

A Cross-Country Comparison of National Nutrition Sufficiency Programs in ASEAN Member States: An Integrated Analysis of Strategies, Outcomes, and Best Practices

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Abstract

The Association of Southeast Asian Nations (ASEAN) confronts a persistent "double burden of malnutrition" (DBM), characterized by the coexistence of undernutrition—manifested as stunting and wasting—alongside a rapid increase in overweight, obesity, and diet-related non-communicable diseases (NCDs). This comprehensive analysis integrates systematic literature review findings with strategic archetype analysis to examine national nutrition sufficiency programs across ASEAN member states. Through analysis of 17 studies covering eight ASEAN countries, this study identifies four distinct strategic archetypes based on economic development and nutritional challenges: NCD-Focused High-Income Model (Singapore, Brunei Darussalam), Double-Burden Middle-Income Model (Malaysia, Thailand, Indonesia, Philippines), Undernutrition-Focused Lower-Income Model (Cambodia, Lao PDR, Myanmar, Timor-Leste), and Integrated Success Model (Vietnam). The analysis reveals that political commitment mechanisms fundamentally determine nutrition program success across all ASEAN contexts, operating through resource allocation, multi-sectoral coordination, policy continuity, and implementation barrier resolution. Critical success factors include strong political commitment, effective multi-sectoral coordination, robust surveillance systems, sustainable domestic financing mechanisms, and community-centered implementation strategies. Vietnam emerges as an exemplary model, achieving substantial stunting reductions by embedding nutrition interventions within broader national development frameworks, thereby securing sustainable domestic financing.

Keywords: ASEAN, nutrition policy, public health, comparative analysis, systematic review.

Introduction

The ASEAN Nutrition Paradox and Its Significance

The Association of Southeast Asian Nations (ASEAN) represents a region of unprecedented economic transformation, yet complex and persistent nutritional challenges paradoxically accompany this remarkable growth trajectory. Southeast Asian nations face what scholars have termed the "triple burden of malnutrition": undernutrition, micronutrient deficiencies, and rising rates of overweight and obesity ⁴. This nutritional paradox poses significant threats to the region's human capital development, economic productivity, and healthcare sustainability.

The "double burden of malnutrition" (DBM) phenomenon is characterized by the simultaneous presence of traditional undernutrition indicators, including stunting and wasting, alongside emerging patterns of overweight, obesity, and diet-related non-communicable diseases (NCDs). This coexistence reflects the complex interplay of socioeconomic, environmental, and policy factors that characterize the contemporary Southeast Asian development landscape.

Systemic Drivers of Nutritional Transition

The DBM in ASEAN is fundamentally driven by interconnected systemic forces that operate at multiple scales. The primary catalyst is the region-wide nutrition transition, a phenomenon intrinsically linked to rapid economic growth and accelerated urbanization. As household incomes increase and urban populations expand, traditional dietary patterns characterized by diverse, locally-sourced foods are progressively displaced by processed and ultra-processed foods high in energy density but poor in essential micronutrients.

Compounding this transition is the escalating impact of climate change, which functions as a threat multiplier for food and nutrition security. Climate-induced disruptions to agricultural systems and fisheries reduce the availability and affordability of nutrient-dense foods while increasing price volatility. These changes disproportionately affect vulnerable populations, forcing dietary shifts toward cheaper, calorie-dense processed alternatives that simultaneously exacerbate micronutrient deficiencies and contribute to the obesity epidemic.

Literature Review and Research Gaps

Existing research on nutrition policy in Southeast Asia has predominantly

focused on single-country case studies or specific intervention types, limiting a comprehensive understanding of effective policy approaches across diverse contexts. Previous research has highlighted inconsistencies in policy alignment with international recommendations across the region ³. Additionally, advocacy efforts have emphasized the importance of evidence-based policy change processes in improving nutrition outcomes ¹⁰.

While studies have examined individual components such as school feeding programs or taxation policies, no comprehensive framework exists for understanding how different countries strategically approach their unique nutritional challenges. Furthermore, despite the established importance of political commitment in nutrition programming, limited research has systematically analyzed how governance structures and political factors influence program effectiveness across different economic and political contexts in Southeast Asia.

Study Objectives and Novel Contributions

This research challenges the prevailing assumption that nutrition program effectiveness depends primarily on economic resources by demonstrating that strategic policy integration and political commitment mechanisms are the fundamental determinants of success across all development contexts in ASEAN. This study makes four primary contributions:

1. **Development of a Novel Strategic Archetype Framework:** We provide the first evidence-based typology that categorizes nutrition policy approaches based on countries' economic development levels and nutritional burden profiles.
2. **Comprehensive Cross-Country Effectiveness Analysis:** Our study presents a systematic evaluation of intervention effectiveness across ASEAN member states, examining the full spectrum of nutrition policies.
3. **Evidence-Based Success Factor Identification:** Through comparative analysis, we identify critical success factors that determine program effectiveness across diverse contexts.
4. **Context-Specific Policy Recommendations:** We synthesize evidence to provide tailored recommendations for both individual countries and regional-level ASEAN initiatives.

Method

1. Research design

This analysis employed a mixed-methods approach combining systematic literature review methodology with strategic archetype analysis. The systematic review component followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to maximize transparency, minimize selection bias, and ensure comprehensive synthesis of available evidence.

2. Search Strategy and Data

A comprehensive search strategy was developed targeting national nutrition programs in ASEAN member states. Databases searched included SciSpace, PubMed, and Google Scholar using terms related to nutrition programs, food security, malnutrition, and ASEAN countries. The search encompassed peer-reviewed literature published between 2010 and 2025, extended to include grey literature through a systematic review of official government documents, policy reports, and strategic plans from national ministries of health and nutrition.

3. Inclusion and Exclusion Criteria

Inclusion criteria: Studies were included if they (1) focused on national-level nutrition sufficiency programs in any of the 10 ASEAN member states, (2) examined formal national nutrition programs or policies targeting food security or malnutrition reduction, (3) employed empirical study designs with clear methodology, (4) measured outcomes related to nutrition status or program effectiveness, and (5) were published in English between 2010-2025.

Exclusion criteria: Studies were excluded if they focused solely on micronutrient supplementation without a broader nutrition sufficiency context, examined only community-level programs not integrated into national strategies, or lacked empirical data on program outcomes.

4. Quality Assessment and Data Analysis

All included sources underwent critical appraisal using the ROBINS-I tool for non-randomized studies. Data extraction followed a standardized protocol capturing information on country context, program objectives, intervention strategies, implementation approaches, outcome indicators, and identified challenges. Comparative analysis employed thematic synthesis to identify common patterns and strategic

archetypes across countries.

Results

Strategic Archetypes and Evidence-Based Analysis

1) Study Selection and Characteristics

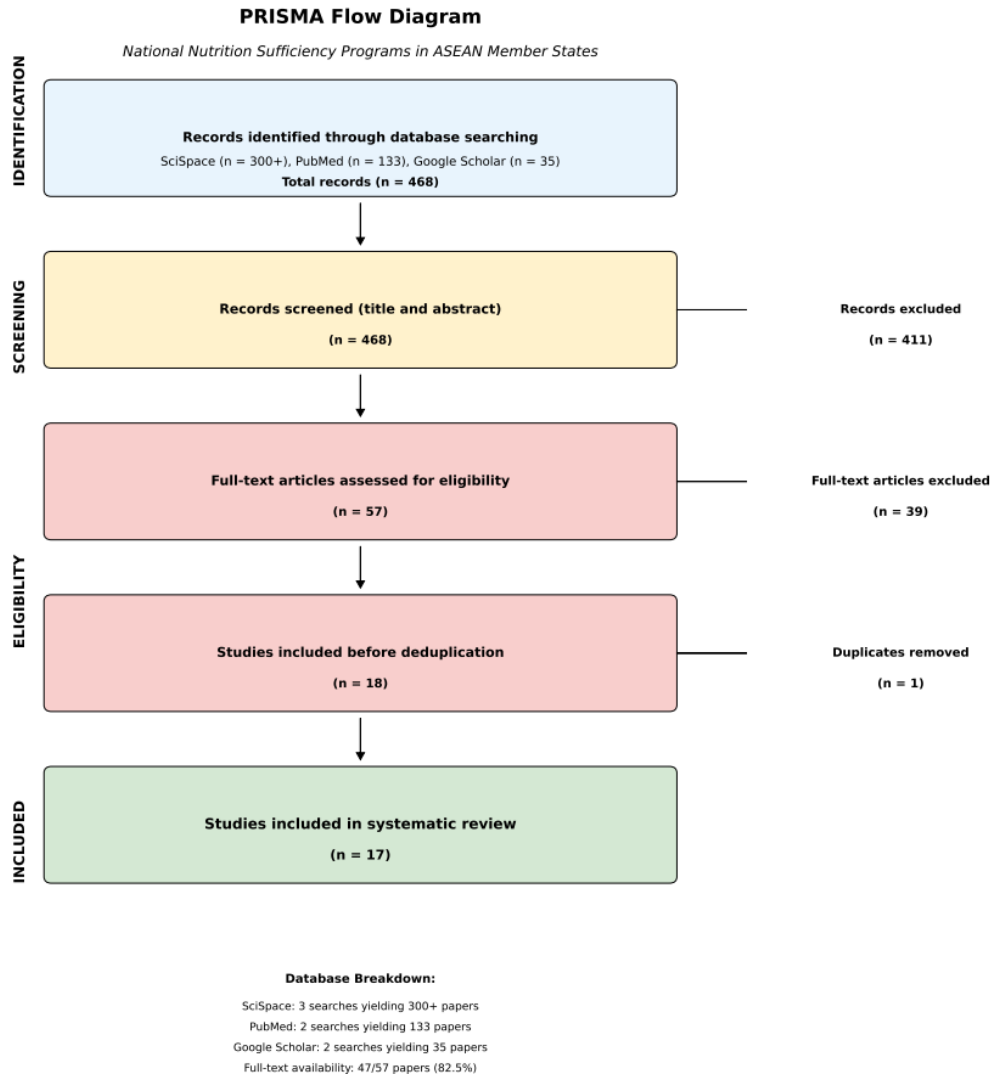


Figure 1. PRISMA Flow Diagram

The search strategy identified 468 initial records. After title and abstract screening, 57 studies were selected for full-text review. Following full-text assessment and deduplication, 17 studies were included in the final analysis. The included studies covered eight ASEAN member states: Indonesia (4 studies), Vietnam (3 studies), Thailand (1 study), Malaysia (1 study), Myanmar (1 study), Philippines (1 study), Cambodia (1 study), and Laos (1 study), with several multi-country analyses.

2) Overview of Strategic Archetypes

The comparative analysis reveals four distinct strategic archetypes reflecting different stages of nutritional transition and corresponding policy priorities:

- Archetype 1: NCD-Focused High-Income Model
- Archetype 2: Double-Burden Middle-Income Model
- Archetype 3: Undernutrition-Focused Lower-Income Model
- Archetype 4: Integrated Success Model

3) Archetype 1: NCD-Focused High-Income Model (Singapore, Brunei Darussalam)

High-income ASEAN member states have largely addressed traditional undernutrition challenges but face significant burdens from diet-related NCDs. These countries employ sophisticated, state-led public health infrastructure characterized by evidence-based policy development and comprehensive regulatory frameworks.

Singapore exemplifies this approach through its data-driven National Nutrition Survey, which provides regular surveillance data to inform policy decisions and evaluate intervention effectiveness. The country's food environment policies include comprehensive front-of-pack labeling systems and restrictions on marketing unhealthy foods to children.

Brunei Darussalam utilizes fiscal instruments, including sugar-sweetened beverage (SSB) taxation, combined with mandatory nutritional labeling to influence consumer behavior and create healthier food environments.

4) Archetype 2: Double-Burden Middle-Income Model (Malaysia, Thailand, Indonesia, Philippines)

Middle-income ASEAN countries represent the epicenter of the regional nutrition paradox, confronting persistent stunting alongside rising obesity rates. Policy responses are necessarily multifaceted, addressing both under- and overnutrition through diverse intervention strategies.

Malaysia operates a well-established, targeted school meal program serving low-income students, demonstrating sustainable implementation through local procurement and community engagement mechanisms¹³.

Thailand implemented successful multi-sectoral approaches, with its community-based maternal and child nutrition program achieving significant reductions in child

undernutrition through coordinated implementation across health, agriculture, and education sectors. Stunting rates declined from 25% to 16% over the implementation period ¹⁷. The country has also implemented a tiered SSB tax structure designed to incentivize industry reformulation while generating revenue for health promotion activities.

Indonesia launched comprehensive food assistance initiatives, including the Rastrea (subsidized rice distribution) and BPNT (non-cash food assistance) programs targeting poor and vulnerable communities ¹⁴. The recent universal *Makan Bergizi Gratis* (MBG) program represents an ambitious attempt to address child malnutrition through free school meals, though implementation challenges have limited program effectiveness. Additionally, Indonesia's Kadarzi (Nutrition-Conscious Family) program represents a national nutrition education initiative promoting balanced nutrition behaviors through community-based approaches ².

Philippines implements comprehensive nutrition strategies through decentralized governance structures, with success depending heavily on Local Government Unit (LGU) capacity, creating significant variation in implementation quality and outcomes across regions ¹².

5) Archetype 3: Undernutrition-Focused Lower-Income Model (Cambodia, Lao PDR, Myanmar, Timor-Leste)

Lower-income ASEAN countries prioritize addressing persistent high rates of stunting, wasting, and micronutrient deficiencies. National programs typically focus on the critical first 1,000 days of life and rely heavily on international partnership and support.

Lao PDR has developed a multi-sectoral "nutrition convergence approach" implemented in high-burden provinces. This model delivers coordinated packages of health, agriculture, and social protection services, demonstrating positive impacts on dietary diversity and nutritional outcomes.

Timor-Leste, with one of the world's highest stunting rates at 47.1%, has prioritized stunting reduction through its *Multisector National Nutrition Action Plan (NAP) 2024-2030*. The plan emphasizes community-based interventions and cross-sectoral coordination.

Myanmar presents a unique case where protracted conflict has disrupted development-oriented nutrition programs, necessitating a shift toward emergency humanitarian

response led by international agencies. Myanmar's nutrition-sensitive food system approach demonstrated policy analysis and investment framework development, though implementation outcomes were not fully evaluated due to political instability ¹⁵.

Cambodia has developed comprehensive national nutrition strategies, though analysis reveals gaps in alignment with international recommendations and implementation mechanisms ¹.

6) Archetype 4: Integrated Success Model (Vietnam)

Vietnam demonstrates exceptional progress in addressing undernutrition through strategic policy integration. The government has successfully embedded specific, costed nutrition interventions within major national development frameworks, including the National Targeted Programmes for poverty reduction and ethnic minority development. This integration strategy has achieved multiple benefits: unlocking substantial domestic financing, mainstreaming nutrition across government sectors, and ensuring interventions reach vulnerable populations at scale.

Vietnam's approach demonstrates the successful implementation of integrated communication strategies combining social franchising with nationwide mass media campaigns. A cluster-randomized evaluation showed significant increases in adequate complementary feeding practices, with intervention areas achieving 15-20% higher rates of appropriate feeding behaviors compared to control areas ⁷.

Vietnam has exceeded its 2025 child stunting target, with prevalence declining to 18.2%, representing an 11.4 percentage point reduction over 10 years. The country's cost analysis revealed significant funding gaps between planned interventions and available resources, yet the integration strategy enabled innovative financing mechanisms that reduced donor dependency from 70% to 30% over the implementation period ⁷.

7) Types of Nutrition Programs and Their Effectiveness

Food Assistance Programs

Food assistance programs demonstrate highly variable outcomes depending on design and implementation approaches. Evaluation of Indonesia's BPNT program demonstrated positive impacts on household food security and caloric intake, though challenges in beneficiary targeting and program equity were identified ¹¹. The program achieved substantial population coverage, reaching over 15 million households, but targeting accuracy remained a challenge with inclusion and exclusion errors affecting program

effectiveness¹⁴.

Targeted, locally-sourced models employed by Cambodia and Malaysia show greater sustainability and positive nutritional impacts compared to poorly planned universal programs such as Indonesia's MBG initiative. The superior performance of targeted programs stems from adequate planning periods, local procurement systems that ensure cultural appropriateness and community buy-in, and phased implementation that enables iterative learning and adjustment.

Nutrition Education and Behavior Change

Indonesia's Kadarzi program emphasizes family-level behavior change through trained community health workers and has been integrated into national health system delivery mechanisms². Programs that achieved sustained behavior change emphasized community participation and local ownership, with Vietnam's social franchising model successfully engaging private healthcare providers in nutrition service delivery, creating sustainable implementation mechanisms beyond government capacity⁶.

Fiscal Policies and Regulatory Measures

Fiscal policies, particularly SSB taxation, represent increasingly popular tools among middle- and high-income countries for addressing overnutrition. Thailand's tiered tax structure demonstrates particular promise in encouraging industry reformulation while generating health promotion revenue. The effectiveness of fiscal policies depends critically on tax levels sufficient to influence consumer behavior (typically >20% price increase), the comprehensive scope of coverage, and complementary policy measures such as public education campaigns.

Food environment regulations, including front-of-pack labeling and marketing restrictions, show limited impact due to voluntary adoption frameworks and inadequate enforcement mechanisms. Countries with mandatory, comprehensive systems (Singapore, Brunei) demonstrate greater effectiveness than those relying on voluntary industry compliance.

8) The Role of Political Commitment in Nutrition Program Success

Political commitment emerges as the most critical determinant of nutrition program effectiveness across all ASEAN contexts, operating through four distinct mechanisms:

1. **Resource Allocation and Sustained Financing:** Political commitment directly influences the magnitude and consistency of financial resources allocated to

nutrition programs. Vietnam's success exemplifies how high-level political support translates into sustained domestic financing, with the government's decision to embed nutrition interventions within the National Targeted Programme framework securing substantial domestic funding.

2. **Multi-Sectoral Coordination and Institutional Integration:** Strong political leadership enables effective coordination across government sectors. Thailand's National Food Committee Act established high-level coordination between multiple ministries, with political backing allowing the committee to override bureaucratic resistance and implement integrated interventions ¹⁷.
3. **Policy Continuity and Implementation Consistency:** Political commitment protects policy reversals and ensures consistent implementation across electoral cycles. Singapore's sustained investment in nutrition surveillance systems reflects political consensus that transcends individual administrations.
4. **Overcoming Implementation Barriers and Resistance:** High-level political support provides the authority necessary to overcome bureaucratic resistance and industry opposition. Indonesia's MBG program demonstrates both potential and limitations of political commitment, where presidential support enabled rapid rollout but insufficient attention to implementation planning created operational challenges.

Discussion

1. Intervention Effectiveness Analysis

The comparative analysis reveals significant variation in intervention effectiveness across different policy instruments and implementation contexts, with several key patterns emerging:

Multi-sectoral integration within national development frameworks emerges as a critical success factor, requiring sustained political commitment and formal coordination mechanisms. Thailand's experience particularly illustrates the importance of sustained political support and institutional coordination mechanisms, while Vietnam's integration strategy demonstrates how strategic framing can overcome budget constraints.

Community-based implementation through existing health systems and trained community health workers represents an effective delivery strategy. Successful

programs leveraged existing primary healthcare infrastructure for service delivery, with community health workers serving as key implementation agents ^{2, 17}.

Health system integration emerges as crucial, with Thailand's approach emphasizing capacity building of local health personnel and integration with routine maternal and child health services, though capacity building remains a persistent need across countries.

2. Critical Success Factors

Analysis of country experiences and systematic review findings identifies five critical success factors for effective nutrition programs:

Strong Political Commitment and Leadership: Successful programs require sustained high-level political support and integration into national development priorities, as demonstrated by Vietnam's experience and Thailand's multi-sectoral coordination.

Effective Multi-Sectoral Coordination: Programs addressing complex nutritional challenges require coordination across health, agriculture, education, and social protection sectors. However, coordination challenges are commonly reported, including unclear roles and responsibilities, competing priorities, and insufficient resource allocation ¹⁵.

Robust Data and Surveillance Systems: Evidence-based policy development requires comprehensive, regular data collection and analysis capabilities, as demonstrated by Singapore's National Nutrition Survey.

Sustainable Domestic Financing: Moving beyond donor dependency requires integration of nutrition interventions into national budgetary processes, as achieved by Vietnam's embedded approach. Current resource allocation remains insufficient for comprehensive program implementation across most countries ⁶.

Community-Centered Implementation: Effective programs empower local actors and communities, with community engagement effectiveness depending on genuine participation in program design, capacity building, and feedback mechanisms.

3. Integration Strategy Analysis: Learning from Vietnam's Success

Vietnam's exceptional progress offers critical insights into operationalizing political commitment through strategic integration mechanisms:

Integration Process: Vietnam's approach involved economic analysis demonstrating malnutrition costs, embedding interventions within existing National Targeted

Programmes, and integrating performance indicators into government evaluation systems.

Financing Innovation: The integration strategy enabled innovative financing mechanisms, reducing donor dependency while maintaining program quality through strategic framing that linked nutrition outcomes to poverty reduction targets.

Implementation Implications: Successful integration requires economic justification, institutional embedding utilizing existing systems, and accountability integration, creating implementation incentives at all levels.

4. Common Challenges and Persistent Barriers

Despite diverse approaches, ASEAN countries face common challenges:

Policy Alignment and Coordination: Studies consistently identified gaps between national nutrition policies and international recommendations, with incomplete coverage of evidence-based interventions^{8, 3}. Multiple ASEAN countries developed comprehensive National Plans of Action for Nutrition (NPANs), though alignment with international recommendations varied significantly¹.

Resource Constraints: Inadequate funding emerged as a persistent challenge across programs, with significant gaps between planned interventions and available resources affecting program coverage, quality, and sustainability.

Implementation Capacity: Limited implementation capacity, including insufficient trained personnel and weak health system infrastructure, constrained program effectiveness across countries.

Monitoring and Accountability: Weak monitoring and evaluation systems limited program learning and improvement, with many programs lacking systematic outcome measurement and feedback mechanisms.

Limitation

This analysis is subject to several limitations. Data availability varies significantly across countries, potentially affecting the comprehensiveness of comparisons. The search strategy, while comprehensive, may have missed relevant studies published in local languages. The heterogeneity of study designs and outcome measures limited quantitative synthesis possibilities. Geographic coverage was uneven, with some ASEAN countries having limited representation in the literature.

Quality assessment revealed concerns about risk of bias in several included studies, particularly regarding confounding variables and outcome measurement. The observational nature of most included studies limits causal inference about program effectiveness.

Conclusion

This comprehensive analysis demonstrates that nutrition program effectiveness depends less on economic resources than on strategic policy integration and political commitment mechanisms. Countries like Vietnam have achieved superior outcomes compared to wealthier nations by developing sophisticated integration strategies that embed nutrition within broader development frameworks.

The evidence reveals four distinct strategic archetypes across ASEAN, each requiring tailored approaches while sharing common success factors: strong political commitment, effective multi-sectoral coordination, robust surveillance systems, sustainable domestic financing, and community-centered implementation. The diversity of approaches and experiences across ASEAN countries presents significant opportunities for regional knowledge sharing and cooperation.

Key findings demonstrate that:

1. Political commitment mechanisms fundamentally determine program success across all development contexts through resource allocation, coordination authority, policy continuity, and barrier resolution.
2. Strategic integration approaches, exemplified by Vietnam's model, can overcome resource constraints and achieve superior outcomes through innovative financing and institutional embedding.
3. Evidence-based implementation strategies, including targeted rather than universal approaches and community-centered delivery mechanisms, significantly improve program effectiveness.
4. Regional cooperation opportunities exist for knowledge sharing, harmonized standards, and collaborative research initiatives.

By implementing these evidence-based recommendations at both national and regional levels, ASEAN can make substantial progress toward addressing its nutrition paradox and building a more food-secure and nutritionally healthy future for all citizens.

Conflict of Interest

No conflict of interest.

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