

Land tenure, Gender, and Productivity in Ethiopia and Tanzania

Annual World Bank Conference on Land and Poverty

Tigist Mekonnen (Ph.D)
World Bank, USA

Yesuf Awel (Ph.D)
Economic Commission for Africa, Addis Ababa, Ethiopia

March 26, 2019

Introduction

- Land is one of the main assets for food production and to generate income.
 - **Collateral to access credit.**
- **However, land distribution is more unequal than income distribution in Africa.**

Introduction

- For instance,
 - In Ethiopia, **the Gini coefficient for owned land distribution is about 0.55 (Kebede, 2008) compared to 0.33 for income distribution** (World Bank, 2010).
 - In Tanzania, **it is about 0.5** (Wineman and Liverpool-Tasie, 2016) compared to **0.39 for income distribution** (NBS, 2014).
- **This could be more pronounced if one looks at the distribution of land by gender.**

Introduction

- **Even though, there have been land reforms in Africa that aim to remedy the issue.**
 - **However, the degree to which these reforms have brought about the desired economic effects, and particularly if they have improved the status of women, remains debatable.**
- **In addition, studies on analyzing the differential effect of land certification by gender on productivity are limited in Ethiopia.**

- **Few exceptions focusing at regional level provide evidence.**
 - **Holden et al (2011) show the +ve effect of land certification on improving land rental market participation of female-headed hhds in *Tigray regional state*.**
 - **Holden and Gebru (2013) document evidence of +ve effect of land certification on food security and nutrition of female-headed hhds in *Tigray*.**
 - **Bezabih et al (2016) show that land certification improves the productivity of female-headed hhds in *Amhara regional state*.**

The main aim of the research

- Using a nationally representative **Living Standard Measurement Study (LSMS)** panel surveys from **Ethiopia, and Tanzania**, the study analyze the differential effect of land right on the productivity by gender.
- **Research question:**
 - **To what extent formal land rights/certification affect the productivity of farm households in general and that of female-headed households in particular?**

- **Three rounds (2011, 2012 2015)** LSMS surveys collected by the World Bank in **four major regions of Ethiopia**.
 - The agricultural module provides **details of agricultural production at plot level**.
 - It also contain issues **on land ownership right, titles or certification**.
- **Covering more than 3,500 households cultivating more than 6,200 plots in Ethiopia**,
 - LSMS survey collects **information using household, agriculture and community modules**.

- The survey **attrition rate b/n each round at hhd or plot level is low (less than 10 percent)** and it is unlikely to affect interpreting the result.
- In the case of Tanzania, the **latest 2014 round of LSMS survey is also used.**
- **The survey covers 3,352 households cultivating more than 5,500 plots.**

- **To analyze the differential effect of land certification on productivity by gender of agricultural households:**
 - **Fixed effect approach is applied to the three rounds of data from Ethiopia .**
- **Assuming that land certification is exogenous, we controls for the spatial heterogeneity effects.**
 - **(E.g. differences in productivity across regions and quality of plots that was not captured in the regression).**

- **First**, the analysis estimates the **impact of formal land certification on the productivity** of agricultural households.
- **Secondly**, it analyzes the **productivity effects separately by gender focusing on male-headed and female-headed households**.

- **To estimate the effect of land certification on productivity by gender of agricultural households**

$$y_{ipt} = \alpha_0 + \alpha_1 \mathbf{cert}_{ipt} + \delta \mathbf{X}_{ipt} + \varepsilon_{ipt} \quad (1)$$

$$y_{ip} = \beta_0 + \beta_1 \mathbf{cert}_{ip} + \epsilon \mathbf{X}_{ip} + \varepsilon_{ip} \quad (2)$$

- *Productivity is measured in crop value per plot/acre*

Descriptive statistics (Ethiopia)

- **The average land holding size of the hhd is nearly 3 hectares.**
 - Male-headed hhds holding about **3.21 ha** compared to female-headed hhds (**1.99 ha**).
 - The plot size by gender also shows different b/n male-headed and female-headed hhds (**0.15 and 0.1 hectares, respectively**).
- **About 49 percent of the plot have some form of land title.**
 - Around **52 percent** of the plots owned by female-headed hhds and **49 percent** of male-headed hhds have land title.

Descriptive statistics (Ethiopia)

- The average crop value of production in the sample is about **1,413.6 Ethiopian Birr per plot**.
 - The average crop value of production in male-headed hhds is higher (**1,470.1**), while female-headed hhds (**1,133**).
- **Indicating the gender gap in agricultural productivity.**

Descriptive statistics (Tanzania)

- **The average land holding size of the household is 6.8 acre.**
 - Male-headed hhds holding about **7.5 acres**, while female-headed hhds holding **4.8 acres**.
 - The mean plot size cultivated by Male-headed hhds is **1.8 acres** compared to female-headed hhds that cultivate **1.2 acres**.
- **About 34.6 percent of the plots have some form of land title.**
 - **34.1 percent** of the plots owned by female-headed hhds have land titles against **34.8 percent** of male-headed hhds.

Descriptive statistics (Tanzania)

- The average crop value of production in the sample is about **225,420.2 Tanzanian Shillings per acre**.
 - Female-headed hhds have average crop productivity of **195,721.34 Tanzanian Shillings per acre**, while male-headed hhds of **235,689.6**.

Econometric Result

Table: Fixed effect estimation result

Dependent variable	Ethiopia			Tanzania		
	All samples	Female-headed	Male-headed	All samples	Female-headed	Male-headed
Land certificate	0.710*** (2.76)	0.814* (1.86)	0.868*** (2.89)	0.223*** (5.36)	0.142* (1.78)	0.236*** (4.83)
Constant	-0.971* (-1.74)	-0.194 (-0.31)	-0.726 (-1.23)	11.31*** (186.07)	11.30*** (107.07)	11.38*** (148.43)
N	3835	1109	2958	2810	722	2088
rho (Eth.)and adj.R 2(Tanz.)	0.014	0.002	0.013	0.124	0.113	0.137

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Econometric Result

Table: Fixed effect estimation result

Dependent variable	Ethiopia			Tanzania		
	All samples	Female-headed	Male-headed	All samples	Female-headed	Male-headed
Crop value per acre	0.710***(2.76)	0.814*(1.86)	0.868***(2.89)	0.223***(5.36)	0.142*(1.78)	0.236***(4.83)
Land certificate						
Total land size	7.651***(3.27)	5.615(0.70)	16.455***(4.59)	0.00158(0.90)	-0.00133(-0.46)	0.00407(1.86)
No. of female adults	-0.018(-0.16)	0.307(0.73)	-0.045(-0.34)	-0.0359(-1.07)	0.00915(0.15)	-0.0425(-0.98)
No. of adults	-0.025(-0.45)	-0.058(-0.59)	-0.069(-1.07)	0.0819***(4.43)	0.0803*(2.24)	0.0755***(3.19)
Education of head	0.083(0.61)	-0.107(-0.55)	0.096(0.64)	0.0650(1.51)	0.0820(1.08)	0.00892(0.16)
Gender of the head (M/F)	0.607* (1.82)					
Plot size	0.672***(3.34)	-0.403(-0.40)	0.510***(2.25)	-0.0782***(-8.45)	-0.163***(-5.08)	-0.0768***(-7.71)
Distance to plot	-0.006(-0.24)	0.021(0.33)	-0.018 (-0.63)	0.000534(1.09)	0.00551(1.86)	0.000493(0.98)
soiltype1 = loam	0.068(0.17)	-0.129(0.21)	-0.011(0.02)	-0.206***(-3.57)	-0.0915(-0.89)	-0.269***(-3.88)
soiltype3=clay	-0.105(-0.26)	0.408(0.82)	-0.186(-0.38)	0.158***(3.14)	0.0520(0.53)	0.184***(3.14)
soiltype4= other	-1.744(-1.62)	2.877(1.13)	-2.027*(-1.68)	-0.0184(-0.16)	0.182(0.83)	-0.0749(-0.57)
soilqly1 = fair	0.672***(2.37)	0.736(1.62)	0.704***(2.11)	0.162****(3.93)	0.112(1.43)	0.181****(3.74)
soilqly3= poor	-0.165(-0.47)	0.484(0.72)	-0.128(-0.32)	-0.251***(-3.13)	-0.260(-1.91)	-0.231*(-2.36)
soilerosion1= yes	0.037(0.15)	0.369(0.97)	-0.037(-0.13)	-0.0113(-0.19)	0.273*(2.44)	-0.109(-1.59)
plotslope2= flat	3.580****(12.14)	1.507****(3.35)	3.955****(11.46)	-0.0606(-0.61)	-0.0842(-0.39)	-0.0373 -0.33)
plotslope3= slightly sloped				0.00728(0.15)	0.0694(0.75)	-0.0256(-0.45)
plotslope4= very steep	0.444(1.34)	0.180(0.36)	0.529(1.37)	-0.149(-1.12)	-0.148(-0.55)	-0.173(-1.13)
Organic fertilizer use = yes				0.162***(2.77)	0.156(1.37)	0.186***(2.73)
Inorganic fertilizer use= yes	0.448*(1.82)	-0.505(-1.35)	0.638***(2.19)	0.202****(3.28)	0.0533(0.45)	0.270****(3.73)
Herbicide use= yes	-1.061***(-3.97)	0.789*(1.68)	-1.426***(-4.55)	0.488****(4.26)	0.811***(3.06)	0.410****(3.23)
Pesticide use= yes	-0.563(-1.60)	0.018(0.03)	-0.507(-1.25)	0.318****(4.61)	0.155(1.16)	0.393****(4.86)
Mechanization use=yes				0.387****(4.61)	0.266(1.65)	0.427****(4.37)
Input credit accessed=yes	0.579***(2.22)	-0.714*(-1.80)	0.741****(2.38)	1.009****(6.15)	2.052****(5.03)	0.749****(4.13)
Plot irrigated use = yes	-0.110(-0.16)	-0.060(-0.04)	-0.104(-0.13)	0.492****(3.45)	0.116(0.44)	0.553***(3.27)
Location dummy	0.120****(4.12)	-0.047(-1.11)	0.160****(4.62)			
Constant	-0.971*(-1.74)	-0.194(-0.31)	-0.726(-1.23)	11.31****(186.07)	11.30****(107.07)	11.38****(148.43)
N	3835	1109	2958	2810	722	2088
rho (Eth.) and adj. R 2 (Tanz.)	0.014	0.002	0.013	0.124	0.113	0.137

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Econometric Result

- **Dis-aggregated by gender and at the aggregate level (full sample)**, the result shows that there is a **direct r/s b/n land certification and crop productivity in general.**
- **The productivity-enhancing effects of land certification on the sub-sample of male-headed and female-headed are positive and significant.**
 - **However, comparing the results with the male headed samples, the effect is lower.**

- **Indicators that positively correlate with crop productivity:**
 - Land and plot sizes
 - Use of modern inputs (e.g. inorganic fertilizer)
 - Input credit access
 - Herbicide use
 - Soil and plots type

Conclusions

- **This study analyses the differential impact of land titles on the productivity of smallholder farmers in two East African countries (Ethiopia and Tanzania).**
- **The main findings show the significant and positive effect of land title on crop productivity both in Ethiopia and Tanzania.**
- **Importantly, the positive effect persists for the sub-sample of female-headed households.**

Conclusions

- The results suggest that **an avenue for improving agricultural productivity and reducing the gender gap in productivity is by enhancing both tenure security of women and other complementing inputs.**
- **The results are in line with previous studies that underscore the significance of land right.**

Policy implication

- **Women right to land empower their capability to be economically self-sufficient.**
- **However, the study shows a lower proportion of women have a land ownership right highlighting the need for gender-sensitive land policy that ensures womens right to own land.**
- **A land policy needs to be based on the principle of gender equality in the right to land**
 - **As land is an important asset for food production and income generation in the rural households.**

Thank You