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“Reconcile land system changes  
with planetary health”

## Transitions of the hanoi food environment: insights from systems thinking and leverage points

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### Abstract

Urban food environments have undergone recent drastic transitions in emerging economies. Some of these changes have had positive impacts on reducing undernutrition, while others have contributed to negative outcomes such as overnutrition and diet-related non-communicable diseases. Understanding the dynamics of the food environment system is key to identifying leverage points for sustainable, health-promoting transformations.

This study examines the changes in the food environment within the Hanoi food system, its driving factors, and identifies key leverage points for intervention. We conducted a systematic literature review to examine the evolution of Hanoi's food environment through the lens of system dynamics, analysing both external (i.e. availability, prices, vendor and product properties, and marketing and regulations) and personal (i.e. accessibility, affordability, convenience, and desirability) domains of the food environment.

Our study reveals the changes in the Hanoi food environment from 2008 to the present, where traditional markets were initially dominant, followed by the emergence of supermarket-based distribution systems, and more recently, the rise of online food platforms. Service and convenience are two dominant emerging trends in the food environment transition, with a variety of vegetable sources and increasingly accessible delivery services. However, concerns about vegetable quality persist. Our findings also highlight the interplay between globalisation, urbanisation, market systems, and consumption behaviours, which has contributed to the near eradication of hunger and a reduction in undernutrition, but at the same time has led to increased health risks (e.g. obesity), food safety concerns (e.g. risk of pesticide and other chemical residues, unhygienic post harvest practices), urban waste (e.g., plastic, food, agricultural inputs), and inequities in access to safe vegetables. Furthermore, using Meadows' leverage points framework, we identify targeted interventions, including promoting short supply chains, increasing consumer awareness (e.g. information point and labelling), developing behavioural nudges to encourage sustainable consumption (e.g. colour-coded stalls for clear distinction), having a dedicated authority focused on monitoring and optimising multiple system objectives.

The study offers insights for policymakers and stakeholders to foster integrated strategies that address food security, nutrition, public health, environmental sustainability, and inclusion within Hanoi's food system.

**Keywords:** Convenience, digitalisation, food safety and quality, leverage points, sustainable nutrition transitions, system dynamics, urbanisation

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