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CASSAVA: ADDING VALUE FOR AFRICA - STRATEGIC MARKET INITIATIVES THAT SUPPORT WEALTH CREATION FOR WOMEN ALONG THE CASSAVA VALUE CHAINS IN SOUTHWEST, NIGERIA

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ABSTRACT

Empowering and creating wealth for cassava producing and processing smallholder farmers (of which women constitute the majority) through value addition and competitive market led opportunities for inclusive growth in agriculture is very important to counter poverty and ensure food security. This study attempts to examine the extent to which Cassava: Adding Value for Africa (C : AVA) project in Nigeria has created market led opportunities for smallholder farmers of cassava roots in Southwest Nigeria from 2008 to 2010. Data were collected through interview schedule administered on 237 randomly selected farmers who are participants in C: AVA project registered with the Agricultural Development Project (ADP) in Ogun, Ondo States and Justice, Development and Peace Movement (JDPM). Catholic Diocese of Abeokuta from Ogun State and Ondo State respectively. Data were analyzed descriptively by using measures such as frequency distribution, table, percentages and Chi-square. The study revealed that 60% of the respondents were men and 40% were women. Men were more educated than women with 28.6% of women farmers having no formal education when compared with 10.3% of men. The difference in income between the third and the fourth quartile was very high compared with other quartiles and the mean income earned by male farmers was more than twice the mean income earned by female farmers. With regards to the level of production there was an increase in the yield of cassava roots on the farms surveyed from the average national range of 10-12 tonnes/ha in 2008 to an average range of 20-25 tonnes/ha in 2010. These improved varieties resulted in an average yield advantage of about 65% over local varieties. Owing to the observable increase in yield, farmers in the study area increased the hectares under cassava from an average of 0.5-1.5 ha in 2008 to an average of 10.0-20.0 ha in 2010. The average annual income of women farmers increased from \$1000 in 2008 to an additional average income of \$1700 in 2010. Chi-square analysis revealed significant associations ($p < 0.05$) between yield of improved varieties ($\chi^2 = 29.187$), gender ($\chi^2 = 50.632$), value addition ($\chi^2 = 32.547$), improved technologies ($\chi^2 = 29.507$); Types of market ($\chi^2 = 14.743$), group membership ($\chi^2 = 10.973$), capacity building ($\chi^2 = 68.490$) with income. The study concluded that C: AVA has provided systematic development of specialization in which women cassava roots producers/processors produce specifically for multiple markets to ensure wealth and household food security for women and their households.

Keywords: Smallholders, women, cassava, market, wealth and food security

INTRODUCTION

Nigeria is agrarian in nature and agriculture remains the hub of the economy, providing employment for over 90 percent of rural workers, who constitute about 70 percent of the total population. Women constitute more than fifty percent of the adult population resident in the rural areas of Nigeria (Federal Ministry of Women Affairs and Social Development (FMWASD), 2007). More than 90 percent of the agricultural output is accounted for by small-scale farmers with less than 2 hectares under cropping. Cassava (*Manihot esculenta* Crutz) is Nigeria's largest agricultural crop (45 million tonnes/annum) and as such, the economic buoyancy of much of rural Nigeria rests upon the success of cassava production and processing (Nweke, 2002). Between 30-70 % of the labor involved in Nigerian cassava production, processing and sale is carried out by women (Abdulsalam-Saghir, 2011) at the village level, working independently or organized into informal groups or cooperatives. However, their traditional roles as producers, selectors, processors, marketers of cassava and custodians of on and off farm cassava genetic diversity has been rendered inefficient because they have not succeeded in the application of value chains strategies to gain access to profitable markets to increase income.

Men are generally presumed to be the chief actors in agricultural production and as such are often the main participants in and/or recipients of program-related support into market opportunities in Nigeria (FMWASD, 2007). The result is a relatively low agricultural productivity which is inversely proportional to the enormous labor intensive output produced by women. The identification of ways to increase benefits accrued from agriculture through market

participation most especially for women who remains the majority of producers and processors of cassava, and thereby provide incentives for more households to remain in rural areas continues to be a research challenge of critical importance. Linking smallholder farmers to markets and making markets work for the poor is therefore increasingly becoming a focus of research and development organizations in Africa and beyond. Increasing consumption of cassava products both at local and urban level, particularly in the fast-growing economies of the developing world, has been an important determinant of rising prices for these products. These price surges provide new incentives and opportunities for using cassava roots as a viable and value adding root crop to help poor people escape from poverty. Taking advantage of the so-called "cassava revolution," many countries and development organizations have prioritized cassava market development as part of their rural development and poverty reduction strategies.

Value chain development can play an important role in reducing poverty and generating on and off-farm employment for rural people and women through adding value to raw products, and the creation of, and participation in, new, more formal and niche markets for higher quality and differentiated cassava roots and cassava products. Evidence also shows that in some instances increased access to market opportunities can open up competition by other producers, driving local producers out of production, or allowing powerful elites to capture new economic opportunities that were previously undertaken by the poor (DFID, 2000). Poor farmers from developing countries like Nigeria lack the capacity to meet the high requirements of final products in high income markets. Consequently, the disproportionate benefits

from producing and exporting goods may threaten the survival of small agriculturally dependent farmers from developing countries (Kaplinsky *et al.*, 2001) if smallholder farmers' capacities are not strengthened to add value to cassava for more competitive market opportunities at the local and international markets.

Women, Cassava and Marketing Continuum

Agricultural marketing systems are highly gendered in Nigeria. Various factors contribute to the extent of gendered agricultural systems including the nature of the commodity, distance to markets, and type of marketing system (whether informal, formal). According to Harris-White (1998), women are more likely to be involved in and retain control of income from informal markets for traditional food crops, although recent evidence suggests that this may be changing with increasing commercialization of traditional food crops and small livestock (Njuki *et al.*, 2011). In Nigeria, 62% of the agricultural labour force is represented by women, which is equivalent to 89% of total female employment (Federal Office of Statistics, 2009). This strong association between the agricultural sector and women implies that improved performance of the agricultural sector, through improved markets for example, can therefore increase the benefits gained by women (Arndt and Robinson, 2006). Increasing commercialization can however have negative consequences for women. Lessons from crop farming have shown, repeatedly, that changes in control over productive activities and the resulting income can occur when activities' profitability changes in response to market and other conditions. Specifically, as a crop becomes more profitable, men tend to take over control. The converse, too, is true

(FAO 2000). Men have a tendency of taking over control of cash crops when the income increases and relinquishing it to women when income decreases (von Braun and Webb 1989; IFAD, 2000). When the agriculture economy is dominated by crops for export, there develops a male dominated market-crop and a parallel female dominated food crops for use by the household members (Boserup, 1970).

The transition from subsistence farming to commercial production alters the values and norms of production, processing relations and relations attributed to everyday life (Moryaridi, 1992). Once agricultural production is commercialized, the income and survival of farming and households begin to dominate social relations (*ibid*). For example, women's low status as unpaid family labour is perpetuated by social relations within the household and intensified in commercialization. Thus, women are further exploited to the benefit of household accumulation (*ibid*). Women traditionally engage in more informal trade in local rather than regional or international markets therefore they may be excluded from formal value chain trading arrangements designed to link rural areas to cities and towns. In his work in Guatemala, Sweatman (1998) demonstrated a market based sexual inequality whereby most women sold goods that carried high risk, the lowest profits, and the least potential for amassing wealth. Women also lack secure rights to production resources including land, labor and capital (Moser, 2009; Kabeer, 2001), have a lower human capital (Morrison and Jutting 2005) and are, therefore, less likely to be served by formal financial institutions than men. The increase in demand for cassava and their products offers an opportunity for growth of cassava markets and participation in these markets by smallholder

farmers, who include women. Participation in markets by smallholders is determined by numerous costs and benefits, such as transaction costs, which may or may not be compensated for by high revenues; prices; turnover; uncertainty; cooperation and collective initiatives; and labour and capital investment (Nweke *et al.*, 2002) lack of quality certification, disorganized brokers and agents, inability to pool products in order to benefit from economies of scale, and inter-seasonal and inter-regional variation of production (Fafchamps and Quisumbing, 2001). Whether women benefit, or not, from participating in markets depends entirely on the context of the market and the factors that govern that market. Overall, commodity markets are suitable for women because they require intelligence and decisiveness rather than heavy manual labour, (Mintz, 1971). It is, therefore, not surprising that women in less developed economies are found more in trade than other occupations (Boserup, 1970).

In Nigeria, cassava tubers deteriorate quickly after harvesting, and of the 45 million tons of cassava produced per year, 55 percent is wasted due to post harvest spoilage, inadequate processing capabilities and lack of markets opportunities (Phillips *et al.*, 2004). These losses are made worse by poor infrastructures, lack of product quality control, and inadequate knowledge in processing/adding value to meet market requirements. This created a need by the Nigerian Government to find a way of creating more markets opportunities for smallholder farmers by deliberate instituting public policy interventions that lobby (or force) value chain actors (especially private sector) to include smallholders in the chains with insistence on 10% inclusion of high quality cassava flour (HQCF) into wheat flour by

flour millers in 2002. This created a surge in demand for cassava roots, boosted production, processing and sale of cassava and its products for subsistence farmers both at the local and industrial markets. Regular purchase of HQCF came to a halt with the end of the Presidential Initiative program on Cassava in 2007. Since early 2008, less emphasis was placed on markets/markets opportunities and most HQCF processors were not operational. This was the situation deluding cassava root crops production and marketing of its products until the commencement of the Cassava: Adding Value for Africa (C: AVA) project in Nigeria in 2008 spearheaded by the Federal University of Agriculture, Abeokuta (FUNAAB), Nigeria in collaboration with Natural Resources Institute (NRI), United Kingdom and other partners.

Cassava: Adding Value for Africa

The C: AVA Project, funded by the Bill and Melinda Gates Foundation, started in Nigeria in May 2008 and is still on-going. It developed value chains for high-quality cassava flour (HQCF) to provide ample opportunities for interconnectivity of market access, gender and smallholder farming enterprises and in micro-, small- and medium scale enterprises. C: AVA focuses on three key intervention points in the value chain: (1) ensuring a consistent supply of raw materials; (2) developing viable intermediaries acting as secondary processors or bulking agents in value chains; and (3) driving market demand and building market share (in, for example, the bakery industry and components of traditional foods or plywood/starch, pharmaceuticals, ethanol and paper board applications). C: AVA strategies identify the participation of smallholder farmers as a critical feature of agricultural development, success and sustainability by recognizing that women comprise the vast majority of smallholder

farmers, processors and food producers, given their dual responsibilities/roles in reproduction and production in rural households, which are not formally recognized or acknowledged.

From the foregoing, this study attempts to examine the extent to which C: AVA project in Nigeria has created market led opportunities for women smallholder farmers of cassava roots in Southwest Nigeria. C: AVA strategies identify the participation of smallholder farmers as a critical feature of agricultural development, success and sustainability by recognizing that women comprise the vast majority of smallholder farmers, processors and food producers, given their multiple responsibilities/roles in reproduction and production in rural households, which are not formally recognized or acknowledged.

MATERIALS AND METHODS

Ogun and Ondo States in South western Nigeria were purposively selected for C: AVA project because the two States are classified as moderate (sub optimal) region for cassava production in Nigeria. Ogun State has a land area of 16,762 sq. km and a population of 3,728,098 (NPC, 2006) with females accounting for 50.5% of the population. Ondo State has a slightly smaller land area (15,500 sq. km) and population (3,441,014 - 49.7% female) (NPC, 2006). Both States have seen a gradual expansion of cassava production during the last few years, and have a total production of 3-5 million tonnes per annum; production capacities in the two states are supported with SMEs establishment with mechanized equipment (flash driers) for HQCF processing.

Data were collected through interview schedule administered on randomly selected

237 participating farmers who registered for C: AVA project with the Agricultural Development Project (ADP) in Ogun, Ondo States and Justice, Development and Peace Movement (JDPM) Catholic Diocese of Abeokuta, from Ogun State and Ondo State from 2008-2010 respectively. Data were analyzed descriptively by using measures such as frequency distribution, table, percentages and Chi-square.

RESULTS AND DISCUSSION

Description of the Socio-Economic Characteristics of Respondents

Table 1 shows a total of 237 farmers were interviewed in 4 selected communities of Ogun and Ondo States. Of these 237 farmers, 60% were men and 40% were women. Men were more educated than women with 28.6% of women farmers having no formal education compared to 10.3% of men. Over half (58%) of the farmers had attained a primary education. More notable differences were seen in secondary and university education where men were more educated than women farmers. Morris and Jutting (2005) submitted that education signifies economic empowerment, implying that male farmers in the study area were economically more advantaged than the female farmers. The mean age of the farmers in the study was 48 years; the average household size was 6.7. Households' annual income were categorized into four quartiles based on income (cash only) generated from on farm and off farm economic activities for the 12 months prior to the study. The difference in income between the third and the fourth quartile was very high compared to other quartiles. From the results, it appears that the rich were very rich and the poor really poor. The largest difference in the distribution of male and female farmers across the four income quartiles was in the fourth quartile. Male farmers were

more evenly distributed across all the quartiles with an almost equal proportion in each income quartile. For female farmers, only 7.1% were in the highest income quartile and the majority were in the 1st and 3rd income quartile. Comparatively as shown in Table 1, the mean income earned by male farmers was more than twice the mean income earned by female farmers. Participation of women in surplus production and marketing of cassava products increases household incomes. From the FGDs conducted for this study, women (80%) have

better access to and preferred selling around the village markets near their homes compared to men (70%) who preferred farther regional markets. As markets get further away from home, women participated less. This could affect their management of income because less participation results into less benefits and reduction in price. Hanson and Mandel (2006) 'theory of mobility' justified that location of the market matters whereby benefits increase with an increase in the distance travelled to markets.

Table 1: Percentage Distribution of Respondents Socio-Economic Characteristics

Characteristics	Male (%)	Female (%)	Overall (%)
Mean age (yr)	48.6	48.2	48.5
Sex	60.0	40.0	100.0
Level of education			
No formal and illiterate	10.3	28.6	13.5
No formal education but literate	09.2	07.1	08.9
Primary	59.5	52.4	58.2
Secondary	14.4	07.1	13.1
University	04.1	0.1	03.4
Household size (members)	06.9	06.4	06.7
Household annual income			Mean annual H/H income
Income quartile (\$)			
Lowest (1 st)	23.1	33.3	101.53
2 nd quartile	24.1	28.6	536.80
3 rd quartile	23.1	31.0	801.33
Highest (4 th)	28.7	07.1	3,337.00
Types of Market (s)*			
Doorsteps (other farmers)	20.0	80.0	
Farm gates (middlemen)	40.0	60.0	
Farm gates (SMEs)	65.0	35.0	
Village market	40.0	60.0	
Regional market	70.0	30.0	

₦1=\$150, *multiple response
Source: Field data (2008-2010)

At The Production Level: Increase Yield

To close the income gaps (Table 1) that was noticeable between male and female farmers and to respond to increase in demand for cassava, C: AVA observed that cassava yield is an important precondition for farmers to earn additional income. C: AVA collaborated with IITA to release early bulking high yielding improved varieties of Cassava that grow in suboptimal conditions in 2008. This was to increase yield and targeting lower production costs through increased efficiency and promotion of best practices and reduce the cost of weed control. Demonstration farms were established for stem multiplication for distribution to farmers. As reflected in Figure 1, after 2 years, it was observed that there was increase in yield of cassava roots on the farms surveyed from an average of 10.0-12.0 tonnes/ha in 2008 to an average of 20.0-25.0 tonnes/ha in 2010. The yield advantage was calculated as

the difference between the average yields of improved and local varieties in farmers' fields. These improved varieties resulted in a yield advantage of about 65% over local varieties. The annual income of women farmers increased from average annual income \$1000 in 2008 to \$1700 in 2010. Due to the observable increase in yield, farmers in the study areas increases areas planted in 2008 from 0.5-15 ha in 2008 to 10.0-20.0 ha in 2010. Women cited high yield and market access as the principal reasons for their expansion of cassava area. The fact that agricultural productivity could increase by 20-30 percent if women's access to resources were equal to men's and raise agricultural output by 2.5-4% and reduce hungry people by 100-150 million (FAO, 2011) is reason enough to promote projects that will enhance women's control over crops and income from sale of crops.

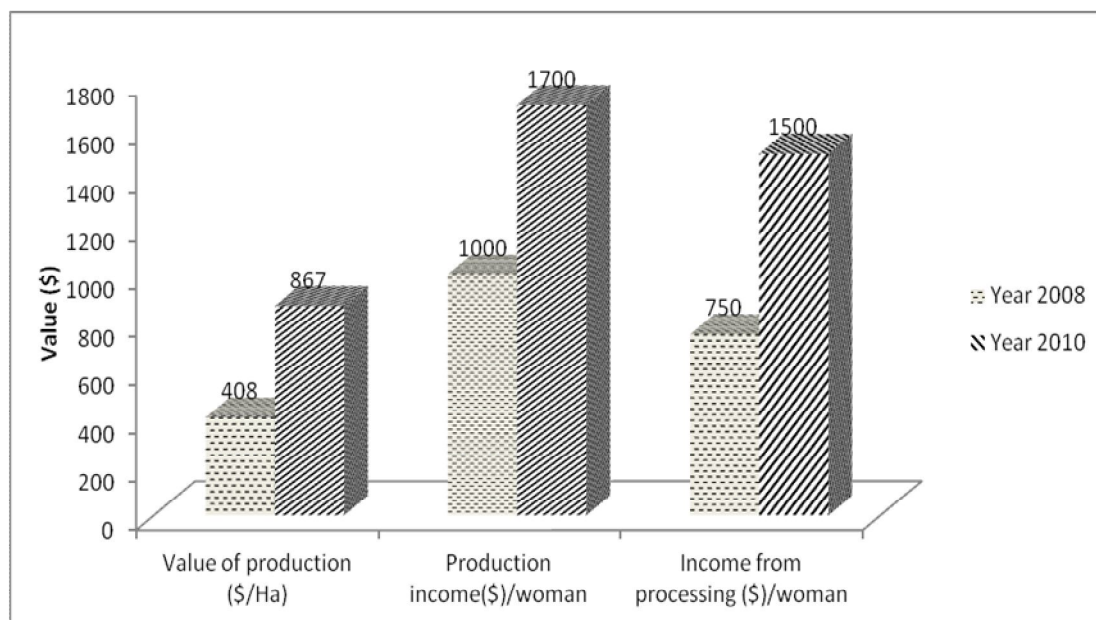


Figure 1: Values of Production and Processing by Year

Source: Field data (2008-2010)

Through collective action, women farmers sell roots directly to Village Processing Units and Small and Medium Enterprises at the farm gate to increase their bargaining power and economies of scale. Galab and Rao (2003) observed that one of the pathways out of poverty for smallholders is collective actions and group membership which is critical for information exchange, access to services and collective voice within the group. Results from the study showed that majority (87%) of the female farmers belong to a cooperative society compared to 60% of the male farmers. Some women processors also contract farmers to produce cassava roots for their processing plants directly and are also employed to peel. This created additional income for the women peelers.

At The Processing Level: Improve Post-Harvest Handling

Women are the primary and most knowledgeable processors of cassava, but their access to improved technology is often denied. Cassava processing technologies is important for the marketing of cassava processed products; processing reduces the bulk and extends shelf-life and improves the quality and quantity of the products. The recent rise in commercial cassava production will accord even greater importance to the role of women, as it is in the post-harvest activities that women's labour predominates. C: AVA collaborated with Federal Institute of Industrial Research, Oshodi (FIIRO), Nigeria and an SME (Peak Products Nigeria LTD) to create women friendly equipment that will make processing easier, removing some of the associated drudgery to free women's time for other productive and reproductive activities. Village processor groups were encouraged to buy and own mechanized graters. This group owner-

ship provided some level of independence and sustainability for the women in identifying new technology and feeding into the development process, ultimately results in greater market opportunities. There was observable increase in the annual income of participating processors. Their annual average income increased from \$750 before CAVA to \$1500 compared to income of non-participants with just an increase from annual average income of \$750 to \$1000 after processing (Figure 1). This implies that there is high potential propensity of adoption of market-related technologies to enhance welfare and ultimately reduce rural poverty especially among women in the study area.

C: AVA Capacity Building and Empowerment Strategies

Women's labour inputs for production, harvesting, transport and processing are very substantial and increasing but barely encouraged nor strengthened in Nigeria. Due to this conjecture, C: AVA saw that there is a need for capacity building and utilization for farmers to improve farm efficiency, develop downstream processing skills, improve their business management skills and establish market connections for them to generate employment and increase income. This is because C: AVA understands that empowering women is one of the keys to success in the creation of wealth and food security in the cassava subsector. As such, C: AVA ensured provision of gender sensitive extension services by agricultural extension agents from the two states supported by other partners. Food quality control specialists, post-harvest handling specialists and business advisors were employed by C: AVA for empowerment and good managerial skills. Women (100%) were taught how to process their cassava roots to wet cakes that meets qualities preferred by end users. Processed

wet cakes by women (65%) were then sold directly to SMEs that have artificial drying facilities for further processing to HQCF. Women groups (90%) were trained on how to make HQCF and maintenance of hygiene on *fufu* wet mash and cake. Groups (68%) were linked with international entrepreneurs who identified and keyed into market niches through upgrading and adding value to traditional cassava processed products (e.g., *fufu* and *gari*) by exporting packaged and branded cassava products to international supermarkets in the USA and UK. This has considerably yielded more adoption of such methods by the end users and ensured more market opportunities for women. Access to and actual use of extension services and other expertise provided enabled farmers to access and apply modern and efficient technologies to add more value to cassava roots through modern packaging (65%), use of modern fabricated implements (66%) and quality control (80%).

More importantly, the success recorded in the C: AVA empowerment and capacity building attracted more group memberships from other locations outside of C: AVA catchment areas such as Kwara and Osun States from 20% to 94% between 2009 and 2011. These opportunities spurred both farmers and processors groups to establishing local cassava markets to sell roots directly at the farm gates to end users which eliminated the interference and additional cost experienced from middle men. It also serves as motivation for formal registration of groups with the both State Ministry of Cooperative and Community Development Association (CDA) for recognition. This effort provided further access to other opportunities such as governmental and non-governmental agencies recognition that cre-

ated ripple effect on farmers having subsidized farm inputs, access to credit facilities, training and other benefits both locally, nationally and internationally.

Private Sector Initiatives Provided To Supply Planting Materials, Processing and Marketing Services

Cassava is a multi-commodity product and has a complex marketing system which may be difficult for an individual to handle successfully. Through group dynamics, women's cooperatives are strengthened by C: AVA to engage in marketing cooperatives for better results through collective actions especially in reducing marketing cost and benefitting from economics of scale that enables them to compete favorably with large scale farmers. Women were assisted in marketing different products such as cassava stems cuttings, marketing of roots and marketing of the respective products from processing. Groups were linked with international entrepreneurs exporting packaged and branded products to international supermarkets. This has considerably yielded adoption by the end users and ensured more market opportunities for women. Private sector, service providers and young people in project villages were empowered to serve as intermediaries between women producers and commercial end-users by serving as bulking agents of cassava stems cuttings for women who sold cassava stems for additional income. SMEs cassava processing plants have the capacity for large tonnage processing with wider marketing opportunities for end users markets. Women were employed within SMEs for various purposes that ranged from peeling roots, operating some of the machines that do not involve heavy lifting and also in provision of managerial services. This created additional income opportunities for women. The fear that mechanization of such indus-

tries would take away women's job was eliminated as some of the managers of these plants during FGDs affirmed that '*no machine can equate women's processing ability*'.

The success stories in linking women to markets stemmed from under listed reasons:

- CAVA was able to integrate agricultural training with enterprise training which is helping women smallholders to manage and market their farm produce more effectively, to take advantage of new agricultural and market opportunities.
- Encouragement of group membership and collective action. Belonging to group membership afford women the opportunity to collectively take actions, increase bargaining strength at the existing markets, have joint liability and assets that leads to increase repayment of revolving loans.
- Training on quality control, access to formal and informal credit with friendly interest rate, record keeping, financial management and market situation that helps women to engage successfully with larger markets to compare price both at the local and international markets to achieve better price for their produce.
- Bottom-up approaches whereby groups are able to influence training deliverables, access informal credits, increase the number of women who were able to benefit from training.
- Incentives were given to rural banks/service providers to lend at little or no interest/collateral to groups. The initiative and responsibility for ensuring repayment remains with the group, as this is a key factor in ensuring the sustainability of credit access beyond the lifetime of the project.

- At every step of the way, C: AVA has been adjusting their programs and interventions to meet the emerging changes; to implement their objectives and measure impacts through service providers backstopping communities.
- To ensure access to training for women, both men and women were trained and women were empowered to assume leadership roles. C: AVA ensured that training were fit into existing skill levels and very flexible.

Result on Table 2 show that yield of improved varieties ($\chi^2= 29.187$), gender ($\chi^2= 50.632$), value addition ($\chi^2= 32.547$), improved technologies ($\chi^2= 29.507$); Types of market ($\chi^2= 14.743$), group membership ($\chi^2= 10.973$) and capacity building ($\chi^2= 68.490$) had significant associations with increase in income of farmers. This signifies that all these variables positively affect farmers' income. These results confirm the *a priori* expectation of possible existence of positive relationships between selected variables and the enhancement of income for farmers. This implies that C: AVA has been able to achieve the goals of increasing farmers' income through some of its strategies irrespective of gender.

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Table 2: Chi-Square result of Relationships between selected Variables on Farmers Income from cassava roots and its products

Variable	X^2	df	P<0.05	Decision
Yield of improved varieties of roots	29.187	3	0.000	Significant
Gender	50.632	1	0.003	Significant
Value addition	32.547	4	0.000	Significant
Improved technologies	29.507	4	0.000	Significant
Types of Market	14.743	4	0.001	Significant
Group membership	10.973	1	0.000	Significant
Capacity building	68.490	5	0.000	Significant

CONCLUSION

There has been a systematic development of specialization in which women processors produce specifically for both local and International markets to ensure wealth and household food security. Women farmers and processors in Nigeria appear to have a significant opportunity for the large scale market for fresh and processed cassava roots. These trends in the cassava sector suggest that demand for roots for local food and industrial products are likely to be on the increase if women's roles are factored in cassava production and processing. This will ensure more market opportunities and food security for men, women and their households. Increasing markets opportunities ensures role and responsibility reversal within the households and between men and women because women are financially empowered and therefore are doing things that were seen to be men's responsibilities for example, more money is available for household needs. More negotiations are

conducted even in the areas of household activities like men looking after the children when women are engaged in processing or attending training, though this is not frequent. Given the necessary resources and the same enabling environment as their male counterpart in farming activities, women farmers and processors are equally efficient in the utilization of resources to achieve higher productivity proxy by profitability given their potential in price (allocation) and economic efficiencies.

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