atai
AGRICULTURAL TECHNOLOGY ADOPTION INITIATIVE

EMERGING INSIGHTS

Sharing Information to Support Smallholder Farmers in South Asia and Sub-Saharan Africa:
Evidence from the Agricultural Technology Adoption Initiative

Agricultural Technology Adoption Initiative:

The Agricultural Technology Adoption Initiative (ATAI) has funded more than forty rigorous evaluations, the majority full-scale randomized controlled trials, addressing critical evidence gaps with robust, causal evidence. ATAI studies seek to advance practical understanding of the obstacles and opportunities critical to technology adoption for smallholders. The "Emerging Insights" series distills evidence from ATAI and complementary studies to broadly share the outcomes of the project as a means to inform programs and policy. The following brief focuses on sharing information.

Context:

Farmers face a range of potential production technologies and practices to choose from, each of which may have different risk profiles, and different suitability on a farmer's own plots. A farmer's decision to adopt a new technology requires several types of information. The farmer must know that the technology exists; she must believe that the technology is beneficial; and she must know how to use it effectively. Agricultural extension is the most common program model used to transmit this information to farmers in developing countries.

Evidence-based insights:

How can information be effectively transmitted to encourage profitable decisions among farmers?

- We know from a number of agricultural surveys that **the use of these traditional government extension services is low** (Beaman et al. 2015) (Blair et al. 2013) (Duflo et al. 2008) (Kondylis et al. 2014) (Waddington et al. 2014).
- **Extension services** such as farmer field schools (FFS), train and visit (T&V) models, and test plots **can be ineffective if they promote a technology which is unprofitable** (Duflo et al. 2008).
- **Extension may be effective when providing information on a profitable practice that overcomes a behavioral bias.** Providing information that helps **overcome procrastination** (Duflo et al. 2008), or demonstrates an effective practice that **may have previously seemed counterintuitive** (Cole & Fernando 2016) or whose **benefits that were not readily apparent** (Hanna et al. 2014) can increase agricultural technology adoption.

Given these challenges to agricultural training, adapting the pedagogical model has been shown to impact agricultural activity:

Approaches to direct farmer training:

- **Information that is more easily accessible to farmers than traditional extension models** (ie. T&V or FFS) **or more tailored to individual farmers at a given moment in time can be effective in changing practices** (Islam 2014) (Duflo et al. forthcoming). **Technology can be used to refine the training message and increase points of contact for farmers** (Cole & Fernando 2016) (Casaburi et al. 2014).

- **Trainers face meaningful incentive problems and are more effective at improving technology adoption when incentivized** (BenYishay & Mobarak 2014) (BenYishay et al. 2015) (Jones & Kondylis 2015) (Masset & Haddad 2014).

Approaches to encourage social diffusion of training content:

- **Farmers may be more likely to follow advice from someone similar to them** (BenYishay & Mobarak 2014) (BenYishay et al. 2015), **or from multiple people within their network** (Beaman et al. 2015) (Tjernstrom 2015). **Social learning can be improved by the systematic selection of the "messenger."** (Beaman et al. 2015) (BenYishay & Mobarak 2014)

Information: Future research

Given the evidence-based insights above, and current interest among related researchers and practitioners, ATAI suggests emphasis on the following topics to further understand effective training and information-sharing strategies for improved smallholder productivity and profits

Emphasized:

- Information provision in the context of the adoption of novel technology
- Making targeting more efficient using information networks
- Mechanisms to tailor information more precisely to individual farmers' contexts (soil quality, precision agriculture)

De-Emphasized:

- Business-as-usual extension systems for familiar crops

Evidence cited

Beaman, L., Karlan, D., Thuysbaert, B., & Udry, C. (2014). Self-Selection into Credit Markets: Evidence from Agriculture in Mali. National Bureau of Economic Research (NBER) Working Paper 20387.

[ATAI] Beaman, L., Ben Yishay, A., Magruder, J., & Mobarak, A. M. (2015). Can Network Theory-Based Targeting Increase Technology Adoption? Working Paper.

BenYishay, A., Jones, M., Kondylis, F., & Mobarak, A. M. (2015). Are Gender Differences in Performance Innate or Socially Mediated? Working Paper.

BenYishay, A., Mobarak, A. M. (2014). Social Learning and Communication. National Bureau of Economic Research (NBER) Working Paper 20139.

Blair, R., Fortson, K., Lee, J., & Rangarajan, A. (2013). Should Foreign Aid Fund Agricultural Training? Evidence from Armenia August 2013. Mathematica Policy Research Working Paper 19.

Casaburi, L., Glennerster, R., Suri, T., & Kamara, S. (2014). Providing Collateral and Improving Product Market Access for Smallholder Farmers: A Randomized Evaluation of Inventory Credit in Sierra Leone. 3ie Impact Evaluation Report 14. July 2014.

[ATAI] Cole, S., & Fernando, A. N. (2012). The Value of Advice: Evidence from Mobile Phone-Based Agricultural Extension. Harvard Business School (HBS) Working Paper 13-047.

Duflo, E., Kremer, M., & Robinson, J. (2008). How High are Rates of Return to Fertilizer? Evidence from Field Experiments in Kenya. American Economic Review, 98(2), 482-88.

[ATAI] Duflo, E., Schilbach, F., Robinson, J., Islam, M., & Kremer, M. (forthcoming). Examining Barriers to Fertilizer Use in Kenya.

Hanna, R., Mullainathan, S., & Schwartzstein, J. (2014). Learning through Noticing: Theory and Experimental Evidence in Farming. The Quarterly Journal of Economics 129(3). 1311-1353.

[ATAI] Islam, M. (2014). Can a Rule-of-Thumb Tool Improve Fertilizer Management? Experimental Evidence from Bangladesh. Working Paper.

Jones, M. & Kondylis, F. (2014). Yor Feedback Matters, To You: Evidence from Extension Services. World Bank Development Economics Research Group.

Kondylis, F., Mueller, V., & Zhu, S. J. (2014). Seeing is believing? Evidence from an Extension Network Experiment (August 1, 2014). World Bank Policy Research Working Paper 7000.

Masset, E., & Haddad, L. (2015) Does Beneficiary Farmer Feedback Improve Project Performance? An Impact Study of a Participatory Monitoring Intervention in Mindanao, Philippines. The Journal of Development Studies 3(51). 287-304.

[ATAI] Tjernström, E. (2015). Signals, Similarity and Seeds: Social Learning in the Presence of Imperfect Information and Heterogeneity. Working Paper.

Waddington, H., Snilstveit, B., Hombrados, J. G., Vojtkova, M., Anderson, J., & White, H. (2014). Farmer field schools for improving farming practices and farmer outcomes in low-and middle-income countries: a systematic review. Campbell systematic reviews, 10(6).