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Agricultural Technology Adoption in Zambia: Are Women Farmers Being Left Behind?

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**Selected Poster prepared for presentation at the 2017 Agricultural & Applied Economics
Association Annual Meeting, Chicago, Illinois, July 30-August 1**

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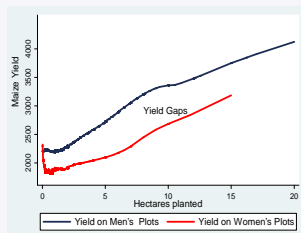
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INTRODUCTION

Low adoption of improved technologies is widespread among smallholder farmers, however, it is more severe on fields controlled (owned) by women. The question is why is there a gender gap in adoption of improved technologies? The study present evidence from Zambia that women farmers fare worse than their male counterparts regarding adoption of improved technologies and level of productivity. We use the gender of the field owner (decision maker) as opposed to the gender of the household head to determine the gender differences in technology adoption and productivity.



Source: CSO/MAL/IAPRI (RALS) 2012 and 2015

RESEARCH QUESTIONS

- What are the factors that contribute to the gender differences in technology adoption?
- Does the presence of a male head of a household affect the adoption behavior of women smallholder farmers?
- Are there any gender differences in maize production efficiency?

DATA

- The data used in this study primarily comes from two waves of Rural Agricultural Livelihoods Surveys (RALS). These are nationally representative surveys conducted by the **Indaba Agricultural Policy Institute (IAPRI)** in collaboration with the **Zambia Central Statistical Office (CSO) and the Ministry of Agriculture and Livestock** and cover the 2010/11 and 2013/14 farming season.
- In the first wave of the survey (2010/11) **8,839** smallholder farm households were interviewed, while in the second wave covering 2013/14 agricultural season a total of **7,254** households were re-interviewed.
- For the econometrics analysis of this study, we used a balanced panel of **4,166 households that grew maize** in both 2010/11 and 2013/14 farming seasons. The RALS data was supplemented with **Focus Group Discussions (FGDs)** which were held in three provinces covering two districts in each province

ESTIMATION STRATEGY

- The decision to adopt a given technology was analysed using a panel binary choice model.
- The model of adopting either hybrid seed, fertilizer, herbicides, or animal traction is specified as:
 - $Y_{it} = X_{it}\beta + \varepsilon_{it}$, $i = 1, 2, \dots, N$; $t = 1, \dots, T$
 - $\varepsilon_{it} = \alpha_i + u_{it}$
 - $Y_{it} = \beta_0 + X_{it}\beta + \alpha_i + u_{it}$
- Correlated Random Effects Approach (CRE) was used to control for time invariant heterogeneity (Mundlak (1978) and Chamberlain (1984))

RESULTS

DESCRIPTIVE RESULTS

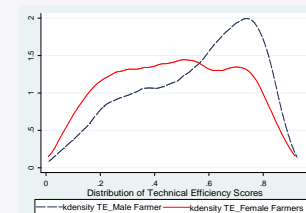
Variables	All Farmers	Male Farmer	Female Farmer	--Female farmers in --	
	A	B	C	Male-HH	Female-HH
Landholding size (ha)	4.10	4.45	2.93	3.13	2.71
Adult equivalent	4.90	5.16	4.03	5.02	3.85
Hectares cultivated (ha)	1.26	1.37	0.87	0.91	1.07
Member of cooperative (%)	51.9	54.40	43.9	46.01	44.00*
Value Assets	13,306	15,000	7,699	3,569	6,645
Access to extension (%)	73.70	74.70	68.01	74.00	69.30
Access to credit (%)	18.50	19.90	13.80	16.80	13.30*

Notes: T-test was done to compare differences between groups. * indicates cases that are not statistically significant at 10%

- There are significant disparities in access to agricultural resources by gender of the farmer.
- On average male farmers in Zambia have more access to resources such as land, labor, credit and other productive assets compared to their female counterparts.
- women in male headed households have more access to land, labor, and credit compared to women in female-headed households.
- Most women in the rural parts of Zambia access land through their spouses or fathers.
- Female farmers in female-headed households have difficulties in obtaining land in some parts of Zambia

ECONOMETRICS RESULTS

- The low adoption of improved technologies is attributed to **limited access to productive resources**
- Female farmers who had **access to agricultural credit** were more likely to adopt hybrid seed and fertilizer (Ragasa, 2012).
- Productivity as measured by **technical efficiency in maize** production on plots owned by men was higher than that of women.
- The differences in the level of technical efficiency is mostly **explained by the disparities in resource endowment** rather than the gender of the farmer.
- Gender of farmer does not affect the farmer's productivity



- The estimated technical efficiency on male- and female-controlled fields is 55% and 48% respectively.
- Factors found to contribute positively to maize productivity are access to credit, access to extension services, use of fertilizer and improved seeds.

CONCLUSIONS

- Evidence from the study suggests that adoption of improved technologies among smallholder farmers is still low in Zambia especially among women.
- The main factors contributing to low adoption included limited access to productive resources.
- Closing the resource gap can largely improve the overall agricultural productivity among smallholder farmers in Zambia especially women
- There is a need for supportive policies to enable the private sector and farmer organizations to develop better credit systems tailored to small-scale farmers
- Government should channel more resources towards extension services for the staff to train farmers on best farming practices.

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