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REVIEW

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Variety use and preferences among smallholder sweetpotato farmers and how best to improve their access to quality seed: A gendered perspective and implications for breeding program design

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Abstract

Uganda is a secondary centre of diversity of sweetpotato with most farmers maintaining at least four varieties in their fields. However, most of these varieties are landraces, with the uptake of improved sweetpotato varieties being quite low in the country, especially among women. Efforts to decrease the gender technology adoption gap are critical for inclusive impacts of innovations. This study aims to understand gendered drivers of sourcing and use of sweetpotato varieties among smallholder farmers exposed to behavioural interventions in Uganda. Key informant interviews (KII), focus group discussions (FGDs) and semi-structured interviews (SSI) were used to gather baseline information from farmers located in communities that received behavioural interventions. The results indicate that while men sourced seed-vines mainly from purchasing in the market, women farmers did so mainly from social networks including fellow farmers or neighbours. Men had higher tendency to source vines from the market likely because of higher mobility than women. Consumption traits, especially quality characteristics were strongly associated with variety use. Notably, sweet taste played a big role and was linked to preference for Iboi, Ejumula and Kakamega, the leading varieties. This was followed by high root yield. The challenges women face in sweetpotato production included limited labour force and shortage of farm equipment/machinery, lack of timely access to planting material at on-set of rains, and lack of access to affordable/ cost of improved varieties. These findings highlight the importance of paying attention to both quality and agronomic traits, and not only the latter, in variety development. They also suggest the need for implementation of effective promotional strategies including demonstration gardens, technical backstopping to extensionists to equip them, radio talk shows and market linkages.

Keywords: sweetpotato, varietal use, smallholder farmers; gender; seed-vine sourcing, improved varieties

Introduction

Besides the simple biological differences between men and women, gender encompasses roles, behaviours, activities and attributes that society accords to women and men at a given time (Williams, 2017). Olagunju *et al*. (2013) found no relationship between gender of respondents and adoption of improved sweetpotato in the aggregated sample but found that gender is a significant predictor for the adoption of improved sweetpotato in disaggregated or specific social groups, such as young women producers. However, gender is more frequently confounded with household structure and comparing male-headed with female-headed households while ignoring the existence of women who farm and make adoption decisions as members of a male-headed household. In Uganda, more than 60% of sweetpotato farmers are women (Polar *et al*., 2022). Women, in sweetpotato production, are responsible for, among others, seed sourcing, selection and conservation, usually through informal and closed networks due to their immobility (McEwan *et al*., 2023). Men, on the other hand, are usually more involved in transportation and sales transactions of

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marketed sweetpotato (Echodu *et al*., 2019). Despite the fact that the current Uganda gender policy aims at strengthening women's presence and capacity in decision making including household and personal level empowerment, still only 23% of married women in Uganda make decisions on their own (UBOS and ICF International Inc., 2012). At farm level, while women's role in agriculture worldwide is indisputable (Williams, 2017), plant breeding programs often overlook quality traits that are indispensable to women. For instance, women's distaste for varieties with labour-increasing traits such as "hard to peel" and those that increase demand for unpaid female labour in the farm family, are treated as secondary by breeders. Mulwa *et al*. (2023) showed that women producers are less likely than men producers to adopt improved varieties.

Yields obtained by female farmers have been found to be 20–30% lower than for male farmers (FAO, 2011), and this is attributed to lower adoption of new technologies and inputs such as seed and market opportunities (World Bank *et al*., 2009). Assuming the differences in adoption were removed so that women and men produced the same, agricultural output in developing countries would rise by an average of 3.5% and reduce the number of undernourished and hungry people by 12–17% (FAO, 2011). In Uganda, the cost of the gender gap has been estimated at $67 USD million (UN Women *et al*., 2015). It is further estimated that closing the gap would lift 119,000 people out of poverty as well as deliver their nutritional benefits and potential reductions in hunger and malnutrition. Essentially, to take a gendered approach, organizations should have commitment and the necessary resources, and should ensure that during project implementation, gender is integrated into the project cycle (Williams, 2017).

However, gender is frequently confounded with household structure and comparing male-headed with female-headed households is considered as adequately covering gender differences, ignoring the existence of women who farm and make adoption decisions as members of a male-headed household. Danso-Abbeam *et al*. (2022) strategically aimed at addressing the lower rate of adoption of improved varieties among women as "having a preference is not the same as exercising a choice" and considering traits that are more exclusive to women producers than men. Misconceptions such as sweetpotato being women's crops based on gender dominance during production and rather unattractive combination of attributes such as labour arrangements relegated to the disadvantage of women are an example of parameters of choice constrained by unequal gender relations (Farnworth *et al*., 2020). Although sweetpotato is grown mainly for subsistence use (Echodu *et al*., 2019; Mayanja *et al*., 2022), a change towards "commercialization" may lead to convergence of women's and men's varietal preferences in regards to the traits required for successful market penetration.

This study aims to examine behavioural interventions intended to influence farmers to adopt improved sweetpotato varieties. Specifically, it aims at understanding if, and how, preferences for certain traits differentiate the uptake by smallholder men and women farmers. Behavioural interventions can be used to stimulate adoption of agricultural technologies, especially where conventional extension approaches for technology diffusion strategies have failed to work (BenYishay and Mobarak, 2019; Shikuku, 2019; Balew *et al*., 2022). Findings by BenYishay and Mobarak (2019) indicate that incentivising farmers to regularly replace planting materials and use good agronomic practices can induce adoption of improved technologies. However, Okello *et al.* (2023) found that interventions based on social incentive nudges instead acted to lower the demand for improved varieties. This study complements the findings of Okello *et al*. (2023) using qualitative data collected from sweetpotato farmers, agricultural officers and vine multipliers in the Amuria district (02°02′N 33°39′E) in eastern Uganda. It specifically attempts to understand the differences among smallholder men and women sweetpotato farmers in the sourcing and preferences for varieties grown.

The study focuses on three research questions, namely:

i What sources do men and women obtain sweetpotato vines from?

ii Why do men and women farmers choose not to adopt or upgrade to newer/ improved sweetpotato varieties?

iii What types of marketing/ promotional strategies are needed to get men and women farmers to adopt new/ improved varieties?

Review methodology

The selected studies on adoption of improved varieties were reviewed and references obtained were used to check for additional relevant materials, peers consulted on available reports and any upcoming unpublished studies. The study targeted smallholder men and women growing white/cream and orange fleshed sweetpotato (OFSP) producers for home consumption and fresh markets (Ojwang *et al*., 2023). Key informant interviews (KII) were conducted with relevant stakeholders at the various levels of the seed promotion and delivery system including extension agents, vine multipliers and NGOs. Two focus group discussions (FGDs) were conducted per selected community, each separately for men and women for the qualitative data collection. Each focus group comprised between 8 and 10 participants who were "homogeneous" in terms of knowledge/experience with regards to sweetpotato and their role in the community. Follow-up questions based on what emerged from FGDs were administered in form of semi-structured interviews (SSI).

Data were collected on intersectional characteristics, including age, education, wealth, caste or ethnicity (Polar *et al*., 2022), and interactions between other aspects of social identity (Bacud *et al*., 2023). The farmers targeted were in communities/villages that had benefited from behavioural interventions designed to increase demand for quality seed of improved varieties of sweetpotato.

Methods

Study samples and data: This study used focus group discussions (FGDs), semi-structured interviews (SSIs) and key information interviews (KIIs). Eight farmer FGDs (four with men and four with women) each comprised 8 to 10 people, were designed to gather farmer perspectives on sweetpotato varieties grown. FGDs were conducted in behavioural interment (i.e., treatment) villages each lasted 90 to 120 minutes. The behavioural interventions deployed included the issuance of trial packs to resolve liquidity constraint and cooking demonstrations in which the promoted varieties were offered to farmers to cook and taste and experience their sensory/ quality characteristics. The study focused on– two villages that received trial packs only, one village that received consumption only and one village that received both trial packs and consumption. Only farmers who participated in the household survey designed to assess the impact of these behavioral interventions and also received the treatment(s) were interviewed. That is, the farmers targeted were in communities/villages that had benefited from behavioural interventions designed to increase demand for quality seed of improved varieties of sweetpotato. For recipients of trial packs only, participants were selected from Acia and Awitwon villages. On the other hand, Odubai village and Sabatia village were selected to represent recipients of cooking demonstration/ consumption only and both trial packs and consumption, respectively. Focus group discussions were conducted in local language (Ateso) and were recorded and detailed notes written. Following each FGD, one farmer was selected from the group to provide deeper insights into specific topics in form of semi-structured interviews (SSIs). The SSIs were conducted using a pre-designed and pre-tested checklist of questions that probed the aspects of variety choices and preferences.The KIIs were on the other hand carried out with experts knowledgeable about sweetpotato farming and marketing practices. These included the area extension workers, vine multipliers, district agricultural officer

and seed inspection officer. They were also conducted using a tool that was pre-designed and was pre-tested and adjusted for context. Each KII took approximately 30 minutes. A total 80 participants for FGDs, 8 semi SSIs and 15 KIIs were successfully completed. This study further borrows from the findings of a feedback and validation workshop to address the third objective. The workshop was convened to discuss the preliminary findings of the baseline survey with transdisciplinary participants drawn from among farmers, extension workers, policy makers, NGOs, seed producers, producer association representatives, consumers and agriculture department. This study was conducted in accordance with the ethical research guidelines laid down in the Declaration of Helsinki. It was implemented jointly by the International Potato Center, Cornell University, the Norwich Institute for Sustainable Development, the Ugandan Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), and the National Agricultural Research Organisation (NARO) under the Cornell University Institutional Review Board (IRB) ethics approval ID# 2110010648. Verbal consent was obtained from participants. Research participants were offered refreshments and modest token of appreciation for their time and to cover transportation expenses to the meeting point.In addition to the data collected via FGDs, SSIs and KIIs, relevant studies on adoption of improved varieties were reviewed and references obtained used to check for additional relevant reference materials. Key informants and peers were also consulted on available reports and any upcoming unpublished studies. The study targeted smallholder men and women growing white/ cream and orange fleshed sweetpotato (OFSP) producers for home consumption and fresh markets (Ojwang *et al*., 2023). After each FGD, KII and SSI session, the data were transcribed and coded. Following Polar *et al* (2022) and Bacud *et al* (2023), limited quantitative data were collected on intersectional characteristics, including age, education, wealth, caste or ethnicity, and interactions between other aspects of social identity. Furthermore, the preliminary findings were presented to stakeholders in a workshop and their suggestions on marketing and promotion strategies needed were extracted as indicated in Table 3. Analysis: This study uses descriptives statistics and information from interviews and observations to triangulate the evidence. Therefore, the findings discussed present association and correlations and are not of causal effects. Our sample sizes are, by design, too small to utilize regression techniques that could have enabled us to assess the causal effects. In the analysis, thematic, content and comparative analysis techniques were used. Analysis was conducted using Atlas ti version 5.0, Statistical Package for Social Sciences (SPSS) with the latter used for categorization/characterization of the participants and frequency distribution tables. Microsoft Excel software was used for generating tables.

Results

In this section, the study findings are presented with emphasis on the gender dynamics of access to and use of preferred sweet potato varieties, the factors influencing varietal trait preferences for production, consumption and sale as well as the gendered constraints on uptake of improved varieties. Analysis of the FGDs, KIIs and SSIs revealed five major themes dissecting the gendered perspective of variety preference and replacement as follows: sources of sweetpotato planting material, sweetpotato variety preferences for sale, commonly planted sweetpotato varieties, attributes considered for the choice of varieties for consumption, and the challenges that affect women more than men in sweetpotato production.

SOURCES OF SWEETPOTATO PLANTING MATERIAL

KII findings indicate that farmers obtain sweetpotato seed/vines from multiple sources such as religious leaders, politicians, vine multipliers but more so from fellow farmers or neighbours and buying from the market (Table 1). There were differences in the most commonly used sources by men and women. Buying from markets was the main source specifically for men (16%), possibly because of their mobility and financial capability to pay for vines. Although more men (15%) than women (5%) opted to source vines from neighbours/fellow farmers, neighbours were the main source for women. Overall, for men and women farmers combined, the main source of vines was neighbours/ fellow farmers.

Table 1. Percentage of men and women accessing vines from different sources in eastern Uganda (n = 15).

	%		
Source	**Male**	**Female**	**Reason**
Neighbours/fellow farmers	15	5	More sustainable but quality may not be reliable
Buying from the market	16		Source is known
From farmers associations	8	4	cheap but may harbour pests
Local vine multipliers	8	4	Cheaper but often adulterated
Previous field sprouts	8		Trusted source if from trained people
Model farmers	4		Assured quality since vines are well managed
Religious leaders	4		They are trusted by their followers
Politicians	4		Source is reliable
SOSPPA	4		Cheap but may harbour pests
PDM	4		
Extension workers support	4		Cheap and very small quantities
Exchange of labour for vines		4	Respect accorded by farmers within the community
Agricultural show and promotions		4	Good but target audience may not receive
Total (100%)	79	21	

FGD findings reveal that because of the higher mobility and financial capacity of men, they stand higher chances of accessing vines.

> *"I think men can access these new varieties easily because they can move so much and they also have money to buy unlike for women who sit at home."* (Women FGD, Awinton village).

> *"Men can also easily access vines when brought to the sub county because they can fight their way to get some vines unlike for us the old women who have no energy."* (Women FGD, Acia village).

However, some men, especially those who are less mobile, face similar challenges like women in accessing vines. "*There are men who do not move so they are similar to women in terms of accessing new varieties through organizations, from vine multipliers and neighbours/ relatives."* (Women FGD, Odubai Village).

SWEETPOTATO VARIETY PREFERENCES FOR SALE

From the FGD findings, we see that the preferred varieties for sale include *Iboi*, *Ejumula*, *Kakamega*, *Esiimo*, *Ijenero* and *Ateseke* (Table 2). *Iboi* (landrace) and *Ejumula* (OFSP) were the main varieties sold by women and men, respectively as mentioned several times in different FGD sessions. Women's preference for *Ateseke,* because it cooks easily, implies the importance of convenience to women.

The KII findings reveal that men are drawn to the *Kakamega* variety because of the lucrative market it is associated with. Additionally, men's preference for *Kakamega* is attributed to the variety's early maturity and high yields, big roots and orange flesh colour. Early maturity makes the variety ready for the market earlier in the season than the rest of the varieties, hence fetching higher prices. While this has a positive revenue effect, it is not necessarily good in terms of gender and food security. High prices typically led men to take-over control of the crop thus disenfranchising women. In terms of food security, high prices led to competition of sales with food by encouraging farmers to harvest.

Table 2. Percent responses by male and female farmers on preference for varieties sold (n = 80).

Gender	Variety	(%)	Reasons for preference
Men	Ejumula	12	It has a market It has healthy roots It is tasty (variety is nutritious)
	Kakamega	5.8	Gets ready faster so it is preferred by business people, especially restaurants because it uses less fuel to cook
Women	Iboi	64.8	Produces white "inginyo" commonly sold as flour Produces good shaped and big roots attractive to customers
	Esiimo	5.8	Yields highly and has white flesh colour
	Ateseke	5.8	Cooks easily
	Ijenero	5.8	Has red skin colour and yields highly

The results further reveal that the *Ejumula* variety's nutrient-rich and high-yielding traits with a very attractive colour appeal to customers hence making it more marketable.

> *"Ejumula and Kakamega are the most preferred varieties for market because they are high yielding. Only a few heaps can fill a bag and are orange fleshed in colour."* (Key informant respondent, Amuria sub- county).

COMMONLY PLANTED SWEETPOTATO VARIETIES

FGD findings indicate that larger proportions of the participants (18%) plant *Iboi* sweetpotato variety (Fig. 1), attributed to its superior *amukeke, inginyo* and easy marketability (Table 2). Additionally, *Iboi* is preferred for its high yielding capacity and pests and disease resistance. These aspects are indicated in the FGD participants' quotes, notably: "*Iboi is the most yielding and resistant to pests and diseases."* (Men FGD, Sabatia village). Despite their high yield and lucrative market, only 16% of the farmers interacted with planted improved sweetpotato varieties.

ATTRIBUTES CONSIDERED IN THE CHOICE OF VARIETIES GROWN FOR CONSUMPTION

Figure 2 reveals that sweet taste particularly loved by children during eating is the most considered trait when choosing a variety for consumption, collaborated during FGD (Woman participant, Acia village). Other important attributes are smoothness of the roots and pests and disease-resistant roots (Table 2 and Fig. 2), and less cooking time (Woman participant, Acia village) FGD.

CHALLENGES THAT AFFECT WOMEN MORE THAN MEN IN SWEETPOTATO PRODUCTION

In most cases, women play a vital role in the management and success of different farm activities. Men tend to be more mobile (Echodu *et al*., 2019) and have less time for agricultural

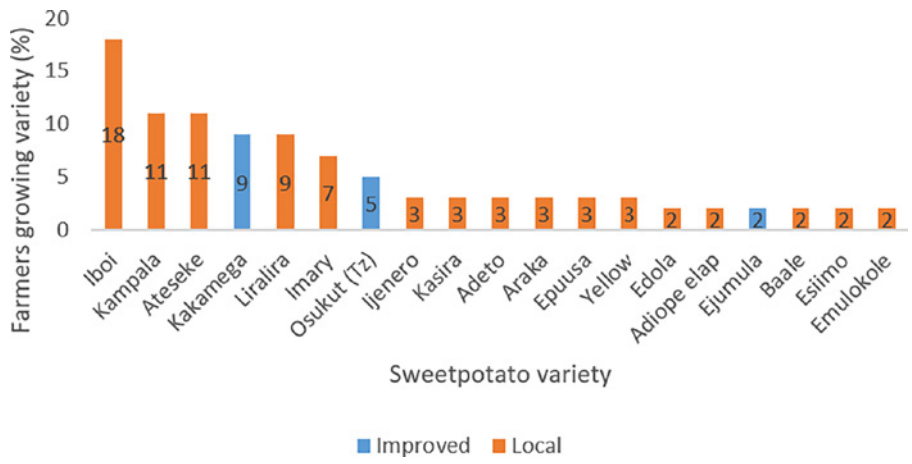

Fig. 1. FGD findings on the commonly planted sweetpotato varieties.

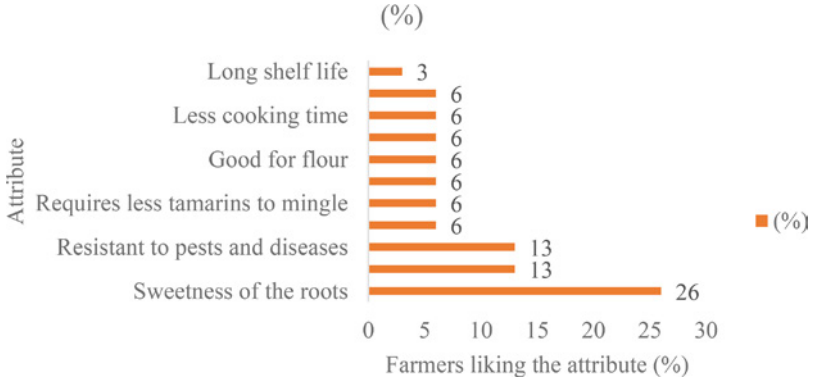

Fig. 2. Attributes considered when choosing a variety of sweetpotato for consumption.

Table 3. Stakeholders' suggestions on the strategies for effective varietal promotion (n = 20).

Strategies	(%)	Ranking
Demonstration gardens (Participating in farmer field days).	11	1
Trainings through refresher information sharing events-community of practice. The strategy works for all sweet potato varieties since farmers are always slow to take up new technologies.	8	2
Building capacity of extension agents/peer farmers/vine multipliers at village level to produce outside the season.	8	2
Collaborating and partnership, working with local and international organizations like CIP, NARO, NGOs to talk about varieties. Working alongside other development partners is crucial because they work with members who easily adapt to new technologies. This can not only create a spillover effect but also more linkages. Making farmers to access planting material in a timely manner.	8	2
Working closely with research and extension. More labs for early generation seeds, proper product formulation and consumer tests.	8	2
Awareness: creating awareness on the performance of these varieties through local radios, TVs, WhatsApp, exhibitions and extension workers. This will create demand for them.	8	2
Advertisements like jingles, signposts and cover page booklets.	5	3
Radio talk shows. We promote the varieties using media via radio talk shows through model farmers and politicians among others.	5	3
Sensitization "We visit groups and talk to them about the varieties, we use gatherings like at church and funerals to talk to people."	5	3
Integrating them in government programs such as the Parish Development Model (PDM), extension approach, farm visits and livelihood programs. "We used to procure vines for the district guided by the national development plan and council budget". The strategy is the same for all varieties.	4	4
Exchange visits or tours.	4	4
Market linkages: strong market linkage. Identify different chain actors and their involvement.	4	4
Agricultural shows, "we move with the products (flour, roots) to markets, schools and hospitals to promote the varieties".	4	4
Linkage to financial institutions (credit facilities).	4	4
Value addition to enable consumption of sweetpotato in different forms.	2	5
Subsidizing supplies (For irrigation machines, transport).	2	5
Donations: We donate to grieved families to plant these varieties for food security and income.	2	5
School feeding programs. The strategy is the same for all varieties that we promote.	2	5
Rewards: Recognizing best farmers and decentralized vine multipliers-awards.	2	5
Extension agents to get weather data and early warning signs for the farmers.	2	5
Digitalizing the vine multipliers.	2	5

production. These aspects can affect production. Pressing challenges affecting women more than men in sweetpotato production include a limited labour force, especially for weeding large fields that overwhelm many women farmers in addition to their other domestic duties which compete for their time. This is reflected in the quote from one of the farmers during the FGD, namely: "*I weed alone and if the man realizes that the work is too much he can then come and assist me to weed"* (Women FGD, Acia village).

Participants of this study also emphasized the challenge of limited access to important productive resources. Two such resources mentioned repeatedly were land and capital. Access to these resources was identified to be a major constraint that women face more than men. The statements below from the interviewees highlight this point: [i] "The food aspect is left to women and yet they do not have enough resources to use" [i] (District officer, Amuria). [i] 'Women are most affected because: I have little land so I prepare and plant and then germination is not good. But I do not have another place to plant. Our men have used the land to plant cash crops and without food, the woman is worried. The husbands give us small places to grow food.' [i] (Women FGD Sabatia village). These findings corroborate those of a study in Nigeria by Osuji *et al*. (2023). The study found that women's gain from sweetpotato production is compromised by their restricted access to land and agricultural inputs. Gender disparities in terms of access to productive resources potentially amplifies production-related challenges for women (Katz, 2020). In case women need more land for replanting after yield loss, their best option is renting land and yet they are highly resource constrained to implement desired strategies as also discussed by Kristjanson *et al*. (2015) and Mudege *et al*. (2020).

Varietal adoption and dissemination challenges

Key informant interview findings revealed that there were several factors affecting new/ improved sweetpotato seed adoption. These factors included: i) Culture and tradition - people prefer eating fresh boiled roots hence value addition will be difficult for large-scale storage. Some products such as *Inginyo,* is a monopoly of individual communities and cannot be widely promoted due to negative attitudes or perceptions towards specific products. ii) A false myth that OFSP is genetically modified (GMO) negatively influences use. Delayed access to planting material after prolonged dry seasons that desiccate all vines is a disincentive to variety uptake. This is reflected in the quotes from one of the key informants, namely: "*Sweetpotato being annual, sometimes the vines are not there. During the bumper harvest, there is always a lot of sweetpotato which results into bulk and no alternative use".* District official, Amuria.

"No reliable market, except in food crisis, which discourages large-scale production of sweetpotatoes". "Moreover, Vitamin A is not enough for marketing, tastes and preferences are key for high adoption". "Cost of vines/basic seed is high, Uganda shillings 2000 per 100 vines is not affordable to most smallholder farmers who are the main producers of sweetpotato". "Limited dissemination of information, funding and budget allocation for demonstrations limits farmer exposure to new varieties/ products hence low uptake". District official, Amuria.

Strategies for effective promotion

The stakeholders highlighted a number of seed promotion and delivery strategies suggested by the different participants. These included:

i Creating demand through continuous advertisements, conducting demonstrations, consumer tests, field days and exchange visits to cause awareness and sensitization (Table 3);

ii Building strong market linkages by identifying and involving key value-chain actors;

iii Building the capacity of extension agents, peer farmers and vine multipliers at village level in cost effective production through use of good agronomic practices including disease-free planting material.

FGD Quote: *"Some people may not know the varieties including information on cooking ability, nutrition, agronomy and marketing"*, (District official, Amuria).

Generally, it was agreed that promotional strategies should be inclusive to accommodate target populations of interest e.g. youth/ women/disabled, and support those who cannot afford planting material. Besides, it is imperative to train extension workers on inclusiveness, incorporate school feeding programs, and all other stakeholders at the village level. Encourage people to work in groups but with limited stringent factors that may stop people from joining those groups. Tagging sweetpotato to income generating enterprises to enable production for the market.

Discussion

Findings of this study indicate that most farmers source their planting material from other farmers/neighbours followed by purchases from markets. It is clear that access to quality planting material is better for men, as they mainly purchase vines from the market, than women who source from fellow farmers. This is explained by the fact that men are more mobile (Echodu *et al*., 2019) than women who, due to household duties have limited time to go to the market for vines (Anania, 2016). Nchanji *et al*. (2020) documented differences in access to new bean varieties between men and women as a result of immobility. Differences in access to vines based on financial capacity were also highlighted. Men were believed to have better financial liquidity and hence able to afford vines from the market as compared to women who are resource-constrained (Zawedde *et al*., 2014). Therefore, it is likely easier for men to obtain new varieties as they source from the market while women source recycled material from neighbours. Okello *et al*. (2023) reports recycling of vines from neighbours as detrimental to yields as other farmers' fields might be heavily infested with pests (sweetpotato weevil) and diseases (especially the sweetpotato virus disease). For the case of women, they were more likely to adopt if the variety had a sweet taste but less likely to adopt varieties that were more labour intensive, especially those that required a lot of weeding or those that required purchasing from the market. This is attributed to women's time and financial constraints (Arora and Rada, 2017). Similarly, men were more likely to adopt if the variety was high yielding and highly marketable. These findings are consistent with those of Mulwa *et al*. (2023) who reported that women's preferences are more inclined towards quality and less drudgery-inducing traits, while men's preferences lean more on agronomic traits. The differences in variety preferences between men and women are also because of immobility. Women's immobility explains the value they attach to varieties that require less labour and time. On the other hand, men, being mobile have more time to invest in marketing which explains their preference for traits that make a variety marketable. Important to note are the gender differences in variety preferences, which are crucial in broadening the scope of inclusivity.

The study results also show that limited dissemination of information is one of the factors restricting farmer exposure to new varieties/ products hence low uptake. Among the strategies suggested for effective promotion derived from key informant interviews was capacity building of peer farmers in good agronomic practices including quality planting material. Providing training to peer farmers is likely to intrinsically motivate them to share information with other farmers (Shikuku and Melesse, 2020) and in turn other farmers are more likely to trust a trained fellow farmer as a source of knowledge (Buck and Alwang, 2011). This complements the findings of Okello *et al*. (2023), a prior quantitative study on social networks and diffusion of improved varieties, which revealed that training best farmers is likely to increase information diffusion and varietal replacement. This study's finding that fellow farmers are a major source of planting material for both women and men producers makes the strategy to train peer farmers plausible for promoting the diffusion of agricultural knowledge and farmers' uptake of quality seed.

Recognizing and rewarding the best farmers was another one of the suggested promotion strategies reported in the KIIs. Providing incentives is expected to spur information sharing and uptake of improved varieties. However, Okello *et al*. (2023) found that although incentives are increasingly used in adoption interventions, social incentives, especially those involving public recognition can instead lower the trained farmers' efforts in disseminating knowledge to other farmers. This was attributed to the fact that some lead farmers might already be famous, negating the effect of public recognition as a reward on reputation.

CONCLUSION AND RECOMMENDATIONS

This study explores the preferences of smallholder sweetpotato farmers using qualitative methods. It found that the main sources of sweetpotato vines were neighbors, local markets, farmer associations, and farm-saved planting material. Farmers prioritize traits such as long shelf life, pest and disease resistance, and sensory attributes like sweet taste. However, most farmers are not upgrading to new or improved varieties due to limited labor force, lack of farm equipment, and access to affordable varieties. The study suggests marketing strategies to reach farmers with quality seed, including demonstration gardens, technical support to extension workers, radio talk shows, and market linkages. The study also emphasizes the importance of incorporating quality and agronomic traits in variety development, reducing the gender technology adoption gap, and implementing effective promotional strategies. Key technical recommendations include empowering both men and women with improved skills and access to improved varieties, using the Triple S (sand, storage, sprouting) method to conserve and multiply planting during dry periods, prioritizing sweetpotato through parish development model (PDM) structures and community-based programs, and promoting the use of improved varieties to replace local low yielding ones.

CONFLICT OF INTEREST

The authors declare no conflicts of interest with respect to the research, authorship, and/or publication of this article.

ETHICS STATEMENT

This research was registered and received ethical clearance from Cornell University IRB 2110010648. The study was conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

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