Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Agricultural Extension Service and Technology Adoption for Food and Nutrition Security: Evidence from Ethiopia

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Abstract

The objective of this paper is twofold. First, using a three rounds panel data of 7110 households, we investigate the adoption decisions and the complementarities among the four labor-intensive technologies (agricultural extension service, irrigation, soil conservation and planting seeds in a row) and a comprehensive use of four modern inputs (improved seed variates, inorganic fertiliser, pesticides, organic fertiliser) which have been frequently adopted by smallholder farmers. Second, controlling for the dynamic effects of wealth, previous technology adoptions and other cofounders, we estimate the impact of agricultural extension services and other multiple technology adoptions on food and nutrition security of the smallholder farmers in Ethiopia. We measure food and nutrition security using four variables including the number of months that households experienced food shortage problem during the last 12 months, if the households experienced food shortage problem in summer, household dietary diversity score (HDDS) and if the households had only few varieties of food to eat because of inability to afford more varieties

We find that adoption of technologies reduces food insecurity and increases dietary diversity. Specifically, we find that the higher the number of technologies that the households adopted, the more likely that they are food secured and have diversified diet. This has an interesting policy implication that policies should aim at encouraging multiple technologies adoptions by, for example, providing credit for the rural poor who cannot afford joint adoption of multiple technologies. In addition to the joint effects of the technologies, most of the eight technologies have also statistically significant effects individually. For instance, the results reveal that households who adopted improved seed, chemicals, irrigation, organic fertiliser, extension service, and soil conservation mechanisms are less likely to experienced food insecurity and are more likely to have higher HDDS.

In addition, our finding suggests that farmers who adopt technologies once are more likely to adopt the technologies again, reflecting the profitability of agricultural technology adoption.

Keywords: Agricultural technologies adoption, food and nutrition security, input complementarity

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