



Driving factors for developing integrated farming: Multi-criteria decision-making analysis

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ABSTRACT

Integrated farming (IF) by temporal and spatial mixing of crops, livestock, fishery, and allied activities in a single farm, is considered a critical multifunctional option for smallholder farmers, who form the backbone of Indian agriculture, to ensure sustainable livelihoods, the productivity of agricultural enterprises, stability of farm income, food and nutritional security. However, the adoption of IF still remains low. To explore the critical factors of IF systems and prioritize them for stakeholders' decision-making and development of strategies, the current research was undertaken to integrate SWOT (Strengths, Weaknesses, Opportunities, and Threats) - AHP (Analytic Hierarchy Process) analysis. We used a multi-stage sampling to select 60 practicing IF adopters in West Bengal state of eastern India for the collection of pair-wise comparison data on 32 SWOT factors using a close-ended questionnaire and subjected to AHP analysis to understand the quantitative importance of each factor of SWOT. Results of the multi-criteria analysis showed the total priority weight of the opportunity component (0.450) was the highest, followed by strength (0.341), weakness (0.114), and threat components (0.095). Based on the global priority weight of all 32 SWOT factors, "sustainable livelihood security" was the key driving factor (0.081) followed by "promotion of organic farming" (0.072), "better risk management" (0.063) and "incorporation of high-value crops" (0.063) of opportunity component. "Increased farm production and productivity" (0.058) and "enhancement in income" (0.055) of strength component also played as vital driving factors. There was no factor of weakness and threat components within the first 10 important factors. The insights of this study may help improve extension services to smallholder farmers for prioritizing strategies in the adoption process of IF. Additionally, it can also help policymakers to design targeted policies, remove barriers, foster innovation, and promote sustainable practices, contributing to food security and environmental sustainability.

Keywords: Analytic hierarchy process (AHP), Driving factors, Integrated farming (IF), Limiting factors, SWOT analysis, West Bengal

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