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**Chronic Poverty**  
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# EVALUATING THE LONG-TERM IMPACT OF ANTI-POVERTY INTERVENTIONS IN RURAL BANGLADESH

## DOES SOCIAL CAPITAL BUILD WOMEN'S ASSETS?

### Disseminating Agricultural Technologies to Individuals versus Groups in Bangladesh

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This series of notes summarizes findings of a project entitled “What development interventions work?” undertaken by researchers of the Chronic Poverty Research Centre, the International Food Policy Research Institute, and Data Analysis and Technical Assistance Ltd. As part of a larger longitudinal study that resurveyed 1,907 households and 102 villages in 14 of Bangladesh’s 64 districts, the project focused on assessing the long-term impacts of a number of anti-poverty interventions—specifically, microfinance, agricultural technology, and educational transfers—on a range of monetary and nonmonetary measures of well-being. This note focuses on the long-term impacts on men’s and women’s assets of disseminating agricultural technologies to individuals compared with groups. It is hoped that these results will help policymakers, donors, and other stakeholders to effectively evaluate different interventions thereby contributing to the design of future anti-poverty programs in South Asia.

### OVERVIEW

Many of the best-studied programs targeting women in Bangladesh—particularly microfinance programs directed toward

#### The Definition and Benefits of Collective Action

- Collective action is voluntary action taken by a group to achieve common interests
- Under collective action, social capital and group liability can substitute for physical capital
- Collective action is viewed as a way of accumulating social capital

women—have operated through women’s groups. In these programs, group liability acts as a substitute for personally owned assets as a form of collateral. Whereas some evidence does suggest that collective action has a positive impact on gender relations and broader development objectives like reducing poverty, when evaluating impact, many studies do not satisfactorily account for other factors associated with participation in collective action. For example, it is possible that women who are more “empowered” to begin with are more likely both to participate in and benefit from collective-action programs, perhaps because of

### BACKGROUND AND METHODOLOGY

Although Bangladesh experienced impressive reductions in poverty from the mid-1990s until the onset of the food price crisis in 2007—with the percentage of the population living in poverty falling from 51 percent in 1995 to 40 percent in 2005—50 million of the country’s people still live in extreme poverty, and 36 million people cannot afford an adequate diet. In addition, poverty in Bangladesh has a well-recognized gender dimension, with the result that many government and nongovernmental organization (NGO) interventions designed to help individuals and households escape poverty are targeted toward women.

This study focused on determining the long-term impacts of the adoption of new vegetable varieties and polyculture fishpond management technologies on men’s and women’s land and asset holdings. The researchers used alternative definitions of assets according to ownership, whereby “exclusively owned” assets are those identified by the husband or wife as his or her own, and “exclusive and jointly owned” assets are exclusively owned assets plus half of jointly owned assets. (Although an equal assignment of jointly owned assets is unlikely to hold in reality, in the absence of more detailed information, it was a useful starting assumption.)

The study measured impact using the average treatment effect on the treated (the ATT method), which was estimated using nearest-neighbor matching (NNM), a technique that matches comparison households with households exposed to the treatment on the basis of observable characteristics. Alternative definitions of “the treatment” were also explored. For more information, see the CAPRI Working Paper on which this note is based.

greater wealth, higher levels of schooling, or better social connectedness. The panel data set employed in this study addresses this issue by providing the necessary conditions for more rigorous, long-term impact evaluation.

## The Interventions

The agricultural technology interventions were implemented in three areas of Bangladesh. Starting in 1994, credit and training in small-scale vegetable varieties were provided to women who grow vegetables on small plots of land on or near their household compounds in Saturaia. These varieties were initially developed at the World Vegetable Center in Taiwan (formerly the Asian Vegetable Research and Development Center). They were subsequently adapted to local conditions by the Bangladesh Agricultural Research Institute and were disseminated by the local nongovernmental organization (NGO) Gono Kallayan Trust. In Mymensingh and Jessore, technical advice in polyculture fish production was provided. These technologies had been developed by the World Fish Center (then known as the International Center for Living Aquatic Resource Management) and were disseminated in two ways. In Mymensingh, they were distributed to individual households that owned fishponds via a fisheries project that began in 1990 and was funded by the Danish International Development Agency (Danida). In Jessore, they were introduced via a medium-sized local NGO, Banchte Shekha, which arranged long-term pond leases managed by groups of 5 to 20 women who received credit and training starting in 1993.

## Sample Details

A short-term impact evaluation of the three technologies was conducted in 1996/97. In each of these three sites, selection of households for the survey was preceded by a census in two types of villages: those where the disseminating institution had introduced the technology (treatment villages), and those where the technology had not yet been introduced but was planned to be introduced in the future (comparison villages). Both types of villages were affiliated with the same disseminating institution, received the same type of supporting service from that institution, and undertook the same agricultural activities, but households in the comparison villages were not given access to the improved technologies being studied.

Data were collected across four survey rounds covering a complete agricultural cycle in 1996/97 for three types of households: (1) adopting households in villages with the technology; (2) likely adopting households in the villages where the technology had not yet been introduced (that is, NGO members who had expressed interest in adopting the technology); and (3) a cross-section of all other non-adopting households, representing the general population in the villages under study (that is, non-NGO members and NGO members not likely to adopt). Detailed information was collected on asset ownership, by individual family member; production and other income-earning activities, by individual family member; expenditures on various food, health, and other items; food and nutrient intakes, by individual family member; time allocation patterns; and health and nutritional status, by individual family member. This detailed information on men's and women's assets, both at the time of the survey and at the time of marriage, allowed us to analyze how the interventions affect gender asset inequality.

The 2006/07 longitudinal study resurveyed households originally interviewed in 1996/97, mirroring the same agricultural season (November to March). At the agricultural technology sites, this in-

cluded 957 core households that took part in the original survey and 280 new households (or "splits") formed in the same district by children of the original households. The questionnaire was very similar to the original household questionnaire, enabling the researchers to estimate long-term impacts. At this stage, a community-level questionnaire was also administered to key informants to obtain basic information on each village and changes since the previous survey round.

## RESULTS

Households in all three study sites increased the value of land and asset holdings between 1996/97 and 2006/07 (Table 1). Although land still accounts for the major portion of the household's total land and asset value, the average growth rate in land value declined over the 10-year interval, possibly indicating diversification away from agriculture into nonagricultural activities. This trend is confirmed by the decline in agricultural durables and the rise in other asset categories, particularly jewelry, nonagricultural durables, and consumer durables.

The asset levels at the time of the resurvey indicate a general decline in the share of assets held by wives, even if wives increased their holdings of land. This decline is significantly (and surprisingly) high in the case of jewelry, and comes as a result of both an increase in joint ownership of jewelry and in jewelry exclusively held by husbands (Table 2). While this could be attributable to reporting bias or changes in perceptions regarding jewelry as men's or women's assets, it could also reflect households' purchase of jewelry as a convenient store of value, or husbands' buying jewelry in preparation for daughters' weddings (since providing a good dowry and marrying daughters well is considered a father's responsibility). Jewelry may also be shared with daughters or sold to purchase other assets. On average, even if the absolute values of assets controlled by wives increased over the 10-year survey interval, the growth rate of men's assets was larger. Thus, the share of assets controlled by women declined from the initial survey. This indicates that overall increases in asset ownership by the household did not lead to increases in women's ownership and control of assets, thereby increasing gender asset inequality.

**Table 1. Growth of household-level assets over time, 1996 and 2006**

Type	Household holdings		
	Value (1,000 taka in 2007 prices)		Average growth rate (%)
	1996	2006	
Total nonland assets	27.0	49.7	8.4
Consumer durables	8.1	15.8	9.4
Agricultural durables	4.8	1.5	-6.9
Nonagricultural durables	1.2	4.4	25.8
Jewelry	2.5	11.1	35.2
Livestock	10.5	17.0	6.3
Total land owned (decimals)	148.5	117.4	-2.1

Note: One decimal is equivalent to one-hundredth of an acre.

**Table 2. Growth of exclusively held assets over time, 1996 and 2006**

Type of asset	1996		2006		Change (%)	
	Husband	Wife	Husband	Wife	Husband	Wife
<b>Landholdings (decimals)</b>						
Homestead	10.3	0.3	10.9	0.6	5.8	44.5
Cultivated land	85.9	1.9	67.9	3.2	-21.0	39.7
Other land	5.4	0.1	5.0	0.2	-8.9	6.1
Total land owned	101.7	2.4	83.8	4.0	-17.6	39.2
<b>Nonland assets (1,000 taka in 2007 prices)</b>						
Consumer durables	2.2	0.3	5.8	0.4	166.4	40.8
Agricultural durables	1.6	n.s.	0.6	n.s.	-62.7	6.2
Nonagricultural durables	0.5	n.s.	3.3	0.1	494.3	428.9
Jewelry	n.s.	1.5	1.5	2.1	5,262.2	38.5
Livestock	5.8	1.7	9.1	1.1	57.5	-31.9
Nonland assets (excluding livesto	4.4	1.8	11.2	2.6	155.3	42.1

Notes: One decimal is equivalent to one-hundredth of an acre; n.s. indicates not significant.

How did implementation modalities affect the growth of men's and women's assets? Table 3 compares the growth of assets held by husbands and wives within the same household across the three agricultural technology interventions: vegetables disseminated through women's groups in Sauria, group fishponds in Jessore, and individual fishponds in Mymensingh. The NGO members in the vegetables sites experienced increases in the wife's assets, and decreases in the husband's assets, although the difference between the husband's and wife's asset levels was not statistically significant. In the group fishpond sites, the value of land held by wives increased, and that held by husbands decreased, but overall both the wives' and husbands' values of assets increased. The difference, however, indicates that, among NGO members, the value of land held by wives had a net increase relative to husbands', whereas the value of nonland assets held by husbands had a net increase relative to the wives'. Only in the individual fishpond sites did program membership increase the value of land held by husbands relative to wives, with insignificant impacts on nonland asset values.

These results provide evidence that implementation modalities are important in determining the impact of new technologies on

men's and women's asset accumulation. Although the initial gender disparity in asset ownership is not eliminated, women's assets do increase more compared with men's when technologies are disseminated through women's groups. These findings are robust to controls for unobserved household-level characteristics when comparing asset growth by husbands and wives within the same households. While it could be argued that the difference across study sites could be attributed to technological differences, the comparison of the individual and group fishpond sites shows that dissemination through women's groups has a greater impact in reducing gender asset inequality compared with individual targeting even when the same polyculture fish technology is employed. Moreover, individual targeting was actually found to increase asset disparities between husbands and wives. It can therefore be inferred that the social capital accruing to women through their involvement in women's groups not only serves as a substitute for physical assets in the short run, but also helps to build their asset portfolios in the long run.

The study may underestimate the impact of the social capital mobilized by women's groups because it focuses on tangible physical assets. Qualitative work in Sauria found that some poor and very

**Table 3. Impacts of NGO or program membership on levels of men's and women's exclusively owned land and assets**

Outcome variable	Group vegetables site			Group fishpond site			Individual fishpond site		
	Husbands' assets	Wives' assets	Change	Husbands' assets	Wives' assets	Change	Husbands' assets	Wives' assets	Change
<i>Bangladesh Taka (in 2007 prices)</i>									
Land value	-1.716***	0.507**	-37,433.34	-4.784***	6.162***	-81,901.17***	-2.919***	-2.230***	220,064.20***
Nonlivestock asset value	-4.246***	-0.830	-1,836.32	0.988	0.531	-449.99	-5.039***	2.625***	-2,807.70
Total value of assets, including livestock	-3.520***	2.533***	-2,328.85	2.737***	8.210***	4604.69*	-4.013***	2.715***	2,602.06

Notes: Results are derived based on the average impact on the treated (ATT) method. "Change" indicates husbands' assets minus wives' assets, such that a negative value means that the wives' assets increased more than their husbands'. \*\*\*, \*\*, and \* indicate significance at 1, 5, and 10 percent levels, respectively.

poor adopters of vegetables distributed produce to family and neighbors as a way of building and maintaining social solidarity—something that women valued but men did not, because men perceived gifts of vegetables to have low status. It should be noted, however, that not all aspects of collective action are beneficial; a number of group fishponds in Jessore failed precisely due to the failure of collective action. The poor women's focus groups conducted in Jessore found that problems within the group, rather than the technology itself, made the technology unsustainable.

It is also possible that, in addition to implementation methods, this result was brought about by other underlying differences in the sociocultural environments of Mymensingh and Jessore. For example, group-based approaches were not used in Mymensingh, perhaps because they were infeasible given the social and cultural setting. Mymensingh has been known to have a more conservative culture, making it less receptive to NGO-based activities compared with Saturaia and Jessore. This conservatism manifests itself in women's weaker control of resources and the greater reluctance on the part of husbands to have their wives involved in fish production because it would increase their exposure to the market, which is regarded as a male domain.

## CONCLUDING REMARKS

Our findings suggest that NGOs or other development agencies seeking to introduce new technologies in areas where women's groups are not active or do not exist may find it useful to begin by harnessing community support for women's empowerment. Introducing new technologies without this background work may backfire if lack of

support leads to the project's failure. At the same time, development practitioners need to realize that gender norms are complex and can change in response to shifting economic, political, and cultural forces, which can create new opportunities for women and men. These norms do not change overnight, and attempts to directly challenge such norms may unintentionally erode women's claims to resources. Strategies that challenge gender norms must be weighed against other project objectives, such as increased food security or better management of natural resources, which themselves may transform gender norms over time. Encouraging women to define their needs and preferences prior to the design of projects may help to ensure a balance between challenging and respecting local norms.

It is also important to recognize that intrahousehold impacts may be quite different from household-level impacts. The individual fishpond program would be considered the most successful at the household level because it increased household assets and consumption the most, but benefits to women and children were actually higher under the group-based programs. This reinforces the need to look within the household when evaluating the impacts of programs and policies.

**FURTHER READING:** Hallman, K., D. Lewis, and S. Begum, "Assessing the impact of vegetable and fishpond technologies on poverty in rural Bangladesh," in *Agricultural Research, Livelihoods, and Poverty: Studies of Economic and Social Impacts in Six Countries*, M. Adato and R. Meinzen-Dick, eds. (Baltimore: Johns Hopkins University Press, 2007); Pandolfelli, L., R. Meinzen-Dick, and S. Dohrn, "Gender and collective action: Motivations, effectiveness, and impact," *Journal of International Development* 20 (No. 1, 2008).

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