UNIVERSITY OF CENTRAL ASIA

Life in Kyrgyzstan

Gender in Agriculture: An Investigation of Productivity Differences in Household Farms in Kyrgyzstan: Evidence from LiK 2019

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Introduction

- According to the World Food Program, **16% of the weakest quintile of Kyrgyz households have inadequate food consumption** (2022).
- Approximately **one-fourth** of all households in certain regions have subpar or worse food consumption scores. **More than 20% of children in the predominantly rural south of the country are stunted**
- All these constraints and deficiencies contribute to high unemployment in rural areas and **mass labour migration** to Russia, Kazakhstan, and other countries.
- Migration leads to **demographic changes in the households**, women are **left in charge of farms**, this provides new scope for analysis on how women can contribute to the issues of food insecurity and rural poverty
- Within AG sector, females comprise **40% of employment. However, f**emale-led farms often are **not as productive** in many countries, because of various issues, including limited resources, access to credit, land ownership, etc.

Research Questions and Objectives

To demonstrate quantitative and updated indicators of the relationship between the household head and agricultural productivity, this study aims to answer the following questions:

What is the relationship between the gender of the household head and agricultural productivity (measured as yield per area unit) in Kyrgyzstan? How does this relationship differ when controlling for household characteristics and agricultural inputs?

Literature Review

Gender and Agriculture

Sexsmith et al, 2017; Khitarishvili, 2016; Doss, 2015:

- Multiple dimensions in gender inequality: women face challenges in securing land, access to labor markets, and are underrepresented in the decision-making bodies (Doss, 2015; Sexmith et al, 2017).
- This applies to TJ and KG as well, where gender roles are highly pronounced (Khitarishvili, 2016). If women had equal access to the same resources, the gap would be closed.

Measuring the gender gap in agricultural productivity

Gebre et al, 2019; Hasan Aly & Shields, 2010; Thapa, 2008; Backiny-Yetna & McGee, 2015, Peterman et al, 2011: Studies conducted in Ethiopia, Nepal, Niger, Nigeria, Kenya and Uganda have found that **there is no significant relationship between the gender of the HH head and agricultural productivity**. AGP is measured in two ways: output per hectare in mass, and in currency. Most of the studies consider the yield of only one crop (corn, wheat, rice).

Literature Review (cont.)

Gender and Agricultural Productivity in Kyrgyzstan

So far, very limited attention has been given to the study of relationship between agricultural productivity and gender in Kyrgyzstan.

Sulaimanova & Jasoolov: Employed mean decomposition (based on a study done by Palacios & Lopez in 2015) to estimate the gender gap in agricultural labor productivity based on LiK 2013. They found no indication of a gender discrepancy in agricultural labour productivity in both families. However, there is a statistically significant difference in agricultural land production between male- and female-headed farms.

Our Contribution

Present study will extend the existing literature in several ways.

——Availability of specifics from the recent LiK dataset for the year 2019 is a significant resource, as it provides a more comprehensive and detailed overview of households and their agricultural activities.

——Offers a nuanced perspective on the challenges faced by female-headed farms in Kyrgyzstan, considering factors such as land ownership, household characteristics, and agricultural practices.

——Contributes to the existing scarce pool of literature dedicated to gender and agriculture in Kyrgyzstan, further research could be built upon it.

Descriptive Statistics

	Overall			Female			Male			
	N	Mean	sd	N	Mean	sd	N	Mean	sd	Diff.
Yield Mass (ton)	815	1.31	4.15	219	1.36	4854.47	596	1.3	3867.1	0.06
Area Planted (ha)	815	0.28	0.91	219	0.2	0.52	596	0.31	1.01	-0.11
Yield per area (ton/ha)	815	4.68	64.44	219	6.8	11603.44	596	4.2	74805.44	-11.61
HH Age	815	56.13	13.07	219	59.65	13.16	596	54.84	12.81	4.81
Household Size	815	6.27	2.77	219	5.88	2.84	596	6.41	2.74	-0.53
Land Size (ha)	815	0.94	11.33	219	0.36	1.06	596	1.16	13.23	-0.8

Descriptive Statistics

Crop	Female		Male	
	Mean Area (ha)	Mean Yield (kg)	Mean Area (ha)	Mean Yield (kg)
Apricot	0.137	191.43	0.134	273.09
Grapes	0.013	13.75	0.012	23.09
Potato	0.141	257.97	0.24	376.46
Corn	0.417	420.12	0.40	526.07
Lucerne	0.73	1040.07	1.1	855388.7
Pepper	0.055	43.18	0.03	616.76
Tomatoes	0.05	83.29	0.04	901027.6
Rice	0.36	610	0.36	416.54
Beetroot	0.035	1005	0.03	22.4
Cotton	3.81	976.6	1.23	537.85
Apples	0.08	368.69	0.07	3207284
Wheat	1.81	16166.67	2	150
Barley	3.11	1595.77	2.29	1428910

Methodology

Building upon previous studies in the field, our methodology employs a cross-sectional multiple linear regression model to investigate the primary relationship between yield per area unit and gender of the household head.

The multiple linear regression models employed in this study is specified as follows:

- $Y_i = \beta_0 + \beta_1 Gender + \beta_2(HH\ Demographics) + \beta_3(Agri\ Activities) + \beta_4(Land\ Quality) + \varepsilon_i$

Yi represents the dependent variable, indicating the agricultural productivity measured in yield per unit of land for each of the four crop categories: *Vegetables, Fruits, Grains, Other Crops*.

$\beta_0, \beta_1, \beta_2, \ldots, \beta_{13}$ are the regression coefficients associated with the respective variables.

ε denotes the error term capturing the unexplained variation in the model.

Regression Results

	Dependent variable: Yield per area			
	Vegetables	*Fruits*	*Grains*	*Other Crops*
HH Head Female	*-12.461***	*-8.038*	*5.474*	*-20.848*
	(4.929)	*(9.105)*	*(5.996)*	*(14.208)*
Naryn	*10.120*	*88.691****	*0.809*	*-30.263*
	(8.470)	*(9.881)*	*(10.153)*	*(18.568)*
Talas	*106.368****	*136.528*	*18.178*	*36.037**
	(35.209)	*(92.903)*	*(18.286)*	*(17.909)*
Insecticides	*11.371***	*1.561*	*-1.448*	*1.480*
	(5.546)	*(4.807)*	*(4.797)*	*(4.135)*
Erosion/Salinity_No	*1.940*	*-9.719*	*-3.242*	*23.616***
	(6.388)	*(12.535)*	*(8.519)*	*(11.357)*
Tillage_Yes	*-25.073***	*41.933*		*27.775*
	(11.580)	*(33.243)*		*(37.926)*
Adjusted R squared	*0.15*	*0.11*	*0.21*	*0.10*
Note:		**p**p***p<0.01*		

Limitations

- **Limited sample size:** The study's findings may not apply to all female-headed farms in Kyrgyzstan due to the small proportion of these farms within the dataset.
- **Self-reported data bias**: The reliance on self-reported data from farmers introduces potential biases and inaccuracies, affecting the reliability of certain aspects related to female-headed farms.
- **Cross-sectional data limitation**: The study's use of data from a single year (2019) hinders capturing changes over time in the status and conditions of female-headed farms.
- **Recommendations for future research**: The study suggests conducting research with larger samples, validating self-reported data through other sources, and employing longitudinal approaches to assess long-term trends and impacts in female-headed farming.

Conclusion

Female-headed farms in Kyrgyzstan make significant contributions to the agricultural sector, but face various challenges.

- They include **lower production, limited land access, resources, and services**, as well as **gender-based discrimination** and **social norms.**
- **Gender-sensitive policies**, land access, and empowerment **are key** to supporting female farmers. **Collaboration among stakeholders** is **vital** for a more inclusive and prosperous agricultural sector.

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Thank you!

Appendix A

Full model:

$$Y_i = \beta_0 + \beta_1 Gender + \beta_2 HH\_Age + \beta_3 Household\_Size + \beta_4 Oblast + \beta_5 Land\_Size + \beta_6 Machinery\_Costs + \beta_7 Irrigation + \beta_8 Fertilizers + \beta_9 Herbicides + \beta_{10} Manure + \beta_{11} Insecticides + \beta_{12} Land\_Quality + \beta_{13} Tillage + \varepsilon_i$$