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Discussion Paper BRIEFS

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An Integrated Economic and Social Analysis to Assess the Impact of Vegetable and Fishpond Technologies on Poverty in Rural Bangladesh

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Green Revolution technology has contributed to increased agricultural production, but interest has arisen in better measuring its impact on poverty reduction. This case study seeks to integrate economic and social analysis to assess the impact of new vegetable and fish technologies on poverty and vulnerability in three rural sites in Bangladesh. The study draws on data that include both traditional measures (such as household income sources, profits from farm production, nutrition outcomes, and food expenditures) and others that are more social in nature (such as social connectedness, empowerment, and institutional structures).

There were three interventions assessed in the study. The technologies all originated in international agricultural research institutions. However, the modes by which they were disseminated differed. In Saturia, an NGO provides credit and training in small-scale vegetable technology to women who grow vegetables on small plots on or near the household compound. In Mymensingh, polyculture fish production is undertaken in privately-held single-owner fishponds. The project provides training to relatively better off households, and training with credit to relatively poorer households. The intervention is directed at both men and women, but men more often than women. In Jessore, an NGO arranged long-term leases of fishponds, which are managed by women's groups. The women receive credit and training in polyculture fish production methods.

Methodology

The study combined quantitative analysis of survey date with qualitative analysis of key informant and focus group interviews in three sites where NGOs were active in disseminating the technologies. The study design included two village types in each site. "A villages" were those where the improved technology had already been introduced, and "B villages" were those where the technology had not yet been introduced, but where it was eventually planned to be introduced. In both types of villages, the disseminating institution delivered all the same other services.

A household survey collected detailed information on production and other income-earning activities; expenditure on various food, health, and other items; food and nutrient intakes; time allocation patterns; and health and nutritional status. Four surveys of 955 households were conducted at four-month intervals beginning in June 1996, and covered one complete agricultural cycle. Survey data was supplemented with qualitative research on factors affecting intrahousehold bargaining power, which fed into formulation of questions in the last survey round on dowry, assets brought to marriage, and bargaining power. Focus group and key informant interviews with project staff, conducted in 2001, provided additional qualitative data on vulnerability, social relations, disseminating institutions, and how the new technologies fit into household livelihoods. Combining qualitative and quantitative analysis provides a more complete picture of the impact of new technologies on poverty.

Research Questions

The Sustainable Livelihood framework was used to help organize the main research questions, broaden the understanding of poverty, and draw together the various perspectives. The questions were as follow:

- What is the overall vulnerability context, and what is the relationship between adoption of the technology and household vulnerability?
- What is the relationship between access to assets, adoption, and livelihood strategies? What are the constraints to adoption?
- How do the dissemination approaches of the NGOs and public sector agencies involved affect livelihood strategies?
- How are intrahousehold decisions about livelihood strategies made, and do the technologies fit these strategies?
- What are the direct and indirect effects of technology on adopting and non-adopting households?

The study found the strongest poverty impact in the case of the vegetable technology, which is targeted toward women in households with relatively small amounts of land.

Findings

Vulnerability, poverty, and the impact of technologies. The study found the strongest poverty impact in the case of the vegetable technology, which is targeted toward women in households with relatively small amounts of

land. It is essentially a "nonlumpy" technology that requires a very low level of investment but which has disproportionately significant returns to the very poor and signs of positive impact on female empowerment and child nutritional status. The noneconomic benefits of this technology in terms of network building and reciprocity among women, and intrahousehold empowerment of women also were apparent.

The private fishpond had positive effects on the pond and crop profits of adopting households. However, it technology had less impact on poverty and empowerment, since better-off households tended to own ponds, and the technology was adopted more by men than by women.

The operation of the women's group fishpond technology, though a potentially beneficial agricultural program for poor households, was significantly undermined by collective action problems. Relative to women who did not have access to this group-based program, however, female fishpond group members appeared to have more mobility, greater likelihood of working for pay, higher off-farm incomes, and better nutritional status.

On the other hand, theft of fish from ponds had the capacity to increase vulnerability. Also, intrahousehold inequalities could lead to coercion—women who begin to gain income may be compelled to pass on resources to the husband or in-laws. Institutional factors may also contribute to increased vulnerability, as in the case of the collective action problems that contributed to group fishpond failures.

The qualitative research showed a higher level of trust for NGO as opposed to government services, especially by the poor. It also highlighted the variable performance of NGOs, which affected the dissemination of technologies and extension support services for the technologies. Programs that made particular efforts to reach poor women with the technologies had significant impacts on empowering women, and thus had an impact on poverty beyond the household monetary income gains.

Research Methodology

A particular strength of combining the social and economic approaches here is that questions that cannot easily be answered by a quantitative survey are informed by a series of qualitative studies with households, groups, and institutions in the survey areas. These include issues such as perceptions of poverty, livelihoods strategies, the institutional setting, and technology dissemination pathways.

Quantitative and qualitative data were found to complement each other well in the research across a range of issues. For example, the survey addressed female empowerment adopters by measuring the frequency of women's visits outside the home, attendance at meetings, and knowledge of local politics, while the focus groups revealed insight into the nonmonetary exchange of vegetables between households, which had the effect of building and maintaining social networks, thus reducing vulnerability.

The time lag between the quantitative and the qualitative data collection was a weakness of the study, since it was sometimes found that earlier findings were out of date by the time the focus groups met. Nevertheless, the approach was found to be useful, and there were gains in the overall use of the sustainable livelihood framework as a way of sharpening understanding of the different entry points at which technology can impact household wellbeing and vulnerability.

Keywords: poverty, agricultural research, sustainable livelihoods, vulnerability, agricultural extension, Bangladesh

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