

Module 1: Sustainable Food Systems

Module Description

Module 1 introduces students to sustainable food systems as connected chains rather than isolated products or problems. Students examine how production, storage, processing, transport, retail, consumption, waste interact and how sustainability depends on environmental pressures, economic realities, infrastructure, policy and stakeholder priorities. Through Vietnamese case studies, students learn to identify hotspots in food systems, assess trade-offs and consider what realistic intervention looks like in practice. The activities emphasise systems thinking, stakeholder analysis and evidence-based reasoning.

This module lays the foundation for the rest of the Food Science and Technology sustainability stream. By learning how to map systems, identify pressure points and understand competing stakeholder priorities, students are better prepared for the more applied focus on processing in Module 2, packaging and waste in Module 3 and AI-supported diet planning in Module 4.

Learning Objectives:

- Explain food systems as interconnected networks linking production, processing, distribution, consumption and waste.
- Identify sustainability hotspots in Vietnamese food systems, including emissions, food loss, infrastructure pressures and market dependence.
- Apply systems thinking to evaluate food-system trade-offs and stakeholder tensions.
- Compare possible interventions and judge which are most realistic in a Vietnamese context.
- Communicate a concise food-systems analysis using evidence from readings and case studies.

Module 1 Pre-class activities

Purpose: To prepare students to analyse food systems in Vietnam by identifying key actors, vulnerable areas and intervention pathways across the chain from production to consumption and waste. This reflects the emphasis on systems tools, interdisciplinary analysis and food-system trade-offs.

Pre-class Activity 1: Choose one article or report from the list below and identify one key idea to help understand food systems in Vietnam.

- Fanzo, J., et al. (2022). Sustainable food systems and nutrition in the 21st century: A report from the 22nd annual Harvard Nutrition Obesity Symposium. *The American Journal of Clinical Nutrition*, 115(1), 18–33. <https://doi.org/10.1093/ajcn/nqab315>
- Food and Agriculture Organization of the United Nations, & World Health Organization. (2019). *Sustainable healthy diets: Guiding principles*. <https://doi.org/10.4060/ca6640en>
- Pope, H. P. H., et al. (2021). Developing a functional food systems literacy for interdisciplinary dynamic learning networks. *Frontiers in Sustainable Food Systems*, 5, Article 747627. <https://doi.org/10.3389/fsufs.2021.747627>

- World Bank. (2020). *Vietnam food smart country diagnostic*.
<https://documents1.worldbank.org/curated/en/301051601307169189/pdf/Vietnam-Food-Smart-Country-Diagnostic.pdf>

Pre-class Activity 2: Short written response to a real-world case:

Pick one of the following real-world cases:

Low-emission rice in the Mekong Delta: rice remains central to Vietnam’s agrifood system, while low-emission rice is being promoted as part of climate adaptation and emissions reduction.

Food and Agriculture Organization of the United Nations. (2025, February 28). *The development of a low-emission and high-quality rice sector in the Mekong River Delta*. <https://www.fao.org/vietnam/news/detail/The-development-of-a-low-emission-and-high-quality-rice-sector-in-the-Mekong-River-Delta/en>

Climate-smart coffee in the Central Highlands: coffee sustainability in Vietnam is increasingly tied to agroforestry, climate resilience, finance and traceability.

SNV. (n.d.). *Vietnam country factsheet*.
<https://www.snv.org/assets/downloads/f/191310/x/6e4e2a618f/vietnam-fact-sheet.pdf>

Dragon fruit, cold chains and post-harvest loss: Vietnam’s dragon fruit sector depends heavily on export markets and faces shelf-life, storage and loss-reduction challenges.

Axmann, H. B., Soethoudt, J. M., & Thuy, V. Đ. (2022). *Roadmap post-harvest loss reduction in selected Vietnamese value chains* (Phase 2; Report 2330).
Wageningen Food & Biobased Research. <https://doi.org/10.18174/577022>

Choose one of the following questions and write 200-250 words total and post to the online class discussion forum before the session.

- What insight does the reading give students about food systems thinking, food-system trade-offs or sustainable diets?
- Which stakeholder group is most affected: producers, processors, distributors, retailers, consumers or policymakers?
- What kind of intervention seems most realistic and why?

Module 1 In-class activities

Food System “Mapping” Workshop

Goal: Use pre-class work to identify where sustainability pressures sit across a Vietnamese food system.

In groups, each student should share their pre-class response. Identify any overlaps. Teams select one local food system from the reading selection to map in more detail.

Mapping questions:

- Where do the main environmental pressures occur?
- Where do food loss, waste, or inefficiencies emerge?
- Which stages depend most heavily on infrastructure, markets, or policy?
- Which trade-offs appear when one part of the system improves?

Output: Teams produce a visual food-system map and give a 5-minute explanation of a key target area and why it matters.

Stakeholder Role-Play: “The Food Systems Roundtable”

Goal: Explore competing priorities in food-system decision-making.

Scenario: A Vietnamese food system is under pressure to improve sustainability while remaining economically viable and socially acceptable.

Roles: farmer/producer, processor, logistics operator, retailer/exporter, policymaker, consumer advocate.

Task: Each role argues for or against a proposed intervention using stakeholder priorities, costs, risks and likely benefits.

Debrief: Whose perspective dominated? Which stakeholder concerns were easiest to overlook? Were students prioritizing environmental gains, economic feasibility, or food access?

Intervention Pathway Challenge

Goal: Move from diagnosis to practical intervention design.

Group task: Teams take one case from pre-class work and propose three linked interventions:

- One at the production level
- One at the supply-chain or infrastructure level
- One at the policy, market or consumer level

Output: A one-page intervention pathway with 1–2 recommendations that could make the system more sustainable without ignoring trade-offs. This follows the World Bank’s emphasis on comparing alternative interventions in terms of effectiveness, costs and benefits.

Post-class Reflection

Students respond to the prompt: “What makes a food-system intervention realistic in Vietnam, and which trade-off would you be least willing to accept?”

Students should write one key insight and one lingering question for the next module.