Field Scientific Report

Gendered Food Mapping on Fried Plantain-Dodo in Nigeria

Understanding the Drivers of Trait Preferences and the Development of Multi-user RTB Product Profiles, WP1

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Ethics: The activities, which led to the production of this document, were assessed and approved by the CIRAD Ethics Committee (H2020 ethics self-assessment procedure). When relevant, samples were prepared according to good hygiene and manufacturing practices. When external participants were involved in an activity, they were priorly informed about the objective of the activity and explained that their participation was entirely voluntary, that they could stop the interview at any point and that their responses would be anonymous and securely stored by the research team for research purposes. Written consent (signature) was systematically sought from sensory panelists and from consumers participating in activities.

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ABSTRACT

This report is part of the RTBfoods project (Work Package 1), aimed at deploying RTB varieties that meet user-preferred quality traits to increase the adoption and impact of improved RTB varieties in sub-Saharan Africa (SSA). The report presents the findings of a gendered product mapping (Step 2) of plantain products in Nigeria, conducted based on surveys in 12 rural communities in Osun in Nigeria's South west, in Delta and Rivers in Nigeria's South South, and across major urban centres and secondary towns.

Plantain is an important food security crop for farming households in Nigeria, but little is known about the main food products of plantain across regions in Nigeria. This report presents the findings of the relative importance of plantain food products in the sampled states, while identifying the quality characteristics along the food chain by different stakeholders.

It was found that farming practices vary across the study locations, influenced by household composition, ethnicity and migrant status. Dodo (fried plantains), boli (roasted plantains), boiled plantain, plantain with beans and porridge were the most common food products identified in the study areas. Fruit size, pulp texture (firmness/softness), colour, maturity stage and taste were identified as the most critical characteristics, with impact on quality of processed food products. Although there were significant differences between states regarding the importance of plantain food products, little interstate and gender differences were found for fresh fruit and food product quality characteristics.

In the following chapters, the report describes the socio-economic context of plantain production, product preferences, varieties and important characteristics of the crop, product processing and characteristics,and marketing of plantain in Nigeria.

Key Words: Breeding, consumer preference, food quality characteristics, Musa spp., plantain hybrid, plantain consumption, plantain marketing

1 INTRODUCTION

This report is part of the RTBfoods project, Work Package (WP) 1. The main objective of RTBfoods is to deploy RTB varieties that meet user-preferred quality traits to increase the adoption and impact of improved RTB varieties in sub-Saharan Africa (SSA). To do so, the project is working to (1) Define what are the key user-preferred quality traits for a range of RTB food products (plantain, cassava, yam, potato, sweet potato, banana) through surveys with end-users (product profiles); (2) Link these product profiles with biophysical and functional properties of RTB food products, and develop laboratory-based methods to assess these properties in a quantitative manner; (3) Develop high-throughput phenotyping protocols (HTPP) for rapid screening of user-preferred quality traits in new RTB varieties; (4) Integrate key user traits into breeding and variety deployment programs.

WP1 provides the evidence base for user's preferred characteristics for the selected products that are the focus of the RTBfoods project. Varietal preferences start with the demand from a range of users, such as producers, processors, retailers and consumers along the food chain. User's varietal choices are informed by the preferences they have for certain characteristics of the crop (characteristics preferred) that can be linked to traits. Preferences for characteristics, are in turn, influenced by the products, and their variations, that users make (e.g. matoke in Uganda, gari, fufu or pounded yam in Nigeria), and for what purpose (e.g. urban or rural markets, household consumption). Users often have several specific characteristics that they prefer and/or have 'non-negotiable' sets of characteristics, such as, for producers, that the crop is high yielding or disease resistant. These different interests culminate into trait packages that can help explain the drivers of varietal acceptance.

Sometimes there are clear differences in the characteristics preferred by user groups that follow product/consumption profiles, but other times it is more complex. Different users of a crop may live in the same household, have different interests with how the crop is used and what products are made. This can result in multiple and, perhaps, contrasting preferences that vary according to the user's role in the food chain, meaning that the input and decision-making roles of different users is of primary importance in RTB crop breeding.

Preferences for certain product characteristics stem from broader socio-economic and gender dynamics, which are in turn an integral part of understanding crop choice and use. Men, women, boys and girls play different roles in RTB food chains, and differ in their access to, perceptions of risk for, and ability to decide on use of improved varieties. For example, gender roles regarding household food security and marketing can mean that one gender may prioritise crop or product storability characteristics (in ground or after harvest) over yield characteristics. In addition, in locations with shared farming systems between men and women, such as in Uganda, one household member may have more decision-making authority on cropping decisions than others. Different varietal characteristics can also influence the level of labour and exertion involved in processing. In addition, consumers have their own sets of sensory preferences linked to different varieties, and consumers may have different preferences based on their background, gender, location or food culture. Therefore, characteristics that respond to multiple-use and multiple-user groups (such as yield and disease resistance), or differentiating segments of use, including men and women in all their diversity, are an important factor in breeding initiatives.

However, there is a gap in knowledge of preferences for RTB crops among different user groups, particularly food processors, retailers and consumers, and diversity within user groups (e.g. producers can have different size of landholding, access to extension etc.), as breeding programmes have historically focused on production related characteristics at the expense of post-harvest and consumer preferences. In addition, information on characteristics is often overly-simplified by not including information on the optimal range or description that would help breeders be able to meet user needs. Furthermore, there is little known about how gender relations and norms influence and result in preferred characteristics, along with varietal uses. WP1 aims address these gaps in knowledge under the RTBfoods project, which will contribute to shaping crop breeding to be more responsive to user needs along the food chain.

The WP1 approach uses interdisciplinary methods and lines of inquiry (food science, gender and economics) to collect evidence on the preferences of RTB product characteristics for different user

groups in the product chain and identify the factors that influence these preferences for men, women and other social segments, and how they may be prioritised differently (e.g. labour requirements and storability may be prioritised more for women, over yield characteristics). The delivery of the information is expected to support the capacity of RTB breeding programmes to be more demand-led. The approach has the following activities:

- Activity 1: State of Knowledge review
- Activity 2: Capacity strengthening and sharing
- **Step 2: Gendered product mapping**
- Step 3: Community-based RTB Food processing/preparation diagnosis
- Step 4: Consumer taste tests in rural and urban market segments

This report presents the findings for Step 2, Gendered product mapping.

The objectives of Step 2, are to:

- Understand who is producing, processing, selling and consuming the crop and product, from a gendered perspective.
- Understand the multiple uses and products of the crop and possible trade-offs between uses
- Identify the quality characteristics and descriptors by stakeholder group (e.g. producers, processors) and demand segment (e.g. rural consumers).
- Understand how gender influences preferences and prioritisation for characteristics.

This activity focuses on plantain and specifically dodo (fried plantain) in the context of Nigeria. Because little is known about the main food products of plantain across regions in Nigeria, the activity took a broader approach and tried to establish how plantain is used in different regions of the country. The study aimed to identify the quality characteristics along the food chain (production, post-harvest and market) by different stakeholders, the multiple uses and trade-offs between uses, that may reflect different interests of men and women. Besides identifying food preferences for plantain, the research also looks at the distribution and use of improved plantain varieties across the visited locations.

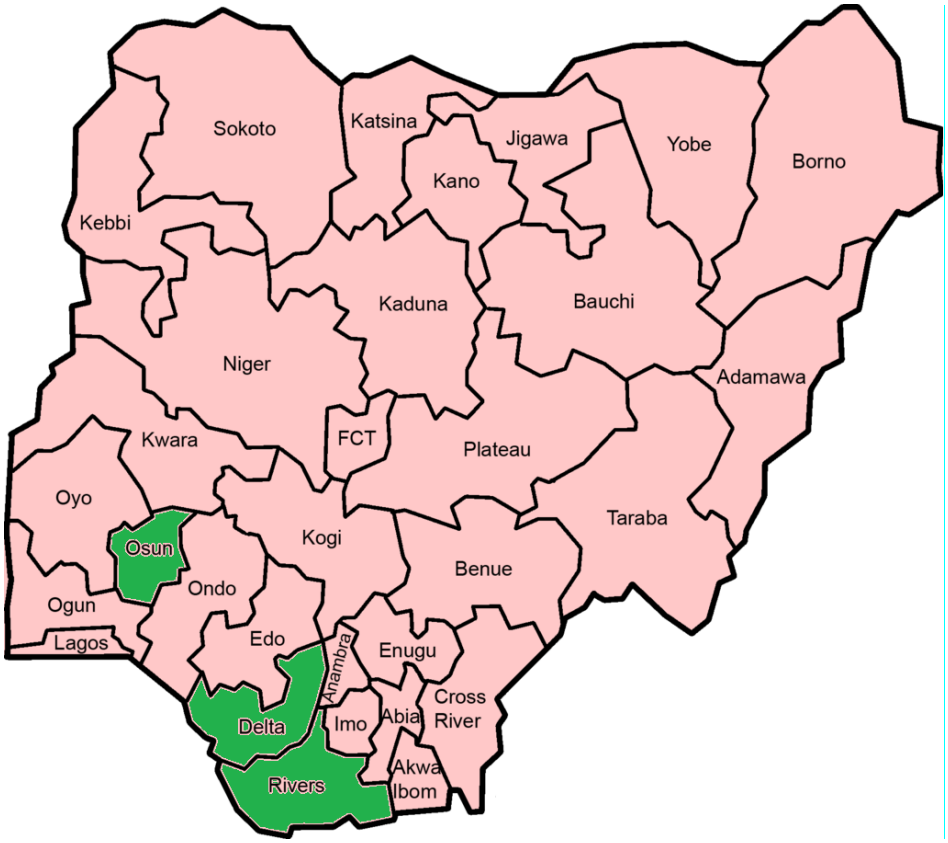
2 METHODOLOGY

Plantain is mostly produced in Nigeria's South West, South South and South East, which include Cross River, Akwa-Ibom, Imo, Enugu, Rivers, Edo, Delta, Lagos, Ogun, Osun and Oyo states. For this study, 3 states in Nigeria´s South West and South South were selected based on their high plantain production. In Nigeria´s South West, Osun State was selected as one of the highest plantain producing areas. In the South South, Delta and Rivers State were selected based on the fact that these are important plantain producing areas and because improved varieties have earlier been distributed in these States by IITA. In each state, 4 rural communities were visited. There are four activities under Step 2 that take place in rural communities where people grow, process and consume the crop. These are:

- Key informant group interviews (KII) with community leadership.
- Sex-disaggregated Focus Group Discussions (FGD) with people who produce, process and consume the product. The FGDs specifically provide information on products, gender roles and social segments, processing steps and equipment, characteristics and descriptors that can be probed in further in IIs.
- Individual interviews (II) with community members who process the product (and produce the crop, if possible) in the community, conducted by a food scientist and gender specialist. The IIs provides individual/household level description of preferred characteristics and priorities at different stages of product processing, household decision making, and trade-offs.
- Market Interviews (MI) with key individuals or groups involved in marketing and trading activities.

The study assumed that there may be a difference in the consumption pattern of dodo (fried plantain) between urban and rural centres. To get a better view of these assumed differences, 8 extra market interviews were held in a secondary town and in a major city in each State.

- Annex 1 - KII Q1 (list of participants): % men and women, age range, ethnic composition, role in the community etc.
- Annex 2 - FGD Q1 (list of participants): % men and women, age range, ethnic composition, crop producers/processors etc (from Y/N responses)
- Annex 3 - II Q1-13 (demographic data: % men and women, age range, ethnic composition, relation to household head, religion, main profession, crop producers, crop processors)
- Annex 4 - MI Q1-7 (original questionnaire) Q1-14 (Nigeria learning doc)
- Annex 5 – ranking of varieties



Surveyed states in Nigeria.

Activities performed in Period 2 on Fried Plantain in Nigeria			Dates of Field Surveys		Regions surveyed	List of Localities: Cities Small Towns Villages	Nb of Individual Interviews		Nb of Focus groups	Questionnaires uploaded on RTBfoods platform	
			start	end			M	F		start	end
Step 2	Primary Country	Nigeria	8 July 2019	28 August 2019	Osun State	Ago-Owu	8	3	2	14 Oct.	14 Oct.
						Patara	2	8	2	14 Oct.	14 Oct.
						Ogudu	7	3	2	14 Oct.	14 Oct.
						Akola Alaerebere	6	4	2	14 Oct.	14 Oct.
					Delta State	Isele Uku	1	9	2	14 Oct.	14 Oct.
						Ossissa	5	5	2	14 Oct.	14 Oct.
						Agoloma	5	5	2	14 Oct.	14 Oct.
						Umeh	5	5	2	14 Oct.	14 Oct.
					Rivers State	Choba	4	7	2	14 Oct.	14 Oct.
						Omoku	6	5	2	14 Oct.	14 Oct.
						Abua	6	5	2	14 Oct.	14 Oct.
						Etche	6	5	2	14 Oct.	14 Oct.
Step 3	Primary Country	Nigeria									
Step 4	Primary Country	Nigeria									

3 FINDINGS: SOCIO-ECONOMIC CONTEXT AND PRODUCT PREFERENCES

3.1 Social segmentation and livelihoods

What are the different groups of people in your community? (Probe gender social segmentation). What is the relative proportion of the community population in each of the categories? KII Q2

Table 1: Social segments (KII Q2)

Community name	Social segments (%)
Community 1 Ago-Owu (Osun)	Ethnicity: Ago-Owu settlement was created in 1959 by Awolowo. Farmers from different parts of the country have been able to settle in Ago-Owu. That means 50% of the population is Yoruba, while 50% is from other ethnicities. The Yorubas are however more permanent inhabitants while others come as labourers. Wealth: The land of the settlement belongs to the Osun State government. Initially, the government used to give out 10 hectares per farmer, while it eventually reduced to 5 hectares per farmer. Now a new settler can only get 2 hectares. This means that about 30% of inhabitants have 10 hectares, 50% has 5 hectares, and 20% has 2 hectares. The large farmers are mostly Yoruba and grow cacao and palm oil. Household headship: One of the conditions for accessing land is being married. The proportion of male to female farmers was therefore estimated to be 70-80% male to 20-30% female. The female headed households mostly consist of widows of farmers that have passed or young married women whose husbands work elsewhere.
Community 2 Patara (Osun)	Ethnicity: The settlement was established in 2001 and allocation started in 2003. The land is allocated to anyone who can farm, on the condition that it is not left fallow for more than a year. The majority of settlers in Patara are from Osun State (Yoruba) while others are from Kogi, Oyo, Togo, and Benue. Although there is no restriction of ethnicity in land allocation, most of the non-Yoruba do not settle but come for short term contract farming. Wealth: There are 7 settlers from the house of assembly and some senators. These categories of farmers have up to 50 hectares of land and work mostly with labourers and mechanised farming. Most of the rich farmers are people from the village who moved to town and only come back to farm. Household headship: There are mostly male headed households, about 80% of families, although most farmers have joint ownership between husband and wife. 20% of families are female headed.
Community 3 Ogudu (Osun)	Ethnicity: The land in Ogudu is owned by the forefathers, so most of the land has been inherited. Most inhabitants are therefore indigenes. Foreigners have been allowed to farm as well, which has attracted Igbo's, Togolese, Hausas, people from Delta, Kogi, Cotonou, Ghana, and Abakaliki (Igbos). Some of these so called foreigners have been in Ogudu for a long time, and became part of the community. Although some of them received land from the fathers of the indigenes, they pay an annual fee to the farm owners. While some of them are staying permanently, others go home every year and return the land when they leave. Wealth: Most of the indigenes have nothing less than 20 acres. Even the smallest farmer has 15 acres. The non-indigenes have smaller plots of land of around 10 acres. Household headship: Many households in Ogudu are polygamous. Men are the head of the household and owners of the land, and often allocate a plot of land to each wife. This means that in real numbers, there are more women into farming.

Community name	Social segments (%)
Community 4 Akola Alaerebere (Osun)	Ethnicity: The population is largely made up by Yorubas (95%). The remaining 5% are visitors, mainly Igbo's and Igede's. There are only a few Hausas. Wealth: The difference in wealth is seen in the size of the farm. There are small scale farmers who have 2 to 5 acres, medium scale farmers of 6 to 10 acres, and large scale farmers who have 11 acre and more. This big farmers are typically made up of indigenes, most of whom live in town, but have their farms here. Others are from Kwara and Oyo State and have settled in this community too. The big farmers farm different cash crops such as cocoa, kola nut, plantain, banana and oil palm. Household headship: Most households are polygamous. The husband and wives farm on separate lands to avoid conflict but do help each other in terms of production and processing. When it comes to gari processing for example, the men handle the milling and squeezing while women do most of the frying.
Community 5 Isele Uku (Delta)	Ethnicity: Isele Uku is made up of 18 communities and 3 clans. It consists of two ethnic groups, the Aniocha and Olukumi. The Aniocha's speak a language closely related while the Olukumi's speak both Yoruba and Aniocha. The Aniocha are in the majority, the Olukumi's occupy 3 villages out of 18. Since Isele Uku is a large township, strangers from other states around Nigeria also settled in the community. There are people from Anambra, Ebonyi, Kogi and Benue State. Wealth: There are small- and large-scale farmers. The large-scale farmers cultivate large stretches of land of 10 acres or more, have capital and can produce in large quantity. Access to capital and equipment is an important difference between large- and small-scale farmers. The large-scale farmers borrow from micro finance banks or associations to expand or support their farming, while small scale farmers do not have access to loans. The large scale farmers live both within or outside the community, but have their farm in Isele Uku. Household headship: Men generally head the household and have access to land through inheritance. Women face problems of gaining access to land because of the land tenure system. They can only farm on their husbands' farm or hire land, but they cannot own land. This is one of the reasons why men are more into farming while women are more into processing of food crops. In many cases, husband and wife also share the land, in which case women are more involved in production. Polygamy is rare in Isele Uku, but in polygamous families the husband also shares his land with his wives. The proportion of families that farm together is about 65% while 35% of families farm separately.
Community 6 Ossissa (Delta)	Ethnicity: The inhabitants of Ossissa are all called Igbo, although their own dialect is Ukwani. Most people speak both Ukwani and Igbo. The community accomodates people from other regions of the country who want to settle in Ossissa. There are people from other parts of Delta State, from Anambra, Imo and Benue State. Wealth: According to the FGD and KII, a small farmer may have 3 to 4 or even up to 10 acres. The king of the village is a large farmer and has up to 100 acres. Large farmers are able to mobilise the power and support of others to work on their farm. Being a wealthy farmer is not only defined by the size of your land, but also by the variety of crops grown. A small farmer may not farm more than 2 to 3 crops (such as yam, cassava, and plantain), while large farmers may have fish ponds and farm many different crops including vegetables. The FGD participants estimate that the large farmers are not more than 2 to 10% of the farmers in the community. Household headship: Culturally, men own the farmland and are the head of the household. A husband may decide to give a portion of land to his wife to farm, but a married woman cannot ask for land from her husband. Also women believe that men own the farms, even if it is a woman who farms. There are some women who have their own farms, they are mostly widows and singles. A single woman may request the community for land, which will be appropriated to her after paying.

Community name	Social segments (%)
Community 7 Agoloma (Delta)	Ethnicity: Agoloma community is made up of inhabitants from the Kumbowei clan. Agoloma is the headquarters of the Kumbowei clan which is made up of 5 communities. About 80% of people in Agoloma are Kumbowei, while there are also people from Anambra, from other parts of Delta State and Hausa. Wealth: The majority of farmers in Agoloma are subsistence farmers. These farmers have small plots of land and consume most of their production. They do not have access to land by renting. There are also other categories of farmers, depending on individual land holdings and funds. People mostly farm on their inherited family land, although wealthier people are able to purchase extra land, for example from another family. As the population grows, the land sizes are getting smaller and it is especially difficult to get a land holding in one location. Household headship: People generally farm on land gotten through inheritance. This means that most families farm on the husband's land, or on the woman's father's land. Women may also rent land to farm. 20% of the women have their own farm while 80% of the families share the land between husband and wife. Some of the women who have their own farm are married, divorced or single.
Community 8 Umeh (Delta)	Ethnicity: According to the key informants, there are 3 to 4 million people living in the kingdom that involves Umeh and other communities. Umeh is in the Southern part of Isoko. There are also people from other regions living in Umeh. Most of these people come as labourers from October to February, and come to farm and fish or work on palm oil processing. Wealth: The status of farmers mostly depends on having good connections that allow a person to obtain a loan or capital to establish a farm and employ labourers. Also having access to a cooperative can help farmers to establish a large communal farm and employ labour. Small farmers may have between 5 to 10 acres and large farmers may have around 10 acres or more. 50% of the farmers in Umeh are large farmers and 50% fall under the category of small scale farmers. Access to land is not a problem, since there are still many virgin lands in Umeh available for rent or buying. Household headship: There are both monogamous and polygamous households in Umeh. Among the monogamous households, some farm together while most have separate plots between husband and wife. Also among the polygamous households there are more families that farm separate than those who farm together.
Community 9 Choba (Rivers)	Ethnicity: Choba has become a largely urbanised area. The indigenes are Ikuere. There are about 30 to 40% non-indigenes who settled in this community. These are Yoruba's, Igbo's, Hausa's and people from Calabar. Wealth: Although the indigenes of Choba are farmers, most of them do not own land anymore since it was taken over by the government. Most people changed their means of livelihood and became traders, contractors, businessmen. About 10% of the inhabitants can be considered wealthy, they are mostly people who work as contractors for government or companies. Among those who are still into farming, there are 'first class farmers' who use farming as a business and invest in it. They have 20 acres and more. There are medium scale farmers, people who are part of working class and also farm on the side (but not as their main business). Small scale farmers are those who farm in small portions and reside in villages. The main difference between these categories of farmers is the money they are able to put into production and the size of land at their disposal. Household headship: Due to urbanisation, role patterns between men and women have changed, and there is no demarcation in the type of job men and women do. This means there are male and female farmers. 50% of women farm on their own. 25% of men farm on their own, mostly because some of them are also working as civil servant, and 25% of families farm together.

Community name	Social segments (%)
Community 10 Omoku (Rivers)	Ethnicity: The Omoku LGA is made up of three tribes: Ogba, Egbema and Ndoni. The LGA is surrounded by water/swampy area and swampy forests that favour root/tuber crops. Omoku is guided by their oba's and chiefs. The culture of the three communities (Ogba, Ndoni and Egbema) differs. Egbema is made up of 15 villages and has upland and lowland (swampy) areas. Wealth: A large scale farmer can be categorised as a farmer with a large expanse of land (5 to 10 hectares) while a middle scale farmer has 2 to 3 hectares. A small-scale farmer has 4 to 6 chains (which translates to around 0,5 ha). According to the FGD participants, small farmers own up to 10 chains (which translates to 10 acre), while large farmers own 10 chains and more. However, it is underlined that the size of land does not translate to wealth. This largely depends on how much a farmer is able to put into the farm work. The community therefore classifies rich and poor based on the production. Large farmers may have more money to rent land and employ labourers. Smaller farmers rely on family labour and renting of land in some cases. The large farmers are only engaged in farming, while small farmers also do petty trading. Household headship: Men and women in Omoku are engaged in farming. If a man is a farmer and gets married, the wife automatically becomes a farmer as well. Although land ownership is in the hands of men, men sometimes attribute separate plots to their wife, especially in the case of a polygamous household. According to the participants of the FGD with men, 20% of men farm alone, 20% of men farm together with their wives and 60% of women farm alone.
Community 11 Abua (Rivers)	Ethnicity: The people in Abua are from the Abua tribe. There are also non-indigenes in Abua, such as Igbo's, Ibibio's and Hausa's. The non-indigenes are more engaged as labourers and in marketing, since they face difficulties in accessing farmlands. Wealth: Small scale farmers are categorised as farmers with a small portion of land which they use for subsistence farming. Medium scale farmers has about 1 hectare or more and grows more than he or she can consume. Large scale farmers are those who use machines and employ labour, although there are also some medium scale farmers who have access to employed labour. The majority of inhabitants of Abua are small scale farmers (60% according to the KII, and 98% according to the FGD participants), while medium scale farmers are fewer (about 40% according to the KII and 2% according to the FGD) and large scale farmers absent. Household heading: Although men generally head the household, about 50% of families farm together while 50% farms separately. Some men may not show interest in farming so they do not join their wife, therefore a good percent of women farm separately the men. The women in the FGD even estimate that only 30% of farmers are men, while 70% are women.
Community 12 Etche (Rivers)	Ethnicity: Umu Akuru in Etche is made up of many compounds and families. There are six units: Umakuku, Amaji, Umu Onu, Umu Kwpu, Umu Aka, and Umu Okwe. Besides these indigenes, there are non-indigenes in the community too. The indigenes makes up of about 75% of the population. The non-indigenes are Hausa's, Igbo's, and people from Calabar. Wealth: Being a big or small farmer is determined by the expanse of land, and by the number of seedlings a farmer has. A small farmer can have 3 plots of land while a big farmer may have 7 to 10 plots. A plot is 50 by 100 meters. Having a big farm does not automatically translate into being wealthy, because the profit also depends on proper management. Household heading: In Etche, men and women farm separately. Access to land is through the head of the household, and although women are allowed to buy land, they generally do not have the resources to do so. Key informants explain that most women harvest and sell, and use their money to sort other issues immediately meaning they do not safe much.

All communities visited in Osun are dominated by Yoruba's. Ago-Owu and Patara are similar in the sense that they are both settlements. Except for the locations visited in Delta North, which are considered to be Delta Igbo, the communities in Delta and Rivers State all have their own tribes. In all communities, immigrants from other regions of Nigeria and in some cases even Benin and Togo were found. In many cases, these immigrants work as labourers or engage in short term farming (on rented land), although some finally settle in the host communities. Most farmers can be categorised

as small-scale farmers, who mostly live from what they produce and sell the little excess they have. In Osun State, most farmers were also engaged in (small scale) cacao farming as cash crop. Generally, labour was used by both male and female farmers in Osun State. The use of labour was an indicator of being a large-scale farmer especially in Delta and Rivers. Also, the ability to rent or buy land and access funds are indicators of being a large scale farmer. In all communities, families are generally male headed and land ownership is also in the hands of men. Only in a few cases women become the head of the household in case their husband dies or in case they inherit land from their father (because there are no male children for example). In most cases, men and women have separate farms although some families farm together. This seems partially dependent on whether a family is polygamous or not. Across the different locations, polygamous households can be found. In these cases, a husband often allocates a different plot of land for each of his wives.

What are the livelihood activities of people in the community involving food crops? How important are these activities for people in the community? FGD Q2

Table 2: Livelihood activities (FGD Q2)

Male/female FGD + Community name	Livelihood activities and people they are important for
Community 1 Ago-Owu (Osun)	Ago-Owu is a settlement which the government allocated to farmers. The key informant describes that elites, doctors, retired civil servants all live in the community. Cacao is an important crop in the settlement and was originally planted by the government. Due to the importance of cacao, plantain is also widely spread, primarily as a shade crop for cacao. Other crops grown are pepper, melon, watermelon, tomato and cassava. Cassava is processed into gari, and some people also have poultry, pigs and goats. Both oil palm, cacao and cashew are cash crops which are farmed majorly by wealthier farmers. Cash crops are considered to be more of a man's business while women focus on food crops, amongst which plantain. Although cacao is considered a man's crop, women are engaged in drying cacao once harvested. Women are generally more engaged in processing of different crops, including palm oil and gari. The people that came to Ago-Owu as secondary leasers do not plant cash crops, they focus on crops that can be harvested within one planting season. Also the Igede's from Benue do not work on crops like cacao, they work mostly as labourers and do not have access to land. In some cases, female labourers can help with harvesting or making of dried plantain chips for flour (elubo).
Community 2 Patara (Osun)	Patara is a settlement that was established by the government. Although most settlers are from Osun State itself, there are also people from other regions that work in the community. The people from other regions generally work as labourers and therefore do not grow plantain or other perennial crops since they go back home at the end of the year. There are however some people from other regions who settled in Patara and grow the same crops as the long term settlers coming from Osun. Besides farmers, there are a few people who work as salary earners for road construction companies. People with other professions (such as teachers) moved to Iwo, so the salary earners are only into road construction. Most of the settlers of Patara are farmers, and grow cassava, cacao, yam, okro, yam, maize, pepper, tomato, cashew, groundnut, plantain and banana. The rich farmers plant cucumber, watermelon, cashew, green pepper, cabbage, cocoa, and pineapple. Richer farmers plant cash crops and labour-intensive crops since they are engaged in mechanised farming and make use of farming implements such as tractors, planters, while the low income farmers use hoes, cutlers, and labourers. Although most people plant plantain, it is mostly large-scale farmers who are into plantain production since they have been able to buy suckers at a large scale. During the FGD, women explain that both men and women can grow the same crops, but that men are generally more focused on the production of cash crops such as green pepper and cabbage. The women also explain that men generally have larger farms, and that as women, they do not plant cucumber, watermelon and other cash crops since the labour requirement (due to amongst others spraying) is higher. The men during the FGD reiterate that their women farm equally much as men, and that they both hire labourers for most of their farm activities. They only assist their wives during harvest. Despite these differences, most people grow plantain, maize, oil palm, cassava and are engaged in livestock rearing.

Male/female FGD + Community name	Livelihood activities and people they are important for
Community 3 Ogudu (Osun)	The participants to the FGD and KII explain they are all farmers by profession. Main crops grown are oil palm, cocoa, yam, maize, plantain, orange, pineapple, cassava, and cashew. There are both locals and foreigners who settled in Ogudu, and despite differences in land size, the way they farm is the same. There are long time settlers who are staying permanently, while others go home every year and will return the land to the original owner (renting). Despite that, there is no difference in the way they farm, or the crops grown. Although men and women farm separately, women and men plant the same crops and women also engage in cash crops such as cacao and cashew production. Women mostly help their husbands with fetching water when they want to spray, while the husband may assist the wife in getting her hired labourers.
Community 4 Akola Alaerebere (Osun)	Most people in Akola Alaerebere are engaged in farming of crops and in poultry production. Crops grown are amongst others: cacao, plantain, kolanut, citrus fruits, pineapple, vegetables, pepper, tomato, cocoyam, cassava, and maize. Women during the FGD explain that there are no other professions in the community apart from the traders who trade plantain in Lagos and people who sell rice and other food items. Despite differences in farm size, every farmer owns cacao and plantain except for labourers. Plantain is mostly used as a shade crop for cacao. While the indigenes and permanent settlers practice sole cropping (not intercropping), it is only short term settlers who do intercropping of maize and vegetables to make good use of the land available to them. The indigenes practice sole cropping to reduce competition among the crops and thereby increase production. Although men and women have separate fields (most families are polygamous and want to avoid conflict between the wives), there is no difference in the crops men and women plant. Women explain that there is no crop that men grow that they cannot grow. Labourers in the community are mostly Igede's, and they are used for land clearing since they do not have access to farm machines. Apart from land size, there is no other apparent difference between small and large farmers either. There are also gari and soybean processors in the community. Both men and women participate in the processing of soy beans and gari. For gari processing, the men handle the milling and squeezing while the women mostly do the frying. They also have a palm oil processing center which is majorly handled by women.
Community 5 Isele Uku (Delta)	Isele Uku is a large settlement consisting of 18 different communities. Although in the urban town there are many different occupations, farming is the main occupation of the people in the communities. In the coastal areas, fishing also forms an important part of the livelihood activities. Whereas women can engage in farming, most women focus more on processing of farm produce. When women are engaged in farming, they focus on cassava while men produce yam and plantain. Women participate in planting, weeding and harvesting while men do the clearing, making of mounds or ridges, harvesting and in some cases weeding. In many cases labourers are employed to help with the farm work. Although labourers can be non-indigenes, most labourers are indigenes. There are people from across the Niger river (South East) who came to Isele Uku to farm. These immigrants generally have different farming practices. They hire land in Isele Uku and grow more of food crops (such as yam, cassava and maize) and not permanent crops. Besides, when they plant their yams, they make heaps for it, while the indigenes of Isele Uku do not make ridges but plant directly.
Community 6 Ossissa (Delta)	The inhabitants of Ossissa are generally peasant farmers. There are only a few traders and civil servants in the community. They call themselves peasant farmers since they are not empowered with farm machineries, fertilizers, funds and all other resources. In terms of farming, plantain, cassava, yam, okra, and maize are priority crops. Although the farm work is done by both men and women, okra, pepper and tomatoes are mostly women's crops while cassava, yam and plantain are mostly cultivated by men because it is heavy work. There are no apparent differences between male and female, rich and poor farmers. All farmers try to keep their farm neat to increase production. Some of the foreigners that work in Ossissa work as labourers in the harvest of banga (palm oil).

Male/female FGD + Community name	Livelihood activities and people they are important for
Community 7 Agoloma (Delta)	Key informants describe the inhabitants of Agoloma as majorly subsistence farmers. People generally grow staple foods such as yam, cassava, plantain and some vegetables for home consumption. People from Anambra also settled in the area and engage in yam farming, Hausa´s come annually to engage in fishing and people from Urhobo/Isoko (Delta South) process palm oil and do forest fishing in Agoloma. Other short term settlers who rent land grow different crops including plantain. Male participants claim that men mostly grow plantain while women focus more on yam and cassava. They explain that women focus on cassava and yam as main staple foods in the community, while men are more concerned with the products that bring in money. However, based on observation and accounts of the FGD with women, most men spend their time drinking and playing draft, while women do all farm and other work. When asked if men indeed focus on plantain while women focus on cassava and yam, a female FGD participant said *´my husband does not even know how to find the road to our plantain farm´*. There are a few big farmers who engage in large scale plantain production and others who produce pepper, okra and yam in large quantities.
Community 8 Umeh (Delta)	People in Umeh are mostly farmers and fishers. They farm food crops as cassava, sweet potato, pepper, maize, groundnut, sugarcane, vegetables, yam, palm oil, and cash crops as cacao and rubber. The latter crops are mostly produced by indigènes of the community. People also engage in poultry farming. It is estimated that about 75% of the inhabitants engage in farming and 25% in fishing. Fishing is not for a particular social group, and both men and women engage in fishing. Plantain farming in Umeh is mainly for men, while women are known for farming cassava. Husband and wife of monogamous households generally farm together, unless the husband has a salary job meaning the woman does most of the farming. Differences can be observed in the way men and women farm. Men who farm plantain do not intercrop plantain while women will intercrop plantain with okra when the suckers are still small. They do so because intercropping will provide food and income for the family before the plantain matures. If husband and wife farm together, the wife participates in planting plantain after digging, fetching water for spraying, and gathering of plantain bunches after harvest. If a woman runs a personal farm, she will hire labour to help her with the digging of holes, spraying and other tasks normally carried out by men. There are both short term and long term settlers in Umeh. Short term settlers come between October to February to farm, fish and to work as labourers. Many settlers are from Delta State itself, and engage in palm oil processing. Tiv people who come from Benue State cultivate mostly yam. They have different farming techniques for yam, such as the making of big heaps. Since they have higher yam yields, the indigenous inhabitants of Umeh also started growing their yams like the Tiv.
Community 9 Choba (Rivers)	People in Choba are originally farmers. A FGD participants explains *´an Ikuere man is a farmer´*. However, the land has been taken over by the government and the area mostly urbanised. That is why the original inhabitants do not have land for farming anymore and now became business men, contractors and traders. People have been forced to change their means of livelihood, although there are still some people who have been able to buy land to farm. They mostly grow yam, cassava, maize, vegetable, cocoyam, pepper, sweet potatoes, water melon and egusi. People in the community generally have plantain in their compound. Farming is mostly done by young people (80%) because of the strength it requires. Many non-indigenes settled in the community (30-40%), these are amongst others Hausa, Yoruba, Igbo and Calabar. The Hausa are majorly shoe cobblers and people who hawk using wheel barrows. Yoruba's are bus drivers and traders, while the Yoruba women are more into hawking of shoes and clothes. Some non-indigenes also go into farming. They can plant any crop, but have to keep into account that once their rent expires, they have to vacate the land.

Male/female FGD + Community name	Livelihood activities and people they are important for
Community 10 Omoku (Rivers)	People in Omoku are majorly farmers which includes fishing, hunting and oil palm processing. Main crops grown are cassava, plantain, maize, sweet potato, groundnut, oil palm, vegetables, okra, pepper, cocoyam and yam. In Omoku, farming is generally done by women. However, men may occasionaly help in stamping, bush clearing, digging and harvesting. Women maintain the farm and engage in regular weeding. Plantain farmers are mostly men because of the labour requirements such as clearing the woods and digging holes before planting plantain. Women farm cassava, corn, vegetables, and to a lesser extent plantain and yam because of the digging and bush clearing involved. Besides, they must cross the river via canoe to get to the plantain, yam and oil palm farms (which is in a swampy area). However, the women can plant plantain and yam around their houses or backyard. Besides these crops, there is no difference in the way men and women farm and the FGD participants describe that ´some women can even paddle canoe to cross the river and get to the plantain, yam and cassava fields´. Youths are increasingly going into farming because of the high unemployment rate. The young people also work as labourers for people in the community. There are also foreigners living among the indigenes, for example people from Calabar and Yoruba´s. Yoruba´s are mostly oil company workers and do not engage in farming. The people from Calabar are mostly into palm oil, they buy already established oil palm plantations and they can be hired to help others cut their oil palm kernels. The Calabar women help with the processing of palm oil. Other non-indigenes are allowed to farm but they have to rent the land, meaning they plant short term crops. While men and women in this community farm similarly, the farm owned by a non-indigene can easily be distinguished. The non-indigenes plant their yams and cassava on very big and high heaps, while the indigenes make very flat heaps for yam and cassava. There also is a difference in the type of crop grown: non-indigenes plant cucumber, tomato, and pineapples while these crops are not common in Egbema. Non-indigenes also plant different species of cassava than the ones commonly known in the community.
Community 11 Abua (Rivers)	People in Abua are majorly farmers. Most common crops are cassava, plantain, vegetables, pumpkin, rubber, groundnut, and orange flesh sweet potato. Other common activities are fishing and palm cutting. The community mostly depends on family labour, meaning husband and wife work together. Women assist the men during weeding and harvesting while men engage in clearing, planting and harvesting. If a woman has her own farm, she and her husband will continue to help each other on each other´s farm. Plantain cultivation is common among men because of the work it requires especially when planting a virgin land. Women who produce plantain generally employ labourers, but not all women have the funds to do so. Men have more access to funds due to the nature of their work, which is more focused on cash crops such as rubber and palm oil production. Women engage more in the production of seasonal crops like groundnut, pumpkin and pepper since these crops require less labour. Besides the crops grown, a woman´s farm can be recognised by the size (it is generally smaller than a man´s farm), and by the smaller size of the heaps. According to the participants of the FGD with women, a woman's farm is neater than a man's farm, since women weed more. Although foreigners are said to have different methods of farming, especially the ridging system, people explain that most non-indigenes take over the method of farming commonly practiced in the community. Most farmers in Abua are small scale farmers (98%), meaning they mainly produce for home consumption. Medium scale farmers are those who have more than one hectare and produce more than what they consume. They focus on cash crops such as palm oil production, plantain, and pineapples. The medium scale farmers (2%) also practice more of intercropping of cassava, maize, pumpkin and okro, and oranges with cocoyam, which the small scale farmers hardly do.

Male/female FGD + Community name	Livelihood activities and people they are important for
Community 12 Etche (Rivers)	The inhabitants of Etche are mostly farmers. Most common crops grown are cassava, vegetable, yam, and corn. Husband and wife generally farm on separate plots. Men face yam and plantain while women face cassava and vegetables. Men mostly work on plantain and yam production because of the work it involves in terms of land clearing and planting. Also, women may not have access to the funds to engage labourers to help them clear the land. Apart from farming, women in the community often engage in trading of agricultural products like avocados, plantain and vegetables. There are not apparent differences in the way large and small farmers farm, they grow the same crops. The main difference is that large farmers have a working class spouse or relative who is supporting them. There are different non-indigenes who settled in Etche. The Hausa's mostly trade jewelleries and accessories. There are also some Hausa that engage in farming. They plant in big ridges while the ridges the indigenes make are low. The people from Calabar engage in different activities. They buy land and cultivate maize and cassava. They also engage in cassava processing. Besides, they own palm oil processing factories and engage in palm fruit cutting.

Farming was the core livelihood activity for all communities in the sample. Generally, both husband and wife work on the production of crops. While women focus on food crops, men are more engaged in cash crops including plantain. Respondents often explained that women engage in food crops because of the lower labour requirements. Cash crops such as plantain, yam and cacao, were often considered to be strenuous for women. Besides production of crops, women often also work on the processing and marketing of different products and crops.

Differences were found in the activities and farming methods of indigenes and non-indigenes. Many non-indigenes come as temporary labourers or engage in other trades. Those who settle in the host community engage in farming, and frequently have slightly different farming methods compared to the indigenes. In Delta and Rivers State, farmers noticed that especially the non-indigenes from Nigeria's South East and Nigeria's Northern belt make bigger heaps or ridges for yam. In Osun State, there does not seem to be a clear difference in farming techniques of the indigenes and non-indigenes.

Large-scale farmers were said to work more with mechanised labour or labourers, whereas small-scale farmers depend more on family labour. In some communities, large-scale farmers also seem to engage in other crops, generally cash crops or labour-intensive crops.

3.2 Farming practices and social segmentation

3.2.1 Farming practices and social segmentation

Are there differences in the ways in which people farm in your community? FGD Q 4.1

Are these differences related to different groups of people in your community? Probe social segments. FGD Q4.2

Table 3 Farming practices

Male/female FGD + Community name	Farming practice (Q4.1)	People who practice (Q4.2)
Community 1 Ago-Owu (Osun)	Both oil palm, cacao and cashew are cash crops which are produced majorly by wealthier farmers. Cash crops are considered to be more of a man's business while women focus on food crops, amongst which plantain. Although cacao is considered a man's crop, women are engaged in drying cacao once harvested. Women are generally more engaged in processing of various crops, including palm oil and gari. The people that came to Ago-Owu as secondary leasers do not plant long term cash crops, they focus on crops that can be harvested within a planting season. Also the Igede's from Benue do not work on crops like cacao, they work mostly as labourers and do not have access to land. In some cases, female labourers are hired to assist with the harvesting or making of dried plantain chips for flour (elubo).	Wealthy farmers Men Women Secondary leasers Igede Female labourers
Community 2 Patara (Osun)	The people from other regions generally work as labourers and therefore do not grow plantain or other perennial crops. There are however some people from other regions who settled in Patara and grow the same crops as the long-term settlers coming from Osun. The rich farmers plant cucumber, watermelon, cashew, green pepper, cabbage, cocoa, and pineapple. They plant more cash crops and labour-intensive crops since the richer farmers are engaged in mechanised farming and make use of farming implements such as tractors, planters, while the low-income farmers use hoes, cutlers, and labourers. Although most people plant plantain, it is mostly large-scale farmers who are into plantain production since they have been able to buy suckers at a large scale. Women explain that both men and women can grow the same crops, but that men are generally more focused on the production of cash crops such as green pepper and cabbage. The women also explain that men generally have larger farms, and that as women, they do not plant cucumber, watermelon and other cash crops since they have higher labour requirement and must be sprayed three times. The men during the FGD reiterate that their women farm equally much as men, and that they both hire labourers for most of their farm activities. They only assist their wives during harvest.	Immigrants Rich farmers Low income farmers Men Women

Male/female FGD + Community name	Farming practice (Q4.1)	People who practice (Q4.2)
Community 3 Ogudu (Osun)	There are both locals and foreigners who settled in Ogudu, and despite differences in land size, the way they farm is the same. There are long time settlers who are staying permanently, while others go home every year and will return the land to the original owner (renting). Despite that, there is no difference in the way they farm or the crops grown. Although men and women farm separately, women and men plant the same crops and women also engage in cash crops such as cacao and cashew production. Women mostly help their husbands with fetching water when they want to spray, while the husband may assist the wife in getting her hired labourers. Youths and middle-aged men farm more because they are still more agile. They all plant the same crops, no difference and no limitation. You cannot know if a farm is for a woman or for a man because the women are hardworking as well.	Immigrants Men and women Youths and middle aged
Community 4 Akola Alaerebere (Osun)	Despite differences in farm size, every farmer owns cacao and plantain plantations except for labourers. Plantain is mostly used as a shade crop for cacao. While the indigenes and long-term settlers practice sole cropping (not intercropping), it is only short-term settlers who do intercropping of maize and vegetables to make good use of the land available to them. The indigenes practice sole cropping because we believe that there will be competition among the crops and some would do well while some will suffer. Although men and women have separate fields (most families are polygamous and want to avoid conflict), there is no difference between men and women since they both plant the same crops. Both men and women are into processing. There are also gari and soybean processors in the community. For gari processing, the men handle the milling and squeezing while the women mostly do the frying. They also have a palm oil processing center which is majorly handled by women. Labourers in the community are mostly Igede, and they are used for land clearing since they do not have access to farm machines. Apart from land size, there is no other apparent difference between small and large farmers either.	Labourers Indigenes and long term settlers Short term settlers Men and women Igede

Male/female FGD + Community name	Farming practice (Q4.1)	People who practice (Q4.2)
Community 5 Isele Uku (Delta)	Women are more into processing of farm produce while men are into production. When women are engaged in farming, they focus more on cassava while men produce more yam and plantain. Women participate in planting, weeding and harvesting while men do the clearing, making of mounds or ridges, harvesting and weeding to a lesser extent. In many cases labourers are employed to assist with farm work. Labourers are mostly indigenes. People who came to Isele Uku from across the Niger river (South East) came to farm and generally have different farm practices. They hire land in Isele Uku and grow more of food crops (such as yam, cassava and maize) and not permanent crops although some of them also plant plantain. Also, when they plant their yams, they make heaps for it, while the indigenes of Isele Uku do not make ridges but plant directly.	Women and men Settlers
Community 6 Ossissa (Delta)	Although the farm work is done by both men and women, okra, pepper and tomatoes are mostly women's crops while cassava, yam and plantain are mostly cultivated by men because it is strenuous work. There are no apparent differences between male and female, rich and poor farmers. All farmers try to keep their farm neat to increase production. Some of the foreigners that work in Ossissa work as labourers in the harvest of banga (palm oil).	Men and women Rich and poor farmers Foreigners
Community 7 Agoloma (Delta)	Inhabitants generally grow staple foods such as yam, cassava, plantain and some vegetables for home consumption. People from Anambra also settled in the area and engage in yam farming, Hausa´s come annually to engage in fishing and people from Urhobo/Isoko (Delta South) process palm oil and do forest fishing in Agoloma. Other short-term settlers who rent land grow different crops including plantain. Male participants claim that men mostly grow plantain while women focus more on yam and cassava. They explain that women focus on cassava and yam as main staple foods in the community, while men are more concerned with the products that bring in money. However, based on observation and accounts of the FGD with women, most men spend their time drinking and playing draft, while women do all farm and other work. When asked if men indeed focus on plantain while women focus on cassava and yam, a FGD participant said ´my husband does not even know how to find the road to our plantain farm´. There are a few big farmers who engage in large scale plantain production and others who produce pepper, okra and yam in large quantities.	Indigenes Foreigners Men and women Large scale farmers

Male/female FGD + Community name	Farming practice (Q4.1)	People who practice (Q4.2)
Community 8 Umeh (Delta)	Fishing is not for a particular social group, and both men and women engage in fishing. Plantain farming in Umeh is mainly for men, while women are mainly known for farming cassava. Men with one wife farm together and thus cultivate the same crops, unless the husband has a salary job meaning the woman does most of the farming. Men who farm plantain do not intercrop plantain while women will intercrop plantain with okra when the suckers are still small. They do so because intercropping will provide food and income for the family before the plantain matures. If husband and wife farm together, the wife participates in planting plantain after digging, fetching water for spraying, and gathering of plantain bunches after harvest. If a woman runs a personal farm, she will hire labour to help her with these jobs. There are both short term and long-term settlers in Umeh. Short term settlers come between October to February to farm and fish and to work as labourers. Many settlers are from Delta State itself and engage in palm oil processing. Tiv people who come from Benue State cultivate mostly yam. When they grow yam, they make big heaps and their yams produce better than those of the indigènes. However, the indigenous inhabitants of Umeh also started growing their yams like the Tiv.	Men and women Short and long term settlers Tiv
Community 9 Choba (Rivers)	Due to urbanisation, people have been forced to change their means of livelihood. There are still some people who have been able to buy land to farm. They mostly grow yam, cassava, maize, vegetable, cocoyam, pepper, sweet potatoes, watermelon and egusi. People in the community generally have plantain in their compound. Farming is mostly done by young people (80%) because of the strength it requires. Many non-indigenes settled in the community (30-40%), these are amongst others Hausa, Yoruba, Igbo and Calabar. The Hausa are majorly shoe cobblers and people who hawk with wheelbarrow. Yorubas are bus drivers and traders, while the Yoruba women are more into hawking of shoes and clothes. Some non-indigenes also go into farming. They can plant any crop, but when once their rent expires, they vacate the land except if they have bought the land.	Indigenes Young people Non-indigenes

Male/female FGD + Community name	Farming practice (Q4.1)	People who practice (Q4.2)
Community 10 Omoku (Rivers)	In Omoku, farming is generally done by women. However, men may occasionaly help in stamping, bush clearing, digging and harvesting. Women maintain the farm and engage in regular weeding. Plantain farmers are mostly men because of the labour requirements such as clearing the woods and digging holes before planting plantain. Women farm more cassava, corn, vegetables, and less of plantain and yam because of the digging and bush clearing involved. Besides, they must cross the river via canoe to get to the plantain, yam and oil palm farms (which is in a swampy area). However, the women can plant plantain and yam around their houses or backyard. Besides these crops, there is no difference in the way men and women farm. Youths are increasingly going into farming because of the unemployment rate. The young people also work as labourers in the community. There are also foreigners living among the indigenes, for example people from Calabar and Yoruba´s. Yoruba´s are mostly oil company workers and do not engage in farming. The people from Calabar are mostly into palm oil, they buy already established oil palm plantations and they can be hired to help others cut their oil palm kernels. The Calabar women help with the processing of palm oil. Other non-indigenes are allowed to farm but they have to rent the land, meaning they plant short term crops. While men and women in this community farm in the same way, the farm owned by a non-indigene can easily be distinguished. The non-indigenes plant their yams and cassava on very big and high heaps, while the indigenes make very flat heaps for cassava and yams. There also is a difference in the type of crops grown: non-indigenes plant cucumber, tomato, and pineapples. These crops are not common in Egbema. Non-indigenes also plant different species of cassava than the ones commonly known in the community.	Women and men Youth Foreigners

Male/female FGD + Community name	Farming practice (Q4.1)	People who practice (Q4.2)
Community 11 Abua (Rivers)	Women assist the men during weeding and harvesting while men do clearing, planting and harvesting. If a woman decides to have her own farm however, they will continue to both help each other on each other´s farm. Plantain cultivation is common among men because of the work it requires especially when planting a virgin land. Women who produce plantain generally employ labourers, but not all women have the funds to employ labour. Men have more access to funds due to the nature of their work, which is more focused on cash crops such as rubber and palm oil production. Women engage more in the production of seasonal crops like groundnut, pumpkin and pepper since these crops require less labour. Besides the crops grown, a woman´s farm can be recognised by the size (it is generally smaller than a man´s farm), and by the smaller size of the heaps. According to the participants of the FGD with women, a woman's farm is neater than a man's farm, since women weed more. Although foreigners are said to have different methods of farming, especially the ridging system, people explain that most non-indigenes take over the method of farming commonly practiced in the community. Most farmers in Abua are small scale farmers (98%), meaning they mainly produce for home consumption. Medium scale farmers are those who have more than one hectare and produce more than what they consume. They focus on cash crops such as palm oil production, plantain, and pineapples. The medium scale farmers (2%) also practice more of intercropping of cassava, maize, pumpkin and okro, and oranges with cocoyam, which the small scale farmers hardly do.	Women and men Foreigners Small scale farmers Medium scale farmers
Community 12 Etche (Rivers)	Men face yam and plantain while women face cassava and vegetables. Men mostly work on plantain and yam production because of the work it involves in terms of land clearing and planting. Also, women may not have access to the funds to engage labourers to help them clear the land. Apart from farming, women in the community often engage in trading of agricultural products like avocados, plantain and vegetables. There are not apparent differences in the way large and small farmers farm, they grow the same crops. The main difference is that large farmers have a working-class spouse or relative who is supporting them. There are different non-indigenes who settled in Etche. The Hausa's mostly trade jewelries and accessories. There are also some Hausa that engage in farming. They plant in big ridges while the ridges the indigenes make are low. The people from Calabar engage in different activities. They buy land and cultivate mostly maize and cassava. They also engage in cassava processing. Besides, they own palm oil processing factories and engage in palm fruit cutting.	Men and women Large and small scale farmers Non-indigenes

In all sampled communities, both men and women are engaged in farming. In some cases, where husband and wife work on the same plot together, there may be a difference in the task division. In these cases, men generally take responsibility for the more strenuous tasks such as digging holes, making ridges, clearing land and spraying, while women help with fetching water, weeding and

planting. At the same time, there are many households where husband and wife (wives) have separate plots. In these cases, men often focus on cash crops such as yam, plantain, cacao, oil palm and rubber, while women focus on food crops such as vegetables and cassava. Women are also more engaged in processing of crops such as gari and palm oil.

In some cases, differences in farming practices between indigenes and non-indigenes can be found. Firstly, temporary settlers often only engage in short term crops that can be harvested within one year. Secondly, long term settlers especially Igbo's who settled in different locations in Delta and Rivers make different (bigger) heaps for the cultivation of yam and cassava. In some cases, these practices have been taken over by the indigenes.

Do men and women farm on separate plots or shared farms in this community? If separate, what are the differences and similarities between men and women's plots? If shared, what proportion are each? If men and women farm together, are there differences in the type of work that men and women do? FGD 4.3

Table 4: Differences in men and women's plots (FGD 4.3)

Male/female FGD + Community name	Women's plots	Men's plots
Community 1 Ago-Owu (Osun) According to the FGD's, 20 to 30% of women have their own farmland. They are mostly widows or young women whose husband work elsewhere. In the remaining 70 to 80% of households husband and wife work together on the same plot.	Women prefer to process palm oil. They also grow cassava. Women generally do not cultivate more than 2 hectares. Women with money have very clean farms because they can employ labourers. Men do not need to hire labourers because they can do all farm work themselves. Female labourers help mostly with harvesting and making of elubo.	Men are mostly engaged in cacao production. After harvesting, the wife of the farmer will dry the cacao.
Community 2 Patara (Osun) Women and men farm seperately in Patara. This is mainly to avoid quarrels or cheating over the profit. Men and women help each other on their farms.	There is not much difference between the plots of men and women, because the women in Patara farm as much as men. Women hire labourers for most of their farming activities. Only a lazy woman's farm will be small and weedy. Women do not plant cucumber and watermelon because it is labour intensive especially because you need to spray these crops three times.	Men assist their wives only during harvest. Men have larger farms. Both men and women grow the same crops but men grow more cash crops such as green pepper, watermelon, cucumber and cabbage.
Community 3 Ogudu (Osun) Men and women farm separately. This is partly related to the fact that many men have more than one wife. When women marry a husband the husband will provide her with her own farm. In this manner, each wife can contribute to the family needs.	Men and women both plant the same crops. Women equally plant cash crops such as cacao and cashew. There is no visible difference in the plot of a man or a woman, because the women are hardworking as well. Women help their husbands especially with fetching of water when they want to spray. If the men harvest, women will help them pack.	Men assist their wives mostly by providing them with hired labourers in case the women need help on their farm.

Male/female FGD + Community name	Women's plots	Men's plots
Community 4 Akola Alaerebere (Osun) **Men and women farm separately in Akola Alaerebere, mostly because most men have more than one wife and want to avoid conflict between the wives as much as possible. 2 out of 10 families farm jointly, while 8 out of 10 families farm on separate plots. Those who farm on separate plots do assist one another.** **Despite having separate plots, all farmers farm in the same way, people generally make ridges and do not intercrop to avoid competition among the crops.**	All farmers in the village plant the same crops and farm in a similar fashion. Both men and women work with labourers. In some cases, women even spend more money on taking care of their farms. Although men and women farm separately, people do assist one another. Women help in fetching water for herbicide and insecticide application. Women also help in carrying farm produce to the village.	The husband's land is usually larger than that of the wife. The wife can have 15 acres while the husband owns 25 acres. They help each other with some farm activities. The husbands help their wives for example in spraying and harvesting.
Community 5 Isele Uku (Delta) **Culturally, men in Isele Uku are more engaged in farming than women. The proportion of families that farm together is 65% while 35% of families farm separately.**	In terms of crops, women grow the same crops as men. When farming together (as mostly the case), women are mostly engaged in planting, weeding and harvesting. Women who farm alone employ labour for weeding. Many women who farm alone are widows.	Men do other things like clearing, making of ridges, weeding and harvesting. Also male farmers employ labourers. Men farm more (95% of farmers are men) while women often buy farm goods from them for sale.
Community 6 Ossissa (Delta) **Culturally, the farm is owned by the husband as he is the head of the family. In most cases, men and women in Ossissa farm jointly, although the wife may take a portion of land to farm herself, or a husband can decide to give a portion to his wife after discussing with his family. It is mostly widows and single women who have their own farm. If a single lady wants to farm, she will go to the community to request for land, and they will give her once she has paid.**	In case of joint farming between husband and wife, women help in bringing the suckers into the farm. Sometimes they get the suckers from far distances. They also help in taking the harvest to the farm. Women do not clear the farm, even a widow will have to look for labourers to help her to clear the farm. Crops mostly grown by women are okra, pepper and tomatoes. A widow who farms alone will also plant cassava and plantain, which are normally men´s crops.	Crops as cassava, yam and plantain are cultivated by men and women together, with a higher engagement of men because of the high labour requirements.

Male/female FGD + Community name	Women's plots	Men's plots
Community 7 Agoloma (Delta) **20% of the women have their own farm while the remaining 80% share a farm with their husbands. The land is usually a family land where the husband give some part to their wives to support herself and the family. Some of these women who have their own farm are married, divorced or single.**	Although land ownership is in the hands of men, 90% of farmers are women and only 10% are men. According to the women who participated in the FGD, men are more interested in drinking and playing draft. Farming is an important way of taking care of their families for women, especially in case their husband is not around. Women plant cassava and yam while their husbands cultivate plantain. Cassava production and gari processing is done by women and very labour intensive. Men consider cassava production and gari processing as too much work.	According to the male participants to the FGD, men focus on plantain production as a cash crop. Some men help their family in clearing the farm except when there is money to employ labour.
Community 8 Umeh (Delta) **The labour division in farming depends on the famly arrangement. In monogamous families, husband and wife farm together while in polygamous setting husband and wives have separate farms. There are more polygamous households where husband and wives farm separately than families who farm together. In the case a husband has a salary job, his wife is mostly in charge of the farm.**	Men and women who farm together grow the same crops, although women are generally more engaged in cassava production. Women participate in planting after digging, fetching water for spraying, and gathering of plantain bunches during harvest. A woman that has a personal farm will hire labour to do the jobs her husband would otherwise do, such as land clearing, digging and spraying. Women who farm alone intercrop plantain with okra when the suckers are small. They do so to help the family before the plantain grows.	Plantain farming is mainly done by men although there are some women who have their personal farm and also grow plantain. Contrary to women, men do not intercrop plantain with other crops.
Community 9 Choba (Rivers) **Due to urbanisation, many men and women have other jobs next to farming. As such, only 25% of families farm together as husband and wife, while 50% of women farm on their own, especially in case her husband has another primary engagement. 25% of men farm on their own.**		

Male/female FGD + Community name	Women's plots	Men's plots
Community 10 Omoku (Rivers) **In monogamous families, men and women farm together while in polygamous households, husband and wife mostly farm separate. At the same time, most farmers are female. According to the women, 85% of farmers are women. Also, the participants of the FGD with men estimate that 60% of women farm alone, 20% of women farm with their husband and only 20% of men farm alone.**	In Omoku, men do not engage in planting, which is a woman's task. Women also maintain the farms by weeding. Although men are said to help with heavy labour duties, people also agree that women are more into farming than men, and some women can even paddle canoe to get to the waterlocked areas where some of their fields are located.	According to the women in the FGD, some men help their wives on the farm, although they are very few. The help mostly provided by men is in financial terms. In some cases, men help with the heavy duties such as land clearing, bush clearing, land stamping, digging of holes and harvesting. In this regard, plantain farming also falls largely in the responsibilities of men because it requires digging holes, and clearing the woods/trees in the bush before planting.
Community 11 Abua (Rivers) **The people in this community mostly depend on family labour. Even though families generally work together on the field, when a woman decides to have her own farm the husband will support his wife to do so. When husband and wife work on separate plots, they still assist each other on each other's farms. According to the male participants to the FGD, about half of the families farm together and half of the families farm separate. The female participants to the FGD claim that only 30% of farmers are men, and 70% women.**	A large percentage of women farm separately from their husbands because their husbands are not interested in farming. Some families farm together, especially in the production of cassava and other crops. The women's farm is neater than the men's farm, because women weed more regularly. Women assist their husbands in weeding and harvesting Female farmers generally focus less on cash crops as rubber and oil palm and more on food crops.	According to the male participants to the FGD, it is not possible to differentiate between man or a woman's farm, except for the farm size and the heaps; the man's farm is usually big and has bigger heaps. Men who have their own farm are mostly involved in production of cash crops such as rubber and palm oil. When farming together, men are more engaged in the heavier tasks as land clearing, planting and harvesting while women maintain and weed the farm.
Community 12 Etche (Rivers) **Husband and wife normally have separate plots in Etche.**	Women are generally occupied with the production of cassava and vegetables, because they are less labour intensive. Although men are generally involved in plantain production, women may in some cases plant a few plantains around the house for home consumption as well. While men clear the land, women often weed and maintain the farm until it is time to harvest.	Men are more focused on yam and plantain production. These are men's crops because of the labour involved. Men's work is to clear the land. Women may take over the maintenance and weeding of the farm until it is time to harvest.

Whether husband and wife farm together often depend on ethnicity, migration status and most importantly the family construction. In the case a husband has more than one wife, the husband and wife often farm on separate fields while husband and wife in monogamous household's farm together. Despite the different arrangements, husband and wife assist one another. Men are more involved in land clearing, digging and harvesting, while women are more involved in planting, weeding, maintenance and help with the harvesting. Men and women often grow similar crops, but men in larger proportions and women with the addition of vegetables for home consumption. Cassava is often considered a woman's crop because of the labour required to process it into gari. In terms of plantain, it is considered both a cash and a food crop. If produced at large scale, mostly men are involved while many women may also have a few plantain trees for home consumption. It seems Plantain is more often produced by men not only because it is a cash crop, but also because it is often planted on virgin lands, meaning a lot of bush clearing is required before planting. Although

land ownership is in the hands of men, and men also claim to be equally engaged in farming, it was noticed that especially in Rivers and Delta State men leave the farming activities more to women.

3.2.2 Important crops in the community

Priority question: What are the three most important crops for people in your community, in order of importance (1 is most important)? FGD 5.1

Table 5: Important crops in rural communities (FGD 5.1)

		1st	2nd	3rd
Community 1 Ago-Owu (Osun)	Men	Plantain	Oil palm	Maize, cacao
	Women	Plantain	Cassava	Maize
Community 2 Patara (Osun)	Men	Maize	Cassava	Plantain
	Women	Cassava	Yam	Cashew, plantain
Community 3 Ogudu (Osun)	Men	Cacao	Plantain	Oil palm
	Women	Plantain	Oil palm	Cacao, maize
Community 4 Akola Alaerebere (Delta)	Men	Plantain	Cacao	Cassava
	Women	Cacao	Plantain	Kolanut
Community 5 Isele Uku (Delta)	Men	Plantain	Cassava	Yam, Maize
	Women	Plantain	Yam	Cassava
Community 6 Ossissa (Detla)	Men	Plantain	Cassava	Yam
	Women	Maize	Melon	Cassava
Community 7 Agoloma (Delta)	Men	Plantain	Cassava	Yam
	Women	Plantain	Groundnut	
Community 8 Umeh (Delta)	Men	Plantain	Cassava	Pepper or yam
	Women			
Community 9 Choba (Rivers)	Men	Cassava	Yam	Plantain
	Women	Cassava	Plantain	Yam
Community 10 Omoku (Rivers)	Men	Cassava	Plantain	Yam
	Women	Cassava	Plantain	Vegetables (ugu)
Community 11 Abua (Rivers)	Men	Plantain	Cassava	Oil palm
	Women	Pineapple	Cassava	Plantain
Community 12 Etche (Rivers)	Men	Cassava	Plantain	Yam
	Women	Cassava	Yam	Plantain, vegetable

Count	**Female 1st (x3)**	**Male 1st (x3)**	**Female 2nd (x2)**	**Male 2nd (x2)**	**Female 3rd (x1)**	**Male 3rd (x1)**	**Summary score**		**Ranked priorities**	
							Female	**Male**	**Female**	**Male**
Plantain	**12**	**21**	**6**	**6**	**2**	**2**	**20**	**29**		
Cassava	12	9	4	12	2	1	18	22		
Yam			6	2	1	5	7	7		
Maize	3	3			1	2	4	5		
Cacao	3	3		2	1	1	4	6		
Oil palm			2	2		2	2	4		
Vegetables					2		2	0		
Pineapple	3						3	0		
Pepper						1	0	1		
Kolanut					1		1	0		
Melon				2			2	0		
Groundnut				2			2	0		
Cashew					1		1	0		

Plantain, cassava, yam, cacao and maize are the most important crops in the visited communities, in order of importance. Although according to the FGDs, KIIs and IIs, cassava seems to be an important woman's crop, cassava ranks higher as a priority crop among the male FGD participants. In line with information from FGDs, plantain is important for both men and women although considered slightly more important by men. Even though yam is generally considered to be a man's crop, yam ranks equally high among men and women. Also for cacao and maize, there is little difference in the ranking between men and women. The main difference in ranking between men and women is the fact that women seem to focus on a wider variety of crops, including kolanut, cashew, groundnut, melon, vegetables and pineapple, all crops that were not mentioned by men.

Plantain is considered the most important crop by both men and women in Delta, while in Rivers there is a clear focus on cassava. In Osun State there is less clearly a focus on a particular crop, although is mentioned most frequently as most important crop.

Why are those crops important? FGD 5.2

Are there groups of people in the community for whom the crop is more important? (Probe differences in social segments) FGD 5.3

Table 6: Reasons why the crop is important and for who (FGD 5.2 and 5.3)

Crop	Reasons why the crop is important (FGD 5.2)	People for who the crop is important (FGD 5.3)
Cassava	Cassava is a staple food Cassava provides income Cassava is good for many products Cassava is resilient to flood Cassava is easy to cultivate Cassava is suitable to our land Cassava has a high market value Quotes: Cassava is good because we make akpu and gari from cassava. Cassava is our major staple food in the community. – Men Isele Uku Cassava is good for income generation but very stressful to process compared to plantain and yam. – Women Isele Uku Cassava is important because of the many products you use it for, such as gari, fufu, starch, and you also can plant the stem. - men Agoloma Cassava is important for family consumption, every family eats cassava once a day (a day without eating cassava is a wasted day). Besides consumption, cassava is also important for income generation. People also grow cassava because it can stand flood, unlike plantain that is easily destroyed by flood. – men Umeh	Cassava is important for everybody Cassava is important for women Cassava is important for men Quotes: Cassava is eaten by everybody. Cassava can be processed in all major food products. It also provides us with money for education. Cassava generates income for the family by processing it. – men Choba Cassava is important for women, they process it into different food products. - Women Agoloma We process cassava into gari and fufu. Cassava helps the family. If you grow cassava, the family will never be hungry. If your husband gives you 300,000N you can spend everything on food, but if you grow cassava, you can use the money to buy land. – Women Etche Cassava: in this community men don't play with fufu and gari, it is an important food to them. It is the community major food and can be eaten at all time. Men Etche Everybody eats cassava at all time, both male and female and children, because it gives energy. Men Omoku

Cassava is one of our staple food, it is important because if you don't have food, you cant work in the farm. - Men Akola Alaerebere

Cassava is important because we mostly eat cassava products such as starch, gari - Women Ago-Owu

Cassava is important because of food that comes from it and it also gives us money. However, cassava production is very stressful. Planting, harvesting and processing of cassava involves a lot of stress that cannot equate the profit. - Women Abua

Cassava is our major crop, is a crop the community cannot do without. We like it because it can be processed into different products like gari, fufu and we use it to bake. Apart from consumption, we also sell it to make money. However, planting, processing and harvesting of cassava are very stressful. – Men Omoku

Cassava is our staple/main food. We use it for gari, so we cannot do without cassava. Plantain is usually disturbed by wind so we do not always have much. But for cassava, we don't lack cassava because once you have gari in the house you cannot go hungry and you will also get some money from its sales. In terms of production (farm work), cassava is very easy to cultivate. Also in terms of market value, cassava comes first. – Women Omoku

Crop	Reasons why the crop is important (FGD 5.2)	People for who the crop is important (FGD 5.3)
Plantain	Plantain is a cash crop Plantain is good for consumption Plantain has high nutritional value/is good for health Plantain is easy to produce, harvest and process Plantain is a long term crop Plantain provides food and income throughout the year Plantain is suitable to our soils There is a high demand for plantain Plantain can be made into many different products Plantain is used as a shade crop for cacao Quotes: Plantain is a cash crop because you can make money from it. It is also good for consumption. It is durable in the sense that you can keep harvesting for 10 years or more - men Isele uku When there is food scarcity, plantain is always there to feed the family. Even at the dry season, it is sustainable and profitable. – women Isele Uku Plantain is important because you can plant once and continue to harvest. The demand for plantain is high, and it is recommended for diabetic patients. The management of plantain after planting is easier, and plantain will grow even without fertilizer, although the geographical location does influence the growth of plantain. Sometimes they (market people) carry loads of plantain to the market and before you know they are back. That tells you how important plantain is. The climatic and edaphic factors of the area also favours plantain. – men ossissa Plantain brings more money than any other crop. Plantain is important because it gives iron and you can make different products from it. Even the peel can be used to make soap. We used it to make soup in our community. – Men Agoloma Plantain farm is the most important crop in the community because 2-3 bunch will give you 3000-4000. Income from plantain income is	Plantain is important for everyone (men, women, and children) Plantain is important for men Plantain is important for people with health problems Quotes: Almost everyone (male , female, children) takes plantain Amala because it is nice and has health benefits. The children likes Dodo and they take it every day. Also when you pound plantain with yam, the iron in the plantain balances the starch in the yam. One man said it helps him work hard on the farm when he eats this. – men Ossissa Orewa plantain is used as a medicine for children that suffer convulsion. - Umeh women We all eat flour, young old etc. we eat dodo with rice. We as men like the unripe, our women prefer the ripe one for dodo – Men Ago-Owu The unripe plantain is cooked and eating it increases men's libido. - Men Patara Plantain is sometimes prescribed for hypertension, the unripe one is boiled with the peel, when it is boiled we will peel it and eat it with oil. - Women Patara Plantain is very medicinal especially the unripe one is recommended to the old people of people with health challenges. – Men Omoku Diabetic patients prefer immature plantain because it contains less sugar. - Women Omoku

much better than the income from other crops. Plantain farming is less stressful than cassava farming, because weeding and harvesting cassava is very stressful. Besides, the market for cassava is lower. – women Agoloma

Plantain is our main source of income. Almost everybody grows plantain in our community. Some houses were built with plantain money and people used the money to train their children too. It also gives men iron. – Men Umeh

We plant plantain for income generation, for consumption and for health reasons. Plantain regenerates so you don't need to replant. The only problem is the flood. Plantain is better than yam and cassava because once you establish your farm you will be having a continues harvest – Umeh Women

Plantain brings in money for farmers earlier than other crops like cacao and provides food for us too – men Akola Alaerebere

Plantain because you begin to earn from the produce earlier than you would for cacao. Plantain saves you from poverty, because whenever you get to the plantain farm you will always find a few bunches to harvest and sell. Apart from making money from plantain, we eat from it too. We make flour from it and we have also learned that it is good for our health. We use plantain as a shade crop, and we also plant alone. – Women Akola Alaerebere

Plantain covers for all other responsibility as it is a continuous source of income. We also feed on it so it is very important to the welfare of the home. You can go to the farm to harvest plantain every 2 weeks. Plantain is important because of its products too. We eat it at home and we also sell to the marketers and the producers who use it for different things. – Men Ogudu

Before cacao is mature, plantain has already brought you money. That money will help you in the cacao farm. I bring my plantain to the market every five days and besides, we use it to feed the family. Cacao can be harvested only once a year. – Women Ogudu

Plantain is a good crop in terms of cash inflow and for consumption. – Men Ago-Owu

We use plantain to make elubo, dodo, chips. Plantain is also important as a shade crop for cacao. It can be planted in the bush unlike cassava - Women Ago-Owu

Plantain is third because you can harvest it at any season of the year, this means we will

always have it to eat and sell throughout the year. - Men Patara

Plantain is important because there is always market for it and you can process it into different products. It is a cash crop, anytime I take it to the market, I can sell it because people make it into different products. It is also very important to us because, if we are tired of yam, we can pound plantain or make it into different products. With plantain we are sure we can eat diverse foods and we can also sell it. – Women Patara

Plantain brings income. Plantain contains iron and is a food that has different nutrients from other crops. Plantain stays in the farm for a longer time than cassava and yam. Besides, plantain can be used for commercial purpose and a great money is generated from it. – Men Choba

We plant plantain for consumption and for sales to get money. Both reasons are very important to us. When we go to hospital today, they tell us that plantain gives iron and makes the body strong. It is even more important for the body than yam. Plantain is very good for combatting diabetes. - Women Choba

Plantain can easily be harvested to provide food in the house. You can also sell the plantain to get money to buy other things needed in the house. – Women Etche

Plantain generates income every month and you get money from time to time. Plantain is also good for consumption and it gives strength to work. – Men Etche

People use plantain because it contains iron, gives strength, is good for consumption, and it brings money too. Plantain production is lucrative if there is means of expansion. Plantain income is consistent and can be relied on more than cassava and any other crop. Plantain production does not require much stress before selling, it is direct to the market after harvesting while for cassava you have to process it into gari before selling it in the market. - Men abua

Plantain is like pineapple because it regenerates very well, you don't need to replant it. Plantain gives money if flood does not disturb it. Plantain is less stressful because you just clear your land and plant and wait until harvesting. Plantain brings more money than cassava. - Women Abua

Plantain is important because you can eat it and make money from it. The money we get from plantain is bigger than other crops.

	Plantain gives strength and is recommended by doctors for sick people to eat, especially for diabetic patients. You do not need to replant plantain yearly unlike cassava and yam that you replant every year. – Men Omoku Plantain is easier to cultivate than vegetables in terms of watering and care. Plantain comes second in market value after cassava. In the season of plantain, it brings in even more money than cassava and vegetables. Processing of plantain is also easier than cassava. Plantain fills your stomach better than cassava and vegetables. Plantain is costly in the market now because it is scarce because of the heavy wind. We have table land more than swampy land. We plant plantain more on the swampy land – Women Omoku	
Crop	Reasons why the crop is important (FGD 5.2)	People for who the crop is important (FGD 5.3)
Maize	Maize can be harvested fast Maize brings in quick money Maize production is not stressful Maize can be processed into different products Quotes: Maize production is less stressful and the income is very fast. – women Ossissa Maize matures in 3 months. You can process it into many different products and it brings money as well. - women Ogudu Maize – you can eat it raw, make pap, make ade. - Women Ago-Owu Maize ranks first because it gives fast money. - Men Patara	Maize was often mentioned as an important crop for temporary settlers. Quotes: ´For some other tribes, they also do plantain but since they are not the land owners, they prefer to plant short term crops´. – Women Patara

Crop	Reasons why the crop is important (FGD 5.2)	People for who the crop is important (FGD 5.3)
Yam	Yam provides income generation Yam provides food for home consumption Yam is easy to prepare Yam is nutritious Yam has cultural value Yam can be processed into different products Quotes: Yam provides income generation and is easy to prepare for consumption. Is important to old people because of health reasons. – Women Isele Uku Yam is important because it has cultural value. They don't celebrate new yam festival or new plantain festival, but they celebrate new yam festivals. Nearly everyone plants yam. During new yam festivals, if you did not plant yam, there will be no recognition for you. A person that plants yam will go to the farm to harvest and presents his new yam during the dance. No way you can be a farmer in Delta without planting yam, it is a traditional pride. – men Ossissa Yam: we cannot do without growing yam. Even if we have yam, we are tempted to buy it. We can roast it, pound it, elubo etc and we can also market it. – Women Patara Yam gives income to the family. It can be consumed and processed into different products. – Men choba Yam can also be sold to make money and is also important for family consumption. – Women Etche In the community we don't do without yam. Yam is celebrated more than any other crop that is why yam is very important. – Men Etche Yam is important for consumption and you can also make money out of it. – Men Omoku	Yam is important for people from Anambra Yam is important for the whole family Quotes: Yam is important to people from Anambra. Only Anambra people plant ordinary or normal yam. – men Agoloma Yam provides income for the family – men Choba

Crop	Reasons why the crop is important (FGD 5.2)	People for who the crop is important (FGD 5.3)
Cacao	Cacao generates much money (more than other crops) Cacao provides money from generation to generation Quotes: Cacao has higher money value than other crops and it is a crop that lasts and brings in money from generation to generation. – men Akola Alaerebere For cocoa, it may take up to 5-6 years, but once it reaches fruiting stages and you can harvest, then you begin to earn big. – Women Akola Alaerebere Cacao is important because it is usually and inheritance and it can be a source of wealth because you can get good money from it. They sell cocoa and they learned that it is process into beverage. – Men Ogudu Cacao, because it is profitable, it brings in more money than other crop – Women Ogudu In terms of cash inflow we rate plantain first then cacao. – Men Ago-Owu	Cacao is important for men Quotes: Cocoa and oil palm are made of men's crops, they are more relevant for men. - Women Ago-Owu
Oil palm	Oil palm is important because it provides different products (palm oil, kernels, broom, and fonts) Quotes Oil palm is also important because they get palm oil and kernel from it. Most of them don't plant oil palm because they don't have individual land. – men ossissa Oil palm is seasonal too. No work is as fast as plantain. Sometimes you will even want to harvest the palm and not get someone to do it for you. All products from oil palm are important. You get palm oil, broom, kernels, fonts from it that has different use to both homes and industries. - Men Ogudu	Oil palm is important for women Oil palm is important for men Quotes: Palm oil processing is important for women, you can take it to the market every five days and get money. – Ogudu Women Cocoa and oil palm are made of men's crops, they are more relevant for men. - Women Ago-Owu

Crop	Reasons why the crop is important (FGD 5.2)	People for who the crop is important (FGD 5.3)
Vegetables	Vegetables are important as accompaniment of cassava and plantain products Quotes We need vegetable to cook soup and eat other food made from cassava and plantain. However, vegetable is susceptible to insect infestation, vegetable is less profitable in terms of market value than cassava and plantain, and vegetable production is also stressful because you have to plant it very close to a water source (close to a swampy area), and it must be watered from time to time. – women Omoku	Vegetables are important for women for the production of soup and accompaniment of cassava and plantain products.
Pineapple	For pineapple, you plant it once and you can continue to harvest for 4 years (contrary to cassava). Pineapple also generates more income than cassava. - Women Abua	
Pepper	Pepper production is now a way for people to make money, it gives money quickly. Once it starts to fruit, you can be getting money every 7 days. – Men Umeh	
Kolanut	Kolanut may take up to 7 years before it reaches fruiting stage but once you can harvest you begin to earn big money.– women Akola Alaerebere	
Melon	Melon is an important food for everybody and enables you to realize your money fast. – women ossissa	
Groundnut	Groundnut ranks second because it needs to be weeded twice a year. Once you harvest and sell the groundnuts, you get your money back which enables you to invest – women agoloma	

Most crops are important crops for the whole family. Despite earlier identified differences between crops produced by men and women, the importance of the crop does not seem to correspond to these labour divisions. Cassava, yam, plantain, cacao and maize are mentioned as important crops by both men and women.

Cassava is a very important food crop. Most people grow it primarily for home consumption. Cassava is appreciated because it is easy to grow and withstands floods, but a major disadvantage is the high labour requirements for cassava (gari) processing. Although cassava was often mentioned as a women's crop, men also often rate cassava among their top three most important crops.

Plantain is highly appreciated because it is relatively easy to grow and multiply, and functions both as food and cash crop at the same time. People appreciate plantain for the high diversity of products it can be made into, and because it generates a high market value with little labour input (contrary to gari or other cassava products). People ascribe different medicinal qualities to plantain. In Osun State, where cacao is a common crop, plantain has a third function as shade crop. Besides providing shade, plantain brings in money in the years before cacao or other tree crops start to fruit. Another important quality of plantain that was often mentioned is the fact that it produces year-round, meaning that farmers have a year round source of income and food.

Although yam is appreciated as food and cash crop, yam is also important due to its cultural value, especially in Delta and Rivers State. Although yam is mostly produced by men due to the labour requirements, yam is considered as an important crop for the whole family.

Cacao is merely produced in Osun among the sampled states. Cacao is appreciated because of its ability to generate income. Main disadvantage is the fact it takes a few years before it starts fruiting. Once it starts fruiting however, it generates more income than any other crop. Cacao is a permanent crop, and therefore generates income from generation to generation. Cacao production is male dominated although some women in Osun State are also into cacao production.

Maize is produced across the different states, and is valued for its ability to fruit quickly, whereby generating quick revenue. Maize was therefore often mentioned as an important crop for short term settlers. People also appreciate maize for the wide variety of products it can be made into.

3.2.3 Crop of focus

***Please describe how the crop is generally grown in this community (KII Q4)**

***What is the estimate proportion (%) of people in the community who grow the crop? KII Q5**

***Can you estimate the proportion (%) of the crop that the average household uses for making the product? Probe on social segmentation gender, ethnicity, age, wealth status. KII Q8.**

Table 7: Differences in men and women's plots (KII Q4, 5 and 8)

	Description of how the crop is grown	Proportion (%) of people in the community who grow the crop	Proportion (%) of the crop that the average household uses for making the product
Community 1 Ago-Owu (Osun)	Plantain is used as a shade crop for cacao. Plantain is not commonly intercropped with other crops. The key informant explains *´some people plant pepper, but they don't use plantain to shade it because shading would reduce the fruiting of the pepper´*. Apart from intercropping with cacao, plantain is also commonly planted around people´s houses, usually for home consumption. Plantain production takes a year according to the key informants '*you start planting around April/May because it doesn't need much rain. During the dry season, the growth will reduce. But at the onset of rain the following year, it will start growing well again. You start harvesting around between July, August downward. That is why I said it takes a year*'.	All farmers in Ago-Owu plant plantain. The key informant explains '*100% of the farmers plant plantain, because you can't plant cacao without planting plantain'*. Settlers from other states plant plantain too, although they are focused on cacao production.	Out of the total production, about 5% is used for home consumption. Most peope in Ago-Owu do not eat plantain every day, plantain is consumed about twice a week. Most people rely on other staple foods like yam and cassava.

	Description of how the crop is grown	Proportion (%) of people in the community who grow the crop	Proportion (%) of the crop that the average household uses for making the product
Community 2 Patara (Osun)	Plantain used to be intercropped with other food crops such as cassava and maize. However, plantain production in Patara is currently being affected by the invasion of cattle rearers. Fulani herdsmen cut down the plantains to feed their animals, so many people moved away from plantain production.	Prior to the cattle rearer invasion which started 7 years ago, all settlers grew plantain. Currently it is only 50% of inhabitants who grow plantain. Many farmers have even deserted the farm alltogether because of fear, while others are trying to secure their farm with fences.	When farmers harvest plantain, they take most of it to the market. A full load of pick up can contain up to 120 bunches. If a full pick up load is harvested, only 4 bunches will be left for home consumption. Most of it is eaten as dodo.
Community 3 Ogudu (Osun)	In Ogudu, farmers plant Paranta (desert banana), Saro (cooking banana) and Agbagba (plantain). These are indigenous species and have not been bought from anywhere. Some people plant plantain alone, while others use it as a shade crop for cacao. According to the key informant, '*a banana of the Saro specie earns more money than Agbagba. The Saro plant lives longer than Agbagba in terms of life span. It changes the soil and gives cacao with a high water content. Saro is therefore more produced than the Agbagba´*.	The key informant was not able to estimate the percentage of people cultivating plantain. Although according to the key informant, Saro (cooking banana) is produced more than Agbagba (plantain), almost all people in Ogudu cultivate plantain as well.	The key informant indicates '*I can't tell, but I am sure every family drops some bunches out of their total production for home consumption'*.
Community 4 Akola Alaerebere (Osun)	The community members dig holes of up to 1 foot in the ground in which they plant the suckers. Weeding is done manually becuase chemicals are believed to have a residual effect. Weeding is done regularly after planting.	All farmers in Akola Alaerebere plant plantain, although some farmers to a larger extent than others.	Farmers consume about 10% out of their total production. Consumption is high during the dry season, when plantain is in excess. During that period, farmers may consume and process about 50% of their production. During the dry season, a lot of plantain is processed into elubo (plantain flour) because due to the excess in the market, the prices drop. Besides, the dry weather is favourable for plantain drying. Farmers sell more plantain during the rainy season, when there is a scarcity and the prices in the market are high.

	Description of how the crop is grown	Proportion (%) of people in the community who grow the crop	Proportion (%) of the crop that the average household uses for making the product
Community 5 Isele Uku (Delta)	In Isele Uku, plantain is intercropped with different crops such as cocoa, kolanut, pineapple, and oil palm, except for cassava. Clearing of farm land needs to happen before June/July, when planting starts. Some farmers already plant plantain in April/May. Off season planting happens in October/September. Some varieties are planted early like Piper while Medine are planted off season. Farmers make sure they keep the farm weeded after planting. Plantain starts to fruit from the 9th month.	Every farmer in Isele Uku grows plantain. Key informants explain '10 out of 10 farmers will have plantain on their field'. However, about 30 to 40% of farmers have plantain plantations, while the rest only have a few stands of plantain in their compound.	Most of the food products consumed are starch based, so many farmers sell most of their plantains. Farmers consume only about 10% of their production.
Community 6 Ossissa (Delta)	The key informant does not intercrop plantain with other crops, but practices crop rotation. Crop rotation means they have a plantain plantation on a particular land for three years, after which the land is planted with another crop. Generally, plantain is not intercropped with cassava. Plantain is an expensive crop to cultivate because of the required herbicides and insectides.	Many people grow plantain around their homesteads. However, the key informant insists that these are not plantain farms. He explains *´the plantain grown around people´s houses are not farms, they are like gardens and the plantains are the flowers´*. According to the key informant, there are only 20 people in the community into large scale plantain production. In his own family, they are up to 40 people out of whom only 4 are into plantain production.	The key informant does not know how many plantain is generally eaten by people in the community. To examplify, he himself eats plantain very often, and takes about 3 to 4 bunches home on a weekly basis (most of which is processed into flour).
Community 7 Agoloma (Delta)	In Agoloma, plantain is grown in plantations and in backyards. Plantain is intercropped mostly with yam, which does not affect the plantain (contrary to for example cassava).	The majority of the indigenes or inhabitants in Agoloma grow plantain.	The amount of plantain consumed varies from one household to another. There are some people who grow plantain mainly for home consumption, some sell the little they have to buy fish for consumption, while others grow plantain for commercial purposes. The major determinant is the land holdings. An average plantain farmer possesses 1 acre to 1 hectare, while large scale farmers have more than 2 hectares in different locations. The large scale farmers sell about 90% of their products and consume about 10% in their homes. Small farmers sell 50% and consume 50%.

	Description of how the crop is grown	Proportion (%) of people in the community who grow the crop	Proportion (%) of the crop that the average household uses for making the product
Community 8 Umeh (Delta)	Most plantain is grown in plantations and it not intercropped.	Plantain is an important crop in Umeh and there are many plantain farmers in the community.	Producers of plantain sell about 85% of their produce and consume 15% of their plantain.
Community 9 Choba (Rivers)	Plantain plantations have to be fenced because of goats. Plantain is often intercropped with cocoyam, while intercropping with yam and cassava is not favourable becuase the leafs of plantain take away too much sunlight. Plantain is a secondary crop in Choba, people mostly focus on yam, maize and cassava. Only few people cultivate plantain in the forest because the areas are disturbed by flood.	Although plantain is a secondary crop, there are many many people who grow plantain in their backyards in Choba. About 30% to 40% of the farmers grow plantain in their backyards, while about 30% have a plantain plantation.	
Community 10 Omoku (Rivers)	In Omoku, the land is divided in upland and low land, which is generally swampy. In the uplands, people try to use the land as much as possible, and intercrop plantain with cassava and sugarcane, while in the low swampy areas, plantain is planted alone.	Many people in the community (98%) have stands of plantain around their house for home consumption. Only 2 to 10% of people sell part of their plantain production. The key informants explain '*if we have the opportunity, we will plant more so we can have excess plantain for sales'*.	Most people in Omoku use their plantain merely for home consumption. Only 2 to 10% of the inhabitants have excess plantain for sales.
Community 11 Abua (Rivers)	Plantain is generally planted solely, but when intercropped, it is mostly intercropped with oranges and cocoyam.	About 60% of the community members grow plantain in their backyards while only 10% grows plantain in large quantities.	Among the farmers who grow plantain in their backyards, about 90% of the production is eaten and only 10% sold. Those who plant plantain in larger quantities sell 95% of their plantain and eat only 5% at home. It is estimated that the small scale farmers harvest about 20 bunches per month, while the larger plantain farmers harvest 100 bunches monthly.
Community 12 Etche (Rivers)	In Etche, plantain is not intercropped but planted alone. Plantain is only intercropped where oil palms are grown to break the wind. Plantain is best grown on humus soil. When plantain is planted on hummus soil, the soil will decay but it supports the growth of plantain very well. The other soil types are used for other crops. Plantain plantations are not rotated, plantain is only removed when people want to vacate the land for example for building a house.	About 30% of the farmers in Etche are plantain farmers, 25% are yam growers and the majority of 45% focuses on cassava production.	Plantain is mostly produced for sales, and is eaten only about 3 to 4 times in a month. The non indigenes, for example the hausa's, eat plantain more frequently.

Plantain is primarily planted as a shade crop for cacao in Osun State, where cacao is an important cash crop. In Delta and Rivers State, the farm land is not suitable to cacao production. In this region, plantain is planted alone or intercropped with other crops such as cocoyam, yam and in some cases even cassava. Most communities in Rivers and Delta State consist of high lands and low lands that are prone to flooding. In these cases, plantain is preferably planted in the high lands, since plantain is a permanent crop and not resistant to flooding. Across the regions, plantain is commonly planted around people's homestead for home consumption. In each community, there are farmers who focus on plantain production on a larger scale. Plantain is consumed in different forms (see next sections), and farmers generally keep 5 to 20% of their production for home consumption. This depends on the household size, on the volume of production, and on the season. In Omoku and Abua, both in Rivers West senatorial zone, there is a clear distinction between small scale and large scale plantain producers. Key informants explain that small scale plantain producers eat most (up to 90%) of their plantain production, while larger scale plantain producers sell up to 90% and consume only a small percentage.

3.2.4 Varieties of the crop and planting material

What are the varieties of plantain that you grow? Rank in order of importance 1=most important. (Note local and technical name – verify with key informant) II Q15.1

Table 8: Varieties grown in order of importance (II Q15.1) (see annex 5 for full ranking)

Importance	Women (N=62)	Men (56)	Osun State (N=38)	Delta State (N=38)	Rivers State (N=41)
Main plantain	14	15		29	
Beribe (main plantain?)	11	6		17	
Ogede une/Ogede-Jioko	12	3		15	
Agbagba (nla/gidi)	35	47	82		
Koloko	16	26	42		
Agbagba dudu	6	3	9		
Main plantain (okrima)	24	24			48
Agric/improved variety	7	7			14
Mpiele	10	3			13

All varieties mentioned above are suspected local varieties. The agric or improved plantain in Rivers State is the only improved variety that can be found in the top 3 ranking. Across the regions, main plantain scores as the most important variety. Agbagba nla and Agbagba gidi that were found in Osun State can also be translated to main or original plantain.

The challenge is that many different names are given to plantain. In Rivers State, 23 different plantain varieties or names were found, 18 in Osun State and 20 in Delta State. It can be assumed that many of these names relate to the same variety. For example in Osun, many farmers mentioned a variety with many but small fingers. Different names were given to this possibly same variety/variety with similar characteristics, therefore possibly affecting the ranking of this variety.

What are all of the varieties of plantain grown in this community? Rank in order of importance 1=most important (Note local and technical name – verify with key informant) FGD Q6.1

Table 9: Varieties grown in the community and ranking in order of preference (FGD 6.1)

	Men's FGD	Women's FGD	KIIs
Community 1 Ago-Owu (Osun)	We have three varieties of plantain, Koloko, Olomo yoyo and Agbagba. Koloko is the most preferred variety because it has the highest market value. Agbagba comes second, due to the size of the fingers and bunch, while Olomo yoyo is not cultivated on purpose, but it is found in the farmers' field accidentally.	We plant Agbagba and Onigba omo. There are some plantains that have white pulp and others have brown pulp. The variety Onigba omo has plenty fingers. There is little difference in how we use the plantain with brown and white pulp. We use both for pounding, although the white one does not get as smooth as the brown one. It is also ligther in weight, it does not rise/swell in the pan. Also customers prefer the plantain with brown pulp. The white one is good for chips, dodo, and flour although the amala made from the flour from white pulp will be light. We have more plantains with brown pulp (80%) than white.	Olomo yoyo (french type), Koloko, and Agbagba. People prefer the French type because it is sweeter than other varieties. It can be boiled and used for dodo. The other varieties are used for elubo because it has low sugar content. Most customers do not know the difference between the plantain varieties, but they may complain and say you sold a plantain to them that is not sweet.
Community 2 Patara (Osun)	We cultivate Agbagba nla, Koloko, Olomo wewe and Boobo. Agbagba and koloko are the most preferred varieties because they are usually big. We plant them mainly for our own consumption. The fingers of the Koloko variety are usually very big. Therefore, it attracts customers attention and has a high market value. One finger fills one easily. All varieties can be used for any of the plantain products we eat.	We cultivate Agbagba, Adaa loko, Olomo yoyo, and Olomo nla. Agbagba gidi is most preferred, second comes Adaa loko, third is Olomo nla and Olomo yoyo comes last. Agbagba gidi is most preferred because it has more fingers than Olomo nla, and the pulp is bulkier than that of Adaa loko. Even if the fingers are not as big as that of Adaa Loko, you get more slices for dodo from Agbagba Gidi than from Adaa Loko. You get 20 slices for dodo of Agbagba gidi and 10 from Adaa loko. Adaa loko comes second because it has big and long fingers, and the pulp is bulky. We prefer Olomo nla over Olomo yoyo because even though you find only 8 fingers on a bunch, the pulp is bulky. Olomo yoyo has plenty but small fingers. The way the fingers are arranged is very tight. We prefer Agbagba gidi, Adaa loko and Olomo nla because of their size, but in terms of pulp they are all the same.	We have a variety with 2 branches that we call Koloko. We have Agbagba, one with a short and one with a tall stem. The short agbagba is an agric variety while the tall one is the normal agbagba. The variety with the short stem does not lodge in time of wind while the tall one lodges easily. The agric matures within one year and the fruits are very thick while the normal one matures in one and a half years. We cook all types of agbagba without any preference, although the agric variety is sweeter than others. The pulp of the agric variety is somewhat yellow while the other one is white. The customers prefer the agric one with yellow pulp.

	Men's FGD	Women's FGD	KIIs
Community 3 Ogudu (Osun)	We cultivate Agbagba. It is a variety we inherited, we were brought up and fed with this variety so we cannot change it.	We cultivate Olomo yoyo (also called Olofiri olugba), Alabobo (or Koloko) and Agbagba. Olomo yoyo has plenty fingers (between 150 and 200) but they are small. Alabobo is the plantain with the biggest fingers in size, but the fingers are fewer, about 20 to 25 per bunch. Agbagba has big fingers but not as big as Koloko. It has more fingers in a bunch than Koloko (between 40 to 50). We plant everything because they all bring money. It is what our forefathers have been farming, so that is what we continue to do, we get suckers from the existing mother plants. We use all three varieties for all products.	We only have Agbagba.
Community 4 Akola Alaerebere (Osun)	We plant agbagba, koloko (alabameta), asogba (olomoyoyo), and alabameji (twin). All of them have the same pulp colour. All of them are used for flour, roasted plantain, boiled, dodo, and can be eaten fresh when hungry.	We have different varieties : Asogba has plenty fingers, but tiny. Alabameta (bunch with 3 branches) has long and plenty fingers. Alabakan (bunch with one branch) has long and plenty fingers too. Agbagba (normal plantain) is big but not as big as the one with 3 branches. We normally use the reddish yellow pulp for roasting plantain. When you use the white pulp for flour, it will turn out white and nice	The varieties we have are Asogba, Koloko/alabakan (may have many hands but it will be one bunch), Onibeji (plantain with twin bunches), Ogede fufu (white plantain), Ogede pupa (red plantain, both the leafs and the fruit are red or wine colour), Ogede Ado (dwarf plantain), Agbagba gidi (normal plantain), Alabameji (2 branches on a bunch), and Alabameta (has 3 branches on a bunch).
Community 5 Isele Uku (Delta)	We have Ogede jioko and Eze ogede plantain varieties. Eze ogede is not common, it is a variety with more fingers that look like banana. We have not experienced new varieties in our community, we only have these local varieties.	We only have plantain. Plantain is called Abiroka in Igbo language, and in Delta State we call it Ogede Jioku. This is how the indigenes call it.	We have different varieties of plantain. Horn plantain: has few fingers (15 – 20) on a bunch. Ezeogede: has numerous fingers but of a small size. It is not really accepted in the community because of its small fingers. We have local plantain which is the most common one in the community. Cameroon plantain: plantain with many fingers, up to 70. They are short in length but big in size. Plantain with double bunches which is an improved variety.

	Men's FGD	Women's FGD	KIIs
Community 6 Ossissa (Delta)	We plant Une Ogede, that is how we call plantain, we do not know of different varieties.	People differentiate between the plantain with two bunches (two in one, called Unekanabu), and plantain with a single bunch (Uneotuaka). The Unekanabu has longer fingers than Uneotuaka. The two varieties are accepted in the market, but we have more of Uneotuaka in our farm. The Unekanabu variety does not grow everywhere, but the Uneotuaka grows everywhere easily.	We call plantain Unne. We have one with a white body, one with a red body and one normal plantain. Any of the plantain varieties can be used for any plantain product. We like them all, they all have the same taste, only the size differentiates them. Also, the one with the red body is stronger than the other two varieties, if the other varieties are dying off, the red ones survive.
Community 7 Agoloma (Delta)	We have different varieties of plantains: 1) plantain with single bunch 2) plantain with twin bunch 3) Berigbe plantain (normal plantain) has a big bunch and there can be up to 20 fingers in a bunch. If the Efrun plantain (see next) is matured people will price it higher than Berigbe. Once the plantain matures, the colour is the same. People that roast plantain like Berigbe more than Efrun. 4) Efrun: plantain that looks like banana. The fruits are very compacted together, making the bunch so heavy with so many fingers, that it will be difficult for one person to carry it. The colour is light green and the pulp is the same as Berigbe. You can make any product with Efrun. 5) We have a variety with few fingers. 6) We have another variety that has a very small bunch and the fingers (about 2 to 3 per bunch) shoot up. 7) There is another variety that has seeds in the pulp, I started seeing these ones from my childhood. We do not have preferences for one variety or another. All plantain are the same to us as long as they bring in money.		We do not have a special name for plantain, athough there are some differences in size and fruiting. We have: 1). Single bunch plantain: produces a single bunch but big fingers. 2). Twin bunch: produces a double bunche but has smaller fingers than the single bunch. We started experiencing the twin bunch since the nineties. 3). There is a plantain that looks like banana, the bunch is very long but the seeds (fruits) are not big (Efrun variety). 4). We also have a variety with few fingers. 5). We have another variety which has a very small bunch and the fingers (only 2-3 on a bunch) shoot up. 6). There is one variety that has seeds in the pulp. It has a big finger and when you cut it, you see seeds inside. I started seeing the ones with seed since I was a child. 7). There is a variety that matures within six months. This variety is not usually acceptable among people, they say it is not as sweet as the other ones. All plantain are the same to us whether it has seeds or not as long as they bring in money.

	Men's FGD	Women's FGD	KIIs
Community 8 Umeh (Delta)	We have several varieties of plantain. We have Orewa, Areni, Real plantain, Red plantain and Twin plantain. Real plantain is the normal plantain and has more than 50 fingers on a bunch. Orewa and Oreni have a similar red stem and red fingers. Orewa plantain has a higher number of fingers per bunch, and a good stand of Oreni can even have over 100 fingers per bunch. The Orewa and Oreni varieties have however smaller fingers than real plantain. A bunch of real plantain is therefore higher in price, becuase of the size of the fingers. Any plantain can be used for any plantain product, but Orewa is tastier than other varieties. In the community, we plant more real plantain than Orewa because Orewa does not bring in much money. We therefore only plant a few stands of Orewa. We use Orewa and Oreni more for home consumption, because customers do not pay much money for them.	We have different varieties such as Orewa and Oreni. The bunch of these varieties is long. The Yoruba call it Origbaomu, Oregege, Oregbive. Orewa is not very common, and it is preferably used for home consumption. It is also used for children that have a medical convulsion condition. The Oreni plantain (that translates to elephant plantain in English) is good for Ekpa, dodo, roasting and boiling. Despite differences in size, all plantains are good for preparing any plantain product.	We have normal plantain, the fngers are big and it has up to 40 fingers on a bunch. We also have elephant plantain (Oreni). It has small but plenty fingers (up to 100). People don't plant it often, when you see it in a farm it is usually planted by mistake. It has been in existence for long. Both varieties have the same pulp colour. Normal plantain ranks first, because it can be used for all products and it always comes out well. It is bigger and has a better taste than Oreni. It has more sugar in taste than Oreni, it is tasty even when you boil it without salt. When you fry the normal plantain it stands and look firm in your hand, while Oreni floats in the oil. Normal plantain gives more energy than Oreni.
Community 9 Choba (Rivers)	We cultivate different varieties of plantain. Akirima Osukwu has a long bunch with many fingers, there can be more than 50 pieces per bunch. It is sweet and has a long psuedostem. Akirima has two bunches per stem. The psedostem is shorter than Akirima Osukwu. It has long fingers and the fingers are few. Normal Plantain has one bunch with long fingers and it produces very well. The most preferred variety is the Normal plantain, because the bunches are big and it attracts more money for commercial purposes. You can also use it as a gift. The income from it is higher. The bunches are very attractive.	We have different plantain varieties in Choba. There is one variety that has only 7 to 9 fingers that point upward, the fingers are very long and big. Monkey plantain has short but plenty fruits, if unripe we boil it for eating but when ripe we fry it for dodo or we eat it directly (fresh). Osuku has a big bunch, plenty fingers and long but slim fingers. We use it the same way we use the local plantain but the local one is better. Local plantain (Ikwere plantain) produces big and long fingers if it is planted in a very good soil. The fingers can be plenty but not as plenty as the last two aforementioned plantains (monkey plantain and osuku). Local plantain is preferable to all of the above mentioned plantains, both at home and in the market. However, the first mentioned variety (with few fingers) is also cherished in the market.	1. Osykuo: small fingers, long fingers, numerous fingers 2. Akrenima: small fingers, fingers face up 3. Normal plantain: has big fingers. 4. Red Osukuo : red peel, small fingers There are no preferences for any variety when we want to eat. But when it comes to marketing, the normal plantain is preferred because you can sell it for a good price.

	Men's FGD	Women's FGD	KIIs
Community 10 Omoku (Rivers)	The varieties we grow in Omoku are Ekpa Oluaka (one buch), Ekpa Ejima (two to three bunches), Ekpa Nkere, a hybrid from the Green rivers project and Epachi. **Ekpa Otuaka (one bunch):** The fingers are very big and long. The bunch is also heavy when matured. The peel has a dark green colour like ugu leave. The pulp colour is orange. The bunch is attractive. When matured, the tip of the finger is usually dark (black). **Ekpa Ejima (2-3 bunches):** The fingers are usually medium size, not too big like ekpa otuaka, There can be 2 to 3 bunches in one psedostem. The colour of the peel is the same as the colour of ekpa otuaka, it is also orange in colour. The pulp is much sweeter than any other plantain. **Hybrid variety from green rivers project**: the bunch weight is heavy, the fingers are medium size. The plantain spoils easily when ripe. The weight of the bunch makes it to fall, the psedostem is not too strong. **Ekpachi:** has one hand or 2 hands. The fingers are usually the biggest among the plantain varieties. The finger size is very long and fat. One person may not be able to finish one finger, so it is more satisfying than other plantain varieties. It is good for a gift and very eye catching. Some varieties are considered to be better because of their size, such as Ekpa Otuaka and Ekpachi. They can be used for any product becuase of their size, while Ekpamkere and the hybrid variety can only be used for home consumption becuase the size is not good and they spoil fast.	We differentiate Akala gbo (Ekpa Ejima), Otuaka, Normal plantain, and Ekpa Nkere **Otuaka**: has one bunch and one hand. The seeds (fingers) are usually very big such that one person cannot finish one. The bunch carries about 10 fingers. The fingers are usually long too. **Akala gbo (Ekpa Ejima)**: has up to 2 bunches and carries about 20 fruits on each side. It is just one bunch which splits into 2 sides when fruiting. Otuaka fingers are bigger but fewer. It has higher market value but it is not very common. **Normal plantain**: one bunch (stand) has plenty seeds (fruits), the size varies depending on the soil, the fruit number is about 40 per bunch. **Ekpa Nkere**: has a very big and long bunch, the fruits are small and plenty, far more than the normal plantain. It looks so much like banana. You may think it is not mature because of the size. There is no difference in the peel colour. The difference is in the fruit size, fruit set (style) and the number. In terms of market value, Otuaka brings in more money followed by the normal plantain. People don't really like the Nkere because of its small fruit size. All the varieties fruit and mature about the same time. Nkere spoils faster after harvest, while others store longer. As regards to usage, all the varieties can be used for different products. Just that Nkere is small in size but the taste is the same.	1) local plantain variety 2) cadava: there are different types of cadava but I do no know their names. One is short, another is medium tall. One has a long and big bunch. It is a hybrid from IITA Onne. We got it 10 years ago. The fingers are short like banana. People rejected it but I use it for flour in my company. Also, people are becoming aware that it can be used for chips production and this has forced up the price. Market demand is higher for our local variety. The IITA variety is usually priced very low in the market. 3) Ekpa Nkpere variety (Green Rivers project): a bunch is almost 30 to 35 kg. If you don't stake it when it produces a bunch, it might fall before it matures. I admire this a lot, just that the stress of staking is what puts off the farmer. Once it produces a bunch, the stem would fall due to the bunch weight. 4) I also have another variety which I have given to Green Rivers Project to multiply. The finger is very big and longer than banana. The bunch is very weighty. From seedlings to fruiting is 7 months, while the local variety takes 9 months to fruit. Usage of the local and improved varieties is the same. The major challenge is the production aspect. Also the improved varieties spoil faster than the local one (that is, it does not store for a long time). Also lack of access to suckers of the improved varieties is a challenge. People prefer the local variety which can easily be sourced within the community. The staking of the pseudo stem of the improved variety is a lot of work and thereby discourages farmers.

	Men's FGD	Women's FGD	KIIs
Community 11 Abua (Rivers)	**Isigheneen (emuele)**: the bunches are always big and the fingers are small. They have about 7 to 9 hands or more. Each hand can have 8 to 15 fingers. **Ekedi okaany**: normally has 1, 2 or 3 hands and each finger is very big and long. It has a bulky bunch and is tasty after eating. **Esam ekaany**: has a heavy bunch and short fingers, it has 6 to 10 hands per bunch. The pseudostem has an average height. Esam is bigger in bunch than Isigheneen. It is a good variety, it is tasty when cooked. **Okaany Igbila**: has been introduced from Akwa Ibom State and is sweeter than any other plantain variety. It is reddish in structure. It is very gummy when eaten and sweet in taste. **Okpirikpiri or Ogorogboro variety**: the bunches are the longest while the fingers are very short. It is sweet when cooked. **Unknown improved variety**: the finger is big and a bunch has up to 5 to 7 hands. The fingers are bigger in size than other plantains. It is easily cooked and soft when cooked. The fingers are big and you cannot finish one finger easily. We do not value it. We do not buy it and when we sell it, the price is usually low.	**Ogborogboro/Kataba (local Plantain):** When you plant one sucker, the plantain multiplies vigorously and kills any other variety that comes near it. It matures within a year (fruiting and maturity). The bunch has plenty steps/hands. The fruits are not too long but they are big. The hands will be up to 8 – 10 per bunch. There will be between 50-80 fruits/fingers on a bunch. **Ogey Okaany:** has a big buch with five steps (hands). Each hand will be big like the length of an arm. The number of fruits per bunch is between 30 and 40. **Ekidi Okaany:** It has two steps in a bunch and on each step it will have 8-10 fruits. A family of 10 can eat it and be satisfiedd because the fingers are very big. **Okpirikpiri Okaany**: Has up to 15 steps in a bunch. The fingers are small and there are about 15-16 fingers on each step. The bunches are very heavy and require 3 men to harvest. **Okanny Igbila:** The peel of Okaany Igbila fruits is pink/red. It is the colour of hourse blood and very sweet in the mouth. It has 5 steps per bunch and 5-8 fruits on each step. **Twin bunch (Iyan ebera okaany):** This twin bunch variety is like Ogey okaany. The bunch is not big. If you cut the focus it will not produce two bunches again. It has 6 steps per bunch. All the plantain varieties can be used to make all the same products. Only for Ogey okaany, it is better to use it for pounding when it is not well matured.	**Okaany**: It brings out big fingers of 1 foot. It is used for cooking and fried plantain. **Cadaba**: you can cook it and also use it as banana. It is also good for dodo. It is a variety from the ADP. It is not elongated but robust and stout. It has 3 to 4 edges. It is used for dodo or boiling. We grow the okaany more than the cadaba variety, because most people (except the diabetic patient) prefer to eat Okaany. Cadaba is seen as an improved variety introduced over 20 years ago (in the 80s). 10% of the farmers have cadaba in their farms because the demand for it is not much. It is only demanded for by processors. Most diabetic patients use it because it is cheap.

	Men's FGD	Women's FGD	KIIs
Community 12 Etche (Rivers)	**Ogbaranu:** The bunch is longer than that of the original plantain variety. It does not mature as fast as the original plantain. The seeds are smaller and a bunch has more seeds than the original plantain. The amount of seeds per bunch can be up to 100. There are about 20 steps (hands) in each bunch, and each step will carry up to 15 seeds. **Mpiele:** The bunch size is not big and smaller than original plantain. The fingers are long and bend. The fingers are fatter than those of the normal plantain. There are about 5 to 6 steps (hands) on each bunch, and each step has 3 to 4 fingers. **Okirima Lagos**: The peel colour is yellow even when it is not ripe. The bunch is not big/does not have many fingers (up to 15). The fingers are very straight. When the plantain is ripe, the pulp colour will look orange like our normal plantain. The taste is like that of plantain but slightly different. There are not many people in this community people who have it (not up to 10). **Original Plantain:** The bunch can be very heavy, depending on where you plant it and whether the soil is good or not. The fingers are longer than those of Mpiele, depending on the soil. When matured, the peel easilty splits sinto 2. The bunch size may have between 10 to 40 fingers depending on the soil. The income from original plantain is higher and it sells fast in the market. The colour of the plantain peel and pulp is all the same, as well as the taste.	**Akanchawa**: has long and big fingers, and has a maximum of about 15 fingers in a bunch. **Okrema**: This is the native plantain. The bunch is usually big, and has 30 to 40 fingers. The fingers are also big. Okrema fingers are bigger than Akanchawa. **Mpiele**: usually has 7 to 10 very big fingers. The most preferred is Okrema variety. People buy it mostly when taken to the market. It is sweeter than other varieties. Akanchawa is grown by only few people because it is scarce and people do not like it because it is not sweet like okrema.	**Ogbarannu**: the fingers are many compared to others. You can get about 100 fingers on a bunch, the finger size is the same like others, and they are not big. It is longer than banana fingers, it has a good taste and the pulp colour (cream) is similar to that of other varieties. **Mpiele**: does not have much fingers, the fingers are longer and fatter than Ogbarannu, but the main food (pulp) inside it is not big. **Main plantain**: the fingers are longer than that of ogbarannu. It may have about 70 – 80 fingers in a bunch. Tastes and colour are the same as the other varieties.

Many different plantain varieties were found across the different communities sampled. There are only a few communities in Delta North, where no differentiation between plantain varieties is made and plantain is generally called '*Ogede*'. Although people describe different varieties, they often indicate that there are very few differences in plantain colour also in how the varieties can be used.

In several communities it is however stated that, mostly irrespective of the product made from it, local less high yielding varieties have significantly better taste and are therefore more expensive and not easy to find to buy and are especially grown for home consumption. The most preferred variety is often a compromise between bunch size and finger size, two important characteristics for a good plantain. In many communities there is a variety with big fingers but few fingers per bunch, one with an average amount of fingers per bunch and average finger size, and a plantain variety with a big bunch with many but small fingers. In these cases, people prefer the variety with average finger size and average amount of fingers per bunch. Often, this variety is referred to as 'original plantain' or 'main plantain' (*agbagba gidi* or *agbagba nla* in Yoruba). Only few hybrid or improved plantain varieties were found across the sampled regions. Although a few plantains were referred to as 'agric' in Patara, Osun State, community members explained that varieties that is merely means the plantain produces well. A few varieties that are suspected hybrids or cross-breeds were found in Agoloma, Delta South. The most commonly used suspected hybrid was a plantain called '*Efrun*', characterised by the fact it looks more like banana than plantain, is sweet in taste and softens easily when cooked. Improved varieties were also found in Rivers, they rank second highest after main plantain according to the II. However, it is not clear whether all respondents refer to the same or different improved varieties, because both ADP, IITA and the Green Rivers project have distributed improved varieties. As analysed in table 11, the reason for appreciation of the improved/agric varieties is their big size.

Why do you grow this variety? II Q 15.2 a+b

Table 10: Reasons why the variety is grown (II Q15.2).

Variety	Reasons why preferred	% of women citing (N=62)	% of men citing (N=56)
Main plantain (including Agbagba) (All regions combined)	Big fingers	47.6	37
	Big bunch	42.9	7.4
	High market demand	9.5	44.4
	High market price	19	29.6
	It has many fingers	19	11.1
	It is sweet	14.3	11.1
	It has yellow pulp	9.5	7.4
	Good taste		7.4
	Does not soften easily		3.7
	It is the only variety	4.8	14.8
	Good for many/all products	4.8	14.8
	It fruits regularly		3.7
	It withstands weather changes		3.7
	It is the most common variety	4.8	3.7
	It has a thick peel	4.8	
	It gives high quality products		7.4
	It has a dark green peel	4.8	3.7
	It is a variety from my childhood		3.7
	It is good for consumption	4.8	7.4
	It has a good texture		3.7
	It has an average height (psuedostem)	4.8	
	It is tasty (not too sweet)	4.8	
	It is good for dodo	14.3	
	Good for flour	4.8	
	It is good for porridge	4.8	3.7
	It is good for pepper soup		3.7
	It is good for boiling		3.7
	It is good for raw consumption	4.8	

Variety	Reasons why preferred	% of women citing (N=62)	% of men citing (N=56)
Koloko (Osun State)	High demand	50	50
	High price		17
	Big finger	100	50
	Big bunch		17
	Good for consumption		17
	Can be used for any product		17
	Good taste and texture		17
Beribe (Delta State)	High market price	20	
	Big fingers	40	100
	Only variety	20	
	Can be used for all products	20	
	Matures fast		20
	Is more common than other varieties		20
Ogede Une (Delta State)	It is the only variety	50	100
	Because it is strong, sweet and yellow in colour	25	
	Because it is better for pounding	25	
Ogede Jioko (Delta State)	It is the only variety	100	100
Agric (Rivers State)	Big fingers		100
	Big bunch		100
	Looks attractive		100
Mpiele (Rivers State)	Can be used for all products	50	
	Big fingers	100	

Q6.2: **Why do people plant this variety? (Open response) FGD Q6.2 and - is this variety good for this purpose? If yes, why? FGD Q6.3**

The most important characteristics include big bunch, big fingers (which includes answers such as long fingers, fat fingers), high market demand and high market price. Upon analysis, there are considerable differences between the answers of women and men. While the size of the bunch, size of the finger and number of fingers are very important to women, men are more interested in cultivating varieties that are in demand and high in price. This is in line with the finding that men are more focused on producing plantain as cash crop, while women are more focused on plantain as food crop, where big bunch, big fingers and number of fingers are all determinants of food quantity available. At the same time, big bunch and big fingers are also described as most important traits for people who buy plantain in the market, and may therefore also relate to marketability of plantain. In a few cases, a specific difference is made between a variety that are preferred for home consumption and a variety that is more marketable. In these cases, the taste is an important indicator for a good plantain for home consumption, and bunch and finger size important qualities for commercial purposes. A woman in Umeh, Delta South, explains *´main plantain moves faster in the market while Oreni is very sweet and better for home consumption´*. Also a man in Agoloma, Delta South, explains *´the big finger and big bunches are preferred for marketing but for eating the native one is much better and acceptable´*.

In Osun, Agbagba is most preferred because of the size of the fingers and relative size of the bunch, followed by Koloko. Although Koloko is also highly preferred for its big fingers, it often produces a small bunch with fewer fingers than Agbagba. Agbagba therefore seems to have a better ratio between big fingers and bunch size. Whereas Olomoyoyo and a few other varieties produce even bigger bunches, the relative size of the fingers is small and therefore less preferred. These varieties are often used for plantain flour and not preferred for dishes as *dodo* and *bole* in which the plantain is used as a whole or in big slices. Also across Rivers and Delta state, 'normal plantain' is generally most preferred for similar reasons. In Rivers State, improved varieties also have a high score. Although improved varieties score high because of their big bunches, big fingers and therefore

attractive look, many people score it as their least favourite because it spoils easily, it softens easily when cooked and because it is not as tasty as original plantain.

Respondents have many different reasons for preferring one variety over another, mostly related to their size, processing qualities, taste and marketability rather than agronomic qualities. Although women are generally in charge of processing, qualities related to processability or giving a high quality product are mentioned by both men and women. Qualities like ´it is sweet´, ´it has a good taste/texture´, ´it is good for consumption´, ´it gives a high-quality product´ and the use of a particular variety for a particular plantain product are important to both men and women.

Although some people have very specific reasons for cultivating a particular variety, there are also respondents who do not differentiate different plantain varieties. A woman in Ossissa, Delta North explains '*we have only one variety. We call it une ogede or iyin ogede. People from Ogoachukwu call it ogede, people from here call it Une, but they are the same thing'*. The fact that there are many different names for plantain is especially the case in Rivers and Delta State, where many people speak different languages. In Rivers and Delta State, there were also relatively more respondents who were not able to differentiate different varieties, whereas most indigenes in the sampled communities in Osun were able to differentiate different plantain varieties.

Less preferred varieties pertain in many locations because people cannot differentiate the variety when buying suckers. Farmers explain it is even difficult to differentiate between plantain and sweet banana. A man in Umeh explains ´w*e don't like to plant these other varieties but you cannot identify them at sucker stage*´. As such, the cultivation of a specific variety is not by choice in first instance. After a first crop cycle and harvest, people will start to multiply suckers of the varieties they prefer most.

What varieties does your spouse grow? What varieties does your spouse prefer? (II Q 15.4)

Husband and wife generally grow the same plantain varieties. There are no big differences in the preferences for a particular variety by men and women (as can be seen from table 9) and it is difficult to differentiate varieties at sucker stage. Farmers in Ogudu, Osun East, explain '*we farm separately from our wives. We grow the same varieties, we exchange the planting material'*. Although men and women prefer similar varieties, the reasons for selecting these varieties are different between men and women (table 11).

Are there plantain varieties that are less preferred in the community? Why? FGD 6.b.

Despite people´s preferences for certain morphology (big bunch and big fingers), most respondents explain that all plantains are very similar in terms of usage. Physically, people prefer to see plantain with big fingers and big bunches especially in dishes where plantain is used whole or in large slices such as *dodo* and *bole*. Since the characteristics of the pulp of the different plantain varieties is described to be similar, this preference seems to be merely based on the plantain size, and not on other varietal differences such as taste. A main reason for a plantain to be less preferred is when it is not matured, when the fingers are small/thin, and the pulp white. Although plantain with yellow pulp is preferred, there are some communities that mention specific uses for the plantain with white pulp, such as chips, dodo and flour. As for flour of white or immature plantain, women in Omoku, Rivers West explain '*if you use the immature plantain for flour/amala it will draw better than the matured one'*. In Osun state, people also explain they use white pulp for amala, although it is of a lesser quality because it will be lighter and has lesser capacity to swell.

Planting material

From what source did you receive this planting material? (specify if they received it, from who directly, and if third party) II Q 15.3

Table 11: Source of planting material (II Q15.3)

	II Q	
Source of planting material	% of women citing N=62	% of men citing N=62
N/A	24,2	16,1
Family	14,5	12,9
Friends	4,8	6,5
Neighbours	22,6	12,9
Husband	1,6	0
Market	4,8	0
Other farmers	33,9	33,9
Other communities	11,3	21
Institute	1,6	4,8

*Please note that some people mentioned different sources

The way in which men and women source suckers is very similar. Most cited sources were in both cases other farmers. Women seem to source more suckers from neighbours, whereas men source more from other communities. Reasons for going to other communities to source suckers was often related to the quality or availability of planting material. A man in Umeh, Delta South, explains '*we do buy from people in the community but since last year's flood, we have been buying from other Isoko communities (we buy at 100N per sucker)*'.

A few people (4) indicate to have received suckers from an institute or organization (CRIN, Ministry of Agriculture, Green Rivers Project, and ASADEP in Iwo). Three of them are men and one is a woman. It is also interesting to see that there are a few women who bought plantain suckers on the market, while market has not been mentioned by men as a source.

Which factors/challenges could be limiting use of improved crop varieties in this community? And, how have these been addressed? KII Q7

Most communities in Osun, Rivers and Delta State are not familiar with improved plantain varieties. In this regard, key informants explain that access is the main challenge limiting the use of improved varieties. The king of Ogudu explains '*we have never been introduced to any improved plantain variety'*. In Agoloma, where Mr. Paul has received suckers of improved varieties from IITA, there are some people who sourced suckers from him. While most of them were washed away by flood, there are some people who are still consciously cultivating improved varieties, while based on people´s accounts, others incidentally seem to have hybrids or cross-breeds in their farms. Considerations of key informants regarding hybrids vary. While key informants in Akola Alaerebere in Osun explain '*if we get a good improved variety that can sustain, we will adopt and grow it. Especially if it is early maturing an does not grow tall like the ones that fall'*, others are hesitant to adopt improved varieties. The key informant in Choba, Rivers State explains '*improved varieties are those that grow with fertilizer, they are not as good as our native plantains'*. In Omoku, Rivers State, where Green Rivers Project has distributed improved varieties, the key informant explains '*the improved varieties spoil faster than the local one, it does not store for a long time. Also lack of access to suckers of the improved varieties is also a challenge. People prefer the local variety which can easily be sourced within the community. The staking of the pseudo stem of the improved variety is very tasking and thereby discourages farmers'*. So apart from limited access and availability of improved varieties which is a mayor limiting factor, also people´s reservations regarding improved varieties may limit the use of improved varieties.

3.2.5 Important characteristics of the crop (in general not specific to the product)

What are the most important characteristics that would make it a good crop you would use? **OPEN QUESTION NOT SPECIFIC TO A PRODUCT. Rank in order of importance. The question aims to understand the indicator the participants use to assess a good crop – (agronomical characteristics, post-harvest characteristics: morphological and storability characteristics, technological characteristics) II Q14.1 and 14.2

Table 12: Characteristics of a good crop (II Q14)

Characteristic	Women N=62	Men N=62	Osun State N=41	Delta State N=39	Rivers State N=43
Income generation	29	23	13	23	16
Home consumption	19	16	10	13	12
Easy to produce, market and process	12	9	3	12	6
Nutritious	8	7	4	4	8
Multiplies by itself	3	1	2	1	1
Produces fruits throughout the year	3	5	2	1	5
Quick income	5	4	5	4	
Can be processed into different products	3	5	4	2	2
Shade crop	1	4	5		
Ceremonial purpose		1		1	

*Please note that most respondents did not rank the characteristics. The table is therefore based on how often a characteristic was mentioned.

- **What are the characteristics of the crop that would make it a good crop? Open Question. FGD Q7.1**
- **What are the most important? Rank in order of importance. The question aims to understand the indicator the participants use to assess a good crop – (agronomical characteristics, post-harvest characteristics: morphological and storability characteristics, technological characteristics) FGD Q7.2**

The most important reasons for growing plantain are home consumption and income generation, and often a combination of both. This applies to both men and women across the regions. People appreciate plantain above other crops because it produces income quick, throughout the year, and because it is often considered to be more profitable than cassava. People also value plantain because it is easy to process for consumption and sales (easier than cassava that needs to be processed into gari first), because it can be processed into many different products (post-harvest characteristic) and because it requires little maintenance (agronomical characteristic). The fact that plantain is easier to produce and process is important to both men and women, but seems overall important in Delta State. Another important reason for many people to grow plantain is because of its nutritional value. Whereas there is no much difference in the importance of nutritional value given to plantain by men and women, the nutritional value is especially important for people in Rivers State. The fact that plantain is used as a shade crop (for cacao) only plays a role in Osun State, and is more frequently mentioned by men than by women, which is in line with the finding that men are more into cacao than women (see table 6).

Table 13: Most important crop characteristics in order of preference (FGD Q7.1)

Characteristic	Men's FGD	Women's FGD	Osun State	Delta State	Rivers State
Plantain provides income generation	9	10	6	5	7
Plantain is good for home consumption	7	7	5	2	6
Plantain is nutritious	7	3	1	4	5
Plantain is easy to produce and process	2	4		2	4
Plantain is a long term crop	4	2		3	3
Plantain produces fruits throughout the year	4	2	3	1	2
Plantain is suitable to our soils	1	2	1	1	1
There is a high demand for plantain	1	1	1	1	
Plantain can be processed into different products	2	3	3	1	1
Plantain is used as a shade crop		2	2		

The answers of the FGDs are in line with the individual responses, where income generation and home consumption are the most important characteristics of plantain. The nutritional value of plantain and the fact that plantain is easy to produce and process are important too, where the nutritional value is especially considered important by men and the fact it is easy to produce and process by women.

Plantain is also considered an important crop because of its high market turn-over. Men in Ossissa, Delta North explain ´*Sometimes we carry loads of plantain to the market and before you know we are back. That tells you how important plantain is*´.

In addition to the responses given by the individual interviewees, FGD participants mention that plantain is suitable to the specific soil and/or landscape where they live. Men in Ossissa, Delta North explain ´*our geographical location aids the growth of plantain very well. The climatic and edaphic factors of the area also favours plantain*´.

Do you think these would be different characteristics/criteria for your spouse? Why or why not? II Q14.3

As seen from table 13 and 14, men and women have very similar criteria that make plantain a good crop. This is supported by the few answers given to the question above. Women during the FGD in Patara, Osun West, explain ´*between yam and plantain, we choose plantain because you can harvest yam only twice while plantain is year round. The men also have the same view*´. Although the criteria for a good crop applied by men and women largely correspond, there are some answers that show differences in criteria. A man in Omoku, Rivers West, explains '*my wife also farms, we farm together on the same plot. My wife will also rank cassava first. Cassava is important to her because she can produce it on her own while plantain is regarded as a man's job because it requires power*´. This answer shows that especially the labour requirements for the cultivation of a crop is an important criteria considered by men and women. This is also in line with some of the responses of the FGDs that show that women focus on crops that are relatively low in labour requirements while men focus on crops as plantain and yam which are more labour intensive. Besides, the FGDs show that women focus more on food crops and men more on cash crops, while plantain serves both as a cash and food crop. This is exemplified by a woman in Etche, Rivers East. She explains '*my husband will choose plantain as the most important crop because he sells it to make money. Plantain brings more money than gari now*'.

3.2.6 Uses of the Crop

List all the products from the crop FGD Q8.1

Table 14: Summary table of products (FGD Q8.1 and 8.3)

Product	Osun State	Delta State	Rivers State	Ripening stage
Roasted plantain (bole)	4	7	7	Unripe and ripe
Chips (ikpekere)	2	6	6	Unripe
Boiled	7	6	5	Unripe and ripe
Porridge	1	7	7	Unripe and ripe
Flour/amala	8	6	6	Unripe
Pudding (okpa)		6	2	Flour of unripe plantain and overripe plantain
Biscuit (achicha)		1		
Fresh	5	2	4	Ripe
Fried (dodo)	7	6	6	Ripe
Boiled with beans	2	5	7	Unripe and ripe
Pounded with yam	2	2		Unripe
Pounded with cassava or gari		1		Unripe
Pounded unripe plantain	1	2	3	Unripe
Pounded ripe plantain (onunu)			2	Ripe
Pounded roasted plantain (Utara Okirima)			1	Unripe
Pepper soup		3	8	Unripe and ripe
Water from soaked plantain (medicinal)	1			Unripe
Plantain and maize moimoi			1	Ripe
Boiled with yam	1			Unripe
Dodo-Ikire	1			Overripe

Table 15 Summary table of products per region (II) **(all responses mentioned more than 20 times are highlighted)**

Delta	Frequency N=38
Amala	5
boiled plantain	24
Bole	33
Chips	23
Dodo	32
Flour	10
leave (medicine)	1
pepper soup	11
plantain with beans	24
Porridge	28

Delta	**Frequency N=38**
pounded plantain	3
pounded plantain with gari or yam	7
Pudding	18
raw plantain	16
roasted pounded plantain with gari	1
Osun	**Frequency N=38**
Amala	3
Biscuit	1
boiled plantain	26
Bole	25
Chips	21
Dodo	33
dodo ikire	1
Flour	24
plantain moimoi	1
palm wine	1
Pap	4
plantain with beans	18
Porridge	4
pounded plantain	2
pounded plantain with yam or cocoyam	18
raw plantain	9
smashed plantain	2
Rivers	**Frequency N=41**
Amala	4
boiled plantain	18
boiled plantain with yam	1
Bole	26
Chips	17
Dodo	28
Flour	4
Pap	1
pepper soup	26
plantain akara	1
plantain roll	1
plantain with beans	20
Porridge	29
pounded plantain	15
pounded plantain with yam	2
pudding with maize	1
raw plantain	18

Table 16 Summary table of products per sex (II) **(in yellow are the top 6 products based on frequency)**

Female (N=62	**Frequency 331**
Amala	9
Biscuit	1
boiled plantain	31
Bole	42
Chips	31
Dodo	47
Flour	18
plantain moimoi	1
palm wine	1
Pap	4
pepper soup	19
plantain akara	1
plantain with beans	34
Porridge	32
pounded plantain	11
pounded plantain with gari	1
pounded plantain with gari or yam	1
pounded plantain with yam	8
pounded plantain with yam or cocoyam	2
Pudding	11
pudding with maize	1
raw plantain	23
roasted pounded plantain with gari	1
smashed plantain	1
Male (N=56)	**Frequency 309**
Amala	3
boiled plantain	37
boiled plantain with yam	1
Bole	42
Chips	30
Dodo	46
dodo ikire	1
Flour	20
leaf (medicine)	1
Pap	1
pepper soup	18
plantain roll	1
plantain with beans	28
Porridge	29
pounded plantain	9
pounded plantain with gari	3

Male (N=56)	Frequency 309
pounded plantain with gari or yam	1
pounded plantain with yam	10
pounded plantain with yam or cocoyam	1
Pudding	7
raw plantain	20
smashed plantain	1

Table 17 **Ranking of products per region (II)** (in yellow is the top ranking product based on frequency)

Based on ranking of products

Delta	Dodo	14
	Chips	9
	Bole	13
	Porridge	26
	Amala	5
	plantain with beans	7
	raw plantain	1
	boiled plantain	18
	Pudding	8
	pounded plantain with yam and gari	2
	pepper soup	11
Osun	boiled plantain	8
	Dodo	23
	Chips	4
	Amala	11
	Bole	3
	plantain with beans	7
	pounded plantain with yam	12
	raw plantain	4
Rivers	Dodo	15
	plantain with beans	10
	pounded plantain	1
	Bole	11
	boiled plantain	5
	Porridge	18
	pepper soup	12

People across the regions make many different products from plantain. In the sampled states, plantain forms an important part of people's diet, and is consumed daily (or at least several times per week) in different forms. In Osun State, processing unripe plantain (and in some cases also desert and cooking banana) into flour (*elubo*) used for making *amala* (i.e. a *fufu* like substance that is refined enough to swallow without chewing) is the most popular product followed by boiled and fried plantain. In Rivers State, plantain pepper soup in which either ripe or unripe plantain is used is

the most popular plantain product. In Delta State, plantain pudding (okpa) is popular. Okpa is made by mixing flour of unripe plantains with overripe plantain. In both Rivers and Delta State, roasting unripe or ripe plantain and plantain porridge are also very popular. Other frequently consumed plantain products are plantain chips, *amala*, fried plantain, boiled plantain and plantain boiled with beans. The consumption of fresh plantain as a snack is also popular across the sampled communities. Across the different States, plantain flour, boiled plantain, fried plantain and roasted plantain are the most popular plantain products.

3.2.7 Labour

Who sells plantain products in your household? Probe household members, gender, age (II Q16.3 original or 16.2 revised)

Table 18 Frequency of citations of people who conduct the selling of plantain products by sex (II Q16.2)

People who sell	% of women citing N=64	% of men citing N=60
Fresh bunches		
Men	3.1	25
Women	78.1	59.4
Sister of husband	1.6	
Female children	1.6	
Male/female children	1.6	
Middlemen/okada driver	6.3	
People who come to the farm to buy plantain		16.7
Bole		
Women	3.1	3.3
Men		1.7
Flour		
Women	6.3	3.3
Men		1.7
Middlemen	3.1	
Pudding		
Women	4.7	3.3
Men		1.7
Dodo		
Women	1.6	
Chips		
Men		3.3
Women		1.7
Plantain rolls		
Women		1.7

Most people sell plantain in fresh bunches. There are only a few respondents who process bole, flour, pudding, dodo, chips and plantain rolls. The answers to the IIs show that women are majorly responsible for the marketing of plantain, either as fresh bunches or in processed products. Most respondents explain '*men don't like to go to the market. It is considered as a woman's job'*. A few women (6.3%) also mention middlemen, often okada drivers, who pick up their plantain and sell it for them in the market.

Although only 3.1% of women cite that men sell fresh plantain bunches, 25% of male respondents also indicate to sell plantain. Many men who sell plantain (16.7%) sell it from their farm rather than going to the market. One farmer in Agoloma explains '*I sell the bunches myself to Umeh and Patani market, and sometimes buyers will come to the house or the farm to buy plantain from me. They come from Ughelli, Patani, and Agoloma*'. Both men and women explain that in some cases, the husband helps the wife in bringing the plantain to the market. A man in Omoku, Rivers West explains '*I take plantain to the market with my motor bike but it is my wife who sells it in the market'*. Processing of plantain is generally seen as a woman's job, although almost all men across the regions indicate to process plantain for home consumption or sales. In Osun state, we encountered at least one man processing flour on a medium large scale and one man running a chips factory. In Omoku, one man explains he and his wife are into plantain rolls sales '*I process plantain rolls to sell while my wife goes around to hawk the plantain rolls'*.

In your community and in general, who sells plantain (products)? FGD Q8.3 - original or FGD Q8.2 -revised

Table 19: Persons responsible for processing and selling plantain (FGD 8.2, 8.3)

	Men FGD	Women FGD
Community 1 Ago-Owu (Osun)	People in Ago-Owu do not process plantain products for sale, but merely for home consumption. FGD participants explain that processed plantain products can be found in towns. Most customers who buy plantain in Ago-Owu come from Idebu Ode, Ikoyi, Ikire, Osogbo, Ilesha, Ibadan, and Lagos. This is where we have most customers from. These buyers are mostly middlemen who will retail the plantain.	Women in Ago-Owu explain '*we only sell fresh plantain. We sell it to boli and chips processors, and in some cases to consumers directly. The buyers come from Ibadan and Lagos'*.
Community 2 Patara (Osun)	In Patara, men explain 'we men take the bunches to the market to sell'.	Women in Patara explain that no one in the village sells plantain products, because most people process plantain products at home. There are however a few buka's (small restaurants) where dodo and plantain boiled with beans is sold. The women also explain that the fresh bunches are mostly for home consumption and not for sales, only in case plantain is excess they may take it to the market. The main plantain product sold in the market is plantain flour. Men generally give (part of) their plantain produce to their wives for them to process it into flour. Flour commands a higher price in the market. Contrary to what men stated, women always go to the market to sell their products, even if it is from their husband's farm. The profit made belongs to the owner of the plantains. In case the women have processed plantain into flour, the money from the sales is for the women because of the time it took them to process the flour.

	Men FGD	Women FGD
Community 3 Ogudu (Osun)	Part of the plantain production is taken to the market where it is sold to marketers and producers. Women take care of the processing and marketing.	The women who participated in the FGD explain that they are responsible for selling plantain flour in the market, also if it from their husband's farm. Whether processed or not, the money made with the sales of plantain will be brought back to the husband.
Community 4 Akola Alaerebere (Osun)	Men in Akola Alaerebere explain that women are responsible for the processing of plantain, although men help them once in a while when the women are too busy.	Women explain during the FGD ´*we women make plantain flour and take it to the market to sell*´.
Community 5 Isele Uku (Delta)	Farmers in general harvest and sell plantain. Women are the people who participate in the processing of plantain products. Plantain pudding is mostly processed by elderly women, while chips are mostly produced by young women.	The people who sell plantain in the market are majorly women. The percentage of men that sell plantain in the market 7% while 93% of the people who sell plantain in the market are women.
Community 6 Ossissa (Delta)	The men in Ossissa explain that they gather their plantain produce from their farms that are generally not motorable with speed boats and bring their harvest to the market in Isellegu, which is a general market. Men in Ossissa explain ´*traders from different cities and towns come to Isselugu market to buy our plantains. Some even come from Abuja to buy plantain and sell it in the market in Abuja*´.	It is mostly women who sell plantain in the market.
Community 7 Agoloma (Delta)	Men in Agoloma explain that men are more engaged in selling of plantain than women, mostly to avoid problems between husband and wife. At the same time, women may help in the selling of plantain and, according to the men, are sometimes even more successful in the selling than men.	
Community 8 Umeh (Delta)	Men in Umeh explain ´*we carry our plantain to the market in Umeh by bike every 4 days*´. According to the respondents, it is more economical to take it to the market than to sell it from the farm. The customers who buy plantain in Umeh market carry the plantain to different places as Ughellli, Warri, and Port Harcourt. Some people buy bus loads full which they take to other states.	The women in Umeh explain that women process plantain and prepare the food at home. According to them, it is also the women who sell plantain in different markets after harvest.
Community 9 Choba (Rivers)	Male participants to the FGD in Choba explain ´women and men can sell plantain. Although anybody can sell plantain, it is majorly the men who assist while the women sell´.	The women in Choba also explain that it is women who take the plantain to the market to sell.
Community 10 Omoku (Rivers)		The women in Omoku explain that it is women who sell plantain in the market. They state ´*even if a man harvests his plantain, he would give it to his wife to sell*´.
Community 11 Abua (Rivers)	In Abua, farmers explain that customers come to the house to buy plantain after harvest, or men send their wives to sell the plantain in the market. They explain ´*only a few men sell plantain in the market themselves*´.	The women in Abua explain ´we women sell the plantain on our own after harvest´.
Community 12 Etche (Rivers)	The male participants in Etche explain that it is the women who sell the plantain after harvest.	Also women state that mostly women sell plantain. They explain ´*except greedy men, greedy men carry plantain to the market themselves*´.

The FGDs confirm that women are more engaged in sales of plantain bunches than men. It is little accepted for men to go to the market to sell plantain products themselves. Women in Etche explain '*women sell plantain mostly. Except greedy men. Greedy men carry plantain to the market themselves'*. In case men talk about plantain sales, they mostly sell the plantain from their farm or house to buyers, or they merely transport it to the market where they sell it to female marketers. Men in Abua explain '*The customers come to the house to buy. People also send their wives to sell, only few men sell plantain in the market themselves'*. The FGDs also show that, in line with the findings from the IIs, there are buyers who come to buy fresh plantain bunches from people's farm directly. Little processing for commercial purposes takes place in the sampled communities. Some respondents explain that processing of plantain products mostly takes place in towns or larger urban centres, and not in rural areas because most people process their own plantain at home. Although most plantain is sold as fresh bunches, there are some women in Osun State who process plantain (and banana) flour. Women in Patara explain '*we mostly sell flour in the market. Flour processing and sales is for women. Men can give the plantain to their wives to process it into elubo. Women always go to the market to sell even if it is from our husband's farm. Whoever owns the plantain is the owner of the money'*.

3.3 Decision making and trade-offs between the different uses of the crop

Table 20 Mean score of independence in decisions by sex and region (II 16.4)

Decision	Mean score of independence 1-4*	
	Women	Men
Variety of crop to plant	3.12	3.43
Use of crop	3.11	2.92
Marketing	3.15	3.18
Use of profits from sale of fresh plantain bunches	3.07	3.23
Use of profits from sale of alternative product	3.31	2.39

*Legend

1=no independence the decision is made by someone else,

2=a little independence to suggest ideas but decision is taken by someone

3=most independent but need to consult someone

4 = complete independence.

Overall, many men and women answer that they do most of the farming and decision making together with their partner and the mean scores of men and women do not differ much.

In terms of use of crop (what product to make), women often explain to either decide what to cook for the family or cook whatever their husband wants. A woman in Agoloma explains:

´my husband decides what to eat at home. He will tell me what he will like to eat. Whatever he likes, we follow. If he does not eat, we will not have appetite either´.

Other women explains:

´most time I decide about what to consume. When there are differences, I prepare what the husband wants´.

Whereas women indicate to often follow their husband´s choice in terms of food products to prepare, men often indicate:

´this is my wife's area. I can suggest but whatever she prepares, I will eat´.

Other men consider making food choices part of the duties of the head of the household and explain

´I am the head of the household and so I take the decision on what to eat´.

In terms of marketing, some people explain that the amount of plantain to market depends on the availability of bunches and their ripening stage. A woman in Patara explains

´most time during harvest, we select the best ones for home consumption, I select the ones that are good for my products and my husband selects the ones that he wants to use. We bring the rest to the market. Most times we don't keep more than 3 bunches, no matter how many bunches we harvest´.

Others explain it is either their own decision, or a joint decision between husband and wife.

Whereas there is little difference in the independence in decision making regarding the marketing of plantain itself, men have more control over the use of profits from sales of plantain than women. Many women explain that when they sell the plantain, they bring the profit back to their husbands, sometimes after purchasing some household items in the market. The use of profit from sales of fresh plantain bunches is mostly related to ownership over the plantain (who has cultivated them). A woman explains

´we only sell fresh bunches. I sell them on the market, even when my sons want to sell their plantain I help them to take it to the market for them. If it is from my farm, the money is for me. If it is from my sons farm, I give them their money´.

Upon processing of plantain, the ownership over the profit may change from the producer to the processor. A man in Umeh, Delta South, explains

´before my wife goes to the market, I will tell her what to do with the proceeds from the fresh bunches. But for the profit made from ekpa, she does whatever she likes with it´.

This is also the case for the use of profits from the sale of alternative products (either processed plantain products or products of other crops), over which women have an averagely higher control than men. A man explains

´the profit from cassava is for my wife, the profit from melon is for both of us. The money from plantain is for me, because plantain is serious business´.

Many women bring back the profit of fresh plantain to their husbands. Others explain:

´after sales, I deliver the money to my husband and we plan together on what to use the money for´

Although some men explain that they have outright ownership over the profit, most men explain they sit together with their wife to deliberate on how to use the money.

Are there people in your household that take most of the decisions regarding the [product]? Probe specific household members, gender, age. Please describe. II Q16.4 (original) or 16.3 (revised)

Table 21 Frequency of citations of people who make decisions on sales and consumption of plantain by sex and region (II Q16.4 original or II Q16.3 revised)

	People who make decisions on plantain processing and marketing	% of women citing N=57 answered	% of men citing N=52 answered	% of respondents in Osun State N=37 answered	% of respondents in Delta State N=34 answered	% of respondents in Rivers State N=39 answered
1	Men	40	50	57	38	38
2	Women	33	31	14	24	59
3	Husband and wife	25	27	22	32	23
4	Children	14	19	8.1	15	26
5	Widow	1.8			3	
6	Business partner		1.9	2.7		

***In your community, if the crop is used for different purposes and products, does it happen where there is disagreement on how the crop is used? FGD Q9**

	Men FGD	Women FGD
Community 1 Ago-Owu (Osun)		We hardly have disagreements about the use of plantain. When plantain is about to get spoiled, our husbands will advise to process/dry it.
Community 2 Patara (Osun)		Women process plantain into flour and sell it on the market, also if it is from the husband's farm. If we need to buy something in the market, we use the money of the plantain we sold, whether it is our husband's or our own. We will inform our husband. We have control over our own money, if we process into flour, we get the money from the sales, because it takes time to process.
Community 3 Ogudu (Osun)	It is the producer who has cultivated the plantain who will decide to sell and when to sell, this may be the husband or the wife. Once they bring the money home, they will decide if there is a specific need they want to use the money for. There is no strict rule on who decides which plantain product to eat. Sometimes the children may decide what to eat, because things like this determines a happy home.	Women in Ogudu explain that their husbands normally inform what product to produce. According to them, en generally prefer to process plantain flour.
Community 4 Akola Alaerebere (Osun)	According to the FGD participants, the decision on what to eat is decided by the household head. At the same time, the ripening stage of the plantain may also inform the product to process it in. They explain '*if you bring home ripe plantain it automatically signifies that we will use it for dodo*'.	
Community 5 Isele Uku (Delta)	Families normally agree on what product to eat. In cases of disagreement, the women settles their husband's wish first before that of others.	The woman decides on what plantain product to eat and her family normally accepts. There are no disagreements.

	Men FGD	Women FGD
Community 6 Ossissa (Delta)	The decision making process depends on individual households. Although men are generally in charge to make the decision on what to eat, they may also allow the children to eat the product of their own choice.	
Community 7 Agoloma (Delta)	Men in Agoloma explain '*when things are good in the family, we can fry dodo for the children. When things are not good, the family, including the husband will eat whatever the woman prepares'.*	
Community 8 Umeh (Delta)		According to the women in Umeh, women generally decide on which product to eat and everybody will agree with their choice.
Community 9 Choba (Rivers)	Men in Choba explain '*the wife will ask the husband what he wants to eat and the wife will prepare. The children will also follow his choice and there is no argument on what to be prepared*'.	With regards to the harvesting and marketing of plantain, women in Choba explain '*either of us (husband/wife) can take the initiative to harvest or sell the plantain*'.
Community 10 Omoku (Rivers)		
Community 11 Abua (Rivers)	Men in Abua explain '*the decision making depends on the individual, but we prefer to eat whatever our wives want to cook*'.	
Community 12 Etche (Rivers)	According to the male participants in Etche, '*our wives but also I can tell her what I want to eat and there is no problem or argument'*.	The women in Etche explain '*men decide what to eat. If the woman wants something different, she can make her own separately. Children have to choose what the father or the mother choses*'.

***Have there ever been challenges or disagreements in the household about these decisions? Please explain. II Q17.3 E.g. For example, in some areas, men may prefer to sell the crop fresh while women prefer to sell the crop processed. This is linked to who has control over the product's sale and profit.**

Although not all respondents answered this question, the majority (28) of women say there are no disagreements and only 6 women say disagreements may arise at times. In line with the answers from the FGDs, many women who say there is no disagreement, explain that they eat whatever their husband decides. A woman in Ossissa, Delta North, explains:

'*it is my husband who decides what we eat. The Bible says obey your husband so whatever the husbands says that is what I will do'*. Many other women also explain that they follow the choice of their husband, whether they agree or not. '*There are times when there are disagreements when he wants to eat boiled plantain, while I want dodo, in those cases we always have to make what he wants to eat'*.

Also men who explain there may be disagreement at times, all explain that the women follow the choice of the husband in those cases:

'*In case of disagreement, our wives follow what we want to eat and cook their own choice the next day'*.

A few women explain that they may cook different products according to each person's wish. '*I take the decision on which product to cook. When my husband wants another product, I will cook it for him separately'*. Another woman also explains to cook different products according to everybody´s wish '*when my husband wants to eat a particular product, I will cook even my children can eat a different product'*.

Also most men (33) explain normally no disagreements arise and only 7 say disagreements sometimes occur. Most men explain that disagreements may arise on what plantain product to eat between the children and the wife or between him and the family. Few men (2) explain they will allow their wife to prepare what they want to eat and join them:

'*If we disagree on what to prepare, I will allow my wife and children to prepare what they like, I will eat whatever they prepare'*.

Two other men explain that they will cook what they want to eat themselves while the wife and children eat their own:

'*When there is disagreement, I can prepare my own food by myself while she prepares her own. The children are still young, they can either join me or their mother. When they grow up they can prepare what they want by themselves'*.

3.3.1 Household food budgeting

Thinking about when you harvest plantain, how much of the harvest was used for consumption at home? As what product? (kg/t) (II Q33.1)

Table 22: Percentage of harvest used for home consumption and sold fresh by sex and region (II Q33.1)

	Women	Men	Osun State	Delta State	Rivers State
Consumed					
% of harvest	21.9	18.7	24.7	9.4	23.2
Range (%)	0-50%	0-100%	0-100%	0-33.3%	0-100%
Sold					
% of harvest	78.1	81.3	75.3	90.6	76.8
Range (%)	50-99%	0-100%	0-100%	66.7-100%	0-100%

How much of the harvest was sold? (kg/t) Fresh or processed into what product(s)? To what market(s)? Probe between rural or urban market, trader, restaurant, food vendor, large company. II Q33.2

Obtaining quality data about the exact amounts of plantain harvested was difficult, although most people were able to estimate the percentage consumed and sold. Roughly, farmers consume on average 20% of their produce and sell the remaining 80%. There is relatively little difference between the estimate amounts consumed and sold by men and women. The most striking difference is the relatively low percentage used for home consumption in Delta State, which is in line with the finding that plantain is considered an important cash crop in Delta State (table 13).

As described in 'uses of the crop', most people sell plantain fresh. Only a few respondents specified the amount of plantain used for other products such as *bole*, flour and chips. One woman explains:

'*I can harvest like 3 to 4 bunches from my farm. When I harvest 4 bunches, I can sell 2 bunches, keep one bunch for consumption and one bunch for roasting bole'*. A man in Osun explains '*if I harvest 10 bunches, I will take all of the bunches to my company for chips making'*.

In many cases, the amount of plantain consumed is dependent on the season. The statement of a man in Ogudu is exemplifying for the answer of several respondents. He explains:

'*I always keep 2 bunches for home consumption irrespective of the quality harvested. I harvest plantain every 15 days. If I take more than 2 bunches at home it will spoil*'.

Other respondents sell more or less plantain depending on the season, and the associated fluctuations in terms of price and availability. Two men in Abua explain:

'*plantain has a scarce season between April to June. Surplus season is during November/December. Mr. Igenewari: I harvest 10 to 15 bunches every 4 days during the scarce period. During surplus I harvest 30 to 40 bunches. In my family, we use 2 bunches every week, whether scarcity or no scarcity. Mr. Ttor: I harvest 3 bunches every week during scarcity, and I*

harvest 40 to 50 bunches per week during surplus season. During scarcity season, I bring one bunch home and during abundance we use three bunches per week'.

Several people explain to only eat the plantain fingers that fell during harvest or that are about to ripen on the tree. These ones have been counted as 100% sold.

When has it been different? Under what circumstances? II Q 33.3

Almost all respondents witness an increasing production (mentioned by 52 respondents) and demand of plantain (mentioned by 20 respondents). This goes hand in hand with an increase in processors and availability of processed plantain products (mentioned 4 times). Most people explain the increased consumption (mentioned by 49 people) by the higher awareness of the health benefits of plantain. Plantain production is therefore also becoming more financially interesting, attracting more farmers to plantain farming. Others simply reason the population has increased and thereby also the consumption of plantain. A woman explains:

'*I have more customers buying dodo from me, many school students like dodo very much and there are more students in the school now than before'*.

Although most people explain production is increasing, there are a few individuals who personally experienced a decrease in plantain production (30). A woman in Isele Uku explains:

'*we harvested more plantain last year because we had more sunny days, this year, the rain is disturbing harvest of plantain'*.

Other reasons for a decrease in plantain production are ants, wind damage and dry season which all negatively affect plantain production. The most important reason for a decrease in plantain production is flood, especially mentioned in Delta and Rivers State (19). A woman in Umeh, Delta South, explains:

'*before, I did not worry about money because there was enough plantain to cut. But now, everyone is struggling as a result of the flood. Even the buyers don't come like they used to because the production has reduced. The people of Umeh used to eat plantain a lot, but now they go for alternative food products because plantain is not widely available'*.

A second problem with the recurrent floods is the unavailability of suckers. People in Umeh explain:

'*there is scarcity of suckers to plant. The problem of flood has affected the income of the family*'.

The community in Choba has experienced serious urbanization in the past years. 5 people therefore mention a decrease in plantain production. A woman explains:

'*in the recent time production has reduced due to land encroachment for residential buildings. Most of us now go outside the community to rent land for production'*.

A few people (6) talk about fluctuations in plantain production and marketing throughout the year. A woman in Ago-Owu explains:

'*plantain production and marketing has been fluctuating. Between march and June, plantain business is usually lucrative in the sense that it is not a plantain season and so few of us who have it are able to sell it at a very good price but from end of June to February there will be glut and the marketing price will be very low. It doesn't affect my family much since I have other business, I am doing to support the family needs'*.

Have changes in the production, processing or sale of the product affected you/your spouse/children? II Q34.1

Most people who have been affected by flood explain this affected their household income. A woman in Agoloma, Delta South, states:

'*the last seven years till now the planting has reduced because of flood. The flood reduces our income and causes us financial constraint. The flood reduces our income and make families to abandon their farm and relocate to other communities'*.

Another woman in Umeh, Delta South, explains:

'*the flood started in 2012 and has caused many people to leave this are. It has reduced the availability of suckers and also the demand for plantain has reduced because not many people are planting plantain again. The problem of flood has affected the income of the family*'.

It is mostly women who are concerned about the impact of flood on their family.

Some people who talk about fluctuating prices throughout the year explain to be prepared for the effect of the fluctuations on the family. A man in Ago-Owu, Osun West, explains:

'*the sales fluctuate depending on the season (in the past 5 years). Although the money one will reap from plantain in the time of glut will be small, my family does not feel it much since I have other crops I can sell to make more money*'.

Not all people are financially able to cope with fluctuations in prices and market demand. Another man in Ago-Owu exemplifies

'*when there is no market, it affects our family finances in the sense that we will not be able to pay for our children's school fees and it also affects the way we eat because we will not be able to afford a balanced diet*'.

Have there been any changes in the market or mechanization in your community? How has this affected your work? What about other groups of people? II Q34.2

The most frequently mentioned change (48) in mechanization is the **availability of chemicals and fertilisers**, which have reduced the labour involved in farming. A woman in Isele Uku explains:

'*we now have access to chemicals to control weeds on our farms. This has gone a long way to reduce the stress and time of weeding*'.

Many people experience a pest which is called Tampepe in Osun State, where insects make plantain trees to fall. The pest is often controlled with a chemical called Tari Tari. Amongst the availability of chemicals also spraying machines are mentioned. Apart from the use of chemicals to control weeds and pests, fertilisers are to a lesser extent used in plantain production. A man in Abua exemplifies:

'*some people are now using fertiliser unlike before, but I don't use fertiliser because the plantain planted with fertiliser tastes differently*'.

Although some people consider the introduction of chemicals and fertilisers as changes or innovations, others complain that chemicals and fertilisers have been available for around 30 years, and that since, no other innovations or mechanization took place. Apart from the increased availability of chemicals and fertilisers, people also mention the increased availability and use of tractors (9 people, in Isele Uku, Ago-Owu, Patara, and Ogudu), while 5 people (in Ossissa and Akola Alaerebere) complain they do not have access to tractors at all. A few people (7) mention the use of **hand trowels** (mostly mentioned in Osun State) compared to using cutlers. Only 16 people mention there are no changes in terms of mechanization or marketing in their community.

In terms of marketing, most innovations are related to the construction of better roads and the availability of improved methods of transport. The **construction of new roads** is mentioned by 4 respondents, in Isele Uku and Ago-Owu. A woman in Isele Uku explains:

'*the road from my farm to town is better now and so we can easily transport our plantains with bikes or trucks*'.

Although not mentioned by the IIs, also in Agoloma, the construction of a road played an important role in the previously water locked community. Apart from the construction of new roads, 3 people mention the improvement in terms of **transport**. A man in Ago-Owu explains:

'*we now have tractors in the settlement that help us to convey our crops from the farm to the settlement but in the past we use to pay women to do this which is more stressful and time consuming*'.

Also, the access to **new markets** is mentioned as positive change in the marketing of plantain by a few respondents (2). A man in Ago-Owu explains:

'*in the community the production of plantain is increasing and so has the volume of sales. Some people have even started exporting plantain. With this, many farmers in the settlement can now send*

their children to schools, meet basic needs of their families and maintain their farm'. Another man in Ago-Owu explains '*people are becoming more market oriented, and we have more places where we can sell our flour to*'.

3.4 Preparation and processing the product

***What are the processing and preparation steps for the three most common plantain products in your community? FGD Q12**

	Men FGD	Women FGD
Community 1 Ago-Owu (Osun)	For processing flour, we dice the plantain into chips after harvesting. Some even pound it before drying to make it dry faster. After drying we pound it and sieve it. Plantain is dried in the sun for 3 to 4 days. The flour should be creamy white, which makes a chocolate colour amala. If there has not been enough sun, the flour will make a dark coloured amala which indicates a bad quality. To make amala, we boil water and add the flour until it is done. For frying dodo, we use ripe plantain. We use a knife to open the finger and slice it into a plate. We use palm oil or vegetable oil which we heat on top of firewood or gas. We add salt to the dodo before frying. The quality of the oil is important. Also, the plantain should give an odour upon frying, if it does not, the plantain is not good. Also, the plantain should not be too ripe because it will take too much oil. We prefer dodo that is still firm. For making chips, we slice the unripe plantain. We add salt and use palm oil. The palm oil is heated in our frying pan or local pan. For chips, the crispiness is the most important.	
Community 2 Patara (Osun)	Dodo: peel and slice the ripe plantain. Sprinkle a little salt on the slices before frying. We heat the groundnut or palm oil. Once fried, the dodo will come out brown. Boli: peel the unripe plantain, split it with a knife and place it in a fire. Flakes: peel and slice the unripe plantain unripe and spread it out to sundry.	Dodo: you put oil in a pot on the fire, once it is hot, you peel and slice the ripe plantain and you put salt on it before frying. Flour: we put the peeled plantain into warm water over night, the following day we drain the plantain. If we don't soak it in water, the final product can cause stomach upset. Also, if it is not soaked, you will know the difference in the amala because it will draw, while the one that is not soaked breaks. After soaking, we slice and dry the slices in heaps on slabs. We use a mill to mill it, we have millers in the community and also in town. Before taking it to the millers in the community, we first pound it. When we take it to the big machines in town, we do not have to pound it beforehand, we can mill the flakes itself. If we have a big bag, we pay 300N to the miller. If the flour is for home consumption, we sieve it but for sale we don't because people do it themselves. We have a sieve in our house.

	Men FGD	Women FGD
Community 3 Ogudu (Osun)	Flour: we peel, slice and sun-dry the unripe plantain. After drying, you mill it into flour. Chips: we slice matured unripe plantain into thin pieces, add salt and fry. It should be very crispy once ready. Dodo: we peel ripe plantain, slice it, add salt and fry. We use palm oil or vegetable oil. We normally eat dodo with rice. Boiled: slice unripe plantain, add salt, and cook in water till it is soft. We eat it with red oil. Roasted: you can roast both ripe and unripe plantain. Here we like to roast the plantain with the peel. We roast the plantain on coals. When the plantain is done, you scrap the peel off the plantain. Roasted plantain is eaten with red oil.	Flour: we peel the plantain and slice it into pieces. We use clean polythene bags for drying. After 3-5 days of sun-drying the plantain is dry. Boiled/mashed plantain: we first put water on fire, after which we wash the plantain with peel. When the water boils, we cut the plantain in 4 to 5 pieces and boil it in the water with salt. After 5 minutes, it should be ready. When it is boiled, we peel the plantain slices. Then, we use a small plate and pestle to mash it. We eat it with stew or vegetables. The stew or vegetable must be ready so you eat it together before the plantain gets cold and hard. We use unripe plantain for boiling. Dodo: we use ripe plantain and vegetable oil or palm oil. First you slice the plantain and add a little bit of salt. After frying, we eat the dodo with rice, beans, vegetable, fried egg, gari or pap.

	Men FGD	Women FGD
Community 4 Akola Alaerebere (Osun)	Dodo: when plantain is ripe, remove the peel, slice it with a knife, sprinkle a little salt and fry it in a pan with palm oil or groundnut oil. Palm oil is more commonly used here. When finished, it should have a sweet smell, the appearance will be very brown. It should not be black because it means it is burnt. While eating, it will be sweet in the mouth and it will be a little bit soft in the mouth. If it is too soft it means the plantain is too ripe. Upon touching it will not be too soft or tough. We eat it with gari, rice, beans or pap. Boiled plantain: we wash the fingers, cut the tip at both ends and use the knife to open up the peel a bit. Then we slice it into a pot, and cook it with a little bit of salt and water. Some remove the peel before cooking but plantain boiled with the peel is more beneficial to the body. We eat boiled plantain it with palm oil, groundnut oil, fried pepper sauce, and abumu vegetable (made from leaves of red cocoyam). When boiled, the smell is not as sweet as fried dodo. When touching, it will be hard because it is an unripe plantain, but when chewing it will scatter in the mouth like cooked yam. Boli: we split the plantain with a knife, put it besides the fire place, pour hot coal on it and when ready (when soft on feeling/touch) we remove it from the fire. Then we remove the peel and eat it with red palm oil and fried pepper sauce. When ready, the plantain will have a slight brown colour. If it is too brown it means it is burnt. It will be a bit soft on touch, the taste will be palatable. Pounding: we pound plantain with yam. We spread a freshly harvested plantain in the sun and cook it later. If you want to pound plantain with yam, you peel and slice the yam into big slices and arrange it in a pot. After that, you remove the peel of the plantain. You may cut the plantain into two and arrange them on top of the yam in the pot. You boil it for 10 to 20 minutes. You wash the mortar and pestle and pound the plantain first because it takes more water than yam. When smooth, remove the pounded plantain from the mortar and transfer it into a plate. Then pound the yam until smooth and then add the pounded plantain. Add water and mix with pestle until you get a desirable texture. We eat the pounded plantain with yam with okra soup, egusi, ogbolo, vegetable soup with meat, ewedu soup and stew. When ready, the appearance will be attractive, butter colour, and smooth (no lumps). When touched or eaten, it will be soft and it will be weighty when you pick it. Flour: when you harvest plantain, detach the fingers, remove the peel, slice it like chips and spread it out on concrete slabs to sundry. If the sun is very high, it will dry within 3 days. When dry, pound the dried flakes in a mortar, then take it to the milling machine. After milling, sieve it to remove shaft. To make amala, boil water and mix the flour until it forms a desirable texture. The flakes should smell like plantain, the amala will have a chocolate brown colour, the flakes will be white if it is well dried, when you break them they will cut/break easily. The colour of the flour itself will be butter colour/creamy. We eat it with vegetable soup, ewedu and bean soup.	Amala: after sieving the flour, boil water and pour the flour into the water. You mix and stir it until the right texture is derived. Add water if you need to and allow it to cook. It can take up to 10 minutes to prepare amala. When you have good flour, you only need a small quantity because it rises/swells in the water. The colour is light brown. You can have bad Amala if the flour is not well dried. In that case it does not separate (it is not smooth) like the good flour. Dodo: slice ripe plantain, add salt and fry in hot oil. Once ready the colour is golden yellow to brown. A good dodo is soft and still a little bit firm, plantain that is not too ripe is best for dodo, when is a bit soft.

	Men FGD	Women FGD
Community 5 Isele Uku (Delta)	Dodo: make a fire, peel plantain, pour oil into the pot on the fire, slice the plantain, pour the plantain slices into the oil and allow it to fry. Boiled plantain: make a fire or light a stove, cut plantain into 3 pieces, wash them and put them in the pot and allow it to boil. Plantain porridge: Set a fire, slice the plantain in pieces after peeling. Boil it in water. When it boils, add ingredients like pepper, crayfish, salt maggi, and palm oil. Plantain pudding: Peel and slice unripe plantain, dry in the sun and grind into powder. Then look for ripe plantain (overripe) and pound the overripe plantain. Then turn the powder into the pounded overripe plantain, mix them together, and add oil, pepper, crayfish and salt. Once mixed put it in a nylon or local paper and put the nylons in the pot to cook. It will turn to pudding.	Plantain porridge: wash and peel unripe plantain. After peeling, put the plantain in water and wash again. Then cut to your desirable size and bring pepper, tomatoes, onion, crayfish, (dried) fish, oil, and scent leafs. Then boil the plantain and add the ingredients. The leafs are added last. After adding the leafs, cook it slightly longer before it is ready for consumption. The food is ready when the smell of the scent leafs and other ingredients covers everywhere. The porridge will be soft like beans when it is cooked. Dodo: peel and slice ripe plantain, use salt and when the oil is hot you put the plantain slices and fry them to a golden colour. The aroma is sweet like sugar and the texture should be firm. When you put it in your mouth it tastes good. Plantain and Beans: wash beans and put them in a pot and cook them for a while until they are a little bit soft. When soft, you cut the ripe plantain and add it to the beans. You also add onions, crayfish, pepper, tomatoes and red oil. Then you leave it to cook until done.
Community 6 Ossissa (Delta)	For amala: peel, slice and dry the plantain first. Then pound the dried slices with a mortar. Sieve the flour after pounding. Then boil water and add the flour while stirring. A good plantain amala is soft and light brown in colour. If you have amala that draws, it means it has been mixed with something else, or it means the water was not boiling well when adding the flour. When the plantain has not matured well, the amala will be darker in colour. Also when the flakes are not well dried, the amala will turn out dark in colour. Pounded plantain: peel and boil the unripe plantain. Then pound it in a mortar with either fufu or yam. Add warm water till smooth to taste. It can be eaten with any soup. Averagely-matured plantain is easier to pound and is light green in colour. Well-matured plantain is dark green. Porridge plantain: peel the plantain and cut it into small sizes. Then put it in a pot, add fish and other ingredients. If we do not want to eat porridge plantain, we boil the plantain and make the sauce separate. You will know your porridge is done when you pick with a fork and it is soft.	Porridge: peel and cut unripe plantain into small pieces. Then put water on the fire and heat it for some time before adding the slices of plantain. Add cray fish, pepper, red oil, onions, vegetable and scent leafs. Cook the porridge until it turns red (it is the oil and ingredients that turn the porridge red when mixed very well). Beans and Plantain: the beans will be cooked for 45 minutes until half done. Then add the slices of ripe plantain, onions, cray fish, magi and oil. Leave it on the fire until the beans and plantain is done. Plantain porridge can be eaten with pap. Bole: we use unripe plantain for roasting bole. We first make a wood fire. When the wood turns red, we peel the plantain and roast it until it is brown. Once finished, we scrape the body with a knife. We use oil and onions to eat bole. The texture will be soft and brown and the taste is sweet when you are eating it. Roasting both ripe and unripe plantain is very sweet. Soap: sun-dry the peel of unripe plantain. Then burn it into ashes, gather the ashes and add water. When mixed, sieve the mixture into a plate with a strainer (cloth). Dry the liquid and turn it to potash. Add fragrance of your choice and turn it on a fire until it rises (it will be bubbling), remove from fire and allow to cool. It is then ready for use.

	Men FGD	Women FGD
Community 7 Agoloma (Delta)	Plantain with beans: boil beans first, wash them and boil again. Then add potash, and once it softens, add the other ingredients. Peel and cut the plantain into pieces. Do not allow the plantain to get too soft when cooking it with beans. Both varieties of plantain can be used but people say Efrun is sweeter than Gberibe. Porridge plantain: wash the plantain, peel and cut it into pieces. Then boil it with the addition of potash and then add the other ingredients. Porridge plantain will be soft like ripe plantain when it is not cooked. Dodo: peel and slice the ripe plantain, add salt and fry it. A good dodo is when you put fork and it holds. The colour will be yellow or red, depending on the oil you use. We do not like dodo or plantain when it is forced to ripen because it does not taste well.	Plantain and beans: put the beans in a pot on the fire and boil until soft. First wash the plantain, then peel and cut the pulp into small sizes. Add the plantain to the beans, and add pepper, crayfish, oil, salt, onion and maggi. Continue to boil and turn well to mix. The colour will be red and the texture will be thick. Some plantains may scatter while others will remain hole.
Community 8 Umeh (Delta)	Boiled plantain: some people like ripe boiled plantain, others prefer it unripe. Peel and wash the plantain, then put it in the pot on fire, and add salt and potash. We add potash to unripe plantain to soften it. It will turn from white to yellowish when it is done. A good boiled plantain is sticky in the hand when touched. The taste is sweet but not as sweet as the boiled ripe plantain. Plantain with beans: peel the plantain, cut it into small pieces and boil with beans. Add seasoning and other ingredients. It boils faster when you use fire wood to cook the unripe one. The most important step is to ensure the softness of the beans. Pepper soup: for fish pepper soup, put the plantain together with the fish in a pot, add all the necessary ingredients and water. It will be watery. After boiling the plantain, pound it in a mortar and add back to the soup to make the soup thicker. The most important step in preparing plantain is the addition of salt and potash to make it sweeter.	Boiled plantain: Peel and wash unripe plantain and put it in a pot. Then add pepper and potash and cover it to boil. You use red oil or groundnut oil and egg to eat it. If you do not eat it with oil and egg, you add salt and magi while boiling. After some time, you add potash and you leave it to cook for a little longer. Then you use oil to eat it. Porridge: Wash plantain and cut it in small pieces. Wash the beans and put it in the pot with the plantain and boil it together. Then add pepper, onion, potash, crayfish and fish, and allow the water to dry up. Plantain pepper soup: peel and cut the plaintain into small pieces, boil it and add fish when is about to be done. Add fish, pepper, and onion and boil until it is done. We eat it with oil.

	Men FGD	Women FGD
Community 9 Choba (Rivers)	Pepper soup: wash and peel unripe plantain and cut it into pieces. Then allow it to boil before adding fish, periwinkle, scent leaf, pepper, magi, and onions. Cook all ingredients together until it is done.	Plantain porridge: cut unripe plantain from the bunch, wash it, peel it, and cut it into smaller pieces. Then arrange it in a pot and add a little water, crayfish, dry fish, onion, salt and maggi to taste, red or vegetable oil (depending on your preference), and pepper. Put it on a fire and monitor until it is cooked. Cooking porridge takes 10 minutes when using gas. Bring it down from the fire and serve. When done, it should not be watery, it will take on the colour of the oil, the plantain should be soft but not as soft as moimoi or yam, and the taste will be nice. The aroma will be very fine. The softness will depend on the size that you cut it into and people's individual choice. It will be very attractive. If not well cooked, the plantain will draw in the mouth. Some also poor away the water from the pot after a first boiling and before adding the ingredients. Pepper soup: cut the plantain into the size that you want but not as small as that of plantain porridge. Then wash it with hot water so that the plantain will not turn black. Then put it in a pot and add water, fish, pepper, salt, maggi, crayfish, and periwinkles. When cooked, add the scent leaves and allow it to cook for a little while before removing it from the fire. Dish the plantain into a plate, cut it into smaller sizes, sprinkle oil on the plantain as well as fresh pepper and onions and mix. The soup will be served into a separate plate. You will eat the plantain and drink the soup along with the plantain. The plantain will be very soft and as you mix it with oil, the colour will be red. The aroma of the pepper soup will be attractive and the taste will be nice. Dodo: keep the plantain until it is ripe. You can wrap it in a bag to ripen while some leave it to ripen on the ground. When it is ripe, peel and slice the plantain and add salt. Then you put groundnut oil on a fire, and add a little bit of salt and onion to the oil. When hot you can add the plantain and fry it. We eat it with tea. The taste is sweet and you will taste that salt has entered. The colour is brown but if it is black that means it is burnt. The texture should be soft when you touch it. It should have a fine aroma/smell, Ikwere (main plantain) plantain smells better than other varieties of plantain.

	Men FGD	Women FGD
Community 10 Omoku (Rivers)	Dodo: wash and peel ripe plantain. Then slice it and add salt. In the meantime, you heat groundnut oil on a gas fire or stove. Then you fry it while turning until it is cooked. It is cooked when the colour is golden yellow and the texture soft but firm because we do not use overripe plantain. Plantain and beans: put the beans in a pot and parboil for at least 30 minutes. Remove the boiling water and wash the beans. Then start to boil again by adding plantain, onion, pepper, crayfish, or fish, salt and magi. You add leafs and palm oil at the last moment when the beans and plantain have cooked. Leave it to boil for a little before removing the pan from the fire and serve. Pepper soup: peel the plantain by washing it first and cut it into three pieces. Then put it in a pot and boil it for some time before adding pepper, salt, magi, onions and pepper soup spices. Cook until the plantain becomes soft then add fish and allow it to cook for some more time. Add scent leafs at the end. Serve the soup by removing the plantain, which is served on one plate and serve the pepper soup water with fish on another plate.	Plantain porridge: wash the plantain, peel it and cut it into small slices (dice into four smaller pieces). Cut it into a clean pot, add water, pepper, oil, maggi and other ingredients and cook until it is ready. Then add sliced vegetables, steam it for 2 minutes and turn it with a spoon. Bring the pot down so the vegetables will not be too soft. The preparation of porridge will take about 30 minutes all together. Plantain porridge can be made with unripe plantain or plantain that is about to ripen. Beans and plantain: parboil the beans, drain the water and add fresh water to cook for a while. When it is done (cooked), wash, peel and dice your plantain and add to the beans. Add oil, pepper and other ingredients. Keep checking the pot from time to time. When cooked, bring it down from the fire. Dodo: peel and cut ripe plantain into straight pieces (do not dice it like that of porridge), add a pinch of salt according to the quantity of plantain. Fry in heated oil on fire in a frying pan.
Community 11 Abua (Rivers)	Onunu: buy a dry yam, bring out one hand of plantain (well ripe), cut the fingers into 3 pieces, and boil it with the yam. Don't add salt until after boiling. Remove the peel of the plantain after boiling, then pound the ripe plantain, add the yam and pound together. Add pepper, salt, maggi, onion and keep pounding. You can use pepper soup or stew to eat it with. Any ripe plantain can be used for onunu. The oil will determine the colour of the onunu. The texture will be bristle but it does not break or draw. It will be soft and you smell the aroma of the yam or ripe plantain. Porridge plantain: peel the plantain. Allow water to boil before adding the plantain. Prepare fish or snails, cut the leaf of ugu or any other vegetable, add pepper and salt. When you have fresh fish, you boil it for a while before removing it. Then you add oil to the boiled ingredients and turn the porridge. All the plantain varieties are good for porridge. A good porridge plantain will be dark red because of the oil. Roasted plantain: Some roast plantain with the peel while some peel before roasting. Also, some do not use salt for roasting while others do use salt to roast. You peel and use salt to rob on the pulp and place it on a brim of fire and allow it to roast for about 30 minutes. You can eat it with either oil or any other thing. Any plantain variety can be used for roasting. Pepper soup: peel the plantain and cut it into pieces. Put water in a pot on fire and allow it to boil. Add the plantain, salt, pepper, and fish and allow it to boil. Others prepare pepper soup and boil plantain separately. When ready, the colour of the plantain will change from light yellow to dark brown.	Porridge: put water in a basin and wash the unripe plantain in it. In the meantime, place a pot of water on fire. Peel the plantain and cut it into smaller pieces. Pour the plantain into the boiling water. Allow it to boil for a while before adding bitter leaf, meat, fish (dry or fresh), ugu leaf or native leafs (akporh), pepper, maggi, salt, and onions. At the last stage, add oil and allow it to cook for a little while before serving. Onunu: put water on fire. Wash the unripe plantain, cut it and put it in the pot with the peel. Peel, wash and cut the yam and add it to the pot together with the ripe plantain. We put the unripe plantain first because it takes longer to cook than the yam and the ripe plantain. When cooked, peel the unripe plantain and pound it first till smooth. Then add the yam and pound it together. When smooth, peel and add the ripe plantain and pound it all together into the desired texture. When pounded, add salt and red oil to taste and pound again for proper mixing.

	Men FGD	Women FGD
Community 12 Etche (Rivers)	Boiling: peel and wash the plantain in water. Wash the pot as well, and put the plantain in the pot while cutting it into 3. Add water, put it on the fire and boil. When boiling, the peel will tear which shows it is cooked. We use oil and pepper to eat it. When cooked the plantain will change to a darker colour. The texture is soft and we use a knife to check the texture. It will taste like plantain. Porridge: peel and slice the plantain with a knife and wash the pot. Fry the other ingredients like onions and pepper. After frying, we pour it in on the plantain and cook it together. We also add periwinkle and oil. Once cooked, the texture will be soft. After cooking the plantain will gum together. If the plantain does not gum together (if the plantain 'stands') it is not well cooked. Bole: roast the plantain with the peel in the fire and turn it every once in a while. When roasted the plantain will swell because of the fire. We will remove the peel and take it back to the fire to roast it a little bit longer without the peel. When ready, we scrape the pulp with a knife. In the meantime, we will prepare pepper, onions and oil to eat it with. When cooked, the plantain colour will be yellow both inside and outside. Also, after roasting, the plantain finger will be lighter in weight.	Porridge: peel and cut the plantain into small pieces. Pour the pieces into a pot on the fire. Add water and ingredients such as stock fish, crayfish, periwinkle, onions and salt. Allow it to cook together before serving. Boiled with beans: boil beans first, throw the water away and poor the beans back inside the pot. Add water and sliced plantain and boil it together. When the plantain is soft you add other ingredients. It is soft enough when both the beans and plantain melt. The colour is red from the oil. Pepper soup: peel and wash the plantain. Cut it into 3 to 4 pieces. Pour the slices in a pot and add water, pepper, salt and meat. You can perceive the aroma (pleasant aroma like scent leaf) when it is cooked. When the colour of the pepper soup turns yellow (deep) you will know it is cooked.

***Are there variations of the product and variations of the processing of plantain products in your community? Are the variations related to different varieties, food processes or food preferences? Please describe. FGD Q13.**

The FGD participants were asked to describe the processing steps for their three favourite plantain products. There are many different products with some variations across regions. Roasted plantain, boiled plantain and dodo are commonly consumed across the different regions. In Osun State, plantain flour that is used for making amala plays an important role in people's diet, while plantain porridge and beans with plantain are more common across Delta and Rivers State. Plantain pepper soup is commonly found in Rivers State.

The way in which the products are prepared is similar. The FGD participants explain that other tribes process plantain similarly. Men in Ago-Owu, Osun West, explain:

´other tribes process their plantain similarly´.

As can be seen from the descriptions above, there are differences in processing methods depending on individual preferences. Women in Ogudu exemplify:

´the processing depends on individual preferences, some people like dodo well fried until it becomes soft, while others prefer it when still firm´.

This can also be seen for other plantain products. Some people boil or roast plantain with peel, while others peel plantain before cooking. Similarly, there are variations in the amount of salt and types of other ingredients added, especially for products as plantain porridge, pepper soup and plantain with beans.

Who typically is involved in conducting this step? Probe: social segments and hired or household labour etc. e.g. female hired labourers; women and girls in the household FGD Q12.2

All FGD participants state that women are mostly involved in the processing of plantain, both for home consumption and for sales. In Isele Uku, a differentiation is made between the products prepared by young and older women. The participants to the male FGD say

´pudding is mostly prepared by elderly women, while chips are mostly made by young women´.

Male participants to the FGD in Abua, Rivers State, explain women are generally responsible for cooking plantain products, but only young women are engaged in processing plantain for sales and only young women hawk plantain products.

Flour is a common product in Osun state, and mostly processed by women. However, both in Ogudu and in Akola Alaerebere, men and women explain that husbands may help in case of need. Men in Akola Alaerebere, Osun East, explain:

'*the women in the house process but we men help them once in a while when the women are too busy*'.

Women in Ogudu state that apart from their husbands, also children and labourers may help with the flour processing if the quantity of plantain is much. The labourers are mostly from Togo and paid on an annual basis to help in different aspects of farming.

***What are the most important processing steps or parameters you need to control very well to obtain of high quality [product under study]? II Q22.**

CODE all of the steps mentioned in all of the response and create a list. This list can go in the first column of the table. Secondly, count the frequency that the group who makes the decisions in the female II, then the male II, followed by region X and region Y. Repeat table for all the products.

Table 23 The most important processing steps to obtain a high quality product cited by sex and gender (II Q22)

	Most important processing steps	No of women citing	No of men citing	No of Osun State citing	No of Delta State citing	No of Rivers State citing
Dodo	Ripen unripe plantain	2	2	1	3	
	Wash the unpeeled plantain	7	4	2	1	8
	Peel	29	17	16	14	16
	Slice	29	16	16	14	16
	Wash the peeled plantain	2	2		3	1
	Sprinkle salt	23	14	12	11	14
	Add water to oil (to avoid plantain from soaking oil)		1			1
	Fry (in vegetable, palm or groundnut oil or shea butter)	30	17	16	15	16
	Add onion to oil	3			1	2
	Fry on high fire to avoid soaking oil	1	2	1	2	
Flour	Wash		1	1		
	Peel	10	6	14	1	1
	Soak in water	2		2		
	Slice vertical	10	6	14	1	1
	Sundry	11	8	17	1	1
	Pound before milling	2	3	5		

	Most important processing steps	No of women citing	No of men citing	No of Osun State citing	No of Delta State citing	No of Rivers State citing
	Grind/mill	7	8	13	1	1
	Sieve	6	7	12		1
	Package in airtight container	1			1	
Amala	Boil water	1	4	3	1	1
	Pour flour into boiling water	1	4	3	1	1
	Turn the amala with wooden stick till smooth	1	4	3	1	1
Plantain with beans	Wash beans	3	4		2	5
	Soak beans	1	1		1	1
	Parboil the beans	14	13	5	9	13
	Strain the beans	7	5		5	7
	Fry the bans in palm oil		1		1	
	Add clean water	5	5		4	6
	Wash the plantain	4	2	1		5
	Peel plantain	4	7	4		7
	Slice the plantain	4	3	1		6
	Parboil the plantain		1			1
	Add unripe and/or (over)ripe plantain	12	10	2	8	12
	Add oil, onion, pepper, salt, vegetables, crayfish, maggi	13	12	3	9	13
	Add potash	1	2		3	
	Boil	10	5		8	7
	Mash	1			1	
Roasted (bole)	Wash the plantain		2	1		1
	Leave the plantain for 2 to 3 days to allow sap to dry	1				1
	Peel the plantain	14	15	5	8	16
	Make marks on the body (so that heat and/or salt can penetrate)	3	3	1	2	3
	Add salt	8	4	2	3	7
	Prepare coal fire	6	5	2	5	4
	Place plantain on wire gash	4	4	3	3	2
	Place plantain on coals directly	6	7	1	4	8
	Roast plantain with peel	3			1	2
	Roast	12	9	3	9	9
	Keep vanning the coal		1			1
	Keep turning the pulp	6	7	2	4	7
	Scrape the plantain with a knife	10	6		8	8
	Cut/break in pieces	2	1		2	1

	Most important processing steps	No of women citing	No of men citing	No of Osun State citing	No of Delta State citing	No of Rivers State citing
Boiled plantain	Wash unpeeled plantain	5	8	2	4	7
	Cut peel lengthwise (without removing)	2		2		
	Peel	8	9	5	9	3
	Wash after removing the peel	3	4	1	5	1
	Cut/slice	6	16	5	9	8
	Add salt (while boiling)	10	10	6	6	7
	Add potash		1		1	
	Boil in water	11	17	8	10	10
	Allow to dry and add fresh water	1				1
	Peel (after boiling)		4			4
Porridge	Wash before peeling	11	6		4	13
	Peel	27	16	1	17	25
	Scrape the pulp after peeling	1				1
	Wash plantain with water (after peeling)	15	4		10	9
	Cut into pieces	26	15	1	17	23
	Wash fish and put on top of plantain	1			1	
	Boil in pot with water	24	15		17	22
	Add potash	2	2		4	
	Add salt, fish, meat, maggi, tomatoes, pepper, onions, oil.	29	18	1	19	27
	Add vegetable leafs (scent, ogu or pumpkin leaf) towards the end of the cooking	17	6		13	10
	Add periwinkle	5	1			6
Chips	Wash the plantain before peeling	2	1	1	1	1
	Peel	5	7	5	3	4
	Slice into long slices with a slicer	1	1		2	
	Slice into water	1			1	
	Slice	5	8	5	4	4
	Wash the slices	1	1	1	1	
	Sprinkle salt (or sugar)	5	5	3	4	3
	Fry (in groundnut or palm oil)	6	9	5	6	4
Pudding (okpa)	Peel	5			5	
	Do not wash	1			1	
	Wash the plantain	2			2	
	Slice/cut	5			5	
	Dry under the sun	6			6	
	Pound/grind the dry slices	6			6	
	Sift/sieve	1			1	
	Pound/mill overripe plantain	5			5	
	Mix the overripe plantain with the flour	5			5	
	Add potash	1			1	

	Most important processing steps	No of women citing	No of men citing	No of Osun State citing	No of Delta State citing	No of Rivers State citing
	Add sugar	1			1	
	Add oil, salt, onions, pepper and water	5			5	
	Mix well	4			4	
	Scoop in leaves/plastic wrapper	6			6	
	Boil	5			5	
	Ensure heat circulation	1			1	
	Ensure water does not enter the wrapping leaves	1			1	
Pounded plantain	Wash the plantain	2	1	2		1
	Prepare (yellow) gari	2	1		3	
	Peel plantain	5	6	6	4	1
	Cut plantain	2	4	2	2	2
	Wash the plantain	1				1
	Use 4/6 ratio plantain to yam		1	1		
	Wash yam	1	1	2		
	Peel/cut yam	2	5	7		
	Boil yam	3	5	5	3	
	Boil plantain	6	5	5	4	2
	Boil yam and plantain together (arrange plantain on top of yam)	1	3	4		
	Boil without salt		1	1		
	Pound the plantain	7	7	9	3	2
	Pound yam	1	4	5		
	Mixt/pound together	6	7	9	4	
	Add gari	1	1		2	
	Add (warm) water	2	1	3		1
Pepper soup	Wash unpeeled plantain	6	2		1	7
	Wash unpeeled plantain with salt	1				1
	Peel plantain	14	7		5	16
	Wash peeled plantain	6	2		3	5
	Cut plantain	12	9		5	16
	Boil in water	14	8		6	16
	Wash fish	2	1		2	1
	Add fish/meat, salt, pepper, maggi, scent leaf	14	8		7	15
	Boil	7	3		3	7
	Make separate fish pepper soup and eat with the boiled plantain	1				1
	Peel the plantain after boiling		1			1
	Serve plantain and fish separate	6	2		2	6

Processing resources and access

***What are the resources required for processing plantain? note if they are community or household based FGD Q12.3**

Utensils required for the processing of plantain are pots, knives, mortar and pestle, sieve, spoons, stove, wire gash, (aluminium) plates, frying pan, bowls, and polythene sacks or slabs for drying of plantain. These are all basic household items in the possession of most families. For the grinding/milling of dried plantain chips into flour, many people go to a milling machine. A milling machine is not a household owned asset but normally owned by individuals and rented out as a

private business. If people do not want to use a milling machine, they use mortar and pestle to grind dried plantain into flour.

In yesterday's group discussion, it was mentioned that people require a number of resources [list] for processing the product. How do you access those resources? See codes 1 to 5 below. II Q32

Table 24 Mean score of access (1-4*) to equipment or utensils required for processing the crop into the product by sex, region and ethnicity

Equipment or utensils required for processing the crop into the product	Mean score of access 1-4*	
	Women	Men
Pots	1	1
Knives	1	1
Mortar and pestle	1	1
Sieve	1	1
Spoons	1	1
Stove	1	1
Wire gash	1	1
Plates	1	1
Frying pan	1	1
Bowls	1	1
Sacks or slabs for drying plantain	1	1

*Legend

1-own outright, 2-use but wouldn't take in a divorce, 3-rent, 4-borrow from husband, 5-other

Similar to the findings from the FGDs, all interviewees explained to have outright ownership over all utensils used to prepare different plantain products. Respondents explain that the utensils are basic household items that any household should have. A woman in Abua, Rivers West, explains:

'*a matured woman must have all these things like pots, knives, and frying pan'*.

Four respondents explain own all resources required, but that they may borrow a utensil from family members or neighbours in case of need. A woman in Etche, Rivers East, explains:

'*we have pots, bowls, knives, plates. I sometimes borrow a pot from my neighbour if I want to make many different dishes'*. Only one young woman in Ossissa, Delta North, explains '*I do not have fry pan but I borrow it from my mother and return it after use. I am planning to buy a big one when school opens*'.

Most people explain that if they lack any of the items used to prepare plantain products, they can easily buy them at the market. A man in Etche, Rivers East exemplifies:

'*the resources for processing plantain are readily available, not at all expensive'*. The only resource not owned by all households is a milling machine. Only four respondents (three women and one men) in Osun (where plantain flour is a common product) explain to own a milling machine, which they rent out. A woman in Akola Alaerebere, Osun East, explains:

'*I own a mill and people come to mill and pay me for that'*. Milling machines are generally easily available for people who do not own a milling machine.

Processing challenges

Are there any challenges you experience with processing and sale of the product? Please explain. Rank in order of importance 1=most important challenge. II Q26.

If the responses are sparse, summarise challenges and in what locations, and for who.

There are relatively few challenges in processing and sale of plantain. 49.7% of people who answered the question do not experience problems related to plantain processing and sales. Many people do however describe challenges related to the production of plantain (which have not been taken into account in this question). Main challenges faced regarding marketing of plantain are a lack of demand or market (13.8%), fluctuation in prices or low prices (8.6%) and transport challenges (13.8%) due to bad roads or high costs associated with transport. Main challenges in terms of processing of plantain are related to lack of ingredients for the making of plantain products (5.2%) such as wrapping leaves and fire wood. Others experience challenges related to the processing itself, such as burning (8.6%), staining of hands and cloths by plantain juice (8.6%), and slicing which is considered tiring and/or time consuming (3.4%). Another major challenge in plantain processing, especially in Osun State, is the fact that plantain cannot be dried during the rainy season (8.6%).

3.5 Consumption of the product

How is the product prepared? (immediately prior to consumption) (cooked into paste, added with water, with ingredients, boiled, steamed…) FGD Q16.1

Please refer to table 23 for a summary of all steps required for the preparation of all most important plantain products. Although there are differences between respondents, the most important steps in the preparation of products are generally similar. As can be seen for fried plantain (*dodo)*, the main steps are peeling, slicing, adding salt and frying. Some people wash the plantain either before or after peeling, some do not add salt due to taste differences or health reasons, and others add ingredients such as onion or water to the frying oil to enhance the taste or to reduce the absorption of oil by the plantain slices. The preparation of dodo is rather straight forward and there are only few variations. Dishes involving more ingredients and more preparation steps, such as pounded plantain, plantain porridge plantain with beans, and plantain pepper soup, show more differences between one respondent to another. These differences may be regional, for example the addition of periwinkle to plantain porridge which happens mostly in Rivers State, or dependent on personal preferences.

Although the chapter on ´Preparation and processing the product´ shows that women are mostly engaged in the processing and preparation of plantain products, men are equally able to give detailed accounts of the important steps in the preparation of plantain products. Products that seem especially important to men are roasted plantain (bole) and boiled plantain. Roasted plantain is often prepared while working in the field, and also boiled plantain is preferred by men.

What is the product consumed with? FGD Q16.2

Dodo can be consumed as a snack or with tea, as breakfast accompanying rice and beans, with fried egg, pap or gari. Plantain flour is often used for the preparation of amala, which is consumed with any kind of soup. Amala is mostly consumed in Osun State, whereas plantain flour is more frequently used to produce plantain pudding in Delta State. Like amala, pounded plantain is also consumed as swallow (a fufu like subsistence) with any kind of soup. Boiled plantain can be considered as a substitute for rice or starch component of the meal, and eaten with either red palm oil alone, fish, stew or vegetable soups. Plantain pudding is consumed alone. Also plantain with beans is a dish in itself and can be consumed as breakfast or lunch. Roasted plantain (bole) can be eaten as a snack. In Osun State, many people eat bole with groundnuts, while in Delta and Rivers, people use red palm oil and in some cases fish to eat bole. Plantain porridge and plantain pepper soup are both consumed as a meal in itself.

***When a person (you or a member of your family) says that the quality of a plantain product is not good when they eat it, what are the general reasons for this? II Q29.**

Summarise the poor sensory characteristics of a very bad product. Explain if the main reasons come from the crop variety, the harvest time of the crop, some processing steps, the processor's skill or time after product preparation or storage conditions… If there are differences by gender, region, ethnicity, product variation etc show in a table and describe in the text.

Main reasons for having a poor quality product are related to either the cooking process (69%, mentioned 28 times by women and 26 times by men) or the qualities inherent to the plantain itself (31%, mentioned 14 times by women and 10 times by men). The latter mostly refers to plantain that is either not mature (42.9%), or too ripe for the prepared product (53.6%). There is just one female respondent (3.5%) who explains that plantain with white pulp is unsuitable for making chips:

´unripe firm plantain is best for chips, but when the colour is white, it will not turn out fine, it will be hard´.

In the cooking process, there are different aspect that can go wrong. The most important reason for a plantain product to be of lesser quality is because it is not well cooked (31%), burnt (26%) or overcooked (6.5%). Other reasons relate more to the added ingredients, such as the usage of bad or rancid oil (9.7%), the addition of too much salt (3.2%), the addition of too many ingredients (1.6%), or the addition of salt too early in the cooking process preventing plantain to soften (1.6%). Specific to pounded plantain and amala is the fact that it should not have lumps after pounding or stirring (9.7%). For dried plantain flakes used to make flour, it gives a bad product if it is not well dried (4.8%). Other steps mentioned are the slicing of plantain for dodo (1.6%), which should not be too thick or thin and the soaking of oil by plantain slices for dodo (often related to the ripening stage of the plantain) (1.6%).

Thinking of people in your community, how often is the product consumed. Is this the same for everyone in the community? Probe on social segmentation. How has this changed in the last five years? KII Q9.

Across the different regions, plantain is consumed between once a week to daily. The diet in some locations is based mayorly on plantain while others are more based on cassava. For example in Ago-Owu, the key informant explains that the diet of people is more based on cassava and yam than plantain:

´people here do not eat plantain every day. They eat other foods like yam and cassava´. Also in Etche, Rivers East, the key informant explains *´people in the community can take plantain 3 or 4 times in a month. They focus on producing for sales rather than for consumption. In this community we depend more on gari´*,

While in Omoku, Rivers West, the key informant explains:

´People in this community (indigenes and non-indigenes) eat plantain almost every day´.

The consumption of plantain depends on individual preferences and seasonality. The key informant in Ossissa, Delta North explains:

´I cannot tell how often people eat plantain, because some eat it fresh, some can buy plantain chips as snacks, and some can go buy dodo to take with Akamu every morning´.

Also in Agoloma, Delta South, the key informant explains:

´the consumption varies from one household to another. Some people grow plantain mainly for consumption while others sell the little plantain they have to buy fish for consumption´.

Apart from differences in individual consumption patterns, the consumption of plantain is seasonal. In Osun state, plantain flour is an important plantain product mostly processed during the dry season when there is a general surplus of plantain. The key informant in Akola Alaerebere, Osun East, explains:

´farmers eat more plantain during surplus, and lesser during scarcity when plantain is expensive and people prefer to sell most of their plantain´. The key informant in Patara, Osun West, explains *´we only make plantain flour when the market is not good´*.

There is no clear difference between the consumption patterns of plantain of different social groups. The key informants across the regions underline that there is no difference in the consumption of men, women, young or old people. The key informant in Omoku exemplifies:

'*people in this community, indigenes and non-indigenes, eat plantain almost every day. Both men, women, adults and young people consume plantain without difference'.*

Although different people eat plantain similarly, plantain is an important product for men while working on the farm, especially in Osun State. The key informant in Ogudu, Osun East explains:

´when we go to the farm, we sometimes even forget about the food we brought from home because we either boil or roast plantain. Men therefore consume plantain more because we are always on the move and will always need fast food, especially because we are always busy with their cocoa plantations´.
Also the key informant in Patara, Osun West, explains that men often roast bole when working on the farm:

´we always put plantain in the fire when we work on the farm´. In this regard, bole and boiled plantain may be consumed more frequently by men in Osun State compared to other social groups.

Do you think people are buying more or less compared to five years ago? Why? Probe on social segmentation. How has this changed in the last five years? KII Q10.

82% of the key informants explain that consumption of plantain is increasing. Only one respondent (9%) says there is no change in consumption patterns, and one other respondent (9%) does not know if there is any change in consumption compared to five years ago. Many key informants (60%) explain the consumption has increased because of the increasing awareness of the health benefits of plantain. The key informant in Akola Alaerebere, Osun East, explains:

'*Over the past years, farmers have been encouraged to produce and consume plantain through radio jingles. The past government (last six years) had a program called O-Plantain where they also gave support to farmers. The use of plantain flour for amala and other plantain products was encouraged for health reasons'*.

Also, other farmers explain that plantain has been medically recommended, and that people are trying to move away from starchy products as cassava and yam due to fear of diabetics. Another reason for the increasing consumption is the increase in population (20%). Two key informants (20%) relate the increasing consumption of plantain to the fact that plantain is cheap. The key informants in Isele Uku, Delta North, explain:

'*instability and overhead costs in cassava production which is the major crop here is pushing farmers into plantain production. Hunger also contributes to the increase in plantain consumption. Plantain production is cheaper in terms of cost implication than other crops*'.

Also, another respondent in Patara explains plantain consumption is increasing because it is cheap to buy.

Are there any taboos or restrictions of people in growing, processing or consuming the crop or its products? Probe differences in social segments. KII Q11.

Are there any taboos or restrictions of people in growing, processing or consuming the crop or its products? Please explain. (Probe differences in social segments) II Q18.

According to most of the key informants (85%), there are no taboos or restrictions for people to grow, process or consume plantain. In Umeh, Delta North, there is a general restriction (applicable to all crops) that nobody is allowed to go to the farm or harvest on a market day. If anybody is caught in the farm, a fine of 25,000N has to be paid to the community leader. This rule has been established to avoid people from stealing other people's crops while they are on the market and away from their

farm. This restriction is also mentioned by 4 respondents of the individual interviews, of which 2 in Delta and 2 in Rivers State.

Although not really a taboo, in Isele Uku there is a general perception that plantain planted around the house does better than those planted on farms. In Agoloma the key informants mention that a woman who is still bearing children should not eat the plantain variety of which the fingers shoot up, because the woman will not be able to get pregnant or bear children again. Another belief in Agoloma is that eating plantain from twin bunches will cause women to bear twins.

Various taboos and restrictions are highlighted by 24% of the respondents to the individual interviews. (76% of the respondents to the individual interviews explain there are no taboos or restrictions regarding plantain production, processing or consumption). Some of the taboos or restrictions that are described are more related to health considerations. For example in Osun State, 25% of the respondents explain it is not recommended to eat plantain on the same day it has been harvested. According to the respondents, this may cause saliva or stomach upset. In Rivers State, there is one respondent who explains that you should not cut the leafs of the plantain variety with double bunches, because it will not produce a double bunch again.

There are also a few taboos mentioned in the different regions, which are mostly related to pregnancies or apply to markets. In Ossissa, Delta North, there is a custom that when a woman gives birth, the umbilical cord of the child will be used to plant either plantain, coconut or any other crop based on the choice of the parents. In Agoloma, Delta South, similar to what the key informants explained, it is believed that a pregnant woman who eats twin bunch plantain will get twins. The respondent adds:

´it is not compulsory to eat twin bunch plantain if you don't want twins'.

In Idimuje Ugboku market in Delta State, plantain cannot be sold inside the market, but has to remain in front of the market or along the road. Another respondent in Isele Uku also explains that it is not allowed to sell plantain bunches in the market, unless you cut it into pieces/fingers. In Ipetu market in Osun State, there is a similar taboo on bringing plantain bunches into the market. Different women explain:

'*in Ipetu it is not allowed to sell bunches, because there is a god that does not like to see bunches. So we have to break the fingers and we therefore don't go there very often'*.

Another taboo found in Osun state is that fresh plantain is not consumed in the morning during the rainy season, especially for children it can make them to throw up. Taboos found in Rivers State also mostly relate to pregnancies. It is believed that when plantain falls, a pregnant woman is not allowed to eat it. Another taboo is that children between 0-7 years are not allowed to eat ripe plantain because it is believed to cause convulsion. A last taboo is related to a specific variety of plantain, called Akalabi. It is not allowed to use a knife to cut or harvest the plantain, it is considered defilement and it is believed it will not produce well again. People therefore have to use a stick called obi, which is also used in staking yam.

3.6 Product characteristics

This section is priority and should be completed with the product profile already – and copy and pasted in this section with text to support.

The quality characteristics of a final product depends on the quality characteristics of the crop (raw material) and the processing ability of the crop. You may distinguish the raw final product just after processing (for example raw gari e.g. dry gari) and the final product ready to eat (for example gari cooked into eba or gari added with water and peanuts).

Please refer to the Guidance Document on Step 2 Priority Data and the PPT presented during the training in Abuja: qualitative analysis (coding and organising text) and quantitative analysis on the counts of citation per sex and region using the weights (X3 for first priority, X2 for second priority and X1 for third priority).

In the supportive text, write a summary description of the characteristics that were mentioned by the

Raw Material (Crop for the product)

	Total (N= 118)	Female (N=62)	Male (N=56)
finger size	90	48	42
peel colour	74	36	38
pulp colour	41	19	22
tip colour	40	20	20
bunch size	36	11	25
maturity	23	14	9
Number of fingers	17	9	8
peel appearance	11	8	3
finger firmness	10	6	4
fruit angularity	10	5	5
good taste	7	4	3
freshness	6	2	4
leaf colour	6	2	4
bunch firmness	3	3	
peel thickness	3	2	1
peeling	3	1	2
psuedostem	3	2	1
male bud	2	1	1
germination	1	1	
sap flow	1	1	
Starch content	1	1	
sucker quality	1	1	
fruiting	1		1
number of hands	1		1
wax	1		1

***In your opinion, what variety(ies) give the highest quality product? Why? Facilitator to note if these varieties are different then the varieties they grow" (Q14), or what was stated by the FGD the previous day. II Q19.**

***If you were to purchase the crop on the market to make the product, how do you recognise and perceive a good crop variety for making a high-quality product? By looking at it, by touching, smelling or by tasting it? Rank in order of importance 1=most important. Note for use for pairwise ranking exercise. II Q20.**

Characteristic	Frequency Women N=62	Frequency Men N=56	Frequency Osun State N=38	Frequency Delta State N=38	Frequency Rivers State N=41
Big finger	34	33	20	21	26
Deep green peel	25	21	11	22	17
Matured	20	20	6	16	18
Big bunch	16	19	11	13	11
Black/dry tip	14	11	11	11	5
Yellow pulp colour	13	15	8	11	9
Strong/firm	10	2	3	7	3
Split peel	9	4	1	7	5
Full pulp	6	1	1	2	4
Fresh	4	6	1	3	2
Shiny	3	3	4	2	
Male bud fallen off	3	1		4	
No edges on the finger	3	5	6		2
Bunch with 20-30 fingers	3		1		
Bunch with 20-60 fingers		4			2
Bunch with 12-50 fingers				5	
No black spots	3		2		
Black spots on the body	2	3		4	2
Even/easy ripening	2		1		1
Ripe/unripe		2		2	
Dry plantain leaf	1	1		2	
No dry plantain leaf	1				1
Big plantain stem	1				
Smooth peel	1	2	1		1
Sharp edges on the body		1			
Germinates easily	1				1
Easy to peel		2		1	1

Big fingers are by far the characteristic that is considered to be most important. Also important are the deep green colour of the peel, the size of the bunch and the maturity. Characteristics such as split peel, full pulp, faded edges on the finger, black/dry tip and male bud fallen off are all indicators of maturity. Another important quality that also relates to maturity is the colour of the pulp. The preferred colour of the pulp is described differently, ranging from milk colour to pink, orange, red and even brown. Based on individual interviews and assessments where plantain was cut open, the preferred colour always refers to a yellowish plantain colour. White pulp colour is also associated with immature plantain and although in some cases used for specific products, it is never preferred over yellow pulp. The deep green peel colour is also often linked to maturity by respondents, where a white or pale green colour is associated with immature plantain. When looking at the ranking of products, characteristics related to the maturity of the fruit often scores higher than characteristics related to volume (big fingers, big bunch). The size of the fingers was described in different ways, such as long fingers or fat fingers, which have all been categorized as 'big fingers'. Between the size of the bunch and the size of the fingers, finger size is often considered to be more important. In some cases, respondents even specified that the bunch should not be too long or contain too many fingers, since that would compromise the size of the individual fingers.

There are no considerable differences between the answers of men and women.

***Thinking about when you harvest the crop or purchase the crop on the market to make the product, how do you recognise when the crop will make a good, high quality [product understudy]? What are the characteristics? Rank in order of importance 1=most important. Note for use for pairwise ranking exercise. FGD Q10.**

Characteristic	Frequency Men's focus groups	Frequency Women's focus groups
Big fingers	8	8
Big bunch	8	2
Matured	6	4
Deep green peel	4	10
Split body	5	6
Dry tip	3	6
Yellow pulp	4	5
Long fingers	4	2
Firm fruits	2	4
Fresh	3	2
No edges on the body	4	1
Many fingers	1	3
Black spots on finger	2	1
Big stem	1	
Smooth	1	1
Dry leaf	1	1
Easy to peel		1

What are characteristics of a variety of the crop that give a poor quality product so that you would not use or buy it? II Q23.

***How do you recognise a bad crop variety for the [product under study]? What are the characteristics? Has your community experienced this before? Please describe. FGD Q 11.**

Most important characteristic that will give a poor-quality product is immaturity of plantain, mentioned in 71.4% of the answers. Other characteristics often related to immaturity of plantain are light green peel (17.9%), white pulp (10.7%), white tip (3.6%), gummy taste (3.6%), sharp edges on plantain finger (3.6%). Second most important negative characteristics are small fingers (35.7%) and small or light (not heavy) bunches (17.9%) or spacing between the hands on the bunch (3.6%). Other characteristics relate to the appearance of the peel, such as the presence of bruises (10.7%), spots on the peel (3.6%), plantain with uneven colour (7.1%). Rot on either the peel or the plantain tips is mentioned (7.1%) as sign of bad plantain. Also the presence of pests and diseases is mentioned (7.1%) as characteristics of a bad plantain.

Processing (revise as applicable to your product)

II questions:

***Thinking about when you process plantain, what would be the characteristics that show it has good processing-ability? Rank in order of importance 1=most important. Note for use for pairwise ranking exercise. II Q23.**

***When buying or selling the product (after processing the product), what are the essential and most important characteristics required for a high quality product? By looking at it, by touching, smelling or by tasting it? Rank in order of importance 1=most important. Note for use for pairwise ranking exercise. II Q24.**

See product profile

FGD questions:

***Thinking about when you process plantain, what would be the characteristics that show it has good processing-ability at each stage of processing? Rank in order of importance1=most important. Note for use for pairwise ranking exercise. FGD Q14. N/A**

Final product (raw or ready to eat final product) characteristics

II questions:

***At home, when preparing plantain (cooking into a paste, boiling, adding water, ingredients etc), what are the characteristics of the product required? Probe: sensory characteristics – texture, appearance, taste, smell etc. II Q27.**

***Describe the characteristics of a high-quality end [product] prior to consumption, just by looking or touching it. Rank in order of importance – or use pairwise ranking exercise for final product characteristics.**

II Q28.1 When you eat the product, what are the characteristics of a high quality product in the mouth and how do you evaluate it? Taste, texture in the mouth, aroma etc., depending on the consumption form? II Q28.

See product profile

FGD questions:

***What is a high quality final product? What are the characteristics? Rank in order of importance. Note for use for pairwise ranking exercise. FGD Q17.**

3.7 Conclusion

Provide bullet points or text on important findings and their implications for WP2 and breeders.

- Plantain is highly appreciated for more than food qualities only: plantain fulfils a specific need in people's livelihood and is considered both a food and cash crop. Important characteristics are the nutritional value, the fact that it is relatively easy to grow and multiply, it produces fruits year round, the high diversity of products it can be made into, and the generation of high market value with little labour input (contrary to gari or other cassava products). In addition, in Osun State, where cacao is a common crop, plantain has an additional function as shade crop.
- Although there are no considerable differences in the way different social groups produce plantain, men value plantain more as a cash crop whereas women appreciate the food value of plantain. Depending on the size of a farmer's land and the household needs, farmers sell an estimated 80% of their plantain.
- Plantain is used to make a wide variety of food products, with regional differences. Most important products across the regions are boiled plantain, bole, dodo, chips and plantain with beans. In addition, in Delta State, porridge plantain and pudding are main plantain food products. In Osun, flour is an important product and predominantly used for making amala (a fufu like dough). Also pounded plantain with yam is popular here. In Rivers, plantain pepper soup and porridge are main food products. The different end products of plantain have different quality parameters, where colour and texture are often indicated as most important.
- There is no differentiation of varieties for products. In Osun, where flour is a popular product, plantain (or unripe bananas) of lower quality is often used for the production of flour, although people agree that the preferred variety gives the highest quality product. Across the regions, the most preferred plantain variety is 'main plantain' or 'agbagba' in Yoruba. The fact that there is no variety differentiation means a new plantain variety should be suitable for all main plantain products, just like the current main plantain variety is.
- Important characteristics of raw plantain are big bunch, big fingers, high market demand and high market price. While the size of the bunch, size of the finger and number of fingers are very important to women, men are more interested in cultivating varieties that are in demand and high in price. At the same time, big bunch and big fingers are also described as most important traits for people who buy plantain in the market, and may therefore also relate to marketability of plantain.
- Improved varieties are not commonly used. Although some high performing varieties are referred to as 'agric' most varieties found across the regions are assumable local varieties.

Only in Delta and Rivers State, a few suspected hybrids or cross-breeds between hybrids and local cultivars were found. In Agoloma, farmers described two varieties of plantain which may refer to hybrids or cross-breeds: one plantain with stones inside and a plantain that looks like banana. Agoloma is located next to Patani, a village where a farmer has been growing and selling improved plantain varieties from IITA. In Rivers State, several farmers described improved varieties distributed by the Green Rivers Project. These varieties, although appreciated for their big (heavy) bunches, were considered inferior especially because of its small fingers, because it spoils easily when ripe and production challenges. Farmers explained that the plantain requires staking because the weight of the bunch makes the psuedostem to fall, which is labour intensive.

4 FINDINGS: MARKET STUDY

4.1 Sample information

Background information on sample MI Q1-7 (first) Q1-14 (Nigeria learning doc)

Table 25: Background information on sample (MI Q1-7/1-14)

Interview	
Gender	2.9% men 97.1% women
Age (profile)	42.3
Ethnicity	34.4% Igbo 31.3% Yoruba 9.4% Isoko 9.4% Urobo 6.3% Ikwere 3.1% Ijaw 3.1% Kalabari 3.1% Abua
Household size	7.9
Level of education	35.5% primary school 38.7% secondary school 9.7% no education 6.5% JSS3 3.2% SSS 3 3.2% WAEC 3.2% tertiary education
Ownership of means transportation (If yes, type)	88.5% No 11.5% Yes
Ownership of means of communication (If yes, type)	88.5% Yes (mobile phone) 11.5% No
Road to nearest town is good (Y/N)	69.2% yes 30.8% no
Distance to market from the home (in km)	41.9
Distance to market from the home (in minutes)	67.4
Marketing experience (years)	16.7
Main occupation (Specify)	50% wholesaler 43.8% retailer 6.2% retailer and wholesaler

4.2 The value chain

***What are the major locations where plantain is grown and marketed? (MI Q8 original questionnaire, Q15 revised Nigeria)**

What is the proportion (percentage) of the crop kept by the farmer for home consumption and what is sold by farmers, and to which markets in (MI Q9 (first), Q16 (Nigeria))

- **Fresh form**
- **Processed form: [product]**
- **Processed form: other products from the crop**

And

MI Q10 (first), Q17 (Nigeria) What is the proportion (percentage) of the crop consumed in urban areas around the market you are situated; in: Fresh form, Processed form: [what product], Processed form: alternative products from the crop.

Plantain is mostly marketed in fresh form. Marketers estimated that farmers sell the majority of their produce, between 10 to 30%, which is in line with findings from the individual interviews (table 21). Farmers sell their plantain bunches in community markets, also called bush markets, or sell their plantains directly to off takers if they have a large amount of bunches available. From these bush markets, plantains are sold to wholesalers in towns and urban centres. The wholesalers resell the plantain in bunches, mostly to retailers but also to food vendors, bole processors, and in some cases to individual customers. Wholesalers mostly deal with unripe plantain bunches. Retailers cut hands or fingers off the bunches and retail them in pieces (ripe and unripe) rather than bunches. There is a smaller market for dried plantain flakes, mostly processed at farmer level during the dry season. In Osun State, flakes are often sold along the road side and sold to processors who mill the flakes into flour. A smaller proportion of flakes is also sold to individual customers who process the flakes into flour at home. Customers prefer to buy flakes rather than flour in order to be sure the flour is not mixed with any other product (for example cassava or yam flour) and of good quality.

Most marketers were not able to estimate the proportions of processed products consumed by consumers at different levels. A trader in Abua, Rivers State, explains:

´people are eating plantain, but I cannot really talk about the trend in Abua, it depends on individual preferences´.

Although most plantain is traded in fresh bunches, there are food vendors in towns and urban areas who sell and process products as bole and dodo. Traders on the market in Ibadan therefore explain that in urban areas, 30 – 40% of plantain is consumed as bole, 20 – 40% as dodo, 10 – 30% as flour and 10 – 20% as chips, whereas in villages, most plantain is consumed as flour and a smaller percentage as dodo, bole and chips. In line with these estimates, a trader in Akola Alaerebere (village level), Osun State explains:

´out of the ones we keep for home consumption, the larger percentage is kept for flour, and a small percentage for dodo and boli. In the cities people like modern food so the percentage of dodo and boli eaten is higher´.

In each region sampled, there are different locations where plantain is majorly grown. In Rivers State, Mbiana in Bayelsa is a well-known location where many traders get their produce from. In Osun State, Area 5 is mentioned by several traders, and also the area along the Ondo road is high in plantain production. According one of the traders interviewed on Oje market in Ibadan, Area 5 in Osun is responsible for 70% of plantain production. She explains:

´I get my plantains from Ago-Owu, Oyere in Osun state. The farmers bring it to my stall at Oje market. Plantain is mainly produced in area 5 (eg. Olomu, Araromi, Oke-Ode, Fadaka) in Osun State. It is responsible for 70% of the production´.

In Delta State, Isele Uku (part of the sampled communities) was one of the locations often mentioned as high plantain producing area. Also Kwale and Okoh are mentioned as major plantain producing

areas in Delta State. Calabar and Benin State are also mentioned as plantain producing areas severally.

Summarise the responses from the respondents in the table below. There may be different responses (e.g. some people saying 10% and others 50%). If this is the case, put the range in the table below. If this is difficult to establish the percentages then try to do scoring, using for example 10 stones

representing the total annual crop, and then score according to how the crop has been used. If that also provides difficult, then do ranking of the responses.

Table 26: Proportion (%) of crop used in fresh and processed forms (MI Q9 or Q16)

	Crop use (home consumption vs sales)	Percentage (%)
Rural level	Home consumption	10 – 30%
	Sold in fresh form	70 – 90%
	Sold in processed form [product]	
	Sold in processed form [other products]	
Town level	Home consumption	
	Sold in fresh form	100%
	Sold in processed form [product]	
	Sold in processed form [other products]	
Urban level	Home consumption	
	Sold in fresh form	100%
	Sold in processed form [product]	
	Sold in processed form [other products]	

***What are the major locations where plantain is processed and marketed? MI Q11 (first questionnaire), Q18 (revised Nigeria)**

Plantain is mostly marketed in major urban hubs such as Lagos, Ibadan, Onitsha, and Port Harcourt, but also in smaller towns such as Ife. Traders explain that the demand for plantain is highest in urban centres due to the high population. A trader in Osun State explains:

´the major location where plantain is processed and marketed is Lagos because they are more exposed to new products than other places. They have larger market for every product´. In urban areas, plantain snacks as bole and dodo are popular and commonly found in restaurants/buka's and sold by road vendors. In villages, there may be one restaurant but most people process and prepare plantain products at home.

***What are the demand segments[1] associated with plantain? (at the applicable level, i.e. community, processing site, city)? MI Q12 (first questionnaire), Q19 (revised Nigeria)**

***What are the demographics of the customer groups / buyers of [product]? e.g. female customers, male customers, youth, high-end restaurants, wealth categories) MI Q22 (first questionnaire), Q30 (revised Nigeria)**

[1] Demand segment: a relatively homogenous group of people who consume the product (purchased or made at home) that have a unique set of preferences (e.g. men from Delta region may have particular preferences for boiled yam or very sour, yellow, gari).

***What are these customers demanding (e.g. what crop characteristics are they interested in?) MI Q23 (first), Q31 (Nigeria)**

Table 27: Customer groups buying fresh plantain

Level and/or demand segment	Demographics of the customer groups / buyers of fresh plantain bunches	Description of what are these customers demanding
Community level:	Youth	Ripe plantain (for dodo)
	Elderly	Unripe plantain (for boiling)
	Retailers	Plantain with big fingers
	Bole processors	Plantain that starts ripening
	Pudding processors	Plantain with small fingers (because it is cheaper so they can make more profit)
	Flour processors	Plantain with small fingers
	Bar vendors	Unripe plantain to make pepper soup
	Hausa's	Plantain that starts ripening (for fresh consumption)
		Plantain with small fingers (to make plantain flour)
	People with little money	Unripe plantain
	Pregnant women	Ripe plantain to fry for their children to take to school
	Mothers	

Level and/or demand segment	Demographics of the customer groups / buyers of fresh plantain bunches	Description of what are these customers demanding
Town level:	Men	Unripe roasted plantain (gives them strength and lasts longer in the body)
		Ripe plantain (for dodo)
	Youth	Unripe plantain (for porridge)
	Elderly	Unripe plantain (to resell before it ripens)
	Retailers	Unripe plantain (so it does not spoil during transport)
	Wholesalers from Ibadan and Lagos	Ripe plantain. Agbagba gidi (because it can be used for several products)
	Urban customers (final consumers)	Ripe plantain
	Food vendors	Old plantain (the peel is turning brown). Half ripe plantain. Ezigbo variety (because it has big fingers)
	Bole processors	Unripe/half ripe plantain
	Porridge processors	Pambola (cooking banana)
	Flour processors	Very ripe plantain. Osuku variety (has small fingers that they will be able to cut it into many pieces to make dodo)
	Restaurants/mama put	Unripe plantain
	People with hypertensia	

Level and/or demand segment	Demographics of the customer groups / buyers of fresh plantain bunches	Description of what are these customers demanding
Urban centre:	Men	Unripe plantain
	Male customers who are food vendors	Ripe or almost ripe plantain (to make dodo in their canteens)
	Youth	Ripe plantain
	Elderly	Unripe plantain
	Retailers	Ripe plantain
	Wholesalers	Unripe plantain
	Food vendors who make beans and plantain	Ripe plantain
	Bole processors	Almost ripe plantain. Normal plantain because it is big in size and has a good taste
	Chips processors	Unripe plantain
	Flour processors	Unripe plantain
	Schools	Ripe plantain
	Hospitals	Ripe plantain
	Household consumers	Unripe plantain (people prefer to ripen plantain at home)
	Restaurants	Ripe and unripe plantain
	Food vendors	Ripe plantain

Traders explain the demand is highest for unripe plantain. Although bole processors, restaurants and consumers generally use ripe plantain for the products they make, many of them buy unripe plantain and ripen it themselves. Also, retailers generally buy unripe plantain and ripen them for sales in fingers.

4.3 Characteristics for a high-quality crop

Ranking of characteristics for a high-quality crop per demand segment (MI Q24 original questionnaire, Q32 revised Nigeria)

Table 28: Characteristics of a high-quality crop

Rank	Characteristic	Indicators used for ranking crop characteristics and demand segment they are important for
1	Big fingers (57)	'As big as my fore arm'
2	Peel colour (30)	A dark green peel is more acceptable than yellow. And if the plantain is ripe, a yellow peel is appreciated.
3	Matured (21)	Maturity means the plantain is strong and ready to eat. The immature one will have small or thin pulp but if mature, the pulp will be full. The colour of the mature fruit will be much more greenish than the immature one. The finger size of the mature plantain will be bigger than the immature one. The finger tip of the mature one will be black in colour while the immature one will be greenish. Maturity is important, we know this through the peel. The peel will be very thick and the colour of the mature peel will be dark green and the pulp will be big. The fruits will also be big. Customers also cut a little part at the tip of the fruit to determine the colour. The good/mature one will have a red pulp. When it is freshly harvested it has a deep green peel. Some crack open, which shows maturity.
4	Big bunches (17)	A big bunch contains 20 to 30 fingers
5	Yellow pulp (11)	A good pulp is mature and brown, an immature plantain will have white pulp. The pulp colour for matured plantain is carton colour.
6	Many fingers (8)	
7	Black tip (6)	A mature plantain bunch will have black patches in the finger peel, the tip of the plantain would have fallen off.
8	No edges (5)	The edges on the peel mush have thinned out.
9	Attractive appearance (4)	
10	Fresh (3)	Fresh (nice looking)
11	Shining peel (2)	
12	Ripens on its own (1)	It should ripen on its own without covering it.
13	Does not spoil easily (1)	
14	Firm fingers (1)	When you press the finger it will be strong and not soft.

4.4 Proportion of the crop consumed and sold

***Proportion of the crop consumed by farmers and sold to different customer groups (in percentages) (MI Q13 original questionnaire, Q20 revised Nigeria)**

Table 29: Proportion (%) of the crop consumed and sold by different customer groups

Customer groups	Percentage (%)	
	Kept	Sold
Rural consumers – farmers keeping the crop for home consumption	10 – 30%	
Rural consumers – purchasing the crop for home consumption		N/A
Household consumers in urban areas / cities		10 – 90%
Wholesalers		60%
Retailers		55 – 80%
Food vendors		2 – 30%
Chips processors		1 – 20%
Institutions such as hospitals or schools		20%
Hotels		5%
Restaurants		2%

According to the traders who were able to answer this question, farmers keep around 10 to 30% of their produce for home consumption and sell the remaining to wholesalers. This is in line with findings from the individual interviews. Wholesalers sell plantain to different customer groups, mostly retailers, consumers, restaurants, and food vendors (such as bole processors and restaurants). Most plantain (between 55 to 80%) is sold to retailers who sell plantain in fingers to individual customers for home consumption. There are practically no rural consumers, since all farmers grow at least a few plantain stands for home consumption.

4.5 Consumption patterns of different consumer groups

Consumption patterns of different consumer groups (Q21 Nigeria) This question may not be in each questionnaire.

Table 30 Consumption patterns of different consumer groups

Osun State	Delta State	Rivers State
People in rural areas consume more flour and boiled plantain than people in urban areas (4)	In rural areas, people consume porridge or boiled plantain	Fried plantain, boiled plantain and plantain porridge are popular products among people in towns and villages
People in urban areas consume more dodo, boli and chips than people in rural areas (4)	In urban areas plantain is mostly consumed as dodo, chips, pudding, roasted, or boiled	People in the village will just roast and cook or boil plantain and eat it with oil (2)
People in rural areas eat more quantity per time, while people in urban areas will eat smaller quantities. The rural population boils four fingers at a time, while in cities they eat only one finger at a time	People in cities consume more plantain than people in villages (3)	People in town use plantain to cook porridge and fry dodo (2)
The urban population consumes more plantain. They value it more and they know the importance of plantain to human health (3)	People in cities pound plantain and eat with oil or soup. This is particularly common with diabetic people	People in town eat more plantain because they have more money than people in villages
Men eat more plantain (2). Men eat more plantain in processed form because most of them are always on the run and thereby eat out more than women. Men eat more plantain because it gives them strength to work and also increases their libido	Rural dwellers pound plantain alone or gari while people in urban areas, they dry and grind the plantain, and consume in flour form for health reasons, especially diabetic patients	
Rural people fry their plantain more in palm oil while the urban dwellers use groundnut oil due to health consciousness.	People in rural areas consume more plantain	
	People from Akwa and Annewi (Anambra state) process plantain into chips and beans with plantain	

4.6 Variations of the product

What are the different variations of plantain products? e.g. varieties, processing key steps, processing parameters, quality differences of the pre-processed and the final products. The information is based on frequency of replies. (MI Q14 original questionnaire, Q22 revised Nigeria)

Roasted plantain, fried plantain, boiled plantain and plantain chips are popular plantain products across Nigeria. At the same time, there are some products that are popular in a specific region. In Osun State, plantain flour is commonly used for making *amala*, especially among the rural population. In Delta and Rivers State, plantain porridge and plantain pudding are more common,

and in Rivers State, plantain is also commonly used for pepper soup. Although there are differences in the popular products consumed across regions, the processing steps are generally similar and more dependent on individual preferences. There was a higher focus on variations of plantain products in the individual interviews, focus group discussions and key informant interviews, see table 15 and chapter 'preparation and processing the product' of the socio-economic context and product preferences.

What are the different varieties/types of the crop demanded? (this may not in each questionnaire)

Due to an increased awareness about the health benefits of plantain, unripe plantain has become higher in demand as compared to ripe plantain than before. Apart from small or big, ripe or unripe fingers, most traders and customers do not differentiate plantain varieties. Several traders explain '*plantain is plantain'*, or '*it is only the size of the fingers that customers are concerned about'*.

In Rivers State, where improved varieties have been released, there are a few traders who differentiate between local varieties and improved varieties. They explain that native plantain has smaller fingers, a sweeter taste and a longer storability. The improved variety has a higher water content and therefore a lesser taste, and a short storability. However, the traders explain that the improved variety is preferred by customers because of its big size. Also when comparing different local varieties, it is generally the size that interests the customers. The plantain variety with few but bigger fingers is called 'better plantain' in Rivers State and most preferred by customers. Traders themselves explain that Osuku, Esam and Isighenheen varieties have smaller fingers but are sweeter in taste. A trader in Rivers State explains:

'*we use all the varieties (Esam, Isighenheen, Better plantain, Iduma) in the same way. We can use all of them to make different products. However, customers/buyers prefer the better plantain because of its big size'*.

Especially bole processors prefer plantain with big fingers since the plantain is used as a whole in the end product, while people who process flour, pudding, or dodo care less about the size of the plantain since they slice the plantain. Also in Osun State, Agbagba Gidi (normal plantain) is most preferred among customers because of its big size and because it can be used for different products compared to Pambola (cooking banana), which is more suitable for flour or fresh consumption. A trader in Osun explains:

'*people demand more for agbagba gidi because it can be used for different types of plantain products while pambola can only be eaten fresh or used for flour. Agbagba is usually thick and does well in oil but pambola floats on oil because the pulp is very light*'.

4.7 Quantities of the crop and product traded

Quantities of the crop and product traded (during a year ; specify from when to when) (MI Q15 original questionnaire, Q23 revised Nigeria)

Table 31: Quantities traded (tonnes) as fresh and processed by region

	Region X Quantities traded (tonnes)	Region Y Quantities traded (tonnes)
Fresh crop		
Processed [product]		
Processed [other products]		

Traders were not able to make estimates of the amount of plantain traded per region. As such, estimates were made based on their own daily throughput (see table 34).

What is the daily throughput/amount traded daily in market of the product (in kg or tonnes), taking seasonality into account? This can only be done for market where the trader(s) are based. (MI Q16 original questionnaire, Q24 revised Nigeria)

Table 32 Amount traded on market days (in bunches) per trader

Part of the year	Level	Quantities of crop (in bunches)
Rainy season	Community	40.9
	Town	63.6
	Urban	142
Dry season	Community	42
	Town	55.6
	Urban	57.4

There is a low and a high season for plantain. During the dry season, plantain is widely available but the prices are low, while during the rainy season, less plantain is available but prices higher. Apart from the differences in marketing between rainy and dry season, other periods also influence the availability and demand for plantain. The planting season does not seem to affect marketing according to traders. The festive period and time of school fees affect the market differently according to different interviewees.

With regards to the festive season, some people explain sales of plantain is low. Various traders (6) explain that the sales of plantain is usually low during the festive season. 2 traders explain the sales is low because people focus more on rice during Christmas period, others (2) explain the sales of plantain is low because people need their money to buy other items such as cloths, while yet others (2) explain the sales is low because their major customers would have travelled home for the festivities. Others (2) explain there is more plantain available during that time of the year, because more farmers bring plantain to the market to make money. According to these traders, plantain prices are therefore low during the festive season. In line with these findings, three traders explain that plantain sells faster during the festive season. Two of them explain this is because the prices drop during the festive season. Contrary to these findings, three traders explain plantain is scarce during Christmas, one trader explains plantain is scarce because many people buy plantain to take home when they travel. In line with these statements, two traders explain that the prices of plantain are high during Christmas period.

Also the time of school fees affects the market in different ways. Although four traders explain the school fee period does not affect the market for plantain, six traders state that prices of plantain drop during the time of school fees. Two traders explain the prices are low because plantain is very available during that time of the year. This also depends on the resumption time; one trader in Akola Alaerebere, Osun State, explains:

'*the resumption of school around April falls in a scarce period. But during the September resumption plantain is abundant*'

Two other traders explain the drop in prices due to the fact that farmers and traders need to sell more in order to meet their financial demands. One trader in Ife, Osun State, explains:

'*during school fees period, we usually sell at a give-away price in order to meet the immediate need*'.

Two traders explain that market will be slow during the time of school fees. A trader in Port Harcourt, Rivers State, explains:

'*the school fee period affects market because people will cut their expenses. Market will be dull*'.

4.8 Transport, storage, and means of selling the crop

Transport, storage, and means of selling the crop (MI Q17 original questionnaire, Q25 revised Nigeria)

***What are the important characteristics of the crop associated with product transportation, storage and sale? (MI Q18 original questionnaire), OR During crop/product transportation, storage and sale, what are important characteristics that might affect the product? (Q26 revised Nigeria)**

Table 33 Means of transportations Daily throughput/amount traded daily (kg or tonnes) in xx Market (specify which market)

	Means	**Important characteristics of the crop associated with product transportation, storage and sale OR Important characteristics that may affect the product**
Transportation	Bike (okada) (5) Tricycle (keke) (1) Car (3) Taxi (4) Pick up (6) Bus (11) Boat (1) Coach (1) Trailer (1) 911 lorry (4)	Do not compress the bunches to avoid damage (5) Place polythene bags/plantain leafs on the floor of the vehicle (2) Bunches should not be thrown (2) Bunches should not get detached or broken (2) Handle the bunches carefully (to avoid bruising) (4) Make sure bunches do not fall off the trunk of the car The bunches should be quickly transported to avoid exposure to heat Avoid contact with water and palm oil (it will affect the pulp quality, delay the ripening process and speed up spoilage) (2) Pray that the vehicle does not break down (2) Ripe plantains are put in baskets for transport Buy green (unripe) plantain Transport it in an open vehicle so that breeze can touch the plantain (3) Load the plantain on the roof or booth of the bus to avoid scattering Use sticks to hold the plantain and tie them together to avoid the plantain from falling on the road

	Means	Important characteristics of the crop associated with product transportation, storage and sale OR Important characteristics that may affect the product
Storage	Store under nylon Store in bags No storage facility (5) Cover with tapuline Cover with grass Under cacao tree In (wooden) shops (6) In baskets covered with sacks Cover with sacks Under shed Under polythene spread sheets (2) Under shade (roofed iron sheets) On polythene spread sheets Store in open space Keep the plantain outside (2)	Store in a cool/shady and dry place (2) Keep away from rodents (2) Do not allow water and/or sun to affect the plantain (2) No means of storage; buy and resell immediately (3) Do not cover the plantain, the rain will keep the plantain cool Do not cover the plantain, keep the plantain in an open space to avoid ripening Put plantain in baskets and handle them gently Cover the baskets with sacks/polythene spreads to avoid rodent attacks (2) Do not store plantain longer than 5 days Buy unripe plantain Store the plantains under shed Store plantain under shade (roofed iron sheets) and on polythene spread sheets Cover plantain with polythene Store plantain in shops To ripen, put the plantain in a wooden closed pallet and cover it with a cloth and polythene I give away the ones that are left over Ripe plantain in batches by covering it up in a blastic bowl that has lid and I cover the top with polythene bags and I place it under the sun left over ripe plantain is kept in a bowl in cold water keep the plantain outside to allow air/dew to touch it (2)
Means and forms of sales	Ripe/unripe Ties/bunches/hands/fingers	Plantain is bought in heads that are tied together (2) Plantain is bought in bunches and cut into fingers for retail If the market floor is muddy, it is covered with something before placing the plantains. If it is not muddy, nothing is used. Customers are not allowed to drag the plantains on the floor to avoid bruising Customers are not allowed to select big bunches in this market, the big and small plantains are mixed and sold together Customers will select big fingers, called ´select´, and they are priced higher Unripe plantain is preferred by the customers, because if they are not able to resell them (in retail) in one day the plantains will not spoil Unripe plantain is sold at a higher price than ripe plantain Store the plantain under a shed at the market during sales Do not allow plantain to get overripe before selling it Plantain is mostly sold in bunches but we also count or weigh the plantain The plantains that are not sold in wholesale, are brought home for retailing in hands

Drivers of change

Drivers of change in terms of demand for crop and final product (MI Q20 original questionnaire, Q28 revised Nigeria)

Table 34 Drivers of change in crop and product demand

	Change	Driver
Production in general	Production increased (urban centre x 6, town x 3, community x 2)	More farmers are into plantain farming (urban centre x 2) Production increased due to unemployment (community x 1, urban centre x 1) Production is increasing because the population is increasing (urban centre x 2)
	Production decreased (community x 3)	Production reduced due to flood (community x 3)
Demand in general	Demand increased (urban centre x 7, community x 4, town x 6)	Demand increased due to increased awareness about health benefits (urban centre x 5, community x 5, town x 4) People appreciate plantain, plantain is easy to prepare, and has multiple uses (urban centre x 3) There are more plantain products available (urban centre x 1, town x 1) Plantain has become more accepted by consumers (urban centre x 1) Demand increased because population increased (urban centre x 1, town x 1)
	Demand is decreasing (town x 2)	Demand is decreasing because we are in rainy season which is a period of glut (town x 1) Demand decreased because many people left Rivers State (town x 1)

	Change	Driver
Marketing in general	Market is low (urban centre x 1, town x 2, community x 1)	Poor economic situation (people do not have money) (urban centre x 1, town x 2, community x 1)
	Profitability increased (community x 1)	Profitability increased due to increased awareness about health benefits (community x 1)
	Marketing increased (community x 1, town x 1, urban centre x 2)	Marketing increased because of unemployment (community x 1)
		Marketers increased because human population is increasing (town x 1)
	Profitability decreased (town x 2, urban centre x 1)	There are too many plantain traders (town x 1, urban centre x 1)
		Plantain is more expensive now because many farmers are cultivating plantain which has made supply to be far more than demand (town x 1)
	Marketing decreased (urban centre x 1)	Governor Ajimobi stopped people from hawking in the street. The government started a new market in Challenge. Not everyone could afford a shop there. So some people were forced out of the business (urban centre x 1)
Consumption in general	Consumption pattern has not changed (urban centre x 1)	The demand for ripe and unripe plantain has not changed (urban centre x 1)
	Consumption has changed (town x 1)	Consumption of bole and chips increased and there are more bole and chips producers (town x 1)
	No changes in the way plantain is processed (community x 1)	
Changes as far as major characteristics of the crop or end-product are concerned	Characteristics demanded has changed (community x 2, town x 2, urban centre x 1)	People are eating more unripe plantain because of health benefits (community x 2, town x 2, urban centre x 1)
		People are eating more plantain flour because of health benefits (community x 1, urban centre x 1)
		Agbagba remains favourite (town x 1)
	No change in the characteristics/type of bunches people demand for (community x 2, town x 1)	

4.9 Economics of the product

Price per season (in Naira)

	Total	Community	Town	Urban
Buying price per dozen during dry season	11,400	15,400	11,500	12,200
Buying price per dozen during wet season	9,300	12,700	9,100	7,600
Selling price per dozen during dry season	14,500	19,100	14,400	15,100
Selling price per dozen during wet season	13,500	20,600	10,700	16,400

Other cost elements (in Naira)

	Community	Town	Urban
Transport per load	8,900	2,100	47,00
Transport per dozen bunches	500	350	1,200
Market fee per day	300	110	
Market fee per load	275		1,700
Shop rent per year		3,000	193,000
Loading and offloading per load	2,000	1,000	1,000
Loading and offloading per dozen		150	
Road	1,100		
Security/police			150
Market ticket		83	1,000
Packaging per dozen		500	
Sanitation			5,000

4.10 Conclusion

Provide bullet points or text on important findings and their implications for WP2 and breeders.

- Farmers sell most of their plantain, between 80-90% of the total production. Farmers sell their plantain bunches in community markets, also called bush markets, or sell their plantains directly to off takers if they have a large amount of bunches available. From the bush markets, plantains are sold to wholesalers in towns and urban centres. The wholesalers resell the plantain in bunches, mostly to retailers but also to food vendors, bole processors, and in some cases to individual customers. Wholesalers mostly deal with unripe plantain bunches. Retailers cut hands or fingers off the bunches and retail them in pieces (ripe and unripe) rather than bunches. Apart from farmers selling plantain from their farm directly, the trading of plantain is dominated by women in the sample states.
- Plantain is majorly traded in fresh bunches at wholesale level and in fingers at retail level. Plantain products form only a small part of the market, and are mostly sold by buka's, roadside sellers and restaurants. Dodo is commonly sold together with rice and beans as breakfast meal. Bole is commonly sold by roadside vendors who sell it as a snack. Also plantain chips is commonly sold along the road as a snack. In Osun State, there is a market for dried plantain flakes, mostly processed at farmer level during the dry season. Flakes are

often sold along the road side and sold to processors who mill the flakes into flour. A smaller proportion of flakes is also sold to individual customers who process the flakes into flour at home. Customers prefer to buy flakes rather than flour in order to be sure the flour is not mixed with any other product (for example cassava or yam flour) and of good quality.

- In retail, plantain is bought in ripe or unripe form, depending on how long customers want to be able to store the plantain, and depending on the product people want to use it for. Due to increasing awareness about the health benefits of unripe plantain, the market for unripe plantain is growing. There is a low and a high season for plantain. During the dry season, plantain is widely available but the prices are low, while during the rainy season, less plantain is available but prices higher.
- Most important characteristics of fresh plantain are 'big fingers', 'peel colour' (either deep dark green when unripe or deep yellow when ripe), and 'maturity'. There are many interlinked characteristics where size and peel colour are indicators of maturity, and maturity an indication for good taste, texture and processability. Indicators as ´black tips´ and ´no edges´ are also largely related to the maturity of the plantain.
- For traders, storability is an important characteristic of plantain. Although most traders are not concerned about the variety of plantain they sell, traders in Rivers State complained about the storability of improved varieties. Traiders explained that native plantain has smaller fingers, a sweeter taste and a longer storability whereas the improved variety has a higher water content, a lesser taste, and a short storability. Although farmers and traders appreciate native plantain for their sweetness, buyers are mainly interested in the size of plantain. The size is particularly important for bole processors since they process whole plantains, while processors of flour, pudding or dodo care less about the size of plantain.

5 APPENDICES

5.1 Annex 1 – Key Informant Interviews

- KII Q1 (list of participants): % men and women, age range, ethnic composition, role in the community etc.

Community	Participant	Role in the community	Ethnicity
Community 1 – Ago-Owu	Comrade Adedoju	President of the association of the settlement	Yoruba
Community 2 – Patara	Cosmos Taiwo	Member of the association of the settlement	Yoruba
Community 3 – Ogudu	Jimoh Ajayi	King of Ogudu	Yoruba
Community 4 – Akola Alaerebere	Asaolu Aremu Alaba and False Abiodun Sugar	ADP officer and community elder	Yoruba
Community 5 – Isele Uku	Edward Azomani, Rose Ojei, O. Okafor, Osuluwe Ifeani, Paul Eze Okwuone, I.P. Oloamiwe, P.E. Oshiuoya, Uzor Sunday, Celestine Udemagwuna, Doroty Okwuone	ADP staff and ADP contact farmers	Igbo (Delta Igbo)
Community 6 – Ossissa	John Nwabuizi	King of Isselegu	Igbo
Community 7 – Agoloma	Pedro Seriboh	Security chairman of the community	Ijaw
Community 8 – Umeh	Dennis Uveruve	Secretary to the king of Umeh	Isoko
Community 9 – Choba	Eze Amadi	Head of community	Ikuere
Community 10 – Omoku	Vincent Uba	Chairman and secretary of the cooperative society	Igbo
Community 11 – Abua	Joe Waris	Farmer and ADP contact farmer	Abua tribe
Community 12 – Etche	Godwin Ogu O	Ochembe of the community (paramount chief)	Igbo

% men and women	Age range
Although all key informants were men, there were 4 female and 6 male attendants to the KII in Isele Uku	45 – 83

5.2 Annex 2 – Focus Group Discussion

- FGD Q1 (list of participants): % men and women, age range, ethnic composition, crop producers/processors etc (from Y/N responses)

Community	Participants	Gender	Age range	Ethnicity	Crop producers	Processors
Community 1 – Ago-Owu	Bowoade Aderemi, Tiamiyu Ganiyu, Sulemon Adebayo, Deacon Samuel Olanrewaju, Samuel Adeleke, Adegboyega Olaniyi,	Men		Yoruba	Yes	Yes
	Funmilola Adesina, Dorcas Iledare, Bimbo Omokaro, Elisabeth Adejunju, Adedumo, Adegunju, Omideyi, Abosede Fashola, Olawore Kehind	Women	30 – 67	Yoruba	Yes	Yes
Community 2 – Patara	Yekuni Sarafa, Mumini Adeleke, Kamoli Adebisi, Ganui Najimu, Ilori Aliu	Men	37 – 46	Yoruba	Yes	Yes
	Dauda Iyabo, Rufai Funmilola, Silatu Adebisi, Silifa Adebisi, Monsura Kamurudeen	Women	30 – 60	Yoruba	Yes	Yes
Community 3 – Ogudu	Nilola Kayode, Serifat Adeyunka, Ajayi Adeyemi, Rafatu Sheidu, Omowumi Odeyemi	Women	35 – 50	Yoruba	Yes	Yes

Community	Participants	Gender	Age range	Ethnicity	Crop producers	Processors
	Adekunle Adefisayo, Mufutu Laural, Hammed Adekunle, Eluyinka Elubayo, Eluyemi Jubril	Men	39 – 62	Yoruba	Yes	Yes
Community 4 – Akola Alaerebere	Oyelekan Gabriel, Innocent Ijoke, Oladejo Adesola, Adebiyi Joshua, Bablola Joshua Kayode	Men	27 – 70	80% Yoruba, 20% Igede	Yes	Yes
	Joke Falase, Elisabeth Oladejo, Toyin Oyedokun, Omoyemi Oladepo, Esther Adekunle	Women	40 – 52	Yoruba	Yes	Yes
Community 5 – Isele Uku	Ifyi Ozuba, Megeai Isioma, Okoh Nonoso, Prince Edmont Uteze, Moemeke Akechukwu	Men	33 – 62	Delta North	Yes	No
	Akuebuzor Loveth, Amaka Ekene, Glory Ofor, Helen Okeafor, Ekechukwu Victoria, Ekene John	Women	27 – 43	Delta North	Yes	67% no, 33% yes
Community 6 – Ossissa	Okwuguni Sunday, Nijiekwu John, Nzemeke Okonji, Okocha Etnmawue, Otiuya Lucky, Dolili Paul	Male	36 – 62	Delta Igbo	Yes	No

Community	Participants	Gender	Age range	Ethnicity	Crop producers	Processors
	Felicia Adule, Helen Osanebi, Patricia Ochinu, Victoria Okonji, Ngozi Nwaokoro	Female	39 – 60	Delta (Kwale)	Yes	Yes
Community 7 – Agoloma	Emieboh Frank, Kobi, S.K., Joy Donard, Ebitimbolo, Favour Goodluck	Female	32-52	80% Ijaw, 20% Igbo	Yes	Yes
	Denmark Nwanbeke, Ezonbuodor Amos, Philip Abai, Fiepre Jonathan, Kelvin Bemehi	Men	42 – 52	Ijaw	Yes	Yes
Community 8 – Umeh	Joy Okoro, Grace Enakeno, Edoka Grant, Dorcas Agajere, Beauty Utoro	Women	49 / 62	Isoko	Yes	Yes
	Emakaware John, Ugbeguo Sunday, Raymond Diamond, Obi Charles, Umukuru Simon, Eniye Raphael	Men	26 – 39	Isoko	Yes	No
Community 9 – Choba	Damian Gbere, Amadi Goodluck, Abel Godwin, Ovundah Wachukwu, Thankgod Nwanaka	Men	28 – 75	80% Ozuoba, 20% Ahoada	Yes	Yes
	Mercy N-John, Mercy Ogundu, Blessing Amadi	Women	41 – 48	Igwere	67% yes, 33% no	Yes

Community	Participants	Gender	Age range	Ethnicity	Crop producers	Processors
Community 10 – Omoku	Charity Anyaladu, Future Akazuam, Ubah Faith, Emily Godwin, Vivian Onwuadi	Women	27 - 48	Igbo	Yes	Yes
	Emeka Adieher, Stephen Obi, Nosike Stanley, Nkemjika Uzoya, Onwuma Douglas	Men	41 – 49	Igbo	Yes	Yes
Community 11 – Abua	Ipah Amemiten, Davidson Nengim, Umor Loyal, Nengi Dighobo, Edum Awiry	Men	32 - 69	Abua	Yes	No
	Onyaioye David, Eyaal Kenoye, Mubula Samuel, Kedian Lucky, Gold Igor	Women	30 – 40	Abua	Yes	Yes
Community 12 – Etche	Christopher Nwuzu, Onyenam Kelechi, Godfrey Iroulor, Kashirim Nwanyawu, Azubuke Amadi	Men	40 – 51	Igbo	Yes	Yes
	Elisabeth Onyeche, Rose Nwaguzi, Comfort Joh, Elizabeth Agbam, Grace Ogwu	Women	41 – 70	Igbo	Yes	40% yes, 60% no

5.3 Annex 3 – Individual Interviews

- II Q1-13 (demographic data: % men and women, age range, ethnic composition, relation to household head, religion, main profession, crop producers, crop processors)

% men and women	Average age	Ethnic composition	Relation to household head	Religion	Main profession	Crop producers	Crop processors
52% women, 48% men	47	38 Yoruba 21 Igbo 14 Delta Igbo 9 Abua 8 Isoko 7 Ijaw 6 Etche 5 Ikwere 3 Egbema 3 Oniocha 1 Calabar 1 Hausa 1 Ogoja 1 Tiv 1 Igede	2 child 58 head 55 wife	96 christian, 16 muslim	60 farmers 29 farmers with secondary occupation (mostly combined with trading of farm produce, processor, civil servant, driver, mechanic, carpenter) 14 traders 9 people who have a main profession not related to farming or trading	110 yes 5 no	103 yes 8 no

5.4 Annex 4 – Market interviews

- MI Q1-7 (original questionnaire) Q1-14 (Nigeria learning doc)

Interview	
Gender	2.9% men 97.1% women
Age (profile)	42.3
Ethnicity	34.4% Igbo 31.3% Yoruba 9.4% Isoko 9.4% Urobo 6.3% Ikwere 3.1% Ijaw 3.1% Kalabari 3.1% Abua
Household size	7.9
Level of education	35.5% primary school 38.7% secondary school 9.7% no education 6.5% JSS3 3.2% SSS 3 3.2% WAEC 3.2% tertiary education
Ownership of means transportation (If yes, type)	88.5% No 11.5% Yes
Ownership of means of communication (If yes, type)	88.5% Yes (mobile phone) 11.5% No
Road to nearest town is good (Y/N)	69.2% yes 30.8% no
Distance to market from the home (in km)	41.9
Distance to market from the home (in minutes)	67.4
Marketing experience (years)	16.7
Main occupation (Specify)	50% wholesaler 43.8% retailer 6.2% retailer and wholesaler

5.5 Annex 5 – Ranking of varieties

DELTA	Eze Ogede	Ogede jioko	Ogede une	Twin bunch	Black psuedostem	White psuedostem	Oyin ogede	Uyere/ogede mba	One bunch	Beribe (main plantain	Main plantain	Local plantain	Efrun	Oreni	Orowa	Ogede	Cameroon	Long bunch variety	Plantain that looks like banana	Red plantain			
Women	3x3	4x3	4x3	1x3 1x2			1x3		1x3	3x3 1x2	4x3 1x2		1x3 1x2	2x2	1x2	2x2	1x1	1x1					
Men		1x3	1x3	1x2 1x1	1x3	1x2		1x3	2x3	2x3	5x3	1x3	1x2	1x3 4x2	1x2 1x1		1x2		1x1	1x1			
Women	9	12	12	5			3		3	11	14		5	4	2	4	1	1					
Men		3	3	3	3	2		3	6	6	15	3	2	7	3		2		1	1			
Total	9	15	15	8	3	2	3	3	9	17	29	3	7	11	5	4	3	1	1	1			

Osun	Agbagba (nla/gidi)	Kolokolo (adooloko)	Agbagba dudu	Onibeji	Agric	Local variety	Variety with 2 hands	Alaba	Alabameji	Asogba	Agbagba fufu	Modern/improved/agric variety	bobloo	olomoyoyo	Variety with many fruits	Onigbaomo	Olomomeji	Agbagba fufu					
Women	11x3 1x2	2x3 5x2	2x3			1x3	1x3	1x2 1x1	1x1	1x1	1x2	2x2	1x2	1x2 1x1	1x2	1x1	1x1						
Men	14x3 2x2 1x1	6x3 4x2	1x3	1x3 1x2 1x1	1x3				1x2	1x2 3x1		1x2	1x1	1x2			2x1	1x1					
Women	35	16	6			3	3	3	1	1	2	4	2	3	2	1	1						
Men	47	26	3	6	3				2	5		2	1	2			2	1					
Total	82	42	9	6	3	3	3	3	3	6	2	6	3	5	2	1	3	1					
Rivers	Main plantain (okrima)	Akwa Ibom	Local plantain	Nkere	Mpiele	Plantain with big/long seeds	Ekide	Esam	Okaany	Agric	Ishigineen	Monkey plantain/cameroon	Agbihike (cooking banana)	Ekpankiri	Ogbaranu	Twin plantain	Red plantain	Plantan with short fingers	Ekpa	Iduma	Plantain that looks like banana	okperepere	Okalabi
Women	6x3 3x2	1x3	1x3	1x3	2x3 2x2	2x3	1x3	2x3	1x3	3x2 1x1	1x3	1x3			1x1	1x2 2x1	1x2	1x2	1x2		1x1		
Men	8x3		1x3	1x3	1x2 1x1	1x3	1x3 1x2		1x3	1x3 2x2	1x3 1x2 1x1		1x3	1x3 1x2	1x2		2x2		1x2	1x1		2x1	1x1
Women	24	3	3	3	10	6	3	6	3	7	3	3			1	4	2	2	2		1		
Men	24		3	3	3	3	5		3	7	6		3	5	2		4		2	1		2	1
Total	48	3	6	6	13	9	8	6	6	14	9	3	3	5	3	4	6	2	4	1	1	2	1

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