



Women’s Empowerment in Agriculture: What Role for Food Security in Bangladesh?

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Summary. — Using a nationally representative survey from Bangladesh, we examine the relationship between women’s empowerment in agriculture, measured using the Women’s Empowerment in Agriculture Index, and per capita calorie availability, dietary diversity, and adult body mass index (BMI). Accounting for potential endogeneity of empowerment, we find that increases in women’s empowerment are positively associated with calorie availability and dietary diversity at the household level. Overall, household wealth, education, and occupation are more important than women’s empowerment as determinants of adult nutritional status, although negative impacts of group membership and credit on male BMI suggest that intrahousehold trade-offs may exist.

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1. INTRODUCTION

While Bangladesh has experienced steady advances in food production through the adoption of agricultural technologies, chronic food insecurity remains a challenge. Similar to other countries in South Asia, there is a strong gender dimension to food insecurity and malnutrition in Bangladesh. In South Asia, the low status of women and gender gaps in health and education contribute to chronic child malnutrition (Smith, Ramakrishnan, Ndiaye, Haddad, & Martorell, 2003) and food insecurity (von Grebmer *et al.*, 2009), even as other determinants of food security, such as per capita incomes, have improved. Renewed interest in agriculture as an engine of inclusive growth and specifically in women’s empowerment has highlighted the need to develop indicators for measuring women’s empowerment, to examine its relationship to various food security outcomes, and to monitor the impact of interventions to empower women.

This paper presents how the recently developed Women’s Empowerment in Agriculture Index (WEAI) (Alkire *et al.*, 2013) can be used to assess the extent of women’s empowerment in agriculture, diagnose areas where gaps in empowerment exist, and examine the extent to which improvements in the underlying indicators in these areas can improve food security in rural Bangladesh. The WEAI is a new survey-based index that uses individual-level data collected from primary male and female respondents within the same households, and is similar in construction to the Alkire and Foster (2011) group of multi-dimensional poverty indices.

Although it was initially developed as a monitoring and evaluation tool for the US Government’s Feed the Future programs, the WEAI has broader applicability as a diagnostic tool for policymakers, development organizations, and academics seeking to inform efforts to increase women’s empowerment. The WEAI was developed and tested during 2011–12 using three country pilots in Bangladesh, Guatemala, and Uganda (Alkire *et al.*, 2013); this paper will represent the first time it is being calculated using a nationally representative survey.

Using nationally representative data from the 2012 Bangladesh Integrated Household Survey (BIHS) conducted by the

International Food Policy Research Institute, this paper examines the relationship between women’s empowerment in agriculture and three measures of food security in rural Bangladesh, per capita calorie availability, household dietary diversity, and adult body mass index (BMI). We use six measures of women’s empowerment—the aggregate women’s empowerment score, based on the five domains of empowerment in agriculture (5DE)—as well as four individual indicators derived by decomposing the 5DE to identify in which of the five domains disempowerment is most acute, and using the specific indicators that comprise those domains. Our sixth measure, women’s empowerment relative to men, is reflected by another component of the WEAI, the gender parity gap. Because empowerment itself is endogenous, we use instrumental variables (IV) regression to examine the relationship between various measures of women’s empowerment and measures of household food security.

Increases in women’s empowerment scores are found to increase both calorie availability and household dietary diversity. Empowerment gaps for women in rural Bangladesh are found to be greatest in terms of leadership in the community and control and access to resources. Analyzing these two

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domains further in terms of their component indicators, we find that the number of groups in which women actively participate and women's greater control of assets are positively associated with both food security outcomes. Narrowing the gap in empowerment between men and women within households is also positively associated with calorie availability and household dietary diversity, consistent with the growing literature arguing that reducing intrahousehold gender inequality contributes positively to household welfare. Most of the indicators for women's empowerment do not have any significant impact on adult BMI, suggesting that other factors, such as household wealth, education, and occupation, are more important determinants of adult male and female nutritional status. However, women's group membership and decision-making concerning credit are negatively and significantly associated with adult male BMI, suggesting possible trade-offs within the household. The impacts of women's empowerment appear to vary by household wealth, as proxied by the size of owned land. Our results suggest that the positive effect of the different dimensions of female empowerment on food security outcomes is greater for smaller landowners, that is, for less well-off households, pointing to the potential positive redistributive effect of focusing women's empowerment efforts on poorer households.

2. BACKGROUND

(a) *Agriculture, women's empowerment, and food security*

Agriculture is closely linked to food security, by providing a source of food and nutrients, a broad-based source of income, and by directly influencing food prices (Arimond *et al.*, 2010). Women account for 43% of the agricultural labor force in developing countries (FAO, 2011a); yet considerable gender bias exists in the agricultural sector, both in terms of quantities of assets, agricultural inputs and resources that women control (see Agarwal, 1994 on land in South Asia; Deere, Oduro, Swaminathan, & Doss, 2013 on assets; and Peterman, Behrman, & Quisumbing, 2010 on nonland inputs), as well as returns to those inputs (Kilic, Palacios-Lopez, & Goldstein, 2013). Similar to the recognition of women's contribution to agriculture worldwide, women's role in Bangladeshi agriculture tends to be underappreciated, owing to the commonly held view that women are not involved in agricultural production, especially outside the homestead, because of cultural norms that value female seclusion and undervalue female labor (Kabeer, 1994; Rahman, 2000). Nevertheless, participation of women in the agricultural sector has increased over time (Asaduzzaman, 2010, citing Bangladesh Bureau of Statistics, various years). During 1999–2000 and 2005–06, the number of employed persons in agriculture increased from 19.99 to 22.93 million—about 15%. For male labor, there has been an absolute decrease of about 6%, while for females the number has increased from 3.76 to 7.71 million—that is, by more than 100%. As a result of such changes, the proportion of women in the agricultural labor force has increased from less than 20% to 33.6% of the total. This is indeed a phenomenal change, although it is not yet clear how much of this change resulted from a true secular increase as opposed to better measurement of women's participation.

Women in poor households, who are at greater risk of being food-insecure, are more likely to be involved in the agricultural sector, particularly as wage laborers, because women's earnings are important to their families' subsistence. Zaman (1995) provides evidence that the gender division of labor in

agriculture is not as strictly demarcated as assumed, with women being involved in agricultural work both inside and outside the household. Rahman (2010) shows that female agricultural labor contributes significantly to productivity as well as technical efficiency, but finds, similar to Zaman (1995), that gender bias exists in the agricultural labor market. Remunerative employment of labor remains skewed in favor of men, since female labor is engaged only when the male labor supply is exhausted.

Women's ability to generate income in the agricultural sector is severely constrained by their limited use, ownership, and control of productive physical and human capital. Bangladeshi women are disadvantaged relative to men with respect to assets brought to marriage (Quisumbing & Maluccio, 2003), current productive assets (including land, livestock, and agricultural machinery) (Quisumbing, Roy, Njuki, Tanvin, & Waithanji, 2013), and human capital. Women lag behind in terms of education in Bangladesh—with more than one in three women having no schooling, compared to one in four men. A recent analysis also showed that lack of education in adult women in Bangladesh is a strong correlate of being "ultra-poor": 80% of adult women with no education live below half a dollar a day (Ahmed, Hill, Smith, Wiesmann, & Frankenberger, 2007).

The rationale for paying attention to gender inequality in agriculture is rooted in a body of empirical evidence that demonstrates the ways in which women are essential to improvements in household agricultural productivity, food security, and nutrition security. Considerable evidence exists that households do not act in a unitary manner when making decisions or allocating resources (Alderman, Chiappori, Haddad, Hoddinott, & Kanbur, 1995; Haddad, Hoddinott, & Alderman, 1997). This means that men and women within households do not *always* have the same preferences nor pool their resources. The nonpooling of agricultural resources within the household creates a gender gap in control of agricultural inputs, which has important implications for productivity. Several empirical studies have found that redistributing inputs between men and women in the household has the potential for increasing productivity (Kilic *et al.*, 2013; Peterman *et al.*, 2010; Udry, Hoddinott, Alderman, & Haddad, 1995). A growing body of empirical evidence suggests that increasing women's control over resources has positive effects on a number of important development outcomes. For *Côte d'Ivoire*, Hoddinott and Haddad (1995) and Duflo and Udry (2004) find that increasing women's share of cash income significantly increases the share of household budget allocated to food. Doss (2006) shows that, in Ghana, women's share of assets, particularly farmland, significantly increases budget shares on food expenditure.

Considerable evidence also suggests that mothers' greater control over resources improves child outcomes—in particular, nutrition and education (Hallman, 2003; Quisumbing, 2003; Quisumbing & Maluccio, 2003; Skoufias, 2005). Although much of the abovementioned evidence has emerged from observational studies, a systematic review of programs targeting transfers to women (Yoong, Rabinovich, & Diepeveen, 2012) has found that these improve children's well-being, especially in the form of investments in children's health and education.

The linkages between women's *empowerment* and food security have been more difficult to quantify owing to the difficulty of measuring empowerment. Despite these difficulties, there is evidence that *disempowerment* in one of its most extreme forms—being a victim of intimate partner violence (IPV)—is associated with poor nutritional outcomes both for children

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