

Feeding Metro Manila in 2050: A Food System Vision

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ABSTRACT

This document argues that the existing food system in the Philippines is dysfunctional because it fails to support the nutritional needs of consumers, degrades the environment, and keeps farmers poor. To correct the system, a multisectoral team led by NAST PHL proposed a consumer-led and farmer-empowered vision of a circular food system. Responsible consumption will trigger transformative changes in all steps of the food system, not the least of which is the improved health of consumers. Farmers' income will increase as they diversify farming in response to consumer demand. In addition, farmers will get a better share of the consumer peso by performing value-adding activities and being more directly connected to consumers. There will be less pressure on the environment with more efficient resource utilization, reduced waste, and pollution.

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INTRODUCTION

In 2019, the Rockefeller Foundation sponsored an international open competition dubbed as the Food System Vision Prize (<https://www.rockefellerfoundation.org/initiative/food-system-vision-prize/>). The Foundation challenged participants to submit a “regenerative and nourishing” food system for their chosen geographical area. The contest attracted more than 1300 participants representing more than 4000 organizations from 119 countries. The NAST

organized a team of 15 stakeholder organizations to participate; this team landed in the top 1% of participants and was awarded a special mention prize.

This paper aims to describe the salient features of the NAST Team's winning entry. An updated version of the NAST team's Vision is found in <https://nast.ph/index.php/nast-related-links/food-system-vision>.

METRO MANILA’S DYSFUNCTIONAL FOOD SYSTEM AND GENERAL APPROACH TO TRANSFORM IT

The food system refers to the chain of human activities that cover food production, marketing, consumption, and waste management. The existing food system in the Philippines (Metro Manila in particular) is dysfunctional and it is not on the road to improvement. It keeps the primary food producers hungry, the consumers unhealthy, and destroys the foundations of its own future, which are biodiversity, soil, and water resources.

All of the steps need reform but consumption and waste management are the most effective starting points. Reforms in these sectors will trigger all the other changes that will ultimately impact not only on food security, but also on the economy and environment.

Why Metro Manila?

Metro Manila is the single biggest food consumer and the cultural leader and trendsetter in the Philippines. If the food system can be fixed in Metro Manila, the rest of the country will follow. Metro Manila has a population of 12 million, but if the surrounding communities are counted, Mega

Manila can easily account for a quarter of the Philippine population.

The Transformation We Need: The Food System Vision

The traditional view of the food system is that it is linear, with three sequential steps: production, marketing, and consumption. This kind of system will not sustain us to 2050. We need to add a fourth component—waste management—and make the system circular.

To visualize the ideal system, we propose a logo (Figure 1) that symbolizes our most important message.

Notice the arrangement of the four components—production (green box), marketing (blue box), consumption (multicolor box), and waste management (brown box). At the core of the system is responsible consumption.

Waves radiating from the system indicate the impact of the food system beyond the system itself. The food system is the main cause of resource depletion and pollution, but it employs as much as 40% of the country’s workforce. Rice shortage can make and unmake Presidents of this country.



Figure 1. Logo of the food system vision “Feeding Metro Manila in 2050”

The more detailed diagram (Figure 2) is an explanation of the logo and how the food system transformation may play out.

The arrows show the flow of materials in the system. Two-way arrows leading to and from the waste management box show materials and energy being recycled or repurposed into the system. This results in minimal external input and minimal waste, ensuring its sustainability.

At the background is the enabling environment: government policies that modulate the operation of the system and technology that enables the system to function. For example, responsible consumption in the middle box requires sustained education and tools provided by advanced technology.

The traditional way of fixing the system is to work on the production side, which explains why we always view the problem as a problem for the Department of Agriculture. Occasionally,

marketing becomes the problem: traders are hoarding or otherwise becoming greedy; prices go up; consumers complain. We never looked at the consumer as part of the problem. The consumer in our mind today is always the victim.

The reality, as the logo shows, is that the consumer is at the core of the system. When we choose to eat white rice, for example, the farmer responds by producing the grain and the millers respond by removing most of the nutrients from the grain to produce the white rice. The retailer delivers it to us in plastic bags. As a consequence, we suffer because excessive white rice consumption is linked to chronic diseases. Environment suffers from the extravagant use of water and land resources, pollution in the rice farms, and plastics used in marketing. Ironically, the farmer also suffers because she does not make enough money for her family's basic needs from growing rice.



Figure 2. Diagram of the envisioned food system showing the relationship of various components and the enabling environment.

Imagine what will happen if the consumer changes his food habit and decides to eat brown rice and less rice but more mungbean (Figure 3).

- The rice farmer will include mungbean in his/her farming system, earn more, and spend less on fertilizer for rice because mungbean can supply some of the nutrients. This will also reduce pollution because about half of the chemical fertilizers applied to rice is not used by the plant and end up as pollutants.
- The miller will produce brown rice, with a 10% higher milling recovery, solving our perennial problem of shortage (note that we import about 10% of our rice requirement every year).

Imagine if the consumer demands that the retailers use biological material such as *bayong* (a traditional basket made of palm leaves) instead of

plastic for packaging.

- With the use of biological material for packaging, plastic pollution will be reduced and the local packaging industry based on the use of bamboo, palm, and banana leaves will be revived.
- Finally, the consumer ends up being healthier because brown rice is more nutritious than white rice.

This analysis shows that consumer behavior ultimately determines the outcome and impact of the food system.

Therefore, we propose a change in consumer behavior as a starting point for fixing our dysfunctional food system.

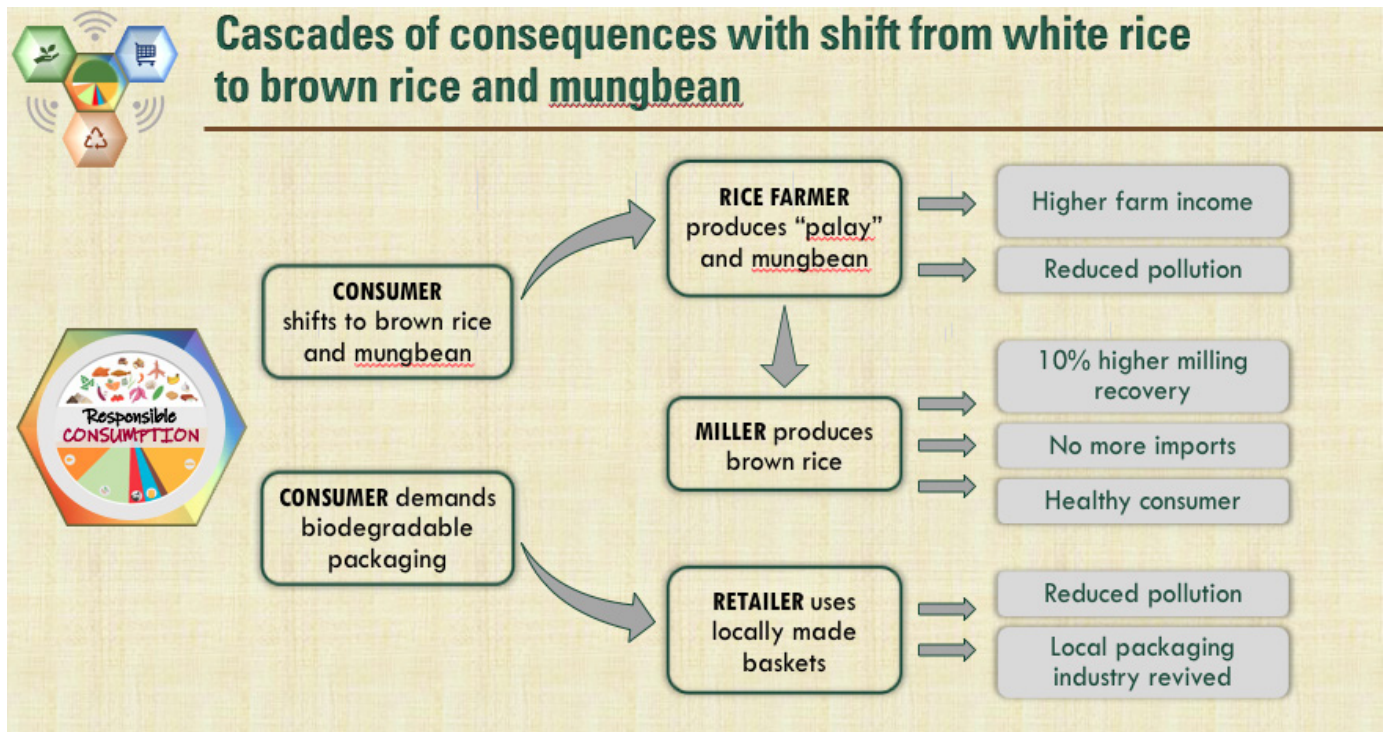


Figure 3. Consequences of consumer choice of food and packaging.

TRANSFORMATION IN THE FILIPINO DIET

For the first time, we have a science-based dietary guide that addresses two of the three major concerns of the food system: nutrition and health of consumers on one hand and planetary health on

the other (Willett et al. 2019). The concept of a planetary health diet (PHD) is barely one year old. It was first proposed by a panel of international multi-disciplinary experts in January 2019.

The difference between our existing diet and the PHD is in diversity, best seen in the colorful plates of the PHD (Figure 4). On the other hand, the typical diet is dominated by white rice. If the diversity is duplicated in the farms, farmers are expected

to benefit by having a more sustainable farming environment and higher income. This would address the third concern of the food system, which is the farmer.



Figure 4. Comparison between the typical Filipino diet (left) and different versions of the Planetary Health Diet (right).

The PHD is a general guide that is sufficiently flexible to be applied to local conditions, down to the level of provinces. It differs from traditional guides such as *Pinggang Pinoy* (DOH n.d.) in that the impact of consumption on the environment is factored in. In the context of the Philippines, adhering to the PHD will drastically change the food consumption pattern, and ultimately, the structure of farming.

For example, the 36% reduction in rice consumption mandated by the PHD may reshape the Philippine agricultural landscape. It may free up as much as 1.5 million hectares of prime agricultural land for more nutritious, more profitable, and environment-friendly crops. If rice is replaced by mungbean, which is needed in large quantities, the environment will benefit because mungbean production produces less greenhouse gases and uses less water than rice.

But changing eating habits will not be easy. This explains why we plan for a 30-year sustained effort,

initially targeting the middle class in Metro Manila. The middle class is educated and more willing to experiment with food choices. The basic change we aim for is the change in the food selection criteria from the present (based on price, convenience, and taste) to one that will be driven by data and values. For this, the consumer may need help from a modern tool.

A tool for data- and values-driven food buying is illustrated by the service provided by *Genopalat*, (Genopalate n.d.), a company that gives food recommendations based on genomic data. The idea is for the consumer to submit her genomic information, which will be analyzed by the company to give advice on what food to eat and what to avoid. This system can be improved by using other data such as the PHD recommendations and financial capability and values such as concern for the local farmer, animal welfare, and religion. We can tentatively call this PHD Plus App using the cellphone as a platform. It can be used for grocery shopping or ordering food from a cloud kitchen.

Overview of the 2050 Food System Vision for Metro Manila

Our envisioned food systems operating in Metro Manila by 2050 is shown in Figure 5.

The chart shows boxes and arrows. The boxes show processes in the food chain. The arrows show the direction of those processes, except for the red arrows.

Red arrows refer to the flow of information. Notice that the red arrows interconnect all processes, that is, all processes are connected to all other processes. Through this information system, a farmer will know the best time to grow a crop based on weather forecasts and market demand. The farmer can select varieties and management practices best suited to his farm. A consumer can choose among different suppliers offering the same product; the farmer can choose among many buyers. The PHD Plus App described earlier will

facilitate matching between consumer and supplier.

Green arrows refer to the flow of perishable food that flows through a cold chain.

Black arrows refer to the flow of non-perishable food. Gray arrows refer to waste or by-products. Golden arrows refer to recycled and repurposed materials.

One can designate the green and black arrows as forward logistics and gray and golden arrows as reverse logistics.

The row of hexagonal boxes refers to similar steps e.g., production, trading and processing, food services and consumption, and finally resource recovery or waste management.

The top row of boxes shows different production systems in the aquatic and terrestrial environments, each of them further differentiating from conventional into high tech monoculture or diversified farms.

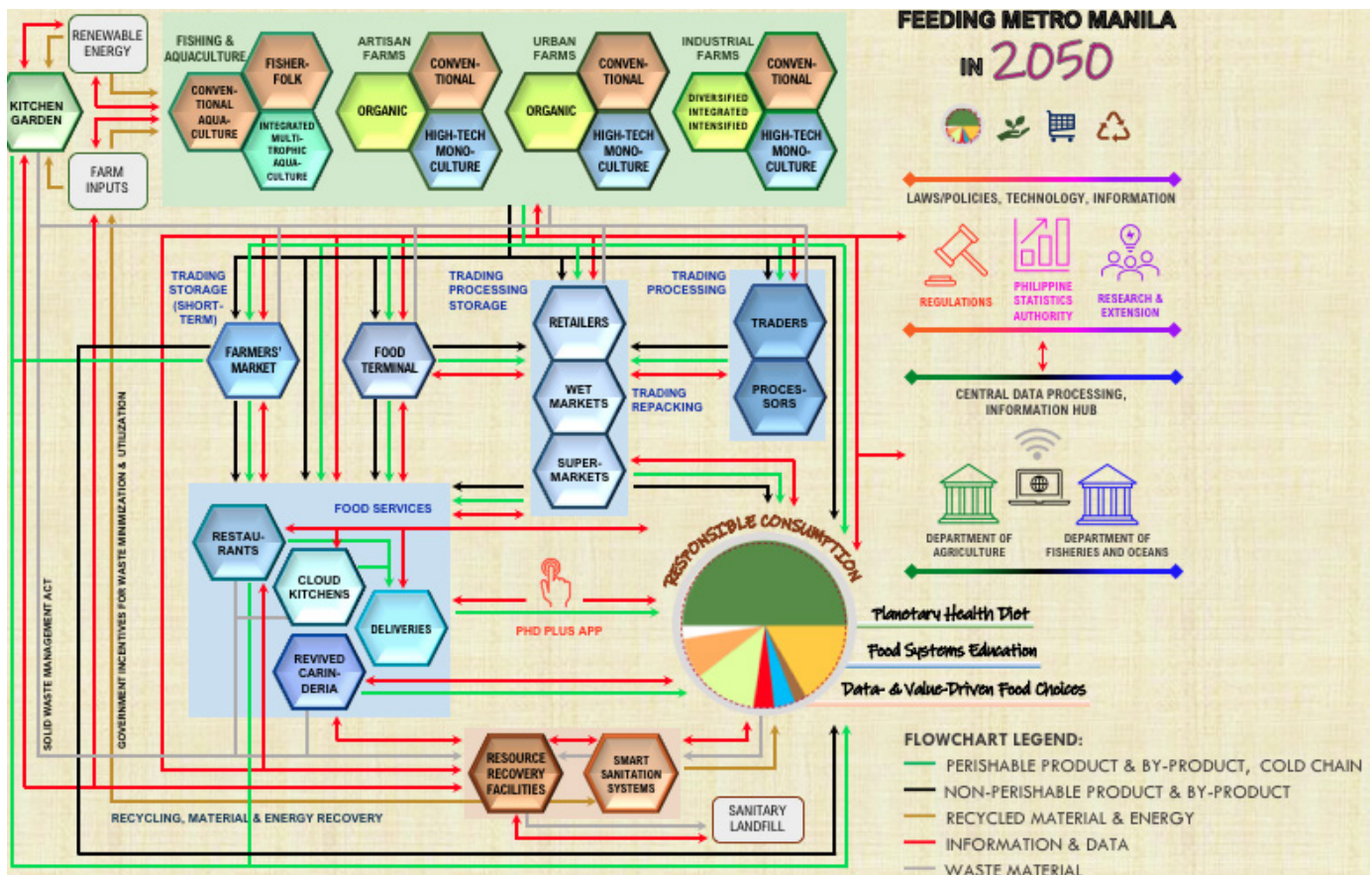


Figure 5. Flow chart showing the components, material and information flow in the Metro Manila food system by 2050.

What features differentiate this 2050 system from the existing system?

1. Individual consumption decisions will be data- and values-driven. Biological needs, financial capability, concern for the farmer, the environment, and preferences dictated by religion and tradition will be factored in. The envisioned PHD Plus App will assist food shopping. Prepared food supplied by “cloud kitchens” will be the norm. Cloud kitchens are shared commercial facilities purpose-built for food delivery.
2. Connection between food producers and the consumer will be more direct. There will be multiple channels: among these are farmers’ markets, food terminal, and direct delivery from farm to household or food service providers.
3. Food production will be highly diversified, local, and seasonal. This will provide food security against disruptions caused by calamities and income for local farmers.
4. Production will be closer to the kitchen as urban and peri-urban farms get a bigger share of the food market. This is necessary as land and water resources for traditional farms become limiting. It is an added assurance of food security.
5. Food production from the aquatic environment will grow faster than land-based production. The aquatic resources around Metro Manila are extensive with Manila Bay, Laguna de Bay, and Taal Lake. In contrast, agricultural lands are being converted to other uses.
6. The food system will be circular. Material and energy will be recovered from wastes, valued as a resource, and returned to the farms and households. The result will be a cleaner city and reduced external inputs in food production.
7. Steps in the food system will be inter-connected, allowing for a high-level of transparency and efficiency. Farmers and consumers will have more market power.
8. Reduced postharvest losses with adequate cold chain. This is also an added assurance that farmers will not be pressured to sell a perishable product at a low price.
9. A revived industry based on the use of biodegradable materials for food packaging. This is a game changer for creating a new industry and reducing pollution from the food system.

CALL FOR ACTION FOR THE REMAINING TIME OF THE DUTERTE ADMINISTRATION

To realize the vision, we made a long shopping list of policies, activities, and technologies that need to be established in the next 30 years. We present the following list of priorities for the last two years of the current administration, in support of the PHD advocacy. The priorities are listed with corresponding national agencies that are called upon to act on them

1. *Department of Education.* The suggested activities are curricular changes to include food system education, training of teachers, and research cum feeding project. The curricular changes will aim to inform the learner of the connection between food choices and health, nutrition, society, and environmental issues. A long-term feeding cum research project will document the health and learning outcomes of the planetary health diet. This feeding program will be done in conjunction with community gardening involving learners and a research program involving the Department of Health.
2. *Department of Health.* The recommended activities are a) advocacy of the Planetary Health Diet as an important component of the Universal Health Care and b) training of medical workers. The suggested activities are meant to emphasize the role of proper nutrition as a component of a healthy lifestyle for preventing disease. Medical workers will be trained to have a deeper understanding of the effects of food on the human body and

gut microbiota in relation to disease resistance and recovery from illness.

3. *Department of Agriculture.* The recommended priorities for the next two years are a) rehabilitation of the Food Terminal, Inc. (FTI) in Taguig City and establishment/operation of more farmers' markets, b) re-structuring production support to give more emphasis to diversification in food crops, animals, or fish, with emphasis on crops such as grain legumes that are needed in large quantities to satisfy the requirements of the Planetary Health Diet, and c) establishment of model rice-, corn-, coconut- and aquaculture-based diversified and integrated farms. The revival of FTI in Taguig City will provide high-capacity cold storage, trading, food processing, and related activities in relation to the mandate of the food terminal. It will reduce postharvest losses and give the farmers a greater share of marketing margin. The recommended production support will enable the farming/sharing sector to respond to the expected increase in demand for PHD food, assuming progress in the consumer-directed campaign by other government departments and other sectors of Philippine society.
4. *Department of Science and Technology.* Within the next two years, we recommend support for R and D on the following priority areas: a) low cost renewable energy and cold storage/transport, b) food technology to convert food commodities into nutritious products, initially for disaster relief and feeding programs, c) understanding the nutritional and functional values of underutilized local species of crops, animals, and sea foods. We also recommend sustaining and expanding the Food Innovation Centers, and support for the development of the envisioned PHD Plus App. The proposed R and D will address the problem of acceptability and enhance nutritional value of alternative

staples and other components of the PHD. It will also address the issue of establishing a robust and low-cost cold chain.

SUMMARY

In summary, we shared the following ideas in this paper:

1. The existing three-step linear food system is dysfunctional.
2. To fix the system, a fourth component (waste management) and circularity need to be established.
3. Responsible consumption is the key to a nourishing and regenerative food system.
4. The broad features of Metro Manila's 2050 food system were introduced

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