Tropentag, September 10-12, 2025, hybrid conference

"Reconcile land system changes
with planetary health"

Navigating uncertainty: What drives farmers' resilience to adapt in multi-disaster regions?

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Abstract

Disaster occurrences show an increased trend, with most of the disaster loss still coming from geophysical disasters, but climate and weather-related disasters increased fourfold in the past decades. Farmers frequently exposed to multi-hazard shocks have developed their capacity for recovery and adaptation. Nonetheless, current literature on disasters' impacts on agriculture mostly focuses on single-hazard risks, particularly those related to weather and climate-induced disasters. In addition, studies on multi-hazard adaptation strategies are limited, particularly those aimed at achieving agricultural resilience. Disaster Risk Reduction (DRR) focused farm-level practices provide farmers with significantly higher benefits, though good practices are highly context- and location-specific, which may not be replicable in other areas or at a large scale.

Farmers in Indonesia frequently face disasters like floods, droughts, and earthquakes, severely impacting their crops and threatening food security. These repeated events push farmers to adopt new farming practices, yet not all farmers respond in the same way. Hence, this study will look into what drives farmers to select specific adaptation methods, such as improving soil quality, planting diverse crops, managing water better, or integrating trees and crops (agroforestry) in a multi-hazard context. The research will examine how household traits (like income, family size, and education), farm features (such as land size and type of crops), experiences from previous disasters, and farmers' perceptions of their vulnerability influence these decisions. Protection Motivation Theory (PMT) guides this analysis, helping to unpack how farmers perceive risks and threats, shaping their adaptation choices.

A multivariate probit model helps test two main ideas: firstly, whether farmers' socioeconomic backgrounds strongly shape their choice of farming adaptations, and secondly, whether past disaster experiences and perceived vulnerability significantly increase the chances of adopting these adaptive practices. The findings from this research aim to give clear, practical insights to policymakers, helping them better support farmers through targeted strategies. Ultimately, this helps strengthen agricultural resilience, making communities more food secure despite frequent disasters.

Keywords: Agricultural adaptations, disaster experience, disaster risk, farmers' perceptions, farming resilience, food security, protection motivation theory

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