Using Social Networks to Promote New Agricultural Technologies in Nepal

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BACKGROUND AND CONTEXT

Low productivity in agriculture is a pressing development challenge in Nepal where nearly 66 percent of the population is engaged in agriculture. To meet the needs of a growing population, agriculture has expanded into marginal areas of the country—increasing pressure on the environment. Extension services, responsible for farmer training and technology dissemination, face inadequate funding and staffing. Hence, there is a need for agricultural technologies that increase yields and better means of disseminating them to farmers.

According to research from the International Maize and Wheat Improvement Center (CIMMYT) conducted in hilly regions of Nepal, intercropping maize with tomato, French bean, or ginger has the potential to improve yields, reduce crop failure, and increase food security for adopters. This practice is appropriate across Nepal's geographic areas and farmers could adopt it at low cost if they learnt the technique. Prior to the study, the adoption rate of this specific combination of the practice was below ten percent. Lack of information was considered a critical barrier to adoption. This study aimed to identify ways to facilitate the diffusion of knowledge and adoption of this type of intercropping by using performance based incentives and leveraging social networks to augment the existing extension services system.

Through a randomized control trial (RCT), researchers from Yale University in partnership with J-PAL South Asia, ICIMOD, and the Government of Nepal examined:

- How well farmers communicate information on maize intercropping to other farmers as compared to extension agents?
- If performance incentives to communicators—either farmers or extension agents—lead to higher adoption?
- If adoption leads to higher yields or other benefits, and whether such benefits vary by communicator or incentive offered?

DATA AND METHODOLOGY

The RCT covers ten districts, two from each of five development regions. Results are applicable to the entire mid-hills region of Nepal. Across the ten districts, 168 wards were randomly selected into 48 control wards and 120 treatment wards. The treatment wards were further randomly assigned to three treatments based on who was assigned to communicate the technology. The three types of communicators were **agricultural extension workers** (25 wards); **"lead" farmers**, selected by the community on the basis of social status, higher education and greater assets than the average farmer (50 wards); and **"peer" farmers**, selected by the community based on having broadly average characteristics in terms of status, education and wealth (45 wards).

Within each of the treatment arms, wards were further assigned to "performance-based" incentives. That is, (a) **in-kind rewards** for hitting levels of adoption and knowledge in their assigned area (39 wards in total across all three arms); (b) **"flat" incentives**, which were given regardless of performance (40 wards); or (c) **no incentives** (41 wards).

In each treatment ward, the communicator (extension worker, lead farmer or peer farmer) was directed to disseminate the technology to the general farming population. To measure impacts, in each ward, 15 randomly selected households were surveyed multiple times across three agricultural seasons between 2014-2016. Success was determined at end line by level of knowledge and adoption of the technology among surveyed farmers, and the resulting effects on agricultural production.

PEER AND LEAD FARMERS ARE AS EFFECTIVE AS EXTENSION WORKERS IN DISSEMINATING INFORMATION AND ENCOURAGING ADOPTION, BUT EFFECTS REDUCE OVER TIME

Maize intercropping was widely known and practiced at baseline, but use of intercropping with the specified crops was limited. Although knowledge and use of intercropping with maize was common (84 percent and 69 percent respectively), knowledge and use of intercropping with the specific crops of tomato, French bean or ginger was far lower (25 percent and 10 percent, respectively).

Treated wards consistently showed higher knowledge scores and higher levels of adoption, and lead/peer farmers were as effective as extension workers. Farmers in treatment wards gained, on average, 1-2 points (out of 16) on knowledge score tests of the technology compared to control. There was an increase in usage of intercropping with maize, French bean, or tomato by 10-20 percentage points, with little consistent difference between the three types of communicators. Female communicators did better, though this was not statistically significant.

Incentives for communicators had no impact on knowledge or adoption, but this could be due to problems in implementation. No significant differences were observed between the incentive arms of the treatment groups. Delays in incentive delivery, after the first midline survey in April 2015 due to an earthquake and later due to a fuel crisis, likely affected implementation and hence knowledge and adoption outcomes.

Treatment effects, on knowledge and adoption of the technology, dissipate from one survey round to the next. At end line, there was sustained adoption (around 20 percent) across treatment arms compared to control. However, both knowledge and adoption fell across seasons—this was observed for both the communicators and other farmers in the community. Adoption rates fell further after third season. This may also indicate an erosion effect due to implementation difficulties, or due to more fundamental problems with the technology, or other constraints (e.g., access to markets, credit).

At endline, no yield or related economic benefits were reported. Self-reported yields and other economic benefits (revenues, profits) were not significantly different between treatments and control.

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