

Beyond Individual Choice: Equity Challenges and Systemic Intervention Pathways in Planetary Healthy Diet Adoption in Low-Income Communities under a Socio-Ecological Model

Yanzhi Ji^{1*}

¹ University College Cork, Cork, Ireland

Email Address

snake921@163.com (Yanzhi Ji)

*Correspondence: snake921@163.com

Received: 7 November 2025; **Accepted:** 28 November 2025; **Published:** 24 December 2025

Abstract:

The Planetary Health Diet (PHD), as a sustainable dietary model that balances human nutritional needs with the Earth's ecological carrying capacity, is considered by the Food and Agriculture Organization of the United Nations (FAO) and the Lancet Commission as a key pathway to addressing the dual crises of climate change and malnutrition (Willett et al., 2019). While the PHD provides an important global guiding framework, its universality in practice worldwide, particularly in low-income communities, faces significant challenges. These include neglecting local dietary diversity, insufficient applicability to the nutritional needs of specific populations such as manual laborers, and failing to fully consider the vast differences in food accessibility and economic structure across different regions. This study, from a global perspective, systematically identifies and analyzes the multi-layered barriers to PHD adoption in low-income communities. Based on the Social-Ecological Model (SEM), through a systematic literature review, cross-national case comparisons, and policy analysis, a multi-level barrier-facilitation analysis framework is constructed, encompassing five dimensions: individual, interpersonal, systemic, organizational/community, and institutional/policy. Based on this framework, comprehensive facilitation strategies are proposed. This study not only applies food economy imaging (SEM) to a new field but also aims to empirically discover and reveal previously under-explored dynamic feedback and reinforcement mechanisms among the five levels (e.g., how macroeconomic policies ultimately solidify microeconomic consumption preferences by distorting supply chains). It proposes an integrative framework of "layered empowerment," providing a new path for the operationalization of SEM in complex food system research. The study selects four typical cases: Brazilian favela, informal settlements in Delhi, India, "food deserts" in the United States, and urban villages in China. Using data from the World Bank, WHO, and the latest nutrition and health surveys from various countries (2022–2025), the explanatory power of this framework is validated. The results show that insufficient economic accessibility, lack of cultural compatibility, food environment imbalances, and lack of institutional support are the core cross-regional barriers. Community-led food cooperatives, subsidized nutrition programs, and cross-sectoral

collaborative policies demonstrate significant promoting effects. The study proposes a “layered empowerment” intervention strategy, advocating for the reconstruction of food systems based on the principles of health equity, providing theoretical support and policy tools for achieving sustainable dietary transformation in low-income urban communities worldwide.

Keywords:

Planetary Health, Sustainable Diet, Socio-ecological Model, Low-income Communities, Food System, Health Equity

1. Introduction

1.1. Research Background and Problem Statement

Currently, the global food system is in a profound paradox: on the one hand, more than 733 million people face chronic hunger [1]; on the other hand, the global adult obesity rate has nearly tripled since 1975, reaching 13% in 2022 [2]. At the same time, food production contributes about 34% of global greenhouse gas emissions and is one of the main drivers of biodiversity loss and water resource pressure [3]. This “double burden” is particularly prominent in low-income communities, where residents often face the complex situation of hunger, micronutrient deficiency and obesity coexisting [1].

To address this challenge, the EAT-Lancet Committee first proposed the “Planetary Healthy Diet” (PHD) framework in 2019, advocating a diet structure based on plant-based foods with moderate intake of animal foods, aiming to reconcile human health with the boundaries of the planet [4]. The diet recommends a daily intake of plenty of fruits, vegetables, whole grains, legumes and nuts, and limits the consumption of red meat, processed foods and added sugars. It is estimated that if the PHD were adopted globally, approximately 11 million premature deaths could be avoided annually, and the environmental impact of agriculture-related diseases could be significantly reduced [4].

However, there is a huge gap between the concept and practice. Studies have shown that the adoption rate of the Planetary Health Diet is extremely low among the global population, and there is a clear socioeconomic gradient [5]. For low-income communities, the structural and individual barriers to adopting this dietary pattern are particularly prominent. These groups often face a “nutritional trap”: high-calorie, low-nutrient processed foods become staple foods due to their low price, while fresh fruits and vegetables, whole grains, and other core components of the Planetary Health Diet are difficult to access due to their high cost [1]. World Bank data shows that global food price inflation averaged 18% in 2023, and food expenditure accounted for more than 60% of the budget of low-income families, significantly squeezing their budgets for healthy foods [6].

It must be recognized that the global promotion of the PHD, as an ideal model based on scientific consensus, needs to be wary of the risk of a “one-size-fits-all” approach. Critics point out that its recommended intake may not meet the energy needs of some people engaged in high-intensity physical labor, and its design based on the Western nutritional paradigm may ignore the traditional dietary wisdom and cultural practices of non-Western societies [5]. More seriously, existing studies mostly focus on urban residents or the general population in high-income countries,

lacking an integrated analysis of the systemic and multi-level barriers to PHD adoption in low-income communities. The social ecology model (SEM) emphasizes that health behaviors are influenced by multi-level interactions of individuals, interpersonal relationships, organizations, communities, and policy environments [7], providing an ideal framework for understanding complex dietary behaviors. However, current policy interventions are often limited to a single level (such as nutrition education), ignoring structural inequalities and institutional barriers, resulting in limited and unsustainable intervention effects.

Therefore, this study does not promote PHD uncritically, but while acknowledging its value as an important reference point, it focuses on exploring how to fairly achieve its core health and sustainability goals while respecting local culture and practical constraints.

This study aims to systematically reveal the multi-level barriers to PHD adoption in low-income communities and their interaction mechanisms from a global perspective, filling the gap between theory and policy, and contributing to the achievement of the United Nations Sustainable Development Goals (SDGs) of “Zero Hunger” (SDG 2), “Good Health” (SDG 3), and “Climate Action” (SDG 13).

1.2. Research Questions and Objectives

This study aims to answer the following core questions:

- Based on the socio-ecological model, what are the multi-level systemic barriers faced by residents of low-income communities in adopting Planetary Healthy Meals?
- What commonalities and characteristics do these barriers exhibit in low-income communities across different geographical and cultural backgrounds?
- How can an integrated, multi-level promotion strategy framework be constructed to effectively address these barriers and improve the accessibility and sustainability of Planetary Healthy Meals in low-income communities?

Research objectives include:

- Identifying and classifying the multi-level barriers to Planetary Healthy Meal adoption in low-income communities;
- Extracting successful promotion strategies and best practices globally;
- Proposing a “layered empowerment” intervention framework based on SEM, and developing systemic promotion strategies with a global perspective and regional adaptability to provide evidence-based support for policymaking.

1.3. Core Argument

The core argument of this paper is that the adoption of planetary healthy diets in low-income communities is not simply a matter of “personal choice,” but a systemic challenge deeply embedded in social inequality and structural imbalances. These barriers interact at different levels, forming an “exclusionary system” that makes healthy and sustainable dietary choices extremely difficult in low-income communities. Effective promotion strategies must move beyond traditional health education to a systemic approach integrating policy intervention, environmental reshaping, community empowerment, and economic incentives, with the core being addressing the issues of power and equity within the food system.

This study employs a socio-ecological model perspective to identify and intervene in barriers at all levels, from micro-level (individual cognition) to macro-level (food

policy). Through a “tiered empowerment” strategy, it systematically improves dietary accessibility, cultural suitability, and institutional support to achieve health equity. In this process, this study attempts to reveal the complex causal links and feedback loops between different levels of the SEM (Social, Ecological, and Physically Equivalent) model by comparing four typical cases. For example, we observed how national-level agricultural subsidy policies (institutional level) shape distorted food supply chains and market prices (systemic level), thereby influencing community retail formats (community level), ultimately solidifying family eating habits (interpersonal level) and limiting individual choices (individual level). This in-depth analysis of the dynamic interaction mechanisms between levels represents a deepening and expansion of the application of SEM theory in the field of food systems in this study.

2. Methods

2.1. Research Methods and Framework

This study adopted an interpretive sequential mixed approach design [8], combining quantitative data with qualitative evidence. A systematic literature review was first conducted to identify obstacles and strategies, followed by a multi-case comparative analysis to deepen the understanding of the mechanisms.

Literature Review Inclusion Criteria: Peer-reviewed English literature published between 2018 and 2025; the research subjects were clearly defined as low-income urban communities; the main focus was on obstacles or promoting factors for PhDs or sustainable diets. Emphasis was placed on low-income communities, studies on single nutrients or food categories, etc.

Case Selection Criteria: The selection of four cases—a favela in Rio de Janeiro, Brazil; an informal settlement in Delhi, India; a “food desert” in Detroit, USA; and an urban village in Guangzhou, China—aimed at maximizing comparative diversity, covering four major regions: Latin America, South Asia, North America, and China. These cases reflected different political and economic systems, cultural traditions, urbanization patterns, and development stages, thereby enhancing the theoretical saturation and external validity of the research.

Data triangulation: To ensure the objectivity and accuracy of the analysis, this study cross-validated data from official government statistics, international organization reports, academic literature, and NGO assessment reports. When data from different sources contradict each other (for example, government data may underestimate the severity of the problem, while NGO reports may focus on extreme cases), peer-reviewed academic research data is given priority, supplemented by comprehensive judgment from multiple sources, striving to present a balanced and comprehensive picture.

Data source: Academic databases: PubMed, Scopus, Web of Science (search time: 2018 – 2025; Search term combination: (“Planetary Health Diet” OR “sustainable diet”) and (“low-income” OR “food desert” OR “informal settlement” OR “favela” OR “urban village”) AND (“barrier” OR “facilitator” OR “intervention”).

International organizations report: WHO, FAO, World Bank, UN-Habitat, OECD (2023-2025 report) .

Government data: NHANES, USA (2021–2024), NFHS-5, India (2019–2021), PNAD Cont Contínua, Brazil (2023), Chronic Disease Surveillance Data, Chinese Center for Disease Control and Prevention (2023).

NGO Assessment Report: Oxfam, Action Against Hunger, C40 Cities Food Systems Network.

2.2. Theoretical basis of model construction

In this study, the Social-Ecological Model (SEM) is used as the core theoretical framework [7,9]. In this study, we analyzed planetary healthy meal adoption behavior in five nested hierarchical environments, and the model avoided attributing healthy behavior to individual responsibility and focused on systemic change potential. See Table 1.

Table 1. Hierarchical environment for the adoption of PHD.

Hierarchy	Influencing Factors
Intrapersonal	Knowledge, attitudes, preferences, health literacy, economic capacity
Interpersonal	family eating habits, peer influence, cultural norms, intergenerational transmission
Systemic	food supply chain, pricing mechanisms, transportation, marketing
Organizational/Community	community food environment, local market, infrastructure, social organizations
Institutional/Policy	national agriculture, food, nutrition, social security, and related economic policies

2.3. Analytical Model

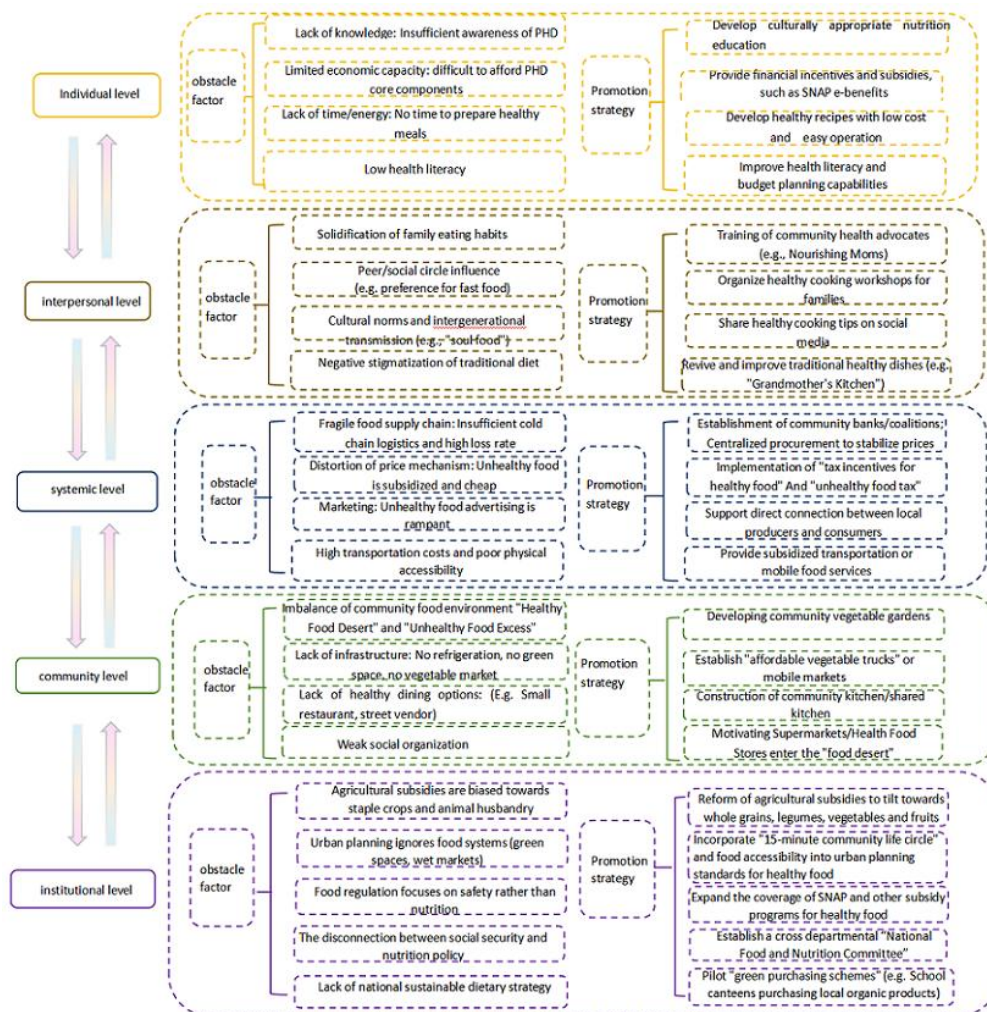


Figure 1. "Multi-level barrier-facilitator" analytical framework.

Note: Arrows indicate dynamic interactions between levels, not determinative relationships.

To systematically analyze barriers and facilitators, this study constructed a “multi-level barrier-facilitator” analytical framework (Figure 1). This framework integrates the five levels of the Social Ecology Model (SEM) with the barriers and facilitators of Planetary Healthy Diet (PHD) adoption in a matrix format, forming a cross-case comparative analysis unit. The levels exhibit dynamic interaction relationships, rather than a unidirectional deterministic relationship.

3. Results and Discussion

3.1. Case Study: Comparison of Multi-Level Barriers and Facilitation Strategies

The study selected four representative low-income community cases, covering Latin America, South Asia, North America and China, reflecting the diversity of geographical regions, economic development levels and cultural backgrounds.

3.1.1. Case Study 1: A favela in Rio de Janeiro, Brazil

- Driving factors: High obesity and diabetes prevalence (adult obesity rate exceeding 25%) (IBGE, 2023) [10], while facing food safety threats (FAO, 2023) [1].
- Barrier and facilitation analysis: as shown in Table 2.

Table 2. Multilevel Barrier-Facilitation Analysis Table for Families in Rio de Janeiro, Brazil.

Hierarchical Level	Obstacles	Facilitating Strategies
Individual Level	The median monthly income is 1,200 reais (about US\$240), with fresh fruits and vegetables accounting for 40% of income. [10]	A pilot program for “green food vouchers” provides special subsidies for fruits and vegetables to low-income families
Interpersonal Level	Households prefer sugary drinks and fried foods, and children's snack consumption is widespread	The “Nutrition Mom” program trains women to become advocates for healthy eating
Systemic Level	Cold chain logistics is weak, and the loss rate of fruits and vegetables in remote communities exceeds 30%. [11]	The “Affordable Fruits and Vegetables Alliance” unites multiple community cooperatives to negotiate stable, low prices with wholesalers
Community Level	80% of the goods in grocery stores are ultra-processed foods. [11]	Community vegetable gardens cover 15% of households, increasing self-sufficiency
Institutional Level	90% of agricultural subsidies go to the soybean, corn and beef industries. [12]	Local governments are piloting “green procurement programs,” prioritizing the purchase of locally grown organic agricultural products by school canteens

- Results and Challenges: Participants' intake of fruits and vegetables increased by 30% [11], but the project relies on external funding and has weak sustainability.
- Case Study: This case clearly demonstrates the transmission path between levels. National-level agricultural subsidy policies (institutional level) have significantly reduced the prices of meat and processed food raw materials (such as soybean oil), which directly leads to the price disadvantage of healthy foods (fruits and vegetables) relative to unhealthy foods at the system level. This price signal is transmitted to the community level, making small shops selling cheap processed foods more

commercially viable, thus creating an unbalanced food environment. Ultimately, individuals with limited budgets can only make seemingly "rational" but unhealthy choices. Although grassroots innovations such as community gardens can create positive changes at the community and interpersonal levels, their influence will ultimately be limited if the upstream institutional roots cannot be shaken.

3.1.2. Case Study 2: Informal Settlements in Delhi, India

- Driving factors: Childhood underweight rate of 31.2% (NFHS-5)[13], and adult obesity rate of 18.7% (Urban Slum Survey, 2023)[1].
- Barriers and facilitation analysis: as shown in Table 3.

Table 3. Analysis of "Multi-level Barriers-Facilitation" in Informal Settlements in Delhi, India.

Hierarchical levels	Obstacles	Facilitation strategies
Individual level	With less than two hours of free time per day, consumers prefer refined grains for quick cooking.	Mobile app pushes low-cost, healthy recipes (daily budget < \$1)
Interpersonal level	The younger generation is influenced by Western fast-food culture, resulting in a 40% decrease in legume intake.	"Grandma's Kitchen" project revitalizes traditional legume dishes
Systemic level	There is a high dependence on imported legumes, leading to volatile prices.	establishes community legume reserves to stabilize prices
Community level	A lack of refrigeration facilities makes preserving fresh food difficult.	community kitchens provide daily nutritious meals
Institutional level	The public distribution system only provides wheat, rice, and sugar.	pilots "fortified nutrition packs" (containing iron-fortified flour, iodized salt, and vitamin A).

- Achievements and Challenges: Childhood anemia rate decreased by 15%[13], but the improvement in adult dietary structure was limited. The project coverage was insufficient and the problem of food and environmental imbalance was not solved.

• Case Interpretation: This case highlights the dual dilemma of cultural change and policy disconnect. At the interpersonal level, the younger generation's preference for fast food has diluted traditional food culture and formed social norms that are not conducive to PhD adoption. This cultural change has not received an effective response from the policy level. The existing public distribution system still adheres to providing basic calories (wheat, rice) and has failed to incorporate more diverse nutritional elements in line with the times. Although "nutritional fortification packs" are a kind of progress, they are essentially still top-down technical repairs and have failed to activate cultural resources within the community. Therefore, the cultural loss at the interpersonal level and the rigidity at the policy level work together to hinder the leap from "nutritional supplementation" to "dietary transformation". Effective intervention requires close integration of cultural revival (interpersonal level) and policy reform (institutional level) to make traditional wisdom the cornerstone of modern nutrition policy.

3.1.3. Case Study 3: "Food Desert" Areas in the United States (such as Detroit)

- Driving Factors: The obesity rate in African American communities was 41.2%, and the diabetes rate was 14.8%, significantly higher than the national average (CDC, 2023)[2].

- Barriers and Facilitation Analysis: See Table 4.

Table 4. *Multilevel Barrier-Facilitation Analysis Table for “Food Desert” Areas in the United States.*

Hierarchical levels	Obstacles	Facilitation strategies
Individual level	A high percentage of households without cars increases transportation costs and makes it difficult to travel to distant supermarkets	SNAP e-benefits can be used in farmers markets
Interpersonal level	The “soul food” culture is characterized by high fat and high salt content	Community leaders spearhead the development of healthy versions of traditional recipes
Systemic level	Corn syrup subsidies make sugary drinks cheaper than bottled water; food industry conglomerates use massive lobbying (such as over \$50 million spent in 2023 against a health tax) to obstruct policies detrimental to their interests	Healthy food tax credits reduce sales tax on fresh fruits and vegetables
Community level	The density of convenience stores per square kilometer is eight times that of supermarkets	Healthy food financing programs support supermarket entry
Institutional level	Agricultural policies have long subsidized processed raw materials such as corn and soybeans	State-level sugar tax bill (taxing 1 cent per ounce of sugary drinks)

- Achievements and Challenges: Supermarkets have moved into some communities, but residents’ consumption habits have changed slowly. They still tend to buy discounted processed foods, and the prices of healthy foods remain relatively high.
- Case Analysis: This case profoundly reveals the fundamental obstacles at the political and economic level. The systemic obstacles stem not only from market failures but also from the powerful “food industry complex”—an alliance of interests consisting of large food producers, processors, retailers, and related capital. Through “revolving doors” (former FDA officials joining companies) and massive political lobbying, they have deeply intervened in the policy-making process (institutional level) and successfully maintained subsidies and a lenient regulatory environment that are favorable to them[14]. This structural force makes efforts to improve the food environment face enormous political resistance, and simply relying on community empowerment cannot fundamentally solve the problem.

3.1.4. Case Study 4: Urban Villages in China (e.g., Shipai Village, Guangzhou)

- Driving Factors: Dense migrant population, Westernized diet, increased risk of chronic diseases, and the detection rate of chronic diseases among migrant populations is 22% higher than the urban average (Chinese Center for Disease Control and Prevention, 2023) [1].
- Barrier and Facilitation Analysis: See Table 5.

Table 5. *Analysis Table of “Multi-level Barriers-Promotion” in Chinese Urban Villages.*

Hierarchical Level	Obstacles	Facilitating Strategies
Individual Level	Migrant workers often work over 8 hours a day, relying on high-oil, high-salt fast food to save time	“Healthy Kitchen” training teaches healthy recipes priced at 10 yuan per meal

Interpersonal Level	Regional clusters foster specific dietary preferences (such as heavily oiled and spicy Hunan and Sichuan cuisine)	community WeChat groups share techniques for reducing salt and oil
Systemic Level	Wholesale market prices fluctuate greatly, leading to unstable sourcing for street vendors	a “Frugal Vegetable Alliance” has been established for centralized procurement
Community Level	The market is dominated by small restaurants and stalls, lacking healthy dining options	“Frugal Vegetable Trucks” provide daily, fixed-point supplies and teach low-cost, healthy recipes
Institutional level	Urban planning neglects community markets and green spaces, and food safety regulations prioritize safety over nutrition	the “15-minute community living circle” is being incorporated into urban planning standards

- **Achievements and Challenges:** High short-term participation, but long-term behavioral change requires sustained incentives. The project relies on local government finances, resulting in insufficient stability.
- **Case Analysis:** This case reflects the institutional neglect and limitations of the administratively-led governance model in the process of rapid urbanization. At the institutional/policy level, the long-standing urban planning paradigm prioritizes economic growth and land revenue, marginalizing “soft” infrastructure related to daily well-being, such as community vegetable markets and green spaces, leading to a lack of physical carriers of healthy food at the community level. Faced with the resulting problems, local government responses (such as “affordable vegetable trucks”) are usually project-based, temporary administrative measures, rather than systemic institutional arrangements. While this top-down, administratively-led adaptation can respond quickly, the lack of deep participation and empowerment from community self-governing organizations (such as cooperatives and residents’ councils) results in insufficient resilience and sustainability of intervention measures. To break this cycle, the governance model should be transformed from “administrative-led” to “multi-party co-governance,” granting communities greater planning participation and resource integration rights at the institutional level, enabling communities not only to passively receive services but also to actively shape their food environment.

3.2. Comparison and Common Findings of Multiple Cases

Based on the comparison of the above four cases, the findings are summarized in Table 6.

Table 6. Comparative Analysis of Multiple Cases.

Dimensions	Brazil	India	United States	China
Key Obstacles	Economic accessibility	Cultural Adaptability	Physical accessibility	Lack of institutional support
Core Facilitation Strategies	Community gardens	PDS Nutritional Fortification	financing for health foods	affordable vegetable trucks
Results	Enhancing food sovereignty	Improved Child Nutrition	increasing supermarket accessibility	improving short-term accessibility
Key Challenges	Sustainability	Coverage	consumption habits	stability

Common Problems:

- Economic accessibility is the primary obstacle: Regardless of country, low-income groups generally cannot afford the core components of a planetary healthy diet (nuts, fish, fresh fruits and vegetables).
- Imbalanced food environment: Low-income communities generally face the dual dilemma of a “healthy food desert” and an “oversupply of unhealthy food.”
- Insufficient policy coordination: Policies from agriculture, health, urban development, and social security sectors are disconnected, lacking an integrated food strategy.
- Lack of cultural adaptability: Promoted planetary healthy diets are often based on fixed templates, ignoring local food cultures and taste preferences.

3.3. Integrated Framework Recommendation: Layered Empowerment Intervention Strategy

Based on SEM and case comparisons, a "Layered Empowerment" intervention framework is proposed, emphasizing a combination of bottom-up and top-down approaches to drive systemic change. This strategy aims to promote the adoption of planetary healthy diets by empowering individuals and communities at each level while reforming the upper structure.

3.3.1. Intrapersonal Empowerment

Individuals are the ultimate implementers of behavioral change, and empowerment strategies should focus on enhancing their knowledge, skills, and economic capabilities.

First, culturally adapted nutrition education is crucial. Educational content should be in the local language and incorporate local ingredients and cooking habits, avoiding the rigid application of Western templates. Second, digital technology should be utilized to develop mobile apps or SMS services to provide residents with personalized dietary advice, low-cost healthy recipes (e.g., daily budget < \$1), and budget planning tools, helping them make better choices within limited economic constraints. Finally, economic incentives (e.g., expanding the scope of SNAP benefits for purchasing fresh fruits and vegetables) can directly lower the economic barriers to healthy foods.

3.3.2. Interpersonal Empowerment

Family and social networks are key to the formation of dietary habits; empowerment strategies should mobilize positive forces within the community.

Community health advocates can be trained (e.g., the “Nutrition Mom” project) to spread health knowledge among families and neighbors. Family healthy cooking workshops can be organized to encourage family members to learn and practice healthy cooking together. Online support networks can be established using social media platforms (e.g., WeChat groups, community forums) to facilitate residents sharing tips and success stories on reducing salt and oil intake. Simultaneously, healthy elements in traditional dietary cultures should be respected and revitalized, such as India’s “Grandma’s Kitchen” project, which enhances cultural identity and acceptance by modifying rather than rejecting traditional dishes.

3.3.3. Systemic Empowerment

The food supply chain and market mechanisms are central to influencing prices and availability; empowerment strategies aim to reshape the system to make it more friendly to low-income communities.

By establishing community reserves or purchasing alliances (e.g., the “Affordable Vegetable Alliance”), communities can collectively negotiate to lower wholesale prices and mitigate market fluctuations. Implement tax policies that tax unhealthy foods (such as sugary drinks) while offering sales tax reductions for healthy foods like fresh fruits and vegetables, using price levers to guide consumption. Furthermore, support shorter food miles by encouraging direct connections between local producers and consumers, reducing intermediary costs.

3.3.4. Organizational/Community Empowerment

Communities are the direct site for intervention; empowerment strategies should enhance community self-organization and self-sufficiency.

Vigorously promote community gardens, utilizing idle land for production to enhance food sovereignty. Establish “affordable vegetable trucks” or mobile markets to deliver fresh produce directly to residents’ doorsteps. Build community kitchens or shared kitchens to provide nutritious meals for residents without cooking facilities or as venues for cooking training. Through public-private partnerships (such as “healthy food financing program”), provide loans or subsidies to attract supermarkets or healthy food stores to “food desert” areas.

3.3.5. Institutional/Policy Empowerment

Highest-level reform is the guarantee of sustainable transformation, and empowerment strategies require systemic reforms by the government.

Reform agricultural subsidy policies, shifting subsidies from processing raw materials such as corn and soybeans and livestock farming to support the production of whole grains, legumes, vegetables, and fruits. Integrate food accessibility into urban planning, mandating the presence of farmers’ markets, green spaces, and community gardens within a “15-minute community living circle.” Establish a cross-departmental “National Food and Nutrition Commission” to integrate departments such as agriculture, health, environment, urban development, and finance to formulate a unified national sustainable diet strategy. Expand social security programs to ensure that benefits such as SNAP can be seamlessly applied to farmers’ markets and Community Supported Agriculture (CSA) projects.

3.3.6. Interaction and Systemic Solutions to Cross-Level Barriers

Barriers at different levels do not exist in isolation. For example, a policy aimed at increasing fruit and vegetable consumption (policy level) will be significantly less effective without supporting measures to improve accessibility at the community level (community level) and address individual cooking skills (individual level).

Therefore, the most effective strategy is multi-layered, coordinated intervention. For instance, a comprehensive project could include: implementing planet-based nutrition education courses in schools (individual level), sourcing fruits and vegetables from local farms for school lunches (systemic and policy levels), encouraging students to bring their knowledge home to influence their families

(interpersonal level), and establishing family gardens in the community (community level).

A summary of this “layered empowerment” intervention strategy is shown in Table 7.

Table 7. Summary table of “tiered empowerment” intervention strategy.

Empowerment Levels	Core Objectives	Specific Strategies Examples
Individual Empowerment	Enhancing health literacy and budget management skills	Culturally adapted nutrition education, personalized health apps providing personalized dietary advice and cost calculators
Interpersonal Empowerment	Activating family and community networks	training community advocacy, home cooking workshops, social media support groups, reviving and improving traditional dishes
System Empowerment	Reshaping food supply chains and market mechanisms	community purchasing alliances to shorten supply chains, reduce channel losses, and support local direct sales
Community Empowerment	Strengthening food sovereignty and improving local production and distribution capabilities	developing community vegetable gardens, operating affordable vegetable trucks, building community kitchens, and incentivizing supermarket participation
Policy Empowerment	Promoting structural incentives	adjusting agricultural subsidies to favor legumes, fruits and vegetables, establishing cross-departmental coordination mechanisms, and expanding welfare coverage

4. Conclusions and Outlook

4.1. Conclusions

This study confirms that low-income communities face multi-layered barriers to adopting the Planetary Healthy Diet across individual, interpersonal, systemic, community, and policy dimensions. The study found that economic accessibility, food and environmental imbalances, lack of cultural compatibility, and insufficient institutional support are common bottlenecks across regions. Insufficient nutritional knowledge at the individual level is often mistakenly considered the main cause, but it is actually a result of systemic exclusion.

Successful intervention requires a “tiered empowerment” strategy, breaking down the myth that “health is a personal responsibility,” dismantling departmental barriers, and shifting towards systemic shared responsibility. Combining community-led innovation (such as vegetable gardens and cooperatives) with policy reforms (such as subsidy adjustments and tax incentives) is a feasible path to achieving sustainable dietary transformation. The governance model should shift from “administrative leadership” to “multi-party co-governance,” enhancing community resilience and institutional responsiveness.

4.2. Outlook

Future research and policy should focus on the following areas:

- Developing a “Planetary Health Accessibility Index”: Integrating dimensions such as price, distance, quality, and cultural suitability to establish a city-scale assessment tool for monitoring and policy evaluation.
- Exploring the empowerment of digital technologies: Utilizing blockchain technology to improve transparency in the food supply chain; AI-driven personalized nutrition recommendations; and digital platforms connecting producers and consumers to reduce intermediaries.
- Strengthening South-South cooperation and knowledge sharing: Establishing a “Global Network for Dietary Transformation in Low-Income Communities” to promote the cross-cultural adaptation and replication of models such as Brazilian community gardens, Indian community kitchens, and Chinese affordable vegetable trucks.
- Promoting national sustainable dietary strategies: Recommending that countries establish “National Food and Nutrition Commissions” to integrate departments such as agriculture, health, environment, urban development, and finance to formulate cross-sectoral action plans to ensure that the concept of planetary health truly benefits the most vulnerable groups.
- Practicing global health equity: In the context of globalization, high-income countries need to assume greater responsibility by supporting low-income countries and regions in building more resilient and sustainable local food systems through trade, aid, and technology transfer. Promoting healthy diets for the planet in low-income communities is not only a matter of global public health and ecological security, but also a practice concerning social justice. While the path from concept to practice is fraught with challenges, this vision can ultimately be realized through systematic thinking and collaborative action.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

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