State of Knowledge for Matooke in Uganda

Food Science, Gender & Market

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1. FOOD SCIENCE – SoK REPORT

Country: Uganda

Product: Matooke (cooked banana steamed in banana leaves then mashed)

Short description: Strips of banana fibres and stalks are put as a foundation at the bottom of a cooking pan to avoid the boiling water touching the bundle of matooke being steamed. Peeled and washed banana fingers are tied up in a bundle of banana leaves (whose midribs have been carefully sliced off) and placed into a cooking pot on top of the fibres and/or stalks with enough water to steam the leaves. After steaming, the cooked bananas are smashed by pressing with the palms of one's hands to make matooke.

The report includes insights from the Breeding Better Banana (BBB) project and existing literature. Also refer to excel file *"Uganda - Banana SoK (all references)"* for more detailed information.

1.1. Methodology

Describe the methodology, sample of key informants and the documents reviewed. Consider the literature as a whole, note any gaps in information e.g. lack of gender disaggregated data, data from a particular region, consumer data etc.

Methodologies used in studies: The main methods used include surveys, focus group discussions (FGDs), participatory varietal selection (PVS), participatory rural appraisal (PRA) and sensory evaluations. Studies with consumers collect data on preferred traits and cultivars using sensory evaluations and taste assessments of a variety of food or dishes prepared from a set of new/introduced cultivars in comparison with a local check. There is scanty data on gender disaggregated studies. Only 4 studies were found that mentioned gender disaggregated preferences in the region (Edmeades et al. 2004; Miriti 2013; Musimbi 2007; Nasirumbi 2017)

1.2. Description

Summarise in a narrative the description of the raw material characteristics that will give a good product identified in key informant interviews and documents using in text citations. Note differences on processing method, gender region, ethnicity etc.

Table 1: Characteristics of cultivars that make good matooke

	Product	Traits/characteristics of cultivars that make good matooke/ traits before preparation
Luwero	Matooke	smooth peeling skin soft peel/easy to peel big fingers straight and big which are easy to peel (e.g. *Muvubo*, *Musakala* and *Nakitembe)* plant height - not so tall and not so short at harvest drought resistant e.g. *Nakitembe* *Kisansa* - not as sweet and cools? down so fast compared to other cultivars some cultivars have bunches that are too compact making it hard to remove fingers e.g. *Nakabululu (-ve) Mpologoma* has weak resistance to weather conditions (-ve) other: mature fruits, not diseased

	Product	Traits/characteristics of cultivars that make good matooke/ traits before preparation
Mbarara	Matooke	at least one finger ripens
		yellowish when peeled
		straight and big fingers hence easy to peel e.g. *Butobe, Embururu, Entaragaza* and *Enjagata,*
		mature fast e.g. *Entaragaza*
		big fingers
		fat fingers
		attractive and appealing to the eye
		easy to cook
		yellow when cooked
		falling of tips on fingers
		makes good matooke even if not ripened (*Embururu*, *Butobe* and *Enjagata* can make nice matooke even when not fully mature unlike *Kibuzi* that can only make nice matooke when fully grown)
		should have some dry leaves
		bursting of fingers when ripe (not all cultivars)
		other: mature banana

Source: FGD data from BBB project

1.3.   Quality characteristics of the raw material

Summarise the quality characteristics of the raw material at each step of processing and preparation to the final product, identified in the key informant interviews and authors using in text citations. Note differences on processing method, gender region, ethnicity etc.

Table 2: Steps in matooke preparation and quality characteristics for good matooke

Steps in matooke preparation	Quality characteristics
1. Harvesting, cut a fully-grown banana bunch(es)	mature big bunch
2. De-hand -remove hands from bunch	big hands
3. Remove fingers from clusters	well filled big fingers
4. Peel fingers	easy to peel, yellow when peeled
5. Wash fingers	
6. Prepare saucepan – put strips of banana fibres and stalks as a foundation at the bottom of a cooking pan to avoid the boiling water touching the bundle of matooke being steamed.	
7. Prepare leaves – carefully slice off the midribs	
8. Tie up the peeled and washed banana fingers in a bundle of banana leaves	
9. Place tied bundle into a cooking pot on top of the fibres and/or stalks with enough water to steam the leaves.	
10. Steam for about 1hr? – depends on the type of firewood	
11. After steaming, smash cooked bananas by pressing with the palms of one's hands to make matooke.	
12. Let the matooke simmer for a little bit	
13. Serve matooke	

Source: FGD data from BBB project

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All steps in the preparation are mostly done by women, except harvesting where men might participate.

1.4. Quality characteristics of the final product

Summarise the quality characteristics of the final product identified in the key informant interviews and authors using in text citations. Note differences on processing method, gender region, ethnicity etc.

Table 3: Traits of a good matooke

	Colour	Texture	Taste, aroma	Other
FGD data	orange after peeling and before cooking yellow when cooked and peeled maturity index of a good banana likened to a pawpaw colour when raw but peeled	soft texture when cooked (pliable like chewing gum) keeps together when mashed feeling in the hand (soft like a sponge and like dessert banana), slippery on the fingers smooth on tongue and throat like sweet banana, smooth as you swallow, "takes itself down" to the stomach	good taste (no feeling of sap) good aroma (can be brought by leaves), good smell	should be prepared in banana leaves should be properly cooked
From literature	good colour, good inside colour when cooked, good yellow colour after cooking, characteristic yellow 'Matooke' colour	good texture, soft food, soft when cooked, not watery, not brittle, uniform texture, stickiness – desirable to some, not lumpy, solid, floury texture, core not hard, starchy, not crumbly, melts in mouth, slippery, not coarse, not rough, fattiness (desirable oily mouth feel), moist mouth feel	good taste, good flavour, astringency (desirable with limits), saltiness (desirable in very low quantities), sweetness (desirable with limits), not fruity, not bitter, smells latexy, good aroma, nice flavour,	good food quality (taste, aroma, soft texture, colour, does not quickly loose heat/harden when served, can be kept overnight and leftovers eaten next day once cooked, has less latex, nice for other dishes (e.g. katogo), cooks easily, doesn't shrink when cooked, does not brown when peeled

Some of the descriptions of the traits/characteristics of a good matooke mentioned by farmers are vague and not detailed enough to be used in the breeding process, e.g. 'nice taste', 'good aroma', etc. Farmers have tacit knowledge which might not be easy to explain to researchers, hence researchers need to probe further and use a range of methods (e.g. repertory grid, modified sensory profiling) to try to extract this knowledge.

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1.5. Level of confidence

Comment on your level of confidence in the information you reviewed. E.g. assessing research findings given the methodology and sampling frame, gender disaggregation.

Highly confident as this information was collected from farmers, consumers and traders in the different areas where matooke is the main staple food. In terms of the methods used, there is need to use methods that will ensure that the information collected is detailed enough and can be used in breeding programs.

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2. GENDER AND SOCIAL CONTEXT

2.1. Description

Country: Uganda

Product: Matooke

Only four studies that reported gender-disaggregated trait preferences were found, indicating a significant gap in the literature. These were (Edmeades et al. 2004; Miriti 2013; Musimbi 2007 and Nasirumbi 2017).

In some contexts, male and female banana farmers mention similar traits related to production constraints, such as host plant resistance to pathogens and pests, a common goal such as food security, marketability and preference for cultivars with ceremonial uses. Both mention preference for cultivars with big bunches and fingers, or cultivars with a commercial value (Musimbi, 2007 and Edmeades et al. 2004; Miriti 2013; Nasirumbi 2017). On the contrary, Musimbi (2007) found that women mentioned traits related to production (high suckering ability and early maturity), whereas men emphasized consumption-related traits (good taste and colour). Women preferred high-suckering cultivars because of the potential to earn higher income from selling the suckers. Nasirumbi (2017) however also reports that men mentioned production related traits such as big bunch for the market whereas women mentioned traits related to consumption characteristics

The similarities however do not necessarily mean that breeders should not consult both men and women, rather gender differentiated preferences of actors in the value chain should be captured to assess and verify any similarities, potential differences and factors driving that.

Refer to excel file *"Uganda - Banana SoK (all references)"* for more detailed information

2.2. References

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3. DEMAND – SoK REPORT

3.1. Description

<u>Country</u>: Uganda

<u>Product</u>: Matooke

Source (first author, year)	Focus groups, interviews, stakeholder analysis, market analysis etc	Description of sample (indicate men/women)	Region	Scale of production of the crop associated with the product	Variations of the product	Demand segments and (size) of the product (add rows for each demand segment)	Trends	Location	Demographics of the demand segment	Preferred characteristics for the demand segment	Description of the product chain including Transportation, storage and sale of product (e.g. gender, socio-economic status, age, region etc.)	Profitability of the product, by value chain
(Bill and Melinda Gates Foundation 2014a)	desk study, stakeholder interviews	Desk Study using more than 40 sources 46 sector interviews covering wide range of public and private stakeholders	Sub Saharan Africa		Steamed matooke	. 70%- Food consumption by the producer's household . 20%- Sold fresh mainly for food consumption in urban areas . 7%- Used for brewing local beer as well as sophisticated wines . 3%- processed into (confectionary, dried) desserts and other foods) - mainly in urban areas	. Uganda banana production has increased from 6.6 to 9.6 million MT btwn 1982 and 2011 . Production rose 48% over the 30-yr. period . Matooke production has levelled off in the past 15yrs due to supply as well as demand constraints	Uganda Ethiopia Ghana Nigeria Tanzania			1. <u>Farm level procurement</u> (farmers/producers-bicycle traders – village brokers- areas brokers) ↓ 2. <u>Transportation and distribution to markets</u> (stage brokers and stage agents – collection holding stage- wholesale transporter ↓ 3. <u>Urban market</u> (market broker or urban wholesaler – retailers – consumers) See Fig 1 below	

Source (first author, year)	Focus groups, interviews, stakeholder analysis, market analysis etc	Description of sample (indicate men/women)	Region	Scale of production of the crop associated with the product	Variations of the product	Demand segments and (size) of the product (add rows for each demand segment)	Trends	Location	Demographics of the demand segment	Preferred characteristics for the demand segment	Description of the product chain including Transportation, storage and sale of product (e.g. gender, socio-economic status, age, region etc.)	Profitability of the product, by value chain
(Bill and Melinda Gates Foundation 2014b)	Stakeholder interviews	Over 100 sector interviews with experts, agencies, NGOs, farmers, traders and companies • Interviewed personnel at all levels of the value chain	East Africa	National production is estimated at 10-12M in UG • EAHB is grown by roughly 55% of SHFs (from 2-3 million smallholders) on 1.8 million ha in Uganda.	Steamed matooke Katogo	EAHB are a staple to an estimated 13 million Ugandans, with 66% of the country's urban population depending on it . On-farm consumption varies from 100% to less than 5% based on the total production of the farmer, size of land, no. of people in the family and level of sophistication in farming methods. . In total, 20%-25% of the production is sold into the fresh market and bought in regional or urban markets (1.6 million tons after losses). . In Kampala, only about half of the total demand is satisfied with the current supply levels . For the fresh market, there is demand for closer to double the current supply	See Fig 2 below	Uganda and Tanzania			Rural farms – bicycle traders – local collection/stage agents – wholesalers/ truck transport – urban retailers	Farmgate prices are less than 20% of retail prices. Middlemen capture wide majority of revenue along the chain Bicycle traders (50-100% markup) Local collectors (40% markup) Wholesalers (60% mark-up) Urban retailers (20-30% mark-up)

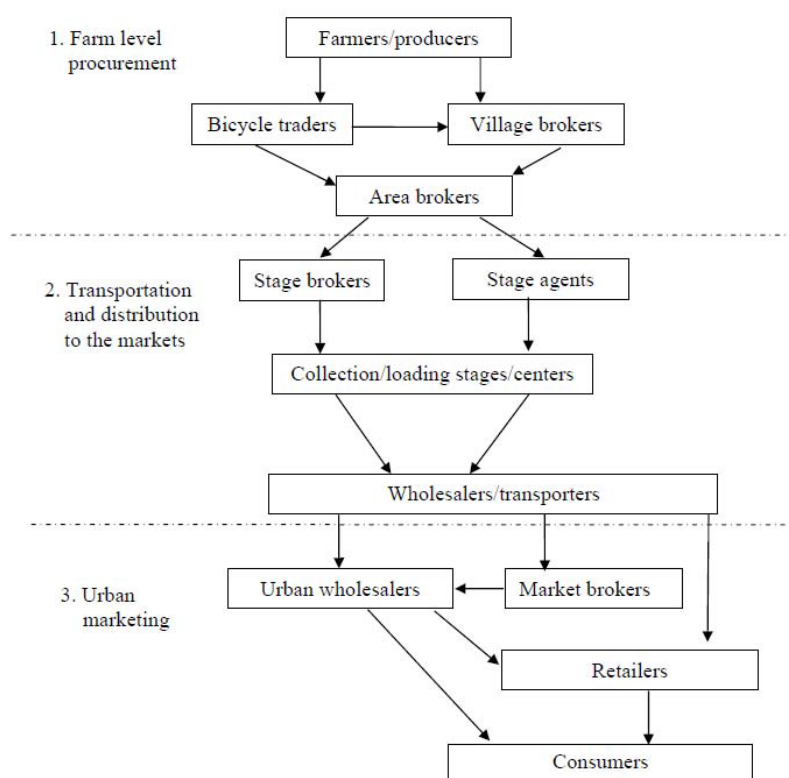| Source (first author, year)	Focus groups, interviews, stakeholder analysis, market analysis etc	Description of sample (indicate men/women)	Region	Scale of production of the crop associated with the product	Variations of the product	Demand segments and (size) of the product (add rows for each demand segment)	Trends	Location	Demographics of the demand segment	Preferred characteristics for the demand segment	Description of the product chain including Transportation, storage and sale of product (e.g. gender, socio-economic status, age, region etc.)	Profitability of the product, by value chain
(Kilimo Trust 2012)	Survey Lit review	Published data and grey literature from national programs across the East African Community (EAC), and international sources. But, because data are limited and often unreliable, Kilimo Trust undertook an extensive on the-ground survey across the EAC region (Tanzania, Uganda, Burundi, Kenya, and Rwanda) to better inform the study.	East Africa	Uganda produces about 10 million MT of bananas annually mostly grown by smallholder farmers on 1.5 million ha. The markets in and around Kampala alone annually cope with over 1 million MT of fresh bananas. Actual annual demand is estimated to be over 3 million MT.		. Producers consume about 70% of harvested bananas in their homes . Banana consumption (and production) is concentrated in the central and western regions with the latter having the highest consumption. Consumption is least in the northern region. . 20% is sold fresh to traders who then supply local, national (urban) and export markets. . 10% are processed into local beers and wines, and secondary food products such as juices and confectioneries Households spend 12% of their income on "matooke" (cooking bananas) which provides the highest calorific intake in the south west region (49%) and central Uganda (31%).	Consumption trends: In Uganda the main drivers are increasing use of bananas for cooking (44%), demand from customers (12%), and tastes and preferences (7%). See Fig 3 below Production trends: Between 2001 and 2006 average productivity across the country declined from 6 to 5.4MT/ha. . However, from 2005-2009 it increased by 2% annually but again declined btwn 2009 and 2010 to the current level of 5.5 MT/ha . Production of cooking bananas has fallen steadily by 49% from 1995-2009 due to biotic stresses such as pests and diseases	Tanzania, Uganda, Burundi, Kenya, Rwanda			Value chain actors: producers, food vendors, traders (retailers, wholesalers), exporters/importers, consumers Women of all ages, incl youth, dominate banana retailing in Uganda. But the majority are relatively young entrepreneurs between 31-40 yrs. Across the EAC retailers use a variety of transport options incl. lorries, pickups, bicycles, wheel barrows, and human labour who carry them on their head or shoulders depending on gender. Women prefer to carry on their head while men prefer using their shoulders	Market vendors are the most profitable actors since their costs are lower and on average - Market vendors report monthly profits of US$915 compared to brokers monthly profits of US$676. In contrast, a banana farmer in Uganda makes an average profit of US$44/month. . farmers end up with the lowest profit margins in spite of undertaking all the production risks and other costs like transportation.
(Nalunga et al. 2015)												

Fig 1: Value chain

Fig. 1. Functional and organizational analysis of existing banana (*Musa* spp.) marketing structure in Uganda.
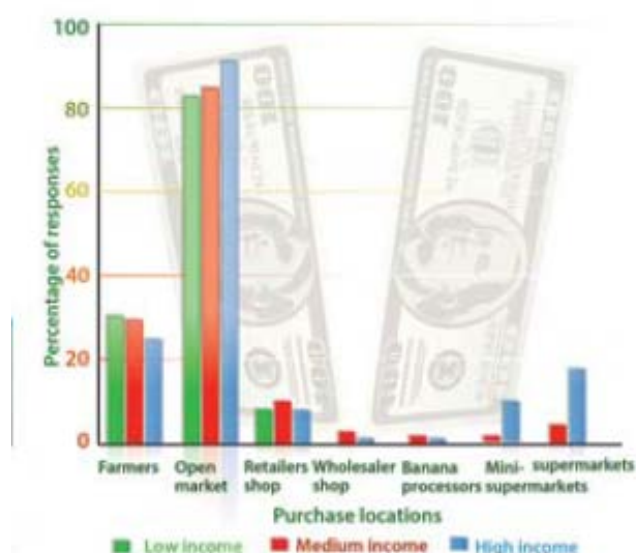
Fig 2: Trends
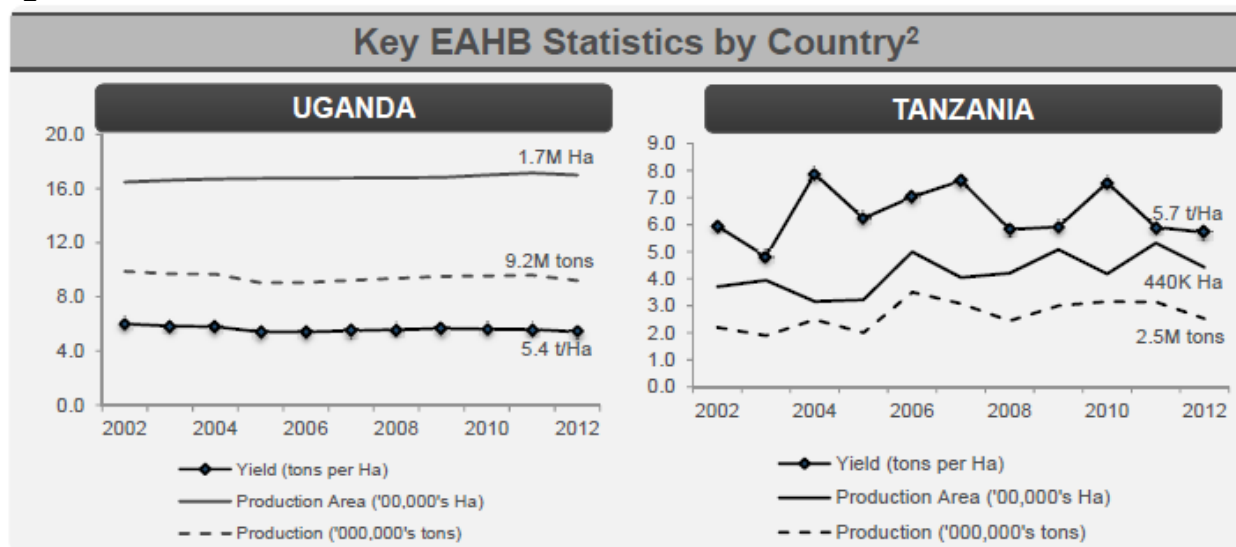
1 Management Practices and Opportunities in East African Highland Banana (Musa spp. AAA-EA) Production in Uganda, Lydia Wairegi, 2010
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Fig 3: Banana consumption trends in Uganda, 2009-2012

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