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Food system resilience: Conceptualisation and empirical application

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Abstract

In the last decades, resilience has emerged as a compelling concept for understanding social and ecological systems in the face of shocks. Although different conceptualisations of resilience exist in the literature, a consensus on its definition has not yet been reached. Furthermore, resilience analyses have focused only on specific living standards or selected components of food systems, failing to capture the whole system complexity.

There are three main approaches to measuring development resilience, which define resilience as a capacity, as a normative condition, and as a return to equilibrium. However, none of them provide a reliable measurement to guide and evaluate development resilience interventions.

This study aims to fill the upward-mentioned literature gaps by proposing and empirically testing a measure of resilience that addresses three dimensions of a food system: economic profitability, environmental sustainability, and adequate nutrition. The proposed model combines the "resilience as capacity" approach developed by FAO with the conceptualisations of resilience as a normative condition and return to equilibrium. The model considers multiple levels, from individual to community, and uses LASSO regression to select the observable variables that enter the model.

As outcome variables, we consider the probability that each of the three dimensions of the food system in the aftermath of the shock is at least at the same level as before the stressor. In this way, we integrate the "return to equilibrium" approach into the model. When the outcome is defined in terms of a threshold, the "normative condition" approach is implemented. To test the model empirically, a cross-country analysis is conducted, using data over at least two points in time from different sources, combining household surveys with GIS data.

The contributions of this study are four. First, it provides a conceptual framework of food system resilience that combines the three different approaches proposed by the literature so far. Second, it uses a food system approach that takes into account environment and nutrition in addition to the development aspect of resilience. Third, it tests the model empirically. Fourth, it uses a technique for measuring resilience that allows for flexibility and adaptability.

Keywords: Food systems, resilience, shocks

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