

Investment and Household Bargaining in Small-scale Farming Households

A Lab-in-the-Field Experiment from Rural Tanzania

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Background

- Upscaling the investments in good agricultural practices by small scale farmers and especially women farmers are key development goals over the past years.
 - To close gender gap in the agricultural production and productivity (about 30% according to UNDP, 2015).
 - To address women's low rates of technology adoption (Nyasimi and Huyer, 2017) and cash crop adoption (Ali et al., 2016) and higher vulnerability to climate change (Goh 2012, Van Aelst and Holvoet 2016).
 - Majority of those women farmers are married, particularly vulnerable to the gender gap (Karamba and Winters, 2015, Doss et al., 2018; Rola & Rubzen et al., 2020)

Background (cont.)

- Investment in new practices usually involve, among others production and market risks and additional household labor allocation (Foster and Rosenweig, 2010)
- Depending on the culture, norms or context, agricultural tasks, capital, or crops can be gendered or joint. (e.g., cash crops vs. food crops; marketing vs. post harvest activities)
- Woman farmers should bargain with their spouses on investment and labor allocation to invest in those practices.
 - Household members often weigh risk and labor costs differently (Vieider et al., 2015; Heise et al., 2019).
- Understanding gendered decision making and household bargaining process is crucial to close the gender gap (Theis et al., 2018) and upscale the investment of small-scale farming households and women in new agricultural practices.

Research question

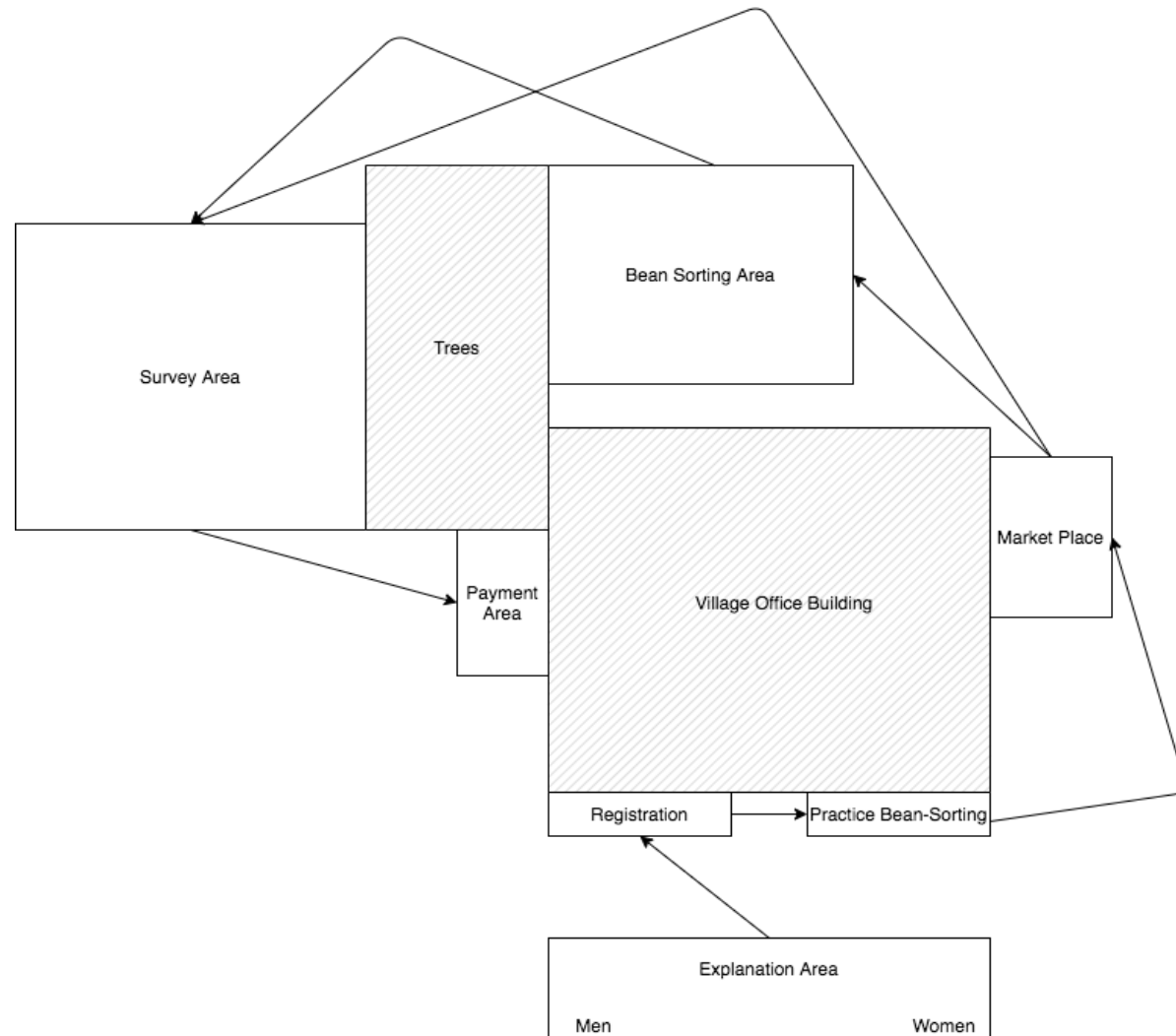
- *How do spouses in small-scale farming households make investment decisions individually and jointly when risk and labor costs are present?*
- *Tentatively test: Is it plausible to expect that the bargaining behavior can be changed through linking women and men with community organizations or participation in gender training? **Will not be discussed in this presentation.***
- **Method: A lab in the field experiment with farming households in rural Tanzania.**
 - The experiment mimics risky agricultural investment decisions of farming households, which farmers must work (put effort) for to make the investment successful.
 - It incorporates labor to the investment decisions.

The Experiment

- Task: sort cups of beans
- Time limit: 40 min
- Couples are given an endowment of 3000 Tsh (~ 1.10 EUR) to spend on 300 Tsh cups (max 10 cups) before they begin sorting.
- Two types of cups: Cups and beans are same for risky and safe cups but returns are different.
 - Risky: 50% chance of 900 Tsh (200% return) and 50% chance of 300 Tsh (0% return) if sorted
 - Safe: guaranteed 500 Tsh (67%) return if sorted.
- Investment decision: how many and which cups to sort
- One spouse from each couple is allowed to sort.

Experiment Setting Layout

- Goal: eliminate observability across couples



The Experiment (in Pictures)



Experiment Design

- Semi-factorial design
- Randomize laborers and decision-makers

Treatment Arm1: Decision making	Treatment Arm 2: Labor arm		
	Man	Woman	Joint
Man	Man, Man	Man, Woman	NA
Woman	Woman, Man	Woman, Woman	NA
Joint	Joint, Man	Joint, Woman	Joint, Joint

The Sample

- 521 couples
- Iringa, Tanzania, suitable location to study small-scale farming dynamics
- 15 villages
- Morning and afternoon sessions (17-18 couples each)

Outcome Variables

- Investments levels in number of total cups, safe cups, and risky cups purchased
- Investment outcomes:
 - Total number of unsorted cups
 - Expected return
 - Risk: portfolio standard deviation
 - Final payment

We present the results in three stages

- Joint-Joint case: Joint choice of investment (number of safe or risky cups purchased)/Endogenous choice of laborers (man or woman)
- Exogenous effect of gender and joint investment decisions and outcomes.
- Exogenous effect of laborer's gender on investment decisions and outcomes.

Results: Joint-Joint case.

- Out of the 76 couples assigned to this group, only 20 (26%) chose men to sort, while 56 (74%) chose women to sort.
- Women leave fewer unsorted cups than men

Variable	Chose man to sort	Chose woman to sort	Diff (F-M)	Total
Total Cups	6.75 [0.74]	5.54 [0.41]	-1.214* [0.812]	5.86 [0.36]
Safe Cups	4.6 [0.93]	3.41 [0.41]	-1.189** [0.886]	3.72 [0.39]
Risky Cups	2.15 [0.65]	2.12 [0.39]	-0.025 [0.760]	2.13 [0.33]
Unsorted Cups	1.2 [0.37]	0.46 [0.15]	-0.736*** [0.328]	0.65 [0.15]
Expected Return	4565 [166.11]	4319.64 [105.82]	-245.357 [203.078]	4384.21 [89.70]
Investment Std. Dev.	0.21 [0.06]	0.21 [0.03]	-0.001 [0.065]	0.21 [0.03]
Payment	4295 [304.74]	4057.14 [136.32]	-237.857 [291.283]	4119.74 [127.98]
N	20	56	76	

Significance levels: * < 10% ** < 5% *** < 1%

Standard errors in brackets. For Total Cups, Grey Cups, Red Cups and Unsorted Cups, standard errors are calculated using a Poisson Distribution. For Investment Std. Deviation, Expected Return, and Payment, standard errors are calculated using a normal distribution, and significance levels are found using a student T-Test.

Results: Effect of man alone, woman alone, joint decision making on the investment outcomes.

- Alone men invest in riskier portfolios than alone women and jointly deciding couples. However, those men leave more unsorted cups

Variable	Woman	Man	Joint	Diff (M-W)	Diff (M-J)	Diff (W-J)
Total Cups	5.28 [0.25]	5.80 [0.27]	5.73 [0.21]	0.525* [0.27]	0.07 [0.25]	-0.456* [0.25]
Safe Cups	3.03 [0.25]	2.96 [0.28]	3.48 [0.22]	-0.075 [0.20]	-0.523*** [0.19]	-0.448** [0.19]
Risky Cups	2.24 [0.24]	2.84 [0.27]	2.25 [0.19]	0.6*** [0.19]	0.592*** [0.17]	-0.007 [0.16]
Unsorted Cups	0.59 [0.11]	0.82 [0.13]	0.69 [0.09]	0.239** [0.10]	0.134 [0.09]	-0.105 [0.08]
Expected Return	4280.27 [64.46]	4445.27 [71.96]	4372.12 [51.76]	164.998* [96.64]	73.146 [86.49]	-91.852 [82.59]
Investment Std. Dev.	0.23 [0.02]	0.27 [0.02]	0.23 [0.02]	0.042 [0.03]	0.04 [0.03]	-0.001 [0.03]
Payment	3980.27 [95.10]	4194.59 [118.85]	4085.4 [78.53]	214.322 [152.34]	109.196 [136.61]	-105.126 [123.95]
N	147	148	226	295	374	373

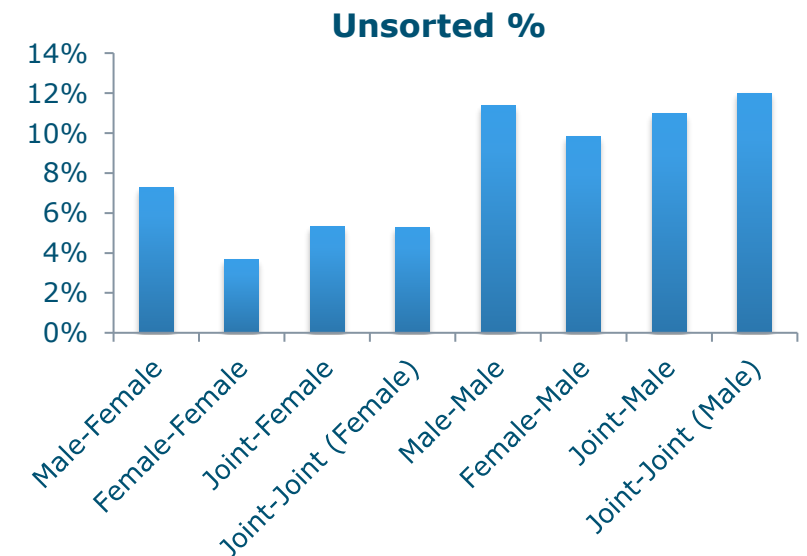
Results: Effect of man or woman laborer on investment outcomes.

- When men sort, more cups are left unsorted
- When men sorts fewer cups are invested. Further investigation shows that this is alone women decision makers, jointly deciding couples invest less when men sorts rather than women.

Variable	Woman	Man	Joint	Diff (M-W)	Diff (M-J)	Diff (W-J)
Total Cups	5.79 [0.21]	5.37 [0.21]	5.86 [0.36]	-0.418*	-0.481	-0.063
Safe Cups	3.18 [0.22]	3.05 [0.21]	3.72 [0.39]	-0.127	-0.669***	-0.542**
Risky Cups	2.61 [0.21]	2.32 [0.20]	2.13 [0.33]	-0.291*	0.188	0.479**
Unsorted Cups	0.5 [0.07]	0.92 [0.12]	0.66 [0.15]	0.418***	0.26**	-0.158
Expected Return	4419.47 [55.07]	4306.85 [53.86]	4384.21 [89.70]	-112.62 [77.08]	-77.361 [105.61]	35.259 [108.29]
Investment Std. Dev.	0.25 [0.02]	0.24 [0.02]	0.21 [0.03]	-0.018 [0.024]	0.023 [0.03]	0.041 [0.03]
Payment	4286.73 [88.81]	3868.95 [79.86]	4119.74 [127.98]	-417.776***	-250.787 [155.14]	166.989 [170.22]
N	226	219	76	445	295	302

Are men worse bean sorters or do they value their labor costs as lower than women's?

- Perhaps both. Men are typically worse bean-sorters,
 - Exit survey shows that spouses believe that on average men are worse sorters than women.
 - To minimize the productivity effect in decision making: We had a practice round where spouses both sorted and observe their sorting skills:
- **Men also leave about 10% of the cups unsorted on average** no matter how many cups they were assigned.



How do decision-makers respond to having the spouse who is worse at sorting be assigned to sort?

- Lower investment in joint-male than joint-female treatment arms.
- Tested whether spouses adapt their investment decision when their spouse who (they believe) is relatively worse off at sorting is assigned to sort.
- They adapt investment decisions-lower investment only when they make the investment decisions **jointly**.
- When spoused decide *alone*, they do not consider their labor preferences.
- Joint investment decisions of couples eliminate some labor inefficiencies resulted in the case of men.

Conclusions

- Risk averseness of women in rural context leads to under investment in terms of risk and levels.
- Men underestimates the cost of their labor when they invest but their risk taking behavior compensates this.
- Joint decision-making (bargaining) leads to more efficient investment decisions (increased investment levels) and are able to deal with labor inefficiencies while sole decision-makers do not.

Policy implications

- When upscaling risky and labor-intensive practices, one should consider which spouse takes investment decisions and which spouse will do the work in the field, specific to that practice.
 - For instance, introducing risky market-oriented crops to women farmers is challenging.
 - Or labor intensive technologies might fail when men are supposed to work.
 - Or overconfidence of men might lead to overinvestment and failures in the projects.
- To upscale the investments and close the gender gap a transformational and behavioral change in gender roles is needed.
 - Encouraging women to take risks? *Our paper provide tentative results showing that gender training is associated with high risk taking among women.*
 - Encouraging joint decision making of couples on investment decisions.

Questions?

Thank you!

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