What we can learn about smallholder farmers from surveys: Results from EPAR analysis of the Tanzania National Panel Survey

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### Gender Matters

<table>
<thead>
<tr>
<th>Mean Value of Maize Sales by Gender of Household Head</th>
<th>Long Rainy Season</th>
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<tbody>
<tr>
<td>Adult men spent more than three times the number of hours as adult women on household work.</td>
<td><img src="image" alt="Graph showing gender difference in household work hours" /></td>
</tr>
</tbody>
</table>

- Female-headed households had fewer plots, smaller landholding sizes, and grew fewer crops than male-headed households.
- Female-headed households made an average of $513 and $122 from maize and non-agricultural households, respectively, from agricultural households.
- Adult women spent more than three times the number of hours in agricultural and non-agricultural households than men.

### Crops in Tanzania

- The Tanzania National Panel Survey (TNPS) is part of the World Bank's Living Standards Measurement Studies, which is a large-scale, longitudinal household survey that tracks changes in household economic and social conditions.
- TNPS data is collected by the Tanzania National Bureau of Statistics (TNBS) and is used by researchers to understand poverty and inequality in Tanzania.

### Challenges and Lessons from Working with the TNPS

- **Survey estimates do not always match estimates calculated by reputable institutions.** For example, our TNPS yield estimates tend to be lower than estimates from the UN Food and Agriculture Organization (FAO).
- **Results sometimes overlook interactions in the literature.** For example, the effects of intercropping are less significant than the literature suggests. Thus, we use this guideline to guide our hypotheses and data manipulation, but we also update our new calculations.
- **Survey questions and response options are sometimes ambiguous.** For example, what farmers perceive as a quality soil. The survey was not inclusive; women were not included in the sample.
- **There is an unwritten consensus for removing outliers from the dataset.** We establish different data cleaning methods such as excluding a certain median or a certain lowest value of the variable.

### TNPS Briefs

- **Evaluating ITSeed Adoption and Its Impact on Production and Income: Long Rainy Season**
- **Market Access and Agricultural Development: Long rainy season**
- **Yield Measurement of Cereal Grains:** The yield measurement of cereal grains is crucial for understanding smallholder farmers' productivity and the impact of agricultural development interventions.

### Markets Matter

- **Paddy was the most extensively sold of the priority crops, with 82% of paddy farming households selling at least 40% of their total harvest in the long rainy season.** Paddy is a staple food in Tanzania and is a major source of nutrition. The high proportion of households selling paddy indicates that it is a valuable crop for smallholder farmers.
- **Weory potato, tubers, and vegetables, paddy, onions, and other types of vegetables and vegetables, paddy, and vegetables.** The proportion of households selling paddy, onions, and other types of vegetables and vegetables reflects the diversity of crops grown by smallholder farmers.

### Forthcoming Research

- **Intercropping:** Intercropping is planting two or more crop species together in one field, with the aim of improving productivity, resource use efficiency, and environmental sustainability. Intercropping can help reduce competition for resources, improve soil health, and enhance crop yields.

### Crop Diversity

- The use of cereals is crucial for smallholder farmers in Tanzania, where substantial regional variation in cropping patterns exists. The use of a single crop can lead to reduced productivity and vulnerability to disease and pest attacks. The use of diverse crops can help smallholder farmers adapt to changing environmental conditions and improve their resilience to economic shocks.

### Yield Measurement

- **Securing food production is a complex strategy involving rural livelihoods and support to smallholder community development.** Measuring productivity is a strategic tool for understanding the impact of agricultural development interventions. The use of different methodologies can lead to different measurement results. For example, some studies might use on-farm trials, while others might use off-farm surveys. The choice of methodology can affect the accuracy of yield estimates and the conclusions drawn from the data.

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**Inputs Matter**

- **Yield of Maize: 17%**
- **Yield of Beans: 5%**
- **Yield of Cowpeas: 4%**
- **Yield of Yams: 1%**
- **Yield of Millet: 1%**

**Comparing IV Seed Use to Other Input Use**

- **Approximately one third of agricultural households spent no money on IV or traditional seed, fertilizer, pesticides, or fungicides during the long and short rainy seasons.** Of those that did purchase these inputs, the median expenditure was USD$10.43.

**Evans School Policy Analysis and Research Group (EPAR)**

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