



## Gender & Agricultural Productivity in Malawi

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Agriculture is critically important to both Malawi's economy and to its social fabric. The sector accounts for 31 percent of gross domestic product, and 84 percent of Malawian households own and/or cultivate land. The majority of farming households practice subsistence agriculture, and their living standards are directly affected by the inconsistent agricultural performance that Malawi has seen over the last two decades. These impacts are especially acute for the poorest households.

Agricultural growth has been shown to particularly benefit the poorest in the developing world. Poverty in Malawi is especially widespread among female-headed households, suggesting that investing in agricultural growth has benefits both for poverty reduction and for gender equality. Yet systematic gender differences persist in agricultural productivity across sub-Saharan Africa, mostly due to differences in: (i) access to and use of agricultural inputs, including improved technologies; (ii) tenure security and related investments in land; (iii) market and credit access; (iv) human and physical capital; and (v) informal institutional constraints affecting farm/plot management and the marketing of agricultural produce. Addressing these gender differences could result in tremendous productivity gains. The FAO reports that if female farmers had the same access to productive resources as men, they could increase yields by 20-30 percent, which could increase total agricultural output in developing countries by 2.5 to 4 percent and lift 100 to 150 million people out of hunger.

### Data and Methodology

Previous studies looking at the gender gap in sub-Saharan Africa rely largely on data from small-scale surveys, and are limited in terms of geographic coverage, topic, or attention to intra-household dynamics (or, in some cases, all three). This study uses data from the Third Integrated Household Survey (IHS3), collected from March 2010 to March 2011 by the Malawi National Statistical Office, with support from the LSMS-ISA initiative. The IHS3 data covers 12,271 households. The full sample consists of 16,372 plots, 26 percent of which are managed by women.

Our econometric approach applies a decomposition methodology that has been widely used in labor economics, starting with studies by Oaxaca (1973) and Blinder (1973). To our knowledge, this is the first time that this method has been used to understand the gender gap in agricultural productivity. We look at the average difference in agricultural productivity (defined as gross value of output per hectare) on male- and female-managed plots, and seek to determine how much of the gender gap is driven by differences in:

- i. Levels of observable inputs or attributes, such as the education level of the plot manager, the amount of inorganic fertilizer application, etc. We refer to the impact of the collection of these factors as the endowment effect.
- ii. Returns to observable inputs or attributes, such as the monetary return that a farmer earns from applying one kilogram of fertilizer per hectare. We refer to the impact of the collection of these factors as the structure effect.

Thus, we seek to quantify the mean gender gap as well as the relative contributions of key inputs

and returns to these inputs. Identifying the factors driving the gender gap in this manner is crucial for informing policy interventions aimed at addressing the gap at its roots.

A second contribution of our study is to move beyond the “average” effects, and to break down how the key factors drive the gender gap at different points in the agricultural productivity distribution. Since farmers at different levels of productivity may face different constraints – or similar constraints but at varying levels – we try to tease out the contributions of key factors towards the gender gap at the low-, mid- and high-level of agricultural productivity.

## Results

On average, we find that female-managed plots in Malawi are 25 percent less productive than plots that are managed by males. The endowment effect explains 82 percent of this gender gap. In particular, female-managed plots are constrained by lower use of inorganic fertilizer, lower use of household adult male labor, lower production of high-value export crops, and restricted access to agricultural tools.

Female plot managers try to compensate for these deficiencies with higher levels of household adult female, household child, and exchange labor, but this is not enough to overcome the differences in productivity.

The remaining 18 percent of the gender gap – the structure effect – is driven by differences in returns to the use of household adult male labor, and the application of inorganic fertilizer.

Not only do adult males in the household spend less time on female-managed plots, but the time that they do devote is less productive than when they work on male-managed plots. One reason for this may be that female plot managers are able to provide less supervision due to other household responsibilities. Indeed, our study found that a greater child dependency ratio decreases the productivity of female-managed plots but has no effect on male-managed plots. This points to childcare responsibilities falling primarily on women, preventing them from providing as much labor supervision as male plot managers.

In terms of inorganic fertilizer use, female farmers not only apply lower levels of this input, but the fertilizer that they do apply does not yield as many benefits. A knowledge gap along

gender lines may account for a relatively less efficient usage of fertilizer by female farmers.

Finally, the gender gap widens as agricultural productivity increases. While the gender gap in Malawi is 25 percent at mean productivity, it ranges from 22 percent at the 10th percentile of the agricultural productivity distribution, to 37 percent at the 90th percentile. At the same time, the returns to key inputs decrease progressively for female farmers but not for male farmers, meaning that the structure effect increasingly explains the gender gap as one moves up in the agricultural productivity distribution. One possible explanation is that even as female farmers use higher levels of productive inputs, they are less effective in achieving the combinations of inputs that result in the greatest yields, and thus experience lower returns than their male counterparts.

## Conclusions

Our findings suggest that a large and significant difference in the levels of inputs is the central factor behind the gender gap, particularly for farmers at lower levels of agricultural productivity. On male-managed plots, higher levels of household adult male labor and area under export crop cultivation widen the gender gap, while household and childcare responsibilities restrict the time that female plot managers can dedicate to farming. Ensuring that female plot managers have similar years of schooling as men and apply similar levels of non-labor agricultural inputs could reduce the mean gender gap by 50 percent. Future research will explore why inequalities in time use, as well as access and returns to agricultural inputs, continue to persist. This will be a first step towards informing policies that are designed to alleviate the gender gap at its roots.

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