



Tropentag, September 11-13, 2024, hybrid conference

“Exploring opportunities ...
for managing natural resources and a better life for all”

Modelling the impact of land use choices on livelihoods and food environments in peri-urban Hanoi

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Abstract

Rapid urbanisation and industrialisation cause major changes in farmers' livelihoods in peri-urban areas. A part of the agricultural lands, once productive food sources for local residents, are now abandoned or underutilised. Consequently, the food environment (context in which consumers engage with the food system) also changes. In this context, farmers who remain in agriculture grapple with the decision of whether to continue maintaining agricultural production or to explore alternative income generation options. However, a food environment conducive to a sustainable diet for peri-urban and urban consumers is crucial in addressing all forms of malnutrition. Modelling approaches offer valuable insights by simulating different scenarios and assessing the potential sustainability impacts of synergies and trade-offs. These models can support farmers to make informed decisions that balance agricultural activities and other income-generating pursuits, while maximizing their livelihood.

We employed a rigorous decision-making framework, integrating literature, observational data and stakeholder consultations, particularly with farmers, to construct three distinct farm-level decision scenarios for peri-urban land-owning farmers: maintaining production on the land (MAINTAIN), rent the land to other farmers (RENT), or leave the land fallow (FALLOW). We constructed an initial impact pathway diagram to visualise these scenarios, encompassing all conceivable costs, benefits, and risks associated with the project. We translated the conceptual model into a mathematical model and used Monte Carlo simulation in the R programming language to forecast benefits and trade-offs of the decision options.

Our findings indicate that MAINTAIN yields many benefits, including income from agriculture, improved health through safe food consumption, and the preservation of cultural values. RENT provides an alternative income stream but entails risks such as fluctuating rental prices. FALLOW results in a higher level of non-farm income, but the abandonment of agricultural land also carries inherent risks, such as potential administrative fines or land reclamation by the government under the Land Law regulations.

Our results offer valuable insights into crucial aspects of land use in peri-urban Hanoi. Local party leaders and committees can leverage this information to bolster support for farmers by strengthening short supply chains, implementing rental systems for land, or enhancing the economic efficiency of agricultural production.

Keywords: Decision analysis, food environment, maintaining agriculture, urbanisation

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