

I. INTRODUCTION

- Agricultural scientists developed new bean varieties adapted to low soil fertility and extreme weather event including drought, which are the major factors limiting agricultural productivity in Mozambique.
- The new bean varieties are drought tolerant and phosphorus-efficient, have the potential to yield almost double that of local varieties, ie, between 1.5 to 3.0 ton/hectare, and represent different market classes and consumer preferences.
- Adoption of the new varieties is crucial for increasing production and productivity of common bean (Sevilla, 2013; Smith & Findeis, 2013). However, it is recognized that many farmers may not adopt the new varieties but continue to grow varieties not well adapted to current soil and climatic conditions.
- Low adoption may result from differences in variety performance in stressed environments that farmers face in their own fields as compared to what happens on station/demonstration plots. Similarly, the potential mismatch between farmer preferences and new variety traits, higher labor or other input requirements for new varieties coupled with the difficulty in accessing newly-released seed slows adoption.
- Recognizing that dynamic power relations, often defined by gender roles, influence men and women's access to information and new technology adoption, this research examined how farmers evaluate and identify their preferred common bean traits.

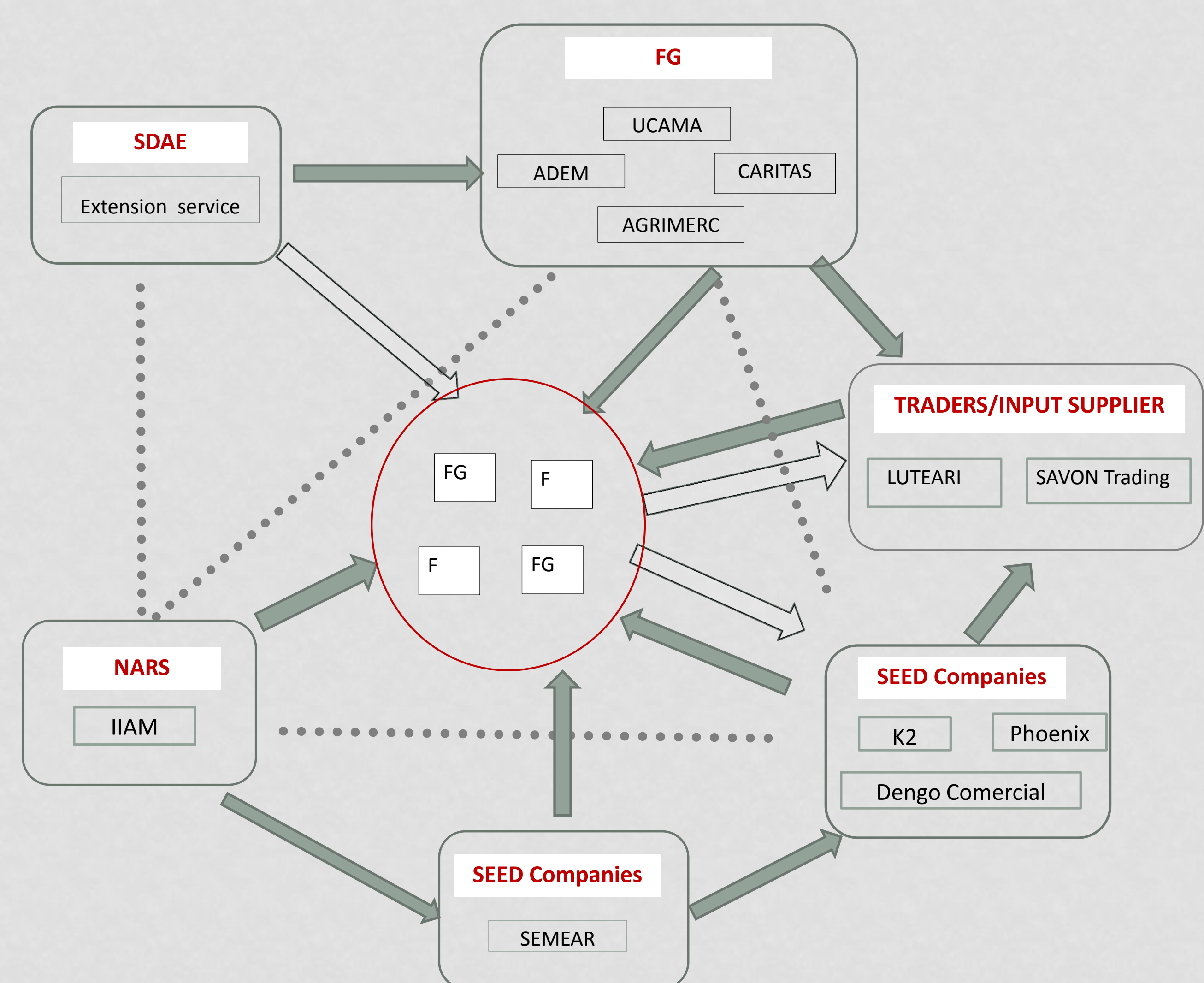
II. MATERIALS AND METHODS

The study uses data from a Farmer Research Network (FRN) established in Mozambique and the Seed Uptake and Network Survey Wave II (SUNS II). The FRN used a crowdsourcing crop improvement approach in 35 communities, located in four of Mozambique's provinces in 2017/18, to explore bean performance and preferences for 12 low-P and/or drought-tolerant varieties of common bean. The communities were aggregated into 4 FRN districts. The SUNS II survey similarly collected data on bean trait preferences from farmers across the same districts in 2018/19.

This project combines the FRN data and bean trait preference data collected from a broad cross-section of Mozambican farmers. Farmers who engaged in the FRN trials were exposed to the bean varieties, managed their own plots, and assessed bean varieties based on production (planting to harvesting) and consumption (e.g. cooking) qualities. The trials consisted of 12 new bean varieties with one local variety (Manteiga) used as a control.

Using 22 common bean traits focused on production, consumption and marketing; farmers were asked to rank attributes that might influence their adoption of new bean varieties based on a four point scale (1=not important, 2=important, 3=very important, 4=critically important). The FRN and SUNS II data was analyzed using ClimMob and STATA softwares. The obtained responses were then tested using unpaired t-test with Welch's correction to determine if there were statistically significant differences between women's and men's ratings on the various traits (attributes).

Figure 1: Partners in Mozambique



- Key:**
- ADEM = Manica Economic Development Agency
 - F= Individual farmers
 - FG = Farmers' group
 - K2 = Klein Karoo (seed company)
 - LUTEARI = Trader
 - NARS = National Agriculture Research system
 - IIAM = Agricultural Research Institute of Mozambique
 - SDAE = Distrital Services of Economic Activities
 - UCAMA = Manica Province Farmers' Union

Figure 2. Women and men's variety assessment exercises



III. RESULTS AND DISCUSSION

- Seven out of the 12 varieties were selected by both men and women farmers to be planted again in the next season. Regional variations are shown in Figure 3.
- For men farmers: the most preferred variety was BFS29, followed by AP 82, BFS142, LPA26, and AP89
- For women farmers : the most preferred varieties were AP89, AP82, BFS142, LPA26, and LPA95

Figure 3. Most preferred varieties among 12 varieties across the four FRN districts. Developed using ClimMob.

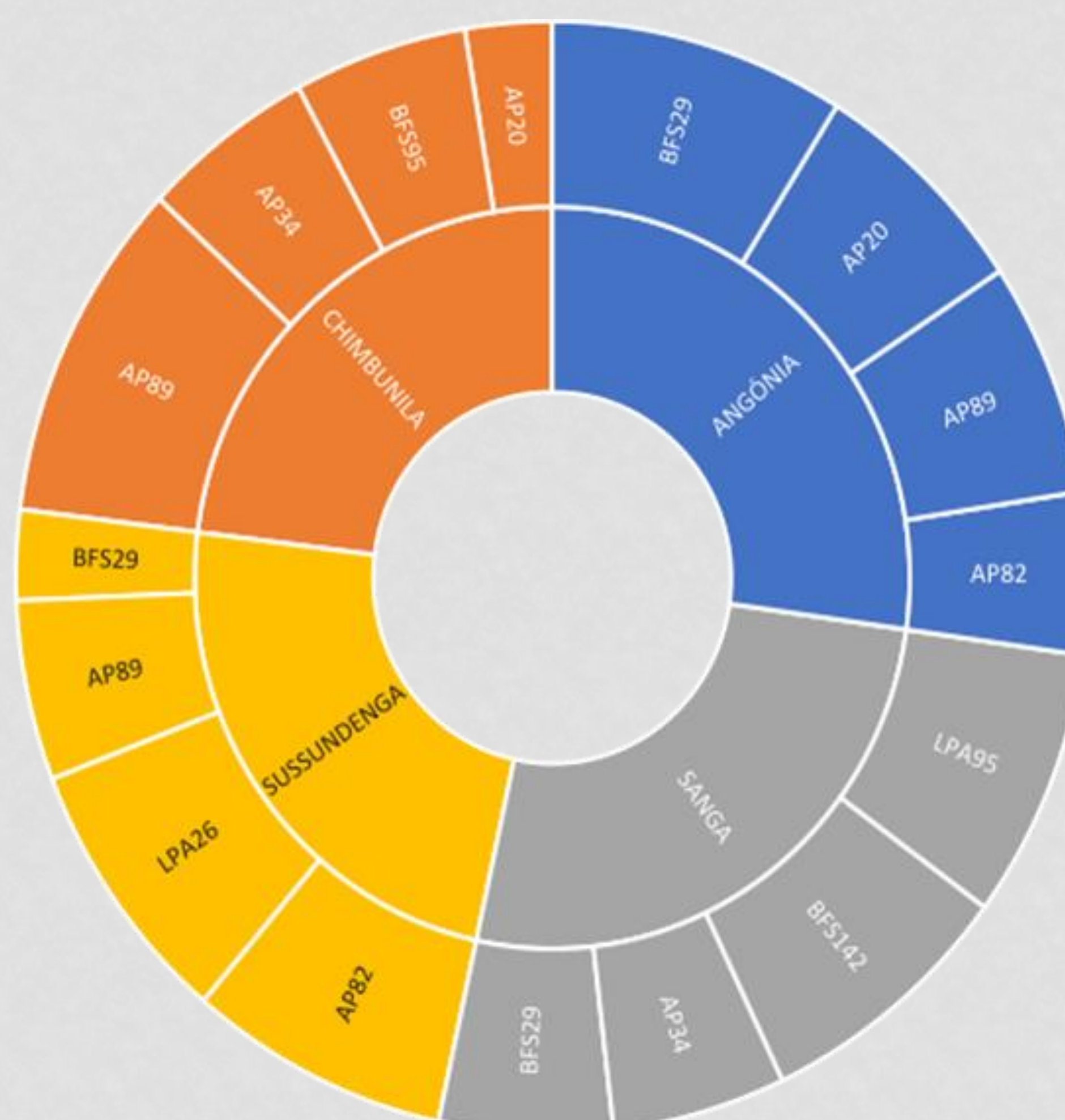
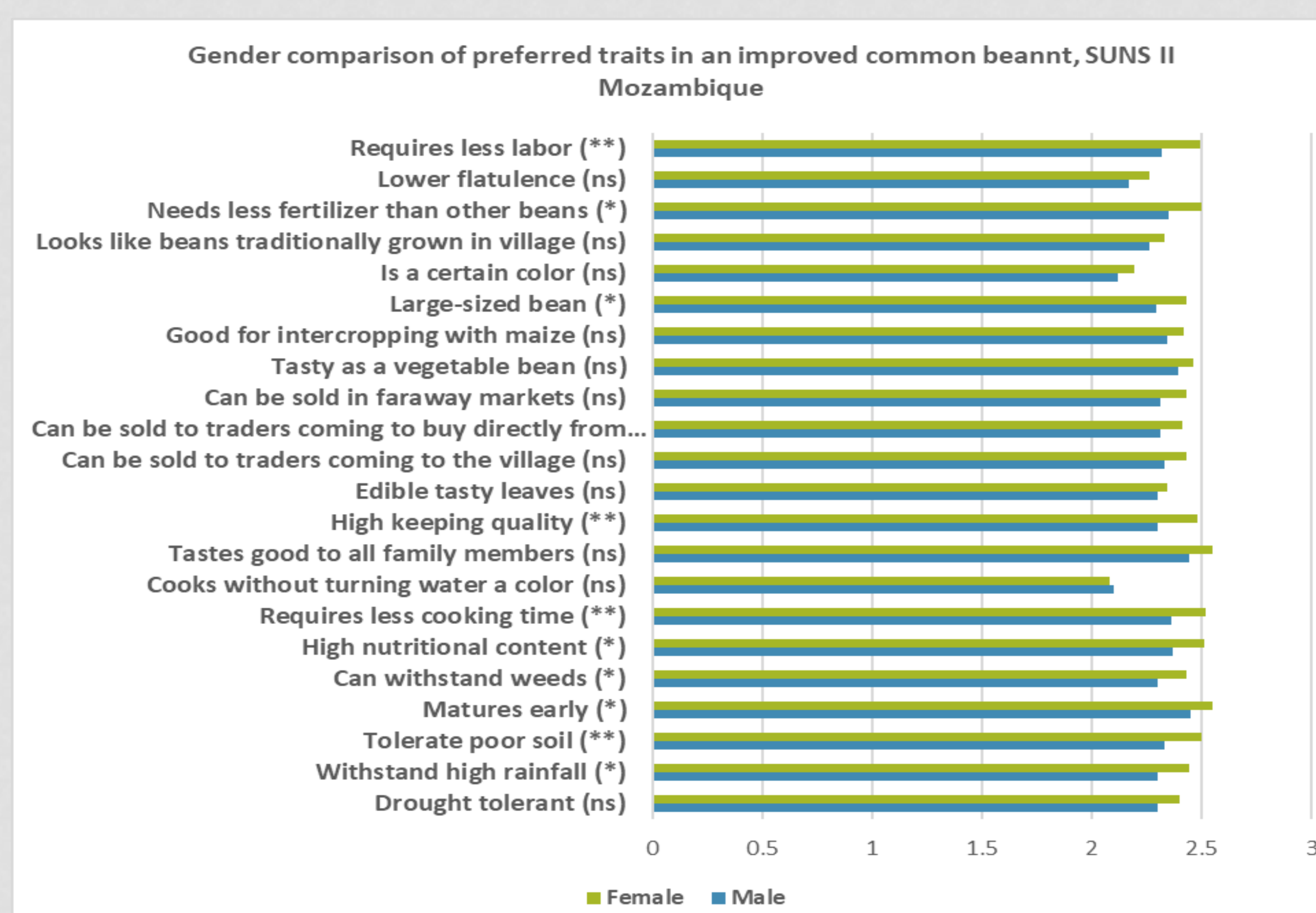


Figure 4. Trait preferences by gender, based on Mozambique SUNS II survey data



Note: The data above is based on an overall sample of 700 farmers (311 men and 389 women). Significance levels included 1% (**), 5% (*) and not significant (ns).

- The two highest rated traits for both men and women included (1) a bean that matures early (short cycle) and (2) a bean that tastes good to all family members.

The SUNS II results showed gender differences in preferences for specific bean traits.

Traits more important to women than men farmers – 1% level of significance

- A bean that tolerates poor soil
- Requires less labor
- Requires less cooking time
- High keeping quality

Traits more important to women than men farmers – 5% level of significance

- Withstand high rainfall
- Matures early
- Can withstand weeds
- Needs less fertilizer
- High nutritional content
- Large-sized bean

Finally, none of the marketability traits examined here are statistically different between women and men. The belief that men are interested (largely) in markets and income from crops and women are interested (largely) in household consumption may not be reflective of reality.

IV. SEED RELEASE AND EFFORTS TO DIFFUSE NEW VARIETIES

- Three highly ranked varieties (Tiyela, Kufuna, Matica) with overall better performance, as judged by farmers in the FRN were selected for release in 2018 and currently are in the process of seed multiplication.
- Community-based seed production was used to respond to demand for seed of the new preferred varieties (informal sector). Seed companies also involved in seed multiplication (formal sector). A promotional campaign which included very broad community engagement was piloted in December 2018.
- Participation of all partners is vital in speeding up the dissemination and rapid adoption of new bean varieties to other farmers and communities (Smith & Findeis, 2013).



V. CONCLUDING OBSERVATIONS

- FRN is viewed as a promising strategy to increase awareness and potential for adoption of new bean varieties and improve smallholder food security.
- FRN exposed farmers to new varieties and enabled farmers to guide the development of the new varieties.
- FRN promotes access to information which allows farmers to make better informed decisions on varieties best suited for their environment.
- Access to primary data (e.g. SUNS II) has provided crop scientists greater understanding of trait preferences of men and women farmers to help guide development of new varieties that align with farmer preferences.
- Approaches that improve women's access to information and seed that meets their preferences –e.g., lower cooking time, less labor intensive, early maturity, etc. might likely increase uptake of new bean varieties that tolerate poor soils, require less (expensive) fertilizer, withstand drought and produce more beans.

VI. REFERENCES

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