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"Global food security and food safety:
The role of universities"

Agroforestry Options in Northwest Vietnam

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Abstract

The mountainous northwest of Vietnam, bordering Lao PDR and China, is home for the majority of the country's ethnic minorities. Both poverty and food insecurity are common in the region. Slash-and-burn maize, rice and cassava monocultures have been the main source of local livelihoods for decades. However, increasing population and land scarcity have induced the expansion of agricultural areas and consequent decline of land productivity due to soil erosion and land degradation. For these reasons, slash-and-burn agriculture practices often fail to guarantee sufficient food and income. As a solution, local farmers have begun to practice agroforestry through the introduction of high value trees into traditional cropping systems. Since 2012, the World Agroforestry Centre (ICRAF) has trialled several agroforestry options in the region with various combinations of timber, fruit, nut forage trees and annual crops. However, because of inherent production risks and many remaining uncertainties, assessing the long-term performance of agroforestry has remained challenging.

Decision analysis is an approach that can address risk and uncertainty, which are expressed as probability distributions to provide a realistic picture of the range of possible system outcomes. The approach provides cost-effective basic assessment, which can be updated as more information becomes available. We simulated prospective system benefits of agroforestry options by developing comprehensive and holistic models that aimed to explicitly consider all relevant risks and uncertainties. Project managers and technical staff from ICRAF, local farmers and extension workers were asked to list all the costs, benefits and risks associated with the implementation of seven agroforestry options. Conceptual models were developed to map out causal relationships among identified input variables. The initial findings reveal model components such as drought and frost and potential extreme weather events as the primary risks to agroforestry in the region. The analysis approach is a promising tool for *ex-ante* assessments of other planned interventions.

Keywords: Decision analysis, food insecurity, holistic model, risk and uncertainty

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