

● ヴ・ハ・トゥー 特定助教

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研究課題: Research Title (English): Impacts of Network-based Interventions on Farmers' Adoption of Agricultural Technologies: Evidence from Field Experiments in Developing Countries

専門分野: Development Economics

受入先部局: Graduate School of Economics

前職の機関名: Graduate School of Humanities and Social Sciences, Hiroshima University



Would free bed net distribution lead to a reduction of malaria prevalence? What would be the impacts of providing microcredits on welfare of poor people? Would information treatments affect farmers' adoption of new technology? These are examples of causal questions which economists and policymakers often ask themselves. As development economists, we answer the questions using causal inference approaches.

In my research, I focus on sustainable rural development in developing countries. My current research topics under the HAKUBI concentrate on a key scientific question: "How to

leverage social networks to promote farmer's adoption of agricultural technologies?". Based on randomized controlled trials (RCTs) conducted in Vietnam and Sri Lanka, this research investigates the impacts of network-based interventions on not only farmers' uptake of new technologies but also their farm production. This research contributes to the emerging literature on social networks and technology adoption. The findings would also enable policymakers to design evidence-based policies that enhance farmers' uptake of new agricultural technologies and thus improve their well-being.

To attain the key research question mentioned above, I have conducted two research projects in Vietnam and Sri Lanka.

Research project 1: Long-term Direct and Spillover Effects of Subsidies on Crop Insurance Adoption: Evidence from an RCT in Vietnam

The majority of the poor live in rural areas and engage in agricultural activities. While poor farmers are often exposed to uncertain income due to natural disasters and pests, they have limited savings to self-insure. Crop insurance is therefore a potential risk management strategy that improves income stability and prevents farmers from falling deep into poverty. However, the uptake of crop insurance has been extremely low at market price in many developing countries.

As with other new agricultural technologies and services, price subsidy is a common policy in developing countries to induce initial uptake of crop insurance. Nonetheless, the insured farmers may not necessarily experience that crop insurance is beneficial because they may not receive any payout if the indemnity conditions are not triggered (e.g., there are no natural disasters during the insurance period). Cai et al. (2020)

is the only study that show the long-term impacts of a temporary subsidy on crop insurance uptake. Therefore, how the price subsidy would affect the subsequent adoption of crop insurance remains ambiguous in the literature.

Despite the significant roles of social networks in the wider diffusion of new technology, none of the previous studies rigorously examine the spillover effect from subsidized farmers to others in their networks in the context of crop insurance. With the high costs of reaching all small farmers, a cost-effective model for agriculture extension in developing countries is to rely on seed farmers who first adopt new technologies and then ask to diffuse them to the other farmers. If such spillover exists through social learning, subsidy provision can be possibly limited only to seed farmers to reduce financial burden, but if not, it may be more effective to subsidize all farmers for wider diffusion.

My research addresses the research gaps by examining the long-term direct and spillover effects of the subsidy on farmers' uptake of crop insurance. This study also explores the impacts of crop insurance adoption on agricultural production and other financial transactions, such as borrowing and savings. To attain these objectives, I conduct an RCT with

farmers in 44 Village Savings and Loan Associations (VSLAs) – a form of autonomous microcredit groups – established by ethnic minority women in Vietnam.

Research project 2: Vaccination based on Community Animal Health Workers (CAHW): A Case Study with Cattle Vaccination in Sri Lanka.

Foot and mouth disease (FMD) is an infectious disease on livestock that remains an endemic in many Asian countries. Although vaccination prove effective in FMD prevention, the FMD vaccination coverage in several countries falls far below the minimum level to reach herd immunity. A shortage of vaccinators, farmers' limited knowledge about vaccination, and difficulties in reaching animals are primary inhibitors curbing farmers' demand for FMD vaccination.

Vaccination based on Community Animal Health Workers (CAHWs) gives a prospective solution to the low vaccine uptake by utilizing the social network among local farmers. CAHWs are typically local farmers who are trained to promote and conduct vaccination in their villages with or without veterinary officers. The engagement of CAHWs hypothetically raises the trust, knowledge, and convenience of local farmers, which eventually results in an increase in the vaccine uptake.

There are a few studies evaluating the effects or performance of CAHWs on vaccine uptake. However, previous findings were mainly based on qualitative methods or primitive before-after comparison with observed data. While studies with robust causal inference are scarce, the impact of CAHW approach on vaccine uptake of farmers is still ambiguous.

In addition, how to sustain CAHWs' vaccination effort is crucial but understudied. Related literature also remains disputed over the effective incentive. Ben Yishay and Mobarak (2019) emphasize the role of financial incentives in motivating seed farmers to diffuse new agricultural technologies. In contrast, Wagner et al. (2020) reveal that financial incentives reduce the motivation of community health workers compared with non-financial social reward.

To address two research gaps mentioned above, my research examines the CAHW-based vaccination system through two RCTs with cattle farmers in Sri Lanka. This research not only evaluates the causal impacts of CAHWs on the uptake of FMD vaccine but also compare the effects on vaccination effort between private reward and social reward for CAHWs.

References

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- Benyishay A. & Mobarak AM. (2019). Social Learning and Incentives for Experimentation and Communication. *Review of Economic Studies* 86(3), 976–1009
- Wagner Z., Asimwe JB. & Levine DI. (2020). When Financial Incentives Backfire: Evidence from a Community Health Worker Experiment in Uganda. *Journal of Development Economics* 144