay-in facilities. Stay-in workers tend to be single and are equally likely to be male or female. In the case of one large fish culture/processing operator, during the ECQ period, the company was operating at 50 percent capacity but rose to 90 percent capacity as quarantine measures relaxed.

Transportation

Throughout the supply chain, players who needed to travel as part of their business faced LGU-imposed restrictions, at least in the initial phase of the lockdown.

Similar to the movement of workers, the transport of goods was also affected by differing LGU policies on quarantine. The more widely reported cases affected rice deliveries (namely in Iloilo, when the provincial government closed its borders, and Bukidnon when the local government temporarily halted the outbound movement of rice).

Figures 11 and 12 identify the locations for which DA Operations flagged incident reports of food supply chain disruptions.[13] The incident reports are geo-tagged; hence, we can plot these on a map (as red dots). We focus on these figures on the demand center of Metro Manila, and we limit the disruption points to the main island of Luzon.

The maps also overlay the main transport routes from each province (standardized at the provincial capital) leading to Metro Manila, first for livestock products (Figure 11) and then for rice (Figure 12). For livestock, there are numerous reports in CALABARZON, outside the main transport routes. However, there are also numerous points along the main transport routes connecting Central Luzon to Metro Manila. A similar finding holds when the transport routes are stretched out to Region II, which traces out transport routes for rice. These have the potential to disrupt the smooth flow of food from the production centers in Regions II and III (as depicted in Section 3.4) to Metro Manila.

Gradually restrictions eased up over May and June, and complaints about transport restrictions have become less frequent.

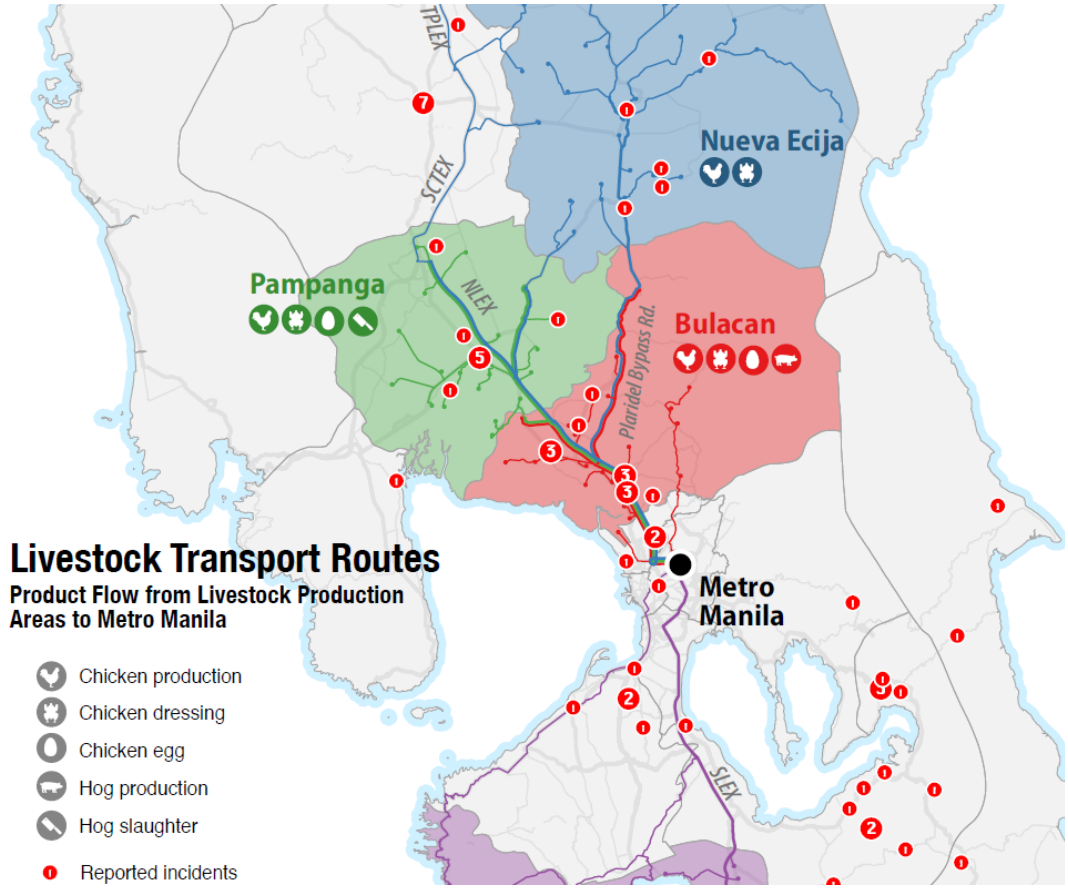
Whereas Figures 11 and 12 compress the disruption points in a single diagram, Figures 13 and 14 offer different snapshots, as it were, over time; moreover, all the disruption points nationwide are mapped. Figure 13 isolates those points reported in the week of 23-29 March 2020, two weeks after the ECQ of Luzon (1 to 2 weeks after the ECQ of Visayas and Mindanao), showing a high number of reports on disruptions. The disruptions eventually eased out or were resolved with the number of points significantly lower, as seen in Figure 14 for status as of 13-19 April.

The points are quite dense around Metro Manila itself, CALABARZON, Bicol Region, CAR, and Ilocos Region, as well as the points along Central Luzon and Cagayan Valley. The Visayas,

[13] https://bit.ly/2OAZHvt.

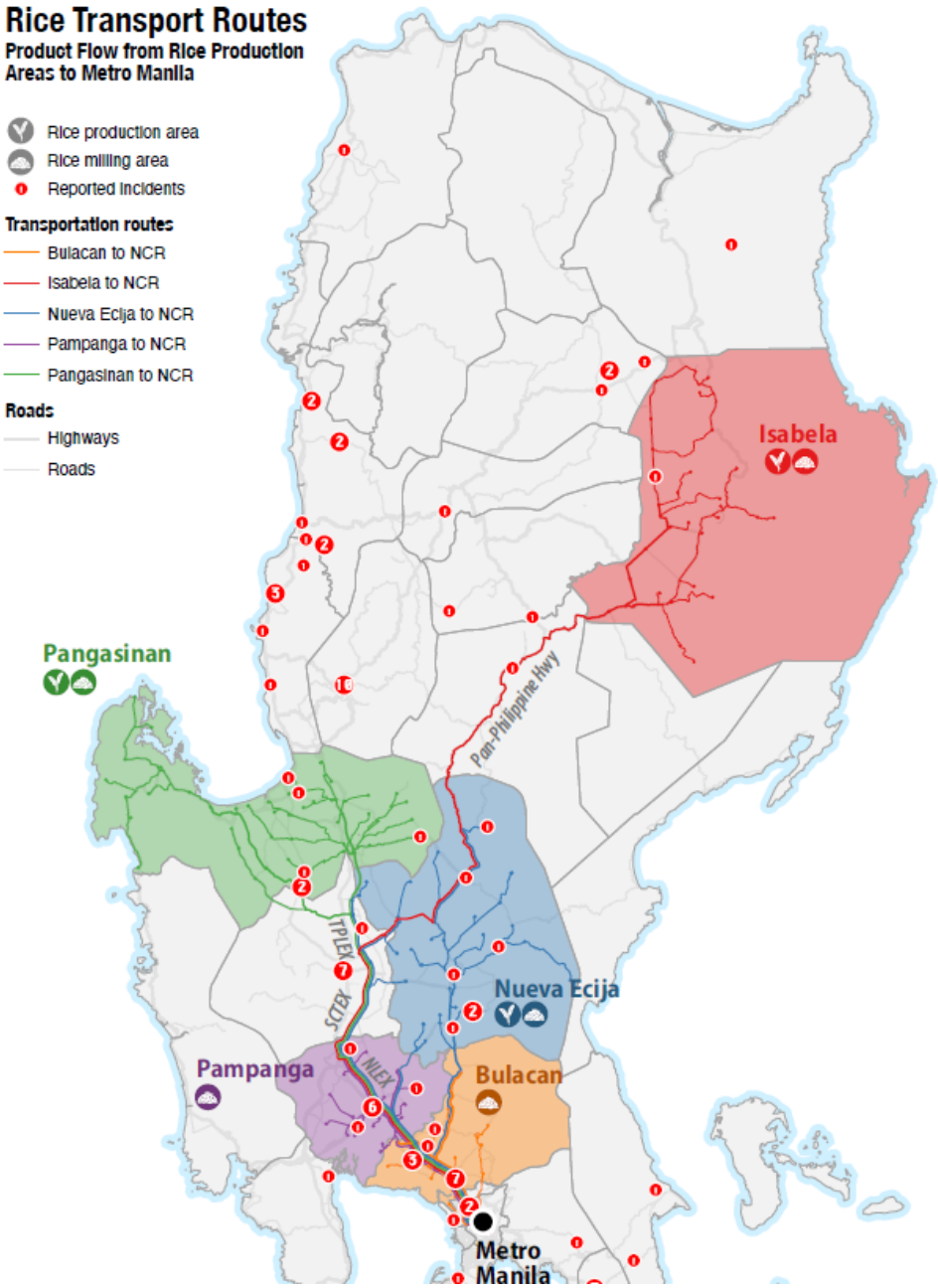
however, has only a few points plotted (and limited to Cebu province). Likewise, relatively few points are plotted for Mindanao (and limited to Region XI and XII).

Figure 1 | Mapping of transport routes against incident reports: the case of livestock



Data source: DA, 2020.

Figure 2 | Mapping of transport routes against incident reports: the case of rice



Data source: DA, 2020.

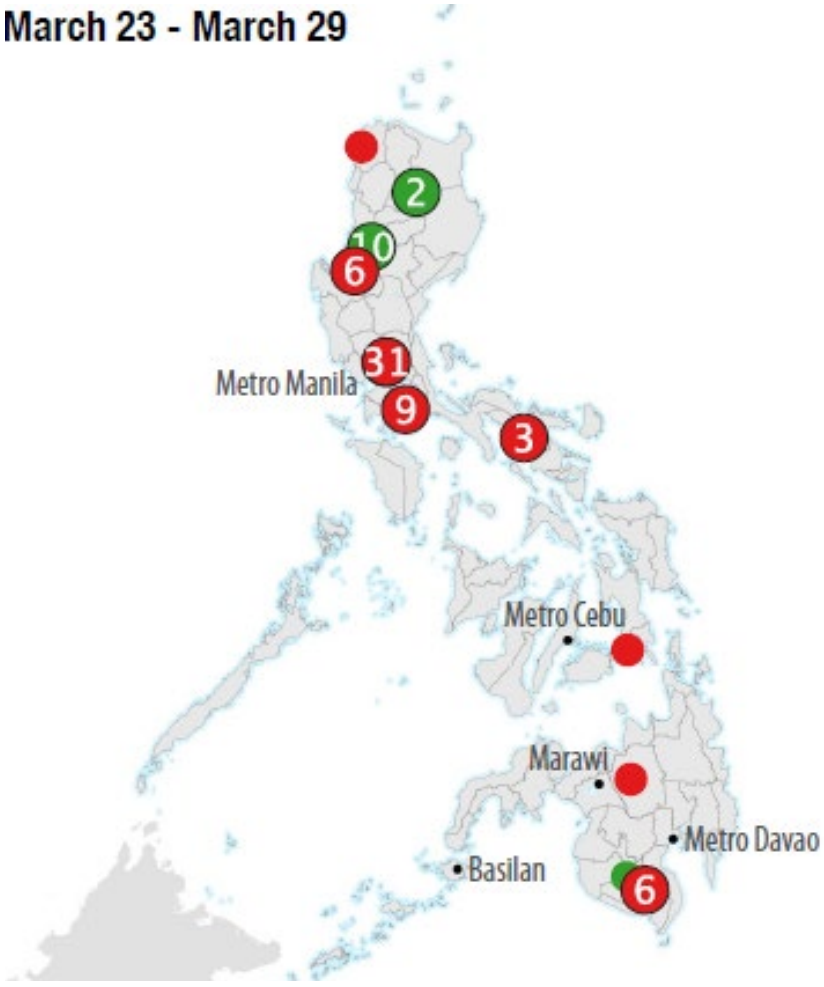
The points plotted in Figure 14, meanwhile, offer a marked contrast. No points are plotted for Mindanao; Visayas disruptions are noted only in Region VIII; even Luzon is pocked by scattered reports in MIMAROPA and Central Luzon (north of NCR).

Both national and local governments imposed other types of restrictions affecting land and sea travel without necessarily stopping movement altogether.

Others mentioned problems, not in the transportation per se, but limited hours for operation of buying stations, trading centers, wet markets, and even fishing ports or landing ports. Deliveries had to be made within a much more compressed time slot compared to pre-COVID-19.

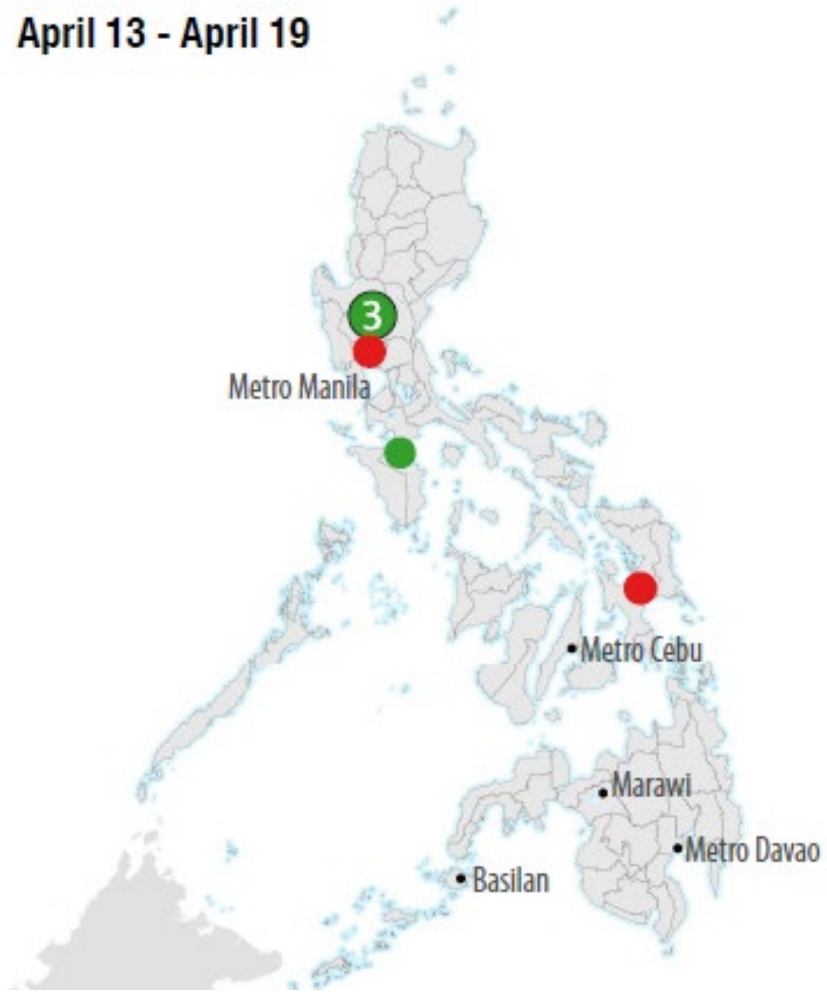
As mentioned previously, MARINA reports that cargo vessels were much less affected by the quarantine as compared to passenger shipping; however, the effect was still substantial. Shipping companies also face issues in allowing their workers to move freely across ports; port operations are also constrained by skeleton workforce restrictions as well as the inability of port workers to report for duty. Finally, some agricultural produce, which travels in the cargo hold of passenger ships, will need to move to regular cargo ships, putting additional stress on an already stretched transport mode. This is reported to have affected shipments from Mindanao (especially Region X) to Metro Cebu and even Metro Manila.

Figure 3 | Locations of incident reports, week of 23-29 March 2020



Data source: DA, 2020.

Figure 4 | Locations of incident reports, week of 13-19 April 2020



Data source: DA, 2020.

Meanwhile, highland vegetables from CAR and crossing the Visayan Sea is also affected by the loss of passenger shipping. Cargo bound for Visayas or Mindanao must first be consolidated before the ship will set sail, which leads to a 1 to 2 day delay. This ages the produce and causes its price to decline as it can only be sold as 2nd class, rather than 1st class, by the time it reaches Iloilo.

Government programmes

There is widespread agreement that DA's food pass, together with DTI's cargo pass, was eventually successful in assuring the movement of goods and agro-inputs.

This was confirmed as well in the key informant interviews. One large meat trader operating nationwide mentioned that, initially, some LGUs would look for the DTI cargo pass rather than accept the DA food pass. Similarly, a large chicken producer mentioned that feed inputs were stopped initially by some LGUs because it was not human food; however, the issue was soon cleared up (after about a week).

Input and credit support from the government was also cited by farmers as helpful, although some had no information about national programmes (which are focused on rice).

Farmers reported that input support received from LGUs (seeds and fertilizers) were very helpful, such as in Basilan province. Local government assistance tends to be more visible; some farmers, however, admitted ignorance of national government programmes (i.e., DA) despite the information campaigns of the agency and the fast-tracking of DA support, which tend to focus on rice. The Php 8.5 billion RRP Fund has already been mentioned previously. Also, 597 404 beneficiaries have been served under RFFA, while 591 246 beneficiaries under Financial Subsidy to Rice Farmers (FSRF) programme (with the budget for both programmes fully utilized).[14]

The Kadiwa ni Ani at Kita programme of the national government, together with procurement for relief goods of LGUs, provided a strong demand boost to fruit and vegetable farmers.

Key informants who had participated in the DA's *Kadiwa ni Ani at Kita* Programme have all reported being satisfied with its implementation. They reported that they even earned a higher margin compared with selling to the usual assembler/consolidator, as they can sell at a retail price; their gross margin, though, is not much higher owing to the controlled price under the *Kadiwa* terms and conditions.

In general, farmers (crop or animal) and fisherfolk have reported that procurement programmes of LGUs to provide relief for their communities under lockdown have boosted their sales. DA reports that Php 3 billion has been spent by LGUs directly for food relief over the period March to June 2020. *Palay* farmers and rice millers specifically cited the role of LGU demand, as relief packs always contained a bit of rice in the ration. Data from DA[15] indicate that 14 930 farmer-beneficiaries have participated in the *Kadiwa*, selling a total of Php 5.486 billion worth of agriproducts. Of this amount, 95.3 percent was sold in NCR. An estimated 1.46 million households have been served nationwide.

For meat suppliers, though, the *Kadiwa* programme has been less effective. Many outlets identified by LGUs have no electricity and facilities for a prolonged display of fresh meat (and presumably, fresh fish) products.

Programmes to expand supply must be constantly confronted with the realities of market demand.

The following is a mini-case study applying this observation with a specific COVID-19 response, namely the UAP. Based on the objectives of the UAP, programme design and project planning entail explicit targets; assume this applies for Metro Manila, and the target is 10 percent of NCR demand for lowland vegetables in this rapid assessment. A quick back-of-the-envelope calculation leads to the following (Table 24).

[14] DA Virtual Presser. Issue No. 12.
[15] DA Virtual Presser. Issue No. 21.

Table 4 | Estimated physical area requirements for assumed UAP targets for NCR

	YIELD (TONS/HA)	AREA HARVESTED REQUIREMENT (HA)	PHYSICAL AREA REQUIREMENT (HA)
Eggplant	11	421	105
Squash	15	151	38
Tomato	13	365	6
Total	-	-	**149**

Source: Authors' calculation.

The estimates lead to some important questions

- How much land is available for UA within NCR? Where are these lands located?
- How likely is land allocated to UA able to shift from current use (or disuse) to urban gardening in a sustained way?
- If enough land is unlikely to be found within NCR, are alternative locations available that can also serve the needs of urban households, i.e., in peri-urban space?
- How much vegetable production in rural space may be displaced, and how can this displacement be addressed?

The last point is a particularly important agenda item for the food supply chain: all other factors constant, additional vegetable production in urban space must displace demand away from rural producers. The only way to avoid this is if UA creates its demand, i.e., by *combining it with a nutrition education campaign aimed at communities, offices, and schools, to consume more nutritious diets (e.g., more vegetables).*

Sales and prices at the level of the farmer and assembler

Most farmers and assemblers report reduced sales and sales prices.

Nationwide, numerous farmers (and some consolidators) report both a drop in sales during the ECQ. Many also expect a lingering effect of the lockdown, although opinions for the remainder of 2020 vary. Examples of this feedback are as follows:

- A milkfish producer in Bohol reports a 75 percent drop in sales and below normal for the year (10-20 percent).
- Hog raiser in Ifugao also expects 10-20 percent drop. A retailer in Ifugao similarly expects 20 percent drop.
- Vegetable assemblers (2) in South Cotabato expect 20-30 percent lower sales for the year. A round scad supplier in Negros Occidental (selling to both Visayas and Luzon markets) expects a similar decline for the year.
- A tilapia supplier in South Cotabato expects a 20 percent decline in farm gate price.
- A nationwide meat seller suffered an 80 percent drop in sales; cassava growers in Basilan and a rice trader in Iloilo City reported a similarly large drop.
- Small fisherfolk in Sulu have reported a 25 percent drop in prices, while in Marawi, there was a 20 percent weakening of sales. A similar figure has been reported for vegetables and banana sales in Davao del Sur by the Office of the Provincial Agriculturist (OPAG).

The reason for the decline is the reduction in visits by assemblers. Also contributing to this is the restriction placed in buying stations and wholesale markets. In the case of the Benguet Agri-Pinoy Trading Center (BAPTC), the volume of delivery trucks was cut from 100 per day before

the ECQ to just 35 to 40 trucks daily during the first two weeks of lockdown. With assemblers obtaining the DA food pass, the volume of trucks almost normalized; however, the number of persons (sellers, buyers, and their workers) allowed to enter the premises physically was limited by the LGU, forcing a slowdown in sales.

A promising exception to this trend is direct online selling to households, which seems to have created opportunities for formal enterprises.

There were, of course, exceptions to this general trend; usually, the luckier farmers were serving some specialized or niche market. A social enterprise specializing in trading of CAR vegetables reported a higher farm gate price for some highland vegetables (e.g., cabbage and lettuce). A vegetable grower in Marawi that supplies a state college reported higher sales (as their vegetables were being procured to support frontline health workers).

By far, the largest new segment has been direct selling online to households. Several formal enterprises have shifted in a big way to online selling; at least two of them (medium-large agribusinesses) have seen their sales go up upon shifting to online retail. They attribute it to households' reluctance to shop conventionally, but rather order food from the safety of their own home.

The DA has also begun to engage in an online version of the *Kadiwa*, called *E-Kadiwa*. [16] Partner merchants and logistics providers include ANI Express, Zagana.com, Abalayan Trading, LiveGreen, Farmfetch, Farmshare GO, Cultigen, Banwa Farm, Benjabi, RAM, Mober, Grab, and Lalamove. Unlike the private-driven online markets, DA assures quality and compliance of pricing with the SRP.

Sales and prices at the retail level

After an initial round of panic-induced buying, retailers in wet markets and service establishments report dramatically reduced sales.

In the first half of March, retailers in Metro Manila (including officers of a national association), as well as in Iloilo, attested to an increase in sales attributed to panic buying. During the ECQ, however, sales declined dramatically. A vegetable trader noted that only 6 out of 11 stalls in her market continued operation during ECQ.

A large market in Quezon City provided more exact numbers. Last February, they were operating at 100 percent capacity (over 1 400 stalls); during ECQ, the number of stalls dropped to between 120 and 150 (all selling only essential goods). Their data on daily foot traffic (average for the month) showed a 37 percent drop between February and April. One reason for low demand is restrictions imposed by the LGU. Since March 27, the city LGU had imposed a maximum of 300 persons at any one time in the market (on average, customers spend only 13 – 18 minutes inside the market). The prospect of restoring the normal functioning of the market appears next to impossible. There is a real prospect of closure within the next six months if the current trend of 50 percent capacity persists.

Similarly, prohibition on dine-in in restaurants had caused a massive drop in orders from food service establishments. This has affected some large food producers (i.e., bulk suppliers/processors of chicken, pork, and fish) who cater to the fast food or related businesses such as school and company canteens.

[16] DA Virtual Presser, Issue No. 9.

In contrast, the quarantines had differential effects in the modern retail segment, favouring the top supermarkets.

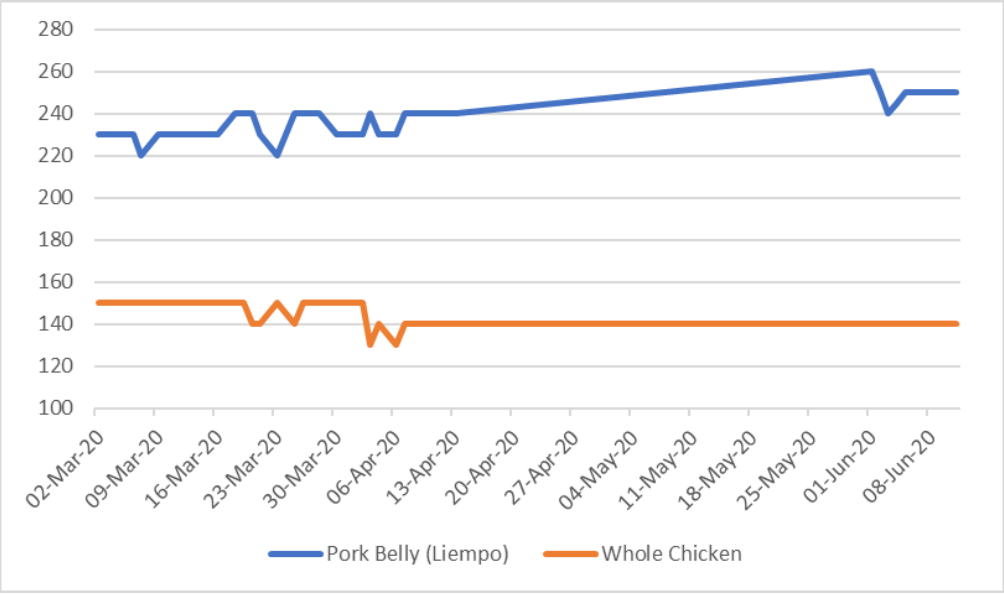
Informants from the supermarket retailer associations reported that the decline in sales had affected the modern retail segment as well. However, there is a unique differentiation in the outcome: the 5 to 6 largest supermarket chains had likely enjoyed an *increase* in sales during ECQ, at least in Metro Manila. They had ramped up their orders from manufacturers in anticipation of the lockdown. As they were favoured customers, manufacturers prioritized their orders – to the detriment of small retailers, who instead were forced to purchase wholesale from the largest retailers.

Retail prices in Metro Manila show a clear pattern of initial volatility in the weeks before and after the ECQ, followed by several weeks of relatively stable prices.

If both supply and demand sides of the market are disrupted, then the relative magnitude of these disruptions can be gauged by the change in price. If supply disruption exceeds that of demand such that the commodity becomes relatively scarcer, its price will rise; in the converse case, the demand disruption exceeds that of supply, and the commodity becomes relatively more abundant; hence, its price will decline.

Figures 15 to 18 show nearly daily data for Metro Manila as available from the price monitoring of DA-AMAS. Rice and chicken eggs are not shown as they show a constant price over the period (at Php 40 per kg for the former, and Php 6.50 per piece for the latter). For the other prices that do fluctuate over time, there seems to be a general pattern: first, in the two weeks before March 15, and the following 2 to 3 weeks after 15 March 2020, the commodity prices exhibit high volatility. However, around the 2nd to 3rd week of April 2020, the prices enter a relatively stable phase.

Figure 5 | Retail prices of pork and chicken, Php per kg, March – June 2020

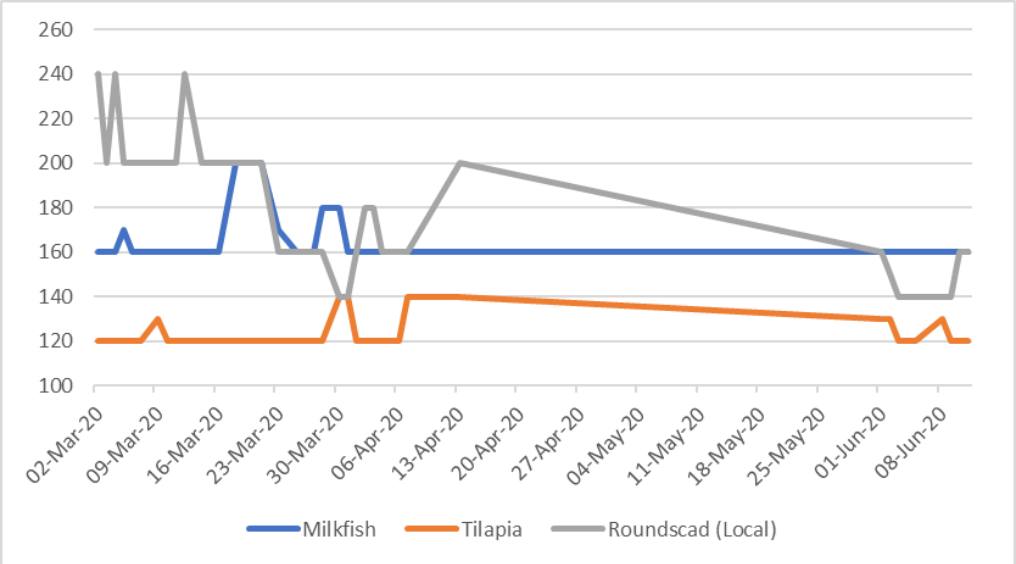


Source: DA – AMAS (2020).

The volatile phase before the ECQ can be attributed to panic buying, while that afterward is due to combined supply and demand disruption in the confusion of the first 2 to 3 weeks after ECQ. In the stable phase, however, the movement of the price depends entirely on the commodity,

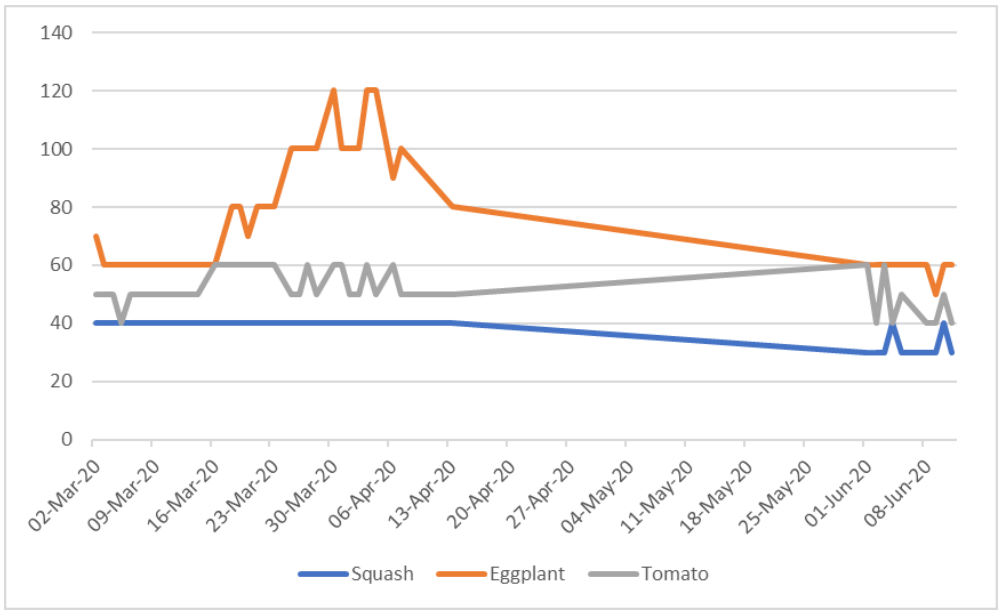
whether constant (chicken), declining (milkfish), or increasing (tomato). Hence, there is no single tendency towards relative scarcity or abundance over the limited period under consideration.

Figure 6 | Retail prices of fish, Php per kg, March – June 2020



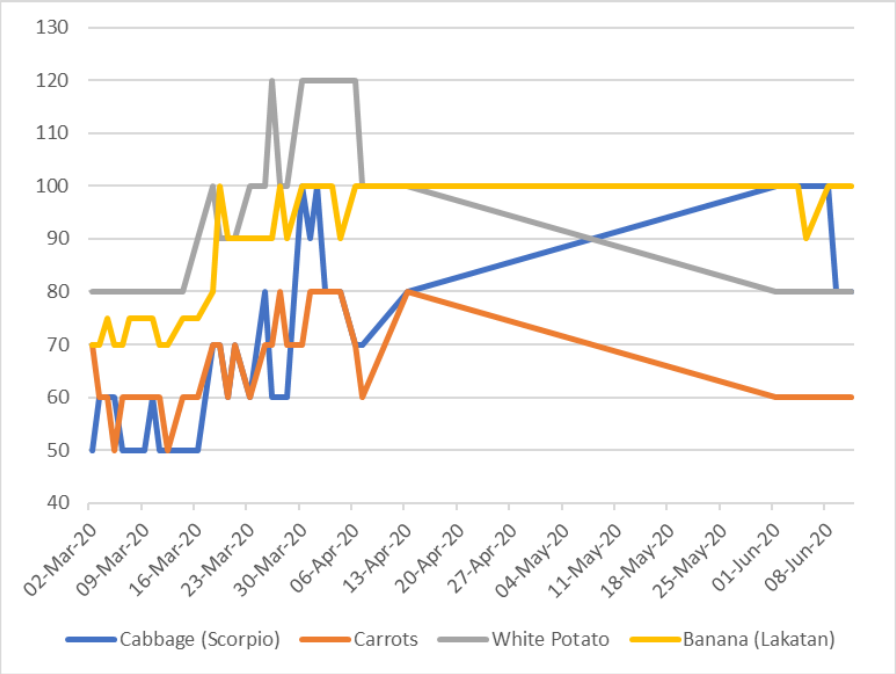
Source: DA – AMAS (2020).

Figure 7 | Retail prices of lowland vegetables, Php per kg, March – June 2020



Source: DA – AMAS (2020).

Figure 8 | Retail prices of highland vegetables and banana, Php per kg, March – June 2020



Source: DA – AMAS (2020).

The majority of monitored commodities under price control are non-compliant.

Among the commodities under price control, rice, chicken egg, and milkfish are generally compliant. The rest, however (chicken, tilapia, round scad, and pork liempo), are non-compliant. One retailer has pointed out that it is unrealistic to observe the price control at the retail level if wholesale prices are free to vary. The general practice is to apply a fixed margin on top of the wholesale price. A rice trader has claimed that her margin has been cut by about 10 percent. Enforcing compliance is, however, costly, will likely drive transactions underground, and lead to unrealistic penalties (such as further extinguishing livelihoods among retailers and their employees).

Households

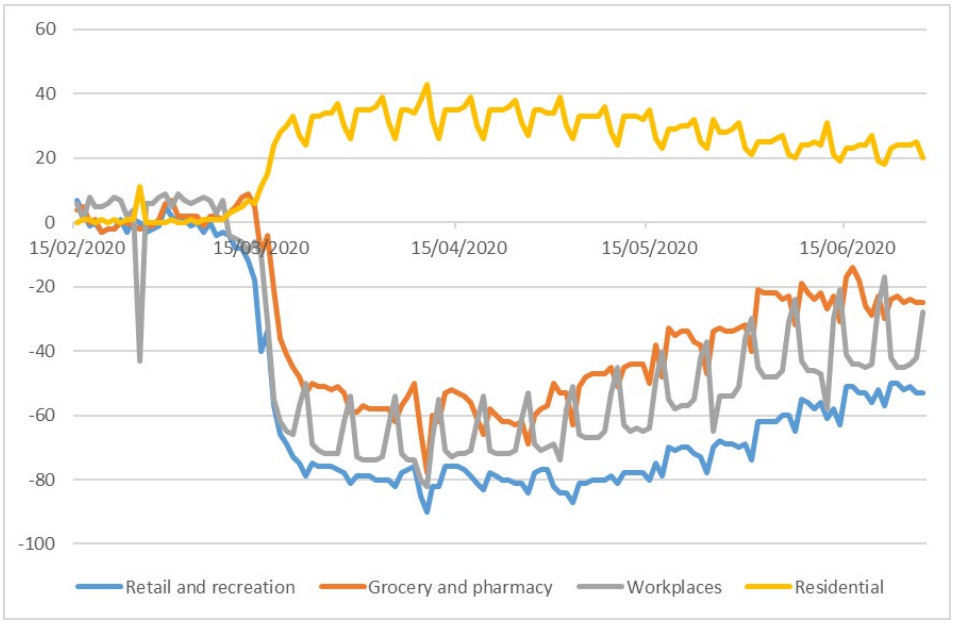
Measures to contain the COVID-19 pandemic has severely affected livelihoods and the ability of households to purchase food.

The quarantine measures were highly effective in restricting movement and keeping people domiciled. Figure 11 summarizes data from Google's community mobility report, which is based on global positioning system (GPS)-tracked location histories. The data shows how visitors to (or time spent in) categorized places change compared to our baseline days. A baseline day represents a *normal* value for that day of the week. The baseline day is the median value from the five weeks of 3 January to 6 February 2020.

Retail and recreation suffered the steepest drop between 15 March and 15 April 2020, dipping to more than 80 percent lower than the baseline. Even grocery and pharmacy visits, which were kept open, suffered a mobility drop of 60 to 80 percent (depending on the day). Meanwhile, staying at home rose by over 40 percent over the same period. Workplace mobility also saw

similarly steep drops over the same periods. Since mid-April, visits to workplace, retail and recreation, and grocery and pharmacy had begun to increase; however, by late-June early-July, workplace mobility was still 20-40 percent of the baseline; grocery and pharmacies were still down 20 percent; and retail and recreation between 50 to 60 percent.

Figure 9 | Percentage change from baseline mobility, by location category and day, Philippines[17]



Source: Google website.

The impact on household consumption is not only due to domestic mobility restrictions. It is projected that per capita consumption of households will decline by 2.2 - 3.3 percent over the year, as a result of the decline in remittance inflows to the Philippines, which may fall from 23 percent - 32 percent (Murakami et al., 2020).

A more direct study of food security impacts at the household level is available for BARMM, covering Basilan, Marawi, Lanao del Sur, and Maguindanao (CRS, 2020). Highlights of their results for Marawi and Basilan during the period of community quarantine are as follows:

- In Marawi, 66 percent of households report suffering a shortage of food; in Basilan, the share is lower but still significant, at 36 percent.
- In Marawi, 57 percent of households have a measured food consumption score (FCS) within the acceptable range; the counterpart proportion is 89 percent in Basilan. However, this implies 43 percent fail to meet the standard in Marawi, and 11 percent in Basilan. One reason why Marawi households suffer lower FCS is the high incidence of IDPs: among IDP households, only 53 percent reach an acceptable FCS, whereas the figure for non-IDP households is 7 percent percent.
- As much as 73 percent of households in Marawi report that their usual income activity has ceased, the counterpart share in Basilan is 51 percent.

[17] (https://www.google.com/covid19/mobility/?hl=en).

- A startlingly high percentage of households cite food as their biggest problem in the next ten days: 64 percent in Basilan, rising to 95 percent in Marawi.

Some large agribusiness enterprises are making relatively optimistic forecasts about the domestic market for food products.

We have already discussed the case of some companies finding online retail a hitherto untapped opportunity for the business. Moreover, a large milkfish producer was planning on making aggressive expansion in fishponds in untapped coastal areas of Southern Luzon. The reasoning is that milkfish is a primary protein source that households will continue to buy even as their income drops, and they stop buying the more expensive fish and meats.

Other issues

Case of pork

Traders, retailers, processors, and producers, all point to the coinciding ASF as the more severe source of disruption for the hog and pork industry than COVID-19. The DA has argued that COVID-19 might have helped arrest the spread of ASF as it has constrained mobility of pork across jurisdictions, by checking the activity of traders and slowing down transportation.[18]

Food and workplace safety

The DA issued Memorandum Circular 15 (S2020) entitled "Guidelines on Food Safety for Philippine Agricultural and Fishery Sectors During COVID-19 Pandemic." It prescribes various food and workplace safety measures to be observed by food enterprises. Some of these are not specific to food establishments, but are supposed to be followed by all workplaces in quarantine areas, namely: maintenance of social distancing among workers; isolation, testing, and, as applicable, contact tracing for workers with COVID-19 symptoms; limits on meetings and prohibition on mass gathering; observance of handwashing and other hygiene practices; and facility sanitation and disinfection. The circular also reinforces food hygiene systems such as Good Agricultural Practices (GAP), Good Hygiene Practices (GHP), Good Manufacturing Practices (GMP), Hazard Analysis and Critical Control Points (HACCP). Food-related establishments interviewed in this study report high compliance with these and related safety measures.

Food losses and waste

Some news outlets initially reported food losses among farmers, as they were unable to sell, process (either due to lack of processing facilities or lack of processing skills), or otherwise dispose of their food. This rapid assessment, however, has found only one instance of corroboration, namely in Marawi, wherein an estimated 20 to 50 percent of vegetables sold in the city market suffered damage as they went unsold or were on stock for too long. The informants pointed out that consumers were patronizing ambulant peddlers instead, thereby minimizing travel away from home to obtain food. In general, however, the other producers reported they are generally able to avoid spoilage or waste of their produce by finding enough buyers, accepting a low enough price, or finding ways to use their produce (such as drying, in the case of fish). [19]

In the case of large meat producers, especially of chicken, the problem of low demand ultimately compelled them to increase their demand for cold storage space, which is very costly. One nationwide meat supplier estimated a cost of Php 1 million a month for storage.

[18] DA Virtual Presser, Issue No. 17.

[19] https://news.abs-cbn.com/news/03/28/20/da-to-help-farmers-sell-surplus-crops-amid-luzon-lockdown/

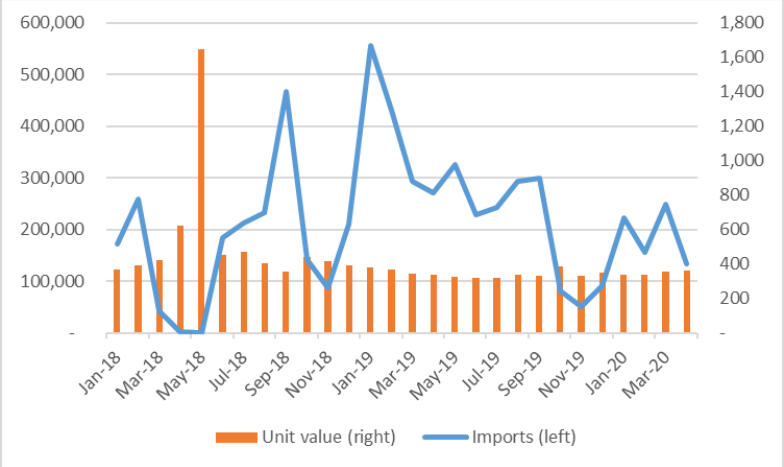
They expect this however, to be a temporary measure as they had dramatically reduced their live animal inventories in order to draw down their stored meat rapidly.

Imports

Poultry producers are particularly vocal in their opposition to imports; in general, though food supply chain players interviewed in this rapid assessment tend to look unfavourably on imports. The study, unfortunately, was not able to cover importers or users of imported inputs such as some meat processors. A domestic producer lobby has argued against allowing imports at least within 2020, to give time for producers to recover from the COVID-19 pandemic. Imports are deemed unnecessary, as there are sufficient inventories to meet domestic demand.[20]

It should be noted, though, that imports have consistently been opposed by domestic food supply players, for similar reasons, irrespective of the COVID-19 pandemic. Moreover, unit values of imports of rice, pork, and poultry are stable over the pandemic period (Figures 20, 21, and 22). On the other hand, monthly imports for April 2020 are all lower than monthly imports the year before, or even the quarter before.

Figure 10 | Imports (in MT) and unit value of rice (in USD per MT), monthly, 2018 – 2020



Note: Figures refer to HS Code 1006: Rice.

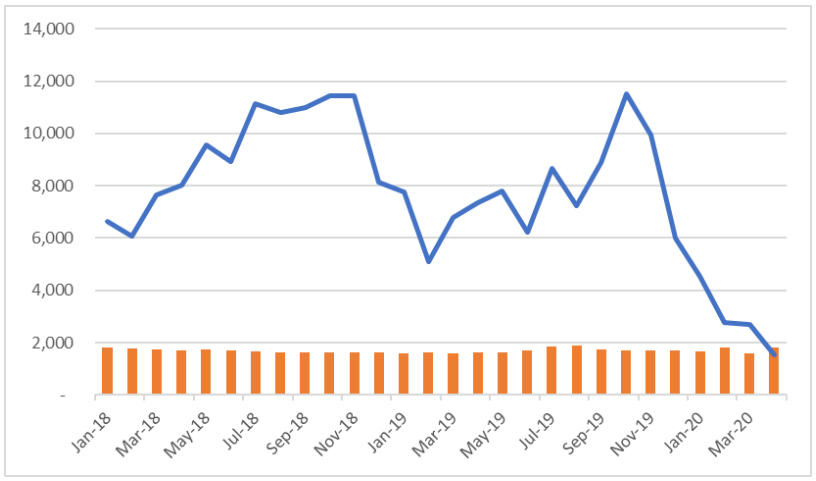
Source: BOC.

To explain this collapse in domestic imports in the course of the pandemic, two reasons may be deduced:

- Logistic problems are not unique to domestic food supply chains; it also affects international logistics in food supply chains.
- Market forces already incorporate the relative abundance of domestic supply in relation to domestic demand. That is, users or consumers of imports no longer find a large price advantage in favour of imports, especially considering the logistical difficulties of international trade.

[20] https://www.manilatimes.net/2020/06/13/business/business-top/no-chicken-pork-imports-until-end-of-year-da-told/731471/

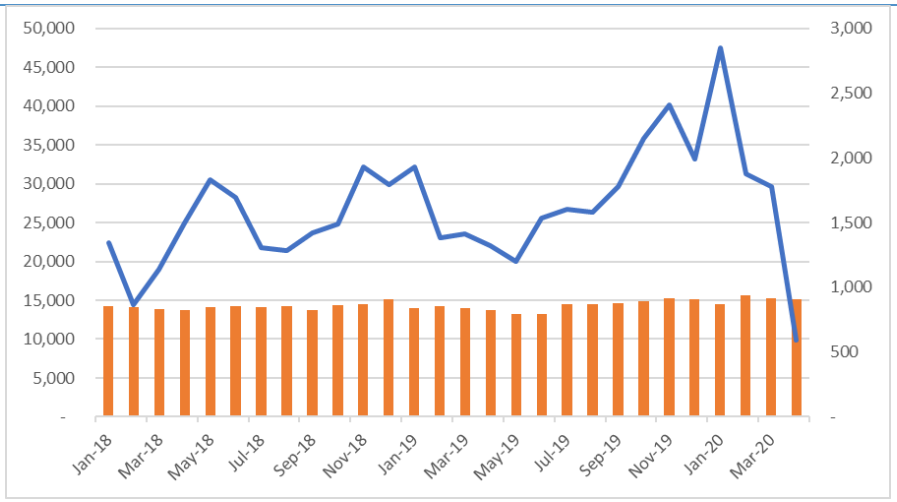
Figure 11 | Imports (in MT) and unit value (in USD per MT) of pork, monthly, 2018 – 2020



Note: Figures refer to HS Code 0203: Meat of swine, fresh, chilled, or frozen.

Source: BOC.

Figure 12 | Imports (in MT) and unit value (in USD per MT) of chicken, monthly, 2018 – 2020



Source: BOC.

Note: Refers to 0207: Meat and edible offal of fowls of the species *Gallus domesticus*, ducks, geese, turkeys and guinea fowls, fresh, chilled, or frozen. Over 99 percent falls under 020727: Frozen cuts and edible offal of fowls of the species *Gallus domesticus.*

The self-corrective nature of market forces makes it unnecessary for the government to step in to stop importation explicitly, especially as these products are already being heavily protected under high tariff walls (40 percent for meat and 35 percent for ASEAN rice). Furthermore, additional import restrictions will make the Philippines vulnerable to trade disputes and will

undermine its credibility in insisting on open trade from exporting countries (such as Vietnam in the case of rice).

IMPLICATIONS

Conclusions

The COVID-19 pandemic hit an agri-food system already confronting serious short-term and long-term challenges.

The agri-food system of the country was already contending with serious pest and disease outbreaks. It was furthermore facing the fundamental development challenge of tepid growth, impoverished livelihoods among SFFs, even as consumers were deriving poor nutritional outcomes from the agri-food system. In particular, an inefficient logistics system was excluding many SFFs from agri-value chains, as well as many poor households from affordable foods.

Despite these weaknesses, the short-term outlook was favourable, leading up to COVID-19**.** Moreover, a reformist leadership at DA was also in place focused on relieving the long--term development constraints of agriculture. The pandemic has reversed these expectations and has forced government agencies to go into crisis mode, delaying the more ambitious elements of their reform programme.

After an initial period of confusion, supply chain disruptions had been mostly addressed as early as the end of April, partly due to resiliency measures already in place.

Quarantine measures initially prevent households from gaining access to food. The DA expanded and fast-tracked implementation of at least two pre-existing programmes that appeared instrumental to warding off the threat of food security. The first was the food pass, which provided a quick verification system to allow transport of food items and agricultural inputs. The second was the *Kadiwa* programme, which linked food producers more directly to households in coordination with local governments. Any remaining problems are a residual disconnect between national directives and LGU policies, whether at the provincial, municipal, or barangay levels.

The crisis has led to a new and persistent problem for the agri-food sector, namely, limited market demand.

Resolving the supply disruption has not removed the threat to food security induced by the pandemic. The new and less tractable problem is that the collapse in demand; note that lack of demand has not appeared in the list of development constraints, as past assessments had mostly dwelt on the ability of supply to meet a vast unmet demand.

Concerning export markets, we have shown that the prognosis for economic growth globally is very gloomy. The world economy is likely undergoing a sharp contraction unseen since the 1930s Great Depression. Domestic markets fare no better; the Development Budget Coordinating Committee has officially adopted a forecast of 2.0 to 3.4 percent contraction for 2020.[21] Consumer demand is expected to contract, first from the decline in purchasing power owing to loss of income, whether from domestic sources or foreign remittances. The

[21] https://www.neda.gov.ph/dbcc-revisits-medium-term-macroeconomic-assumptions-and-fiscal-programme-amid-the-covid-19-pandemic/.

contraction is expected to persist given the limited access (or fear of patronizing) traditional distribution points such as wet markets, shopping centers, and foodservice establishments.

Crisis response measures tend to meet the challenge of supply disruptions, but not those on the demand side.

The "Plant, Plant, Plant" programme is intended to address the supply side constraints of the agri-food system. This is most obvious for programmes that provide inputs (seeds and fertilizers), e.g., urban agriculture and the RRP, as well as those that provide soft production loans (the SURE Aid programme). However, expansion of supply will have limited impacts on demand, given that the bulk of incomes being generated in the country are already outside agriculture. On the other hand, expansion of supply raises the risk of inadvertent consequences of demand displacement and farm gate price reduction.

A promising source of demand boost is conditional cash transfers.

Again, DA's limited scope (e.g., limitation to rice farmers in the case of RFFA and SFRF), the much bigger demand boost from cash assistance will likely come from other agency assistance such as the Department of Social Welfare and Development (DSWD) and Department of Labour and Employment (DOLE).

In the end, the interconnectedness of the economic system implies that the outlook for agriculture and the food industry will depend on economic recovery as a whole. Nonetheless, prospects for the sector are more favorable compared to the other basic sectors (industry and services), as argued below.

Several opportunities for resilience and rebound of agriculture have been noted in this rapid assessment.

There are reasonable grounds for a tempered optimism: that among the basic sectors (including industry and services), agriculture seems best poised to avoid the worse effects of contraction and earliest for recovery. One is the verified fact of Engel's Law, where households tend to devote a lower share of household expenditure to food when income rises, works to protect agricultural spending during an income contraction. An obvious example is the tourism industry; it is far more likely for a household to cut leisure travel from its budget, compared to food. Another is the on-going e-commerce revolution for food, which seems more robust compared to traditional outlets as it allows households to consume food entirely in the safety of their own homes.

Directions for the national food security strategy

This rapid assessment does not include in its scope a detailed and systematic itemization of recommendations. Rather we develop the recommendations into clusters with indicative directions for the national food security strategy.

Transformation towards dispersed food distribution

A direct physical embodiment of a dispersed food distribution system is the "mobile market" as popularized by the *Kadiwa* and the "pop-up stores" wherein fresh produce is being brought closer to the consumers. However, the realities of urban life detract from the sustainability of this solution (i.e., traffic congestion, lack of utilities). A more sustainable and thereby more promising approach is to shift to e-commerce solutions for the marketing of food producers. It is already an on-going initiative of numerous entrepreneurs, from (Micro, Small and Medium Enterprises) MSMEs to large agribusiness companies.

The government, though, has a role in ensuring an enabling business climate for the e-commerce revolution. National Economic Development Authority (NEDA) (2020) has an excellent set of recommendations in this regard, namely: expansion of the E-Commerce Act of 2000, facilitating investments in ICT infrastructure; encouraging financial institutions to implement cybersecurity; and strict enforcement of food safety laws, regulations, and quality standards.

Ensuring inclusion of small farmers and fisherfolk in the e-commerce revolution

Within our rapid assessment, we found that SFF were deeply involved in *Kadiwa*, but not in online commerce platforms, which were more the province of formally registered, medium-to-large enterprises. As the e-commerce revolution unfolds, the government must apply policy actions to prevent the emergence of another digital divide, exacerbating already deep inequities in Philippine society.

Enabling SFF to participate in the e-commerce revolution will entail engagement, capacity building, and empowerment of formal organizations of SFF. It harks back to the extension reforms already discussed, together with the re-emphasis of civil society partnerships. The existing DA paradigm of "product consolidation" is well in line with this strategy, similar to the Department of Agrarian Reform's (DAR) agro-enterprise clustering approach.

A strong partnership between public and private sector action, with a larger role of the public sector in the initial phase

The partnership theme in the recommendation mentioned extends in general to the recovery effort and food security strategy. As asserted in the motto, "We Recover as One" implies that government should not always assume that its direct action is directly responsible for recovery; for instance, *E-Kadiwa* should be offered not as a way to compete with other online platforms, but possibly as a niche aimed at initiating SFF organizations into e-commerce.

The partnership does recognize that the public sector, during this phase of economic recession, must perforce play a bigger role (as it is the only institution with sustained purchasing power, although this is also under threat). Public sector programmes (e.g., input and credit support), however, must have a phase-out stage as recovery progresses. The key stakeholders, namely farmer and fisherfolk enterprises, private sector agribusiness, and civil society organizations, should all coordinate their actions towards the common goal of food security and rising living standards for all.

The expanded role of the public sector implies a greater demand for quality data planning.

The big role of the public sector in this period of economic contraction all the more increases the need for quality planning, which in turn is highly dependent on updated, disaggregated, and reliable data. A particularly pressing imperative is updated nutrition and consumption data down to at least the regional level, though better at the provincial level, covering both household and individual consumption, nutrient intake, and nutritional status.

Planning should also be directed to anticipate possible unintended consequences of public sector action. One unintended consequence is fiscal blow-up: every additional peso of public spending does involve a financing burden, whether by current tax revenue, borrowing (implying future tax revenue), or via inflation (via Bangko Sentral ng Pilipinas finance).

Another unintended consequence of public sector expenditure or investment is crowding out of counterpart initiatives in the private and SFF sector. We have already given an example in the

UA programme; other examples may be recounted, as in World Bank (2020). This is not an argument to cease these programmes, which may well be justified within an emergency context. To emphasize an earlier point, an exit strategy must already be explicit even in the planning phase, so that state intervention be applied at levels not less, nor more, than is warranted by the social benefits.

Preparations for the next crisis

Future disasters and emergencies, among which are public health and pandemics, are inevitable. Ensuring that the country can anticipate and counter threats to food security ahead of time is essential to avoid repetitions of food supply disruptions.

Advance monitoring for disaster preparedness. Nobody knows for sure what or when the next crisis will strike. It may come in the form of a "second wave" of COVID-19 infections, re-intensification of ASF, an outbreak of AI, or a new pandemic due to an exotic virus. Nonetheless, the concerned agencies (such as DA, PSA, DOST, UP Resilience Institute) should ramp up their monitoring activities directed at new and emerging causes of possible shocks, to generate early warnings and immediately apply precautionary measures to avoid or mitigate damage to the agri-food system.

Feedback and information mechanism. The COVID-19 Task Force has served a valuable function in addressing food supply chain disruptions. The mandate will need to be expanded and sustained to ensure continuity in function, at least to cover future public health emergencies that warrant community quarantines. The feedback and information mechanism developed by each agency was a helpful facility to rapidly identify and act on the needs of their respective stakeholders.

Institutionalized linkages between national and local governments. This rapid assessment has traced much of the supply disruption to differences in interpretation of national directives by LGUs, as they sought to protect the needs of their units. Future responses to public health emergencies must ensure that national and local government policies are already well harmonized. This may require Memoranda of Agreement (MOA) or similar legal instrument to document agreements on movements of workers and equipment of food and agri-inputs, together with provisions for contingencies. The national offices can facilitate dialogues between the regions, and regional offices between their provinces.

Fast-track reforms of the extension system. Since 1991 with the enactment of the Local Government Code, the agri-extension system of the country had involved a cooperative venture between national and local governments, with LGUs being the "rower" (frontline service delivery) and DA being the "steerer" (providing policy directions, prescribing standards, and even resources when appropriate). However, over the past thirty years, numerous cracks have been noted in this system. Calls for reform have most recently been voiced by World Bank (2020), with the following reforms proposed: i) a shift from supply-driven extension to demand-driven extension; (ii) expanding focus from a narrow scope (primary rice productivity) to a broader scope, featuring much more diverse content; (iii) adopting a pluralistic system involving the public and private sector, non-governmental organizations (NGOs), and other players; (iv) from person-to-person contact to multiple delivery modes, including digitally enabled tools in order to improve the adoption of research results and the reach of extension. Lastly, the current policy of shifting more province-centric coordination between national and local levels is the more cost-effective direction for national governments to implement its reform advocacies.

Invest in nutrition-sensitive agriculture programmes. Areas for support for nutrition-sensitive agricultural production involves the following (FAO, 2014): a) making food more available and

accessible; b) making food more nutritious (e.g., fortification via plant breeding); and c) making food more diverse and production more sustainable. It is within this context that home gardens and homestead production, as part of a demand-expansion strategy towards increasing fruit and vegetable consumption and diet diversity, have a place in the development of more nutrition-sensitive agriculture. Meanwhile, sustainability measures include sustainable production practices like conservation agriculture, water management, and integrated pest management.

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ANNEX 1

Survey guide questions

Guide questions regarding farm/fishery production in the supply center	Notes:
Covering: rice, hogs, chicken, chicken eggs, milkfish, round scad, tilapia, squash, eggplant, tomato, cabbage, carrot, potato, banana (*Lakatan*), cassava N.B. Organize one set of notes per supply center/commodity. What effects has community quarantine had on the production activity of farmers/fishers? What problems have been encountered by farmers/fishers in obtaining inputs since mid-March? What has been the effect of these problems on their farming/fishing activities? What problems have been encountered by farmers/fishers in obtaining labour since mid-March? How many women (in percent) are in the agricultural workforce? Is there any difference between the ability of women or men to work in farms/fishing activities? What has been the effect of these problems on their farming/fishing activities? What problems have been encountered by farmers/fishers in obtaining financing for their production activity since mid-March? What has been the effect of these problems on their farming/fishing activities? What problems have been encountered by farmers/fishers in selling their harvest/animals/catch? What prevented buyers from buying or buying as much as normal? How would you compare farm gate prices of _____ [commodity] since mid-March versus before March? If a decline or increase, will this be a factor in production planning? Were there instances when the produce was wasted because buyers do not want to buy as much as before? Please elaborate in what way these produce went into waste? How much of the produce of _____[commodity] went to waste, as percent of total? (Reference period is April for livestock, fish; dry season harvest for rice; first quarter harvest for vegetables and fruit) Among the recent changes you have observed since March, which do you think will continue or recur in 2020, and which do you think will be or have been resolved? What contributed to the resolution? What other factors (weather, pest, disease, etc.) and during which stage of production do you think will play an important role in determining production in 2020? Please elaborate. Considering all these issues, what is your expectation of sales in the rest of 2020 (normal, 10 percent below normal, 20 percent below normal, 50 percent below normal, don't know?)	THEMATIC AREA: FOOD SUPPLY CHAIN RESPONSES Production outlook Inputs and financing Continuous supply of food Minimizing food losses Efficient and inclusive value chains Food supply in urban/local markets Sources: DA commodity programmes Rice (banner) Livestock (banner) High value crops (banner) Fish (Bureau of Fisheries and Aquatic Resource, BFAR)

Guide questions: basic food processing operators (rice, pork, chicken): in key processing hub	Notes
N.B. Organize one set of notes per processing hub/commodity. What problems have processors encountered in obtaining inputs since March? What has been the effect of these problems on production activities? What problems have processors encountered in deploying their workforce? How many women (in percent) are in their workforce? Were there any differences between men and women in terms of their ability to report for work? What is the impact of these difficulties (if any) on their production activity? What problems have processors encountered in obtaining financing for their production activity since March? What has been the effect of these problems on production activities? What problems have processors encountered in selling their products? What has prevented their buyers from buying or buying as much as normal? How would you compare factory prices, quality and timeliness in delivery since March to before March? If a decline or increase, will this be a factor in production/processing planning? Were there instances when the product was wasted because of lack of buyers? If yes, in what way did these products are wasted? How much of the product went to waste? Among the recent changes you have observed since March, which do you think will continue or recur in 2020, and which do you think will be or have been resolved? What contributed to the resolution? What other factors do you see are important in determining output in 2020? Considering all these issues, what is your expectation of sales in the rest of 2020 (normal, 10 percent below normal, 20 percent below normal, 50 percent below normal, don't know?)	THEMATIC AREAS: FOOD PROCESSING Food wastes Delivery of food stocks Workers' health and safety Local food processing Sources: National Meat Inspection Service (NMIS) and Bureau of Plant Industry (BPI) (Rice)

Guide questions: product flow mapping	Notes:
Commodities: rice, hogs, chicken, chicken eggs, milkfish, round scad, tilapia, squash, eggplant, tomato, cabbage, carrot, potato, banana (*Lakatan*) What are the top three provinces that you are aware of which are supplying ___[demand center] with _____ [commodity]? How does ___ [commodity] usually move from ____[province] to ____ [demand center]? What are the important hubs for processing [in case of rice, pork, chicken]? What are the important hubs for marketing [remaining commodities]. Please specify how long does each movement take (duration). For Supply Centers to NCR, Davao, Marawi City: What major roads do vehicles transporting ____ [commodity] from _____ [province] take in order to reach ____ [NCR, Davao]	THEMATIC AREA: FOOD SUPPLY CHAIN RESPONSES Production outlook Inputs and financing Continuous supply of food Minimizing food losses Efficient and inclusive value chains

For Supply Centers to Basilan, Cebu City: What ports are used by traders in bringing ____[commodity] to reach ____[Cebu, Basilan]? What major roads are used by vehicles transporting _____[commodity] to reach the port? Were there any issues in transporting the product from the supply center to the main hubs? From the hubs to the demand center	Food supply in urban/local markets Sources: NFA (Rice) DA Livestock (banner) DA High value crops (banner) BFAR (National Fish Programme)

Organise notes as follows:

Demand center: _____ Commodity: _____

N.B. Add as many hubs as needed

Supply center	Route	Hub (identify location)	Remarks
Nueva Ecija			
(repeat as necessary)			

Guide questions: food safety	Notes
What measures do food processors/handlers need to implement to protect their workers from COVID-19? To ensure that the food they produce/handle is safe? Are these measures already in place? If not, are processors/handlers in a process of adopting these measures? What does and how long it take to ensure full implementation of these measures? Were there any changes in compliance of supply chain actors in terms of compliance with halal or halal-based standards? How serious are these changes in terms of affecting food acceptability among Muslim consumers, both currently and for the rest of 2020?	Food safety: Food safety perceptions and impacts Restrictions due to food safety Monitoring food safety Hygiene in production Hygiene in food delivery Food acceptability (halal) Sources: NMIS, BPI

Guide questions: Farm/fishery production	Notes:
For producers of rice, hogs, chicken, chicken eggs, milkfish, round scad, tilapia, squash, eggplant, tomato, cabbage, carrot, potato, banana (*Lakatan*). Normally, who are the main buyers of the _____[commodity]? Is _____ [demand center] an important destination? How much of your harvest/catch goes to ____ [demand center], in percent? (Skip if they don't know.) How has community quarantine affected your production activity? What problems have you encountered in obtaining inputs since mid-March? What has been the effect of these problems on your farming/fishing activities? What problems have been encountered by farmers/fishers in obtaining labour since mid-March? How many women (in percent) are in your work force? Is there any difference between ability of women or men to work in your farm/fishing activity? What has been the effect of these problems on your farming/fishing activities? What problems have you encountered in obtaining financing for their production activity since mid-March? What has been the effect of these problems on your farming/fishing activities? What problems have you encountered in selling their harvest/animals/catch? What prevented buyers from buying or buying as much as normal? How would you compare farm gate prices of _____ [commodity] since mid-March versus before March? If a decline or increase, will this be a factor in your production plans? Please describe the same in terms of quality difference and timeliness of delivery. Were there instances when the produce was wasted because buyers do not want to buy/buy as much? How much of the produce of _____[commodity] went to waste and in what way, as percent of total? (Reference period is April for livestock, fish; dry season harvest for rice; first quarter harvest for vegetables and fruit) Among the recent changes you have observed since March, which do you think will continue or recur in 2020, and which do you think will be or have been resolved? What contributed to the resolution? What other factors do you think are important to determine your harvest/catch within 2020 (weather, prices, diseases, etc.) Considering all these issues, what is your expectation of sales in the rest of 2020 (normal, 10 percent below normal, 20 percent below normal, 50 percent below normal, don't know?)	THEMATIC AREA: FOOD SUPPLY CHAIN RESPONSES Production outlook Inputs and financing Continuous supply of food Minimizing food losses Efficient and inclusive value chains Food supply in urban/local markets Sources: Farmers/Fishers

Guide questions: product flow mapping	Notes:
Commodities: rice, hogs, chicken, chicken eggs, milkfish, round scad, tilapia, squash, eggplant, tomato, cabbage, carrot, potato, banana (*Lakatan*) Is (NCR, Cebu City, Davao City) a major market destination for the ____ [commodity] produced by ____[province]? What are the top three provinces that you are aware of which are supplying ___[demand center]? How does ___ [commodity] usually move from ____[province] to ____ [demand center]? What are the important hubs for processing [in case of rice, pork, chicken] /marketing [in case of chicken eggs, milkfish, round scad, tilapia, squash, eggplant, tomato, cabbage, carrot, chayote, *Lakatan* banana] Please specify how long does each movement take (duration). For Supply Centers to NCR, Davao: What major roads do vehicles transporting ____ [commodity] from _____ [province] take in order to reach ____ [NCR, Davao] For Supply Centers to Basilan, Cebu City: What ports are used by traders in bringing ____[commodity] to reach ____[Cebu, Basilan]? What major roads are used by vehicles transporting _____[commodity] to reach the port? How has the community quarantine affected transport/storage of ____[commodity]? Since mid-March, what problems have you encountered in deploying your workforce? Since mid-March, what problems have been encountered in purchasing inputs (e.g. fuel) and services (e.g. parts and repairs?) Since mid-March, what problems have been encountered in obtaining finance? Since mid-March, what problems have been encountered in finding clients/getting orders? Among the recent changes you have observed since March, which do you think will continue or recur in 2020, and which do you think will be or have been resolved? What contributed to the resolution? Considering all these issues, what is your expectation of sales in the rest of 2020 (normal, 10 percent below normal, 20 percent below normal, 50 percent below normal, don't know?)	THEMATIC AREA: FOOD SUPPLY CHAIN RESPONSES Production outlook Inputs and financing Continuous supply of food Minimizing food losses Efficient and inclusive value chains Food supply in urban/local markets Sources: Transport/Logistics operators; Traders/wholesalers who transport commodities

Organise notes as follows:

Demand center: _____ Commodity: _____

N.B. Add as many hubs as needed

Supply center	Route	Hub (identify location)	Remarks
Nueva Ecija			
(repeat as necessary)			

Guide questions: Marketing	Notes
Commodities: rice, hogs, chicken, chicken eggs, milkfish, round scad, tilapia, squash, eggplant, tomato, cabbage, carrot, potato, *Lakatan* banana How has community quarantine affected your selling activity? Have customers avoided your product because of concerns about COVID-19-related infection? Is this a serious concern for your business? What measures have you taken to address these concerns, if any? Since mid-March, what problems have been encountered in deploying your workforce? How many women (in percent) are in your workforce? Are there any differences between men and women in terms of ability to report for work? What was the effect of these labour problems on your production activity? Since mid-March, what problems have been encountered in obtaining finance? Since mid-March, what problems have been encountered in obtaining supplies of food to sell? Since mid-March, is your gross margin (difference between sales price and procurement price) the same per unit volume? If it has gone down or up, please estimate what is the decline or increase in percent of normal (reference period: April). How have these problems affected the amount of produce sold? Please state in terms of percent of normal monthly sales	THEMATIC AREA: FOOD SUPPLY CHAIN RESPONSES Production outlook Inputs and financing Continuous supply of food Minimizing food losses Efficient and inclusive value chains Food supply in urban/local markets Sources: Traders/retailers

of _____ [commodity] (reference period is April). Were there any changes in compliance of supply chain actors in terms of compliance with halal or halal-based standards? How serious are these changes in terms of affecting food acceptability among Muslim consumers, both currently and for the rest of 2020? How have these problems affected the amount of produce procured? Please state in terms of percent of normal monthly procurement of _____ [commodity] (reference period is April). Among the recent changes you have observed since March, which do you think will continue or recur in 2020, and which do you think will be or have been resolved? What contributed to the resolution? Considering all these issues, what is your expectation of sales of ____ [commodity] in the rest of 2020 (normal, 10 percent below normal, 20 percent below normal, 50 percent below normal, don't know?)	
Guide questions: basic food processing (rice, pork, chicken)	**Notes**
What problems have been encountered in obtaining raw materials and other inputs since mid-March? What has been the effect of these problems on production activities? Has concern over COVID-19 infection affected your business? In what way? What measures have you taken to address these concerns, if any? What problems have you encountered in deploying their workforce? How many women (in percent) are in your workforce? Were there any differences between men and women in terms of ability to report for work? What was the impact of these difficulties on your production activity? What problems have you encountered in obtaining financing for their production activity since March? What has been the effect of these problems on production activities?	THEMATIC AREAS: FOOD PROCESSING Food wastes Delivery of food stocks Workers' health and safety Local food processing Sources: Pig slaughterhouses; chicken dressing plants – see directory Rice – Rice Miller Association https://www.facebook.com/groups/2005254372928227/

What problems have you encountered in selling their products? What has prevented their buyers from buying or buying as much as normal? How would you compare factory prices since March to before March? If a decline, will this be a factor in production planning? Please describe also quality comparison and timeliness of delivery (duration). Were there instances when the product was wasted because of lack of buyers? Please elabourate on what way? How much of the product went to waste? Were there any changes in compliance of supply chain actors in terms of compliance with halal or halal-based standards? How serious are these changes in terms of affecting food acceptability among Muslim consumers, both currently and for the rest of 2020? Among the recent changes you have observed since March, which do you think will continue or recur in 2020, and which do you think will be or have been resolved? What contributed to the resolution? Considering all these issues, what is your expectation of sales in the rest of 2020 (normal, 10 percent below normal, 20 percent below normal, 50 percent below normal, don't know?)	

Production center and distribution channel questionnaire

Rice

Respondent: National Food Authority (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest processing center	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Nueva Ecija				
	Isabela				
	Pangasinan				
Metro Cebu	Iloilo				
	Leyte				
	Antique				
Davao/ Marawi/ Basilan	Maguindanao				
	Bukidnon				
	Cotabato				

Hogs

Respondent: NLP/AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest processing center	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Bulacan				
	Batangas				
	Tarlac				
Metro Cebu	Cebu				
	Iloilo				
	Negros Occidental				
Davao/ Marawi/ Basilan	Bukidnon				
	South Cotabato				
	City of Davao				

Chicken

Respondent: NLP/AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest processing center	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Bulacan				
	Pampanga				
	Nueva Ecija				
Metro Cebu	Cebu				
	Leyte				
	Iloilo				
Davao/ Marawi/ Basilan	Misamis Oriental				
	Bukidnon				
	South Cotabato				

Chicken eggs

Respondent: NLP/AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Batangas				
	Pampanga				
	Bulacan				
Metro Cebu	Cebu				
	Negros Occidental				
	Iloilo				
Davao/ Marawi/ Basilan	Bukidnon				
	South Cotabato				
	City of Davao				

Bangus (milkfish)

Respondent: BFAR/AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Pangasinan				
	Pampanga				
	Quezon				
Metro Cebu	Capiz				
	Negros Occidental				
	Aklan				
Davao/ Marawi/ Basilan	Misamis Occidental				
	Davao Occidental				
	Lanao del Norte				

Galunggong (round scad)

Respondent: BFAR/AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Masbate				
	Palawan				
	Ilocos Sur				
Metro Cebu	Negros Occidental				
	Cebu				
	Northern Samar				
Davao/ Marawi/ Basilan	City of Zamboanga				
	Sulu				
	Tawi-Tawi				

Tilapia

Respondent: BFAR/AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Pampanga				
	Batangas				
	Laguna				
Metro Cebu	Iloilo				
	Negros Occidental				
	Leyte				
Davao/ Marawi/ Basilan	Maguindanao				
	Sultan Kudarat				
	South Cotabato				

Eggplant

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Pangasinan				
	Quezon				
	Tarlac				
Metro Cebu	Iloilo				
	Cebu				
	Negros Occidental				
Davao/ Marawi/ Basilan	Agusan del Sur				
	Cotabato				
	City of Davao				

Squash

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Albay				
	Quezon				
	Nueva Vizcaya				
Metro Cebu	Iloilo				
	Cebu				
	Negros Occidental				
Davao/ Marawi/ Basilan	Bukidnon				
	Agusan del Sur				
	Zamboanga				

Tomato

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Ilocos Norte				
	Ilocos Sur				
	Pangasinan				
Metro Cebu	Iloilo				
	Cebu				
	Bohol				
Davao/ Marawi/ Basilan	Davao del Sur				
	Bukidnon				
	Misamis Oriental				

Cabbage

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Benguet				
	Mountain Province				
	Ilocos Sur				
Metro Cebu	Cebu				
	Negros Oriental				
	Iloilo				
Davao/ Marawi/ Basilan	Bukidnon				
	Davao del Sur				
	Misamis Oriental				

Carrot

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Benguet				
	Mountain Province				
	Nueva Vizcaya				
Metro Cebu	Negros Oriental				
	Cebu				
	Negros Occidental				
Davao/ Marawi/ Basilan	Davao del Sur				
	Bukidnon				
	Cotabato				

White potato

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Benguet				
	Mountain Province				
	Nueva Vizcaya				
Metro Cebu	Benguet				
	Mountain Province				
	Nueva Vizcaya				
Davao/ Marawi/ Basilan	Davao del Sur				
	Bukidnon				
	South Cotabato				

Banana

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Metro Manila	Isabela				
	Oriental Mindoro				
	Bulacan				
Metro Cebu	Iloilo				
	Cebu				
	Negros Oriental				
Davao/ Marawi/ Basilan	Cotabato				
	Lanao del Sur				
	Bukidnon				

Cassava

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Basilan	Lanao del Sur				
	Bukidnon				
	Basilan				

Ampalaya (bitter gourd)

Respondent: AMAD (add rows as necessary)

Demand center	Production Center (Top 3)		Biggest market hub (if applicable)	Delivery route	Status of movement
	Listed	*Validate/ replace here*	*Identify city/ municipality*	*Indicate main route*	*Indicate if normal, abnormal, disrupted. Provide details if not normal.*
Marawi/ Basilan	Zamboanga City				
	Misamis Oriental				
	Agusan del Sur				

ISBN 978-92-5-133791-2

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CB2622EN/1/01.21