Effective communication for technology uptake: The case of Ethiopia

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In Ethiopia, agricultural extension service, the main agricultural knowledge and innovation communication channel, is provided by the government. However, the service is accused of having an additional objective, i.e. to politically persuade the rural population—the majority (Berhanu and Poulton, 2014). This extracurricular activity may have a negative effect on the effectiveness of the extension service on its primary objective which is to increase technology uptake and hence productivity of farmers. However, if farmers are sceptical of the motives of the extension agents, they might have lower trust, and hence could be reluctant to seek information from the agents or participate in field demonstrations of technologies. In such cases, it is imperative to have alternative ways to communicate knowledge and information with farmers. Also, farmers might be inclined to learning from other farmers because they share similar interests, risks and constraints instead of extension agents.

Fortunately, there is an army of appealing alternative theories that show the potential of social learning and peer effects in knowledge and innovation communication (Young, 2009; Cowan and Jonard, 2004; Rogers, 1971). However, the empirical evidence is limited due to logistical implications of conducting such studies. Some of the existing empirical studies are based on geo-spatial formulation of social networks which assumes that learning occurs through geographic proximity. For example, a study by Tessema et al., (2016), by using a spatial econometrics technique, finds a positive neighbourhood effect on adoption of conservation tillage among Ethiopian farmers. A similar spatial study by Krishnan and Patnam (2013) also finds social learning to be more effective than learning from agricultural extension agents in Ethiopia. An experimental study by Kondylis et al. (2014) also shows that, in Mozambique, knowledge diffuses faster from a farmer to a farmer than an extension agent to a farmer. On the other hand, another experimental study by Conley and Udry (2010) conducted in Ghana, shows that peer learning can only be effective after information is made available about new technology—meaning that some expert advisory is required to initiate the diffusion of knowledge and innovation.

The previous studies rely on observational survey data (exceptions; Conley and Udry, 2010 and Kondylis et al. 2014). As a result, their findings suffer from endogeniety problem—limiting them from identifying causal impacts. Moreover, I am not aware of any such experimental study in Ethiopia—a case I believe is interesting for its unprecedented investment in the extension sector and have not yet achieved the desired level of technology uptake. Therefore, in this study, I intend to contribute to the literature by drawing evidence from a randomized training intervention, where I will provide a state-of-the-art training intervention and identify the causal impacts of knowledge and information on the

adoption of blended fertilizers. Moreover, I will evaluate effectiveness of the channels of information communication—fellow farmers, model farmers and extension agents—on knowledge acquisition and blended fertilizer adoption. I will also infer on the causal mechanisms for the different learning outcomes.

To understand the effectiveness different innovation dissemination channels, I will provide trainings on the use of blended fertilizers[1] which is a new technology introduced in 2014/2015 after mapping the soil types of the country. Farmers will be randomly classified into four groups: the first three groups will serve as treatment groups and the other group as a pure control. Then, extension agents, model[2] farmers and farmers elected by the participant famers, henceforth fellow farmers, will first receive the training from experts. Afterwards, our first treatment group will receive the training from agricultural extension agents. The second treatment group will get the same training from model farmers. The third treatment group will receive the same training from fellow farmers. Right after the training is completed, a simple exam based on the contents of the training will be administered to measure the level of understanding of trainee farmers. The training will be provided right before planting period. Following that, I will analyse the scores of the exams in order to identify the channels that lead to better understanding of the training content, as measured by the exam scores. Next, a second survey will be conducted after harvest to study the impact of the training on adoption of the new fertilizer and productivity gains.

For analysis and robustness checks, I will use different regressions; such as, difference in difference, OLS, limited dependent variable models and panel data regression models to analyse the impact of learning channels on knowledge, and the impact of knowledge on adoption and productivity.

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[1] Blended fertilizer is made in accordance to soil types and has been promoted since 2014/15.

[2] Model farmer is a farmer, usually selected by local administrators for showing good performance (in terms of technology use and productivity) and is assigned to educate five to seven fellow neighbouring farmers. There are, however, allegations that the selection of model farmers, in some cases is based on other factors, such as political affiliation than farming performance.

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Employment History

September 2017-present	PhD fellow at UNU-MERIT, Maastricht University, The Netherlands
September 2013- August 31	Lecturer at the School of Agricultural Economics and Agribusiness, Haramaya University, Ethiopia
September, 2009- September, 2011	Graduate Assistant Haramaya University, Ethiopia

Educational Background

September 2013	International Master of Science in Rural Development, specialization in Institutional and Resource Economics (**Great Distinction**), joint master's program at three Universities (Gent, Humboldt and Pisa Universities)
August 2009	BSc in Agricultural Economics (**Great Distinction**), Haramya University, Ethiopia

Teaching Experience

Courses taught	Institutional Economics, Rural Finance, Agricultural Marketing, Introduction to Economics, Research Methods for Agricultural Economists, Research Methods in Agribusiness and Value Chain Management, Developing Value Chain, and Analyzing Value Chain. Supervising BSc. projects

Publications

Musa H. Ahmed **and Hiwot M. Mesfin** 2017. The impact of agricultural cooperatives membership on the wellbeing of smallholder farmers: empirical evidence from eastern Ethiopia. *Agricultural and Food Economics 5:6.*

Mesfin H. 2017. Sustainable Agriculture in Eastern Ethiopia. *Review of Agricultural and Applied Economics 20: 25-35.*

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Mesfin H., Kebede K., Ahmed M. and Tegegne B. Plot level adoption and choice of soil and water conservation practices in Eastern Ethiopia. Submitted to Agricultural *and Food Economics.*

Short term Training

Panel data econometrics. A technical workshop provided by the African Economic Research Consortium (AERC), 20 February- 02 March, 2017, Nairobi, Kenya.

Climate Change and Sustainable Development. 17-28 August 2015, Humboldt University of Berlin.

Harvard Business School type case study writing for higher education, within the framework of the NICHE program. Module I and II, 2013- 2014, Addis Ababa, Ethiopia.

Intensive Training on Value Chain Management and Curriculum Development from 16th May to 10th June 2011 in Dronten, Netherlands.

Training on "Gender Sensitive Leadership Development" February 2-4, 2011. Haramaya University, Ethiopia.

Training on "Applied Econometrics using STATA and E-VIEWS" organized by the Ethiopian Economics Association in collaboration with Haramaya University, September 30-October 5, 2010. Haramaya University, Ethiopia.

Administrative Experience

September 2013-August 2017	Exam Committee member
September 2013-August 2017	School committee member
November 2014-August 2017	Groundnut Strategic plan preparing core team member and Socio-economic research team leader
November 2014-November 2016	Head of Agribusiness and Value Chain Program
November 2014-November 2016	Assistant coordinator for NICHE

Skills

Languages: Amharic (mother tongue), Tigrigna and English.

Computer: Ms Word, Spreadsheet, PowerPoint, STATA, SPSS, R and Eviews

References

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