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## Harvesting insights: Assessment of food systems for children in the Philippines

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## Harvesting Insights: Assessment of Food Systems for Children in the Philippines

*Valerie Gilbert Ulep, Jann Trizia Talamayan,  
Lyle Daryll Casas, Ma. Norma Thea Madeline Conjares,  
Carleneth San Valentin, and Alice Nkoroi*

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### CONTACT US:

RESEARCH INFORMATION DEPARTMENT  
Philippine Institute for Development Studies

18th Floor, Three Cyberpod Centris - North Tower  
EDSA corner Quezon Avenue, Quezon City, Philippines



<https://www.pids.gov.ph>



[publications@pids.gov.ph](mailto:publications@pids.gov.ph)



(+632) 8877-4000

# Harvesting Insights: Assessment of Food Systems for Children in the Philippines

Valerie Gilbert Ulep  
Jann Trizia Talamayan  
Lyle Daryll Casas  
Ma. Norma Thea Madeline Conjares  
Carleneth San Valentin  
Alice Nkoroi

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## **Abstract**

In the Philippines, children continue to face challenges in accessing healthy, sustainable diverse diets that provide sufficient nutrients for growth and development. This is especially critical given the importance of early developmental stages. The overall structure and functioning of the food system shape children's diets. Failure in the food system contributes to the triple burden of malnutrition in the country, with children from poorer households particularly vulnerable to undernutrition, micronutrient deficiencies, overweight, and obesity. Using secondary data available, this paper examines the complex interplay between the food system—encompassing the food supply chain, food environment, and individual-level factors—and its impact on children's diets. Understanding these dynamics is crucial for designing effective interventions to enhance dietary diversity and improve nutrition outcomes. Findings showed that despite decades of targeted interventions and increased food availability, the Philippine food system remains unable to consistently deliver safe, nutritious, and affordable diets to all. As a result, 48.1 million people cannot afford a healthy diet. Addressing the root causes of limited access and availability is key to breaking the cycle of poverty and malnutrition. Building a resilient, equitable food system requires coordinated action to strengthen food supply chains, food environments, and nutrition behaviors and practices. These efforts are essential for improving child nutrition and ensuring a healthier future generation

**Keywords:** food systems, food supply chain, food environment, child nutrition, Philippines

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# Harvesting Insights: Assessment of Food Systems for Children in the Philippines

***Valerie Gilbert Ulep, Jann Trizia Talamayan, Lyle Daryll Casas, Ma. Norma Thea Madeline Conjares, Carleneth San Valentin, Alice Nkoroi<sup>1</sup>***

## Introduction

Children in the Philippines face challenges in accessing healthy, sustainable, diverse diets that provide sufficient nutrients for their growth and development. While poor diets can affect individuals of all ages, their impact is particularly pronounced among children, given the critical nature of their developmental stages.

The overall structure and functioning of the food system significantly impact children's diets (Aggeli et al. 2022; Miller et al. 2021). In the Philippines, diverse and nutritious foods are often limited in terms of both availability and accessibility, especially among families living in poverty. Many households cannot afford a healthy diet, relying instead on cheaper, less nutritious options. In 2023, eight in 10 children aged 6-23 months did not meet the Minimum Dietary Diversity (MDD), most of whom belong to poor families (DOST-FNRI 2025). Economic constraints faced by low-income families bring about poor dietary diversity (Sawyer et al. 2021).

Dietary diversity is crucial because it enables children to obtain the necessary nutrients for growth and development. However, around 23.6 percent or 2.6 million children in the Philippines are stunted mainly due to poor diets and inadequate nutrition, exacerbated by food systems that fail to provide affordable, healthy diets adequately (DOST-FNRI 2025). The impact of an ineffective and unreliable food system creates a vicious cycle of poverty and malnutrition (Siddiqui et al. 2020). Malnourished children are less likely to perform well in school, limiting their economic productivity and future opportunities (Food Research & Action Center 2017; Siddiqui et al. 2020).

At the same time, recent global food system trends have transformed food environments, leading to the widespread availability of ultra-processed food products. Local markets are now filled with energy-dense, nutrient-poor foods and beverages, increasing the risk of obesity and overnutrition, particularly among the poorest populations. In the Philippines, an increase in the prevalence of overweight and obesity has been observed, especially among children, with 12.9 percent of children aged 5 to 10 years old considered to be overweight or obese (DOST-FNRI 2025). Children are especially vulnerable to the pervasive marketing strategies employed by the food and beverage industries, with advertising and promotions aggressively targeting school-aged children (UNICEF 2021). These tactics shape young children's food preferences and dietary patterns, having long-lasting effects on lifelong habits centered around unhealthy food choices.

This paper will discuss the complex interplay of the food system and its impact on children's diets which is crucial for developing effective interventions aimed at improving diet diversity

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<sup>1</sup> Dr. Ulep, Ms. Talamayan, Mr. Casas and Ms. Conjares are senior research fellow, research specialist, senior research specialist, and technical specialist at the Philippine Institute for Development Studies, respectively. Ms. Nkoroi and Ms. San Valentin are United Nations Children's Fund (UNICEF) staff. This work was funded by the UNICEF. The opinions and statements in this article are those of the authors and may not reflect official UNICEF policies.



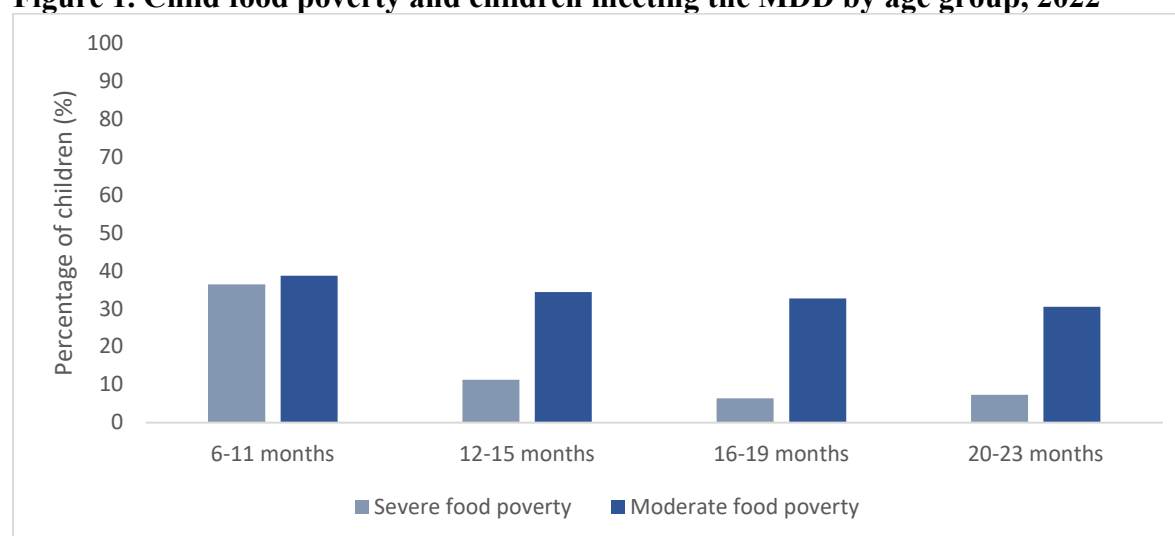
and nutrition outcomes. By enhancing the food system's capacity to provide diverse and nutritious foods in a sustainable way, the health and well-being of children in the Philippines can be significantly improved.

## Child food poverty and nutrition inequities in the Philippines: Patterns, drivers, and regional disparities

The lack of food diversity can increase the risk of micronutrient deficiencies, which may have a damaging effect on a child's overall development (Black et al. 2013). Nutrition deprivation in early childhood is measured and captured as child food poverty. "Child food poverty is defined as children's inability to access and consume a nutritious and diverse diet in early childhood" (UNICEF 2024, p. 10). The consumption of the eight food groups<sup>2</sup> in the metrics for nutrient adequacy classify child food poverty into two categories – *severe* and *moderate* child poverty<sup>3</sup>. A child consuming at least five of the eight food groups is defined as a child meeting the Minimum Diet Diversity (MDD).

Severe food poverty is highest in children aged 6-11 months and decreases with age. During this critical period, children transition from exclusive breastfeeding to solid foods, requiring a diverse and nutrient-rich diet. However, only a few of the children in this age group have adequately diverse diets (Figure 1). Their diets often consist mainly of breast milk, milk, or starchy staples, with insufficient fruits, vegetables, and protein; therefore, they lack essential micronutrients for growth and development. This inadequacy stems from limited access to nutritious foods and insufficient knowledge about proper infant feeding and care practices, which can be both addressed with an effective food system and by amplifying nutrition, counseling and education and closing economic gaps while strengthening social protection systems that are responsive to food and nutrition needs (UNICEF 2019; WHO 2021).

**Figure 1. Child food poverty and children meeting the MDD by age group, 2022**



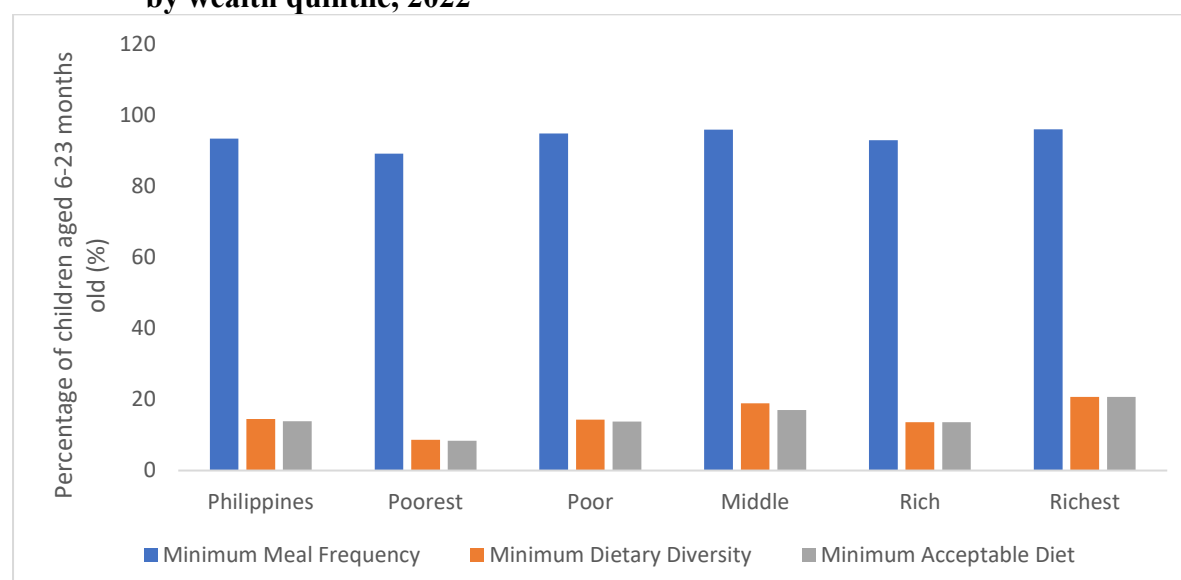
Source: Author's visualization of data from UNICEF database (UNICEF 2022)

<sup>2</sup> The eight food groups in UNICEF and WHO dietary diversity score are (1) breastmilk, (2) grains, tubers, and plantains, (3) pulses, nuts, and seeds, (4) dairy products, (5) flesh foods, (6) eggs, (7) vitamin a-rich fruits and vegetables, and (8) other fruit and vegetables.

<sup>3</sup> Severe child food poverty is consumption of two or fewer food groups while moderate child food poverty is consumption of three or four food groups. To meet the dietary diversity score, children need to consume foods from at least five out of the eight food groups.

Minimum Adequate Diet (MAD) is a composite indicator that combines Minimum Meal Frequency (MMF) and MDD, measuring both the quantity and quality of young children's diets. Children who do not meet the MAD are at risk of inadequate intake of essential macro- and micronutrients needed for optimal growth, health, and cognitive development (Guirindola, Malabad, and Maniego 2022; Shaun, Nizum, and Munny 2023). As seen in **Figure 2**, while the percentage of children meeting the MMF is high across all socioeconomic groups, the quality and diversity of their diets remain alarmingly low. In 2023, only one to two out of ten children aged 6-23 months met the minimum dietary diversity (14.5%) and minimum acceptable diet (13.9%). This disparity is most pronounced among the poorest children, with only around 9 percent meeting both the required diversity and the acceptable dietary requirements. However, the low rates persist even among the richest households, highlighting that poor diet quality is a widespread national concern. This suggests that although children are fed often enough, their diets lack the variety needed to ensure adequate nutrient intake. Insufficient dietary diversity is associated with increased risk of micronutrient deficiencies and adverse health and developmental outcomes (Gibson 2011; UNICEF 2019).

**Figure 2. Percentage of children aged 6-23 months old meeting MMF, MDD, and MAD, by wealth quintile, 2022**

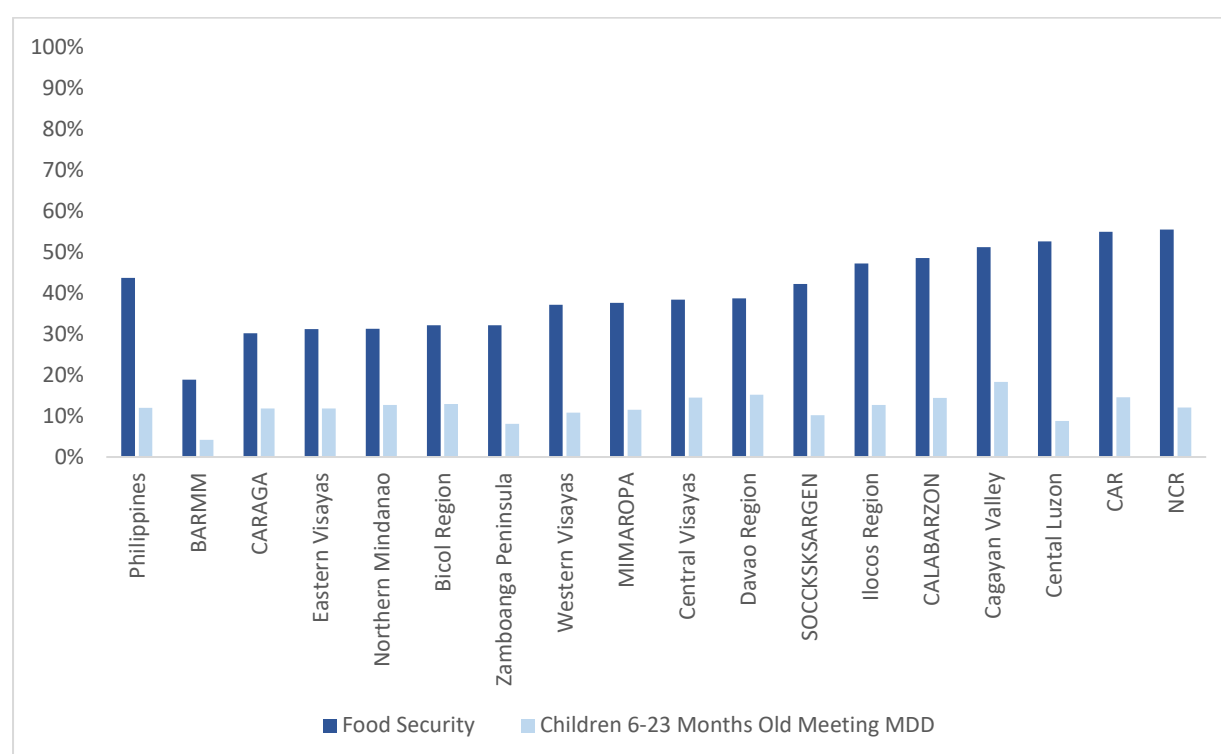


Source: Author's visualization of data from 2023 Expanded National Nutrition Survey (DOST-FNRI 2025)

The degree of food insecurity experienced by households is another factor that shapes the nutrition environment and diet adequacy. In the Philippines, food insecurity is exacerbated by high poverty rates and agricultural challenges (Angeles-Agdeppa et al. 2019). Households that are experiencing food insecurity tend to have less diverse diets.

Research suggests that household's food security level is associated with a low Dietary Diversity Score (Guirindola et al. 2022). This is evident in the Philippines, particularly in BARMM, which is the least food secure region in the country, 25 percentage points below the national average. Consequently, only 4.2 percent of children under two years old meet the MDD (Figure 3), highlighting the strong link between households' food security and children's access to a diverse and nutritious diet.

**Figure 3. Food secure households and children meeting the MDD by region, 2021**



Source: Author's visualization of data from DOST-FNRI 2022

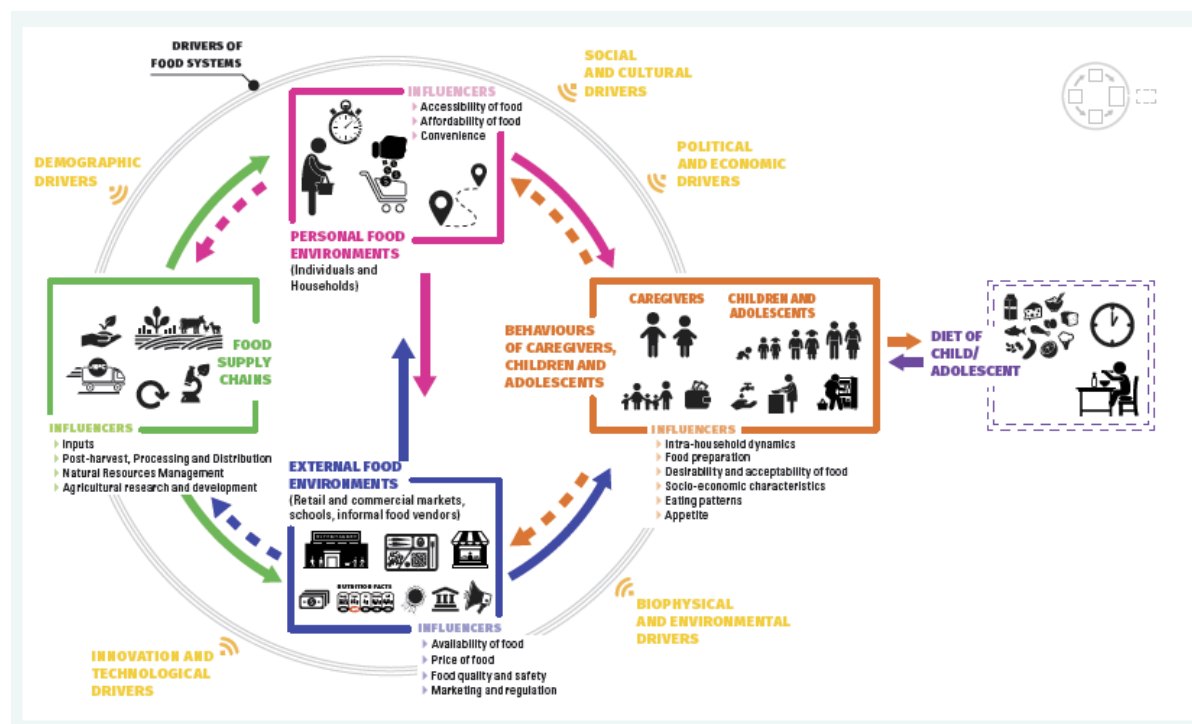
Note: In the MDD results of the FNRI, only children who consumed at least five (5) out of eight (8) food groups on the day preceding the survey were considered to have met the MDD

Geographical disparities, however, exist: Rural areas and regions affected by natural disasters or conflicts often encounter higher levels of food insecurity than the urban areas. Thus, there is uneven access to nutritious food across regions, with households in disaster- or conflict-prone regions being more disposed to poor dietary diversity and greater malnutrition (Drake et al. 2023).

## Food systems in the Philippines

The complex interrelationships among various drivers and influencers that shape the diets of children and adolescents are better understood by looking at the role of food systems. Food systems encompass structural, economic, and physical dimensions of access to safe, sustainable, and nutritious food. Figure 4 presents a food system framework that identifies the broad and overarching drivers, including demographic, social and cultural, political and economic, innovation and technological, and biophysical and environmental factors that affect both the food supply chains and the environments where food is accessed and consumed.

**Figure 4. The Innocenti Framework on Food Systems for Children and Adolescents**



Source: Lifted from the UNICEF Office of Research Innocenti, 2018

The food supply chain, food environment, and the behavior of caregivers and children are all interconnected, each influencing and being influenced by the others to shape the diet of children and adolescents ultimately.

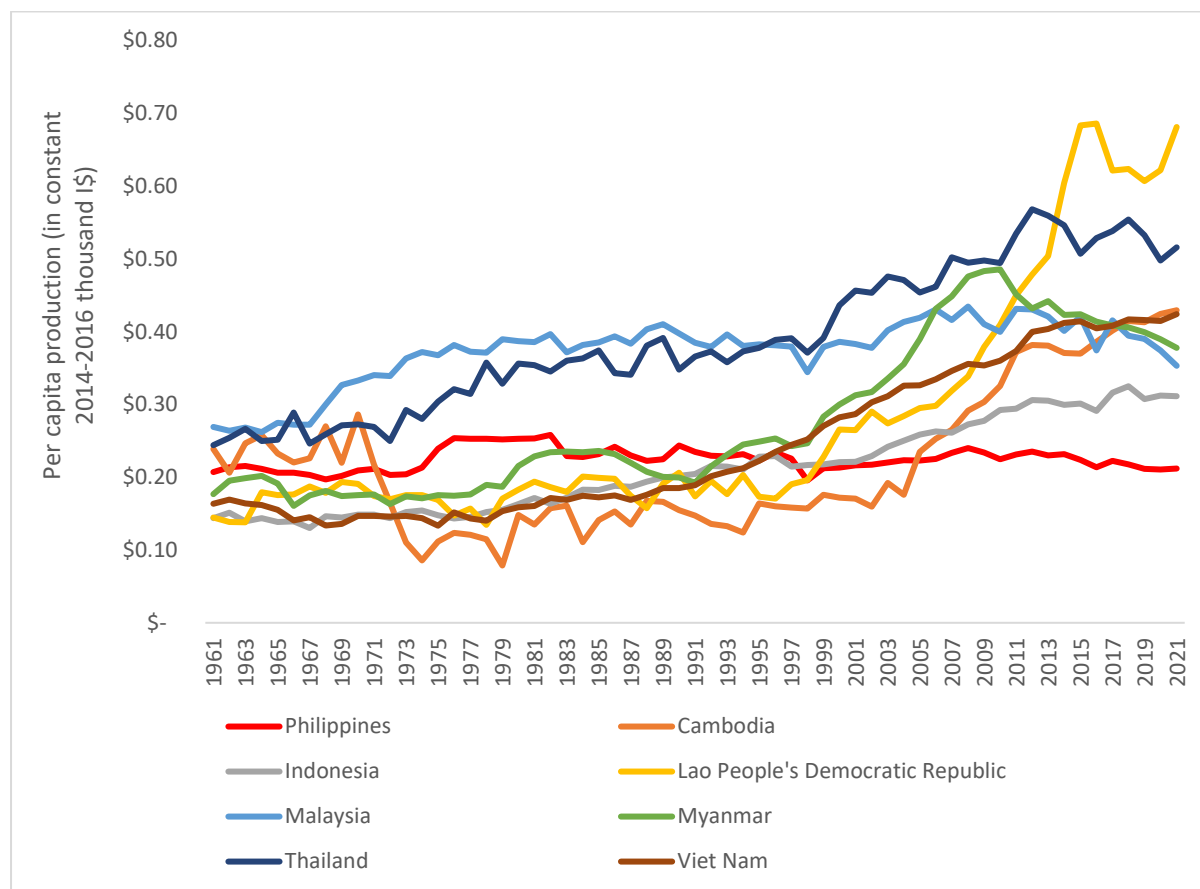
## Food Supply Chain

The food supply chain covers the entire process of producing, processing, distributing, and delivering food from the farm to consumer (Food and Agriculture Organization 2017). It involves a series of interconnected stages and actors, each contributing to the overall journey of food. The efficiency, accessibility, and resilience of the food supply chain directly impact the availability and stability of food for individuals and communities (Orengo Serra and Sanchez-Jauregui 2021). Proper processing methods can enhance the nutrient content of food, and effective distribution systems can make healthy food more accessible and affordable.

## Food Production

Since the 1970s, food production in the Philippines has increased, but the growth rates vary among different commodities. The per capita crop production, with its annual hike of 2.18 percent, is relatively stable. Crop production, in terms of value, also rose over the past decades. However, compared to other countries in the ASEAN region, the rate of increase remains modest (see Figure 5).

**Figure 5. Per capita production of crops in the ASEAN countries, 1961-2021**



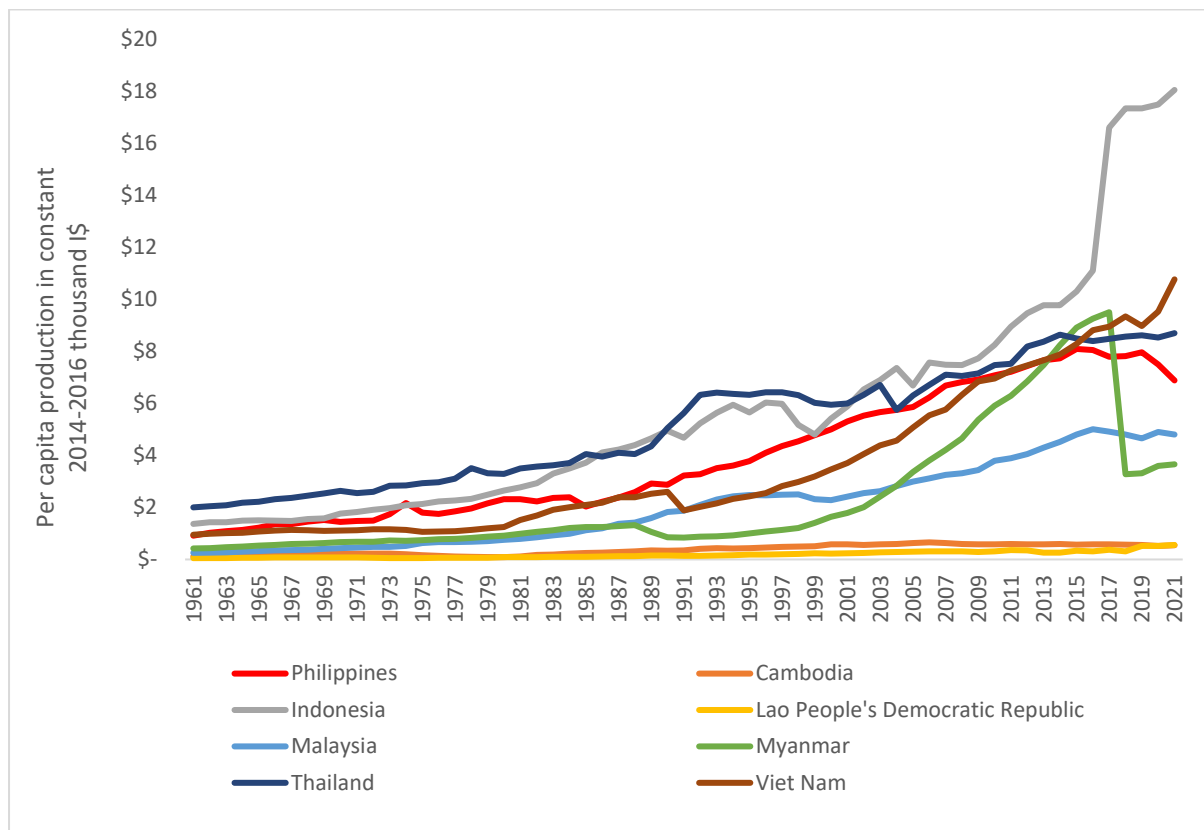
Source: Authors' visualization of data from FAOSTat (FAO n.d.) and World Bank (World Bank 2022)

Note: The per capita production is computed by dividing the gross crop production of each country to their respective total population over the years.

The production of food—encompassing the diversity and sustainability of its supply—relies on several key factors, including fertile soil, an adequate water supply, and essential nutrients to support the growth and development of plants and animals. The country, however, faces challenges such as limited arable land, climatic factors, and resource constraints that can decrease agricultural output, which then affect the availability of nutritious food necessary for a healthy diets (Briones and Dela Pena 2015; Fanzo et al. 2021).

Meanwhile, livestock production also exhibits a modest average hike of 2.77 percent (See Table 1). Higher livestock production increases the availability of meat, dairy, and eggs, which are excellent sources of high-quality protein, essential fatty acids, and micronutrients needed for growth, and cognitive and immune system development in children. However, the trends become more diverse when considering per capita production. In the case of livestock, the growth rate declines when accounting for population growth (see Figure 6).

**Figure 6. Per capita production of livestock in the ASEAN countries, 1961-2021**



Source: Authors' visualization of data from FAOSTAT database (FAO n.d.)

*Note: The per capita production is computed by dividing the gross livestock production of each country to their respective total population over the years.*

**Table 1. Average annual growth rate of total production and the per capita production of livestock and crop over the years in ASEAN countries**

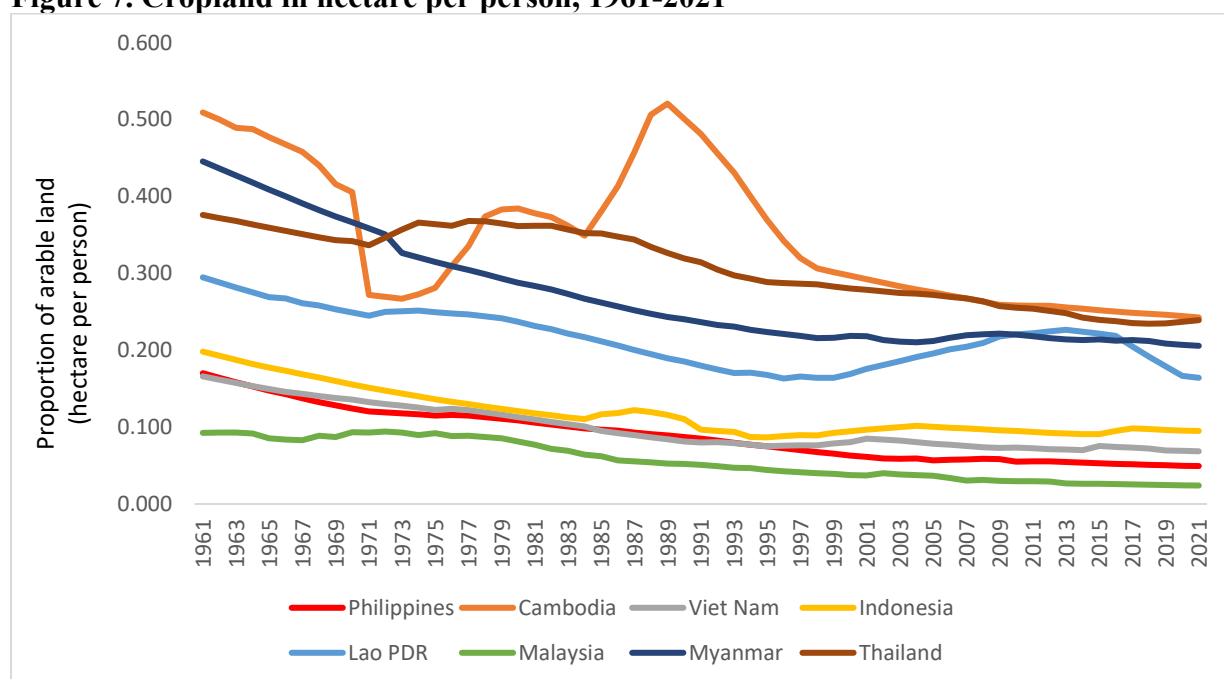
Country	Average annual growth rate of total production						Average annual growth rate of per capita production					
	Livestock			Crop			Livestock			Crop		
	1970 - 1990	1991 - 2009	2010 - 2021	1970 - 1990	1991 - 2009	2010 - 2021	1970 - 1990	1991 - 2009	2010 - 2021	1970 - 1990	1991 - 2009	2010 - 2021
Philippines	3.52%	4.79%	0.02%	3.56%	2.06%	0.92%	0.97%	2.54%	-1.66%	1.01%	-0.12%	-0.78%
Malaysia	7.45%	13.7%	2.89%	3.68%	2.81%	0.39%	4.65%	0.91%	1.41%	0.98%	0.26%	-1.06%
Indonesia	5.64%	2.67%	7.96%	4.03%	3.24%	2.12%	3,23%	1.17%	6.82%	1.66%	1.73%	1.04%
Vietnam	4.34%	5.6%	3.92%	4%	4.89%	2.57%	1.93%	4.21%	2.89%	16%	3.48%	1.55%
Thailand	3.46%	2.03%	1.68%	3.71%	3.10%	0.86%	1.21%	0.93%	1.22%	1.45%	1.99%	0.40%
Cambodia	2.79%	3.12%	-0.58%	3.18%	6.79%	4.4%	1.13%	0.62%	-1.89	1.74%	4.26%	3.02%
Myanmar	1.76%	10.34%	0.43%	2.74%	5.98%	-1.23%	-0.21%	9.19%	-0.35%	0.76%	4.87%	-2%
Lao PDR	3.56%	3.81%	7.76%	3.25%	5.72%	6.81%	1.12%	1.82%	6.19%	0.81%	3.71%	5.27%

Source: Authors' analysis and computation on livestock and crop production from FAO (FAO n.d.)

The size of a cropland in relation to the population size influences agricultural productivity. That is, as the size of croplands per person increases, the more food is produced, thus ensuring that there is enough food to meet the nutritional needs of the population. There will also be a better chance to cultivate nutrient-dense crops (Foley et al. 2011; Tilman et al. 2011).

In the Philippines, the cropland per capita has steadily dropped from 0.2 hectares per person in the 1970s to 0.09 hectares in 2021 (see Figure 7). The Philippines has the lowest hectares per capita in the region. Increased agricultural production from more croplands can reduce food prices, making nutritious foods more affordable for low-income families. This economic access is critical in countries, such as Philippines, where poverty and food insecurity are prevalent, ensuring that children from these households can afford a nutritious diet.

**Figure 7. Cropland in hectare per person, 1961-2021**



Source: Authors' visualization of data from FAOSTAT database (FAO n.d.)

## *Food processing*

In food processing, several steps are taken to transform raw ingredients into consumable food products. It includes basic methods such as washing and cutting; and more complex techniques such as cooking, pasteurizing, canning, and fortifying. While food processing often carries a negative connotation, it also plays a crucial role in enhancing the palatability, safety, and nutritional value of foods, especially in the diets of children (Fellows 2009). It allows for the creation of a wide variety of food products that can cater to different tastes and preferences. This variety is essential for children, ensuring they have multiple options to meet their nutritional needs.

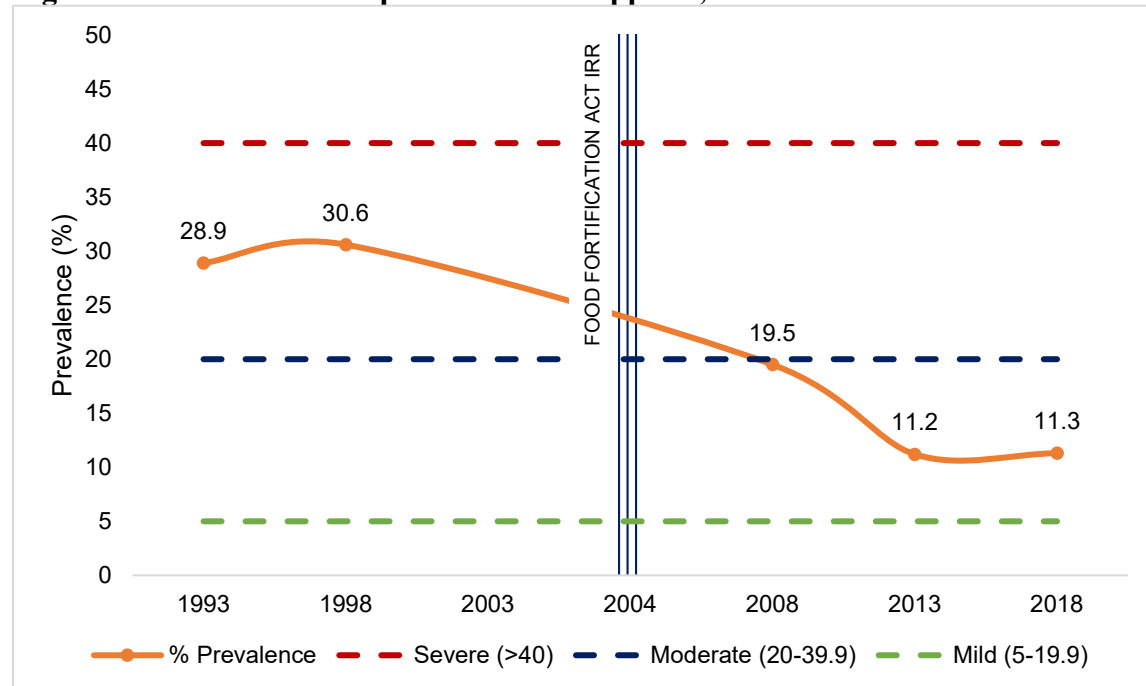
Fortification is one aspect of food processing that improves the nutrient content of foods by adding vitamins and minerals to food products (World Health Organization 2006).

Republic Act No. 8976, or the Food Fortification Act was enacted in 2000 (IRR in 2004) which mandated the fortification of staple foods such as rice, cooking oil, refined sugar, and wheat



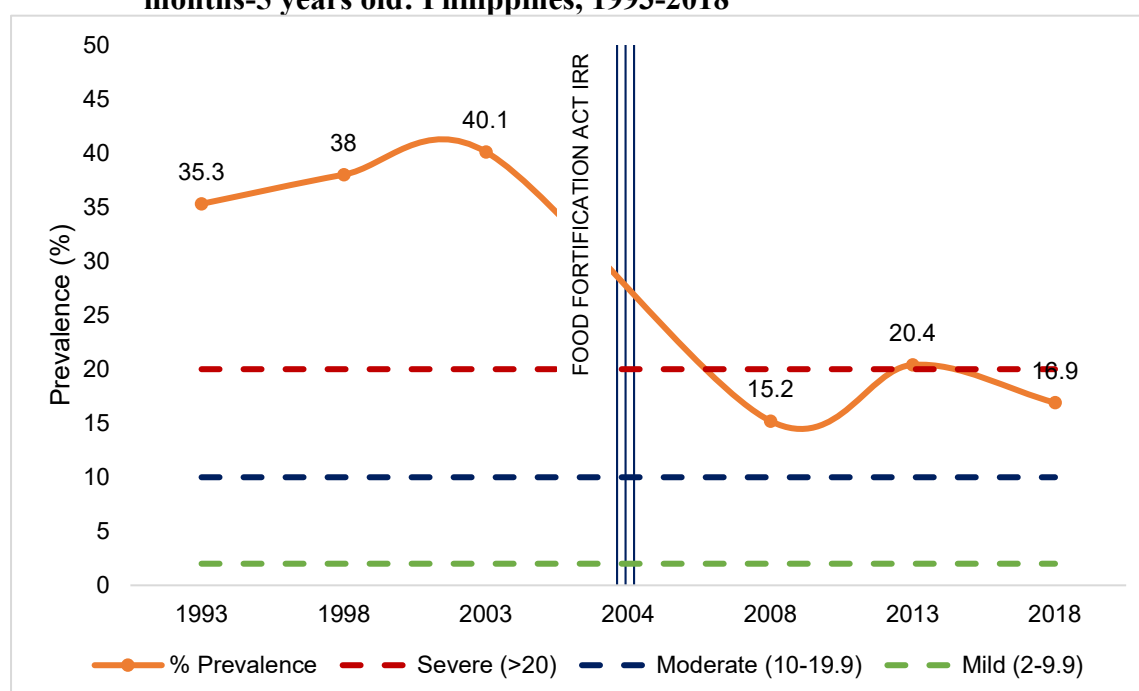
flour with iron and Vitamin A to alleviate the prevalence of anemia and Vitamin A Deficiencies (VAD), respectively. Significant improvements in these outcomes have been made since the enactment of the law. Overall, there has been a consistent significant decrease in anemia prevalence across all age groups (Figure 8). Meanwhile, VAD has notably decreased among young children from 6 months of age to 5 year (Figure 9).

**Figure 8. Trend in anemia prevalence: Philippines, 1993-2018**



Source: Author's visualization of data from Expanded National Nutrition Survey, 2018

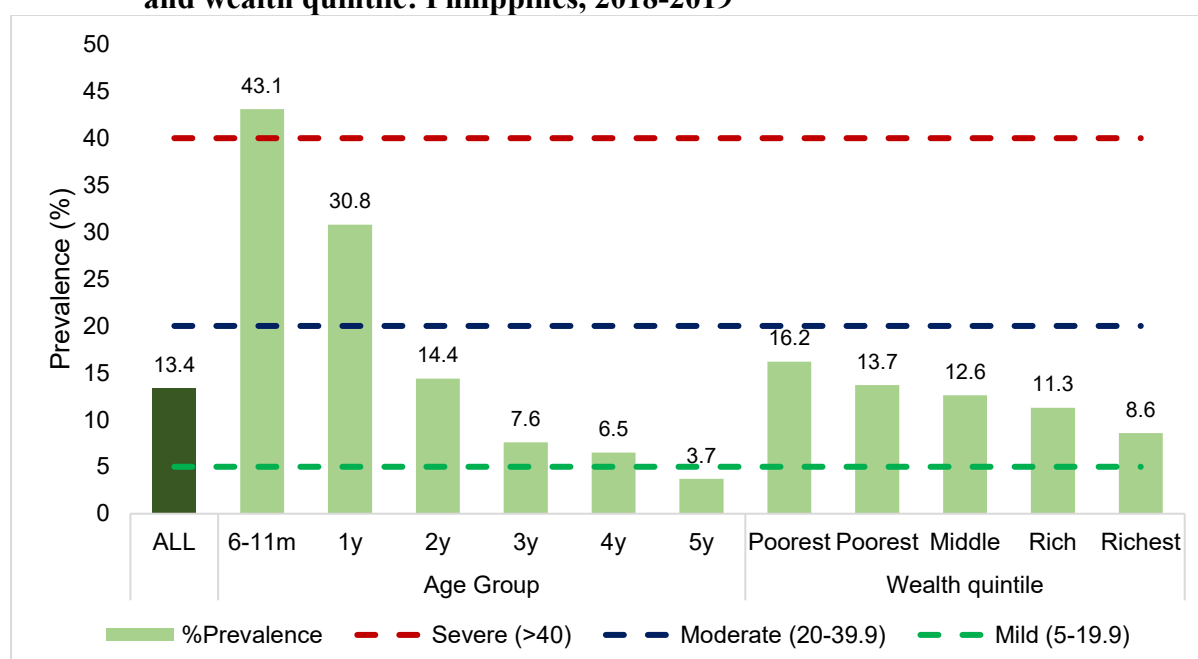
**Figure 9. Trend in prevalence of vitamin A deficiency among preschool children, 6 months-5 years old: Philippines, 1993-2018**



Source: Author's visualization of data from Expanded National Nutrition Survey, 2018

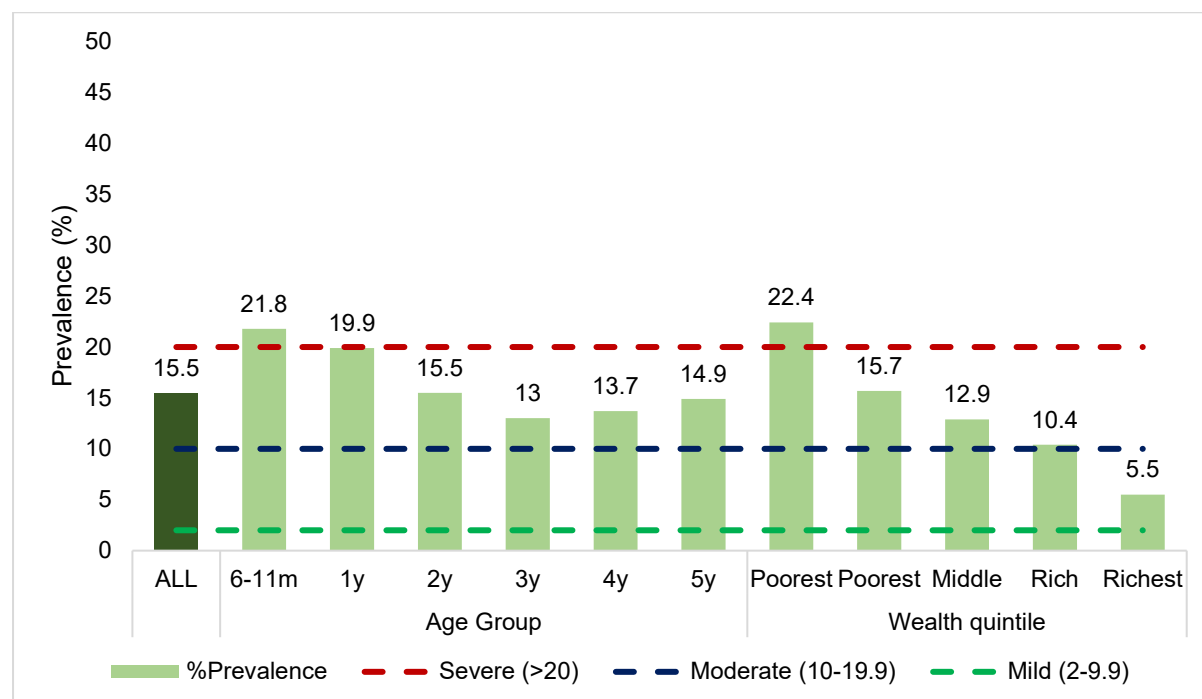
However, further disaggregation of available data once again exposes children to being the most vulnerable and emphasizes the disparity among wealth quintiles. Young children ages 6 to 11 months are the most affected by both anemia (Figure 10) and VAD (Figure 11), reflecting the continued inadequacy in dietary diversity of complementary feeding practices.

**Figure 10. Prevalence of anemia among children, 6 months to 5 years old, by single age and wealth quintile: Philippines, 2018-2019**



Source: Author's visualization of data from Expanded National Nutrition Survey, 2018

**Figure 11. Prevalence of vitamin A among children, 6 months to 5 years old, by single age and wealth quintile: Philippines, 2018-2019**



Source: Author's visualization of data from Expanded National Nutrition Survey, 2018

### *Food distribution*

For food supply chains to be considered efficient, the various factors at play must be available, sufficient, and reliable. For instance, the lack of proper logistical infrastructure directly affects the transportation and distribution of goods, which can affect food prices (Bhattacharya 2016; Latragna 2023). As a result, food is becoming increasingly inaccessible to the community on both physical and financial levels. Poor road conditions make it difficult for rural towns to access major markets or roadways, which lowers transportation efficiency and drives up the cost of logistics (Miraflor 2021).

The Philippine logistics system in agriculture has limited farm-to-market roads (FMRs) and is beset by high transportation costs. While the share of national roads in the national infrastructure budget has been growing in the last 10 years, the allocation for FMRs has been fluctuating (see Table 2). Market sellers attribute the persistent increases in food commodity prices to rising transportation costs due to the inadequate infrastructure (Miraflor 2021). Increased transportation expenses brought about by rising oil prices can also be passed on to consumers in the form of higher food prices (Baumeister et al. 2014; Janda and Křištofuk 2019).

**Table 2. Appropriation for National Roads and Farm-to-Market Roads and their share in Philippine's GDP, 2010-2022**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>National Road</b>													
<i>in billions PHP</i>	66.1	48.7	63.7	88.7	94.3	129.8	162.6	216.9	185.5	95.3	113.4	126.5	127.0
<i>% Share to GDP</i>	0.59%	0.42%	0.51%	0.67%	0.67%	0.87%	1.01%	1.26%	1.02%	0.49%	0.65%	0.67%	0.64%
<b>Farm-to-market Roads (FMR)</b>													
<i>in billions PHP</i>	6.6	2.5	5.0	7.1	12.0	4.1	7.3	6.0	9.9	10.2	9.9	11.7	7.5
<i>% Share to GDP</i>	0.06%	0.02%	0.04%	0.05%	0.09%	0.03%	0.05%	0.04%	0.06%	0.05%	0.06%	0.06%	0.04%

Source: Authors' compilation and calculation of National Road and FMR data extracted from GAA files in DBM and World Development Indicators of World Bank

Poor transportation infrastructure can also exacerbate food deserts. Food deserts are places where one's access to affordable, healthy food options is limited because of inadequate road networks, among others, leading to poor dietary outcomes among children (Ploeg et al. 2012).

To ensure the quality of food from farm to table, the Philippines has existing laws that aim to strengthen its food safety regulatory system, such as the Philippine Sanitation Code and the Republic Act No. 10611, also known as the "Food Safety Act of 2013" Despite these legal foundations, foodborne illnesses persist. There are significant gaps in the Philippine food control system, including deficiencies in food inspection, governance inadequacies, and slow response to food safety issues.

Table 3 reveals that households and food service facilities, including schools, are among the settings where violations of food safety rules are most prevalent. According to the Department of Agriculture (n.d.), of all age groups, it is the young children who are particularly vulnerable to foodborne diseases because their immune systems are still developing.

**Table 3. Locations of foodborne disease outbreaks in the Philippines for 1995-2004 and 2005-2018**

Location	Inclusive years (%)	
	1995-2004	2005-2018
Food service eating facility (school, canteen, restaurants, hotels)	27	35
Household (single and multiple household involvement, community, fiestas, birthday celebrations)	43	49
Others (office, public gathering, orphanage facility, jail)	20	16
Unknown	10	-

Source: Adapted from Rustia et al. (2021)

## Food environments

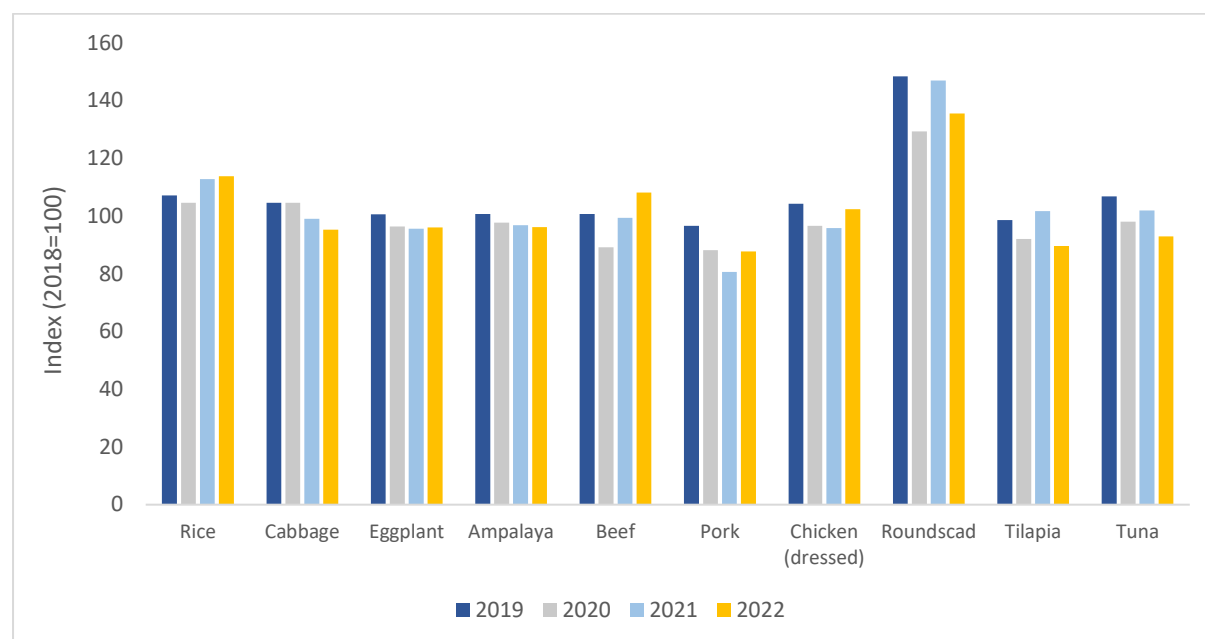
The food environment refers to the physical, economic, political, and socio-cultural surroundings, opportunities, and conditions that influence people's food choices, eating habits, and nutritional status. It encompasses all the factors that affect the availability, affordability, and accessibility of food, and the way food is handled and marketed (Chen and Antonelli 2020; Turner et al. 2018). It can be viewed in two main categories: the external and personal food environments.

### *External food environment*

The *external food environment* encompasses the broader systems and conditions outside of the home. It significantly affects children's dietary practices and nutritional status since it defines what food options are available and accessible to children and their families across various settings (Turner et al. 2018).

Agricultural output and food supply chains influence the types of food available in local markets. When the production and availability of diverse foods is low, the market tends to be saturated with less healthy food options, impacting children's diet quality. Figure 12 shows the change in daily per capita supply of selected agriculture and fishery commodities from 2019 to 2022, with 2018 as the base year. While the availability of staple foods and vegetables has remained relatively stable, that of protein sources has been more variable, which could impact the nutritional quality of children's diets (Angeles-Agdeppa et al. 2022).

**Figure 12. Indices of Daily Per Capita Net Food Disposable of Selected Agriculture and Fishery Commodities, 2019-2022 (2018=100)<sup>4</sup>**



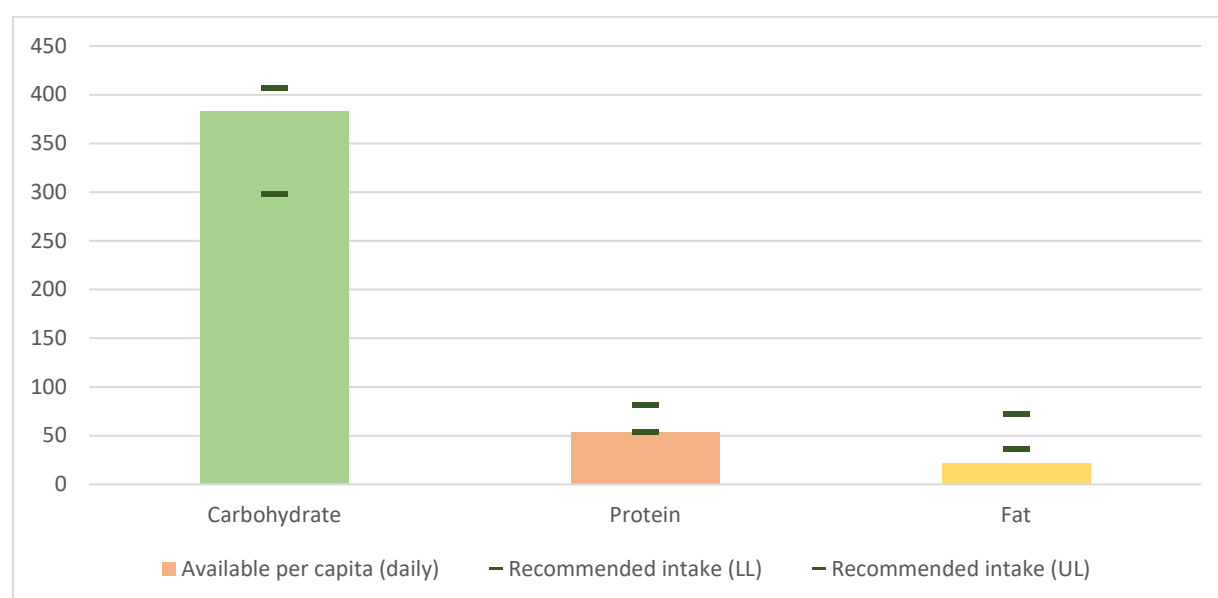
Source: Authors' visualization of Agriculture and Fisheries Indicators 2022 (PSA 2022)

<sup>4</sup> The daily per capita need food disposable index indicates the change in the volume of food available for consumption for the population, each year relative to a base year (2018) (PSA 2022).

The current supply of food may not be sufficient to meet adult energy and nutrient requirements.

Figure 13 compares the nutrient yield of selected agriculture and fishery commodities with the recommended intakes. In total, the energy yield of the available main commodities translates to 1,941 calories—short of the average requirement of 2,170 calories for adults. Also, while the nutrient yield for carbohydrates suffices to meet the recommended intake, the same cannot be said for protein and fat. Protein is essential for growth and development, as well as the repair of body tissues and recovery, while fat is important for one’s energy stores, maintenance of body functions, and absorption of vital nutrients (Singh et al. 2017).

**Figure 13. Availability (in grams, per capita) of selected agriculture and fishery commodities vis-à-vis the recommended intakes per macronutrient<sup>5</sup>**



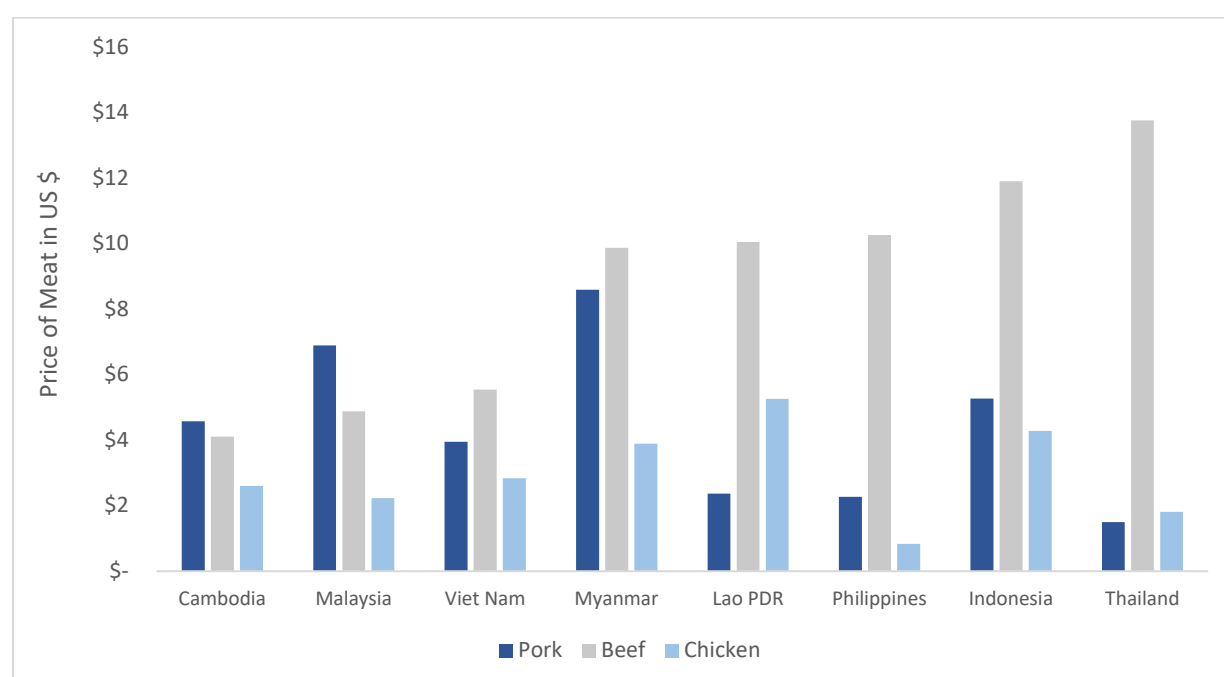
LL = Lower limit; UL = Upper limit.

Source: Authors’ analysis of Agriculture and Fisheries Indicators 2022 (PSA OpenStat 2023), Food Composition Tables 1997 and Philippine Dietary Reference Intakes 2015 (FNRI 2015).

Many children in the Philippines suffer from malnutrition due to inadequate consumption of protein-rich foods, which are vital for combating malnutrition but are commonly unaffordable for most families. The disparity may be attributed to the escalating food costs relative to income levels (French et al. 2019). For instance, meats, an essential source of protein and a component for a healthy diet, varied in price level and might be unaffordable on poorer countries, such as Philippines (see Figure 14). Studies demonstrated that consumption of high-quality protein foods was associated with a lower risk of stunting (Angeles-Agdeppa et al. 2022; Michaelsen and Greer 2014; Semba et al. 2016). While the per-kilogram cost of beef and pork in the Philippines appears lower than that in some of neighboring ASEAN countries, it still exceeds half of a minimum wage earner’s daily income. The affordability and accessibility of meat play a crucial role in shaping dietary choices. Households with poor economic status find it difficult to acquire enough vital nutrients because doing so would consume a substantial proportion of their income (Ederer et al. 2023; Herforth et al. 2020; McQuade et al. 2020).

<sup>5</sup> This was computed based on the daily per capita net food disposable, which refers to the volume of food commodity available for human consumption multiplied to its edible portion and nutritive factor rate to get the equivalent nutrient yield (carbohydrate, protein, and fat). Recommended intakes were based on the average energy requirement of adults aged 19-59 years old (2,170 calories) with 55-75% carbohydrates, 10-15% protein, and 15-30% fats, based on the PDRI 2015. This figure assumes that the daily supply is equally distributed among the whole population and only covers the food commodities monitored by the PSA.

**Figure 14. Price of meat per kg across ASEAN countries as of April 2025**



Source: Author's visualization of price data from Selina Wamucii platform<sup>6</sup> 2025

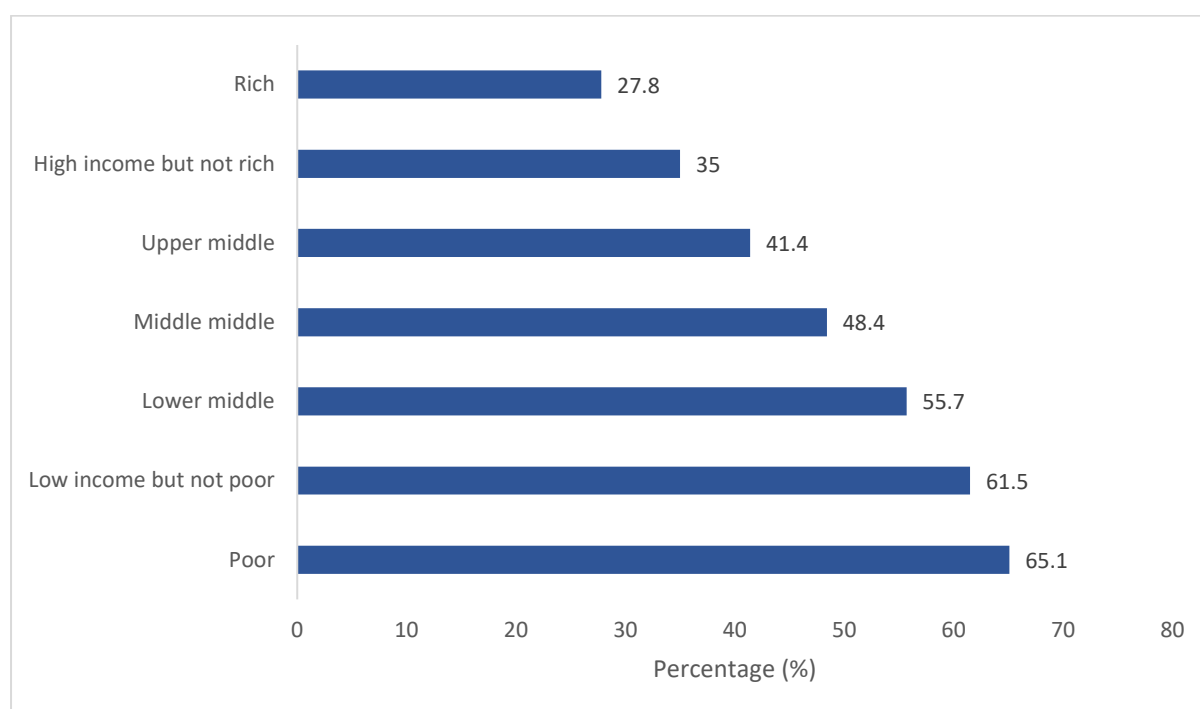
### *Personal food environment*

The personal food environment is the immediate context wherein individuals and households interact with food. It includes factors that influence how people access, prepare, and consume food within their personal spaces. Children are particularly vulnerable to influences within their immediate environment, such as food choices, which affect their dietary intake.

At the individual level, there are socio-economic limitations that hinder access to food. Food accessibility encompasses both the *availability* of food and the *affordability* and *ease of obtaining a nutritious diet*. Filipinos, on average, spend about 43 percent of their expenditures on food (PSA OpenStat 2023). The poor allocate the highest share (65.1%) of their expenditure on food, exceeding the allocation to food of the middle-income class (48.4%) and more than doubling that of rich households (27.8%) (Figure 15).

<sup>6</sup> Selina Wamucii is an agricultural company and a platform that connects smallholder farmers to global markets through digital platforms, and it has partnered with the Food and Agriculture Organization (FAO).

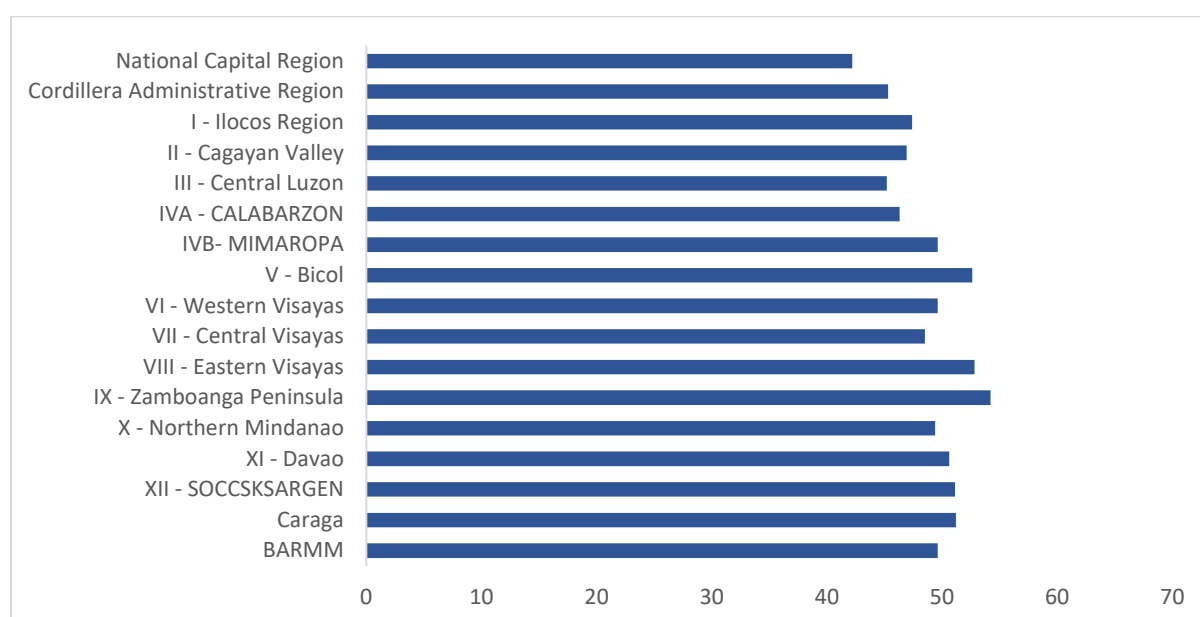
**Figure 15. Percentage share of food to total expenditure by socio-economic status, 2021**



Source: Author's visualization of data from Philippine Statistics Authority (2021)

In all the country's regions, households spend over 40 percent of their income on food (see Figure 16). A higher percentage indicates a larger proportion of household budgets dedicated to food, suggesting potential economic constraints and challenges in food affordability. For instance, Zamboanga Peninsula and Caraga have the highest shares, at 54.2 percent and 51.2 percent, respectively. As a significant portion of the income goes to food, families in these regions may be hard-pressed already to secure adequate nutrition for their children, potentially limiting their ability to allocate a budget for other necessities such as healthcare and education.

**Figure 16. Percentage share of food to total expenditure by region, 2021**



Source: Author's visualization of data from Philippine Statistics Authority (2021)



Food accessibility is also dependent on households' ease of access to a healthy and nutritious diet. According to the FAO (2020), eating healthily costs more than simply meeting basic energy and nutrient needs. In several ASEAN countries, the cost of a healthy diet varies, with Indonesia and Thailand having the highest expenses (Ritchie and Rosado 2021). In the Philippines, the cost is considered moderately high, especially given the country's high poverty rates. A significant portion of this cost is attributed to animal-source foods, which are expensive in many countries, including the Philippines. In contrast, starchy staples like rice are much cheaper and therefore more accessible to most people. Because many low-income families cannot afford a variety of nutritious foods, they often rely on rice and other low-cost staples while consuming fewer fruits, vegetables, and protein-rich foods (Ritchie and Roser 2023). This puts children from poor households at greater risk of nutrient deficiencies, which can contribute to ongoing cycles of malnutrition and poverty.

**Table 4** shows that the Philippines ranks second among the ASEAN members in terms of the share of the population that cannot afford a healthy diet (54.8 million). Most people in the Philippines cannot afford the daily cost of 4.09 \$PPP per person.

Although the cost of a healthy diet per person per day is slightly lower in the Philippines than in Thailand, a significantly larger share of the Philippine population—32 percentage points more—cannot afford a nutritious and balanced diet. In contrast, while Thailand faces a higher daily cost for a healthy diet, only a relatively small portion of its population struggles to access a diverse range of food groups.

**Table 4. Cost of healthy diet and the share of the population who cannot afford it, 2022**

ASEAN	Cost of healthy diet (\$ PPP) *	Share of population who cannot afford healthy diet	
		%	Millions
Indonesia	4.64	47.6	132.6
Philippines	4.09	48.1	54.8
Myanmar	4.56	56.3	30.3
Thailand	4.93	16.4	11.7
Vietnam	3.96	9.4	9.4
Lao PDR	4.65	57.1	4.3
Malaysia	3.77	1.8	0.6
Cambodia	3.48	(no data)	(no data)
Singapore	4.50	(no data)	(no data)

Note: Cost of healthy diet is defined as the cost to purchase foods that are least expensive and locally available, meeting the energy requirements (at 2,330 kcal/day.) based on food-based dietary guidelines. This is expressed in international dollars using purchasing power parity (PPP) (World Bank 2022).

Source: Food Prices Nutrition (V3.1) of World Bank Data Bank

Income levels affect household food consumption, especially for school-age children (Angeles-Agdeppa et al. 2019). The poorest households had the lowest average daily food intake at 2,734 grams, with intake progressively increasing as household wealth improved. These households recorded the least consumption across most food groups but had a high intake of cereals and cereal products. Studies have shown that higher reliance on cereal-based diets, while energy-

dense, often lack the necessary micronutrients needed for healthy development (Ebbisa 2022; Roorkiwal et al. 2021). This trend underscores the need for interventions to improve dietary diversity and nutritional quality among lower-income groups to prevent malnutrition in children.

**Table 5. Food consumption by wealth quintile**

Food Group/Sub-Group	One-day household food consumption in grams									
	Poorest		Poor		Middle		Rich		Richest	
	Mean (g)	%	Mean (g)	%	Mean (g)	%	Mean (g)	%	Mean (g)	%
<b>ENERGY-GIVING FOOD</b>										
Cereals and Cereal Products	1269	46.4	1254	44	1230	40.2	1172	37.1	1105	32.2
Starchy Roots and Tubers	48	1.8	28	1	30	1	39	1.2	48	1.4
Sugars and Syrups	34	1.2	33	1.1	32	1.1	31	1	30	0.9
Fats and Oils	42	1.5	50	1.7	55	1.8	55	1.7	68	2
<b>BODY-BUILDING FOOD</b>										
Fish, Meat, and Poultry	441	16.1	558	19.6	681	22.3	794	25.1	940	27.4
Eggs	59	2.1	81	2.9	89	2.9	90	2.8	95	2.8
Milk and Milk Products	91	3.3	139	4.9	196	6.4	248	7.8	308	9
Dried Beans, Nuts, and Seeds	26	0.9	32	1.1	38	1.2	39	1.2	41	1.2
<b>BODY-REGULATING FOOD</b>										
Vegetables	503	18.4	467	16.4	453	14.8	436	13.8	481	14
Fruits	112	4.1	89	3.1	119	3.9	128	4.1	178	5.2
<b>MISCELLANEOUS</b>										
Beverages	78	2.9	85	3	94	3.1	85	2.7	89	2.6
Condiments and Spices	28	1	30	1.1	33	1.1	37	1.2	38	1.1
Others	3	0.1	4	0.1	6	0.2	8	0.2	8	0.2
<b>TOTAL FOOD CONSUMED</b>	<b>2734</b>	<b>100</b>	<b>2850</b>	<b>100</b>	<b>3055</b>	<b>100</b>	<b>3161</b>	<b>100</b>	<b>3429</b>	<b>100</b>

Source: Facts and Figures, Expanded National Nutrition Survey 2018-2019 (DOST-FNRI 2022)

## How the food system shapes nutrition behaviors and practices in the Philippines

Consumption patterns that are influenced by the broader food system impact intra-household dynamics. These dynamics involve interactions and relationships within the household, affecting decisions on eating patterns, resource allocation, and the desirability of food. Factors like cultural norms, individual preferences, gender roles, power relations, and economic contributions shape these dynamics. It impacts the interaction and behavior towards food of household members, especially children and vulnerable individuals.

In the Philippines, the widespread consumption of ultra-processed foods is increasingly being normalized. This trend is driven by its affordability and availability, as well as the aggressive marketing tactics by the food industry. These ultra-processed products are often more accessible and heavily promoted through television and social media, particularly targeting children (Reyes 2022). Despite the presence of a national law prohibiting untoward marketing

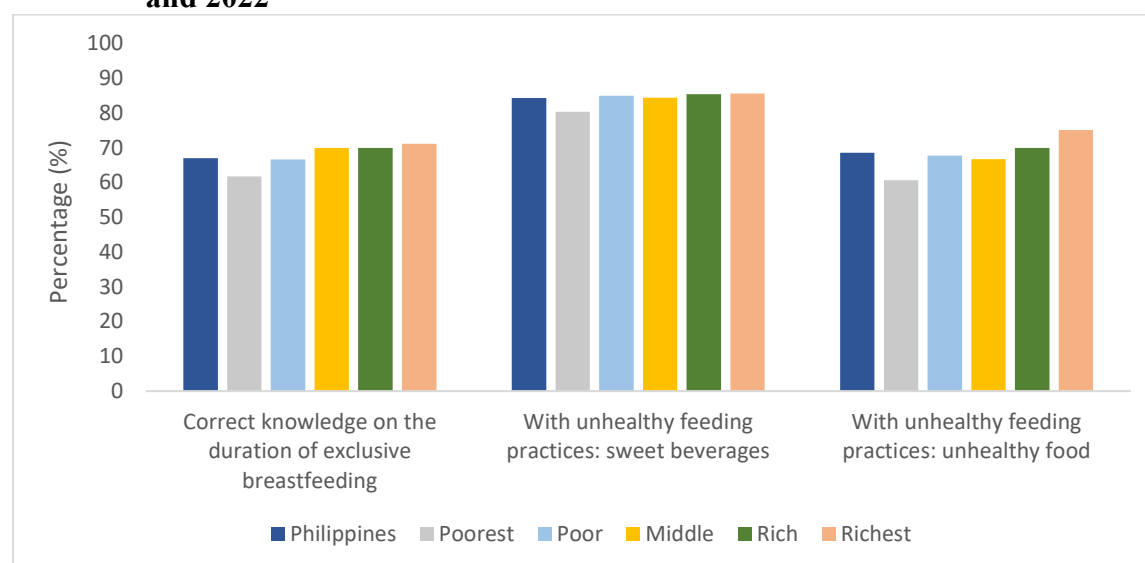
strategies, the influence of marketing begins early—targeting pregnant mothers, infants, and young children (Vilar-Compte et al. 2024). This can often lead to persistent brand associations and long-term dietary habits (Boyland and Whalen 2015; Tatlow-Golden and Boyland 2021). Tactics such as child-friendly packaging, sponsorships within schools, and celebrity endorsements bleed into learning institutions, community spaces, and daily household routines, shaping children’s taste preferences and eating behaviours (UNICEF 2021).

The vulnerability of households to misleading marketing is closely linked to systemic gaps in consumer education, nutrition services, and food policy. Mothers and caregivers, who are central to early childhood care, are often unsupported by formal systems in acquiring accurate nutrition knowledge. These gaps are further exacerbated by persistent industry messaging that distorts beliefs around infant and young child feeding, often delivered through community support groups and by health workers themselves (Baker et al. 2021; Vilar-Compte et al. 2024). As a result, unhealthy consumption patterns are reinforced not solely by personal choices but by an environment lacking adequate support, guidance, and regulation. National data show that more than three-fourths of mothers consume unhealthy foods and beverages, and there are substantial gaps in breastfeeding knowledge and practices (see Figure 17).

The vulnerability of households to misleading marketing is closely linked to systemic gaps in consumer education, nutrition services, and food policy. Mothers and caregivers, who are central to early childhood care, are often unsupported by formal systems in acquiring accurate nutrition knowledge. As a result, unhealthy consumption patterns are reinforced not solely by personal choices but by an environment lacking adequate support, guidance, and regulation. National data show that more than three-fourths

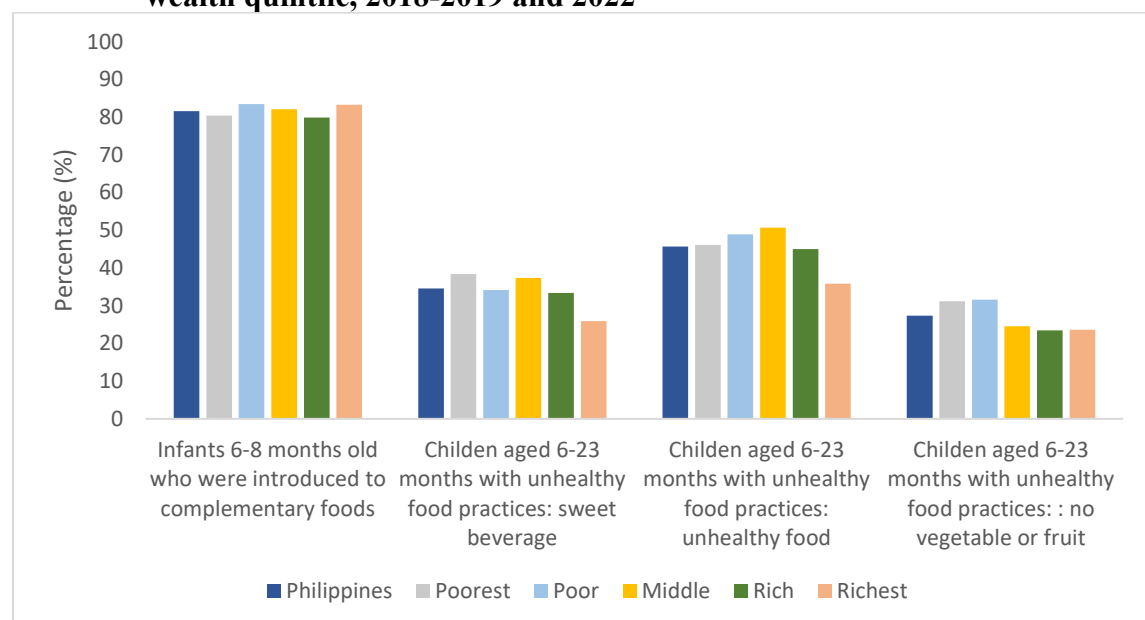
In 2019, 32.9 percent of mothers were unaware of the recommended duration for exclusive breastfeeding. Exclusive breastfeeding for the first 6 months is critical in ensuring a child’s health and survival (WHO 2023). After 6 months, appropriate complementary foods should be introduced to the child to ensure their growth and development (Dewey 2005; WHO and UNICEF 2009); however, this is not happening for 20 percent of the infants (see Figure 18). Nearly half of the children aged 6-23 months consume unhealthy foods, and around 1 in 3 children do not usually consume fruit and vegetables—a reflection of deeper systemic and food environment issues.

**Figure 17. Percentage of mothers with correct knowledge on exclusive breastfeeding duration and with unhealthy feeding practices, by wealth quintile, 2018-2019 and 2022**



Source: Authors' visualization of data from the 2018/2019 Expanded National Nutrition Survey (DOST-FNRI 2022) and 2022 National Demographic and Health Survey (PSA 2022)

**Figure 18. Percentage of infants (6-8 months old) who were introduced complementary foods and children (6-23 months old) with unhealthy feeding practices, by wealth quintile, 2018-2019 and 2022**



Source: Authors' visualization of data from the 2018/2019 Expanded National Nutrition Survey (DOST-FNRI 2022) and 2022 National Demographic and Health Survey (PSA 2022)

## Conclusions and recommendations

The assessment of children's food systems in the Philippines reveals persistent challenges in achieving optimal nutrition. While food availability has improved over time, significant disparities remain—many children still lack access to diverse, safe, sustainable and nutritious diets. Addressing the root causes of limited access and availability requires a multisectoral approach that brings together the health, agriculture, education, social welfare and protection, trade, and finance sectors. Building on the assessment findings, the following recommendations outline actionable steps to strengthen a more equitable and nutrition-responsive food system for children in the Philippines.

### 1. Food supply

- a. **Paradigm shift towards nutrition-sensitive agriculture (NSA).** NSA is a food-based approach to agricultural development, which places access to diversified and nutritious foods at the center of addressing all forms of malnutrition. Evidence suggests that multiple pathways exist through which NSA can affect nutrition practices, ultimately influencing nutrition outcomes. These pathways include food production, nutrition-related knowledge, agricultural income, women's empowerment, and strengthening of local institutions (Sharma et al. 2021).

To improve availability of nutritious food and nutrition outcomes, the Philippine government should increase its investments in diversified, climate-resilient, and smallholder-friendly agriculture. Public investments should be reoriented towards nutrient-rich crops, vegetables, legumes, and indigenous foods. Traditional farming systems, including mixed and relay intercropping, as well as crop-livestock integration, promote crop diversity and resilience (Food and Agriculture Organization of the United Nations 1997). The government should scale up programs that increase diversity in food production. Evidence suggests that promoting sustainable production practices, such as conservation agriculture, effective water management, and integrated pest management, can dramatically improve food production while conserving natural resources. Family farming, home and school gardens, and homestead food production projects can increase the availability of a wider variety of crops at the local level. While these programs have already been in place (e.g., Gulayan as Paaralan, Department of Agriculture (DA) community garden programs), the government must address the technical and adaptable challenges (i.e., through training, research, and innovations) that these programs face at the local level, which hinder their scalability and impact (DA Press Office 2021; Talukder et al. 2010).

The Philippine government must explore women's empowerment as a potential important pathway to contributing to improving nutrition and implementing nutrition-sensitive agriculture programs (Verhart 2015). Evidence suggests that women's empowerment enhances household decision-making, leading to increased investments in food and healthcare for children within households. Also, it enhances their nutritional status and enables them to utilize their time more effectively for economic productivity (Meeker and Haddad 2013). There are different approaches that the government can explore the following: (1) supporting women's leadership and decision-making by creating space for women to participate in food and agriculture planning bodies of LGUs; social and behavior change (SBC) targeting social norms that promote shared household responsibilities between men and women; (3) ensuring

equitable access to productive resources by working with LGUs to simplify land titling for women and enforce gender quotas in land distribution, extension services, and agricultural training programs of national and local government.

- b. Food fortification.** Food fortification has been a proven strategy in addressing micronutrient deficiencies, as evidenced by laws such as Republic Act No. 8172 (ASIN Law) and Republic Act No. 8976 (Food Fortification Law). These legislative measures have contributed significantly to reducing the burden of micronutrient deficiencies in the Philippines. Continued investment in research and the development of strategies to identify priority nutrients and appropriate food vehicles for fortification will be critical to sustaining progress and preventing emerging public health nutrition challenges.

## **2. Food environments**

- a. First foods:** Breastfeeding plays a critical role in reducing the risk of being overweight and obesity in children. However, the inappropriate marketing of breastmilk substitutes and commercial foods and beverages for children under 36 months can undermine optimal breastfeeding practices. Continued enforcement of the Philippine Milk Code (Executive Order No. 51) remains essential to protecting and promoting breastfeeding. In parallel, the implementation of the WHO *Guidance on Ending the Inappropriate Promotion of Foods for Infants and Young Children* is necessary to regulate the marketing of foods and beverages targeted at children under the age of 36 months.
- b. Food in schools.** Creating healthy food environments within schools and their surrounding areas is essential to ensuring children have access to nutritious options and are encouraged to make healthier food choices. To achieve this, school food policies should establish mandatory standards for meals, snacks, and beverages served or sold in day care centers and schools. These policies must also prohibit the marketing, distribution, or sale of products high in free sugars, refined starches, salt, or unhealthy fats; ban sponsorships from the food and beverage industry; and ensure the availability of free, safe, and potable drinking water.
- c. Food marketing (including advertising, promotion, and sponsorships).** Children are the most vulnerable to pervasive marketing strategies of the food and beverage industry. As such, it is imperative to develop policies and guidelines that ensure the strict implementation of marketing bans and restrictions across all platforms and settings. Furthermore, the development of guidelines for private sector engagement in schools and local governments may help school administrators and local chief executives exercise caution when partnering with the food and beverage industry, thereby further promoting and protecting public health interests.
- d. Nutrition labeling.** Complementing other interventions to promote healthy food environments, consumer protection tools such as mandatory nutrition labeling support children and their caregivers in making informed dietary choices. These include front-of-pack labeling for pre-packaged food products sold in supermarkets and sari-sari stores, as well as menu labeling in school cafeterias and other food outlets within the community. Front-of-pack labels provide clear information about foods and beverages

high in free sugars, salt, unhealthy fats, and other harmful ingredients, helping consumers make healthier purchasing decisions.

- e. **Price and fiscal measures.** Price and fiscal policies can be leveraged to promote healthier diets. These include subsidies for local food and agriculture to support the production and distribution of safe, sustainable, and nutritious food options such as fruits, vegetables, and drinking water. Targeted food subsidies—such as discounts, rebates, vouchers, or reduced value-added tax (VAT)—can improve affordability and encourage the purchase and consumption of healthy foods. Partnerships between schools or early childhood care and development (ECCD) centers and local farmers can further enhance access to fresh produce, increasing fruit and vegetable consumption among children. Government subsidies for such partnerships can help scale these initiatives, particularly benefiting low-income households.
- f. **Cash transfer.** Enhancing existing programs such as the Pantawid Pamilyang Pilipino Program (4Ps) by integrating nutrition-specific conditional cash transfers can help ensure that poor households have the means to purchase healthier food options. This can also be coupled with partnership with local producers or accredited food retailers to encourage the consumption of diverse and nutrient-rich food, directly supporting both nutrition improvement and local agricultural economies.
- g. **Food transfers.** Sustain the ability of the vulnerable population to afford a healthy diet by complementing cash assistance with food transfers, ensuring continued access to nutritious food when cash alone cannot keep pace with the rising prices. These food transfers should prioritize diverse, nutrient-rich options rather than relying on cheap, calorie-dense foods that may limit or even worsen the nutritional status of the target beneficiaries.
- h. **Product reformulation.** The evolution of food systems has contributed to the proliferation of convenience foods and ultra-processed, pre-packaged products that may pose health risks to children due to their high content of sodium, refined sugars, and saturated fats. To address this, mandatory regulations on the nutritional composition of processed foods and beverages should be enforced, including the elimination of industrially produced trans fats and the reduction of salt and other harmful ingredients. Food manufacturers must undertake product reformulation to lower the levels of nutrients of concern, thereby helping to prevent childhood obesity and reduce the rising prevalence of non-communicable diseases such as diabetes, hypertension, and heart disease. Reformulation efforts can be further supported through policy measures such as mandatory nutrition standards, front-of-package labeling regulations, and partnerships that foster innovation in the development of healthier food products.

### 3. Behavior and practices

- a. **Social and behavior change (SBC).** SBC is a core strategy for improving nutrition by promoting healthier behaviours at the individual, household, and community levels. Well-designed SBC interventions enhance health and nutrition literacy, support optimal infant and young child feeding, encourage consumption of diverse and nutritious diets, and foster physical activity.

To strengthen the impact of nutrition-sensitive agriculture, SBC should also promote the production, preparation, and consumption of nutrient-dense crops. Integrated, multi-channel approaches—including community sessions, home visits, service-based counselling, and mass media—are most effective in driving behaviour change.

The Philippine government should increase investments in SBC and ensure its integration across nutrition, health, and agriculture platforms to support sustainable improvements in dietary practices and food systems.

Promoting integrated strategies can improve the quality of diets and strengthen the resilience of the Philippine food system, helping to break the cycle of poverty and malnutrition and ultimately fostering a healthier future generation.



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