

COVID-19 impact on local agri-food systems in Cambodia, Myanmar, and the Philippines

Findings from a rapid assessment

Working Paper No. 357

CGIAR Research Program on Climate Change,
Agriculture and Food Security (CCAFS)

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RESEARCH PROGRAM ON
**Climate Change,
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Abstract

The COVID-19 pandemic and the subsequent enforcement of mobility restrictions have created bottlenecks in the agri-food system. When the food supply chain is disrupted, economic loss occurs, putting rural households, already in poverty, into severe food insecurity. A survey was conducted to assess the impacts of restrictions brought by COVID-19 on local food systems operations of Climate-Smart Villages (CSVs) in Cambodia, Myanmar, and the Philippines.

The rural and traditional food systems of agriculture-based villages continued to operate with minimal adjustments during the course of COVID-19 restrictions. Our findings showed high mean household dietary diversity scores in Chhouk CSV (6.4), Htee Pu CSV (8.2), and Himbubulo Weste CSV (7.2) despite significant perceived changes in the availability and prices of certain food groups. Complementary and diverse food production and access to informal food outlets were essential parts of the local food systems and played critical roles in supplying food commodities to the population during the pandemic.

Keywords

COVID-19; food systems; agriculture; climate-smart agriculture; climate-smart villages; food security.

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Acronyms

CSA	climate-smart agriculture
CSV	Climate-Smart Village
COVID-19	SARS-CoV-2 or Corona Virus
HLPE	High-Level Panel of Experts Report on Nutrition and Food Systems
NPI	non-pharmaceutical interventions
WHO	World Health Organization

Introduction

On 30 January 2020, the World Health Organization (WHO) officially declared the SARS-CoV-2 or Corona Virus (COVID-19) outbreak a Public Health Emergency of International Concern. Eventually, it was declared a global pandemic on 11 March 2020 (WHO 2020). Among the non-pharmaceutical interventions (NPI) implemented in countries to avoid virus spread and protect the public health are quarantine measures, enforcing border closures and domestic travel restrictions, school and workplace closure, mass gathering restrictions, and stay-at-home directives.

Although the COVID-19 pandemic is mainly a public health concern, the restrictions on the movement of people and goods have created constraints in the food system. Among the immediate impacts are disruptions in the agri-food value chains. These include the inability to access input supply, closure of markets and workplaces, and food spoilage issues due to congestion at delivery points and general lack of capacity to store crops and absence of cold-chain storage. Moreover, many informal workers and daily wage earners lost employment and income due to the dependence of their jobs on the food system's operations.

In farming communities, acute shocks as COVID-19 can be a threat to smallholder livelihoods. In rural villages, food commodities involve short, fragmented, and geographically dispersed value chains managed by various actors. The movement of food could easily be disrupted by mobility and travel restrictions. During the containment, bottlenecks in the food supply chains exacerbate the already fragmented and poorly coordinated logistics, leading to additional transportation cost and high retail prices of food commodities, even basic staples.

The rapid COVID-19 survey aimed to determine the pandemic's impacts on the local food systems of three rural and Climate-Smart Villages (CSVs) in Cambodia, Myanmar, and the Philippines. For this study, the food system is defined as "all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the output of these activities, including socioeconomic and environmental outcomes" (HLPE 2014).

A survey of individuals involved in the local food system of the villages was administered from October and November 2020. Face-to-face data collection following the local COVID-19 health protocol was conducted by tertiary-level enumerators. The summary of the study population information is presented in Table 1.

Table 1. Respondents in the COVID-19 survey

	Chhouk village, Cambodia	Htee Pu Village, Myanmar	Himbubulo Weste Village, Philippines
N	103	66	96
Male n (%)	30 (29%)	44 (67%)	46 (48%)
Female n (%)	73 (71%)	22 (33%)	50 (52%)
Median age (years)	39	48	46
Age range (years)	14 - 79	31 - 74	18 - 73

The survey instrument captured the impact of the COVID-19 pandemic on key local food systems components in the context of the pandemic: agricultural production systems, distribution and transport, food sources and salespoints, food availability and affordability, diets and household consumption, and food security. Written informed consent was obtained from all study participants.

Local food system

Chhouk CSV, Htee Pu CSV, and Himbubulo Weste CSV have rural and traditional food system typologies, whose livelihood and economy depend on agriculture. Chhouk CSV has a coastal agro-ecosystem and rice as the main product. Htee Pu CSV has a dry, semi-arid agro-ecosystem, where the majority of the households are engaged in farming of groundnut and pigeon pea intercropped with various types of beans, millet, and sorghum. Himbubulo Weste has upland coconut-based agroecology, where most of the residents are smallholder farmers engaged in coconut farming.

Figure 1 presents the activities in rural and traditional food system whereby most movements are in the food supply chains. The local food system provides several jobs. Farmers could raise livestock or produce cash and off-season crops or combine crops and livestock. Others are involved in foraging products in the wild or are farm labourers, distributors, middle persons, transporters, retailers, and sellers in markets.

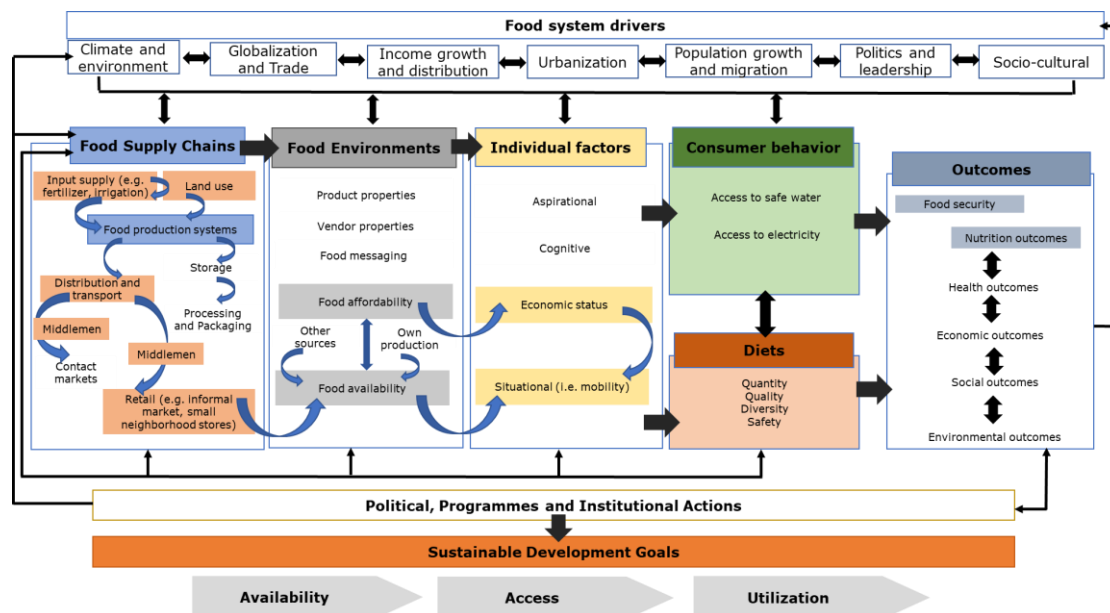


Figure 1. Conceptual framework of the local food system of Chhouk Village, Htee Pu Village and Himbubulo Weste Village. Source: Adapted from HLPE 2017

The village's local food production is insufficient in quantity and diversity to meet all populations' needs. Importation is needed to cover about 70% of the demand for commodities aside from those produced in the area. The local food system's middle persons are essential to bringing the farmer's produce to the contact markets or export products for the village and nearby communities. The distance of the village to the market, and the poor road network, which becomes impassable during heavy rains, are among the commonly cited characteristics of the distribution transport infrastructure.

In general, the population has limited access to essential services such as electricity and clean water sources. The population depends on informal and fragmented markets and small retail stores for food supply. Household diets are inadequate and lack diversity from food groups such as dairy products, fruits, nuts, and seeds. Aside from being home to a significant number of low-income households and populations experiencing food insecurity and malnutrition, the villages are also in the frontlines of stresses related to extreme weather events.

Findings: Local food systems' response to the pandemic

In rural communities, the COVID-19 risk is low, and cases have been kept at zero or very low number. However, directives on travel, mobility and physical distancing as public health measures have disrupted both supply and demand sides of the national food systems and have affected the activities in the rural settings. Food production and markets are classified as an essential sector, but containment measures affected the movement of goods, food supply workers, and consumers. Overall, the workplace, school, and business closures across all sectors significantly affected employment and the food system operations. There has been a reported reduction in consumer numbers and subsequent reduction in purchases and consumer demand.

The local agricultural production in the three villages continued to operate with minimal adjustments. Before the pandemic, the local communities of Chhouk CSV, Htee Pu CSV, and Himbubulo Weste CSV have been receiving support through provisions of training and farm inputs whilst using climate-smart agriculture (CSA) practices as opportunities to address the limited access to fertilizer, the challenge of drought, and lower agricultural productivity. CSA practices aim to increase agricultural productivity sustainably and reduce the farmers' exposure to shocks and risks while building their resilience and capacity to adapt to short- or long-term stresses.

COVID-19 pandemic is considered an external shock to the local food system, exposing the food supply chain's vulnerabilities. However, farmers practising CSA showed early adaptation response on the cascading impact of food production shock to household consumption. The lessons learned in adapting to climate variability were applied to the initial impact of the pandemic. Diversification and intensification are critical elements in a CSA strategy and the recognition and utilization of practices already being used by smallholder farmers in the villages.

The local food system provides informal employment opportunities along the food value chain. This work category includes seasonal agriculture and a wide range of low wage, daily-basis, or output-based jobs, including farm labourers, retailers, drivers, food servers, helpers, and assistants. The elderly persons were perceived to be significantly affected by COVID-19

in Chhouk CSV (75%), Htee Pu CSV (65%), and Himbubulo Weste CSV (69%). Elderly persons usually work in the local food system as farmers, retailers or sellers in informal markets. As the initial advisories suggest that the virus primarily affects older adults, most of them are forced to stay at home. Along with the fear of getting sick from the virus, this segment of workers in the food system also encounters a loss of livelihood and income, especially on prolonged restrictions.

In the working segment of the population, the majority of the respondents in Chhouk (97%), Htee Pu (91%), and Himbubulo Weste (64%) perceived the daily wage earners to be the most impacted by the measures to contain COVID-19 because of their mobility. Moreover, daily wage earners reported losing jobs because of the lockdown and closure of establishments where they work.

On the other hand, between adult men and adult women, the majority of respondents in Chhouk (36%) and Himbubulo Weste (59%) perceived both genders as equally impacted by the measures to contain COVID-19, while men were perceived to be more affected than women in Htee Pu (67%). Men are more at risk due to their daily activity that requires travel. Consequently, women were perceived to be inferior in terms of health and are at a higher risk of contracting the virus. Women's participation in the food system as retailers and sellers in the market or as the purchaser was recognized. In addition, women were perceived as the most economically and emotionally distressed. Aside from the combined housework and activities in the farm, they also have to attend to needs of children on home-schooling.

This study identified six areas where COVID-19 has the most impact on the local agri-food system: 1) farming and agricultural production systems, 2) distribution and transport, 3) food sources and salespoints, 4) food environment: food availability and affordability, 5) diets and food consumption, and 6) food security.

1) Farming and agricultural production systems

Table 2 shows that majority of the respondents in the three CSVs have perceived small negative effects of COVID-19 directives on the food production activities, while almost the same number of respondents have perceived no changes in the activities. In general, farming-related activities were classified as essential work, and activities remained unhampered since the duration of local level COVID-19 restrictions. However, the stay-at-

home national directives and fear of contracting the virus have prevented some agricultural workers from continuing working.

Table 2. Perceived impact of COVID-19 restrictions on agricultural production activities, and access to input supply

	Highly negatively affected	Somewhat negatively affected	Not affected	Somewhat positively affected	Highly positively affected
Farming and agricultural production activities					
Chhouk (n=103)	2%	39%	49%	11%	0%
Htee Pu (n=66)	0%	58%	42%	0%	0%
Himbubulo Weste (n=96)	12%	29%	28%	25%	6%
Access to input supply					
Chhouk (n=103)	7%	58%	32%	3%	0%
Htee Pu (n=66)	5%	55%	41%	0%	0%
Himbubulo Weste (n=96)	17%	33%	24%	21%	5%

The farm labourers and those involved in the food transport and distribution have experienced mobility challenges due to quarantine and public transport suspensions. The farmer-vendors were unable to sell directly to the market, as borders and other markets were closed. In addition, they were unable to roam around the community because of the fear of being infected by the virus. The farm labourers including farm caretakers who do the harvesting and transplanting to other farms were also affected.

Purchasing of farm inputs was a major concern due to the closure of agro-trading shops and the closure of boundaries to get there. Those who reported uninterrupted access to input supply pointed the sustainability of using locally-sourced animal feeds. For instance, livestock farmers in Himbubulo Weste have been practising CSA-feed system where the cultivation of root crops, tubers and bananas are directed for both household consumption and animal feed production. During the pandemic, the availability of local feeds has prevented problems related to disruption in input supply, expenditure from commercial and expensive feeds, and transport cost to buy them.

On the other hand, with the quarantine regulations and subsequent lockdown, the temporary stoppage in banks and local financiers' operations has affected farmworkers' operations, especially those who depend on credit or loans.

2) Distribution and transport

Even before the pandemic, the local food system actors have been challenged by underdeveloped farm to market roads, impassable roads during heavy rains, and high transportation costs. During the pandemic, the stoppages along the food value chain related to mobility restrictions have led to more disruption in the import and export of food commodities in the villages. Table 3 suggests the negative impact of COVID-19 restrictions in the movement of goods and people in the three villages. The dependence of the villages on imports for food commodities other than the local produce for household food consumption makes them vulnerable to surges in food prices, increases in transportation cost, or failures along the supply chains.

Table 3. Perceived impact of COVID-19 restrictions on the movement of food commodities

	Highly negatively affected	Somewhat negatively affected	Not affected	Somewhat positively affected	Highly positively affected
Food import					
Chhouk (n=103)	11%	67%	18%	5%	0%
Htee Pu (n=66)	17%	61%	23%	0%	0%
Himbubulo Weste (n=96)	13%	33%	18%	21%	16%
Food export					
Chhouk (n=103)	8%	67%	23%	2%	0%
Htee Pu (n=66)	26%	65%	9%	0%	0%
Himbubulo Weste (n=96)	22%	32%	16%	23%	7%
Distribution and transport					
Chhouk (n=103)	7%	63%	22%	8%	0%
Htee Pu (n=66)	15%	67%	18%	0%	0%
Himbubulo Weste (n=96)	14%	32%	21%	26%	7%

In the Philippines, the strict and lengthy checkpoint stoppages, travel-related paperwork, and passes resulted in interruptions in the movement of food commodities. In Htee Pu, the villagers can distribute the food by truck from one village to another township's collection points. A recommendation letter is needed to transport food outside the village and to buy food outside.

Movement and transport of food commodity in the village were halted as mobility restrictions were put into place. Table 4 presents the observed changes along the value chain in the villages.

Table 4. Perceived impact of COVID-19 restrictions on distribution and transport

	Challenges along distribution and transport
Chhouk village	<ul style="list-style-type: none"> • reduced number of buyers in the wet market due to fear of COVID-19; • less movement and transport of commodities in the village; • reduced number of carriers/ transporters of food; • selling by motorbike or Tuk-tuk was utilized but challenges by road blockage that affect sales and delivery; • some farmers sell the products for less value causing loss of income; • less availability of perishables such as fruits, vegetables, fish and meat; • when the commodity was available, it was expensive.
Htee Pu	<ul style="list-style-type: none"> • delay of transport of products to the market because of restriction of movement from one area to another area; • the price of chicks and chicken feed is high because of restriction of movement from one area to another area; • delay of transport of the products to market due to the restriction of organizing people; • food commodities are transported by truck, then distributed by car and motorbike in retail amount, thus making the food chain longer; • the role of informal traders and middle persons was recognized during the pandemic.
Himbubulo Weste	<ul style="list-style-type: none"> • limited and scheduled visits to the market, which results in a long queue; • halted transportation operations which affect the delivery of fresh produce from and to the village, which could be seen in the limited food options or available in the market.

3) Food sources and salespoint

A unique feature of the rural and traditional food system is the various food acquisition modalities. Among the salespoints that provide the food supply to the households in the villages during the COVID-19 are the informal wet or public markets and neighbouring retail

stores. In general, physical accessibility to food sources was not a significant barrier during the mobility restrictions, as the majority of the households in Chhouk (75%), Htee Pu (97%), and Himbubulo Weste (80%) reported to have easy access (within 2 km) to a nearby retail store or markets.

Table 5 shows the various food sources and salespoints utilized by the households during the course of the pandemic. Modern grocery retailers or supermarkets were non-existent in these villages, and were availed by a few households who were visited by relatives from other areas. Retail stores in the neighbourhood served as a major source of food in Chhouk village (90%). In Htee Pu, respondents reported varied food sources from public market/informal wet markets (58%), makeshift markets/ roadside stands (76%), and neighbourhood retail stores (73%). In Himbubulo Weste, 96% of the respondents reported public or informal wet markets as the point of sales because of its proximity to the village.

Table 5. Food sources and salespoints availed of during COVID-19 restrictions

Food sources and salespoints	Chhouk (n=103)	Htee Pu (n=66)	Himbubulo Weste (n=96)
1. Public market or informal wet markets	19%	58%	96%
2. Makeshift markets, roadside stands	16%	76%	15%
3. Neighborhood retail stores	90%	73%	40%
4. Modern grocery retailers or supermarkets	4%	0%	3%
5. Own garden	80%	77%	45%
6. Government-provisioned or care package	44%	33%	55%

Majority of the respondents in the three CSVs also shared that they have been growing homestead gardens for domestic consumption (Table 6). However, in Htee Pu, only 36% were able to collect food from any livestock for household consumption. Homestead and traditional farming system, with crops usually grown with small livestock production, have been vital in ensuring the availability of food during the pandemic.

Table 6. Utilization of household food production during Covid-19 restrictions

	Chhouk (n=103)	Htee Pu (n=66)	Himbubulo Weste (n=96)
Able to collect food from homestead garden for household consumption	85%	65%	89%
Able to collect food from any livestock for household consumption	91%	36%	87%

Households in the three CSVs have been engaged with several CSA strategies that enabled them to respond positively to the pandemic. The International Institute of Rural Reconstruction (IIRR) has been working with local communities to complement production systems such as small native chicken production in homesteads in Chhouk village, intercropping of legumes and raising native chicken in Htee Pu village, and traditional pig production in agroforestry in Himbubulo Weste. There has been a significant increase in vegetable production in the villages due to the initial efforts of the local government and IIRR to promote backyard and market-oriented vegetable farming. During the pandemic, access to diverse local food supplies such as vegetables, legumes, root crops, eggs and chicken meat has been crucial in the general response of the vulnerable households.

4) Food environment: availability and affordability

Measures to contain the COVID-19 pandemic have severely affected livelihoods and the ability of households to purchase food. Food producers, retailers, and distributors report massive cuts in demand for certain commodities forcing them to reduce the retail price just to sell the products. There has been panic-induced buying, especially on basic commodities such as rice, leading to a decline in availability and increased price in some areas.

Of all the components, the negative impact of COVID-19-related restrictions was strongly perceived in the food environment. When there were stoppages and restrictions from the start of the food value chain and the movement of food commodities, the availability and prices of food and household consumption were negatively affected.

Rice is the staple in the three villages and is prone to both production and consumption shocks. Regardless of the price of rice, households in the villages will continue to purchase it. The majority of the respondents in Chhouk (81%), Htee Pu (89%), and Himbubulo Weste (60%) reported an increase in rice price. An increase in rice prices prevents households from spending more money on non-rice foods such as meat, fish, fruit, and vegetables.



A small native chicken production in Chhouk village. Source: IIRR Cambodia.

Strained food systems and supply chains increased the reliance on local production and processed foods. The majority of the food commodities that remain stable, such as fruits and vegetables, are from local and short value chains traded among small landholders and communities. The perceived change in the price of commodities may be related to lost income and unemployment that led to the decline in demand in some food commodities. Bottlenecks in the food supply are reflected in market prices, as observed in the products commonly imported in the three villages: meat, fish, and seafood. These also are perishables that require refrigeration facilities.

In Chhouk CSV, the availability of rice (cereals and grains), local root crops (roots and tubers), beans (legumes), dairy products (milk and dairy products), eggs, fruits and vegetables remained stable during COVID-19 restrictions with only slight variations (Figure 2). On the other hand, the availability of meat, fish, and seafood was more variable, as these products were mainly imported and required transport and refrigerated facilities to prolong shelf-life.

Subsequently, despite a relatively stable supply, most of the respondents felt even a slight increase in the prices of food commodities in all food groups. The low-income households

have noted the small surge in the price of vegetables, rice (cereals and grains), and cooking oil (fats and oil), which constitute the household's typical market basket. Similarly, almost half of the respondents stated a significant increase in meat (48%), fish and seafood (48%).

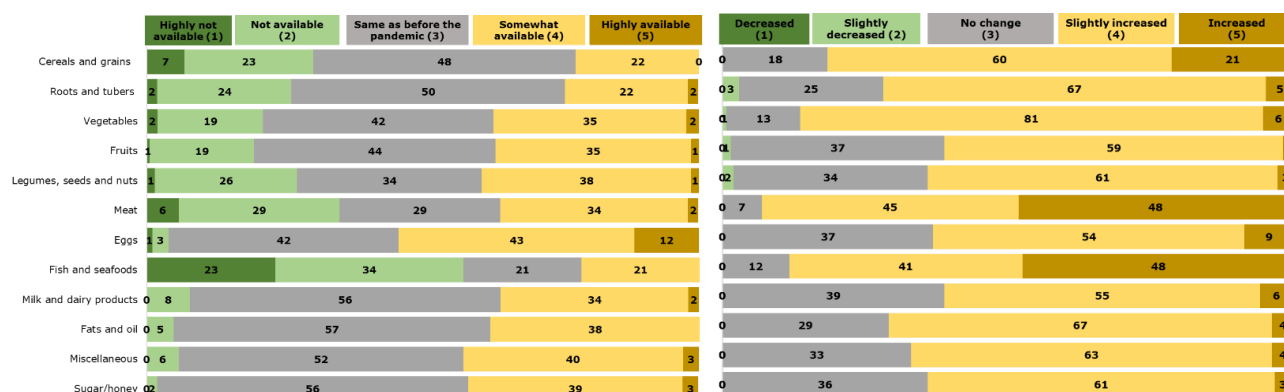


Figure 2. Perceived change in the availability (left) and prices (right) of food groups, Chhouk village (n=103), percent (%)

Meanwhile, in Htee Pu, the availability of food in all food groups remained less variable, except for milk and dairy products (70%) and fish and seafood (58%) (Figure 3). These two food groups are not typically part of the household diets, as reported by the respondents.

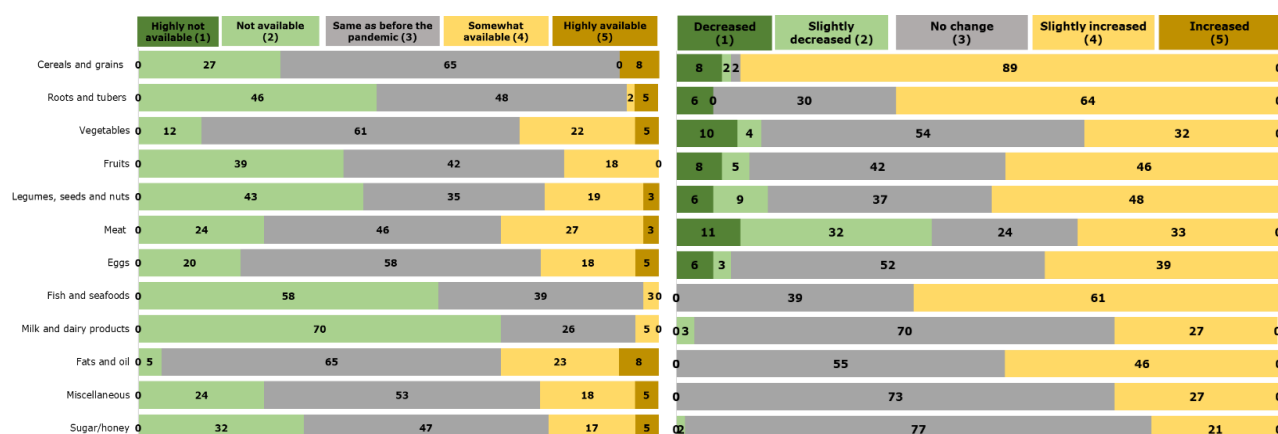


Figure 3. Perceived change in the availability (left) and prices (right) of food groups, Htee village (n=66), percent (%)

The respondents' variability in prices could be seen in two food groups—the staples and legumes. Rice (89%), roots and tubers (64%), and fish and seafood (61%) have marked a slight price increase. Meanwhile, the price of vegetables that constitute the household diet

and are relatively available in the community, whether in retail stores or homestead gardens, has remained stable. This was also perceived for miscellaneous products (e.g. condiments, drinks) and sugar/honey, typically purchased in neighbourhood stores.

Respondents in Himbubulo Weste experienced more variability in the food supply than in two other CSVs (Figure 4). A significant decline in rice availability (cereals and grains), fish and seafood, milk and dairy products, and miscellaneous products (condiments, coffee) were perceived by most of the respondents. Meanwhile, a marked increase in the availability of local roots (roots and tubers), eggs, meat, vegetables, and fruits were observed. A typical household market basket consists of rice, fish and seafood, miscellaneous products, meat, and vegetables. During the pandemic, respondents reported the most notable changes in the availability of these essential goods.

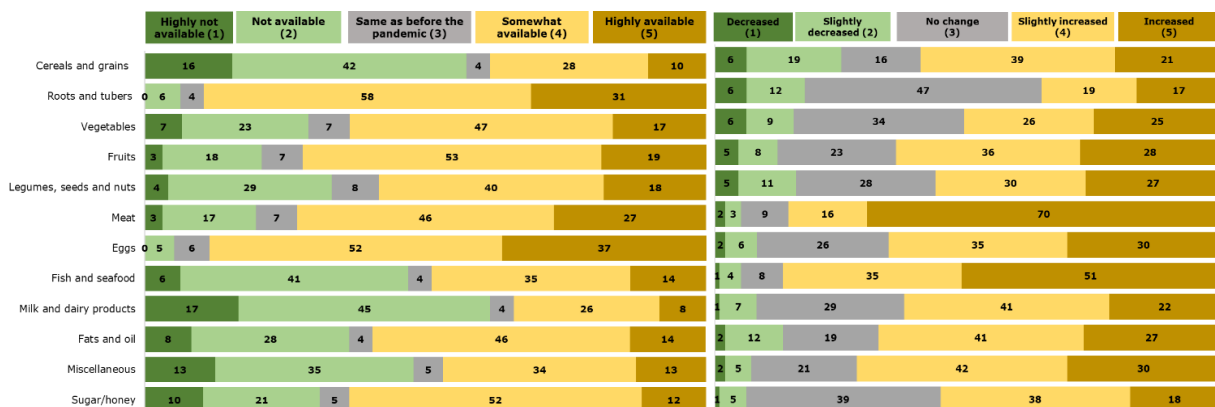


Figure 4. Perceived change in the availability (left) and prices (right) of food groups, Himbubulo Weste village (n=96), percent (%)

The variability in prices as perceived by the respondents could be seen in all food groups.

The top three products that were reported to have increased in price were meat (86%), fish and seafood (86%), and miscellaneous products (72%).

5) Food consumption and household dietary diversity

Figure 5 presents the summary of the reported food groups eaten by the respondents' households in the three villages within the period of the pandemic. The distribution indicates that rice (cereals and grains) and vegetables were the most common food commodities among the households in the villages.

The dependence and utilization of vegetables were partly due to increased household engagement in the backyard and local market-oriented production even before the

pandemic. By promoting robust vegetable production systems by the local government and IIRR, the communities have increased access to vegetables at a relatively affordable price during the pandemic.

Chicken eggs and meat served as the primary protein source among households in Chhouk and Htee Pu. The availability of chicks as part of the local government and IIRR's native chicken raising has strengthened household engagement in traditional native chicken production. The availability and accessibility of broilers, eggs, and chicks have contributed positively to household consumption during the pandemic.

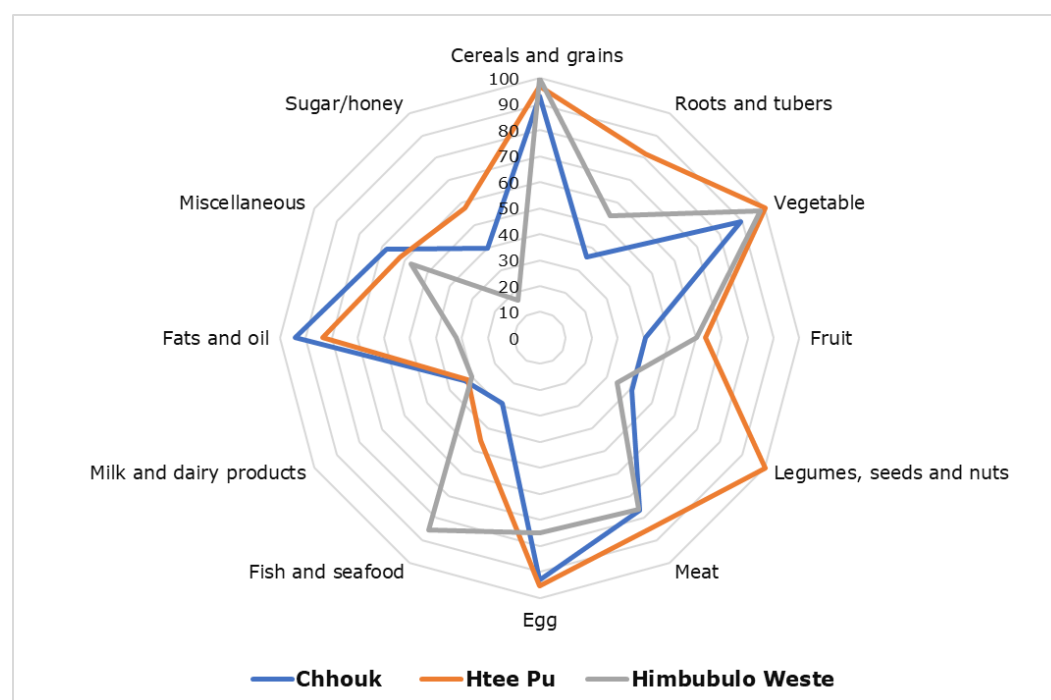


Figure 5. Reported food groups during COVID-19 restrictions

In Htee Pu CSV, legumes, which are primary products of the community (pigeon pea and peanut), were part of all the respondents' diet. This was not observed in the other villages. On the other hand, fish and seafood consumption was notably high among the respondents in Himbubulo Weste, which could be attributed to its proximity to the village engaged in coastal agriculture. In addition, over 60 households are engaged in native pig production, which has contributed partly to emergency access to meat protein among households.

The observed distribution suggests that, on average, the diets of rural households are mainly dominated by cereals and grains, vegetables, egg, fats and oil, with fewer roots and tubers,

fruit, milk and dairy products. Consumption of miscellaneous products (condiments, processed) and sugar was relatively lower.

Noteworthy, most of the respondents in the three villages have medium to high dietary diversity (Table 7). The household dietary diversity score is the proxy indicator for household food access and socioeconomic status (Swindale et al 2006).

Table 7. Household dietary diversity during COVID-19 restrictions

	Chhouk (n=103)	Htee Pu (n=66)	Himbubulo Weste (n=96)
Low dietary diversity (0-3)	20 (19.4%)	0 (0.0%)	6 (6.2%)
Medium dietary diversity (4-6)	58 (56.3%)	17 (25.8%)	33 (34.4%)
High dietary diversity (7-12)	25 (24.3%)	49 (74.2%)	57 (59.4%)

The mean household dietary diversity score is 6.4 in Chhouk village, 8.2 in Htee Pu, and 7.2 in Himbubulo Weste. The varied food sources of the households contribute positively to varied food choices, thus to the consumption of the households. Despite the COVID-19 measures creating bottlenecks in the food supply chains and negatively affecting the actors' livelihoods in the food system, more localized food value chains promote better food access.

By its very purpose, CSA practices aim to increase agricultural productivity sustainably and reduce the farmers' exposure to shocks and risks while building their resilience and capacity to adapt to short- or long-term stresses. COVID-19 pandemic is an external shock on the local food system. Diversification through complementing food production systems in the three CSVs has helped households cope with the pandemic-related impacts.

Although each community has a unique agro-ecological landscape, adopting CSA practices based on indigenous knowledge and community-driven approaches has provided better diets, as seen in the dietary diversity of households.

6) Food security

Table 8 shows the immediate impact of COVID-19 restrictions on economic status as reflected in the meals eaten by the households. The majority of respondents in Himbubulo Weste (51%) and Htee Pu (44%) reported having enough food in terms of quantity, although limited in the kinds of food they prefer. Households in Chhouk have received the most impact, with 43% reporting that they experience not having enough food sometimes while

16% reported a lack of food often. As most households are close to subsistence, they are more vulnerable to shocks that threaten them to reduce their food intake.

Consequently, the ability to adapt to a sudden change in food supply can be seen among households in Chhouk. About 84% of the respondents have household members or themselves cut the size of meals or skip meals because they do not have enough food. Also, households have reportedly reduced their food consumption. When asked about the food stocks, respondents in Chhouk have relatively better adjustments, with about 30% reporting having household food stock lasting for more than two weeks compared to Htee Pu and Himbubulo Weste, of which majority reported up to one week of food supply.

Table 8. Proxy indicators of the level of food insecurity during COVID-19 restrictions

	Chhouk (n=103)	Htee Pu (n=66)	Himbubulo Weste (n=96)
<i>Perceived sufficiency of household consumption: Which of these statements best describe the food eaten in your household during the pandemic?</i>			
Enough of the kinds of food we want to eat	5%	9%	29%
Enough but not always the kinds of food we want	35%	44%	51%
Sometimes not enough to eat	43%	35%	15%
Often not enough to eat	16%	12%	5%
<i>During the pandemic, did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough food?"</i>			
Yes	84%	3%	26%
No	16%	97%	74%
<i>Food stock How long would your household food stock last?</i>			
Less than 2 days	25%	14%	5%
Up to 1 week	27%	58%	55%
Up to 2 weeks	18%	12%	25%
More than 2 weeks	30%	16%	15%

In Himbubulo Weste, women, in particular, reported being able to cope during the pandemic by maximizing the available resources in the area. They have more time to engage in farming, tend to ornamental plants, and sell vegetables and ornamentals online. The stay-at-home directives gave more time to continue livestock and poultry raising. Also, their children who had lost their jobs have helped them attend to the household chores, care for the young ones, and do farming activities.

Moreover, the government's aid and support from other organizations operating in the area have been pivotal in ensuring continuous food production. Despite the decrease in family income, they managed to cope during the pandemic through the provision of additional farm inputs, food care packages and cash assistance.

Conclusion

Health emergencies such as the COVID-19 pandemic is considered as an external shock on the local food system, where economic loss is a significant initial impact that could potentially put rural households into severe food insecurity. As large numbers of local food system actors constitute the informal sector, disruptions in their livelihood negatively affect incomes. While local agricultural production proceeded with minimal adjustments during the quarantine regulations, movement restrictions of people and goods resulted in the daily wage earners' inability to work and farmers unable to access input supply and reach financier providing credits to sell their products. Their already poor economic condition and loss due to COVID-19 regulations prevent them from stockpiling food supply. The ability to adapt to acute food shortage by cutting down meals and extending food supply was observed among households in Chhouk, which also experienced the most severe food insufficiency.

During the period of restrictions, the household dietary diversity in the three villages remained high. While governmental social protection measures have contributed to the households' food supply, domestic food production contributed significantly to consumption during the COVID-19 restrictions. The majority of the respondents reported utilization of their own produce from homestead garden and/or livestock. Moreover, physical access to diverse food sources and informal food sales points in the village including neighbourhood retail stores and makeshift markets, which is an important feature of rural and traditional food systems, enhanced household dietary diversity.

Appendix 1

The three countries have different timepoints for implementing local measures to contain COVID-19 and various NPIs.

Village	NPIs and timeline
Chhouk village	<p>On 27 January 2020, the first COVID-19 case in Cambodia was diagnosed, restrictions on international travel followed immediately after</p> <p>On 16 March 2020, education facilities closed nationwide, while there was no directive on workplace closure.</p> <p>On 27 March 2020, local travel restrictions were issued</p> <p>On 3 April 2020 mass gathering was limited</p> <p>From 9 to 16 April 2020, travel restrictions between districts and provinces were in place, and the government recommended its people to stay at home, although work-related activities remained unhampered</p> <p>On 12 June 2020, the government announced a cash transfer scheme for the poor and the vulnerable groups</p> <p>On 15 October 2020, all public universities reopened</p> <p>On 2 November 2020, all schools reopened in phase 3;</p> <p>Gradual reopening of the economy started but with consequent directives to ban all social gatherings and activities when cases spike</p> <p>(Source: COVID-19 Situation Report #1, dated 6 July 2020; WPRO) #26. 28 December 2020</p>
Htee Pu Village	<p>On 28 February 2020, the country banned mass gathering, followed by entry restrictions from high-risk countries.</p> <p>On 18 April 2020, the country implemented lockdown and stay-at-home at seven townships in Yangon Region, which continued with modifications until December 2020.</p> <p>Suspension of domestic airlines commenced on 11 September and extended until 31 October.</p> <p>Suspension of international commercial aviation has been extended to 31 October 2020.</p> <p>(Source: Situation Report #262, Ministry of Health and Sports, Department of Public Health and Central Epidemiology Unit, Myanmar. 25 December 2020). Situation Report #260, Ministry of Health and Sports, Department of Public Health and Central Epidemiology Unit, Myanmar 23 December 2020) COVID-19 WHO Myanmar contribution update, 9 October 2020;</p>
Himbubulo Weste Village	<p>On 20 January 2020, the first case of COVID-19 was reported in the Philippines</p> <p>On 31 January, restrictions of international travel started</p> <p>On 10 March 2020, nationwide school closure was implemented, and workplace closure on 13 March, along with protocols of wearing face masks, hand hygiene, respiratory etiquette</p> <p>On 17 March 2020, the Philippines' President announced the Enhanced Community Quarantine in Metro Manila in Luzon. Non-essential work outside of healthcare, food processing and food distribution was suspended in Luzon, the major island of the country where Manila, the capital and Quezon Province are located, into restricted movement and closure of major roads and boundary. All</p>

	<p>people except essential services workers, such as medical front liners and those in the food supply, were to stay at home for 24 hours until the lockdown is lifted, and the law enforcement officers were deployed to impose this.</p> <p>On 8 April 2020, an executive order for stricter measures to contain the pandemic was signed by Quezon Governor, and the strict home quarantine was the declared policy.</p> <p>For the rest of the country and subsequent months, enhanced community quarantine was imposed upon recommendation by local government units or the Department of Health.</p> <p>(Source: COVID-19 Situation Report #63, dated 25 November 2020; WPRO COVID-19 Situation Report #66, dated 22 December 2020; WPRO)</p>
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