Women and Water Conservation: Intra-Household Learning in Jordan's Agriculture Sector

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Background

- Jordan is one of the most water-scarce countries in the world
- Agriculture sector consumes 52% of national water resources.
- Farmers over-irrigate crops by 2-5x actual requirement
- Lack of political motivation to incentivize efficient water consumption through higher tariffs, focus on behavior change
- Ministry of Water and Irrigation's strategy: provide targeted advisory to farmers on efficient irrigation technology and crop water requirements

Women in Jordan's Agriculture Sector

- Women are excluded from advisory services due to limited formal role in sector
- Jordanian women spend an average of 21 days/month and 4 hrs/day managing home-based plots (UN Women, 2018).
- Women have a high degree of financial influence and control over water decision-making within the household, but are constrained by a lack of technical information made available to them
- USAID Jordan Water Efficiency and Conservation (WEC)'s approach: (i) directly deliver water conservation advisory services to women, and (ii) leverage women as primary influencers

Methodology

Question

Does delivering water conservation information directly to women (i) increase conservation on wife-managed plots, and (ii) impact intra-household learning?

- Recruit a fixed number of husband-wife pairs where both partners are involved in the agriculture sector
- Randomly assign one spouse to receive a thirty-minute consultation from a WEC expert on water conservation.
- Measure changes in metered water consumption on each spouse's plot post-intervention

Literature Review

- Intra-household information spillovers
  - Field-Based, Differing Preferences
    - Lowe and McKelway (2021): women's labor supply in India
    - Ashraf et al. (2014): contraception use in Zambia
  - Lab/Survey-Based, Shared Preferences/Incentives
    - Fehr et al. (2022): beliefs on position in income distribution
    - Conlon et al. (2022): share of red balls in an urn
- Primary Contributions
  - **Field-based** study of intra-household spillovers in a high-stakes setting with **shared incentives**

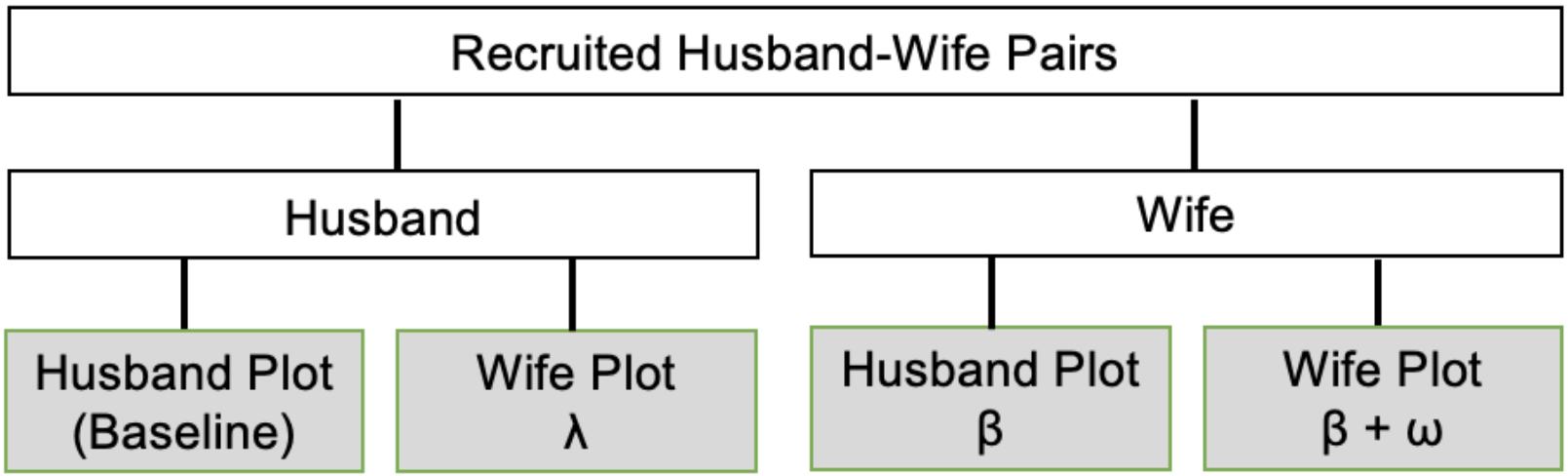
Empirical Framework

$$B_i = \beta Metered_i + \lambda Post_i + \omega(Metered_i \times Post_i) + \gamma X_a + \epsilon_i \quad (1)$$

- B_i = Monthly bill amount
- $Metered_i = 1$ if account had a meter replacement
- $Post_i = 1$ for October 2022
- ω : DiD term to capture treatment effect
- X_a : vector of controls (Zone, Usage Clusters, etc.)

Analysis

$$log(c_i) = \beta T_i + \lambda s_i + \omega(T_i \times s_i) + \gamma X_a + \delta_c + \epsilon_i$$



- Do women change their water consumption behavior more when they are the direct recipient of information? λ *vs.* $\beta + \omega$
- Does delivering information to women increase intra-household learning relative to men? λ *vs.* β
- Do husbands respond less to information received directly versus from their wives? β

Limitations, Questions, and Discussion

- Potential Limitations
  - If households substitute to non-metered water sources, we may not be collecting accurate data.
  - Minimal financial harm from over-watering, so farmers may be less resistant to conservation if they have lost their crops to drought before.
  - People might have more risk tolerance for water conservation on domestic plots than on commercial plots
  - Are women inherently more likely to respond to a conservation campaign than men, regardless of the source?