

BORLAUG SCHOLAR • REVISED PAPER • APRIL 2026

Obesity and Food Insecurity in the Philippines

A Three-Year Revision

Two crises. One system. Three years to write what should have been said the first time.

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AUTHOR NOTE

On what this paper is, and what it is not.

This is a revision of a paper I submitted to the World Food Prize–Wageningen Youth Institute in December 2022, when I was thirteen. That paper was recognised with the inaugural Borlaug Scholar designation. It also received a detailed reviewer letter from the World Food Prize Board of Reviewers in 2023, naming five substantive criticisms and two open questions. For three years, the recognition stood and the work the reviewers pointed at was deferred. This revision, written at sixteen, is the deferred work.

This paper is a revised academic portfolio paper. It is not peer-reviewed. Twenty-three of approximately seventy-one bibliography entries are flagged [verification pending]: references where the source class is identified and the claim is supported, but the specific publication has not been verified against the actual source at the time of this revision. Source verification is named as the next step in the bibliography note, and is the first rung of the public action ladder on the Filipino Food Systems hub.

The thesis line that earned the original paper its recognition is preserved. The apparatus the original lacked — costed interventions, named stakeholders, geographic and cultural specificity, citation discipline, and a political-economy strategy — is what this revision adds.

What the revision changes, in one page.

This paper is a revision of "Obesity and Food Hunger," submitted to the World Food Prize–Wageningen Youth Institute on 25 December 2022 by the present author at the age of thirteen. The original paper was recognised with the inaugural Borlaug Scholar designation. It also received a detailed feedback letter from the World Food Prize Board of Reviewers, which raised five substantive criticisms: solutions lacked detail, the corporatised food-pantry proposal contradicted the paper's own diagnosis, the research-materials section was decorative rather than analytical, 49% of the paper consisted of quoted or copied source text without proper in-text citation, and two questions on government barriers and citizen levers remained unanswered.

This revision takes each criticism seriously. The thesis of the original paper — that obesity and food insecurity in the Philippines are produced by the same broken food environment, and that food literacy must operate as systemic governance rather than as consumer-side label-reading — is preserved and substantially extended.

The five principal changes

- **Terminology.** "Food insecurity" replaces "food hunger" throughout, with hunger named as one consequence of food insecurity rather than as a synonym for it. Standard public-health vocabulary.
- **Research materials moved into the analytical spine.** Section 2 now uses the cultural and household data to answer the reviewers' question on why women and children are disproportionately at risk, drawing on the first 1,000 days framework and Philippine feeding-hierarchy ethnography.
- **Food-bank model replaced.** The surplus-redistribution model is replaced by an adaptation of Brazil's Programa de Aquisição de Alimentos (PAA-PH): smallholder procurement, NNC nutritional governance, 4Ps household targeting, BNS local distribution. The corporatisation contradiction is resolved structurally.
- **New Section 4 — The broken food environment for young Filipino athletes.** Uses the present author's documented competitive observations from chess (2022–2025) and open-water swimming (2024–2026) to argue that the country-level paradox is mirrored at the level of institutional micro-environments and is intervention-tractable at that scale. Hypothesis-generating rather than confirmed.
- **Citation discipline enforced.** Vancouver-style in-text references at the point of use, ~71 references replacing the original's 9. Twenty-three references are flagged as verification-pending, named honestly rather than fabricated.

The paper concludes that the obesity-and-food-insecurity paradox is best approached through a coordinated set of structural moves anchored in existing Philippine institutions — Barangay Nutrition Scholars, the Pantawid Pamilyang Pilipino Programme, the Department of Agriculture's procurement infrastructure — combined with a public-procurement food system modelled on the PAA and a coalition

strategy modelled on the 2012 Sin Tax Reform Law. Total estimated annual cost at full deployment: PHP 13.8–42.1 billion, against an implicit annual cost-of-inaction of approximately PHP 220 billion.

Each reviewer point, where it is addressed.

The reviewers raised five substantive criticisms and named two questions for further thought. The table below maps each to its location in this revision. A reader with the feedback letter and this paper open side by side can verify the answers section by section.

Reviewer point	Status
Praise: obesity–education–infrastructure connection	Preserved & extended
Praise: food insecurity not material lack	Preserved & extended
Crit 1a — scaling cost data	Addressed (§5.3, §6.12)
Crit 1b — stakeholders	Addressed (§6.2–6.11)
Crit 1c — geographic specificity	Addressed (§4 + §6.2–6.11)
Crit 1d — cultural considerations	Addressed (§6.2–6.11)
Crit 2 — corporatisation contradiction	Addressed (§6.1, table)
Crit 3 — research materials decorative	Addressed (§2 entirely restructured)
Crit 4 — 49% citation gap	Addressed structurally
Crit 5a — barriers to municipal action	Addressed (§7.1)
Crit 5b — citizen-side levers	Addressed (§7.2–7.3)
Closing — don't let curiosity end	Addressed (§9.1, 9.5)

Where status is marked "addressed structurally," the answer is in the paper's architecture and citation practice rather than in a single passage. Twenty-three of approximately seventy-one bibliography entries are flagged [verification pending]: references where the source class is identified and the claim is supported, but the specific publication has not been verified against the actual source at the time of this revision. This honest flagging is the second-best answer; the best answer (full source verification before publication) is named as the next step in the bibliography note.

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Bibliography

Vancouver style; verification-pending entries flagged.

SECTION 1

Introduction.

This section addresses · Sets the nine guiding questions the rest of the paper answers.

The paradox this paper addresses is well-documented. In the same Philippine cities where ultra-processed food is abundant and obesity rates are rising, food insecurity persists in the same neighbourhoods and often in the same households [5,6]. In the same rural municipalities where smallholder farms cover seven million hectares [7], rates of childhood stunting reach 45.2% in the Bangsamoro Autonomous Region [8] and the average household struggles to access nutritionally adequate food [9]. The two crises are not separate. They share an underlying system.

The standard public-health vocabulary for what this paper calls food insecurity is the United States Department of Agriculture's: "access by all people at all times to enough food for an active, healthy life" [10]. People who do not meet this criterion are food-insecure. Hunger is one consequence of food insecurity, but not the only one. Chronic micronutrient deficiency, dietary monotony, and the substitution of cheap ultra-processed energy for nutritionally complete food are also consequences, and they are the consequences that produce the obesity-and-stunting double burden the World Health Organization has documented across middle-income countries [11]. The first 1,000 days from conception to a child's second birthday is the analytical window where these consequences become structural and largely irreversible [1]. This window will recur throughout the paper.

The Philippines is one such middle-income country with the double burden. Its population in late 2022 was approximately 113 million, with 54% urban and 46% rural [12]. Its agricultural sector contributes roughly 9.6% of GDP [13]. Its leading cause of death is cardiovascular disease, accounting for around 35% of all deaths [14]. Its childhood stunting rate has remained essentially flat at 28–30% for thirty years [15]. Its obesity rate, by contrast, has risen sharply: from 7.6% to 14% in children aged 5–10, from 10.7% to 13% in adolescents aged 10–19, and from 37.2% to 38.6% in adults aged 20–59, in the most recent Department of Science and Technology–Food and Nutrition Research Institute (DOST-FNRI) survey cycle [16]. Both trends are accelerating in opposite directions inside the same population.

The original 2022 paper identified this underlying mechanism correctly: that food insecurity in the Philippines is not, in this context, a problem of absolute material lack [17]. It is a problem of access — to nutritionally adequate food, to health education, and to the institutional opportunities that translate access into outcomes. From this diagnosis the original paper proposed a ten-point solution organised around three forms of access: Access to Food (two points), Access to Health Education (three points), and Access to Opportunities (five points). The diagnosis is preserved in this revision unchanged. What this revision adds is the apparatus the original lacked: costed interventions, named stakeholders, geographic and cultural specificity, and a full account of the political-economy barriers that any of these solutions has to navigate.

To make the apparatus visible from the start, this revision is structured around nine guiding questions. Each question maps to one or more of the original paper's ten solution points. Each subsequent section opens by naming which question or questions it answers. The Conclusion walks back through all nine and states, for each, what the paper has concluded — and where the conclusion is supported by published evidence, where it is supported by analytical reasoning from cited frameworks, and where it remains hypothesis-generating.

The nine guiding questions

- Q1.** Why do obesity and food insecurity coexist in the same Filipino households, and why does consumer-side food literacy alone not resolve the coexistence?
- Q2.** Why has the existing surplus-redistribution food-bank model defaulted to ultra-processed food, and is there a model that does not?
- Q3.** Why are women and children disproportionately at risk for food insecurity in the Philippines, and what does the first 1,000 days framework predict for the Bangsamoro stunting cohort?
- Q4.** What are the analytically distinct food environments of Metro Manila informal settlements, the Bangsamoro Autonomous Region, and the Visayan rural smallholder belt, and why does a single intervention design fail across all three?
- Q5.** What does it cost the Philippines, in DALYs and in pesos, to leave the obesity-and-food-insecurity paradox unaddressed at current trajectory — and what would it cost to scale Barangay Nutrition Scholars to full national coverage?
- Q6.** Can the Brazilian Programa de Aquisição de Alimentos public-procurement model be adapted to Philippine institutional context, and what role do biofortification programmes (HarvestPlus rice, IRRI climate-resilient varieties) and existing school feeding programmes (DepEd milk, supplementary feeding) play alongside it?
- Q7.** Why has Philippine nutrition governance defaulted to fragmentation across the LGU, NNC, DOH, and DOA, and what coordination conditions would the proposed interventions require?
- Q8.** What citizen-side coalition strategy moved the 2012 Sin Tax Reform Law against corporate opposition, and what does that case suggest for food-policy advocacy?
- Q9.** Are the food environments of young Filipino athletes — chess halls, basketball courts, swimming pool decks — nutritionally indistinguishable from the broken food environments documented at country level, and is intervention at this micro-scale tractable in ways country-scale intervention is not?

The thesis preserved

The thesis that earned the original paper its Borlaug Scholar designation is preserved here in its original wording, because the wording itself is what the recognition was for:

"The term 'Food Literacy' should go beyond food labels but a systemic governance measure to take corporations and individuals accountable for their routine decisions they make."

The revision is the apparatus to act on that thesis.

Structure of the paper

Section 2 (Country, Household, and the First 1,000 Days) addresses Q3. Section 3 (The Broken Food Environment) addresses Q1. Section 4 (Different Philippine Food Environments) addresses Q4. Section 5 (Cost of Inaction) addresses Q5. Section 6 (Solutions and Recommendations) — the longest section in the paper — addresses Q2 and Q6, and presents the costed, stakeholder-specific revision of all ten original solution points. Section 7 (Political Economy and Implementation) addresses Q7 and Q8. Section 8 (Young Athlete Food Environments) addresses Q9, with the explicit caveat that the section is hypothesis-generating rather than load-bearing. Section 9 (Conclusion) closes by walking back through all nine questions in order. A bibliography of approximately seventy-one Vancouver-style references follows.

SECTION 2

Country, household, and the first 1,000 days.

This section addresses · Q3 — why women and children are disproportionately at risk.

The reviewers raised a specific question about the original paper's structure: the cultural and household data was placed at the front of the paper but not used to answer the questions the data could answer. This section corrects that. The household composition data, the dietary diversity data, the cultural feeding-hierarchy data — all of which the original paper had already collected — are reorganised here as the analytical engine the original lacked.

2.1 The first 1,000 days framework

The most consequential window for human nutritional outcomes is the first 1,000 days from conception to a child's second birthday. Stunting that occurs in this window is largely irreversible by age two [1]. Cognitive development losses associated with chronic micronutrient deficiency in this window persist into adolescence and adulthood [20]. Maternal nutritional status during pregnancy and lactation directly shapes outcomes for the child, and pre-pregnancy maternal status shapes outcomes that propagate to the next generation [1,21]. The Lancet 2013 maternal-and-child nutrition series, which remains the foundational reference for this framework, summarises the mechanism: undernutrition during the 1,000 days produces measurable losses in linear growth, cognitive function, immune competence, and adult productivity that intervention after the window has closed cannot recover [1].

The implication for any analysis of Filipino food insecurity is direct. Snapshots of current child welfare — for example, the 28–30% national childhood stunting rate or the 45.2% Bangsamoro stunting rate — are not snapshots of current conditions. They are the visible consequences of an intergenerational mechanism operating across multiple maternal-and-child nutrition lifecycles. The Bangsamoro stunting cohort of approximately 230,000 children [8] entered their first 1,000 days windows with maternal nutritional status that had itself been shaped by that generation's own first 1,000 days a generation earlier. Interventions that target the current cohort without addressing the maternal layer will produce smaller-than-expected gains. This is the standard finding of the maternal-and-child nutrition literature [1,21].

This is the answer to the reviewers' specific question about why women and children are disproportionately at risk. Women of reproductive age are the carriers of the intergenerational mechanism. Their own nutritional status determines outcomes for the next cohort. In a household where food is limited, the marginal allocation decision — who gets the additional serving, who gets the higher-quality protein, who gets the iron-rich vegetables — does not just affect the woman who eats less now. It propagates forward by twenty years.

2.2 Filipino household feeding patterns

In food-insecure Filipino households, ethnographic and household-survey evidence documents a feeding hierarchy in which working-age men eat first and most, women — particularly pregnant and lactating

women — eat last and least, and young children, particularly girls, receive what remains [22]. This pattern is not unique to the Philippines [23], but its specific texture in Filipino households interacts with three contextual factors that compound the biological window.

Dietary monotony.

The Filipino diet, as documented in the 2018 National Nutrition Survey, derives the majority of caloric and nutrient intake from white rice, pork, and breads [24]. Vegetables, fruit, dairy, and pulses — the food groups that supply the micronutrients most critical to maternal and infant nutrition — appear in low frequency across all income quintiles, and particularly in the lowest quintile where stunting rates are highest [9]. A maternal diet of white rice and small portions of pork delivers calories but not the iron, folate, vitamin A, zinc, and iodine that the first 1,000 days requires.

Water and sanitation infrastructure.

Approximately 8.4 million Filipinos lack access to clean drinking water and 7.5 million lack access to toilets [25]. This is not a peripheral consideration; it is foundational. Diarrhoeal disease driven by unsafe water is one of the strongest predictors of child stunting independent of caloric intake [26], because chronic enteric infection blocks nutrient absorption even when food is adequate. The original 2022 paper noted these statistics. It did not connect them to stunting. The connection is not optional: water-and-sanitation interventions and nutrition interventions are not separate programmes operating in parallel. They are components of the same intervention.

Healthcare access.

PhilHealth coverage is broad in name but inequitable in practice: regional access to basic water services ranges from 62% to 100% across provinces [25], and antenatal care utilisation in the lowest income quintile lags significantly behind the highest [27]. A pregnant woman in a low-income Bangsamoro household receives, on average, fewer prenatal visits, less iron-and-folic-acid supplementation, and lower-quality nutritional counselling than her counterpart in a Metro Manila middle-income household. The first 1,000 days window opens the same way for both children. It closes very differently.

2.3 The Bangsamoro figure decomposed

The 45.2% stunting rate in the Bangsamoro Autonomous Region [8] is the highest of any Philippine region. This is not the consequence of a single failure. It is the convergent outcome of several mechanisms operating together.

The Bangsamoro region has the highest poverty incidence of any Philippine region, with a 2021 poverty rate of approximately 37% against a national rate of 18% [29]. Decades of armed conflict prior to the 2014 Comprehensive Agreement on the Bangsamoro left infrastructure underdeveloped, with sustained underinvestment in roads, water systems, and health facilities [30]. Antenatal care utilisation lags behind national averages: the proportion of pregnant women receiving four or more antenatal visits is materially lower than in Luzon or the Visayas [27]. Coverage of conditional cash transfer programmes (the Pantawid Pamilyang Pilipino Programme, or 4Ps) reaches Bangsamoro households at a lower rate than other regions, due to historical registration gaps [31]. And the cultural and linguistic distance between the

Bangsamoro region — predominantly Muslim, with multiple Mindanao languages spoken — and the Manila-centred, Tagalog-dominant public health communications apparatus reduces the effectiveness of standard nutrition-information campaigns [32].

The 230,000 stunted children represented by this percentage [8] are not a self-contained cohort. They are the visible cohort of a much larger intergenerational pattern, and any intervention intended to reduce the regional stunting rate has to operate at multiple layers simultaneously: maternal nutrition pre-conception and during pregnancy, infant and young child feeding through the first two years, water and sanitation infrastructure, healthcare access, and culturally-adapted communications.

2.4 What the household data was telling the original paper

The household composition data in the original paper — average household size of 4.1 persons, the bungalow as the dominant house style, the white-rice-and-pork dietary pattern — was not arbitrary scaffolding to satisfy a rubric. Each data point connects directly to one or more of the mechanisms above. The 4.1-person household size shapes feeding-hierarchy outcomes: in a household of four, the pregnant or lactating woman's reduced share of available food is more consequential per capita than in a smaller household. The dominance of white rice and pork shapes maternal micronutrient adequacy. The Philippine household pattern of women bearing primary responsibility for food preparation interacts with the feeding hierarchy and with the time-compression effect addressed in Section 4 below.

The original paper had this data and did not connect it. The connections are the section above. Section 3 turns from the demographic and household structure of the problem to the food environment that produces the country-level paradox.

SECTION 3

The broken food environment.

This section addresses · Q1 — why obesity and food insecurity coexist; why consumer-side food literacy is insufficient.

The Philippines is grappling with severe malnutrition across both sides of the double burden. On the undernutrition side: nearly thirty years without meaningful improvement in childhood stunting [9]; one in three children under five suffers from stunting [15]; 42.4% of children from households in the poorest income quintile are stunted [9]; the Bangsamoro figure of 45.2% as documented in Section 2 [8]. On the overnutrition side: childhood obesity rising from 7.6% to 14% in five years among 5–10-year-olds, adolescent obesity rising from 10.7% to 13%, and adult obesity from 37.2% to 38.6% [16]. Cardiovascular disease is the leading cause of death, accounting for approximately 35% of all mortality [14]. Across both sides of the burden, the trajectory is wrong.

3.1 Cheap calories versus nutritionally adequate food

The two sides of the burden share a single mechanism: the food economy makes cheap calories easier to access than nutritionally adequate food. This is not unique to the Philippines [11], but the texture of how it operates in Philippine household contexts is specific. Sweetened beverages, instant noodles, pre-packaged biscuits and crackers, sweetened breads, processed cheese-flavoured snacks, and at the better-resourced end of the income distribution fast-food meals — all are cheap on a calories-per-peso basis, all are shelf-stable, all require little or no preparation time, and all are sold through retail infrastructure (sari-sari stores, mall-anchor fast-food chains, cinema concessions) that is densely distributed at neighbourhood level. The UNICEF Philippines analysis [44] documents that the Philippine ultra-processed food market grew at compound rates of 6–10% across the five-year period to 2019, and that fast-food transactions are dominated by burgers (58% of all fast-food transactions).

Nutritionally adequate alternatives — fresh produce, eggs, fish, unsweetened dairy, legumes, whole grains — are not absent from Philippine retail. They are simply more expensive on a calories-per-peso basis, less shelf-stable, and require preparation time that low-income working households often do not have. In Metro Manila informal settlements where female workforce participation is high and household cooking infrastructure is limited (single-burner kerosene or LPG stoves, limited refrigeration), the time and equipment cost of cooking from raw ingredients shifts the marginal household decision toward ultra-processed alternatives even when household income would, in principle, support a healthier purchase pattern.

3.2 Why consumer-side food literacy is insufficient

If the food environment is the mechanism, then consumer-side food literacy — the international standard public-health response of teaching individuals to read nutrition labels and make better choices — does not address the mechanism. It addresses the symptom. International evidence on health-communications campaigns documents modest standalone effects on actual food behaviour, particularly when campaigns

operate against a structural environment that makes the recommended behaviour difficult or expensive [61]. Filipino household contexts are not exceptions to this pattern; they are intensifications of it, because the structural barriers (price, time, retail access, household infrastructure) operate more strongly than in higher-income contexts.

This is what the original 2022 paper meant by its thesis line: that food literacy must go beyond consumer-side label-reading and operate as systemic governance. The revision in Section 6 below operationalises that thesis through three layers — regulatory food literacy at the food-industry level, institutional food literacy at the school, workplace, and Barangay Health Station level, and civic food literacy through accessible public reporting on food-system performance. Each layer addresses a different part of the mechanism. None of them is consumer-side label-reading alone.

SECTION 4

Different Philippine food environments.

This section addresses · Q4 — three analytically distinct contexts; one intervention design will fail in two of them.

The original paper treated "the Philippines" as a single context. This is a significant simplification. Any policy intervention designed for one Philippine context will, on the available evidence, succeed in that context and fail in the others. This section describes the three contexts the paper distinguishes throughout the rest of its analysis.

4.1 Metro Manila informal settlements

High population density (parts of Tondo, Manila exceed 80,000 persons per square kilometre [33]). High availability of cheap ultra-processed food, with sari-sari stores and fast-food outlets densely distributed at the neighbourhood level. Low household food-preparation infrastructure: many informal-settlement households cook on single-burner kerosene or LPG stoves, with limited refrigeration. High female workforce participation that compresses the time available for food preparation, increasing reliance on prepared and ultra-processed alternatives [34]. Strong proximity to municipal health systems, with Barangay Health Stations and Barangay Nutrition Scholar coverage relatively dense. The paradox here is acute: food is everywhere, but nutritionally adequate, time-feasible food is selectively absent.

4.2 Bangsamoro Autonomous Region

Lower population density. Weaker physical infrastructure, with longer farm-to-market roads, lower rural electrification, and lower piped-water coverage. Distinct cultural feeding patterns shaped by Islamic dietary law, with halal availability constraining some of the protein options that dominate Luzon and the Visayas. Linguistic and cultural distance from the Manila-centred health communications apparatus, as noted in Section 2. The highest stunting rate in the country. Interventions designed for Metro Manila — for example, public information campaigns that run primarily in Tagalog, or that depend on dense Barangay Health Station coverage — do not transfer here without substantial adaptation.

4.3 Visayan rural smallholder belt

Agricultural dominance, with smallholder farms below the national average size of 1.29 hectares [7]. Climate-vulnerable rice and corn dependence, with documented yield losses to typhoon damage in recent years [35]. Significant out-migration of working-age adults to urban Visayan centres or overseas, leaving an older population in farming households with reduced labour capacity [36]. The food environment here is structurally different from both urban and Bangsamoro contexts: smallholder farms grow staples partly for sale and import processed food for household consumption, the inverse of the pattern most observers expect from agricultural regions [28]. Interventions in this context have to address the agronomic supply side as well as the consumption side.

4.4 The intervention-transferability problem

These three contexts share the underlying paradox the original paper identified. They differ enough that any single intervention design will succeed in one and fail in the other two. Section 6 returns to this point in operational detail when the original paper's ten solution points are revised against geographic specificity. The principle is simple: a national programme that does not differentiate between these three contexts at the design stage will, in implementation, behave as a national programme designed for one of them and rolled out badly in the other two.

SECTION 5

Cost of inaction.

This section addresses · Q5 — DALYs, pesos, and the cost of scaling Barangay Nutrition Scholars.

5.1 The cost-of-inaction frame

The most direct cost estimate is provided by Nutrition International, which calculates that without additional interventions, the cost of malnutrition to the Philippine economy is approximately USD 4 billion annually [18]. This figure includes lost productivity from stunting-related cognitive deficits, healthcare costs from diet-related non-communicable disease, premature mortality, and reduced earnings across the working lifetime of affected cohorts. The estimate uses standard health-economics methodology applied to Philippine demographic data.

USD 4 billion annually translates, at the 2022 average exchange rate of approximately PHP 55 per USD, to PHP 220 billion — roughly 1.0% of Philippine GDP in the same year [13]. This is not a marginal sum. It is, in cost-of-inaction terms, the implicit annual subsidy the Philippine economy is paying for not addressing the obesity-and-food-insecurity paradox.

The DALY (Disability-Adjusted Life Year) framework provides a complementary view. DALYs combine years of life lost to premature mortality with years lived with disability, weighted by severity [37]. Philippine DALY estimates from undernutrition-related causes (stunting, micronutrient deficiency, low birthweight) and overnutrition-related causes (cardiovascular disease, diabetes, obesity-attributable cancers) together account for a substantial share of total Philippine disease burden [38]. The Disease Control Priorities (DCP3) framework [37,39] provides cost-effectiveness benchmarks for nutrition interventions: vitamin A supplementation, iron-folic acid supplementation in pregnancy, zinc treatment for diarrhoea, and salt iodisation are each documented in the international literature as among the most cost-effective interventions in any health domain, with cost-per-DALY-averted figures often below USD 100 [39].

5.2 The cost of scaling Barangay Nutrition Scholars

The original paper proposed that Barangay Nutrition Scholars should be the operational backbone of urban food-bank management and rural health-education campaigns. The reviewers asked what this would cost. This subsection provides a defensible estimate.

The Barangay Nutrition Scholar (BNS) Programme is mandated under Presidential Decree No. 1569 (1979), which requires the deployment of at least one BNS in every barangay in the country [40]. The Philippines has approximately 42,000 barangays. As of recent reports, BNS coverage is incomplete: the National Nutrition Council estimates that approximately 30,000 BNSs are currently active, leaving a coverage gap of roughly 12,000 barangays [41]. The annual operational cost per BNS — including stipend, training, materials, and supervision — is published by NNC at approximately PHP 25,000–35,000 per BNS per year, varying by region [42].

Closing the BNS coverage gap to full national deployment, on these published figures, would cost on the order of PHP 300–420 million annually ($12,000 \text{ BNSs} \times \text{PHP } 25,000\text{--}35,000$). This is approximately 0.14–0.19% of the PHP 220 billion annual cost-of-inaction figure derived above. The cost-benefit ratio is, on the face of it, favourable to the intervention by approximately three orders of magnitude.

This estimate has limitations. It assumes the marginal BNS in a currently uncovered barangay is as effective as the average BNS in covered barangays, which is unlikely to be true: the uncovered barangays are disproportionately remote, lower-density, and harder to reach. It also assumes that operational cost scales linearly with BNS count, which understates the supervisory and training overhead of expansion. A more realistic estimate would adjust upward by approximately 30–50% to account for these factors, yielding PHP 400–630 million annually. Even at the upper bound, the ratio to the cost-of-inaction figure remains favourable by more than two orders of magnitude.

5.3 What cost framing changes about the diagnosis

The cost-of-inaction framing reframes the obesity-and-food-insecurity paradox from a moral problem to a fiscal one without losing the moral weight. The Philippine government is implicitly paying approximately 1% of GDP annually to not address this paradox. The interventions that would address it — at least the foundational, well-evidenced ones such as iron-folic acid supplementation in pregnancy, salt iodisation, BNS coverage expansion — cost in the aggregate a small fraction of that implicit subsidy.

The original paper's call for "systemic governance" is therefore not an abstract aspiration. It is a fiscally-grounded policy claim: the structural intervention is the cheaper path. The remaining question is what specific structural interventions the evidence supports and how they would be implemented. Section 6 addresses the first half of this question. Section 7 addresses the second.

SECTION 6

Solutions and recommendations, costed and stakeholder-specific.

This section addresses · Q2 — why surplus-redistribution food banks fail; alternative model. Q6 — PAA-PH adaptation, biofortification, school feeding.

This is the longest section of the paper. It revises each of the original 2022 paper's ten solution points, organised under the three Access pillars. Each point is rewritten with: a named lead institution, a defensible cost estimate or cost range drawn from cited Philippine sources, geographic specificity for the three contexts identified in Section 4 (Metro Manila informal settlements, Bangsamoro Autonomous Region, Visayan rural smallholder belt), cultural considerations, and an opportunity-cost comparison with the next-best alternative where the literature supports such comparison.

A structural change at the centre of this section is the replacement of the original food-bank model — the surplus-redistribution model the reviewers correctly criticised — with a Philippine adaptation of the Brazilian Programa de Aquisição de Alimentos (PAA). The first subsection lays out this replacement.

6.1 The food-bank model the reviewers criticised, and the model that replaces it

The reviewers identified an internal contradiction in the original paper. The paper documented that existing food banks act as warehouses for ultra-processed food donated by manufacturers, distributors, retailers, and food-service establishments. The paper then proposed scaling this same pipeline by partnering with the corporations that supply it. Both positions cannot be held.

The fix is not to abandon food banks. The fix is to specify which model of food bank.

Three real-world food-bank models exist in the international literature. The surplus-redistribution model — the model the original paper described and the reviewers criticised — accepts donations of near-expired or unwanted product from corporate donors. The nutritional quality of what circulates through this model is determined by what the donors want to dispose of, and the available evidence is that this is disproportionately ultra-processed and shelf-stable [49]. The fresh-rescue model, used by City Harvest in New York and FareShare in the United Kingdom, redirects perishable produce, dairy, and prepared meals from farms and restaurants under nutritional governance [50,51]. The nutritional quality is materially better than the surplus-redistribution model, but the operational complexity (cold chain, short timelines, distributed pickup) is also higher. The public-procurement model, of which the strongest live example is Brazil's Programa de Aquisição de Alimentos (PAA), is a government programme that buys directly from smallholder farmers at minimum guaranteed prices and routes the food to schools, daycare centres, food-insecure households, and hospital networks [2,3].

Dimension	Surplus-redistribution model	Brazilian PAA model
Supply side	Corporate donors disposing of	Smallholder farmers selling at

	unwanted product	guaranteed prices
Nutritional governance	None or weak	National nutritional criteria specifying fresh staples
Profit logic for supplier	Tax deduction or disposal-cost avoidance	Guaranteed market and farmer income stabilisation
Distribution	Charitable pantries serving food-insecure households	Schools, daycare, hospitals, plus pantries
Quality of food circulated	Disproportionately ultra-processed	Fresh produce, staples, legumes, dairy

The PAA model has been independently evaluated for over a decade, with documented effects on smallholder farmer income [3], school nutrition outcomes [52], and rural food security in the regions where it operates [53]. It is not without limitations: programme reach has fluctuated with Brazilian federal budget cycles, and rural areas with weakest agricultural infrastructure have benefitted less than well-organised farming regions [54]. These limitations are informative for Philippine adaptation: the Philippine version cannot rely on the existence of strong farmer cooperatives in every region, since Bangsamoro and the most remote Visayan smallholder areas do not have this baseline.

A Philippine adaptation of the PAA — call it PAA-PH — would have the following institutional shape:

- **Procurement authority** — Department of Agriculture, leveraging existing procurement channels for the Department of Education school feeding programme [55]. Annual procurement budget of approximately PHP 5–8 billion in initial phase, scaling to PHP 15–20 billion at full deployment, drawn from a combination of Department of Agriculture, Department of Education, Department of Health, and conditional cash transfer (4Ps) budget lines [31,55].
- **Nutritional governance authority** — National Nutrition Council, setting and revising the criteria for what foods qualify for procurement (fresh produce, eggs, fish, dairy, whole grains, legumes), excluding ultra-processed alternatives by definition.
- **Local distribution** — Barangay Nutrition Scholars in each barangay, integrated with the Department of Health Barangay Health Stations.
- **Household targeting** — Existing 4Ps conditional cash transfer infrastructure, which already identifies eligible low-income households and could be expanded to deliver food vouchers redeemable for PAA-PH-procured food at participating barangay outlets.

Crucially, the PAA-PH model does not propose corporate partnerships in the procurement layer. The whole logic of the model is that smallholder farmers, not food multinationals, are the supply side. Corporate partnership is reserved — if at all — for cold-chain logistics and warehousing, where it does not contaminate the nutritional governance of what is procured.

6.2 Original Solution Point A1 — Food banks managed by municipality / BNS

Original 2022 wording: "Provide access to sustainable and healthy foods in urban areas through food banks managed by municipality (or through the already established Barangay Nutrition Scholars)."

Revised: This solution point is operationalised through PAA-PH as described in §6.1, with the Barangay Nutrition Scholars as the local distribution layer. Stakeholders: Department of Agriculture (procurement), National Nutrition Council (nutritional criteria), Department of Social Welfare and Development (4Ps targeting infrastructure), Local Government Units (operational coordination), Barangay Nutrition Scholars (local distribution), Department of Health (Barangay Health Station integration). Smallholder farmer cooperatives where they exist; individual smallholders where they do not. Cost: PHP 5–8 billion in initial-phase annual procurement, scaling to PHP 15–20 billion at full deployment. Operational overhead adds approximately PHP 1.5–2.5 billion annually. Total PHP 6.5–22.5 billion depending on phase. Compared against the PHP 220 billion annual cost-of-inaction [18], the ratio is favourable by approximately 10–30×.

6.3 Original Solution Point A2 — Incentivise farmlands and farming-technology innovation

This is the supply-side complement to PAA-PH, combined with biofortification and climate-resilience programmes. Stakeholders: Department of Agriculture (lead), International Rice Research Institute for climate-resilient rice variety development [56], HarvestPlus for biofortified crop programmes — zinc rice, iron rice, vitamin A cassava — under DA's existing research and extension framework [57]. Direct procurement-side incentives are delivered through PAA-PH (covered in §6.2). Additional research and extension programmes for biofortification and climate-resilient varieties: existing DA-IRRI-HarvestPlus collaborations have published budget envelopes in the range of PHP 800 million to PHP 1.5 billion annually [57,58]. Climate adaptation investment is more expensive — irrigation rehabilitation, farm-to-market roads, and post-harvest infrastructure — but these investments are justified independently of the obesity-and-food-insecurity paradox and should not be charged solely against the cost-of-inaction figure used here.

6.4 Original Solution Point B1 — Educational awareness for urban populations

Reframed away from broadcast public-information campaigns (which the international literature on health behaviour change documents as having modest effects on actual food behaviour [61]) toward institutionally-embedded nutrition information delivered through existing touchpoints with urban Filipino households. Stakeholders: Department of Health, Department of Education, Department of Social Welfare and Development, Barangay Health Stations, employer-based wellness programmes. Estimated incremental cost PHP 200–500 million annually. The larger cost item is the opportunity cost of not constraining ultra-processed food advertising, particularly to children. Advertising regulation is fiscally near-zero in direct cost but politically expensive (Section 7 returns to this).

6.5 Original Solution Point B2 — Rural awareness on infrastructure, sanitation, and farming

This solution point combines water-and-sanitation behaviour change with agricultural extension. The two are operationally linked because Barangay Nutrition Scholars and Department of Agriculture extension

workers are the primary touchpoints for both in rural Filipino contexts. Cost embedded in BNS operational expansion and DA extension service strengthening. Incremental annual cost estimated at PHP 300–700 million. Visayan smallholder belt and Bangsamoro region as primary targets.

6.6 Original Solution Point B3 — Food literacy across urban and rural populations

This is the solution point that connects most directly to the original paper's thesis line — food literacy as systemic governance, not consumer-side label-reading. The revised operationalisation has three components.

Component one: regulatory food literacy.

Front-of-pack nutrition labelling, advertising regulation for ultra-processed food (particularly to children), and procurement-side nutritional governance (the PAA-PH criteria function as a form of regulatory food literacy at the supply chain level). Stakeholders: Department of Health, Food and Drug Administration, Department of Agriculture, Bureau of Customs. Cost: low direct, high political (Section 7).

Component two: institutional food literacy.

School-based curriculum on nutrition (already partially in place under DepEd's MAPEH and EsP curricula but expandable), workplace wellness programmes, Barangay Health Station counselling. Stakeholders: Department of Education, Department of Labor and Employment, Department of Health. Cost: estimated PHP 400–900 million annually for curriculum development and teacher training.

Component three: civic food literacy.

Public reporting on food-system performance (national stunting rate, obesity rate, food-system imports, ultra-processed food market share), accessibility of nutrition data through PSA and DOST-FNRI publications, and public-facing platforms that surface this information for ordinary citizens. Cost: low — this is mostly a question of making existing data more accessible.

6.7 Original Solution Point C1 — Rural water and farmland infrastructure

This is the largest cost line item in the paper. The estimated investment required to bring rural water and farmland infrastructure to a level supporting both PAA-PH supply-side function and stunting-reduction-relevant water-and-sanitation infrastructure is on the order of PHP 50–150 billion across a 10-year horizon, depending on programme ambition and geographic targeting (PHP 5–15 billion annually). Stakeholders: Department of Public Works and Highways, Local Water Utilities Administration, Department of Agriculture (irrigation), National Irrigation Administration, Department of Agrarian Reform, Local Government Units. The paper does not argue that this investment is justified solely by the cost-of-inaction figure for nutrition; it argues that the nutrition-relevant components of this investment are justifiable against the nutrition cost-of-inaction figure even before the broader macroeconomic benefits are counted.

6.8 Original Solution Points C2 and C3 — Sustainability criteria; profitable business models

Operationalised as the PAA-PH nutritional governance criteria set by the National Nutrition Council. The reviewers flagged C3 as connected to the corporatisation contradiction. In the PAA-PH framing, the criteria operate at the procurement layer rather than at the donation-acceptance layer, which removes the contradiction structurally rather than rhetorically. PAA-PH is profitable for smallholder farmers (guaranteed prices stabilise income), for the government (the cost is favourable against cost-of-inaction by 10–30×), and for the public. It is not designed to be profitable for ultra-processed food manufacturers, and it explicitly removes those manufacturers from the supply side where the original paper's framing accidentally retained them.

6.9 Original Solution Point C4 — Establish the roles of Barangay Nutrition Scholars

BNS roles are defined under PD 1569 [40] but the operational scope envisioned by the original paper — local food-bank distribution, food-literacy outreach, water-and-sanitation behaviour change, integration with Barangay Health Stations — exceeds the current standard role definition. The revision recommends that the National Nutrition Council, in coordination with DOH and DILG, develop an updated BNS role specification covering: local distribution layer for PAA-PH; household-level outreach for nutrition information; maternal-and-infant nutrition counselling at Barangay Health Stations; coordination with DA extension workers in rural barangays; reporting of barangay-level nutrition indicators to NNC. Cost: BNS coverage expansion (\$5.2) plus role-expansion training and supervision (estimated PHP 100–200 million annually). Total PHP 500–830 million annually.

6.10 Original Solution Point C5 — Tie up to the Interagency Task Force on Zero Hunger

The Interagency Task Force on Zero Hunger (Executive Order No. 101, 2020) is the existing national coordination body for hunger-related programmes [64]. Its mandate covers coordination across DA, DOH, DSWD, DepEd, and other agencies. The revision recommends that the operational interventions described in §6.1 through §6.9 be formally lodged as components of the Task Force's programme architecture. Coordination costs: PHP 50–150 million annually for secretariat operations and inter-agency coordination at the level of intensity required for the proposed programmes.

6.11 Aggregate cost summary

Solution point	Annual cost (PHP) at full deployment
A1 / 6.2 — PAA-PH procurement and distribution	6.5 – 22.5 billion
A2 / 6.3 — Farming tech, biofortification, climate-resilient varieties	0.8 – 1.5 billion (research); separate infrastructure capex
B1 / 6.4 — Urban awareness, advertising regulation	0.2 – 0.5 billion
B2 / 6.5 — Rural awareness, water-and-sanitation behaviour	0.3 – 0.7 billion

B3 / 6.6 — Food literacy across three components	0.4 – 0.9 billion
C1 / 6.7 — Rural water and farmland infrastructure	5 – 15 billion (over 10-year horizon)
C2 / 6.8 — Sustainability criteria / profitable models	0.05 billion (covered under \$6.1)
C4 / 6.9 — BNS coverage and role expansion	0.5 – 0.83 billion
C5 / 6.10 — Task Force coordination	0.05 – 0.15 billion
TOTAL	PHP 13.8 – 42.1 billion annually

Compared against the cost-of-inaction figure of approximately PHP 220 billion annually [18], the proposed intervention package represents 6–19% of the implicit annual cost the Philippine economy is currently paying for the obesity-and-food-insecurity paradox. The cost-benefit ratio is favourable by approximately 5–15× even on conservative assumptions. The international cost-effectiveness benchmarks [37,39] suggest that this estimate likely understates the benefit, since Philippine baseline conditions are toward the more intervention-responsive end of the global distribution.

The remaining question is not whether the interventions are fiscally justified — they are, by a substantial margin — but whether the political-economy conditions for their implementation can be created. Section 7 addresses this question.

SECTION 7

Political economy and implementation.

This section addresses · Q7 — why nutrition governance is fragmented. Q8 — citizen-side coalition strategy from the 2012 Sin Tax case.

The reviewers asked these as questions for further thought. They are also the questions on which the entire intervention package described in Section 6 stands or falls. Without coordination, the interventions implement as agency-by-agency programmes with the documented Philippine pattern of fragmentation [65]. Without citizen-side support, the ultra-processed food advertising regulation that anchors regulatory food literacy (§6.6) faces sustained corporate opposition without political counterweight.

7.1 The fragmentation hypothesis

Philippine nutrition governance is not under-resourced in absolute terms relative to its delivery outcomes. The total budget across nutrition-relevant agencies — DA, DOH, DSWD, DepEd, NNC, and others — is in the range of several hundred billion pesos annually, of which a meaningful share is nutrition-relevant either directly or as overhead [66]. The persistent stunting rate of 28–30% across thirty years [9,15] is therefore not principally a budget problem. It is a coordination problem.

The coordination problem has structural causes. Nutrition-relevant programmes are owned by different cabinet secretaries with different budget cycles, different KPIs, and different political constituencies. The DA owns agricultural production and procurement. The DOH owns Barangay Health Stations and supplementation programmes. The DSWD owns 4Ps. The DepEd owns school feeding. The NNC has cross-agency nutrition mandate but operates without independent budget at the scale of the agencies it coordinates. The DILG has Local Government Unit oversight, and LGUs have substantial autonomy under the 1991 Local Government Code (Republic Act 7160) [67] and its expanded fiscal autonomy under the 2018 Mandanas-Garcia Supreme Court ruling [68]. Each component agency operates with internally rational logic. The cross-agency outcome is the documented fragmentation.

The 4Ps conditional cash transfer programme is instructive as a counter-example. 4Ps works as a coordinated national programme because it has a single owner (DSWD), a single delivery mechanism, a single conditional structure, and a single budget line [31]. It does not work better than the fragmented programmes because it has more money — its annual budget of approximately PHP 110 billion [31] is comparable to or smaller than the aggregate nutrition-relevant spending across the multiple fragmented programmes. It works better because its institutional ownership is consolidated.

The fragmentation hypothesis is not the only available explanation for persistent Philippine nutrition outcomes. At least three alternatives are plausible. First, absolute funding may be inadequate: aggregate nutrition-relevant spending may appear substantial in pesos but be insufficient relative to the scale of the population and geographic distribution it has to reach. Second, the binding constraint may sit at the LGU implementation level rather than at the cabinet-coordination level — even a perfectly coordinated national programme delivers nothing if individual LGUs lack the staffing, training, or political will to

execute it. Third, ultra-processed food industry political-economy pressure may be the dominant force shaping policy outcomes, with fragmentation a symptom of this pressure rather than an independent cause. The paper foregrounds the fragmentation explanation because the 4Ps counter-example provides the strongest available empirical anchor for it, and because consolidating institutional ownership is operationally tractable in ways that increasing total funding or restructuring industry political influence are not. The other explanations remain live and would benefit from dedicated study.

7.2 The citizen-lever case: the 2012 Sin Tax Reform Law

The strongest empirical case in recent Philippine history for civil-society advocacy moving a corporate-protected status quo is the 2012 Sin Tax Reform Law (Republic Act 10351). The law restructured tobacco and alcohol excise taxes, increasing tobacco tax revenue substantially and using the additional revenue to fund the Universal Health Care programme that became Republic Act 11223 in 2019 [69]. Tobacco and alcohol industry opposition to the reform was sustained, well-funded, and ultimately unsuccessful [70].

The coalition that moved the law had a specific composition. The Department of Health under Secretary Enrique Ona was the Cabinet-level driver. Health-professional associations — the Philippine Medical Association, the Philippine College of Physicians, the Philippine Society of Public Health Physicians, and others — provided technical legitimacy and public-facing voice. Faith-based organisations, particularly the Catholic Bishops' Conference of the Philippines, provided moral authority and reach into local communities. Parent organisations and youth groups provided the affected-population narrative. International public-health organisations (WHO, the Bloomberg Initiative for tobacco control) provided technical and financial support behind the scenes [71]. Academic institutions, particularly the University of the Philippines Manila and Ateneo de Manila University, provided research and policy analysis.

The 2012 coalition's tactics were also instructive. Sustained public information campaigns on the health costs of tobacco. Direct engagement with legislators, particularly health committee members. Use of the Universal Health Care framing to connect the tax reform to a positive narrative (better healthcare for all Filipinos) rather than a purely punitive narrative (tobacco is bad). Persistence across multiple legislative cycles before the law passed.

For ultra-processed food and food-system reform in the Philippines today, the Sin Tax case is the closest available analogue. The opposition is similar in structure: a politically-organised, well-resourced industry with sustained advertising and lobbying capacity. The required coalition is similar: health professionals, faith-based organisations, parent and youth groups, academic institutions, and a Cabinet-level driver. The narrative framing has to be similarly positive: not "ultra-processed food is bad" alone, but "Filipino families deserve transparent information and structurally-supported access to nutritionally adequate food."

7.3 The translation to food-system reform

A food-system reform coalition in the Philippines today would, on the Sin Tax analogue, have the following composition: a Cabinet-level driver (Secretary of Health and/or Secretary of Agriculture, with NEDA support); technical legitimacy from the Philippine Society of Public Health Physicians, Philippine Pediatric

Society (essential for the children-as-affected-population narrative), Nutritionist-Dietitians Association of the Philippines, DOST-FNRI, and University of the Philippines Manila and Ateneo de Manila academic faculty; moral authority from the Catholic Bishops' Conference of the Philippines, with Bangsamoro Islamic religious leadership for the Bangsamoro context and major Protestant and Iglesia ni Cristo leadership where relevant; affected-population voice through parent organisations, the Department of Education, youth-led organisations, and Filipino sports federations (which connects the Section 8 sport-science argument back into the political-economy frame); international support from WHO, UNICEF Philippines, FAO, Bloomberg Philanthropies, and Helen Keller International; civil-society infrastructure through existing Philippine NGOs working on food security and nutrition.

The narrative framing matches the Sin Tax structure. Proposed framing: "Filipino families deserve to feed their children well. The food system today does not let them. This reform makes it possible." This framing connects to Filipino cultural values around family and child welfare that are widely shared across regional, religious, and class lines, and avoids the punitive framing that mobilises corporate opposition without mobilising countervailing public support.

The legislative agenda for such a coalition would include: front-of-pack nutrition labelling regulation (FDA, DOH); restrictions on ultra-processed food advertising to children (Department of Trade and Industry, DOH, advertising-industry self-regulatory body); statutory authorisation for PAA-PH as a national programme (DA, DBM, Office of the President); National Nutrition Council institutional strengthening with cross-agency coordination authority; sin-tax-style fiscal measure on ultra-processed food categories with revenue earmarked for nutrition programmes.

Each of these is politically expensive and faces sustained corporate opposition. The Sin Tax case shows that all of them are achievable on a 5–10 year horizon with the right coalition and the right framing. None of them is achievable through agency-by-agency administrative action alone. Food-system reform faces a more fragmented industry opposition than tobacco — ultra-processed food encompasses many manufacturers, importers, and distributors rather than a small number of dominant players — and may therefore require an even longer advocacy horizon.

SECTION 8

Young athlete food environments.

This section addresses · Q9 — whether young-athlete food environments mirror the country-level paradox; whether micro-scale intervention is tractable. Hypothesis-generating, not the load-bearing argument.

This section presents an analysis that did not exist in the original 2022 paper. It is also the section in which the present author's competitive-athlete experience is brought to bear as observational evidence, properly framed as the autobiographical observational notes that they are.

Reading note. *The country-level argument in Sections 1 through 7 is the load-bearing argument of this paper. Section 8 is hypothesis-generating. The observations are not systematic primary data. The conclusion the section reaches is that a systematic study is warranted, not that the hypothesis is confirmed. A reader pressed for time can skip directly to Section 9 without losing the paper's core argument.*

8.1 The hypothesis

Filipino young athletes — and athletes in adjacent Southeast Asian countries — train in food environments that are, on the available evidence, nutritionally indistinguishable from the broken food environments documented at country level for the general population. The same dominance of ultra-processed convenience food. The same low frequency of vegetables, fruit, and dairy. The same substitution of cheap energy-dense foods for nutritionally complete meals. The fact that this population is composed of children and adolescents in active training does not exempt the food environment from the patterns documented in earlier sections; it intensifies their consequences.

If the hypothesis is correct, two implications follow. First, Filipino young-athlete nutrition policy is currently failing to deliver the basic conditions that the IOC Consensus Statement on Sports Nutrition [43] identifies as foundational for long-term athletic development. Second, the institutional micro-environments where young athletes train — chess tournament halls, basketball gymnasiums, swimming pool decks — are intervention-tractable in ways that country-level food environments are not. Each tournament has organisers who order food. Each training session has a coach who can advise. Each athlete-parent dyad makes purchasing decisions that respond to information. The intervention surface area at the institutional micro-scale is large.

8.2 Methodological framing of the observations

The author has competed in classical chess across Philippine and international tournaments from 2022 to 2025, and in competitive open-water and pool swimming from 2024 to 2026. Across this period, the food environments of these tournaments and training facilities have been observed informally. These observations are not systematic. They were not collected to a research protocol. The author is the observer, the participant, and the source of the framing — none of which independently invalidates the observations, but all of which makes them autobiographical rather than ethnographic. They are presented

here for what they are: hypothesis-generating observations from one young athlete's documented experience.

The paper's claim is therefore the weaker of the two available claims: not that these observations prove the food environments of Filipino young athletes are systematically broken, but that they are sufficient to raise the hypothesis that they are, and to motivate the systematic study that would confirm or refute it.

8.3 The food environment of the chess tournament

The classical chess tournament hall is, on the author's observations, dominated by ultra-processed convenience food. The food available to players during rounds — at concession stands inside the venue, at adjacent stalls, or supplied by parents and organisers — is overwhelmingly composed of the food categories the UNICEF Philippines analysis [44] identifies as the dominant drivers of rising obesity: sweetened beverages, instant noodles, pre-packaged biscuits and crackers, sweetened breads, processed cheese-flavoured snacks, and at the better-resourced tournaments, fast-food deliveries. Whole food — fresh fruit, unsweetened dairy, vegetables, eggs, lean meat — appears rarely and almost never as the default option.

The cognitive demands of classical chess are substantial. Games can last four to six hours. The IOC Consensus Statement [43] and the broader sports-nutrition literature [46] are consistent on the point that cognitive performance at this duration responds materially to nutritional inputs: stable blood-glucose maintenance, hydration, and adequate protein intake all affect sustained concentration. The food environment of the typical Philippine chess tournament does not deliver these inputs reliably. This is not a failure of organisation. The organisers of these tournaments are doing what is normal in their cultural and economic context. The food on offer is the food on offer in the surrounding food environment. The chess hall is not separate from the broken food environment Section 3 documented; it is a small, bounded instance of it.

8.4 The food environment of competitive swimming

The food environment of Philippine and Southeast Asian competitive swimming, on the author's observations from open-water and pool training and competition between 2024 and 2026, shows a slightly different pattern with the same underlying logic. Pre-training and pre-race nutrition is more often discussed at swimming venues than at chess tournaments — the energy demands of swimming are immediately visible to coaches and parents in a way the cognitive demands of chess are not. But discussion of nutrition is not the same as access to appropriate nutrition. The food actually available at training facilities, swimming meets, and open-water race venues remains dominated by the same categories.

8.5 Why the micro-environment is intervention-tractable

The country-level food environment documented in earlier sections is hard to intervene in. Hundreds of thousands of barangays. Millions of households. Tens of thousands of sari-sari stores. The intervention surface area is enormous and the institutional ownership is fragmented (Section 7 above).

The young-athlete food environment is the opposite. A Philippine national chess tournament involves perhaps two hundred players, ten organisers, one venue, one set of food vendors. A regional swimming meet involves perhaps three hundred athletes, twenty coaches, one or two venues, a small set of organising sponsors. Intervention at this scale is operationally tractable in ways country-level intervention is not. Three intervention designs are immediately available: organiser-level food procurement standards for Philippine youth tournaments; coach- and parent-level nutrition information delivered through existing personal-training certification curricula; and athlete-level nutritional self-management as part of competitive development.

8.6 What this section does and does not claim

The section does not claim that fixing the young-athlete food environment is a sufficient response to the country-level paradox. It is not. The young-athlete population is small, and even a complete intervention in this population would not materially affect the 30% national stunting rate or the 38.6% adult obesity rate. The country-level interventions in Section 6 remain the primary load-bearing recommendations of the paper.

What the section claims is narrower. First, the young-athlete food environment is on the available evidence broken in the same way the country-level food environment is broken. Second, intervention at the institutional micro-scale is tractable in ways country-scale intervention is not, which makes this scale a good place to demonstrate that the broader interventions in Section 6 can work in principle. Third, the costs of micro-scale intervention are small enough that they should not be allowed to crowd out attention to the macro-scale interventions where the bulk of the public-health benefit lies.

The hypothesis stated in §8.1 is open. The systematic study that would confirm or refute it is named in §9.1 as part of the future research agenda. The Tournament Food Audit Checklist in the continuation cluster of the Filipino Food Systems hub is the public tool through which any reader, organiser, or parent can begin testing the hypothesis themselves.

SECTION 9

Conclusion.

This section addresses · Walks back through all nine guiding questions and states confidence levels for each.

The original 2022 paper proposed a ten-point solution to the Philippine obesity-and-food-insecurity paradox under three Access pillars. The thesis line that earned the paper its Borlaug Scholar designation — that food literacy must operate as systemic governance rather than as consumer-side label-reading — is preserved in this revision. The diagnostic insight that obesity and food insecurity in the Philippines are produced by the same broken food environment is preserved. What is added is the apparatus the original lacked: costed interventions, named stakeholders, geographic and cultural specificity, and a political-economy strategy for implementation.

This conclusion walks back through the nine guiding questions. For each, it states the paper's conclusion, classifies that conclusion's evidentiary status, and notes remaining uncertainty.

Q1 — Coexistence of obesity and food insecurity

The coexistence is produced by structural features of the Philippine food environment — the dominance of ultra-processed food in low-cost food provision, the time-and-resource constraints on household food preparation, and the limited availability of nutritionally adequate alternatives in low-income geographic and demographic contexts. Consumer-side food literacy alone does not resolve the coexistence because the structural features remain in place regardless of consumer information level.

Confidence: high.

Q2 — Why surplus-redistribution food banks default to ultra-processed food, and the alternative model

The surplus-redistribution model defaults to ultra-processed food because corporate donors disposing of unwanted product disproportionately donate ultra-processed and shelf-stable items. The Brazilian PAA model represents an alternative that does not default to ultra-processed food, because its supply side is smallholder farmers procured at guaranteed prices and its demand side is governed by national nutritional criteria.

Confidence: high for the diagnosis; medium-high for transferability to Philippine institutional context.

Q3 — Why women and children are disproportionately at risk

Women and children are disproportionately at risk because of the interaction between Filipino household feeding hierarchy patterns, the biological window of the first 1,000 days, and structural gaps in maternal-and-infant nutrition delivery. The first 1,000 days framework predicts that stunting reduction in the Bangsamoro cohort will require interventions targeting maternal nutrition pre-conception and during pregnancy.

Confidence: high for the framework; medium for the specific quantitative predictions.

Q4 — Three analytically distinct food environments

The three contexts (Metro Manila informal settlements, Bangsamoro Autonomous Region, Visayan rural smallholder belt) differ on density, infrastructure, cultural feeding patterns, religious dietary requirements, healthcare access, and supply-side agricultural structure to a degree that requires substantially different intervention designs. A single national intervention design implemented uniformly will succeed in one context and fail in the other two.

Confidence: high for the descriptive characterisation; medium for the precise specification of how interventions should differ.

Q5 — Cost of inaction; cost of scaling BNS

The cost-of-inaction is approximately USD 4 billion annually, equivalent to approximately PHP 220 billion or 1% of Philippine GDP. The cost of scaling BNS coverage to full national deployment is approximately PHP 400–630 million annually, plus role-expansion costs of PHP 100–200 million.

Confidence: high for the magnitudes; medium for precise figures.

Q6 — PAA-PH adaptation, biofortification, school feeding

The PAA model can be adapted to Philippine institutional context with the Department of Agriculture as procurement authority, the National Nutrition Council as nutritional governance authority, the 4Ps infrastructure as household targeting mechanism, and Barangay Nutrition Scholars as local distribution. Estimated annual cost at full deployment: PHP 6.5–22.5 billion for procurement and distribution.

Confidence: medium-high for institutional architecture; medium for cost projections.

Q7 — Why nutrition governance is fragmented

The fragmentation is structural — different cabinet secretaries with different budget cycles, KPIs, and political constituencies — and the necessary coordination condition is consolidated institutional ownership at the Interagency Task Force on Zero Hunger level. The 4Ps programme demonstrates that coordinated national programming can work when ownership is consolidated.

Confidence: high for the diagnosis; medium for the prescription.

Q8 — Citizen-side coalition strategy from the Sin Tax case

The Sin Tax coalition (Cabinet driver + health-professional technical legitimacy + faith-based moral authority + parent and youth groups + international support + academic research) translates to food-system reform with the addition of Filipino sports federations and adapted religious-authority composition. The narrative framing — "Filipino families deserve to feed their children well" — matches the Sin Tax positive-framing approach.

Confidence: medium-high for the coalition structure; medium for timeline and political conditions.

Q9 — Young Filipino athletes' food environments

On the author's observations from competitive chess and swimming combined with sports-nutrition literature, the food environments of young Filipino athletes appear nutritionally indistinguishable from the country-level food environments. Intervention at the institutional micro-scale is tractable in ways

country-scale intervention is not. The conclusion's evidentiary status is hypothesis-generating; a future systematic study would be needed to confirm or refute the hypothesis.

Confidence: medium for the hypothesis; the systematic test is part of the future research agenda.

9.1 Future research agenda

The questions where the paper's conclusions are at medium or medium-high confidence rather than high confidence identify the future research agenda the present author proposes to advance over the next several years. Specifically: systematic ethnographic and survey study of food environments at Philippine youth sport and chess tournaments (Q9 confirmation or refutation, supported by the Tournament Food Audit Checklist tool); pilot implementation studies of PAA-PH in one Philippine context (Q6 transferability test); implementation-science evaluation of any consolidated Task Force-level nutrition coordination if one is established (Q7 prescription test); refinement of intervention cost estimates with more granular and more recent Philippine programme cost data (Q5 precision improvement). The first of these is uniquely tractable for the present author given documented competitive-athlete experience. The remaining items will require institutional partnerships that are not yet in place at the time of this paper's revision.

9.2 What the original paper got right

The diagnosis is preserved. The thesis line is preserved verbatim. The three Access pillars are preserved. The recognition that obesity and food insecurity in the Philippines are not separate problems is preserved. The recognition that Barangay Nutrition Scholars are the operational backbone for any Philippine nutrition intervention at scale is preserved.

9.3 What three years of additional work has changed

Costed interventions have replaced gestures at solutions. Stakeholder names have replaced "the government should." Geographic and cultural specificity has replaced "the Philippines" treated as a single context. The corporatisation contradiction has been resolved structurally through the PAA-PH model. The 49% of the original paper that consisted of quoted or copied source text without proper in-text citation has been replaced with aggressively over-cited prose using Vancouver-style references at the point of use. Standard public-health terminology has replaced "food hunger" with "food insecurity." Section 8 has added the present author's behavioural and sport-science perspective drawn from three years of fitness-coaching certification and competitive-athlete experience, framed honestly as hypothesis-generating. Implementation and political-economy considerations have been made explicit through the Sin Tax Reform analogue (Section 7).

9.4 What remains uncertain

The political-economy conditions for implementation are outside the paper's analytical scope. The PAA-PH cost projections depend on programme design choices not yet made. The micro-scale sport-science intervention hypothesis (Q9) requires systematic primary research to confirm. The Bangsamoro stunting

cohort projections require dedicated quantitative modelling. The bibliography contains references where the source class is identified but the specific paper would require further verification before the revision is finalised for publication.

9.5 Closing note from the author

This revision was written three years after the original paper at the request of no external party. It exists because the World Food Prize Board of Reviewers sent a generous and specific feedback letter in 2023 that, for three years, was not acted on. The original paper was recognised. The work the recognition pointed at was deferred. The deferral is the gap this revision is intended to close.

The revision is not perfect. It is, by the present author's intent, the best structured response that could be produced at sixteen, three years after the original was written at thirteen, against the specific feedback the reviewers provided. The work continues — at the Filipino Food Systems hub on kerimdemirkol.com, in the supporting essay cluster, in the public decoders, in the bridge case note <Same System, Two Countries>, and in the bibliography verification work named as the next step.

Calculate. Commit. Continue.

References, Vancouver style.

Vancouver style. References numbered sequentially in order of first citation. Where a reference is identified by source class but the specific publication has not been verified at the time of this revision, the entry is marked [verification pending] and the citation in the body should be read with that caveat. Approximately one-third of the bibliography carries this flag, an honest disclosure rather than fabricated certainty. Verification of these entries against the actual sources is the next step in the revision's preparation for final publication.

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