WOMEN NOURISHING CITIES:

Recipes for transforming the urban food systems of the Philippines

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ABOUT THE REPORT

This document is an abridged version of a report prepared by **Dante Dalabajan** for Oxfam Pilipinas as part of its **Food Hives to Nourishing Cities (FH2NC) Project**. **Prof. Buenaventura Dargantes**, PhD led the team of field researchers in gathering the qualitative data for the report. He also provided assistance on editing the report. The team of field researchers were composed of **Prof. Ana Asumpta Perez**, PhD, **Anna Manahan**, **Lino Moleta**, **Jake Pilare** and **Eula Diza Arpoceple**. **Sasha Dalabajan** assisted in proofreading the report, cross-checking the secondary sources, and documented the team meetings of the research team.

The full report was reviewed by **Earwin Belen**, **Blandina Bobson** and **Marc Cohen**. This abridged version was developed by **Miah Maye Pormon**. The Oxfam Pilipinas team - **Erika Ione Gay Geronimo**, **Leah Payud**, **Randee Cabaces**, **April Ann Bulanadi**, **Aprille Grace Nazaret** and **Eleiza Recaro** - supported the finalization of this report.

The Food Hives to Nourishing Cities Project is being implemented by **Oxfam Pilipinas**, together with partners **Institute for Social Entrepreneurship in Asia (ISEA)** and **AGREA Agricultural Communities International Foundation Inc**. The project aims to establish regenerative, just, and nourishing food systems.

The publication of this report aims to share research results, contribute to public debate, and invite feedback on development and humanitarian policy and practice. It does not necessarily reflect the policy positions of the organizations jointly publishing it. The views expressed are those of the authors and not necessarily those of the individual organizations.

Layout Artist: Roi Mojado

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The information in this publication is correct at the time of going to press.

ABOUT THE COVER

Marites Montajes shows some of the freshly harvested vegetables from their Garden of Hope in Payatas, a former dumpsite converted into a thriving urban garden by the Women Food Producers Association of Payatas with support from AGREA, Puso ng Ama Foundation, and Oxfam Pilipinas.

Photo by: Geraldine Hoggang/Oxfam Pilipinas

INTRODUCTION

Soaring food prices and the escalating incidence of hunger in Philippines cities have brought urban food systems (UFS) under increased relevance and renewed scrutiny. Along with the uncertain situation of the domestic economy, an emerging consensus within the academia and the private and public sectors affirm that food and nutrition security is as fraught as ever.

Due to economic factors such as supply shortages and rising input prices, as well as the lack of a coherent food policy, UFS has been under considerable strain. The decline in fish, agricultural and forestry resources affected the domestic food base. These were primarily due to overexploitation of natural resources and climate change1[1]. Despite these problems, the policy prescriptions at the table are more of the same approaches that have either failed to curb or even exacerbated the problem.

These problems were even aggravated when pandemic-induced lockdowns conjured all the fears and vulnerabilities of the urban food systems which overwhelmed the supply and demand of the food stuffs in a short period. Despite the effort of controlling the spread of the virus, it has set off a protracted crisis of joblessness, hunger, and malnutrition that lingers to this day. The government's food and cash aid and the spirit of volunteerism among ordinary citizens (i.e., community pantries) alleviated the food crisis that it engendered, but only marginally.

Before the COVID-19 pandemic, experts held an optimistic view that the Philippine economy would grow as one of the largest in the world. One estimate puts the growth trajectory at an uninterrupted rate of 7 percent annually from 2020–2030[2]. The country would have had all the means necessary, including the advances in science and technology, to ensure adequate supply and availability of nutritious food produced through sustainable means. A more sober and realistic scenario is that domestic food security, made vulnerable by geography, vagaries of the weather, and increasing dependence on foreign trade, will now have to contend with years of neglect and inaction, episodic shocks, and climate realities. The burgeoning urban population will rely increasingly on processed food bought in fast food shops, convenience stores, and supermarkets, mainly sourced from markets where they are cheap and heavily subsidized. The growth of supermarket chains has led to the concentration of market power in the hands of a few major retailers. It has tightened its grip over small producers through aggressive pricing strategies. These retailers impose stringent measures on the quality and quantity of the food produced and timeliness of delivery in exchange for market access[3]. Timeliness, however, does not apply both ways, as it invariably takes weeks or months before the retail company settles the payment with the producers, squeezing their cash flow. The reliance on processed food has had far-reaching consequences for our domestic food producers' social and economic conditions. It also had a pronounced effect on health and nutrition outcomes as the prevalence of overweight and obesity soared to historic heights.

[1] Brown O. & Sander C., 2007, Supermarket buying power: Global supply chains and Smallholder farmers, International Institute for Sustainable Development, https://www.iisd.org/system/files/publications/tkn_supermarket.pdf
[2] PricewaterhouseCoopers, 2017, The Long View How will the global economic order change by 2050?, https://www.pwc.com/gx/en/world-2050/assets/pwc-world-in-2050-summary-report-feb-2017.pdf
[3] Brown O. & Sander C., 2007, Supermarket buying power: Global supply chains and Smallholder farmers, International Institute for Sustainable Development, https://www.iisd.org/system/files/publications/tkn_supermarket.pdf

With the pandemic taking a strong grip on our healthcare, social protection system, and the economy, it is apparent that the food and nutrition security situation will linger, if not worsen, in the foreseeable future. Given this precarity, Oxfam Pilipinas initiated the Food Hives for Nourishing Cities Program (Urban Food Hives) to contribute to whole-of-society efforts to build the resiliency of the food systems in urban and peri-urban areas. The Urban Food Hives initiative envisages a future where cities are regenerative, nourishing, and equitable. Through this, Oxfam Pilipinas hopes to leverage its abilities to raise awareness, connect disparate interest groups, amplify voices, and empower communities to address intractable social, economic, and political issues around UFS that affect the poor and marginalized groups.

This report presents the key findings of the scoping report on urban food systems in the Philippines, the challenges, the opportunities, and a range of options for addressing them.

Research objectives

The research study aims to:

a.) describe the urban food systems in the Philippine context;
b.) present various nodes of the food systems in the urban Philippines and the food and nutrition outcomes that they engender;
c.) illustrate the physical, economic, political, and socio-cultural factors that shape food preferences and dietary patterns in urban and peri-urban cities;
d.) determine the bottlenecks in the production, storage, distribution, processing, packaging, retailing, and marketing of sustainable and nutritious food commodities;
e.) demonstrate good models of innovative and sustainable approaches to the production, processing, and distribution of healthy food commodities;
f.) identify the critical actors in and the creative and sustainable means of production, processing, and distribution of healthy food; and
g.) identify spaces for the convergence of policy dialogues among civil society organizations and the public and private sectors to address food system issues and scale out good practices.

The report highlights the interplay of factors that make for a more sustainable and resilient food production system, processing, distribution, and consumption. It focuses on the nuances and specificities of the constituent parts of the UFS in four geographical areas: Metro Manila, Metro Leyte, Metro Cebu, and Metro Davao.

Structure of the report

This report consists of four sections. The first section delves into the conceptual understanding of UFS as it relates to the Philippine context. The second section presents the logic model for understanding the range of issues that underpin urban food systems. Using food and nutrition security as an analytical framework, it provides an overview of the unique characteristics of urban areas as they pertain to food availability, access, utilization, stability, agency, and sustainability.

The third section builds on the problem analysis. It provides a more granular picture of the UFS presents the environmental, economic and health, and nutrition outcomes that the whole dynamics bring about. In the fourth and final section, the report argues that urban and peri-urban agriculture open up pathways

for addressing the issues affecting the urban food systems. We present a theory of change to address the range of issues presented and propose an urban and peri-urban agriculture program where social entrepreneurship, access to finance, policy advocacy, and behavioral change communication cut across.

The study design

The study used mixed research methods which consists of quantitative and qualitative data. In addition to this, the explanatory sequential design was also employed to follow up the quantitative results with qualitative data for clarification and substantive interpretation[1].

The quantitative data were secondary data retrieved from desk research. They were collected from OpenStat from the Philippine Statistical Authority (PSA), the National Nutrition Surveys of the Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI), Family Income and Expenditure Surveys (FIES), and the National Demographic and Health Surveys (NDHS) of the PSA. The study also reviewed relevant papers published by World Bank, the Asian Development Bank, and relevant United Nations (UN) bodies such as the World Health Organization (WHO), World Food Programme (WFP), Food and Agriculture Organization (FAO), and United Nations Children's Fund (UNICEF), among others, and complemented them with various relevant papers published in peer-reviewed journals. The qualitative data were acquired from focus group discussions (FGDs) and key informant interviews (KIIs). Key informant interviews are in-depth interviews with a selected (non-random) group of informants who are knowledgeable about a specific issue. The key informants were purposively chosen for their ability to shed light on the issues that emerged from the quantitative phase.

[1] Edmonds, W. A., & Kennedy, T. D. (2017). An applied guide to research designs: Quantitative, qualitative, and mixed methods. SAGE Publications, Inc. https://doi.org/10.4135/9781071802779

Gemma Bautista discusses updates on the Garden of Hope with Leah Payud, Oxfam Pilipinas' Resilience Portfolio Manager. Photo by: Geraldine Hoggang/Oxfam Pilipinas

THE URBAN FOOD SYSTEMS IN THE PHILIPPINES

Urbanization in the Philippines

The discussion of urban food systems should start with a definitional argument about what constitutes an urban city and how it is distinct from other domains. This distinction is vital in understanding the particular social, economic, cultural, political, and demographic processes within the specific geographic environment[1].

Urbanization is often described as the increasing share of the population living in urban areas and the consequent decline of the population in rural areas. A distinguishing feature of urban areas is that the source of their development comes from economies of agglomeration and specialization[2]. These factors create positive impacts in terms of productivity, economic growth, and poverty reduction, such as in the case of the Philippines[3]. However, the lack of comprehensive policies toward urban development could lead to negative externalities[4]. One consequence is urban sprawl[5]. Studies show that sprawling urban and suburban development patterns correlate with habitat fragmentation, water and air pollution, increased infrastructure costs, inequality, and social homogeneity[6]. An analysis of Metro Manila shows a highly complex mixture of urbanized and agricultural land spreading like a belt around the city's center, the circumference of which is growing over time[7]. Metro Cebu and Metro Davao exhibit the same pattern at varying speeds and temporal scales. These urban fringes absorbed the population growth from informal settlement colonies and low-cost housing units built in erstwhile paddy fields[8]. This sort of unplanned development poses challenges in providing services for managing solid waste, wastewater, air quality, transportation, traffic, and other necessities of urban life[9].

Subsequently, it is crucial to interrogate the rural and urban dichotomy[10] in development discourses because food issues and agricultural and rural areas are inextricably bound. However, there are interlinked factors that explain why the difference between rural and urban areas is changing. First, the rural economies have not received the attention they need to expand production, which, as the report will explain lengthily in later sections. Second, diverse food sources in urban areas are transmitted through multiple formal and informal channels that do not necessarily come from rural areas. The declining productivity partly drives this process in rural areas, but there is also a range of factors that make food commodities from rural areas more expensive than other options. These include poor infrastructure, transportation, the lack of mechanization, processing facilities, and many other factors.

Third, as land becomes more scarce in urban cities, large swathes of irrigated agricultural land have been converted for various urban and industrial uses, including export processing zones and industrial estates, institutions, leisure landscapes, and residential subdivisions[11].

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[1] Champion T., 2004, Introduction: Moving Beyond the Urban-Rural Dichotomy, in New Forms of Urbanization, Eds.: Champion T. & Hugo G., 1st Edition, 2004, Routledge, Pages 22, ISBN9781315248073

[2] UN Commission on Population and Development, Sustainable cities, human mobility and international migration, Report of the Secretary-General, 9–13 April 2018, https://undocs.org/E/CN.9/2018/2

[3] World Bank, 2017, Philippines Urbanization Review: Fostering Competitive, Sustainable and Inclusive Cities, https://www.worldbank.org/en/country/philippines/publication/fostering-competitive-sustainable-and-inclusive-cities-in-the-philippines

[4] World Bank 2017, *ibid.*

5 Geospatial patterns accompanying urban development "out of control", Katsoulakos, N. M., Misthos, L.-M. N., Doulos, I. G., & Kotsios, V. S. (2016). Environment and development. In Environment and Development (pp. 499–569). Elsevier. https://doi.org/10.1016/B978-0-444-62733-9.00008-3

[6] Brody, S. D., Carrasco, V., & Highfield, W. E. (2006). Measuring the adoption of local sprawl: Reduction planning policies in florida. Journal of Planning Education and Research, 25(3), 294–310. https://doi.org/10.1177/0739456X05280546

[7] Okta-Pribadi D. & Pauleit S., The dynamics of peri-urban agriculture during rapid urbanization of Jabodetabek Metropolitan Area, Land Use Policy, Volume 48, 2015, Pages 13-24, ISSN 0264-8377, https://doi.org/10.1016/j.landusepol.2015.05.009.

[8] Murakami A. & Palijon A., 2005, Urban Sprawl and Land Use Characteristics in the Urban Fringe of Metro Manila, Philippines, Journal of Asian Architecture and Building Engineering, 2005, Volume 4, Issue 1, Pages 177-183, https://doi.org/10.3130/jaabe.4.177,

[9] HUDCC, 2016, Better, Greener, Smarter Cities in an Inclusive Philippines, Report Presented to UN-Habitat, https://hudcc.gov.ph/HABITAT_III

[10] Dichotomy is a difference between two completely opposite ideas or things (Cambridge University Press and Management, https://dictionary.cambridge.org/us/dictionary/english/dichotomy)

[11] Kelly P., 1998, The Politics of Urban-Rural Relations: Land Use Conversion in the Philippines. Environment and Urbanization. 10 (1). pp. 35–54.

The Philippine urban food systems

Food systems are the aggregate of food-related activities and the political, socio-economic, and natural environments within which these activities occur[1]. In the Philippine urban context, various food systems co-exist. These systems include the traditional, smallholder-driven, environment-dependent, freshly produced foodstuff and the modern industrialized food system that relies heavily on high-intensity production methods and technologies.

The existence of these multiple food subsystems is imperative for food security. However, the growing dependence on the modern food system profoundly affects the poor. First, the reliance of the conventional retail sector on highly processed food commodities has led to a growing dependency on countries where production and processing are more efficient and cheaper. Second, the price signal from processed foods in urban markets creates a steep barrier to the entry of food commodities from rural areas, which forces the rural sectors to the edge of survival.

Food systems in urban areas of the country are facing considerable challenges due to numerous factors. Agriculture and food production in rural areas that end up in urban markets are confronted with manifold factors that increase costs and decrease returns. Moreover, the dominance of highly processed food, mainly sourced from abroad, has further debilitated rural areas. With the ubiquity of cheap, imported, but nutritionally deficient food in urban areas, the dominant food system has endangered a twin paradox where the rate of obesity in urban areas is soaring in parallel with the rates of stunting and wasting in rural areas. This twin paradox is implicated in the rising number of food swamps—the omnipresence of cheap and nutritionally deficient food in almost every city corner, and food deserts—the severe lack of affordable, healthy food in poor urban communities. Peri-urban cities follow the same trend where urban sprawl has been steadily encroaching.

Food systems exist to bring about positive food and nutrition security outcomes for societies. However, urban communities tend to exacerbate the problems, hindering efforts to achieve those outcomes due to large socio-economic differences that affected limited or difficult access to supermarkets and healthful food choices[2]. Therefore, understanding food and nutrition security is a crucial entry and exit point to describe the functioning of the food system.

[1] Pinstrup-Andersen P. & Watson D., 2011, Food Policy for Developing Countries Food Policy for Developing Countries: The Role of Government in Global, National, and Local Food Systems, Cornell University Press, Ithaca and London
[2] Walker RE, Keane CR, Burke JG. Disparities and access to healthy food in the United States: a review of food deserts literature. Health Place. 2010;16(5):876–84.

Food and nutrition in urban setting

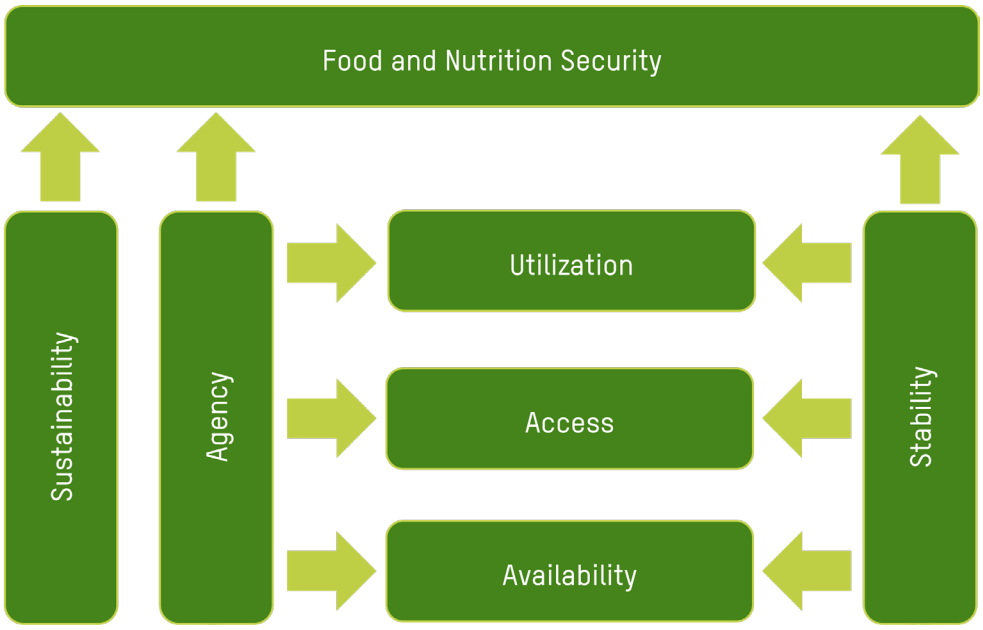

Figure 1. Conceptual framework on Food and Nutrition Security: modified from Weingärtner[1] & HLPE[2]

Food and nutrition security (FNS) means '*all people, at all times, (having) physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life*'[3].

This definition has four explicit dimensions: availability, access, utilization, and stability. *Availability* refers to the physical existence of food at all levels. It presupposes that domestic food production, commercial food imports and exports, food aid, and domestic food stocks are at a level that is sufficient to provide quality food in the right quantity to feed the population even during a crisis. *Access* refers to having enough resources for individuals and households to obtain food in sufficient quantity, quality, and diversity for a nutritious diet. It primarily depends on household income and food and the physical, social, and policy environments that determine food access. *Utilization* refers to the social dimension of a household's food and nutrition security, primarily determined by nutrition awareness and social norms around food consumption. Stability refers to the temporal dimension of food and nutrition security, which impinges on food availability, access, and utilization. *Stability* is achieved when food intake is adequate today and the conditions that such will be the case in the foreseeable future.

Along with the four other dimensions, the conceptual definition of food and nutrition security has also evolved to recognize the centrality of agency and sustainability[4]. *Agency* refers to the capacity of individuals or groups to exercise their choices about what foods they produce, consume, process, and distribute across the food chain and their ability to engage in strategies that shape food system policies and governance[5]. Agency on food and agriculture finds its expression in social movements pushing for rural development,

[1] Weingärtner L., Food and Nutrition Security: Assessment Instruments and Intervention Strategies, Deutsche Gesellschaft für Technische Zusammenarbeit Background Paper No. I, accessed from http://www.oda-alc.org/documentos/1341934899.pdf
[2] HLPE, 2020, Food security and nutrition: building a global narrative towards 2030, A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome, http://www.fao.org/3/ca9731en/ca9731en.pdf
[3] FAO, 1996, Rome declaration on world food security and world food summit plan of action. In: Tech. rep. FAO, Rome, Italy
[4] HLPE, *ibid*.
[5] HLPE, *ibid*.

consumer protection, and many other issues where various civil society actors congregate around. During COVID-19, the notion of the *emergent agency* came to prominence, which is the initiative of individuals, communities, civil society organizations (CSOs), and grassroots organizations to respond to the crisis with innovative strategies, initiatives, and direct actions when social protection and relief programs of the government and the humanitarian community are falling short[1]. While, *Sustainability* refers to the long-term ability of food systems to provide food security and nutrition in ways that sustain the economic, social, and environmental bases that underpin the food system[2].

Having this framework, a resilient and sustainable food and nutrition system embodies the qualities that support the six interrelated dimensions of food security. Food and nutrition systems are sustainable when they are: *productive and prosperous* in ways that ensure the availability of sufficient food; *equitable and inclusive* in ways that provide access for all people to food and livelihoods; *empowering and respectful* to ensure agency for all people and groups, especially those who are lacking in social options and have no voice to exercise their choice; *resilient* in ways that enable it to respond to the volatilities and fragilities of the food system; *regenerative* in ways that ensure the sustainability of the food system in all its dimensions; and h*ealthy and nutritious* at a level that ensures nutrient uptake and utilization[3]. However, complex changes expose the food systems from sudden shocks to long-term stressors—factors impeding resilient and sustainable food and nutrition systems[4].

Critics of the prevailing discourse about food and nutrition security argue that food security says nothing about the terms and conditions by which food is produced, and it is, to them, vital to know what food is produced, who grows food, where and how that food is produced, the scale of food production, as well as the environmental and health impacts of food production[5]. Food and nutrition security suggests a scenario where people have to demand subsistence and survival. It is a recognition that something is radically wrong with the way food is produced, how it ends up on dining tables, and who benefits from and is hurt by it[6]. The notions of food and nutrition security and the right to food are therefore considered desirable goals but severely limiting. Small food producers should not just have minimum income from food production; they should have the means necessary to thrive—to deal with the market's uncertainties and volatilities. Consumers should not just have something to eat; they should have a range of options to fulfill their dietary needs and preferences. Food and nutrition security is the bare minimum beyond which public policies should transcend[7]. For many urban communities, ensuring availability and access to food should also include livelihood security, opportunities to earn a living wage, and access to social protection.

[4] Nampoothiri N. & Artuso F., 2021, Civil Society's Response to Coronavirus Disease 2019: Patterns from Two Hundred Case Studies of Emergent Agency, Journal of Creative Communications, https://doi.org/10.1177/09732586211015057
[2] HLPE, *ibid.*
[3] HLPE, *ibid.*
[4] Wisner et al., *ibid.*
[5] Patel, R., 2009, 'What does food sovereignty look like?', Journal of Peasant Studies 36 (3): 663 -706.
[6] Personal communication, JC Tejano (Urban Green Communes), July 24, 2021
[7] Personal communication, Mary Ann Manahan (Department of Public in Development Studies, Ghent University), July 21, 2021

Zenaida Gesta harvests vegetables from their Garden of Hope in Payatas, Quezon City.
Photo by: Geraldine Hoggang/Oxfam Pilipinas

VULNERABILITIES OF FOOD SYSTEMS IN URBAN CITIES

Cities are inherently fragile because of their sheer size, population density, and economic significance. When disasters hit cities, the result could be catastrophic. This section discusses some of the risks influencing urban food systems in the Philippines and urban residents' food and nutrition security situations based on the data collected by the researchers.

COVID-19 pandemic

Urban cities are highly vulnerable to infectious diseases because of population density and the high rate of mobility of their residents. The national government, as well as local government units, have tried to slow down the spread of the virus and avoid overwhelming the capacity of health services[1]. These containment measures oscillated from moderately restrictive (general community quarantine) to more highly restrictive (enhanced community quarantine) to a severely harsh restrictive measure (modified enhanced community quarantine).

The COVID-19 pandemic has affected all food sectors due to the imposition of travel restrictions by local governments[2]. Food producers were affected as food products were trapped in quarantine checkpoints. Meanwhile, micro, small, and medium enterprises (MSMEs) food producers suffered from longer lead time among distributors, reduced labor capacity, increased checkpoint inspections, heightened quarantine measures, and rising operating costs[3]. Community quarantine measures also led to the closure of formal and informal food vending establishments and services which contributed to the massive loss of livelihood during the pandemic.

On the consumer side, fear of supply shortage of food led to panic buying of canned goods and other food essentials. The shock to the food system disproportionately affected women, who were employed in informal food industries and who were also in charge of care work such as buying food for the household. While COVID-19 impacted society across the board, its impacts on acutely food-insecure people in need of urgent humanitarian assistance are more urgent[4]. The absence of savings coupled with the loss of income had an acute effect on food access among the poorest segments of the urban population.

During the lockdown, innovative humanitarian interventions sought to address the emergency, food insecurity, and vulnerable livelihoods. One of these is a micro-finance institution called Kabuhayan sa Ganap na Kasarinlan Credit & Savings Cooperative or KCOOP, which worked with civic-minded organizations and individuals to grant PHP30,000 to each of the 10 *karinderyas*[5] owners who will serve food to at least 20 families daily for a month. At one point, KCOOP supported 29 karinderyas serving up to 5,800 families[6].

The pandemic also caused a surge of interest in community and home gardening in urban and peri-urban cities in the country[7]. There is now emerging evidence that households engaged in small-scale food production have adapted to the pandemic better than other communities[8].

[1] Ooi Y. & Dambul R., 2020, Food Security Challenges During and post Movement Restrictions of COVID-19 in Southeast Asia, The Journal of Public Health, Vol. 50 No. 2, May-August 2020, https://he02.tci-thaijo.org/index.php/jph/article/view/242553
[2] FAO-WFP, 2020, Early Warning Analysis of Acute Food Insecurity Hotspots, https://www.wfp.org/publications/fao-wfp-early-warning-analysis-acute-food-insecurity-hotspots
[3] https://www.ifpri.org/interactive/covid
[4] Food Security Information Network, 2020, Global Report on Food Crises, accessed from https://www.fsinplatform.org/sites/default/files/resources/files/GRFC_2020_ONLINE_200420_FINAL.pdf
[5] A *karinderya* is a small restaurant usually located by the roadside.
[6] Personal communication, Dexter Flores (Kasagana-ka Credit and Savings Cooperative or KCOOP), July 16, 2021
[7] Household and Community Gardens Surge in the Philippines and Senegal during COVID-19: How Do Contrasting Models Speak to Different Visions for Future Food Systems? Halie Kampman; Shun-Nan Chiang; Salam Sawadogo, Gastronomica (2021) 21 (2): 47–51, https://doi.org/10.1525/gfc.2021.21.2.47
[8] Eileen Bogweh Nchanji, Cosmas Kweyu Lutomia, COVID-19 Challenges to Sustainable Food Production and Consumption: Future Lessons for Food Systems in Eastern and Southern Africa from a gender lens, Sustainable Production and Consumption, 2021, ISSN 2352-5509, https://doi.org/10.1016/j.spc.2021.05.016.

Climate change

The Intergovernmental Panel on Climate Change (IPCC) concluded that climate change affects food security due to rising temperatures, changing precipitation patterns, and greater frequency of extreme events[1]. The IPCC has also noted that climate change will wipe out a significant proportion of species, with consequent "….risks to health, livelihoods, food security, water supply, human security, and economic growth will affect 'the disadvantaged and vulnerable populations, some indigenous peoples, and local communities dependent on agricultural or coastal livelihoods.'"[2]

As climate change impacts worsen over the next few years, experts predict that people will move from less productive lands to areas where there are remaining opportunities for cultivation. Meanwhile, sea level rise and coastal migration will affect aquaculture, leading to dwindling productivity and fish quality[3]. The confluence of migration and resource decline can also lead to conflict, especially in the Philippines where already inequitable access to land has been a driver of insurgency and rebellion.[4]

Climate change impacts urban areas at different levels. Its effect on food availability and access for rural and urban communities is glaringly apparent. Cities are at very high risk from health hazards where levels of heat hazard and exposure are high. A survey of 139 Philippine cities shows that although the National Capital Region (NCR) is highly exposed to such threats, the most vulnerable cities are those where sensitivity is more elevated and capacity to cope and adapt is lower.[5]

Weather extremes - typhoons and droughts

Due to its location, the Philippines is prone to droughts and tropical cyclones. Roughly 20 tropical cyclones enter the Philippine Area of Responsibility (PAR) every year, with about 8 or 9 making landfall[6]. About five typhoons pack torrential rains and strong winds that cause storm surges, landslides, and flash floods, making them devastating to lives and livelihoods[7]. While most typhoons have limited, localized negative impact on the economy, in extreme cases the damage to the local economy could go as high as 23 percent[8].

The damage of typhoons to food and agriculture is far-reaching. When a typhoon coincides with the harvest season, its impact on farmers could be massive. It could threaten local food security as it has a cascading effect on food availability during the emergency period and a knock-on effect on the subsequent planting season. Typhoons are equally damaging to coastal resources and the fishing communities that depend on them. Typhoons are a complicating factor in COVID-19 recovery[9]. The latter part of 2020 saw a procession of

[1] IPCC, 2019: Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)], https://www.ipcc.ch/srccl/chapter/summary-for-policymakers/

[2] IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb M.I., Gomis, M. Huang K. Leitzell, Lonnoy E., Matthews J.B.R., Maycock T.K., Waterfield T., Yelekçi O., Yu R., & Zhou (eds.)]. Cambridge University Press. In Press., https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

[3] FAO, 2008, Climate Change and Food Security in Pacific Island Countries. FAO, Rome, Italy, http://www.fao.org/climate change/media/17003/0/0/

[4] Homer-Dixon T., 1994, Environmental Scarcities and Violent Conflict: Evidence from Cases. Toronto: University of Toronto., http://www.library.utoronto.ca/pcs/evidence/evid1.htm

[5] Estoque R.C., Ooba M., Seposo, X.T., Togawa T., Hijioka Y., Takahashi K. & Nakamura S., 2020, Heat health risk assessment in Philippine cities using remotely sensed data and social-ecological indicators. Nat Commun 11, 1581, https://doi.org/10.1038/s41467-020-15218-8

[6] PAGASA, Tropical cyclone information, http://bagong.pagasa.dost.gov.ph/climate/tropical-cyclone-information

[7] https://www.rappler.com/newsbreak/typhoons-enter-philippines-fast-facts

[8] Strobl, *ibid*.

five typhoons occurring rapidly, which hit the country's major centers of trade and commerce. The typhoons resulted in an estimated PHP90 billion ($1.8 billion) loss, which caused a 0.15 percentage point reduction in the country's GDP[1].

Drought is another natural hazard that could have an enduring effect on society and the environment[2]. In the Philippines, as in many parts of Asia, droughts are caused by El Niño, a natural phenomenon characterized by the warming of the surface water of the Pacific Ocean and the weakening of the equatorial trade winds. The alternating pattern of warm El Niño and cold La Niña conditions is called the El Niño–Southern Oscillation (ENSO), the most pronounced global climate system year-to-year variability. ENSOs trigger a chain of events affecting atmospheric and oceanic circulation, the marine and terrestrial environment, and human societies globally. [3]

Women and the food systems

The Philippines is often seen as a beacon in Asia when it comes to gender parity. It has largely been successful in its efforts to enshrine the numerous inter-governmental agreements that promote women's rights and gender equality into law. The country has also narrowed the gender gaps in economic participation and opportunity (80 percent), educational attainment (96 percent), and health and survival (98 percent)[4]. However, there remain considerable differences in the types of training and tertiary education that women and men receive, which may likely result in inferior employment and decent work opportunities, human capital differences, unpaid domestic labor, and care constraints[5]. All these can hinder women's economic advancement and widen inequality in job opportunities, economic opportunities, and political participation.

[1] Heydarian R.J., Philippines to be Asia's worst economic performer, Nov. 19, 2020, https://asiatimes.com/2020/11/economic-storms-battering-the-philippines/
[2] Salvacion A.R., 2021, Mapping meteorological drought hazard in the Philippines using SPI and SPIE. Spat. Inf. Res., https://doi.org/10.1007/s41324-021-00402-9
[3] Timmermann A., An SI.., Kug, J.S., Jin F.F., Cai W., Capotondi A., Cobb K, Lengaigne M., McPhaden M., Stuecker M., Stein K., Wittenberg A., Yun K.S., Bayr T., Chen H.C., Chikamoto Y., Dewitte B., Dommenget D., Grothe P., Guilyardi E., Ham Y.G., Hayashi M., Ineson S., Kang D., Kim S., Kim W.M., Lee J.Y., Li T., Luo J.J., McGregor S., Planton Y., Power S., Rashid H., Ren H.L., Santoso A., Takahashi K., Todd A., Wang G., Wang G., Xie R., Yang W.H., Yeh S.W., Yoon J., Zeller E. & Zhang X., 2018, El Niño–Southern Oscillation complexity, Nature 559, 535–545, https://doi.org/10.1038/s41586-018-0252-6
[4] World Economic Forum, 2019, Global Gender Gap Report 2020, https://www.weforum.org/reports/gender-gap-2020-report-100-years-pay-equality
[5] ADB, 2013, Gender Equality in the Labor Market in the Philippines, https://www.adb.org/sites/default/files/publication/31194/gender-equality-labor-market-philippines.pdf

Joan Oribia picks up weeds from the vegetable patch in their Garden of Hope in Payatas, Quezon City.
Photo by: Geraldine Hoggang/Oxfam Pilipinas

CHALLENGES TO THE URBAN FOOD SYSTEMS

To acquire a holistic understanding of the determinants of the urban food system, This report used the ecology of food and nutrition (EFN) model to reveal the different issues within the different constituent parts of the food system. This consists of the drivers, the processes, and the outcomes. The model allows us to understand nutritional outcomes as a function of the dynamics of all components of the food chain, including production, harvesting, preservation, storage, transport, processing, packaging, trade, distribution, preparation, composition, and consumption of food, as well as losses and wastages that occur in the whole process. It views food and nutrition issues as part of a broader development context within which these issues persist.

The model also sees food and food systems not just from the perspective of utilization to satisfy human nutritional needs and health, but from a broader canvass of environmental change, business and commerce, governance, and shifting social norms around food. It, therefore, covers not just the relationship between food and nutrition but also food taboos and preferences, ecology and the political economy of food, changes in food habits, food technology and marketing, food and identity, and food sustainability.

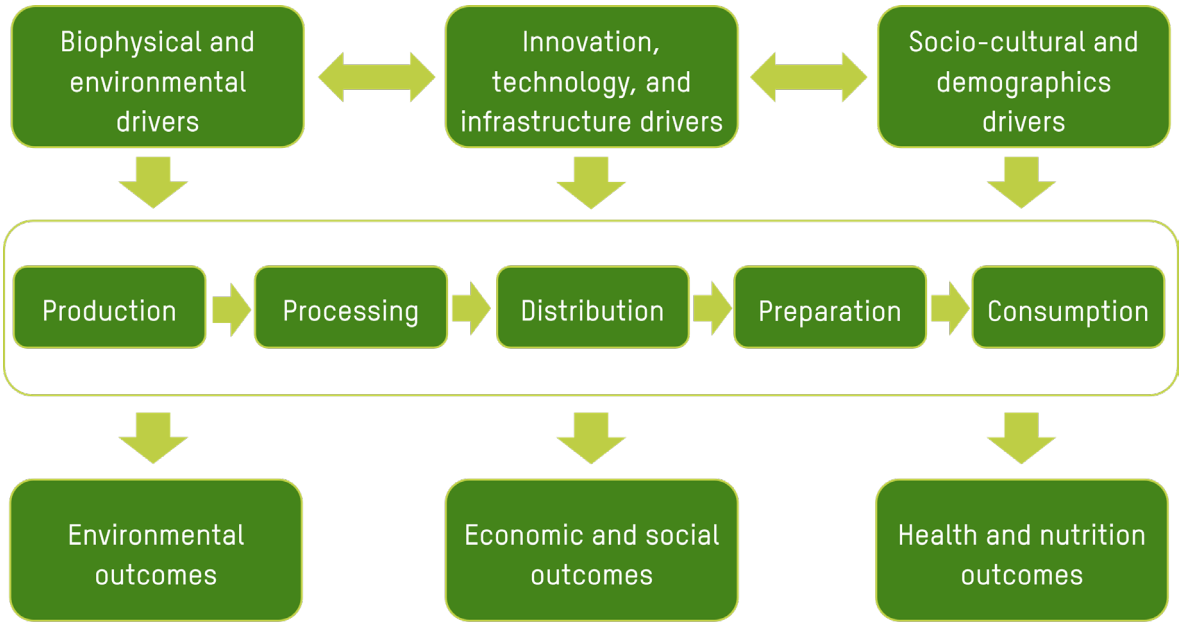

Figure 2. Urban food systems: An Analytical Framework
(as modified from Sobal et al. (1998[1]) and HLPE (2020[2]))

EFN is largely influenced by the food environment, which refers to the physical, economic, political, and sociocultural context in which consumers engage with the food system to acquire, prepare and consume food[3]. The food environment encompasses physical sources of food, the social determinants of food choices, and the political system that underlies the interaction between the various elements of the food system.

[1] Sobal J, Kettel-Khan L & Bisogni C, A conceptual model of the food and nutrition system, Social Science & Medicine, Volume 47, Issue 7, 1998, Pages 853-863, ISSN 0277-9536
[2] HLPE, *ibid*.
[3] HLPE, *ibid*.

Demographic and socio-cultural factors

The population structure of urban cities

Metro Manila has a land area of 690 square meters, Metro Cebu has 1,266 square meters, Metro Leyte has 1,383 square meters, and Metro Davao has the biggest at almost 4,000 square meters. The population density of metropolitan areas also varies wildly within these areas (Figure 3).

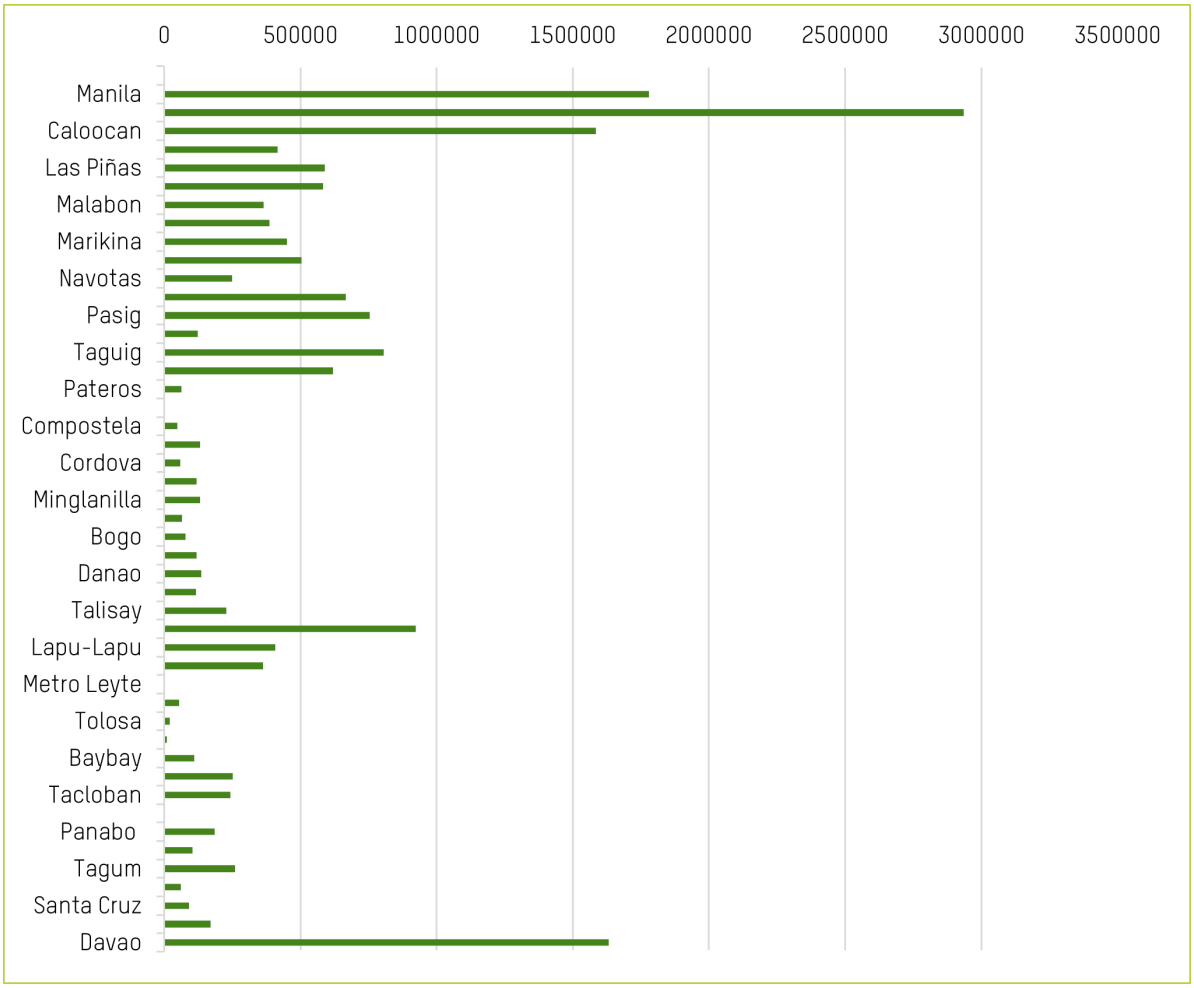

Figure 3. Urban population of selected metropolitan areas (PSA, 2015[1])

Poverty and urban slums

Before the COVID-19 pandemic, there had been some progress in curbing poverty. Poverty incidence among the population, or the proportion of poor Filipinos, fell from 23.3 percent (23.5 million) in 2015 to 16.7 percent (17.7 million) in 2018[2]. However, subsistence incidence among Filipinos was estimated to be 5.2 percent in 2018, exactly as it was in 2015. Poverty incidence varies across geographic areas, with the national averages in urban areas estimated to be 13.2 percent in 2015 and 9.3 percent in 2018.

[1] PSA Urban Population Data (2015).
[2] Estimating poverty incidence has always been controversial. Although the decline in the incidence of poverty from 2015 to 2018 is nothing short of astonishing, it could be that the family threshold has declined. The poverty threshold in 2015 was PHP9,452, on average, for a family of five per month, while it was only PHP7,528 in 2018. For 2015 poverty incidence data, please visit https://psa.gov.ph/poverty-press-releases/nid/144733. For 2018 poverty incidence data, please visit https://psa.gov.ph/content/updated-2015-and-2018-full-year-official-poverty-statistics. For more details on how the poverty incidence is computed, please refer to the section on the technical definition.

The proliferation of slums in urban cities is crucial to understanding food insecurity in the poorest segments of the population. The concentration of low-paying and no jobs is much higher in slums than anywhere else. We plotted the historical data of the people living in slums in the Philippines from 1990 to 2018 based on World Bank[1] data. The data show that although the proportion of the population living in slums has gone down from 54 percent in 1990 to 42 percent in 2018, the actual number of people living in slums has risen in real terms from 38 million to 45 million since the total population grew from 70 million to 107 million over the same period. In Metro Manila alone, which has about 12 million people, over a quarter of the total population in 2010 lived in slums. The slum population growth rate was already at 8 percent annually.[2]

Urban jobs and income sources

To understand the availability of jobs and income for urban communities, we plotted the total employment rate from 1995 to 2018. In the figure shown below, the unemployment rate has consistently fallen from 2004 at varying rates for both men and women. By 2004, over 1 in 10 were unemployed, which has been halved by 2018. Historically, the unemployment rate for women has been higher, but as the figure will show, the drop in the unemployment rate has been faster for women. It is also reported that more women work in the service sector than men, and women's share of employment in this sector has been growing faster than that of men. Men have a more dominant presence in the industry sector, but its growth across the years has been more modest.

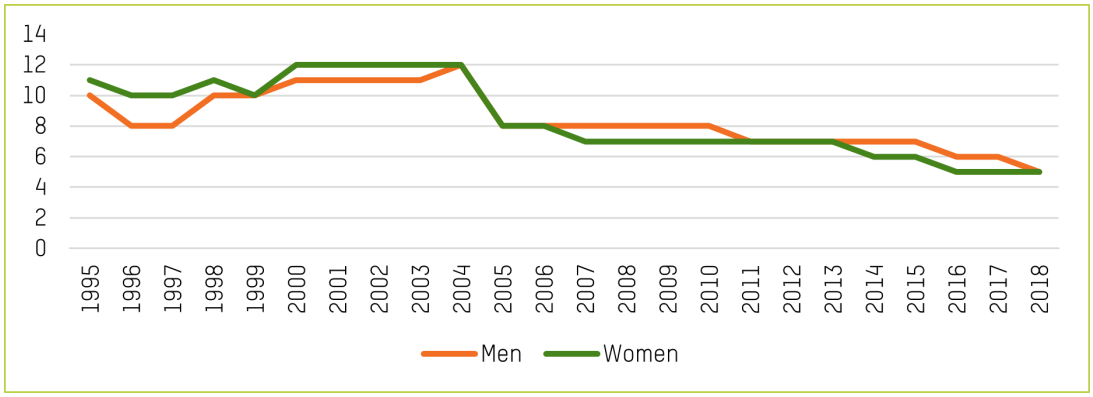

Figure 4. Unemployment rate for men and women (1995-2018) (Source: PSA, 2016[3])

Another employment data point that could determine the stability of food access is employment security. Roughly a third (32.5 percent) of the total employed persons in the Philippines are categorized as part-time employees (those who work less than 40 hours per week). Meanwhile, belong to the latter category. Meanwhile, 27% are classified as self-employed without any paid employee, which is historically filled up by women.

[1] World Bank, Population living in slums (% of urban population) – Philippines, https://data.worldbank.org/indicator/EN.POP.SLUM.UR.ZS?locations=PH
[2] Ballesteros M., 2010, Linking Poverty and the Environment: Evidence from Slums in Philippine Cities, PIDS Discussion Paper Series, No. 2010-33, Philippine Institute for Development Studies (PIDS), Makati City
[3] PSA, 2016 Annual Labor and Employment Status, Reference Number: 2016-172, Release Date: December 20, 2016, https://psa.gov.ph/content/2016-annual-labor-and-employment-status

Aside from this, underemployment is also another important factor in food accessibility. In the PSA's definition, underemployed persons are those who express the desire to have additional work hours in their present job, have other jobs, or have a new job with longer working hours. In 2016, they represented 18.3 percent (7.5 million) of the employed persons. Meanwhile, it should be noted that unpaid care and domestic work which were done by women primarily were not categorized in economic databases. It is considered a missing link in the analysis of gender employment such as wages, job quality, and labor force participation.[1]

The COVID-19 pandemic only complicated what was already a precarious employment status in the cities. By December 2020, an estimated 4.5 million Filipinos had lost their jobs, with the unemployment rate reaching 10.4 percent—the highest in 15 years[2]. By January 2021, recovery remained sluggish, with the unemployment rate declining from 8.8 percent in February to 7.1 percent in March, and rising again to 8.7 in April. By June, the unemployment rate was the same as it was in May at 7.7 percent. An estimated 3.76 million people remained unemployed in June 2021, compared to 3.73 million in May 2021. The underemployment rate in June 2021 remained high at 14.2 percent, which means almost a million persons, from 5.5 million. Moreover, both the unemployment and underemployment rates were higher for men than for women.

Slums and the phenomenon of food apartheid

The situation has been dire for people living in slums. These communities live in informal settlements and crowded conditions with homes built with waste materials[3]. Some eke out a living in poor sections of the cities such as wet markets, where they collect vegetable trimmings and meat entrails, which they process and repackage as food. Others hawk cooked food from meat offcuts, which they buy from market vendors, hotels, and restaurants. But perhaps, what typifies the desperation in many slums is the widespread practice of pagpag or leftovers from restaurants that were re-cooked for family meals. What is food waste to others is edible food to them. This situation was exacerbated by the COVID-19 pandemic which hampered the ability of slum households to work or to scavenge for food resources. Humanitarian aid and cash assistance, as well as community kitchens, were able to reach these sectors but the scale of these initiatives is local at best[4].

Food in the gentrified communities

On the other side of slums are the high- and middle-class living in high-rise condominiums and gated communities who breathe life into the local economy through their purchasing power. A plethora of food options mediated by social media apps enabled middle-class and high-income households in urban areas to order food and maintain food security even during the height of the lockdowns. The food choices of these middle and higher-income groups are shaped by food consumption practices that result in increases in meat consumption, food packaging, and household food waste, all of which have far-reaching effects on the environment[5]. Moreover, there are shifting norms in these communities. Organic and healthy food is slowly being taken up as a main food source while there is an increasing awareness and practice of waste segregation, recycling, and avoidance of plastics. Middle and upper-income groups have also sustained civil society actions that have addressed food security concerns in the cities. These groups have supported community pantries and community kitchens that provide food to lower-income groups by purchasing food

[1] Unpaid Care Work: The missing link in the analysis of gender gaps in labour outcomes. (2014) https://www.oecd.org/dev/development-gender/Unpaid_care_work.pdf
[2] Philippines suffers worst job losses in 15 years due to Covid-19 and lockdown, The Straits Times, December 4, 2020, https://www.straitstimes.com/asia/se-asia/philippines-suffers-worst-job-losses-in-15-years-due-to-covid-19-and-lockdown
[3] Personal communication, Vince Eugenio (Joly Homes Foundation), July 13, 2021
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[5] Sahakian M., Saloma C. & Ganguly S., 2018, Exploring the Role of Taste in Middle-Class Household Practices, Implications for Sustainable Food Consumption in Metro Manila and Bangalore, In: Asian Journal of Social Science, 14 Jun 2018, Volume 46: Issue 3, Pages: 304–329, DOI: https://doi.org/10.1163/15685314-04603005

items that stock in these pantries and kitchens. They also promote urban gardening as evidenced by an increasing number of urban residents that took up urban farming to grow their food or share their produce with neighbors.

Food as a cultural zeitgeist

The dialectics of food and nutrition transition have always revolved around what people eat (environment), who produces what they eat (social justice), and how much people eat (dietetics). It is necessary to talk about food beyond fat and caloric intake, carbon footprint, and sustainable production, which are all important in evaluating food and nutritional status at a macro level. Culture plays a significant role in how and why societies obtain, process, prepare, and eat food. In the Philippines, many ethnolinguistic groups are distinct in their culture around food, and certain kinds of foods from these groups have become a familiar fixture at ordinary Filipinos' dining tables. Urban cities in the Philippines are, in lots of ways, the crossroads of food cultures. They are distinct for their characteristic cosmopolitanism, or the embracing of cultures that are not indigenous. Cities are home to restaurants and food establishments that reflect not just the regional varieties of cuisine in the Philippines but also foreign culinary traditions – from elite enclaves to run-down streets in the city.

Biophysical and environmental factors

A resilient food system relies on a well-functioning ecological system. In this section, we investigate the natural resource conditions upon which production is based. These natural resources include forests, soil, water, and coastal and marine resources. They are complementary and interdependent systems in that human activities have cascading effects on these resources. However, these biophysical and environmental factors are affected by a confluence of climate change hazards and anthropogenic activities that affect degrade these systems.

The degraded land and soil

Food and agriculture depend largely on the combination of minerals, macro- and micronutrients, and microorganisms found in soil. Some of the most significant macronutrients include nitrogen, phosphorus, magnesium, and potassium, and they are required in large quantities in the soil. Micronutrients such as iron, zinc, manganese, and copper are needed in very small amounts but are essential in supporting the plant's enzyme activities[1]. Soil fertility depends on a high proportion of soil organic matter[2] essential in increasing agricultural yields[3]. Cultivation influences the rate of loss of organic matter in the soil, depending on the type and intensity[4]. Conventional farming systems result in erosion and a faster rate of loss of soil because of intensive cultivation and poor harvesting techniques[5]. Paradoxically, the remedy to the consequent decline in yield is increasing synthetic fertilizers to compensate for the nutrient losses[6]. A confluence of climate change hazards and human activities has affected soil quality in the Philippines. The country's climate patterns have contributed to land and soil degradation which affects 200,000 hectares per year. Some of the anthropogenic activities that have affected soil quality include intensive monoculture in agriculture and mining.

[1] Morgan, J. & Connolly E., 2013, Plant-Soil Interactions: Nutrient Uptake. Nature Education Knowledge 4(8):2
[2] Reeves, D.W. The role of soil organic matter in maintaining soil quality in continuous cropping systems. Soil Tillage Res. 1997, 43, 131–167.
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The vanishing forests

Forests are vital to the global carbon cycle, the conservation of biodiversity, and the provision of ecosystem services to the local population[1]. Over 50 percent of the landmass of the Philippines is forestland. It is one of the most ecologically diverse and a recognized biodiversity hotspot that has global significance[2]. Over 80 percent of its coastal wetlands have been cleared[3] and over 90 percent of its original forest cover has been lost[4]. An estimated 151,000 hectares of primary forest was lost from 2002 to 2020, which comprised about 12 percent of its total tree cover at that time[5]. Only a tiny fraction of its roughly 10 percent remaining forest cover is old-growth forest[6]. Numerous economic activities impinge on forests, including mining, hydropower dams, and industrial tree plantations[7]. Over the past few decades, there have been numerous efforts to rehabilitate and reforest the degraded forestlands of the country. Despite these, a significant portion of forest cover is lost annually[8].

The denuded watersheds

Water is a valuable resource for society. About 91 percent of the country's population has access to at least basic water services, but access remains highly inequitable for the rest of the country. There is a disparity in access across regions, with some provinces having as low as 60 percent[9]. Water is a vital source for irrigation, but there is similarly a disparity in the coverage of irrigation systems, with an average of 52 percent nationally but barely 40 percent for Mindanao[10]. Agriculture accounts for more than 80 percent of the total water use[11] and it is not as if the non-agricultural use of water is not growing. Per capita, water availability has also been declining due to increasing water demand and decreasing water supply as a result of the degradation of watersheds in the country[12]. Several river systems in Metro Manila are declared as biologically dead, while major lakes suffer from siltation and high concentration of chemical residues[13]. Without a water resource development program and with the continuous growth in demand, the country will experience water shortage in 2025, with the levels of availability varying in terms of location, quality, and cost[14].

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[1] Barlow J., Gardner T., Araujo I., Avila-Pires T., Bonaldo A., Costa, J., Esposito M., Ferreira L., Hawes J. & Hernandez M.I., 2007, Quantifying the biodiversity value of tropical primary, secondary, and plantation forests. Proc. Natl. Acad. Sci. USA 2007, 104, 18555–18560.

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[3] Gopal B., 2013, Future of wetlands in tropical and subtropical Asia, especially in the face of climate change. Aquat Sci 75, Pages 39–61, https://doi.org/10.1007/s00027-011-0247-y

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[5] Global Forest Watch, https://www.globalforestwatch.org/dashboards/country/PHL/

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[7] Hughes A., 2017, Understanding the drivers of Southeast Asian biodiversity loss, Alice C. Hughes, , 2017, Ecosphere Journal, Volume8, Issue1, e01624https://doi.org/10.1002/ecs2.1624

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[14] Rola A., Pulhin J., Tabios III G., Lizada G. & Dayo M.H., 2016, Philippine Journal of Science, 144 (2): 197-208, December 2015, ISSN 0031 – 7683, Challenges of Water Governance in the Philippines, https://www.wherewaterflows.ph/wp-content/uploads/2020/04/challenges-of-water-governance-in-the-Phils_FinalCopy_05_April_2016.pdf

The collapsing fisheries

The Philippines lies at the heart of the Coral Triangle, considered the world's center of shore fish biodiversity.[1] Coastal zones are a significant source of food, livelihood, and various types of economic activities. For many coastal villages, fishing is the primary means of livelihood. However, coastal resources are progressively declining despite decades of massive deployment of resource management tools that include localized species-specific management, marine habitat rehabilitation, and community organizing. One of the primary threats to fisheries is illegal fishing - such as the use of dynamite and noxious substances, resulting in an ever-increasing pressure on the remaining coral reefs. Other problems include non-reporting of fish catch, non-registration of fishing vessels, and weak enforcement of marine protection laws which could mask the problem of overfishing and fisheries resource depletion in the country. However, policy measures such as the Marine Protected Area (MPA) establishment and declaration of open-closed seasons have not been able to adequately address fishing pressures from illegal and commercial fishing.

Moreover, the COVID-19 pandemic also affected all forms of fishing, as well as the downstream industries and the consumer sector at multiple levels. There was a significant reduction in demand due to restaurant closures while fish processing plants and canneries were closed or operated in severely reduced capacities[2]. Aquaculture production was reeling with the disruption of supply lines of fry and fingerlings, jacking up the costs, while fishers found it challenging to penetrate the market due to travel restrictions[3]. Meanwhile, the focus on imposing travel restrictions by law enforcement agencies has allowed the proliferation of illegal fishing activities offshore.

Production Challenges

For many years now, agriculture has lagged behind all sectors of the economy in terms of performance and growth. It continues to slide relative to the service and manufacturing sectors, while poverty remains highest across all sectors. This is evident in the downward trend of the gross value added to agriculture since 1974. As seen in Figure 7, the latest GVA in 2020 is 10.2 percent, which was attributable to the massive investment in agriculture to forestall the prospect of a food crisis due to COVID-19.

Commodity production trends

The stability of food supplies relies for the most part on the conditions upon which food is produced and that mechanisms exist to fill in the gaps, if there are any. It is essential to look at what is currently in the food basket and appreciate the production patterns of critical food commodities from a long lens. Based on the Food Production Index (FPI) (2012 Base Year), averages for commodities are above 100 percent, with rice at 102 percent, and corn at 110 percent. FPI averages from 2013 to 2019 still hover around 100 percent, with minor production shortfalls in corn, pork, chicken, Tilapia, and chicken-egg.

[1] Avelino J.E., Sasaki J., Esteban M., Salah P., Jamero M.L. & Valenzuela V.P., 2019, Sustainability Evaluation of Marine Protected Areas Index (SEMPAI): A multi-criteria decision-making method to determine the effectiveness of the El Nido-Taytay Managed Resource Protected Area, Ocean & Coastal Management, Volume 181, 104891, ISSN 0964-5691, https://doi.org/10.1016/j.ocecoaman.2019.104891.
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[3] Manlosa A.O., Hornidge A.K. & Schlüter A., 2021, Aquaculture-capture fisheries nexus under Covid-19: impacts, diversity, and social-ecological resilience. Maritime Studies 20, 75–85, https://doi.org/10.1007/s40152-021-00213-6

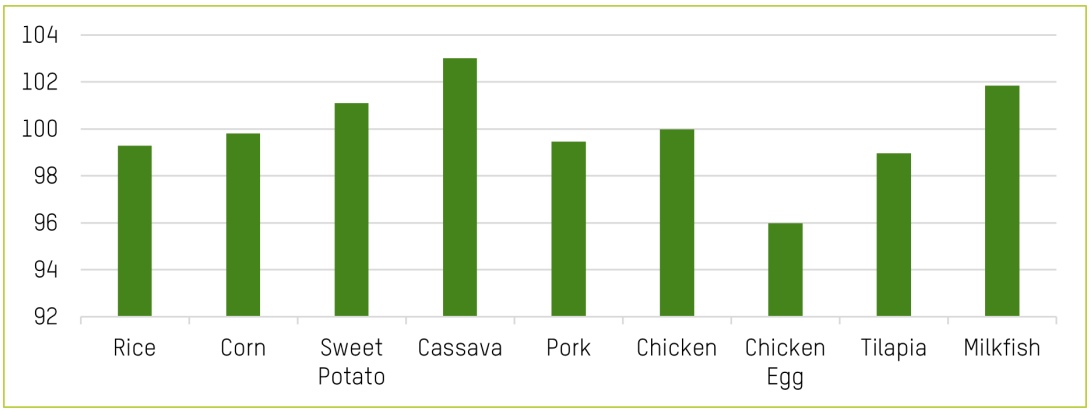


Figure 5. Food production index, Ave. (2013-2019) (FAO, 2019 & PSA, 2019)[1,2]

We can also glean the stability of food production by looking at trends in the production of essential commodities. According to the data from the Department of Agriculture, there is a significant gap in the supply of rice and corn despite the increasing trend, due to severe constraints in production such as input costs. Concerning cattle and hog, there has been relatively stable production, however, the presence of African Swine Fever (ASF) contributed to the decline of production of the latter. In the case of the poultry sector, the establishment of new commercial farms and dressing plants, switching some commercial farms to tunnel-ventilated housing, improving farms' stocking capacities, adequate supply of day-old chicks, and the use of contract farming all contributed to the growth of the subsector[3]. However, the transport of inputs and outputs to and from the farm was more costly, and there was a deflation of demand due to the restrictions in hotels, restaurants, and fast food and retail food shops. For the fisheries sector, the decline in the output per catch in municipal fisheries was due to environmental factors such as climate change.

Growing import dependence

Using the self-sufficiency ratio (SSR) to provide a reference to determine a country's internal supply capacities using a set of index commodities. The PSA data shows that the country is self-sufficient in a wide variety of crops, including milkfish, oysters, pomelo, calamansi, coconut, and sweet potato. Moreover, it showed significant deficits in some of the most frequently consumed food commodities, including corn, pork, potato, tuna, rice, onion, beef, coffee, mongo, peanut, and garlic.

To determine the extent to which a country's supply of commodities came from imports, there is a need to measure using the import dependency ratio (IDR). The data showed that the country relies on imports to fill significant rice, corn, pork, and dressed chicken deficits. There is also a growing demand for gourmet and healthy foods, frozen foodstuff, ready-to-cook food, and many other processed food products sourced from abroad.

Due to this, there is a growing concern about the increasing share of imports in the country's food supplies. Most of the imported foodstuff comes from countries where agriculture is heavily subsidized, which creates a condition that makes the domestic producers less competitive in pricing. Import dependence also puts the country at high risk during global food price volatility.

[1] FAO, Data Glossary, https://databank.worldbank.org/metadataglossary/wdi-database-archives-(beta)/series/AG.PRD.FOOD.XD
[2] PSA, Metadata on Food Security Indicators (Food Availability), Food Production Index, by Commodity and Year, https://openstat.psa.gov.ph/Metadata/3L5FFPI0
[3] Berkhout N., Philippines: Chicken overtakes pork as preferred protein, Poultry World, Apr 30, 2020, https://www.poultryworld.net/Meat/Articles/2020/4/Philippines-Chicken-overtakes-pork-as-preferred-protein-576305E/

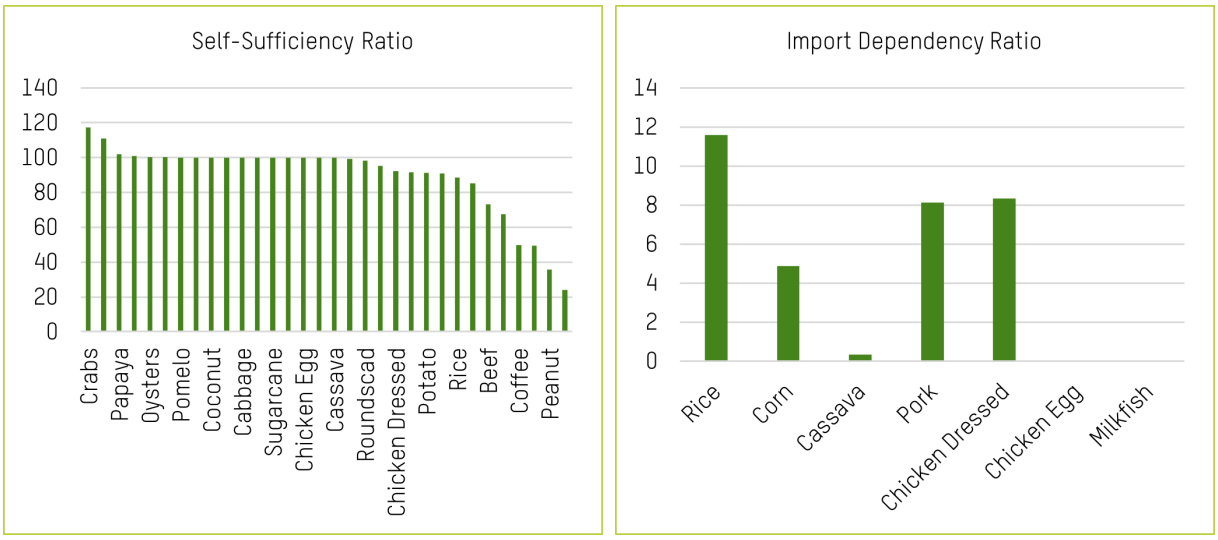


Figure 6. Self Sufficiency Ratio and Import Dependency Ratio of Selected Agricultural Commodities, Philippines (PSA, 2019)[1]

Food contamination and disease outbreaks

Food safety is a significant issue across the food supply chain. Numerous pathogens cause a wide variety of food-borne diseases (FBDs), algal and fungal toxins, and residual effects of illnesses after the acute phase of infection[2]. The most common symptoms were gastrointestinal diseases such as vomiting, diarrhea, and stomach ache. Although amoebiasis, fever, and cholera were cited as the symptoms of some FBDOs, the study assessed that they occur at less frequency[3]. A significant number of FBDOs cite Salmonella spp., Henipavirus, Entamoeba histolytica, and Vibrio parahaemolyticus as primary causes of infections. Based on a study, the cases of food-borne disease outbreaks in the Philippines were associated with multiple food vehicles with unknown causes or origins. Food contamination is also evident in street foods[4] to tube feedings in acute care hospitals[5] and public markets[6].

With this, food and safety in urban and rural areas pose a dilemma among regulatory agencies. In particular, long food chains are susceptible to food safety issues due to multiple nodes where goods can be exposed to microbial and chemical agents[7]. As such, monitoring and evaluation of food production methods, processes, practices, and habits were among the channels to be regulated, especially with climate change and unplanned urbanization[8].

[1] PSA (2019) Self-sufficiency Ratio (SSR). https://openstat.psa.gov.ph/Metadata/2E5FSSR0
[2] Borchers A., Teuber S., Keen C. & Gershwin E., 2019, Food Safety, Clinical Reviews in Allergy and Immunology (2010) 39:95–141, https://doi.org/10.1007/s12016-009-8176-4
[3] Azanza M.P., Membrebe B.N., Sanchez R.G., Estilo E.E., Dollete U.G., Feliciano R. & Garcia N.K., 2019, Foodborne Disease Outbreaks in the Philippines (2005–2018, Philippine Journal of Science 148 (2): 317-336, ISSN 0031 – 7683, DOI: 10.1080/09637480050077121
[4] Azanza et al., *ibid*.
[5] Sullivan M.M., Sorreda-Esguerra P., Santos E.E., Platon B.G., Castro C.G., Idrisalman E.R., Chen N.R., Shott S. & Comer G.M., 2001, Bacterial contamination of blenderized whole food and commercial enteral tube feedings in the Philippines, Journal of Hospital Infection, Volume 49, Issue 4, Pages 268-273, ISSN 0195-6701, https://doi.org/10.1053/jhin.2001.1093.
[6] Sia Su G., Mariano C.M., Matti N.S. & Ramos G., 2012, Assessing parasitic infestation of vegetables in selected markets in Metro Manila, Philippines, Asian Pacific Journal of Tropical Disease, Volume 2, Issue 1, Pages 51-54, ISSN 2222-1808, https://doi.org/10.1016/S2222-1808(12)60012-7.
[7] Uyttendaele M., Franz E. & Schlüter O., 2016, Food Safety, a Global Challenge, International Journal of Environmental Research and Public Health, 13(1):67. https://doi.org/10.3390/ijerph13010067
[8] Käferstein & Abdussalam, *ibid*.

Food losses and wastes

Food losses and wastes are a considerable concern for manifold reasons. First, food that has not reached the market affects the quantity of food produced, i.e., more of the same commodity needs to be produced to price in the losses. In the Philippines, as high as 50 percent of food losses are incurred from harvesting to distribution[1]. Second, the food that has been procured but never consumed is similarly a wasteful use of the energy that goes into the production, transportation, distribution, and marketing of food commodities.

According to FAO's estimate, roughly a third of the world's food is lost or wasted every year, the quantity of which is enough to end hunger[2]. Reports show that food losses per commodity are primarily attributable to low recovery rates in milling due to inefficient, outdated milling plants[3,4]. Additionally, losses of commodities could eventually differ depending on the supply chain node. It can also be attributed to poor transport and a lack of cold chain facilities. Similarly, the lack of mechanized washing facilities for some vegetables results in bruises and rejection[5]. Notably, studies on food losses in fisheries remain sparse.

One of the social entrepreneurs we interviewed attempted to set up a business to make fresh food available during the lockdowns and provide extra income to urban women. However, they experienced losses of up to about 20 to 30 percent of food items. The losses are due, in large part, to poor packaging and handling during transport[6].

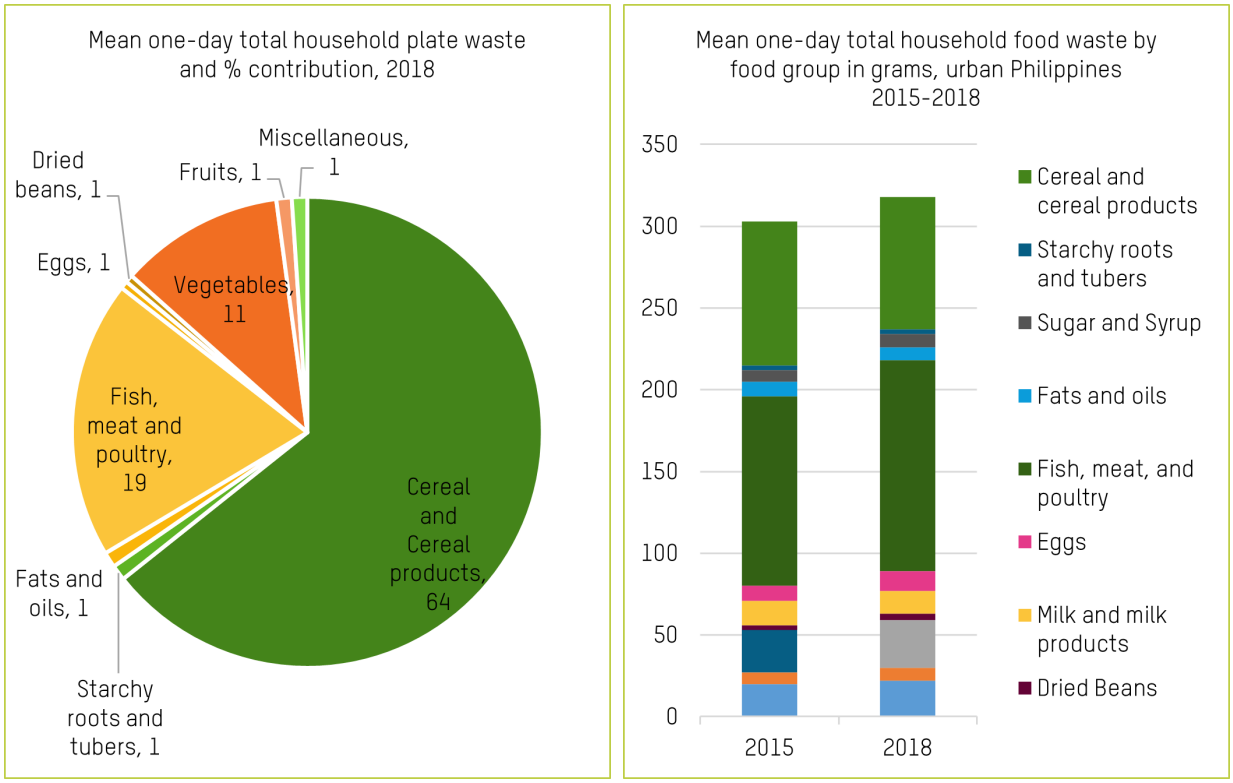


Figure 7. Total Household waste, by contribution and by food group in grams (FNRI, 2019[7])

[1] Mopera L., 2016, Food Loss in the Food Value Chain: The Philippine Agriculture Scenario, Journal of Developments in SustainableAgriculture11:8-16
[2] FAO. 2011. Global food losses and food waste – Extent, causes, and prevention. Rome, http://www.fao.org/3/mb060e/mb060e.pdf
[3] Salvador A., Miranda D., Camaso V., Gutierrez R. & Paz R., 2012, Assessment of the State and Magnitude of the Paddy Grains Postproduction Losses in Major Rice Production Areas. PHilMech Journal Vol 2, No. 1
[4] Salvador A., Malanon H., Calica G., Castillo P., Verena R., Rapusas R., 2012, Quantitative and Qualitative Assessment of Corn Postharvest Losses.
[5] Salvador 2016, *ibid*.
[6] Personal communication, Aison Garcia (Veggies for Good), July 28, 2021
[7] FNRI, 2019, Expanded National Nutrition Survey, http://enutrition.fnri.dost.gov.ph/site/uploads/2018%20ENNS%20Dissemination_Household%20Food%20Consumption%20Survey.pdf

With regards to household-level food waste, the most significant chunk comes from fish, meat, and poultry; cereal and cereal products constitute 83 percent of total food waste. Additionally, comparing the 2018 FNRI data set with the 2015 data set indicates that overall food waste of urban households increased, but only marginally (from 305 grams to 313 grams). The wastage from cereal and cereal products decreased, while it increased in fish, meat, and poultry. A rough estimate of UNEP (with low confidence) shows that the Philippines' household food waste per capita is 86 kilos, equivalent to about 9,334,477 tons per year[1]. This volume of waste takes about 1 million trips of a typical 10-ton garbage truck to ferry. Yet, to date, there are no centralized, nationally driven efforts to comprehensively and consistently track food loss and waste in each node of the supply chain.

Health and nutrition outcomes

The double burden of malnutrition

The rapid urbanization in the country coincides with the radical shift in dietary choices and food access. In this section, we presented a range of the current health and nutrition outcomes and the foreseeable future they will hold.

First, the declining productivity in rural areas and the shifting consumption patterns create a situation where there is a rise in the incidence of hunger across the board. The Social Weather Station (SWS) survey on self-rated hunger in the Philippines shows a generally upward trend, implying that there is still a large proportion of families who experienced involuntary hunger- hunger due to lack of food to eat at least once in the past three months.

Second, dualism exists across the population and within the urban population itself, which creates what some observers refer to as the 'double burden' of malnutrition. In such a phenomenon, there is a coexistence of undernutrition in some parts of the population, and overnutrition in others. The survey also showed that 3 in 10 Filipino households were food insecure. One in 10 households was unable to eat foods they prefer, with a slightly lower number of households often eating food that they do not really want. Almost 4 in 10 households cut back on the variety of food they consumed. In addition, food insecurity is also associated with gender, those female-headed households are more food insecure compared to male-headed households.

Over the past 25 years, there has been a consistent decline in the prevalence rates of stunting and wasting. It can be seen in the case of Eastern Visayas, where the rate of stunting declined in 2018 compared to 2015. Despite the decline, the number is still way below the World Health Organization (WHO) benchmark. The relative success in reducing the stunting rate was attributed to nutrition-specific interventions. These included the supplementation of chronic micronutrient deficiencies such as iron, vitamin A, and iodine for women, and ready-to-use therapeutic food (RTUTF) for wasted children[2].

[1] United Nations Environment Programme 2021, ibid.
[2] Personal communication, Albne Joy Cerro (Provincial Nutrition Office, Leyte)

The worsening food habits

Based on the Household Food Consumption Survey (HFCS) recommended by the Department of Health (DOH), the typical Filipino diet remained to be a rice-vegetable-fish combination. Among the food groups, the highest intake of all the cereals is rice. Vegetables and fish products constitute 14.6 and 11.5 percent of the diet, respectively.

Accordingly, the food intake of urban and rural households was almost the same but the consumption of other cereal products, fats and oils, meat and meat products, poultry, eggs, milk, and milk products, was higher in urban than in rural households. Rural households consumed more rice and rice products, starchy roots and tubers, vegetables, and sugars and syrups than their urban counterparts. The food intake disparity was due to the availability of supermarkets and other food retail outlets which had a greater presence in the urban areas[1]. Metro Manila registered the highest intake of other cereal products, meat and meat products, whole milk, milk products, and beverages. However, there was an increase in the rate of consumption of processed food which was a common food intake of urban households.

Aside from the HCFS, a rapid nutrition assessment survey was also done to get a snapshot of the households' food security situation and nutrition perceptions during the COVID-19 era. The survey showed that over 62 percent of households experienced moderate or severe food insecurity. Food insecurity was higher in the low- and moderate- than in the high-risk areas, which include urban cities where food aid might have curbed hunger. The study-at-home arrangement for children with low-income families was consequential to food and nutrition security outcomes. Before the COVID-19 pandemic, supplementary feeding for low-income families was a key feature of public school programs. Almost 90 percent of children in low- and high-risk areas did not receive supplemental feeding during the quarantine period[2].

The uncertainties in the future sources of nutrition

For middle-income countries like the Philippines, the call for increased emphasis on affordable healthy diets is relevant and timely, as the country has been experiencing a demographic shift and corollary changes in dietary preferences. The increasing preference for highly processed, sugary, and protein-rich diets demonstrates what the authors of the report refer to as the '*hidden*' health and climate-change costs associated with current food consumption patterns. Add to this is the cost savings if the shift is made toward healthy diets that include sustainability considerations.

However, with the current food production rate severely hampered by a range of factors that limit productivity, meeting the projected caloric needs could be a tall order without heavy dependence on food imports, which brings about a range of complexities in and of itself.

[1] Spires, M.; Berggreen-Clausen, A.; Xavier Kasujja, F.; Delobelle, P.; Puoane, T.; Sanders, D.; Daivadanam, M. Snapshots of Urban and Rural Food Environments: EPOCH-Based Mapping in a High-, Middle-, and Low-Income Country from a Non-Communicable Disease Perspective. Nutrients 2020, 12, 484.
[2] FNRI, Rapid Nutrition Assessment Survey on Food Security, Coping Mechanisms, and Nutrition Services Availed during COVID-19 Pandemic in Selected Areas in the Philippines, November 3 to December 3, 2020

These conditions led to the prevalence of undernutrition as well as childhood overweight and adult obesity. Despite the decline in the number of undernourished children in the last 10 years, it is still way above the target of 10 million by 2030. Aside from these, several studies showed the importance of adequate nutrition for the neurodevelopmental processes that occur rapidly during pregnancy and infancy[1]. However, the country currently requires a more innovative data-gathering tool to get a better grasp of food availability, access, and utilization.

Rising incidence of food-related non-communicable diseases

From 2019 to 2020, the top three leading causes of death in the Philippines were 1) ischemic heart diseases, 2) neoplasms, 3) and cerebrovascular diseases categorized as non-communicable diseases (NCDs). Ischemic heart disease, also called coronary heart disease (CHD) or coronary artery disease, is the leading cause of death followed by neoplasms commonly known as cancer, succeeded by cerebrovascular diseases and diabetes mellitus. The occurrence of these NCDs was attributed to the high intake of salty, fatty, and sugary food coupled with a sedentary lifestyle and low intake of fruit and vegetable[2]. As these factors are behavioral and modifiable, dietary patterns should be established through the development of NCD prevention programs.

Programs such as Urban Food Hives can contribute to lowering the rate of NCDs by focusing on a behavioral change communication strategy that will lead to shifts in social norms around dietary preferences and food habits.

[1] FAO, 2020, State of Food Security and Nutrition in the World 2020: Transforming food systems for affordable healthy diets, http://www.fao.org/3/ca9692en/online/ca9692en.html

[2] Cecchini M, Sassi F, Lauer JA, Lee YY, Guajardo-Barron V, et al. Tackling of unhealthy diets, physical inactivity, and obesity: health effects and cost-effectiveness. Lancet. 2010;376:1775–1784. doi: 10.1016/S0140-6736(10)61514-0.

Maribel Teoxon, Joan Oribia, and Gemma Bautista pick up weeds from the vegetable patch in their Garden of Hope in Payatas, Quezon City. Photo by: Geraldine Hoggang/Oxfam Pilipinas

CONCLUSIONS AND RECOMMENDATIONS

Urban cities in the Philippines face the prospect of growing demand for food with production bases that have reached their limits. As one of the leading voices that advance a climate adaptation agenda that put the rights of women and men farmers and fishers at the forefront, Oxfam Pilipinas aims to strengthen existing food and nutrition security programs. Oxfam Pilipinas and its allies must continue to work together with partners that similarly engage the government in advocating for increased investments in smallholder food production and alternative paths to intensive agriculture and aquaculture. To lessen the shock from dependence on food importation, Oxfam Pilipinas needs to scale up its efforts in addressing food security. Focus should not only be directed toward rural areas but also critically, in urban areas, particularly among urban poor communities. This can be done through strengthening social enterprises, upholding women empowerment in these enterprises, and transforming social and economic relationships in ways that benefit food producers and entrepreneurs along the value chains. Moreover, programs addressing malnutrition and hunger should be data-driven while adequate funding needs to be secured to ensure equitable outcomes. Lastly, adequate funding should be prioritized for disease prevention and control, promotion of dietary diversity, infant and young child feeding, vitamins, and micronutrient supplementation, fortification, and other interventions necessary to promote positive health outcomes.

Theory of change[1]

Urban agriculture as a source of food and green jobs

There has been renewed interest in urban farming over the past few years. Some initiatives that can be explored include promoting urban gardening and urban agriculture to provide a secure food supply in urban areas. Many organizations specialize in providing skills, knowledge, and technical support related to urban agriculture. Oxfam Pilipinas' value-added is to transition the scattered initiatives of its partner organizations into a coherent action plan, with vertical and horizontal value chain linkages, support systems, and sustainable financing. Oxfam Pilipinas must seek the support of technical experts who can advise on designing systems suited to the target areas' unique context and compliance with existing regulations, including land and water use, building constructions, and waste management.

Women's leadership

Women's leadership underlies and inspires its efforts to transform the urban food system and cuts across the design of its programs. Oxfam Pilipinas' centerpiece strategy is to develop social enterprises and business models that open up economic opportunities and leadership roles for women across urban food value chains. There is abundant evidence that supports the positive link between women's empowerment and improved access to food, health, and care. Evidence shows that, when women are empowered, agricultural productivity rises, infant mortality declines, and child health improves. Moreover, survey shows that women, far more than men, influence dietary preferences at the household level, even if the men pay for the food in many instances. Child nutrition correlates with women's control over production decisions, resource access, income use, and others. Women's income-generating efforts have a natural tendency to redistribute care work, including child nutrition.

[1] A method that explains how a given intervention, or set of interventions, is expected to lead to specific development change (https://unsdg.un.org/sites/default/files/UNDG-UNDAF-Companion-Pieces-7-Theory-of-Change.pdf)

Social enterprises

Civil society groups and social movements are turning the prevailing business models upside down by prioritizing, not the profit of the retail company as the core of the transaction, but what will work best with the producers and consumers. Based on our interviews with different stakeholders, there are numerous income streams that Oxfam Pilipinas and partners can develop. Oxfam Pilipinas can leverage its resources and bring social enterprises into replicating and upscaling these opportunities. It can work with its partners in utilizing local design features of urban areas to support social enterprises in urban agriculture. The study also proposes negotiating with barangay leaders and city officials for middle-class residential areas to repurpose urban spaces, such as public parks, basketball courts, and village-owned structures, for small-scale crop cultivation.

With improved capacities in urban farming, women in informal settlement communities can supply human resources for rooftop gardens and community farms. Oxfam Pilipinas can support vertical gardening in such communities after a thorough analysis of tenurial rights, the conditions for water supply, organic leachate management, and food safety concerns.

Financing the business models for replication and upscale

Oxfam Pilipinas can leverage its resources and programmatic footprint with public and private funding and other development financing streams. This study proposes analyzing and adapting progressive financing options for smallholder production such as the joint venture business arrangement between SEDPI and Organic Options, Inc. (OOI), a social enterprise that brings farmers' organic produce to some of the biggest supermarkets and retail outlets. These types of arrangements can help bring financing sustainability to local urban agriculture producers. Domestic and international financing is another significant source of financing. The People's Survival Fund or Republic Act 10174 of 2012 makes PHP1 billion ($210 million) available to local government units and accredited local/community organizations to implement climate change adaptation projects that will better equip vulnerable communities to deal with the impacts of climate change.

Policy, governance, and public investments

The Philippine Development Plan identifies urban agriculture as a crucial strategy for hedging against supply disruptions and volatility in the trading system. The national government has recognized the importance of community gardens, backyard gardens, and small-scale livestock as food sources to mitigate supply shocks and ensure access to nutritious food during crises. The national government similarly recognized that LGUs play a role in addressing the barriers toward upscaling urban agriculture. Along with this, Oxfam Pilipinas should continue to engage the national government in monitoring the delivery of the Philippine Development Plan (PDP) and be proactive in shaping the PDP for the next administration (2022–2028) to ensure food and nutrition security is a linchpin of public policy making and budgetary investments.

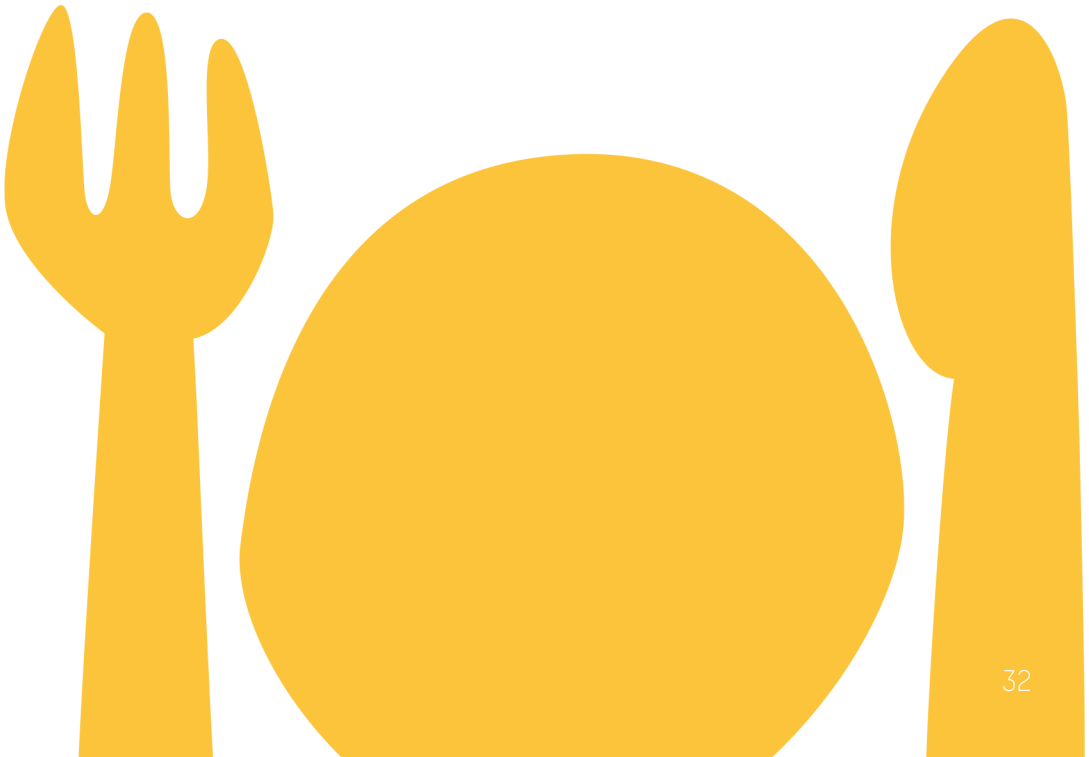
Moreover, sharing knowledge and best practices for replication and upscaling from other local governments should be encouraged. Regional climate change adaptation and disaster risk reduction plans should also be influenced to ensure they have a gender justice and food and nutrition security lens.

Changes in social norms

Dietary preferences and consumption patterns are acquired through social norms—collective beliefs about what people expect from each other. Shifts in social norms often underpin change regardless of the temporal and spatial scale of change. Individual attitudes toward healthy food habits and food waste—two of the most intractable normative issues in food discourses—can produce outcomes on a broader scale. It is recommended that a deeper analysis of how to encourage positive norms in dietary preferences and nutrition uptake be done to encourage a shift of norms. We discourage repressive strategies that enforce norms through fear as these are not sustainable and can oftentimes lead to norm-breaking when there are no enforcement actors around.

Concluding notes

The study proposes a rights-based approach to designing the production systems to elicit the inputs and secure the buy-in of various stakeholders. The design of such systems must be vetted by local leaders and decision-makers and ensure compliance with land use plans, programmatic priorities, existing water-use regulations, and solid waste management. Urban and peri-urban agriculture is a crucial step for ensuring food availability and access for urban residents, but it should be complemented with efforts at strengthening livelihood security, securing a living wage, and access to social protection.

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