

IFAD – 50X2030 Initiative Research Brief

Sources of Information Diffusion and Adoption of Agricultural Technologies: Evidence from Cambodia

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Summary

Agricultural transformation to commercial and modern practices is a goal stated in the 2022-2030 Agricultural Development Policy of the Royal Government of Cambodia. This policy is aligned with the priorities of the Cambodia Sustainable Development Goals 2030, Rectangular Strategy IV, National Strategic Development Plan 2019-2023, Industrial Development Plan 2015-2025 and Strategic Framework and Programmes for Economic Recovery in the Context of Living with Covid-19 in a New Normal 2021-2023. An intervention emphasized in the policy, as part of the agricultural extension services, is to communicate latest information about new technologies and innovative ways to farm households to improve agricultural practices. Nonetheless, farmers often do not have sufficient access to agricultural information, and sources of information and their effectiveness could vary.

Given the limited availability of rigorous empirical studies examining the association between access to agricultural extension services and adoption of agricultural technologies, alongside the current policy framework on agricultural development in Cambodia, this study has two primary objectives. First, the study examines the impact of access to agricultural extension services on the decision to adopt aromatic rice by farm households. Second, the paper investigates how various sources of agricultural extension services (i.e., government, peers, traders and groups) affect the propensity of adopting aromatic rice varieties.

Key Messages

- A lack of knowledge among farmers on appropriate use of improved farm technologies is a key barrier for the competitiveness and modernization of Cambodia's agriculture.
- No studies in Cambodia use the latest nationally representative data with an advanced estimation method to examine the role of extension in adoption of farm technologies.
- Access to agricultural extension services remains a crucial factor in promoting the adoption of new technologies among farmers.
- Information via peers and traders are an important channel for the diffusion of information about new technologies in agriculture.
- Strategies aimed at promoting the adoption of new technologies should prioritize the strengthening of social networks and relationships among farmers and other actors in the agricultural value chain. This channel is particularly relevant in resource-scarce situations.

Background

The economic sustainability of agricultural development in developing countries requires a shift from subsistence farming to more productive and commercialized systems. Promoting agricultural extension can support that transformation. That approach has been considered an ongoing process of transferring information about new technologies, more effective management options, and better farming practices to increase producers' knowledge of how to use and manage land and water

resources effectively to improve production and productivity.



Source: Ministry of Agriculture, Forestry & Fisheries, 2019

Cambodia remains at an early stage of agricultural transformation with low levels of value-added production compared to other developing countries. In this regard, farmers’ knowledge about the appropriate application of improved farm technologies is a major constraint to the competitiveness and modernization of Cambodia’s agricultural sector. Though it is widely acknowledged that extension services and agricultural technology adoption are instrumental, particularly for rural livelihood improvement, the empirical research in this area remain limited.

Research methodology

In this study, we investigated whether farmers are more likely to grow aromatic rice varieties if they have access to information about new agricultural technologies. We looked at how farmers get this information from the government, peers, traders and groups. To do this, we used the Cambodia Inter-Censal Agriculture Survey 2019, the latest nationally representative data on agriculture in Cambodia. The survey consists of 16,000 agricultural households across 25 provinces. Given missing values in variables needed for the analysis, however, the final dataset contains 13,326

households. To address non-randomness of information access, we employ an instrumental variable (IV) approach to estimate the casual association.^{*} Our choice of IV approach is motivated by the diffusion of innovation theory and a previous empirical study which uses the “cumulative adoption rate” as one of the instruments for the endogenous treatment variable on the choice of hybrid maize seed use. The cumulative access rate, in our study, is defined as the proportion of households which have access to the agricultural extension services in each village. Our main econometric identification is a probit model with binary endogenous covariates.

Major findings

We find that access to agricultural information increases the likelihood of adopting aromatic rice varieties and that obtaining agricultural information from peers and traders significantly increase propensity of farmers adopting aromatic rice (Table 1).

Table 1. Effects of access to information on the propensity of aromatic rice adoption.

Sources	Effects
Info. from government	0.003 (0.029)
Info. from peers	0.176*** (0.018)
Info. from groups	0.027 (0.035)
Info. from traders	0.099*** (0.036)

Note: Standard errors in parentheses are computed using Delta method. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Source: Authors’ calculation.

We also find that agricultural information from the government and group sources did not play a significant role in influencing farmers to adopt new agricultural technologies. This might imply that both government and groups could find it challenging to communicate the agricultural information to farmers more

¹ This is an advanced econometrics approach for impact evaluation. Apart from controlling for observable characteristics (e.g., age, training, wealth and so on) of

farm households, this method enables to control for unobservable factors (e.g., motivation, farming ability and so on), which can cause bias to impact estimation.

effectively compared to peers and traders. Other factors such as training and education to farmers, female-headed households and farm size could also have a positive relationship with likelihood of farmers adopting aromatic rice.

Policy implications

This study shows that agricultural information which farmers acquired from peers and traders does support the adoption of agricultural technology in Cambodia. Given the empirical findings, policymakers should consider promoting extension services through informal sources such as peers and traders, especially given the limited resources of the government.

Thus, it is essential for policymakers to recognize the importance of peers and traders in facilitating the exchange of agricultural information and building trust among farmers, implying that strategies aimed at promoting the adoption of agricultural technologies should prioritize the strengthening of social networks and relationships among farmers and other actors in the agricultural value chain.



Source: Ministry of Agriculture, Forestry & Fisheries, 2019

Suggestions for further studies

We hope to address three research questions in future work. First, we want to examine whether aromatic rice growers are better off compared to non-aromatic rice farmers. Our initial estimates suggest they are, but we need to do more research to be sure. Second, it is of policy relevance to understand whether some groups of people benefit more than others from growing

aromatic rice. For example, does it help men and women equally? Third, we might need to better understand the gains (or losses) from a benefit-cost framework, allowing adopters and policymakers to see whether pushing for aromatic rice adoption is worth the time, effort and resources.

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