Epidemiology and Society Health Review | ESHR
Vol. 7, No. 2, 2025, pp. 65-77
ISSN 2656-6052 (online) | 2656-1107 (print)
http://journal2.uad.ac.id/index.php/eshr/index
eshr@ikm.uad.ac.id

Review Article

Sustainable Diets in Southeast Asia: Development, Barriers, and Opportunities

Tri Fajarwaty[1]*, Ahmad Syafiq[1], Ikeu Tanziha[2], Siti Khodijah Parinduri[1]

[1] Faculty of Public Health, Universitas Indonesia, Depok, Jawa Barat 16424, Indonesia
[2] Faculty of Human Ecology, IPB University, Bogor, Jawa Barat 16680, Indonesia

***Correspondence:** tri.fajarwaty@gmail.com.

Received 17 April 2025; Accepted 26 August 2025; Published 02 September 2025

ABSTRACT

Background: Southeast Asia is experiencing a dietary shift from traditional plant-based diets to Westernized, processed foods, contributing to rising non-communicable diseases and environmental degradation. Given the significant impact of global food production on greenhouse gas emissions, freshwater consumption, and biodiversity loss, promoting sustainable diets in Southeast Asia is critical. This review aims to explore the current progress, barriers, and opportunities in adopting sustainable diets across the region.

Method: A scoping review was conducted using a systematic framework to map the existing literature on sustainable diets in Southeast Asia. A total of 37 studies were identified and analyzed to understand the progress, barriers, and opportunities in adopting sustainable diets.

Results: The review shows varying levels of progress across Southeast Asia, with countries like Indonesia and Malaysia advancing through government policies and sustainable agriculture practices. However, economic, cultural, and infrastructural barriers hinder broader adoption. Promising opportunities include leveraging alternative protein sources and the region's biodiversity.

Conclusion: While Southeast Asia has substantial potential for implementing sustainable diets, overcoming economic, cultural, and infrastructural challenges will require coordinated efforts between governments, stakeholders, and communities. Collaborative action is necessary to promote food systems that benefit public health and the environment.

Keywords: Opportunity; Barriers; Sustainable Diets; Southeast Asia

INTRODUCTION

Modern society is now confronted with significant health issues resulting from the consumption of food through phenomenon known as the *'nutrition transition'*. The '*nutrition transition*' which is characterized by the progressive decline of traditional dietary patterns and the rise in 'western diet', has contributed to a significant increase in overweight and obesity, as well as

non-communicable diseases (NCD) such as diabetes, cardiovascular diseases, hypertension, and cancer particularly in high-income countries.[1,2] In Western diets, food is produced using energy-intensive inputs, highly processed and increasingly sold through supermarkets and fast-food franchises from Western countries. It is a modern dietary pattern characterized by high intakes of pre-packaged ultra-processed foods, refined grains, red meat, processed meat, high-sugar drinks, candy, sweets, fried foods, conventionally raised animal products, high-fat dairy products, and high-fructose products.[3,4]

In addition to contributing to global health issues, this dietary transformation imposes a significant burden on the environment. Human activities aimed at meeting food demands have long been recognized as having detrimental environmental impacts. Globally, 11-29% of greenhouse gas emissions (GHGE), 70% of freshwater consumption, and one-third of ice-free territory are attributed to global food production.[5–7] Furthermore, food production and consumption are responsible for 33% of land degradation, 29% of overfishing, 60% of terrestrial biodiversity loss, 80-85% of fertilizers (nitrogen and phosphate) ending up in the oceans and resulting in marine biodiversity loss, 21-28% of GHGE, 70-80% of freshwater use, 80% of deforestation, 20% of fossil fuel/energy use, 38% of land use (12% for agriculture and 26% for livestock).[8–11]

To prevent further environmental degradation and achieve conservation goals, it is crucial to implement changes in food production and consumption. If nations fail to shift their food consumption habits toward sustainability, the environmental damage could be so severe that the planet may become incapable of sustaining human life. For example, GHGE are projected to increase by 80% by 2050 due to rising meat and processed food consumption driven by urbanization and income growth.[4,12] This increase in GHGE is likely to result in more frequent and severe extreme weather events, including heatwaves, floods, and storms, leading to significant infrastructure damage, loss of lives, and economic disruptions.[13] Considering the importance and urgency of the concept of sustainability in food consumption to address diet-related public health issue and mitigate environmental degradation, in 2010, FAO proposed a consensus definition of sustainable diets; “Sustainable diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy, while optimizing natural and human resources”.[14] Since then, research and development of sustainable diets has grown rapidly. However, high income countries are still dominating in the research and development in sustainable diets. According to Springman et al (2021), 74% of studies on sustainable diets were carried out in high-income nations.[15] Moreover, high-income countries have been at the forefront of developing sustainable diet policies, often integrating environmental sustainability into food-based dietary guidelines (FBDGs).

Unlike in developed countries, the research and development of sustainable diets in developing nations, such as Southeast Asia, is still in its early stages. On one hand, the traditional diets in Southeast Asia, which are rich in plant-based foods, align closely with the principles of sustainability. On the other hand, the rapid urbanization and economic growth in the region are driving a shift towards more ‘Westernized’ dietary patterns, which could bring negative impacts to both health and environment. This scoping review aims to explore the existing literatures on the opportunities and barriers to sustainable diets in Southeast Asia

which is critical to shaping the region's future food systems in a way that supports both human health and environmental sustainability.

METHOD

A scoping review is a review approach that involves 'mapping' the relevant literature in a subject of interest.[16] A scoping review is most suited for exploring wider and newer research subjects; hence it is acceptable to investigate the opportunities and barriers in sustainable diets because this is a new study field. Scoping reviews do not evaluate the quality of the studies included, but they are frequently used to choose whether to proceed with a systematic review, summarize and distribute research findings in a given area, and identify potential gaps in the literature. This scoping review was conducted following a structured approach inspired by the framework proposed by Arksey et al. (2005) and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).[16,17] The five-stage scoping framework by Arksey and O'Malley are (1) identifying the research question; (2) identifying relevant studies; (3) selecting studies; (4) charting the data; and (5) collating, summarizing and reporting the results.

Stage 1: The research question, "*What is known from the existing literature about the opportunities and barriers to sustainable diets in Southeast Asia*?" became a guidance for this review.

Stage 2: Between July and August 2024, a comprehensive search of peer-reviewed and gray literature was carried out using following databases: PubMed, Scopus, and Google Scholar. This literature search was further enhanced using an adapted Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework which is presented in Figure 1. The key terms "opportunity," "barrier," "sustainable diets" and "Southeast Asia" form the basis for the search strategy. Table 1 presents the relevant keywords and keyword combinations considered for used in the searches.

Table 1. Relevant keywords and keyword combinations

Concept	Search Terms
Opportunity	Opportunit* OR capability* OR fasilitator* *AND*
Barriers	Barrier* OR Challenge* OR Obstacle* *AND*
Sustainable Diets	"sustainable diets" OR "planetary health diet" OR "eco-friendly diets" OR "planetary health diet" OR "sustainable eating" OR "sustainable food systems" OR "environmentally sustainable diets" OR "low-carbon diets" OR "climate-friendly diets" OR food *AND*
Southeast Asia Region	"Southeast* Asia*" OR "South east* Asia*" OR "Indonesia*" OR "Malaysia" OR "Philippines" OR "Timor-Leste" OR "Cambodia*" OR "Laos" OR "Myanmar" OR "Thai*" OR "Vietnam*" OR "Vietnam" OR "Singapore*" OR "Brunei"

Stage 3: To ensure the inclusion of relevant studies, specific inclusion and exclusion criteria were established. The inclusion criteria for this review were: (1) Peer-reviewed articles, review papers, systematic reviews, meta-analyses, and book chapters published between 2000 and 2023 that focus specifically on sustainable diets in Southeast Asia; (2) Studies that discuss both qualitative and quantitative findings related to sustainable diets, barriers, and opportunities within the Southeast Asian context; (3) Studies examining traditional dietary practices in Southeast Asia and their alignment with sustainability principles; (4) Studies that

discuss the environmental, economic, and cultural impacts of nutrition transition in Southeast Asia; and (5) Reports from reputable organizations such as FAO, WHO, and other international and governmental bodies focused on Southeast Asia. Exclusion criteria included: (1) Studies not specifically focused on Southeast Asia or not addressing the topic of sustainable diets; (2) Articles not available in English; (3) Studies where no abstract is available or where full-text articles cannot be obtained; (4) Articles that only discuss the Western context of sustainable diets without relevance to Southeast Asia; and (5) studies lacking relevant data on the specified barriers and opportunities within the Southeast Asian context.

All identified publications will undergo two stages of screening: title/abstract screening and full text screening. The PRISMA diagram presented in Figure 1 summarizes stages one through three of the scoping review process.

Stage 4: Data from included full-text studies will be entered into a Microsoft Excel form and include the following information: Author(s), year of publication, and study title; Country and journal; aim(s) or objective(s); Development of Sustainable Diets; Barriers in sustainable diets; and Opportunities in sustainable diets

Stage 5: The extracted data were synthesized both quantitatively and qualitatively. A numerical analysis was conducted to describe the characteristics of the included studies (e.g., publication year, country, and research focus). In addition, a thematic analysis was performed to identify and categorize key findings related to the development/implementation, barriers, and opportunities for sustainable diets.

The results were then organized into overarching themes and presented in narrative form, supported by tables and figures. The reporting process adhered to the PRISMA-ScR checklist to ensure transparency and comprehensiveness.

RESULTS

Four hundred and seventy-two records were found. Following the elimination of duplicates, a total of 418 titles and abstracts were evaluated, leading to the exclusion of 328 publications. Full-text review was conducted on the remaining 90 records, and 53 were subsequently excluded, totaling 37 records for inclusion (Figure 1). A summary of the current development/implementation, barriers, and facilitators of sustainable diets, is presented in Supplementary material Appendix 1 (Table 2) and is arranged in several themes: (1) Development and progress of sustainable diets in Southeast Asia; (2) Barriers to adopting sustainable diets in Southeast Asia; and (3) Opportunities for promoting sustainable diets in the region.

Theme 1: Development and Progress of Sustainable Diets in Southeast Asia

Southeast Asia, despite its rich biodiversity and traditional dietary practices rooted in sustainability, has been significantly influenced by global dietary shifts. Traditional diets, often based on plant-rich foods, remain more aligned with sustainability principles compared to the more Westernized, meat-heavy diets. However, the pace of development of sustainable diets in Southeast Asia is uneven across countries. Some have made notable progress, while others remain in the first phases of transition.

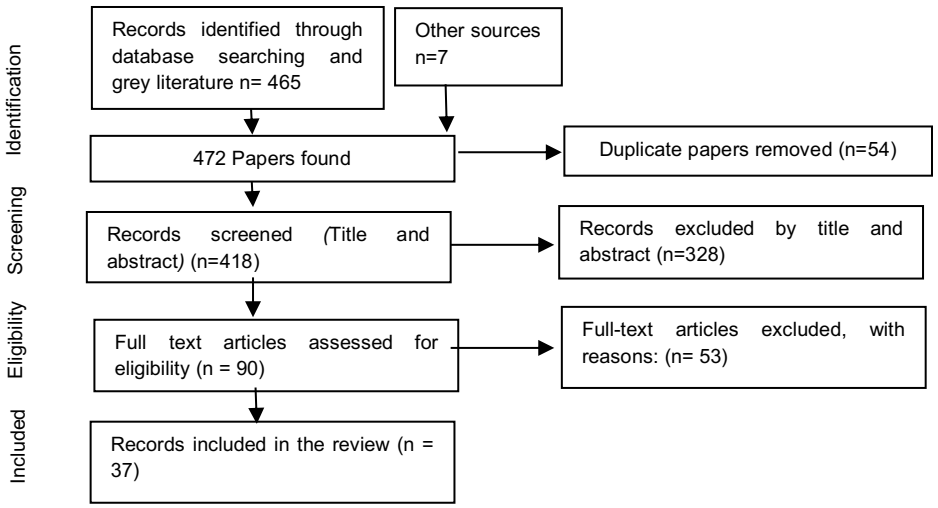

Figure 1. Prisma Diagram Flowchart

In Indonesia, efforts are apparent through governmental policies aimed at food diversification, reducing rice dependency, and the Healthy Living Community Movement (GERMAS).[18,19] However, Indonesia continues to struggle with the triple burden of malnutrition, making it difficult to fully transition to a more sustainable food system.[18] Studies have also explored local, sustainable food sources like wild food plants, and alternative protein sources such as Javanese Grasshopper, considered a high-protein and low-impact food.[20,21] The case of West Papua highlights the potential of sago, a climate-resilient crop, in promoting food security and sustainability.[22]

In Malaysia, there has been progress with the development of the Sustainable Diet Index (SDI) to assess sustainable practices.[23] In Thailand, sustainable agriculture policies are integrated into national frameworks, with programs encouraging crop diversification and organic farming. At the regional level, the ASEAN Economic Community (AEC) has recognized the importance of sustainable food trade to reduce the carbon footprint of transporting food by promoting local and regional systems. This complements sustainable diets, which emphasize locally sourced and lower-impact foods, with trade policies targeted for 2050.[24]

Despite these strides, adoption remains slow in other countries. Vietnam relies heavily on rice and beef, though interest in organic farming and plant-based diets is growing.[25] Myanmar faces environmental challenges from palm oil production.[26] In Timor-Leste, low dietary diversity and dependence on imports impede progress.[27]

Theme 2: Barriers to Adopting Sustainable Diets in Southeast Asia

Several systemic and cultural barriers hinder the widespread adoption of sustainable diets in Southeast Asia. These include:

1. Nutritional Considerations

The majority of Southeast Asian countries are grappling with malnutrition, which includes undernutrition, micronutrient deficiencies, and rising rates of obesity and non-communicable disease (NCD). In 2019, 64.7 million people experienced undernourishment in Southeast Asia.[21,28] Cambodia and Myanmar were classified as facing 'serious' levels of hunger, with

Global Hunger Index (GHI) scores indicating a high prevalence of undernutrition.[28] Deficiencies in essential micronutrients like iron, vitamin A, and zinc remain common, particularly in Myanmar and Lao PDR, affecting women and children. The reliance on staple foods like rice, which lacks key micronutrients, exacerbates this issue.[25] At the other end, overnutrition and obesity are becoming major concerns, as in Malaysia where nearly 50% of adults are overweight.[23]

Traditional diets are inherently sustainable, but the nutrition transition and Western diet influence are concerning. Thailand has seen a shift toward processed, energy-dense foods, despite strong public health campaigns.[29] In Vietnam, urban populations are adopting Western-style diets high in meat, sugar, and fats, leading to obesity, diabetes, and cardiovascular disease.[30] Indonesia also illustrates this dual burden, with urban areas consuming processed foods while rural areas face undernutrition and limited diversity.[18]

2. Cultural Resistance and Traditional Preferences

While traditional food systems support sustainability, cultural preferences often pose barriers. Staple foods such as rice and animal-based proteins dominate in Cambodia, Lao PDR, and Indonesia.[18,31] Dietary diversity is also limited by food taboos and religious practices. For example, the Coastal Endenese in eastern Indonesia maintain specific taboos around food consumption during certain times of the year, restricting access to diverse nutrient sources.[32]

In Vietnam, plant-based diets are often perceived as nutritionally inadequate, particularly among men, creating obstacles to dietary shifts.[33] In collectivist societies like Vietnam, meals center around meat, and cultural beliefs strongly shape choices.[30] Similarly, in Malaysia, meat consumption is integral across ethnic groups, and plant-based diets are often perceived as less nutritious or satisfying.

3. Economic and Infrastructural Barriers

The affordability of healthy and sustainable foods remains a major challenge. In Indonesia, Vietnam, and Malaysia, organic and sustainably produced products such as fruits, vegetables, and plant-based proteins are significantly more expensive than staples like rice and processed foods.[23,30,34] In Vietnam, price sensitivity and doubts about authenticity limit purchases of organic meat and plant-based products.[30]

High transportation costs are another barrier, particularly in Myanmar, where they raise prices at retail markets.[35] Infrastructure challenges such as poor roads, limited utilities, and inadequate distribution systems also hinder sustainable food access.[18,35] Urban consumers in Indonesia and Malaysia encounter difficulties in sourcing sustainable food options.[36] Without sufficient infrastructure and market support, smallholder farmers struggle to produce and sell sustainable products, further limiting availability.

4. Environmental and Policy Barriers

Food consumption patterns, particularly reliance on rice, contribute significantly to greenhouse gas emissions and resource use.[37] In the Philippines, rice is a major source of agricultural emissions and freshwater consumption.[38] Agriculture is also a leading cause of deforestation, with large portions of forests cleared for cultivation, accounting for a substantial share of global

greenhouse gas emissions.[39,40] In Vietnam, rice dominates water use and contributes heavily to methane emissions under flooded conditions.[41]

Livestock production in Indonesia also contributes significantly to greenhouse gas emissions.[21] Ruminants, in particular, are inefficient in converting feed to food and produce high levels of methane, intensifying climate impacts.[40,42] In Thailand, aquaculture expansion poses challenges for water use and environmental management.[43] Policy gaps further complicate adoption. The complexity of defining and operationalizing sustainable diets among diverse stakeholders often leads to knowledge gaps and weak policy implementation.[44] The absence of coherent frameworks and enforcement mechanisms across the region limits effective progress toward sustainable dietary guidelines.[45]

5. Limited Awareness and Education

Awareness and education remain limited. In Malaysia, only a minority of consumers recognize the environmental benefits of plant-based alternatives. In Indonesia, many smallholder farmers lack awareness about the environmental impact of conventional farming and the potential benefits of sustainable practices.[31] This lack of knowledge among both producers and consumers continues to hinder broader adoption of sustainable diets.

Theme 3: Opportunities for promoting sustainable diets in the region.

Despite the barriers, there are numerous opportunities for promoting sustainable diets in Southeast Asia, driven by biodiversity, policy initiatives, and growing consumer awareness.

1. Rich Biodiversity and Traditional Food Systems

Southeast Asia is home to diverse ecosystems that provide abundant marine resources as well as a wealth of underutilized crops and wild food plants. Sampantamit et al., (2021) stated that in Thailand's fisheries sector, the use of nutrient-dense small fish from the Engraulidae family supports both nutrition and sustainability.[43] According to Pawera et al., (2020) traditional food systems in Indonesia that include diverse crops like sago, tubers, and wild vegetables have the potential to be re-integrated into modern diets, offering both environmental and nutritional benefits.[20] In West Papua, the local food systems are rich in sustainable, climate-resilient crops like sago, which could help reduce dependency on environmentally damaging staples like rice.[22] Similarly, according to Fritz et al., (2021), wild food plants (WFPs) in West Sumatra such as various wild fruits and leafy greens still offer potential for enhancing dietary diversity and promoting sustainability if they are reintegrated into modern food systems. Increased knowledge and utilization of WFPs should be encouraged so that they can contribute to more sustainable diets.[31] Timor-Leste, likewise, still has food insecurity as a pressing issue. Nevertheless, the country's rich agricultural biodiversity presents a unique opportunity to promote sustainable diets. The country's agricultural potential is highlighted by its diverse range of crops, including pulses, tubers, vegetables, and fruits, which can enhance nutritional resilience among its population.[46]

2. Government Policies and National Strategies

Policy frameworks, such as Thailand's National Economic and Social Development Plan and Indonesia's Healthy Living Community Movement, provide a foundation for promoting sustainable diets through public health interventions and agricultural reform.[7,37] Additionally,

the development of tools like the Sustainable Diet Index in Malaysia could serve as a model for other countries to track and promote sustainable eating practices and a conceptual framework for sustainable diets has been developed in Vietnam, incorporating input from national decision-makers and stakeholders. This framework includes measurable indicators across various domains such as food production, processing, distribution, and waste management, aiming to streamline policy conversations and improve decision-making transparency.[23,44] Additionally, in Malaysia, functional food intake has been recognized as part of the country's strategy to promote sustainable diets.[47]

3. Potential of Alternative Protein Sources

One of the most promising areas for advancing sustainable diets in Southeast Asia is the development of alternative protein sources. In Indonesia, there is significant potential for edible insects such as Javanese grasshoppers, which have a lower environmental footprint compared to traditional livestock. The adoption of insect-based proteins could help meet the increasing demand for protein while reducing the ecological impact of food production.[21] Similarly, in Thailand, exploring alternative protein sources like algae, insect-based feeds, and corn gluten, are gaining momentum.[43] Tan and Cheng (2024) also reported that public in Malaysia are becoming more interested in plant-based options to meat.[48]

4. Digital Innovations and Consumer Awareness

Digital platforms are also emerging as key enablers in promoting sustainable diets. In Indonesia, for example, the mobile application EatsUp® was developed to promote balanced and sustainable diets, particularly for obesity management. Although still in its early stages, the app has shown promise in integrating sustainable dietary practices into daily life by providing menu recommendations and dietary tracking tools.[49] Besides that, the awareness of the consumers regarding sustainable diets is progressing. For example, consumer behavior in Vietnam is gradually shifting toward more sustainable consumption patterns, particularly among younger, urban populations. Young people in Hanoi have been observed to exhibit sustainable consumption behaviors, although the concept remains relatively new to many Vietnamese consumers.[50]

DISCUSSION

The findings of this scoping review underscore the complex interplay between cultural traditions, socioeconomic factors, and environmental challenges in shaping the development and adoption of sustainable diets across Southeast Asia. While progress has been made in certain countries, the overall picture reveals significant barriers that need to be addressed for sustainable diets to become a reality across the region. One of the most important themes in this review is the tension between tradition and modernity. Traditional diets in Southeast Asia are inherently more sustainable due to their reliance on plant-based foods and minimal environmental impact. However, the nutrition transition towards more Westernized diets poses a significant threat to both health and the environment. Addressing this issue requires a delicate balance between preserving cultural heritage and promoting dietary changes aligned with sustainability goals. Policymakers must be mindful of these cultural sensitivities when designing and implementing sustainable food policies.

Economic factors also play a crucial role in hindering the adoption of sustainable diets in Southeast Asia, particularly in rural and low-income areas. Actually, the issue of economic challenge in the development and implementation of sustainable diets is not only an issue for Southeast Asian countries. Developed countries such as US and EU countries are facing similar issue. According to Biesbroek et al. (2023), many consumers still prioritize price, convenience, and taste over health, sustainability, and equity.[51] However, in developed countries, the challenge often revolves around consumers' willingness to pay premium prices for sustainable diets.[52] In contrast, in Southeast Asia, affordability is a major issue for the majority of the population, where high levels of poverty and undernutrition make it difficult for people to prioritize sustainable food options over cheaper, less sustainable alternatives.[18,34] Moreover, almost every country in Southeast Asia is struggling with the problem of adequate infrastructure and market access. This is concerning because without adequate infrastructure and market access, smallholder farmers are often unable to produce and sell sustainable food products, further limiting the availability of these options to consumers. Therefore, governmental support, including subsidies and market incentives for sustainable agriculture, will be essential to overcoming these barriers.

Defining and operationalizing sustainable diets in Southeast Asia is a complex process due to the involvement of diverse stakeholders, ranging from governments and NGOs to private sectors and consumers. This often leads to knowledge gaps, hindering the development and implementation of coherent policies.[44] This is in stark contrast to the EU, where multi-level governance structures support coordinated policy efforts and allow for better integration across various sectors involved in sustainable food systems. For example, the EU's Farm to Fork Strategy promotes a comprehensive and cohesive approach to making food systems fair, healthy, and environmentally friendly, while encouraging collaboration across member states to ensure policy coherence. Additionally, EU has adopted an integrated approach, linking agricultural, environmental, and public health policies to support the development of sustainable diets. This is reflected in the EU's Common Agricultural Policy (CAP), which is designed to balance the needs of farmers, consumers, and the environment. This level of policy integration helps streamline efforts to implement sustainable diets across the EU, ensuring that policies do not conflict with one another but instead support shared sustainability goals.[53]

Furthermore, the role of education and awareness cannot be understated. Many Southeast Asian consumers are still unaware of the health and environmental benefits of sustainable diets.[31,48] Initiatives that raise awareness and promote behavioral changes are critical for driving demand for sustainable food options. Public health campaigns, school-based programs, and mobile applications are emerging as important tools for disseminating information and promoting behavioral change.

Despite all the barriers, there are significant opportunities for promoting sustainable diets in Southeast Asia. The region's rich biodiversity offers untapped potential for developing sustainable food systems. It has access to a wide variety of traditional crops, wild food plants, and climate-resilient crops like sago, which could be reintegrated into modern diets to enhance food security and sustainability. Additionally, government initiatives aimed at promoting sustainable agriculture, such as Indonesia's Healthy Living Community Movement (GERMAS) and Malaysia's Sustainable Palm Oil (MSPO) certification along with tools such as Malaysia's Sustainable Diet Index (SDI) can help track and promote sustainable eating practices.

Finally, the review highlights the need for a concerted regional effort to promote sustainable diets due to many common challenges shared by the countries in this region, including rapid urbanization, environmental degradation, and the growing prevalence of non-communicable diseases. Collaborative initiatives, such as regional frameworks for sustainable food production and consumption, can provide a unified approach to addressing these issues. Regional cooperation through policy harmonization and knowledge sharing can further accelerate these efforts. Collaborations to support sustainable food production and consumption, aligned with national strategies like Thailand's National Economic and Social Development Plan, will be key to achieving broader sustainability goals.

However, this review has several limitations that may affect the comprehensiveness of the findings. The available literature was unevenly distributed, with more studies from countries like Indonesia, Malaysia, and Thailand, and fewer from smaller nations such as Timor-Leste and Myanmar, which may limit the generalizability of the findings to the entire region. In addition, the review did not assess the quality of the included studies, which is inherent to the scoping review methodology, so the strength of evidence may vary. The reliance on English-language studies also excludes research published in local languages, potentially overlooking important regional insights. Finally, the scope of this review was limited to examining barriers and opportunities for sustainable diets, without exploring specific solutions or interventions, which could be addressed in future research.

CONCLUSION

This scoping review highlights both the opportunities and barriers to advancing sustainable diets in Southeast Asia. While the region’s rich biodiversity, traditional food systems, and emerging policy frameworks offer significant potential for the promotion of sustainable diets, various challenges persist, including economic constraints, cultural resistance, and infrastructural limitations. Nutritional transitions driven by urbanization and Western dietary influences further complicate the region's path towards sustainability. However, opportunities such as the promotion of alternative protein sources, digital innovations, and increasing awareness among younger generations provide promising avenues for future progress. Addressing these barriers will require coordinated efforts from governments, communities, and stakeholders to create tailored policies that respect cultural contexts while promoting environmental sustainability and public health. Future research and interventions should focus on scaling up successful initiatives, enhancing infrastructure, and fostering regional collaboration to accelerate the adoption of sustainable diets across Southeast Asia.

Declarations

Authors' contribution

T.F. conceptualized the study, conducted the literature search and data charting, and drafted the manuscript. A.S. and I.T. supervised the research process and provided critical input throughout the review development. S.K.P. contributed to refining the study protocol and supported the interpretation of findings. All authors reviewed and approved the final manuscript.

Funding statement

This research has not received external funding.

Conflict of interest

There is no conflict of interest in this research.

REFERENCES

1. Popkin, B. M. Urbanization, lifestyle changes and the nutrition transition. *World Dev* **27**, 1905–1916 (1999).
2. Popkin, B. M. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. *Am J Clin Nutr* **84**, 289–298 (2006).
3. Azzam, A. Is the world converging to a 'Western diet'? *Public Health Nutr* **24**, 309–317 (2021).
4. Clemente-Suárez, V. J., Beltrán-Velasco, A. I., Redondo-Flórez, L., Martín-Rodríguez, A. & Tornero-Aguilera, J. F. Global Impacts of Western Diet and Its Effects on Metabolism and Health: A Narrative Review. *Nutrients* vol. 15 Preprint at https://doi.org/10.3390/nu15122749 (2023).
5. Smith, M. R. & Myers, S. S. Impact of anthropogenic CO2 emissions on global human nutrition. *Nat Clim Chang* **8**, 834–839 (2018).
6. Whitmee, S. *et al.* Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. *The Lancet* **386**, 1973–2028 (2015).
7. Vermeulen, S. J., Campbell, B. M. & Ingram, J. S. I. Climate Change and Food Systems. *Annu Rev Environ Resour* **37**, 195–222 (2012).
8. Aiking, H. Protein production: planet, profit, plus people? *Am J Clin Nutr* **100**, 483S-489S (2014).
9. Jägerskog, A. & Jønch Clausen, T. *Feeding a Thirsty World: Challenges and Opportunities for a Water and Food Secure Future.* (Stockholm International Water Institute, 2012).
10. Machovina, B., Feeley, K. J. & Ripple, W. J. Biodiversity conservation: The key is reducing meat consumption. *Science of the Total Environment* **536**, 419–431 (2015).
11. UNEP et al. *Food Systems and Natural Resources. A Report of the Working Group on Food Systems of the International Resource Panel*. (2016).
12. Bellamy, A. S. *et al.* Promoting dietary changes for achieving health and sustainability targets. *Front Sustain Food Syst* **7**, (2023).
13. IPCC. *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*. (In Press., Geneva, 2018).
14. FAO. *Report of the Technical Workshop on Biodiversity in Sustainable Diets.* http://www.fao.org/ag/humannutrition/24994-064a7cf9328fbe211363424ba7796919a.pdf (2010).
15. Springmann, M., Clark, M. A., Rayner, M., Scarborough, P. & Webb, P. The global and regional costs of healthy and sustainable dietary patterns: a modelling study. *Lancet Planet Health* **5**, e797–e807 (2021).
16. Arksey, H. & O'Malley, L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* **8**, 19–32 (2005).
17. Tricco, A. C. *et al.* A scoping review on the conduct and reporting of scoping reviews. *BMC Med Res Methodol* **16**, 1–10 (2016).

18. De Pee, S. *et al.* Balancing a sustained pursuit of nutrition, health, affordability and climate goals: exploring the case of Indonesia. *American Journal of Clinical Nutrition* **114**, 1686–1697 (2021).
19. Vermeulen, S. *et al.* Healthy diets from sustainable production: Indonesia. *London: Chatham House* 12–14 (2019).
20. Pawera, L. *et al.* Wild food plants and trends in their use: From knowledge and perceptions to drivers of change in West Sumatra, Indonesia. *Foods* **9**, (2020).
21. Priyatnasari, N. S. *et al.* Meat-analog made from Javanese Grasshopper, kidney beans, and elephant foot yam as a high-protein and low-cholesterol product. *J Agric Food Res* **16**, (2024).
22. Nurhasan, M. *et al.* Toward a Sustainable Food System in West Papua, Indonesia: Exploring the Links Between Dietary Transition, Food Security, and Forests. *Front Sustain Food Syst* **5**, (2022).
23. Zulkefli, N. F. & Moy, F. M. Development and validation of a sustainable diet index among Malaysian adults: Protocol. *Sains Malays* **50**, 1697–1705 (2021).
24. Rahman, M. A. Food Security Implementation in ASEAN: Towards Sustainable Food Trade and Food Market within the ASEAN Economic Community. *International Journal of Asian Social Science* **8**, 434–447 (2018).
25. Trinh, H. T. *et al.* Diets, food choices and environmental impacts across an urban-rural interface in Northern Vietnam. *Agriculture (Switzerland)* **11**, 1–20 (2021).
26. Downs, S. M., Nicholas, K., Khine Linn, K. & Fanzo, J. Examining the trade-offs of palm oil production and consumption from a sustainable diets perspective: Lessons learned from Myanmar. *Public Health Nutr* **25**, 964–976 (2022).
27. Davis, C. Timor Leste strategic Review: Progress and Success in Achieving the Sustainable Development Goal 2. (2017).
28. Lin, H. I., Yu, Y. Y., Wen, F. I. & Liu, P. T. Status of Food Security in East and Southeast Asia and Challenges of Climate Change. *Climate* vol. 10 Preprint at https://doi.org/10.3390/cli10030040 (2022).
29. Wiriyasirikul, S., Eksirinimit, T., Kusol, K. & Jantasuwan, R. The Effectiveness of Promoting a Vegetable and Fruit Consumption Behavior Program among Preschool Children in Nakhon Si Thammarat Province, Thailand. *Sustainability (Switzerland)* **15**, (2023).
30. Nguyen, H. V., Nguyen, N., Nguyen, B. K. & Greenland, S. Sustainable food consumption: Investigating organic meat purchase intention by vietnamese consumers. *Sustainability (Switzerland)* **13**, 1–15 (2021).
31. Fritz, M. *et al.* Turning indonesia organic: Insights from transdisciplinary research on the challenges of a societal transformation. *Sustainability (Switzerland)* **13**, (2021).
32. Keleman Saxena, A., Mahanty, A., Hugh Allison, E., Armando Medinaceli, M. & Constanza Ramenzoni, V. Taboos, food avoidances, and diseases: Local epistemologies of health among Coastal Endenese in Eastern Indonesia. *Frontiers in Sustainable Food Systems T* (2023).
33. Markoni, E. *et al.* Healthy or Environmentally Friendly? Meat Consumption Practices of Green Consumers in Vietnam and Switzerland. *Sustainability (Switzerland)* **15**, (2023).
34. Chen, C., Chaudhary, A. & Mathys, A. Dietary Change and Global Sustainable Development Goals. *Frontiers in Sustainable Food Systems* vol. 6 Preprint at https://doi.org/10.3389/fsufs.2022.771041 (2022).
35. Thant, P. S. *et al.* Myanmar local food systems in a changing climate: Insights from multiple stakeholders. *Environmental and Sustainability Indicators* **14**, (2022).
36. Godinez, L. J. Building a Community: A Key in Sustainable Eating Lifestyle of Young Urban Professionals. in *DLSU Research Congress 2022* (Manila, 2022).
37. Adhikari, B. & Prapaspongsa, T. Environmental sustainability of food consumption in Asia. *Sustainability (Switzerland)* **11**, (2019).
38. Golloso-Gubat, M. J. *et al.* Sustainability of the Philippine food system. *Front Sustain Food Syst* **8**, (2024).

39. Chin, C. F. *et al.* Transforming food systems in Maritime Southeast Asia and Pacific Small Island Developing States to support food security and sustainable healthy diets. *Frontiers in Sustainable Food Systems* vol. 8 Preprint at https://doi.org/10.3389/fsufs.2024.1304317 (2024).
40. Lin, S. Y. *et al.* Towards calorie-adequate diets to mitigate environmental impacts from food consumption in Asia. *Sustain Prod Consum* (2024) doi:10.1016/j.spc.2024.06.023.
41. Heller, M. C. & Keoleian, G. A. Greenhouse Gas Emission Estimates of U.S. Dietary Choices and Food Loss. *J Ind Ecol* **19**, 391–401 (2015).
42. Clark, M. *et al.* The Role of Healthy Diets in Environmentally Sustainable Food Systems. *Food Nutr Bull* **41**, 31S-58S (2020).
43. Sampantamit, T. *et al.* Aquaculture production and its environmental sustainability in Thailand: Challenges and potential solutions. *Sustainability (Switzerland)* vol. 12 1–17 Preprint at https://doi.org/10.3390/su12052010 (2020).
44. Mayton, H. *et al.* Conceptualizing sustainable diets in Vietnam: Minimum metrics and potential leverage points. *Food Policy* **91**, (2020).
45. Ahern, M., Thilsted, S., Oenema, S. & Kühnhold, H. The role of aquatic foods in sustainable healthy diets. *UN Nutrition Discussion Paper* (2021).
46. Fanzo, J. *Can Fixing Dinner Fix the Planet?* (Johns Hopkins University Press Baltimore, MD, 2021).
47. Mahjom, N., Muhammad, F. & Razak, A. A. Positive Diet Supporting Sustainable Development Aims: Functional Food Intake among Malaysians. *Ann Rom Soc Cell Biol* **25**, 3045–3055 (2021).
48. Tan, X. Y. & Cheng, S.-H. Understanding Malaysian consumers perception and acceptability of plant-based alternatives to chicken: Do texture, taste, and environmental impact matter? *Food and Humanity* **2**, 100304 (2024).
49. Agustina, R. *et al.* Development and preliminary validity of an Indonesian mobile application for a balanced and sustainable diet for obesity management. *BMC Public Health* **22**, (2022).
50. Anh, P. T., Lan, N. T. N., Hanh, N. T. M., Huy, D. T. N. & Loan, B. T. T. Sustainable consumption behaviors of young people in the field of food and drinks: A case study. *Journal of Security and Sustainability Issues* **9**, 36–47 (2020).
51. Heerschop, S. N., Kanellopoulos, A., Biesbroek, S. & van 't Veer, P. Shifting towards optimized healthy and sustainable Dutch diets: impact on protein quality. *Eur J Nutr* **62**, 2115–2128 (2023).
52. Li, S. & Kallas, Z. Meta-analysis of consumers' willingness to pay for sustainable food products. *Appetite* vol. 163 Preprint at https://doi.org/10.1016/j.appet.2021.105239 (2021).
53. Commission, E. Farm to fork strategy: for a fair, healthy and environmentally-friendly food system. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions* **381**, 1–9 (2020).