

# Farm Decision Making and Gender: Results from a Randomized Experiment in Ecuador

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**Summary.** — Substantial resources have been devoted to mitigating the asset gender gap in developing country agriculture. Efforts have been taken to understand the role of women in decision making and in farm operations. Recommendations for best practices in eliciting information on women's roles have emphasized the importance of sex-disaggregated data collection and analysis. Collection of sex-disaggregated data is not straightforward and careful attention to context is needed. In Ecuador's highlands, chemical use in agriculture is widespread, and outreach and training programs to reduce this use are essential. These programs should target the appropriate decision makers.

This paper presents results from a field experiment conducted in the Ecuador highlands where responding farm households are randomly assigned to one of three treatment groups: (i) a male respondent, (ii) a female respondent, and (iii) both adult male and female respondents (interviewed separately, but with knowledge that the other would also be interviewed). We assess whether treatment assignment affects responses to questions about decision making and responsibility for agricultural activities.

Perceptions about household decision making and who is responsible for agricultural activities vary substantially by type of respondent. Men are more likely to claim sole responsibility; women are more likely to claim responsibility or that decisions are jointly made. In households where both man and woman were interviewed (separately) we found stark differences in responses about responsibilities, with men claiming sole responsibility at higher rates. Interviewing both members led to less divergence in responses, but large differences in perceptions about responsibilities remain when both are interviewed. Best interviewing practices depend on the type of information needed: for precise quantification of gender roles, complex methods may be necessary, but where qualitative information is sufficient, single-member interviews may be sufficient.

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## 1. INTRODUCTION

It is now widely recognized that empowerment of women is an important pre-condition for broad-based agricultural growth. In addition to reproductive responsibilities including child rearing and early education, women provide as much as 50% of the agricultural workforce (Food & Agriculture Organization of the United Nations, 2011). Despite their obvious importance to agriculture, in many parts of the developing world women have less access than men to productive assets. The asset gender gap, which includes less access to land, inputs, labor, cash and credit, and training opportunities (human capital development), is associated with 20–30% lower productivity on women's fields and closing the asset gap could raise agricultural output globally by 2.5–4% (Food & Agriculture Organization of the United Nations, 2011). Women face unique obstacles to overcoming the asset gap; for example, lack of land title can constrain access to credit and lower levels of formal education can be compounded by less participation in extension meetings and agricultural training (Doss et al., 2011; Quisumbing et al., 2014).

Recognition of the gender asset gap has led to recommendations about best practices and how to ensure that women's roles and needs are adequately considered during program design and implementation (Alkire et al., 2012). While better understanding of gender dimensions of asset acquisition, accumulation, and use can lead to more effective programs, it is often sufficient to begin with an understanding of household decision making and gendered dimensions of farm operation (Quisumbing et al., 2014). This understanding will allow programs to target the appropriate recipients of training and

other asset-building efforts. Research shows clearly, for example, that agricultural technology adoption is affected by gender-specific constraints (Meinzen-Dick et al., 2011) and that skills gaps between men and women might slow technology adoption (Quisumbing et al., 2014).

In Ecuador's highlands, chemical use in agriculture is widespread, and programs to reduce this use, such as through integrated pest management (IPM), are important to the sustainability of agriculture (Alwang et al., 2005, Chap. 5). Health problems have been associated with storage and application of toxic chemicals and over-application of pesticides leads to off-farm environmental damages (Crissman, Antle, & Capalbo, 1998; Sherwood, Cole, Crissman, & Paredes, 2005). IPM is a promising means of reducing pesticide use and promoting more sustainable agriculture (Carrión Yaguana, Alwang, Norton, & Barrera, 2016; Norton, Heinrichs, Luther, & Irwin, 2005; Yanggen, Cole, Crissman, & Sherwood, 2004). However, uptake of IPM has been slow and scarce outreach resources mean that IPM promotion programs need to be targeted to appropriate decision makers (Carrión Yaguana et al., 2016; Norton et al., 2005). IPM is

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a knowledge-intensive technology; for most IPM practices, few input purchases are needed as management know-how is substituted for chemical inputs (Norton et al., 2005). IPM training programs should be targeted based on the appropriate audience and the constraints they face.

Despite the recognition of the importance of gender roles and asset ownership, control and use, uneven guidance is provided in the literature about how to obtain this information. A recent overview of tools to quantify women's empowerment (Quisumbing et al., 2014) discusses quantitative (mostly survey-based) and qualitative methods such as key informant interviews, group interviews and focus group discussions. As a guidance for development program design, this overview recommends conducting a gender-focused analysis of asset ownership and household decision-making. A mixed method approach is recommended—one that combines quantitative and qualitative approaches. Qualitative methods provide nuanced information but depend critically on the skills of researchers to ensure quality (Quisumbing et al., 2014, p. 31).

The quality of information from quantitative surveys depends critically on survey design and to whom the questions are addressed (Bardasi, Beegle, Dillon, & Serneels, 2010; Dillon, Bardasi, Beegle, & Serneels, 2012). For programs to promote adoption of new agricultural technologies such as IPM and safe pesticide handling, relevant questions include what factors decision-makers consider to be important and who is responsible for key decisions (Alkire et al., 2012). Answers to these questions are not often straightforward. Best practices associated with measuring decision-making responsibility recognize these difficulties, but the most appropriate method depends on information needs of the program decision-maker.

Some studies seek to measure women's empowerment for purposes of program design and monitoring changes. For such studies, quantification can be important. For example, Alkire et al. (2012), in an effort at creating an index to reflect women's empowerment in agriculture (WEAI), suggest that male and female adults in the household should both be interviewed. The literature on WEAI acknowledges differences in responses between men and women when both are interviewed, but note that in an analysis of the data sets they collected "...these results imply that although males and females in the same household may not exactly agree about how decisions are made, their perspectives are more likely to agree than to be at complete odds with each other" (Alkire et al., 2012, p. 23). The WEAI is constructed based on an individual's response to subjective questions and Alkire et al. (2012) conduct numerous evaluations of the consistency of responses with theoretical constructs and whether there is consistency in responses by an individual across numerous questions. The purpose of the WEAI is to create an index to compare across contexts and over time.

For many purposes, however, the cost of data collection can outweigh the need for complete accuracy. In such cases, proxy responses, or having one person answer for multiple household members, can be used. The literature evaluating these proxy responses shows, however, that substantial errors in inference can be made when single respondents are used for the entire household. Responses to objective questions such as labor force participation, hours supplied, and earnings have been shown to be biased when proxy respondents are used (Anker, 1983; Bardasi et al., 2010; Fisher, Reimer & Carr, 2010). For example, men tend to under-report earnings of their wives, whether intentionally or due to imperfect information (Fisher, Reimer, & Carr, 2010). These errors and inconsistencies are consistent with Alkire et al. (2012) who find that male and female respondents differ in their impressions about

who owns assets and who conducts which farm activities. Alkire et al. (2012) go beyond the proxy response literature by examining subjective questions such as who makes decisions and who controls different assets.

None of this literature examines the relationship between the respondent and his or her characteristics, and the consistency of responses to subjective questions. These questions include what factors are important in making decisions, who makes which decisions, and which household members are charged with major responsibilities. Enumerator biases can influence responses, particularly to subjective questions, and it is important to understand the relationship between the gender of the enumerator and the nature of the response. For design of a training program, approximate information may suffice; knowledge that women and men are both involved in decision making can inform what factors to stress and who to target during outreach and training. Information on decision making is clearly relevant for the design of an agricultural outreach program. For example, Buck and Alwang (2011) find that trust in information sources and willingness to accept information varies by gender; messages tailored to the appropriate audience can affect uptake of technologies such as crop varieties and new management techniques.

Since the cost of surveying grows as additional respondents in a household are questioned, it is important to understand tradeoffs. If single-person and proxy responses are relatively close to those gleaned from multiple-member responses, then resources can be saved by limiting questions to a single respondent. If responses differ substantially, single-member interviews will provide imperfect information and may lead to improper targeting of development programs. If precise information is needed for program targeting, implementation or evaluation, then multiple respondent surveys may be necessary, particularly if proxy responses are found to be misleading.

This paper presents results from a survey field experiment conducted in the Ecuador highlands where responding farm households are randomly assigned to one of three treatment groups: (i) a male respondent, (ii) a female respondent, and (iii) both adult male and female respondents (interviewed separately, but with knowledge that the other adult would also be interviewed). We assess whether treatment assignment affects responses to questions about decision making and responsibility for farm production, pesticide purchases and handling, and marketing. Randomized assignment to the interview protocol ensures unbiased identification of the effect of respondent type on reported responsibilities and other outcomes. If household members or enumerators are allowed to choose the respondent, factors affecting this choice may be correlated with the response. This correlation can lead to faulty inference. For example, better-educated members might be chosen to respond yet these members might be less familiar with day to day decision making, especially if they are engaged in off-farm employment. Their responses may not reflect average household conditions.

We find that perceptions about household decision making and who is responsible for agricultural activities vary substantially by type of respondent. Men are more likely to claim sole responsibility for decisions, farm management and sales; women are more likely to claim responsibility or that decisions are jointly made. In households where the senior man and woman were both interviewed (separately) we found stark differences in responses about responsibilities, with men again claiming sole responsibility at higher rates than women. Interviewing both members led to less divergence in responses (between men and women) compared to men and women (alone) responses. Large differences in perceptions about

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