



Exploring the Banana & Cassava Seed Systems: A case study of Luwero district in Central Uganda

RTB Seed System Toolbox
Course:
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Introduction

- The agricultural sector in Uganda is dominated by smallholder farmers (80%) who farm ≤ 2 hectares and contribute 70% of the agricultural production.
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- Most of the agricultural produce is consumed domestically
- Agricultural production is mostly rainfall driven, in two seasons a year.



Introduction

- Season 1: March & June;
Season 2: Sept. – Dec., for most areas around the Lake Victoria Basin.
- Cassava grown in most agro-ecologies of Uganda. In the Eastern, Northern, Central & to less extent Southwestern regions.
- Banana mostly grown in Southwestern, Central & some areas in the East



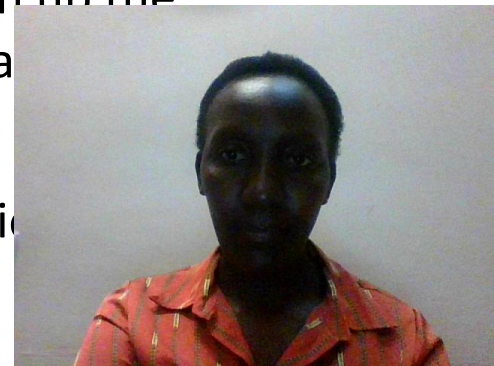
Legend

- Highland Ranges
- Kyoga Plains
- Lake Victoria Crescent
- North Eastern Drylands
- North Eastern Savannah Grasslands



Research 4 Development problem

- Despite its importance, the agricultural sector only meets 40% of its potential (WFP, 2017)
- Its productivity is impeded by a number of factors (pests & diseases, climatic change impacts, limited access by farmers to quality inputs e.t.c. (Fiala & Apell, 2017)
- Agricultural technological improvements in form of innovations such as tissue culture (TC) have been shown to offer potential solutions for farmers to increase crop productivity (Coomes *et al.*, 2015; McGuire and Sperling, 2016)
- Private sector actors & research institutions have taken up the technology of TC to multiply, distribute cassava & banana sources of clean planting materials.
- However, farmer uptake of such technological innovations has been low (Mulugo *et al.*, 2021; Sanya *et al.*, 2020)



Objective

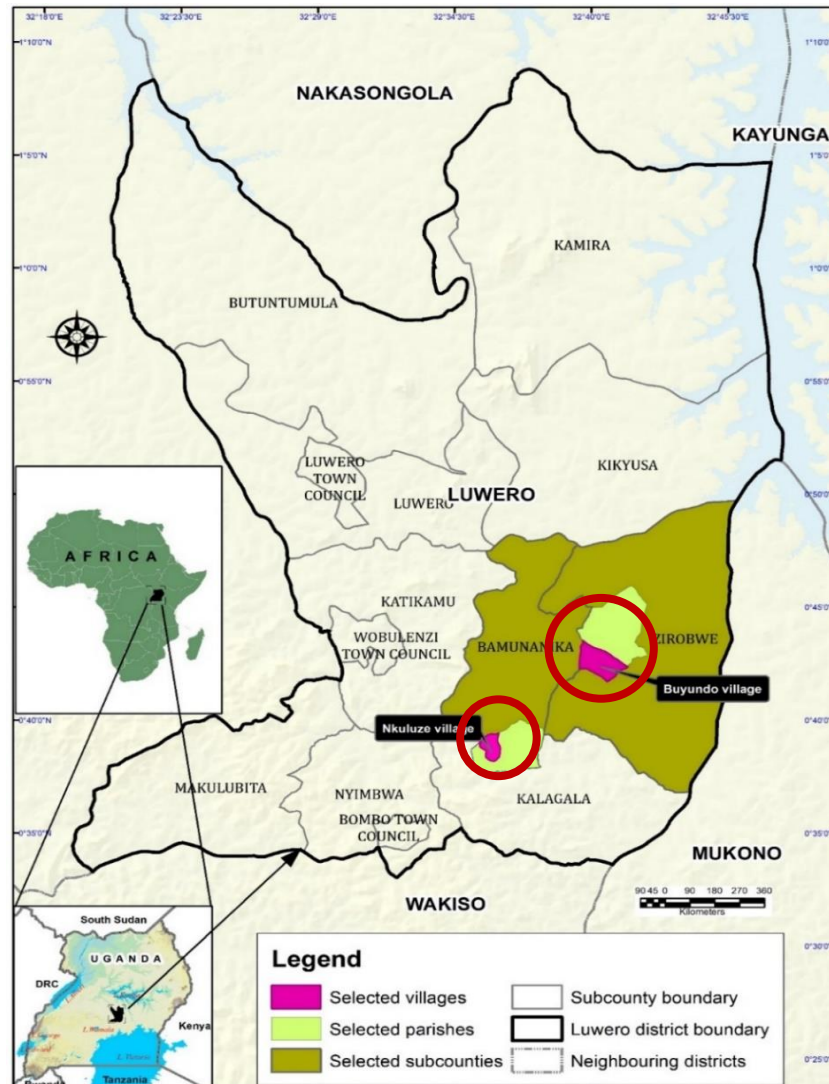
- To find out farmers' underlying motivations in selection of planting materials for both banana & cassava crops
- To inform future work on uptake of clean planting materials for RTBs, spatially & temporarily

-Spatial dimension is in light of the geographic of tissue culture laboratories in the central region
-Temporal dimension is due to the continuous varieties especially for cassava



Method

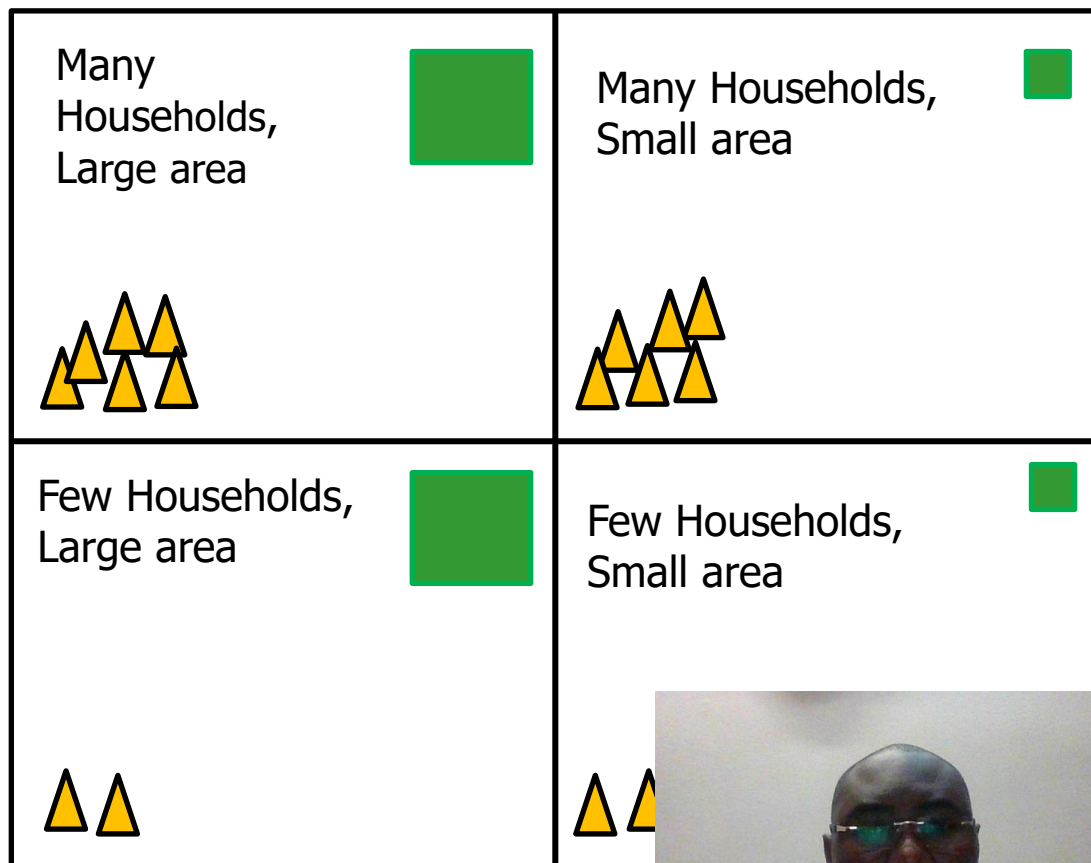
Study area



Method 1

The Four Square Method (4Sq)

- 8 FGDs [2 FGDs for Men & 2 FGDs for women for each crop]
- Total 74 farmers
 - 17 ♂: 16 ♀ for Banana farmers
 - 24 ♂: 17 ♀ for Cassava farmers



Method 2

Means End Chain (MEC) Analysis

- Fifty individual interviews held
- Banana farmers (25) & Cassava farmers (25)



Kilwinger, F.B.M. 2020. User guide to means-end chain analysis. Lima (Peru). CGIAR Roots, Tubers and Bananas (RTB). RTB User Guide. No. 2020-4.

Method

Complementarity of the Tools

- The FGDs (4Sq) were used to describe the diversity of banana and cassava cultivars grown in the study communities.
 - Cultivar uses, desirable and undesirable attributes, year of introduction, origin & prevalence were described.
- MEC hinged on the above information; it solely focused on farmer motivations for selection of banana and cassava planting materials in the study communities



Results

Diversity of Banana Varieties

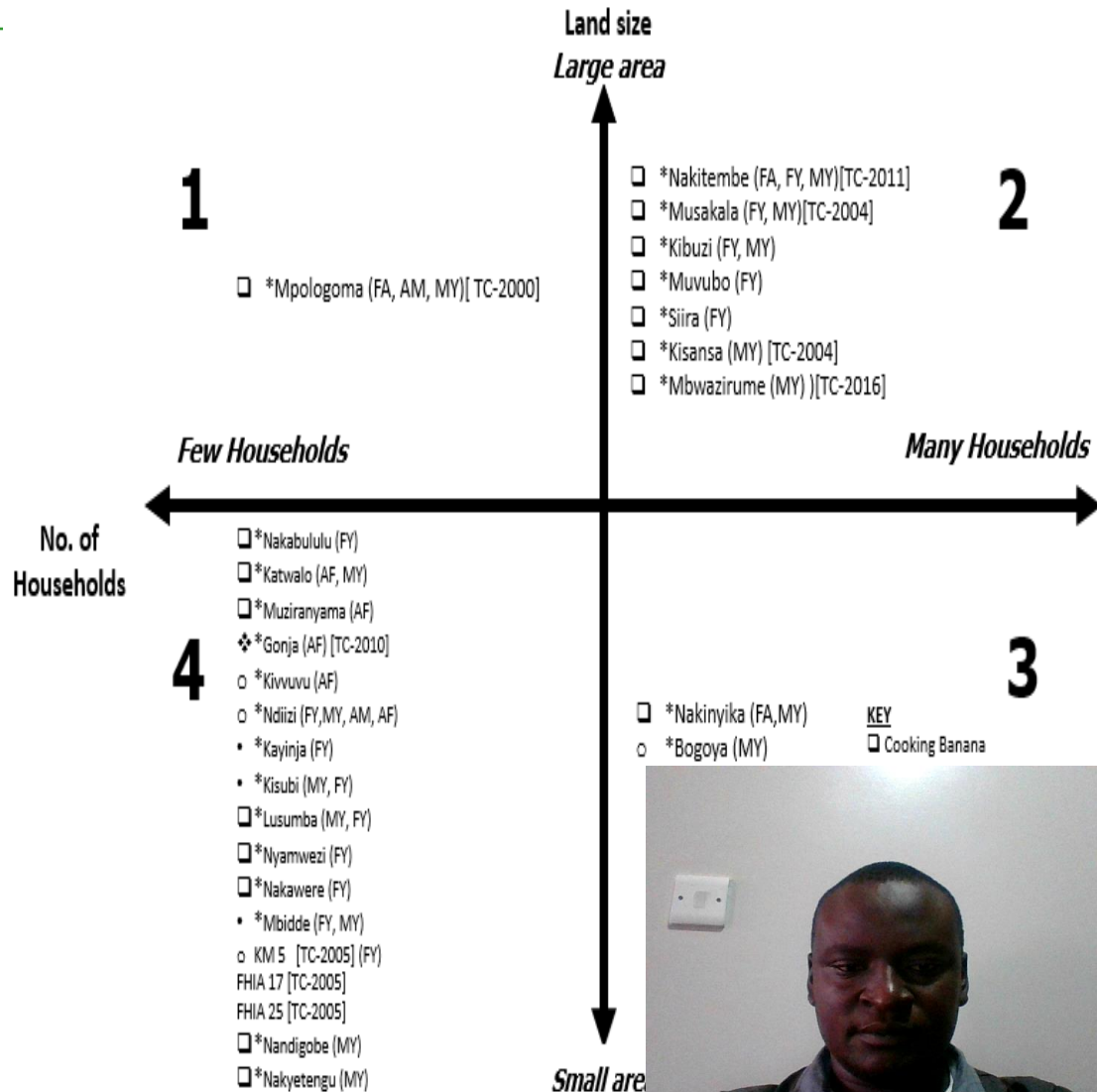
- 80% of all varieties belonged to the endemic East African Highland Banana (EAHB), *Musa* spp, AAA-EA group
- Varieties belonged to the 5 major clonal sets (Mbidde, Musakala, Nakitembe, Nfuuka & Nakabululu)
- Respondents identified 27 local and 3 introduced (FHIA 17, FHIA 25, KM5) varieties. Some varieties though local were re-introduced as tissue culture plantlets.



Results

4Sq analysis for banana varieties, abundance & year of introduction

- Fewer varieties (re-introduced) were grown by fewer HH on large scale, while most varieties (mostly local) were grown by many HH on small scale.
- Improved varieties introduced between 2000 & 2017
- Men have land ownership rights, grow varieties on large scale and for cash, while women with limited land grow cooking varieties on small scale for food
- Women grow more varieties than men, with men growing more of market demanded (*Mpologoma, Kibuzi, Mbwazirume*) & brewing varieties while women concentrate more on food varieties



Results

Diversity of Cassava Varieties

- 83% of the varieties were fresh cooking cassava types, while 17% were the bitter types, **only edible** in processed form
- 23 varieties were mentioned, of which 2 were local and 21 improved
- Farmers usually adopt newly introduced varieties based on desirable attributes at the expense of previous cassava varieties



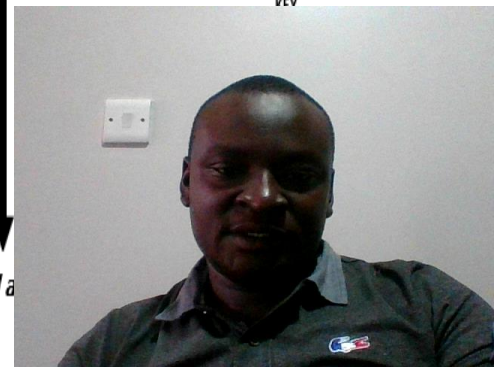
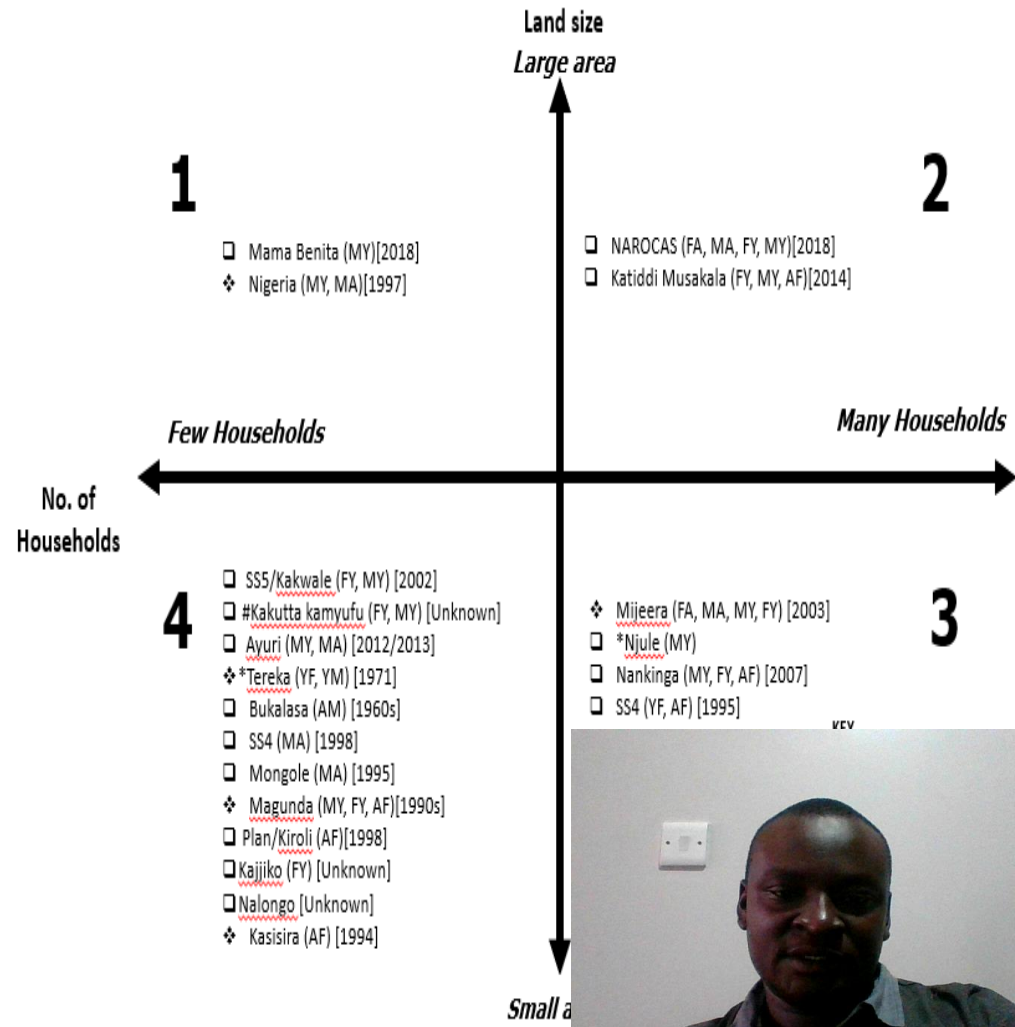
Results

4Sq analysis for cassava varieties, abundance & year of introduction

- Fewer varieties (improved & previously introduced) were grown by fewer HH on large scale, while majority of the varieties were grown by fewer HH on small scale
- Improved varieties introduced mostly b/n 1990 to date

*“Cassava is mainly a woman’s crop”
(Male FGDs)*

- As such, women grow more varieties than men
- Men have land ownership rights, grow bitter (*Mijera*) varieties & those with commercial attributes (*Mama Benita*) on large scale for cash, while women with limited land grow fresh cooking varieties on small scale mostly for food



Results

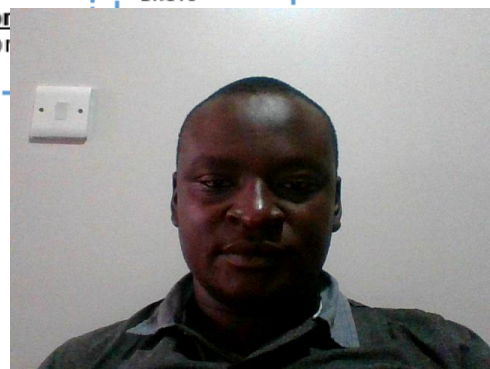
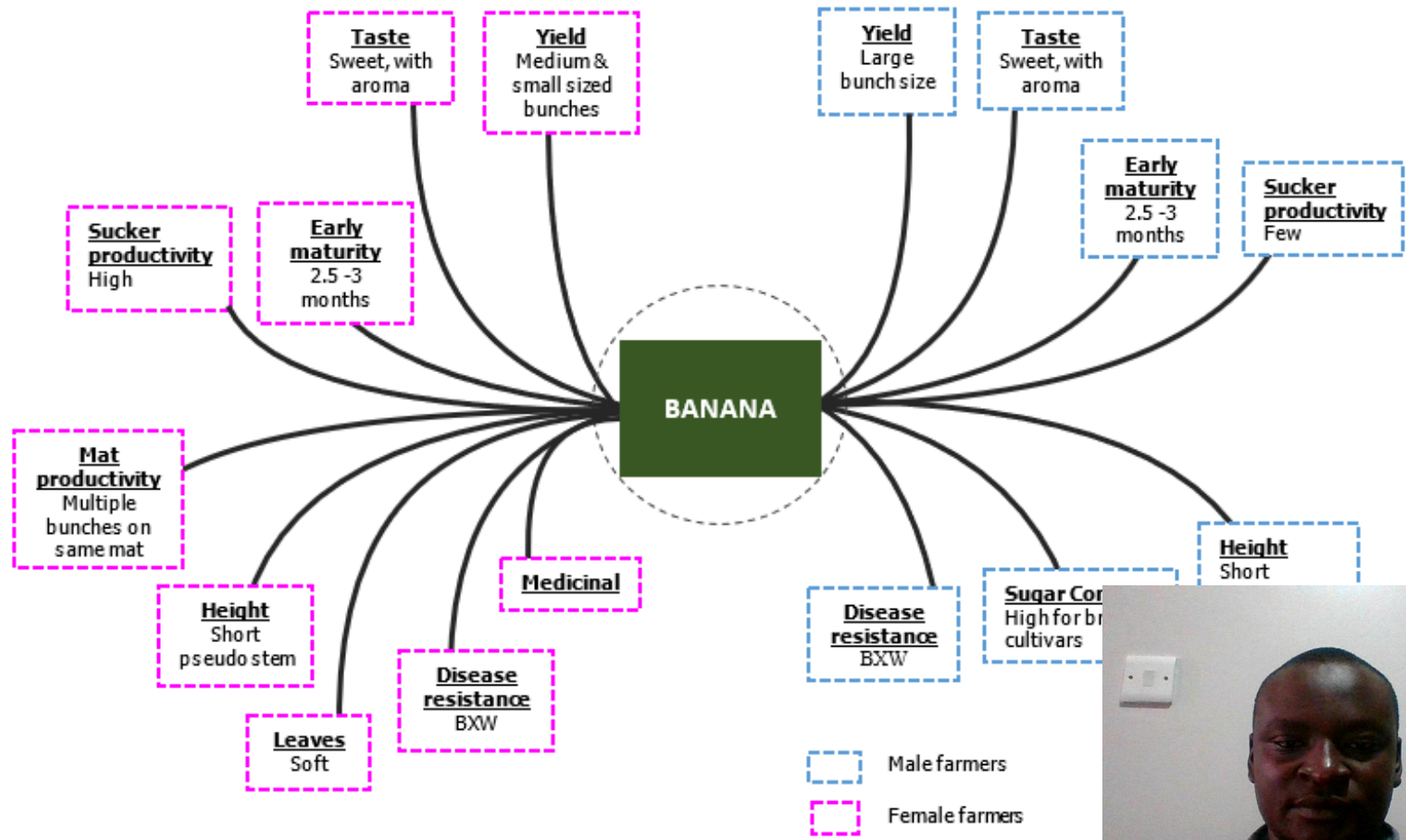
Farmer preferred traits for Banana

- Farmer practices in banana cultivation are not only subject to food and nutritional needs but also finance, food security, traditional rules and beliefs.
- Therefore, in making decisions and choices over which varieties to plant, farmers assess the quality of a specific banana varieties before they introduce it on to their farms.



Results

Important traits for banana considered by Male & Female farmers in the FGDs



Results

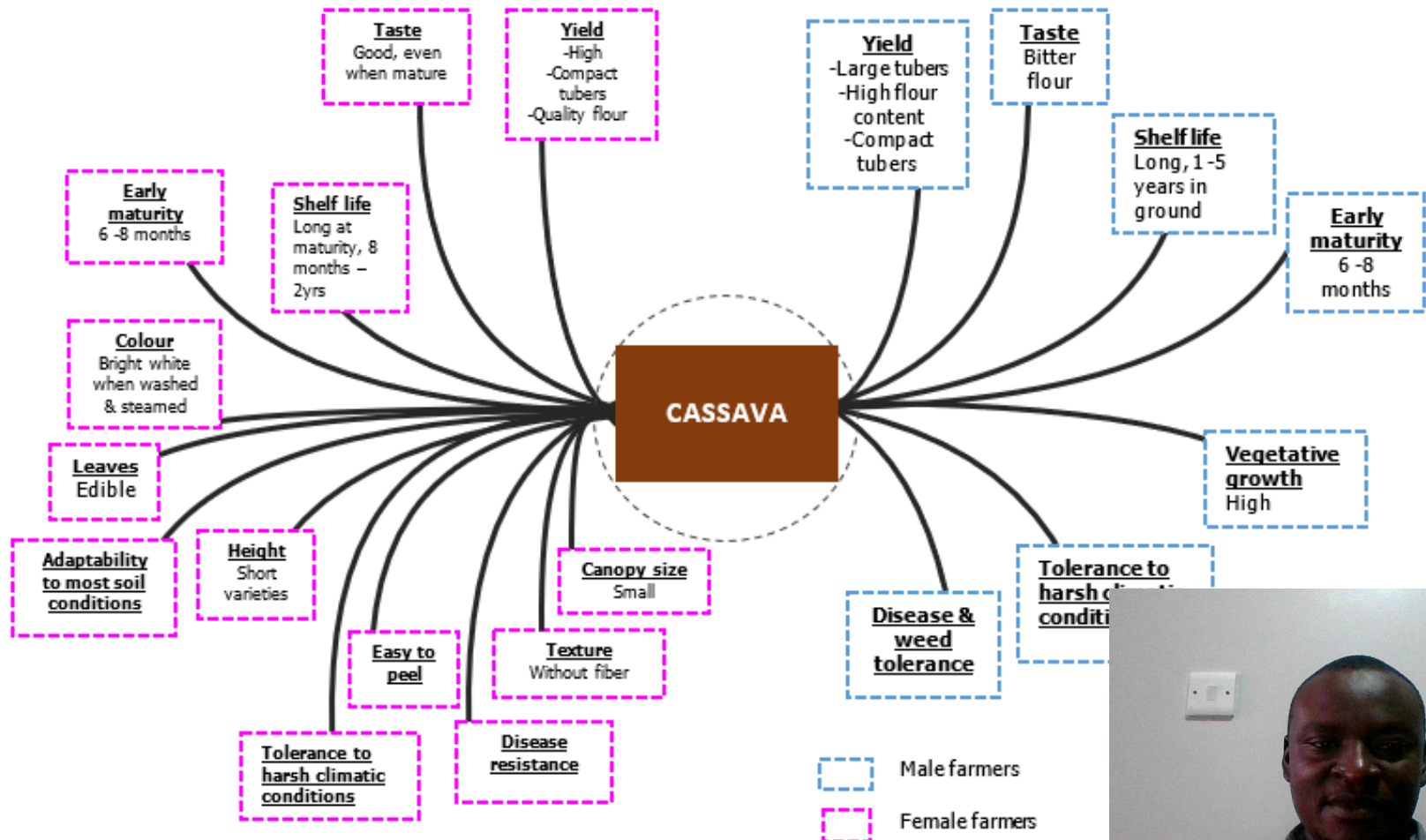
Farmer preferred traits for Cassava

- Farmers maintain diversity of cassava varieties because of the multiple end uses
- Diversity in strength and weaknesses reduces production, consumption & marketing risks
- Low yielding varieties can be retained because of other superior traits e.g. good taste or have certain functions & income values



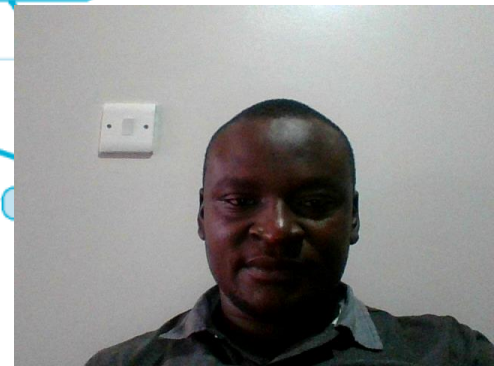
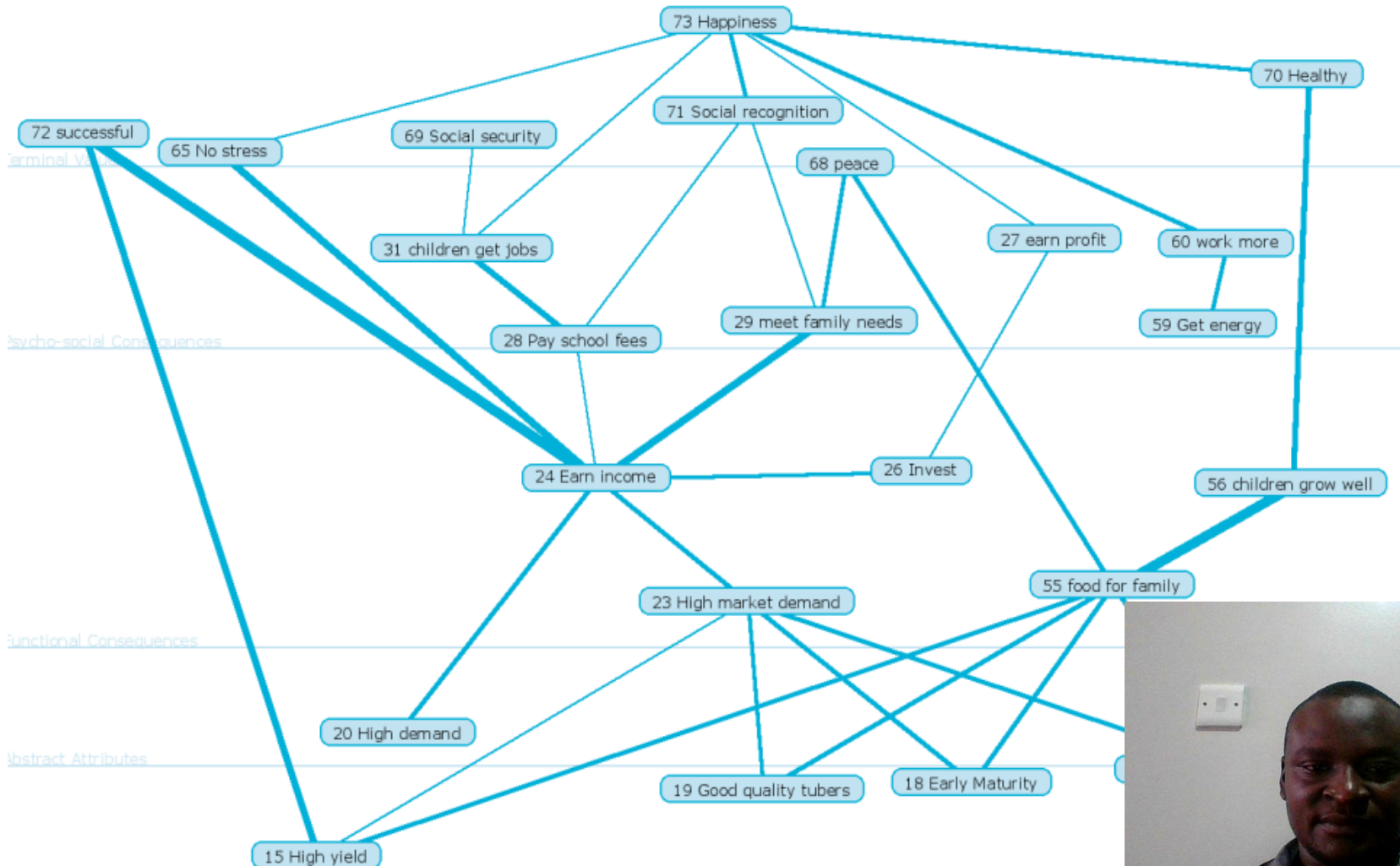
Results

Important traits for cassava considered by Male and Female farmers in the FGDs



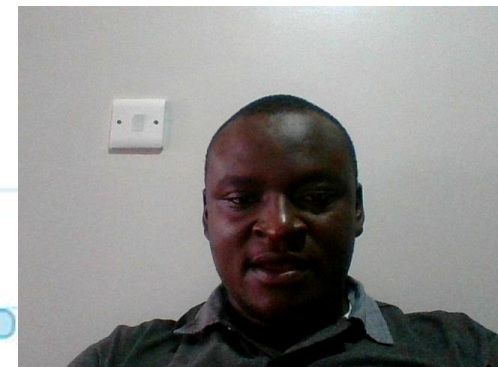
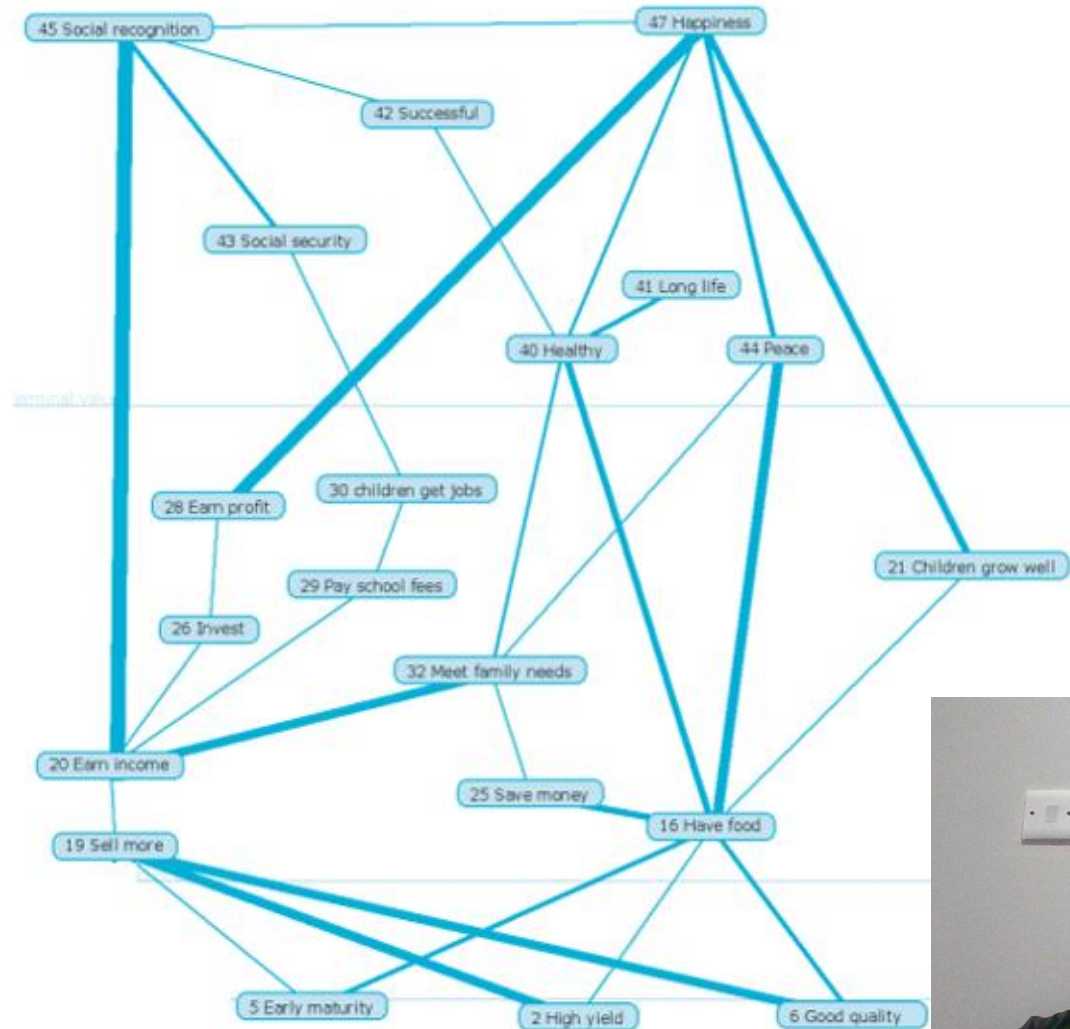
Results

Aggregate Hierarchical Value Map for Male & Female Cassava farmers (Individual interviews, MEC analysis)



Results

Aggregate Hierarchical Value Map for Male & Female Banana farmers (Individual interviews, MEC analysis)



Conclusion & Implications

- There is high diversity in banana varieties on-farm, with women growing more varieties than men

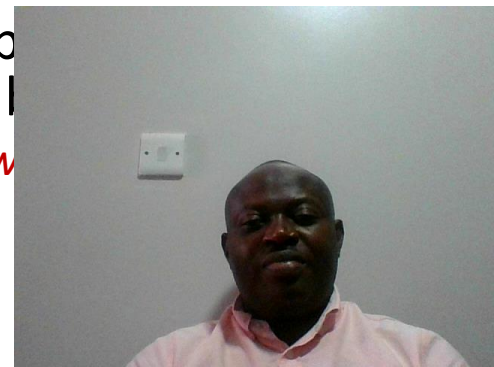
To increase adoption of banana varieties especially among women, breeders ought to factor in diversity & their preferred attributes in breeding

- Though cassava is considered a female crop, men prefer high yielding varieties with consumer preferred traits.

Interventions need to put into consideration male & preferences to foster uptake

- Farmers mostly produce high yielding cassava and be to be counted as successful in the community and l

If a variety doesn't meet the success and happiness of farmers, it w especially among cassava farmers

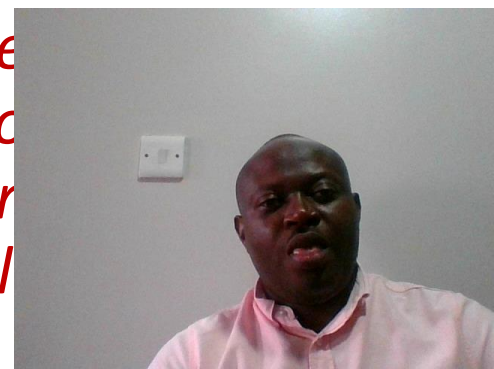


Conclusion & Implications

For banana, if a cultivar doesn't meet the food requirements (mostly improved varieties), or commercial or cultural needs (e.g. to brew beer for weddings) (mostly local varieties), it is dropped and becomes extinct.

- There is higher variety turnover in cassava than banana due to a high degeneration rate.

Cassava farmers frequently replace old varieties with new ones. A variety is currently grown between 2 to 5 years in the past. This has an implication for biodiversity in relation to cassava seed availability, affordability



Acknowledgements

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