

A crop of one's own? Women's experiences of cassava commercialization in Nigeria and Malawi

Lora Forsythe¹, Helena Posthumus² and Adrienne Martin¹

¹Natural Resources Institute (NRI), Chatham Maritime, United Kingdom

²The Royal Tropical Institute (KIT), Amsterdam.

Abstract

Improving the effectiveness of agricultural markets for economic growth and poverty reduction has been a central focus for development initiatives, particularly in Sub-Saharan Africa. Staple crops with low input requirements and drought tolerance, such as cassava, are being promoted for market development due to their accessibility for poor smallholder farmers. Narratives often equate commercialization of cassava to benefits for women, as cassava is commonly labelled a 'women's crop'. However, little is known about whether or how women can engage with new cassava commercial opportunities and the livelihood outcomes from this, particularly given the importance of cassava for food security. Findings from fieldwork in Nigeria and Malawi identify cassava value chains that offer different opportunities and challenges for women, which are often overlooked in agricultural development narratives. Women can gainfully participate in new commercial cassava opportunities while maintaining, if not increasing, food security. However, this is highly dependent on gender norms and household relations. Greater attention is required to these more difficult aspects of gender analysis in development projects to ensure women's integration and benefit from agricultural markets.

Keywords: Cassava, women, gender, markets, food security, norms

Introduction

Contemporary international development discourse reflects a growing emphasis on agricultural markets as a means to encourage economic growth, poverty reduction and food security (Kydd, 2002 and Shepherd, 2007). Agriculture's importance as the largest sector in most developing economies which employs the greatest number of people cannot be overlooked. At the same time there is increasing emphasis on gender equality and the importance of women's income and broader empowerment in the context of development goals such as food security, education and health, as well as recognizing its importance in its own right (World Bank, FAO and IFAD, 2009). These narratives have resulted in initiatives supporting specific agricultural value chains to improve market access for staple crops such as cassava.

There is a strong association between cassava and women in Sub-Saharan Africa where cassava is often referred to as a 'woman's crop'. The association is derived from several factors including the low market value of cassava as a traditional food that is mainly grown and consumed at home, along with characteristics such as its low input requirements and drought tolerance. However, little is known about the influencing factors or impacts of cassava commercialization for women. This paper seeks to address this gap in literature drawing on fieldwork from south-west Nigeria and Malawi, by examining the following questions: Are women able to increase commercial cassava activities in light of new market

opportunities? What are the factors that enable or limit women's ability to commercialize? What are the gender dynamics of household decision making and livelihood strategies regarding cassava? What are the outcomes of cassava commercialization in terms of income and food security?

The gender dynamics of cassava commercialization is explored using results from in-depth qualitative research conducted under the Cassava: Adding Value for Africa (C:AVA) project (Phase 1: 2008-2014). The C:AVA project promotes opportunities for smallholders to gain additional income in cassava markets in Ghana, Tanzania, Uganda, Nigeria and Malawi. The project supports existing cassava value chains and the development of new value chains for High Quality Cassava Flour (HQCF), in order to create income opportunities for smallholders through value addition. This involves three key interventions:

- 1) ensuring a consistent supply of raw materials by supporting local cassava producer groups;
- 2) supporting local processing groups and intermediaries acting as secondary processors or bulking agents in value chains, and
- 3) encouraging market demand for HQCF among industries and consumers (Adebayo et al., 2010:3).

The research was conducted in C:AVA project areas in Nigeria, Ogun and Ondo states, and Malawi in the Central (Nkhotakota) and Southern Regions (Zomba and Mulanje). Nigeria and Malawi were selected as case study countries from the C:AVA project countries due to their significance and difference in terms of the size and range of cassava markets, and therefore provide more learning with regard to cassava commercialization in different contexts.

Literature review

Agricultural commercialization, which generally refers to greater interaction and engagement with markets or the market system, is considered to be an important pathway for development and poverty reduction among smallholder farmers (DFID and SDC, 2008; von Braun, 1995; Leavy and Poulton, 2007; Coles and Mitchell, 2011; Holmes and Slater, 2008). Market interventions in sub-Saharan Africa often aim to integrate farmers with cash crop (e.g. cotton or coffee) markets or high-value crops (e.g. fresh fruits and vegetables) that can exclude poor farmers due to high transaction costs involved, price volatility and the need for high level of inputs (Handschuh and Wollni, 2015).

In the last decade, various international donor organizations have switched their focus to market development for staple crops such as cassava as these are more accessible to smallholders. In the case of cassava in sub-Saharan Africa, cassava is considered a 'poverty fighter' and an important source of income and food for smallholder farmers (NEPAD, 2004) because of its low-risk nature due to its drought tolerance and low input requirements, particularly in the context of climate change (IFAD and FAO, 2000:8; Nweke, 2005; Jarvis et al., 2012). For these reasons, cassava has been the focus of many market-led development initiatives, including the Pan-African Cassava Initiative (PACI) launched by NEPAD and IITA in 2004; the Cassava: Adding Value for Africa project; and the Regional Cassava Processing and Marketing Initiative (RCPMI) with IFAD in West Africa. These initiatives have worked to promote cassava development in different ways, including activities to support increases in production and processing capacity, from improving the agricultural inputs such as improved cassava varieties to the development of new products to increase market demand, and policy advocacy to support growth in cassava commercial opportunities and value chains.

However, cassava activities and the narratives around them have important gender dynamics. Development narratives often relate the crop to women and thus it is often phrased that cassava is considered a ‘women’s crop’ (Forsythe et al., 2015). This is associated to the strong role of women in cassava processing for home consumption and income generation (Nweke, 1994; Afolami and Ajani, 1995; Enete et al., 2002), particularly in West Africa. Cassava is also linked with women because of its important role in household food security, which is often the responsibility of women. Practically, the low-risk and low-input requirements of cassava are particularly important for women who experience more severe constraints in accessing agricultural inputs in comparison to men, and face more constraints in participating in alternative markets such as cash crops (Kiriti and Tisdell, 2003). For these reasons it is often assumed that new commercial opportunities in cassava could increase women’s income, which would most likely be spent on education and health, contributing to a number of development indicators.

Literature on rural markets, livelihoods and gender reveals great complexity around women’s participation and benefit from markets in general (USAID 2005 and 2006; Doss, 1999; FAO, 2011; SOFA and Doss, 2011; World Bank, 2012). One issue is the gender division of labor, where household members participate in different activities based on gender roles and responsibilities (Sweetman, 2008). These roles can be divided based on the type of crop, type of agricultural task etc. (Doss, 1999). Differences in access and control over resources such as labor and land, and inputs such as credit, varieties, fertilizers and information, which the division of labor, influencing the type of crops men and women can produce, the markets they engage in, and ultimately livelihood outcomes (Doss, 1999; Udry, 1996). This has been illustrated in research demonstrating men’s association with cash crops and women’s crops mainly being subsistence or low-value crops (Koopman, 1993; Kiriti and Tisdell, 2003).

Market participation of men and women is influenced by the bargaining power of individuals within a household. Bargaining power refers to the ability of household members to access and control resources, and exercise choice, influence and power over others, based on individual interests (Doss, 2011). The assumption is that household members bargain and negotiate (and conflict over) different outcomes including consumption, production, labor allocation, and asset ownership (Doss, 2011). According to Hadadd et al., (1997) women’s general lack of bargaining power affects their ability to participate in markets and maintain control over benefits when the market value increases or technology is introduced. This trend is found in a number of studies demonstrating women’s exclusion from markets (Doss, 1999; Dolan, 2001; Wiggins, 2012; Quisumbing, 2003) or their poor market position such as the inability to demand fair prices compared to men (Handsouch and Wollni, 2015). However, it is not known whether these same dynamics apply to commercialization processes in staple crop markets, particularly with regard to post-harvest activities.

Contemporary gender studies have explored how gender norms based on wider social constructions of gender underpin inequalities in the gender division of labor and bargaining power at the household level. Gender norms refer to informal rules and shared social expectations that distinguish expected behavior on the basis of gender (ODI, 2015). This literature relates gender differences in time-use, responsibilities and power to differences in opportunities and actions of men and women, based on beliefs of acceptable gender roles and individual abilities and capacity (Muñoz Boutdet et al., 2012). Evans (2014) argues that social gender norms justify unequal gender divisions of labor on the basis of self-interest, as an individual can acquire social respect by following cultural norms. Gender norms

subsequently garner resources, decision making power and control to particular individuals in the household that are negotiated and contested (Pearse and Connell, 2016). Women's agency plays a key role in these processes, referring to their ability to contradict gender norms and also uphold and promote positive gender norms, debate and contest within and outside of the household (Kabeer, 2002; Pearse and Connell, 2016).

With this in mind, women's ability to commercialize, and the outcomes from the commercialization process, is under question. This paper will explore these issues in the context of cassava commercialization processes in Nigeria and Malawi. These two countries have considerably different histories, household structures and value chain environments that can offer a number of insights into gender dynamics of agricultural markets.

Methods

A two-phase, in-depth, semi-structured panel study was held with 30 individual cassava producers and processors in each country (i.e. four processor/producers in Nigeria and three producers in Malawi). Interviews were held with the same individuals at two different times: the first interviews held in 2011 in Malawi, and 2012 in Nigeria, and the second set of interviews were held in 2014 for both countries. The aim of the interviews was to understand changes in commercial cassava activities, livelihood strategies and outcomes. The interviews were based on a semi-structured questionnaire examining the individual's bargaining power and access to resources, participation in cassava commercialization processes, and livelihood outcomes. This panel interview method was selected because it relies less on individual recollection of past conditions and situations and thus is more reliable than single interviews. It also enables the researcher to observe changes over time independently of the perceptions of the interviewee, and to identify different external factors that influence market participation and outcomes, such as seasonality, weather or market prices.

Members of cassava producer and processing groups participating in the C:AVA project were selected for the interviews as they were expected to have been exposed to new market opportunities. The farmer/processor groups and locations were selected randomly from a list of communities/groups, but with representation from each region. Individuals were selected randomly from farmer/processor group lists. The sample size for the individual household interviews was determined by feasibility and the saturation point of new information.

During the course of panel interviews, additional interviews (20 in each country) were conducted in order to explore specific issues as they arose during the fieldwork through snowball sampling and an unstructured interview technique. This included interviews with individuals who were the spouse of the interviewee (mainly husbands), non-members or new members of production or processing groups, village leaders and extension agents. This approach provided the opportunity to investigate issues and themes arising out of interviews and with individuals who were not part of cassava processing and production groups.

The analytical framework used for the study is based on a revised livelihoods framework (Chambers and Conway, 1992; Scoones, 1998) which provides insight into livelihood strategies and outcomes. It however fails to conceptually account for the influence of gender which profoundly structures the livelihoods and opportunities of individuals in different ways, even within the same household. This study therefore focuses on gender issues in exploring the role of commercialization in livelihood strategies and outcomes of women. The definition of agricultural commercialization used for this study is based on three main indicators: increase in use of inputs (e.g. improved varieties or fertilizers), increased

production, and increased sales/marketing. Gender differences in cassava market participation was explored using concepts of gender norms, and bargaining power (in relation to women's agency and access to resources), emphasizing the importance in social relationships, highlighted in Kabeer's (1994, 1999) empowerment frameworks.

Context

Different cassava value chains exist in Nigeria and Malawi, revealing the number of uses, products and markets of cassava. Compared to Malawi, Nigeria has a longer history of processing cassava products for local markets, and a larger demand for the crop for both industrial and food consumption purposes. The two products examined in Nigeria included garri and fufu. Garri is a popular staple food in West Africa that is consumed as a stiff paste or porridge. Processing garri involves grating, pressing, fermenting, and frying cassava, which is then cooked and added to boiling water before being consumed. Fufu, a sticky or heavy dough made from fermented cassava paste is another major product processed and consumed in south-west Nigeria (IFAD and FAO, 2000:24). However in south-west Nigeria garri markets are considerably larger than fufu markets.

In Malawi, cassava is mainly prepared as makaka, non-fermented cassava chips made from dried tubers. This is consumed mainly in the southern districts of the country, but is considered a secondary staple to maize. In the central and northern regions, cassava is consumed as kondowole, cassava flour made after crushing and milling dried cassava chips (Pauw et al., 2010). Kondowole is the preferred food in the central and northern regions. In both countries, processing local products occurs at household or group level, often using simple and hand-operated equipment. These products are referred to as 'local cassava products' in this paper and distinctions are only made where relevant.

The C:AVA project supports processing of local products along with a relatively new cassava product, HQCF, in both countries. HQCF is cassava flour which is not fermented and can be used as a partial wheat replacement for various industrial uses or in baking. The processing of cassava roots in HQCF involves peeling, washing, grating, pressing, disintegration, sifting, drying, milling, screening, packaging and storage. 'High quality' refers to the way of drying and processing cassava without fermentation and contamination. HQCF can be dried using two different methods; sun drying and artificial drying. Sun drying refers to a process which requires equipment for grating or squeezing cassava roots to remove moisture followed by drying the pulp in the sun. Sun drying value chains are characterized by processor groups engaged in seasonal small-scale processing, as evident in Malawi. Artificial drying (or 'flash' drying) is a more advanced technology which dries rapidly by passing hot air through the cassava pulp. A flash dryer can dry one to three metric tons of HQCF per day and are operated by large-scale factories or small and medium enterprises (SMEs), using their own cassava roots or roots purchased from farmers as raw material (Lamboll et al. 2015). In the study areas, there was one factory producing HQCF with a flash drier in Ogun state, Nigeria, and one in Zomba, Malawi.

Cassava processing and production

The dominant ethnic group in south-west Nigeria is Yoruba, where husband and wife(s) generally cultivate crops including cassava independently on separate plots. In these communities women typically provide unpaid labor on their husband's plots, such as weeding cassava or carrying roots from the field to the home when the husband wants to sell it or for it to be used for consumption in the home. Men do not reciprocate labor but will provide oversight, particularly when this involves hiring laborers (who are predominately male) as

men are thought to have greater effective authority. However, this division of labor differs among immigrant communities where husband and wife(s) undertake farming activities together on a shared plot (Forsythe et al., 2015).

Yoruba men tend to dominate the fresh cassava root market due to a preference for selling their roots instead of processing. The main buyers of fresh roots for processing are local female processors, , and increasingly small and medium size (SMEs) and large-scale cassava processing factories, including for HQCF (Forsythe et al., 2015). In contrast, Yoruba women are more involved in processing local cassava products for home consumption and sale, using cassava from their own plots or buying roots from their husbands. Women commonly participate in processing groups, paying a fee to use equipment and gain entry to markets, but sell as independent processors (Forsythe et al., 2015).

In the study districts of Malawi, the division of labor between men and women is less conspicuous at the production level, as both men and women typically work together on shared plots. Although women undertake more weeding as men may undertake more land clearing, they were found to assist each other when needed and therefore gender roles with regard to agricultural activities were less strict. In some areas women had a separate smaller plot for household food security which included cassava. Similarly in south-west Nigeria, the selling of cassava fresh roots is mainly done by men. This differed between matrilineal districts in the south of the country and patrilineal districts in central and northern districts. Matrilineal societies are where the line of descent is traced through mother's lineage and can involve the inheritance of land and other assets. In the matrilineal districts in southern Malawi the cassava roots are purchased by traders, SMEs, and a large-scale cassava factory in Zomba processing HQCF (Forsythe et al., 2015). In Malawi as is the case in Nigeria, processing cassava into kondowole or makaka is almost exclusively done by women depending on the region. One processing group with mainly female membership consulted in the study was making sun-dried HQCF with male labor hired to operate machinery (Forsythe et al., 2015).

Results

Change in commercial cassava activities among women

The study first examined if cassava producers and processors were able to increase their commercial cassava activities, in what markets, and how this fitted within their livelihood strategies.

In south-west Nigeria, men and women indicated that they were able to increase their commercial cassava activities in the past four years. As regards cassava production, 25 out of 30 individuals increased the amount of cassava they planted through renting or buying more land. A minority of interviewees increased their yield through using improved varieties. The increases were in response to growing demands for cassava roots from the HQCF factory, SMEs and local processors involved with garri and fufu. In contrast, 13 out of 26 individual producers/processors reported increases in garri or fufu activities to meet increasing market demand for traditional cassava products. This was achieved by increasing their production or by purchasing larger quantities of cassava roots from their husbands or on the market. Some had decreased their cassava activities, either production or processing, due to illness and old age, along with land being reclaimed, lack of labor availability, and poor access to raw materials.

Similarly, in Malawi; 19 out of 30 individuals had increased their cassava production over the past four years. Compared to Nigeria, smallholders in Malawi used different methods including; reducing the area of other crops planted, changing their planting methods (i.e. reducing plant spaces and planting cassava borders around plots (all from Mulanje), and reducing the amount of cassava consumed in the household, along with planting more cassava on additional land and using high yielding varieties, to increase their commercial activities. The production increases were due to the demands for fresh root from the large scale factory and SMEs. Six out of 27 individuals processors, who also count as producers increased their commercial activities () over the past four years. This occurred mostly in Mulanje where HQCF processing is undertaken by groups as there is lower market demand for traditional cassava products, particularly compared to Nigeria. Reasons for decreasing commercial cassava activities included theft of the roots, a reduction in land due to inheritance or lack of funds to farm, ill health, poor yields caused by drought, prioritization of cassava for home consumption, lack of market and poor land access.

Perceptions of cassava as a commercial crop in Nigeria were largely unchanged during the study visits as the crop has a long history of commercialization in the region. However the change in perceptions in Malawi was more notable among both men and women. Fluctuating demands in Malawi meant that markets for fresh roots or processed products were not always there, and cassava was consequently not considered solely as a cash crop, but rather as a potential resource for food as well as income.

“Sometimes I have a whole plot for cassava with one line cassava and the next line intercropped. A lot of people are using cassava as food and income now so they plant in this way” (female producer, Mulanje district, Malawi).

Enabling factors for commercialization

Various factors influenced the ability of women to increase commercial cassava activities, some shared and some unique to the two countries. Examples from south-west Nigeria and Malawi in particular, reveal highly gendered patterns of access to land, labor and capital that determine individuals' level of engagement with markets. .

Important factors for commercialization in Nigeria

In south-west Nigeria, producers and processors required access to a number of livelihood assets to increase their commercial cassava activities which were highly gendered and dependent on key social and family oriented relationships, determining which value chain they would participate in. One of the most important factors for women to increase their commercial cassava activities was access to fresh roots which is determined by access to secure land. For Yoruba women this is constrained by patrilineal land inheritance practices. Nevertheless, despite the fact that women are allocated plots by their husbands, women do wield considerable authority in decision making, management, and control over profits from the land.

The private land rental market has enabled women and migrants to access land outside of Yoruba lineages. This has provided them with ways of taking advantage of new market opportunities for cassava. However, the ability to rent land is also influenced by relationships with Yoruba land owners, as there were frequent reports of land being reclaimed. Landowners would rent their land to other Yoruba men at a lower cost or at no cost at all since they are regarded to have priority as original inhabitants and owners of land in that region and often having long standing social relationships with the landowners. These same

arrangements were not afforded to women or migrants.

The type of value chain that men and women participate in is partly determined by the area of land they have access to and the volumes of cassava they can produce. Yoruba landowners tend to supply large volumes of fresh roots to the HQCF factory as opposed to farmers with smaller plots of land, as the factory preferred to deal with fewer farmers to reduce risk of inconsistency in the supply and quality of tubers. In contrast, male farmers with smaller plots of land would supply roots to female processors (including and most importantly their wives) who purchase in smaller amounts.

Those considered to have the least access to land, often migrants and women, utilized their roots for garri or fufu processing, a decision which is related to greater financial benefit that they can receive from value addition by processing. Therefore the ability to purchase fresh roots was important. Yoruba women primarily purchase their husbands' roots, which are given on loan until they sell. In most marriages, the norm is for men to give their spouse priority over other processors when selling fresh cassava roots, ensuring women have regular supply. However, when the relationship is poor and this transaction is jeopardized, it is considered as infidelity, as the quote below demonstrates:

“Once in 2005 I paid my husband for his roots before I processed them, but then he sold them to another woman. This brought trouble to the home. I have never recovered *my money*. *He can't sell his roots to other women. I said not to do it again because it's cheating*” (female processor, Ogun state, Nigeria).

Another important factor in determining commercial activities was access to credit to invest in additional land, cassava roots and/or hiring labor. Traditionally women and migrants have difficulty accessing credit, however, alternative sources, namely cultural and social networks have developed over time to meet the need. This includes family-based loans, where women reporting increases in their processing activities received loans from their husbands to purchase additional roots or hire labor. Clan-based credit and savings groups can also provide loans, but the ability to receive loans and the size of loan is determined by the social standing and reputation of the individual and their family within the clan. Cassava roots, garri and fufu were also frequently sold on credit; therefore trust and strong social relationships within market networks were vital for scaling commercial activities.

The availability of hired labor was another constraint for both men and women in production and processing, which was also influenced by clan-based relationships. Migrants would typically work as hired laborers for the Yoruba, but provide reciprocal labor for people within their clan. As there were frequent labor shortages, migrants would prioritize their own processing with other members of their clan or Yoruba households that they had good relations with (e.g. paying on time, treating with respect). Migrant men and women also conduct processing tasks together more freely. Yoruba women would complain that this gave the migrants a competitive edge at the processed cassava markets.

Labor availability and women's time also affected the women's ability to commercialize, related to women's stage in the life-cycle. The social norm was for most women to weed their husbands' plots, along with their own, without remuneration or reciprocation of labor. Women with childcare responsibilities lacked time to increase their commercial activities, and in some cases small children were not allowed at garri processing centers. This explains why those working at processing centers were often predominately middle-aged women.

Membership in processing groups was also important for commercial activities, and based on a monthly fee, as it provided access to the market and processing equipment. In some villages, women had equipment to process at home. Migrants preferred to process using their own equipment and limited their participation with larger processing groups. This is because processing groups also have a strong cultural link, practicing traditional Yoruba rituals and celebrations, which the migrants do not practice or identify with.

For women, access to high-yielding cassava varieties was a strategy to increase their commercial activities. Women reported that they were not able to attend meetings where the planting material was distributed, or they were waiting for their husband to test the new materials or give to them. This reflects institutional difficulties of extension services in reaching women and also a reluctance of women to take risks in trying new varieties.

Important factors for commercialization in Malawi

In contrast to Nigeria, the factors that influenced commercialization in Malawi depended more on resource access by the household as opposed to the individual as agricultural activities are shared among household members. Increasing commercial cassava activities, both in matrilineal and patrilineal areas was decided upon in consultation with the spouse.

Similar to south-west Nigeria, access to land was also the primary factor in Malawi for enabling cassava commercialization. However, there were different dynamics in the central and southern regions. The southern, matrilineal, districts experienced land shortages (partly due to inheritance practices), and a smaller (to non-existent) land rental market. Women did not have problems accessing land due to matrilineal customary practices, however accessing additional land was problematic. In addition, despite matrilineal practices, decision making of how to use the land is often still decided by the men.

The use of high yielding cassava varieties was not often reported among women, but was reported among men. In addition, there were cases where the new variety was used and had failed. This could be related to the lack of extension support for women, as the quote below demonstrates.

“We didn’t receive any training when we got the new varieties. We didn’t know how to manage them and we haven’t seen improvement in yield. They said that people would be trained but this has not happened” (female producer, Nkhotakota district, Malawi).

Surprisingly, compared to findings in south-west Nigeria, only few respondents raised access to financial capital for farming as a constraint. The majority of women had some access to small, savings-based loans through village savings groups which enabled them to meet urgent needs in the household. It was also uncommon for laborers to be hired for activities. This, along with farmers not mentioning finance as a significant constraint could reflect the lack of commercial orientation of cassava and farming more generally, as food security was still an issue in the study areas.

However, since cassava processing activities depended solely on women’s labor, the women’s time constraints posed a challenge for commercial activities. Labor required for HQCF processing was considered to be higher than that required for traditional products and children were not allowed at processing centers thus typically excluding women of reproductive age with small children. There was a similar finding in Nigeria.

Another constraint found among the sun-drying HQCF groups was group governance, of which there are three-linked groups in Mulanje, Malawi. The three groups were long established, and the new HQCF initiative provided training and market facilitation for the new product among the three groups. The processing facility and leadership of the initiative was located in one of the villages, and the remaining two groups were located in nearby communities. Soon after the processing activities started the relationships between the three groups broke down. This was because the leaders from one of the groups undertook product marketing and agreed on a price that was not considered acceptable to the two other processing groups. This caused conflict and the leaders were accused of being corrupt, as selling practices were not agreed or fully transparent. Therefore the original three processing groups had declined to one group within four years. This was related to perceptions of corruption and favoritism of the main group, and discrimination towards the other two (see quote below). This underlines the importance of group governance in enabling processors to undertake activities as a group.

“But the quarrel came when they (the group leaders of one group) went searching for the market. They sold at a low price and we don’t believe this price. Then they said the members needed to pay commission. We think that people from each group should be represented in finding a market. We weren’t briefed” (female producer and processor, Mulanje district, Malawi).

There were a number of other constraints to cassava commercialization that affected both men and women, particularly in the southern region. This included drought, problems with the cassava variety distributed, theft of cassava roots and cassava mosaic virus disease. These problems often led men and women to uproot their cassava prematurely to sell on the market at a low price. Theft was a significant problem in the area which influenced a change in farming strategies, such as planting bitter cassava varieties along the edge of the fields (with sweet varieties in the middle) as bitter was less likely to be stolen.

Gender dynamics of household decision making and livelihood strategies

Overall, commercial cassava activities fit within the broad scope of rural livelihoods for women and men in the study areas in Nigeria and Malawi. This is evident through individuals who had increased commercial activities in the past four years. Commercialization of cassava was considered to be a viable part of the livelihood strategies as the crop can be used for both food security and income generation.

Livelihood strategies involve decisions around budgeting for the amount of cassava used for home (food security) and for sale (income) depending on the value chain to which it is sold, and, the individual who does the work and uses the profit. Cassava can be used for both objectives, however, since resources are constrained, there is need for negotiation to achieve each goal. Although there are exceptions, the general strategy was for women to be involved in processing activities, including new products such as HQCF if processed at the community level, and for men to be involved in the sale of fresh cassava roots, particularly when selling in large quantities. The reasons for this are related to the different roles and responsibilities of men and women in the household.

In both countries women were found generally to value income and crop diversification and low-risk activities for continual and stable sources of food and income, even if in small amounts. This does not mean that women were not acting commercially, in fact, their

commercial activities were numerous. However, the risk is with commercial specialization, particularly in agriculture, if there is crop failure or market fluctuation. Despite the low-risk nature of cassava, in the context of limited resources, producing and selling large amounts would detract farmers from other crops and businesses. Selling in large quantities could also threaten future food supply. Therefore, it is more common that women prefer a strategy of diversification that values consistent diverse cropping patterns and undertaking multiple businesses, adding value through their labor and time, for consistent income and food supply. Cassava fits well in this strategy; it is a crop that can be harvested gradually, and thereby women can process small amounts when income is needed and leave the remainder in the field. Although women are participating in commercial activities to a considerable extent, the degree to which they are involved in any business is limited by these constraints.

However, livelihood strategies for men and women vary by context and are demonstrative of individual agency. While Yoruba women have considerable autonomy and independence in commercial activities and control over income, at the same time their strategies reflect their limited bargaining power in the context of patriarchal household norms. At marriage, husbands usually provide the initial capital for processing, land and equipment, which determines the extent to which women can undertake commercial activities. Men also influence the time women have available as it is the norm for women to work on their husband's plots, unreciprocated, along with undertaking other care responsibilities. Men also varied in how much they contributed to household food supply from their plots and income, which was reported to be declining over time, which strongly influences how much women can sell, as the quote below demonstrates.

"I uproot gradually. Even if there is a good price for garri I will uproot gradually for food security. Because of this my husband doesn't do this method and sells all his cassava roots to companies" (female processor, Ogun, Nigeria).

Migrant households in south-west Nigeria have different livelihood strategies that are more integrated between men and women, and among whom gender norms are not as strict. For example, some men will also process cassava, along with other members of the community, when their wives cannot do all of the work. In these households, women undertook fewer businesses and greater effort was directed in the household to specialize in commercial cassava activities, particularly garri. Interviewees explained that these arrangements were not the same when they were living in their native village, but were changed when they migrated. One reason for this could be the difficulties that migrants face to access resources, such as renting land. They have therefore a larger need to capture additional income off-farm, through post-harvest processing for value addition. In addition, migrants acquire cheap labor more easily within their household or among their clan, and thereby they can make a greater profit from cassava processing than Yoruba women who must pay more for hired labor.

In Malawi, men and women's livelihood strategies were integrated in a similar way to migrant communities in south-west Nigeria. Women and men farm together on shared plots and processing activities for women, increase or decrease, depending on decisions made within the spousal relationship. This was related to established gender roles and norms that influenced the degree of their husband's authority and contributions to the household. Power was commonly vested with men to make these decisions, particularly those which are market-related, even in matrilineal areas. However, overall, it was reported that men and women consulted each other and planned their commercial and food security needs accordingly, with food security being prioritized. This was related to the experiences of many households with

food shortages. In fact, there was only one example raised where a woman felt that the husband sold too much cassava and they did not have enough food.

Despite the different farming systems of Nigeria and Malawi, there are similarities in gender norms of women's responsibility over household food security along with a lack of real choice, control and agency over the use of income. Although Yoruba women reported that they had considerable independence in their economic activities and income generated from cassava, they also perceived that compared to their husbands they were increasingly responsible for important household expenses, such as food (e.g. fish, meat, eggs, beans and cooking oil) and school fees. In both countries, women described a decline in male responsibility for the household that was worsening over time. Men would be less dedicated to their family, take on additional wives, and provide limited support to women and the children. Subsequently women needed to participate in more commercial endeavors independently. As the quote below demonstrates it is uncommon for a man to contribute to education. This demonstrates that although women are benefiting from additional income, this is required for household expenses which may not necessarily reflect free choices.

“A different type of man will pay for the school fees. More of the women take this cassava and pay for school fees” (female processor, Ogun state, Nigeria).

In Malawi, women generally reported minimal independent control over income from cassava sales as income was generally given to the husband, along with household income in general. However, there were exceptions particularly in the matrilineal south, where women were more involved with marketing. However, in most cases, the money made is brought back to the household where husband and wife may consult each other about expenses, as the quote below demonstrates. There can be difficult situations where there are different interests of income use and food security. This affects which type of crops are planted, the quantity of crops planted, and is the quantity to be sold or kept for household consumption. Although interviews with women indicated this scenario could occur, and they knew one or two examples, they said it was rare as men and women both understand the importance of having enough food for the home. However, the situation could be a problem in households where women lack bargaining power and their priorities of income generation and food security may be opposed.

“I show the income to my husband and we decide how to use it” (female producer and processor, Mulanje district, Malawi).

There were some indications of increasing male participation in cassava processing in south-west Nigeria and Malawi, particularly when selling prices were particularly favorable and demand was high (whereas women remained consistently processing). In most cases men would hire laborers for the processing and thus working within the constraints of traditional gender roles. In these cases women would benefit from money earned as laborers, however, this created additional competition for other female processors who also may not have had the resources available to respond to market demand.

There were some cases where men would assist their wives in processing activities since women's labor was insufficient. This was found among migrant communities in south-west Nigeria who frequently shared labor and also in southern matrilineal Malawi. This is demonstrated in the quote below:

“For peeling cassava I will join my wife in doing this. I didn’t do this four years ago but then I saw when I left things to my wife it takes a long time. I also help transport the cassava from the field to the house” (male producer and processor, Zomba district, Malawi)

Men were also involved in operating the equipment at processing centers, which meant that women’s processing activities would sometimes be delayed if men were not available to operate the equipment.

Outcomes from commercial activities

Outcomes from commercial cassava activities reported by men and women involved changes in income status, and with that, changes in diets and the purchase of assets. Those who had not changed their commercial activities reported limited changes in their livelihoods. These patterns were largely similar between the two countries; however the implications from increasing commercial activities in the study areas differed.

In south-west Nigeria, 23 out of 30 interviewees comprising both women and men reported an increase in income over the past four years related to growing their commercial cassava activities. (). Men mainly acquired income through the sale of fresh roots and women through selling processed cassava products along with some sales of fresh roots. Four individuals stated that they experienced a small decrease in income and three stated that there was no change. Six men and four women reported (changes in assets related to increases in cassava income which can help improve the resilience of households. For the men this included acquiring large assets such as grating machines, land, motorcycles and construction materials for housing. For women this included land and a mobile phone. One interviewee gave the money to her husband to buy land.

In addition, slightly over half of those interviewed stated that their food security had improved in the past four years. Food availability was not considered a problem among interviewees in south-west Nigeria (see quote below), the change was mostly in terms of food quality, with reports of eating greater amounts of protein-rich food. Five interviewees experienced no change, while eight experienced a decrease.

“It isn’t that people here have a problem with food security. They have a problem with income. In times of low demand they have a problem. Most farmers will always reserve food by leaving a small part of their land separate for food security. You can’t eat money. It is not possible a farmer to not consider home consumption” (extension agent, Ondo state, Nigeria).

Findings related to income change were similar in Malawi, where 22 out of 30 interviewees stated that they had an increase in income related to cassava. Two reported that there was no change while six reported a decrease due to inconsistent demand or change in personal circumstances (see quote below). For those who reported an increase in income, it had contributed to feelings of security, independence and reduction of work as a laborer. It was found that cassava played an important role in contributing to strengthening household resilience by providing greater income diversification.

Thirteen respondents (including one man) stated that they were able to purchase assets, which can improve their resilience in the context of a livelihood shock or change. This included the purchase of a house or house improvement (i.e. iron roofing), a bicycle, a stove cooker, plates

and pots, a goat, a radio and a mobile phone. However, the majority of respondents indicated that the money for cassava was used to purchase food.

Half of respondents (15) felt that their food security had improved in the past four years. Six respondents reported that there was no change while four reported a decrease. Sales of cassava contributed to diet diversity of households by enabling the purchase of foods such as cooking oil, meat, fish, sugar products and sweet potatoes as stated in the example below.

“We buy good food. Before we ate a lot of pigeon pea, cowpeas and okra. But now that we sell we buy fish, meat and even fresh chambo. We buy cooking oil which we didn't use before” (female producer, Zomba district, cassava factory area).

Some processors were food secure enough to sell to other households during the lean period. However, others were still reliant on storing food that they had grown. Overall, respondents didn't feel that they went without food, but they would change their diets during the lean season. Decreases in food security were related to illness of the respondent or a family member; poor markets, crop failure and theft.

There were cases in Malawi where cassava production increased at the cost of other food crops. This was attributed to constrained land access, particularly in the Southern region where producers were reducing crops such as groundnuts, beans and pigeon peas to plant more cassava. This could potentially reduce consumption of the protein-rich foods, along with reducing soil fertility as they are nitrogen fixing crops. This may indicate that although households may be food secure, there may be nutritional impacts to commercialization, if food purchases do not replace what is lost. While there were no reports of this occurring in the sample, there may be issues if money is not saved for lean periods and spent on nutritious foods.

Discussion and conclusions

Drawing on a sustainable livelihoods framework in the context of agricultural markets, and combining this with a focus on gender relations and gender norms, can draw out a number of implications. In particular, it demonstrates the importance of using more nuanced socio-economic analytical frameworks to understand market participation and impact. The livelihoods framework can provide insights into how people participate in markets and why. However, there needs to be a greater emphasis on gender and social relations in order to understand who can participate and who benefits.

Using this framework, the study demonstrates that the majority of cassava processors and producers are able to increase their commercial engagement with cassava. This is carried out in various ways according to context and the livelihood strategies of individual household members and the household as a whole. Gender plays a significant role in these commercialization processes, as the factors which enable or constrain commercialization are influenced by household structure, bargaining power and gender norms. This is complicated further by the intersection with other factors of social difference such as ethnicity and age. These factors, in turn, determine which market value chains men and women can participate in and the benefits they obtain.

The findings from south-west Nigeria and Malawi highlight various points at which women can participate and be excluded from commercialization, on the basis of their gender and bargaining power. However, trends within any one context can be contradictory and complex,

with different spaces and opportunities that can empower or disempower women. Women can draw on group social or ethnic networks for labor, credit and markets while at the same time being disadvantaged by ineffective extension support and household responsibilities. These are flexible and changing, but regulated in broader sets of gender and social norms. These findings are in line with considerable amounts of gender research that question women's long-term control and ownership over activities that increase in income-potential, due to their these unequal relationships.

In Nigeria, there is a considerable gender specialization between men and women in the cassava value chains whereby men specialize in fresh cassava roots and women specialize in traditional processed cassava products. Social affiliations and gender norms within the household and community, along with ethnicity, are key to accessing livelihood assets, including fresh roots, land, credit and labor. Increasing the use of resources for commercialization requires female processors to bargain with family and the wider clan and community to enable them start and increase their commercial activities. At the same time the separate the farming systems among the Yoruba households provide considerable autonomy and control over income for women. However, this may be at the cost of women's increasing responsibility for food security and education in the household.

In Malawi, household farming and processing activities are more integrated and inter-dependent between family members, and not as strictly divided by gender as in Nigeria. The family-based agriculture in Malawi is under male authority, even in matrilineal areas. The bargaining power of women to choose to change their level of participation in cassava markets and directly benefit is therefore more in question, in circumstances where women lack bargaining power. In addition, high levels of poverty and vulnerability along with land constraints make it difficult for households to acquire additional resources to increase commercial activities as compared to Nigeria.

Despite cassava being an important staple in both countries responses from the interviewees also indicate that cassava commercialization may not be a threat to household food security. Men and women are experienced in budgeting for a variety of crops for home consumption and selling on the market. However this is dependent on agreements made within the household that reflect gender norms that determine how decisions are made over the control over produce while allowing for minimal risk-taking to take advantage of new opportunities. The results from this study indicate that women's responsibilities of the day-to-day care of the household, in terms of food provision and education expense, contributes to a predisposition among women for a diversified livelihood strategy in order to limit risk. For cassava, this means piecemeal processing and marketing to manage their own labor along with guaranteed reliable income and food sources. This is in contrast to male responsibility over large investments (e.g. land, house improvements) that requires a different livelihood strategy to fulfil their role. Men therefore prefer to sell large quantities of cassava roots at once to gain a large sum of money to pay for these large investments.

Given these findings, increased women's participation in cassava markets in particular, will essentially be more long-term and gradual if resource bases can grow over time. This is important as new market opportunities can provide women with greater resilience in the context of fluctuating agricultural markets and more diverse coping strategies. However, it can also mean that a slower, long-term intervention strategy, is required to address the reality of women's livelihood constraints along with the probability of male capture of the benefits of new market opportunities.

The results from the study also point to a number of concerns for development initiatives aiming to support agricultural commercialization and the inclusion of women. Firstly, how can support packages be designed for market initiatives to enable women to increase and sustain their benefit from processing activities at the household level? Taking into account gendered access to resource constraints is particularly vital in ensuring women can capture market opportunities. This may mean that targeting fresh root markets may not be the avenue to women per se, or that significant investment should be made in assisting women to bulk their products. In addition, higher yielding varieties, which are important in areas with land constraints, also need to be tested appropriately and accompanied by training of smallholder farmers in their use so as to prevent decreases in production that could threaten food security.

Secondly, how can they ensure that women's labor doesn't increase along with their responsibilities for household wellbeing? Group processing initiatives can provide an avenue outside the household to support women. However significant investment is required in strengthening the capacity of group governance systems to become transparent and democratic.

Overall, the study demonstrates that there is not one linear trajectory to support positive livelihood outcomes from agricultural commercialization, particularly with staple crops that play dual roles in rural households. Pathways of development become more complex in this context when gender is taken into account. There is a need to take time to understand rural contexts where interventions are taking place, and perhaps adapt traditional understandings of market integration and commercialization to include more diverse and fluid forms of participation that respond more to women's reality.

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