

## Contribution of the “Cassava: Adding Value for Africa” (C:AVA) Project to Income generation in Nigeria: The case Cassava farmers and Processors in Ewekoro Area of Ogun State.

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**A research project submitted to Larenstein University of Applied Sciences  
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## **ACRONYMS**

OGADEP	Ogun State Agricultural Development Programme
C:AVA	Cassava: Adding Value for Africa
FAO	Food and Agriculture Organisation
HQCF	High Quality Cassava Flour
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
NEPAD	New Partnership for African Development
CGIAR	Consultative Group on International Agricultural Research
NGO	Non-Governmental Organisation
RTEP	Root and Tuber Expansion Programme

## **DEDICATION**

This work is dedicated to God Almighty, the one who made impossibility possible for remembering me when I have lost all hope of further academic pursuit. To Him are all glory, honour and adoration due.

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## Abstract

This Research is about the effects of the “Cassava: Adding Value for Africa” (C:AVA) project on cassava farmers and processors in the Ewekoro area of Ogun state, Nigeria. The C:AVA project was launched in Nigeria in 2008 to develop value chains for high quality cassava flour. This project seeks to improve the livelihood and income of at least 90,000 small holder farmers across the five benefiting countries in Africa namely; Nigeria, Ghana, Tanzania, Uganda and Malawi. The purpose of C:AVA intervention at the rural level is to ensure that by the end of 2012, at least 90,000 smallholder farmers are earning additional \$0.52 per day from each producing 0.8 tons per farmer of consistent quality cassava grits per annum for the HQCF industry across the five countries (Adebayo, 2011).

The project started in 2009 in Ewekoro area, targeting small holder cassava farmers and processors who are members of existing cassava processors’ groups consisting of pure cassava farmers and cassava processors. TME 419 cassava stems which is early maturing, high yielding, with higher tuber weight and starches content than existing varieties in the area were supplied free to cassava farmers.

The project also provided processing equipment (cassava steel grater, hydraulic press with jack and processing drums) to all cassava processors participating in the project without any payment. The distribution of the TME 419 cassava stem among farmers and the processing equipment among cassava processors in the Ewekoro area was carried out by Ogun State Agricultural Development Programme (OGADEP) which is the implementing agency of C:AVA in the area.

As it is not known whether the income had improved among farmers and processors in the Ewekoro area, this research objective is to identify the effects of the project. In order to achieve this objective, the following questions were formulated; 1.To what extent has the cassava variety received by farmers affected their output? 2. Is there any change in assets and expenditure of cassava farmers that received the TME cassava variety? 3. Is there any change in volume of cassava processed by the processors’ groups that received the processing equipment? 4. What type of processing activities are cassava processors in the area involved in? 4 What are the costs incurred by cassava farmers and processors in the study area? 5 What are the changes in processing cost that occur as a result of processing equipment received by cassava processors? 6 What changes had occurred in assets and family expenditure of cassava processors that received the processing equipment?

In order to provide answers to these questions, 20 members from 5 out of the 7 groups of processors targeted by the project in the area were selected as respondents. These respondents consisted of 5 pure cassava farmers and 15 cassava processors.

5 out of 20 respondents interviewed in the study area agreed that the new cassava variety has contributed to higher output. The 5 Cassava farmers interviewed did not report any change in asset as a result of increased output. 7 are out of the 15 processors interviewed were involved in fufu processing while 8 respondents processed gari. The cassava grits which is an intermediate product of High Quality Cassava flour (HQCF), the topmost priority of C:AVA was not processed in all the villages visited and groups interviewed. 6 out of 8 gari processors interviewed reported reduction in cost of cassava grating from ₦150 to ₦50. 5 out of 7 fufu processors reported reduction in cost of hiring drums from ₦250 to ₦100. 11 out of the 15 cassava processors interviewed reported that the processing equipment received from C:AVA has increased the volume of cassava processed and their capability to meet family expenditures because of reduction in their processing cost.

Based on these findings, this study concludes that,

- The TME 491 cassava stems distributed to farmers among the 5 processing groups interviewed has increased their output but the quantity distributed to them is not sufficient for all the members.
- The 100 bundles of TME 419 cassava variety distributed to farmers among the 5 processing groups did not result in acquisition of new assets among farmers.
- The processing equipment donated to 5 cassava processors' groups in the study area has increased the volume of cassava processed by the members.
- The steel cassava grater and processing drums distributed to Eleyele, Asipa-ilaho, Osupori, Awowo and Gudugba cassava processing groups have led to reduction in processing cost.
- The hydraulic press and jack distributed to Eleyele and Awowo gari processors are not utilised because it cannot contain the sacs used for packaging grated cassava for dewatering and they are not willing to change the size of the sac used.
- 2 gari out of 8 gari processors interviewed could not benefit from reduction in grating cost because their houses were located further away from the processing shed.

**Given these conclusions, the study recommends,**

- Multiplication of the TME419 cassava variety should be carried out by OGADEP in this area either by selecting some of the farmers' farms for multiplication or buying directly from IITA.
- Linking farmers with multiplication centers for purchase of TME419 cassava stem should be facilitated by OGADEP.
- Cassava processors in the study area should be linked with credit sources so that they can increase the volume and quality of their product because there is ready market for these products in the local market as well as Lagos which is less than an hour journey to the area.
- Processing of cassava grits should be encouraged in area where cassava processors have easy access to cassava flour industries and good demand for the product because there is no demand for the product in the area.
- The hydraulic press should be withdrawn from processors by OGADEP and distributed to medium scale processors that show willingness to use it because the processors in the area did not show commitment and desire to change the sac used.
- Gari processors that show interest in the hydraulic press should be encouraged to use sac sizes that are compatible with the press by given them enough information on the sizes of sac that can be used and the minimum quantity of grated cassava that it can contain before distribution.

## CHAPTER 1: INTRODUCTION

This study focuses on the evaluation of Cassava: Adding Value for Africa (C:AVA), an on-going project in Nigeria supported by a grant from the Bill & Melinda Gates Foundation. The project is involved in development of value chains for High Quality Cassava Flour (HQCF) in Ghana, Tanzania, Uganda, Nigeria and Malawi to improve the livelihoods and incomes of at least 90,000 smallholders' households as direct beneficiaries including women and disadvantaged groups. The purpose of C:AVA intervention at the rural level is to ensure that by the end of 2012, at least 90,000 smallholder farmers are earning additional \$0.52 per day from each producing 0.8 tons per farmer of consistent quality cassava grits per annum for the HQCF industry across the five countries (Adebayo, 2011). At the farmers' level, the aim of the project is to ensure consistent supply of raw materials namely fresh cassava tubers and processed cassava grits. The implementation of the programme is done in Ogun state in five local governments by Ogun State Agricultural Development programme. High yielding, early maturing TME 419 variety cuttings were distributed free to cassava farmers' groups participating in the project in the state while steel cassava graters, hydraulic press, processing drums were distributed to cassava processing groups without any payment. Different types of trainings were also organised for cassava farmers on the use of agrochemicals, fertilizer application and common errors in cassava cultivation while cassava processors were trained on the processing of cassava grits and flour, different uses of cassava flours and hygienic processing..

Ogun state is one of the two states where the project is implemented in Nigeria, the effect of the project on the income of beneficiaries is not known. The focus of the research is to evaluate effects of the project on cassava farmers and processors involved in the project in Ewekoro area of the state in order to see the changes in their income. In order to fulfil this objective, 5 groups were selected among 7 groups benefiting from the project in the area based on the information obtained from the extension officer working in the area and duration of their participation. Each of these groups consists of at least 30 members who are cassava processors and farmers who are pure cassava grower. 20 respondents consisting of 15 men and 5 women were interviewed in all because the groups consisted of more women than men. 4 respondents (3 women and 1 man) were interviewed per group and selection of the respondents among was done randomly, group members were told to pick tallies with "yes" and "no" and respondents with yes were chosen for the interview in order to reduce bias. A semi structured interview consisting of topic lists on the research question was used to conduct the interview.

This report is structured as follows, chapter 1 introduces the activities of Cassava: Adding Value for Africa, Chapter 2 is on the background study and it gives a brief review of activities of C:AVA in Nigeria, actors, collaboration, supporters, food security issues of cassava in Nigeria, cassava Production in Nigeria, cropping systems practiced by farmers, cassava a food crop with much industrial potential, importance of value adding and agro enterprises for poverty reduction, brief history of the study area, challenges involved in evaluating income effect of projects, Chapter 3 covers problem statement, problem definition, conceptual framework, research problem, research objective and research questions. Chapter 4 is on the methodology which consists of Research Strategy, research population, selection criteria, data collection and data analysis, chapter 5 is on research findings, chapter 6 presents the analysis of the findings and chapter 7 is on conclusion and recommendation.

## CHAPTER 2: BACKGROUND STUDY

This chapter focuses on the activities of Cassava: Adding Value for Africa, Activities of C:AVA in Nigeria, actors, collaboration, supporters, food security issues, cassava production, the cropping system practised in Nigeria, cassava as a food crop with much industrial potential, the importance of value addition and agro processing in poverty reduction Nigeria, brief history of Ewekoro local government and challenges involved in evaluating income effect of projects.

### **2.1 Activities of Cassava: Adding Value for Africa (C:AVA)**

The Cassava: Adding Value for Africa (C:AVA) Project is developing value chains for High Quality Cassava flour (HQCF) in Ghana, Tanzania, Uganda, Nigeria and Malawi to improve the livelihoods and incomes of at least 90,000 smallholder households as direct beneficiaries including women and disadvantaged groups. It will promote the use of HQCF as a versatile raw material for which diverse markets exist.

The project is led by the Natural Resources Institute of the University of Greenwich working closely with: University of Agriculture, Abeokuta, Nigeria; Food Research Institute, Ghana; Tanzania Food and Nutrition, Tanzania; Africa Innovations Institute, Uganda; and Chancellor College, University of Malawi and a range of other partners.

The project will focus on three key intervention points in the value chain:

- ensuring a consistent supply of raw materials;
- developing viable intermediaries acting as secondary processors or bulking agents in value chains; and
- driving market demand and building market share (in, for example, bakery industry, components of traditional foods or plywood/paperboard applications).

Farmers and farmer/processors will be supported in production and primary processing activities through partnership with NGOs or other extension services. Business development and other specialists will support intermediaries to meet the requirements of end users. End users will be supported technically in adopting HQCF.

It is anticipated that incomes of smallholder households will increase significantly over the life of the project. There will be additional benefits including: employment at the village and intermediary level, reduced raw material costs for end users, reduced need to import wheat (particularly relevant with increasing prices), development of the capacity to upgrade other similar food ingredient value chains, and, where comparative advantage exists, exporting HQCF.

The most promising market to develop is that of high quality cassava flour (HQCF) and its use as a replacement for wheat flour in the bakery sector, in plywood manufacture and also as an alternative or component in traditional cassava products (e.g. instant fufu in Ghana, fermented fufu in Nigeria) The main reasons for focusing on high quality cassava flour are that value can be added at rural household level by processing the intermediate product (cassava grit or the wet paste), the income of farmers; the requirements for capital investment is lower and less environmental is caused than manufacture of starch and many farmers already know how to make the raw materials HQCF which is the grated cassava. Therefore huge technology leap at the farmers' level is not required to attain the developmental objective. Consequently HQCF offers the easiest entry point, benefits the smallholder farmers/processors in the immediate future and provides a springboard for investment in other products.

### **2.2 Activities of C:AVA in Nigeria**

The C:AVA Nigeria team carried out activities including the establishment of demonstration plots, baseline study, stakeholder forum and training workshops, stem distribution to new farmer groups, capacity strengthening for village processing groups, practical demonstration of the use of HQCF in bread, biscuits and adhesives production as well as the assessment of the drying efficiency of the various flash dryers in the country. At present, C:AVA Nigeria

has 85 village processing groups (1,753 individuals) and 100 farmers groups (3,021 individuals) with their members trained on common errors on cassava cultivation and weed management. A total of 20,394 bundles of cassava stems were distributed to farmers within the reporting period. A total 448 villages-level processors were trained on production of wet fufu cake, good manufacturing practice; quality wet cake (cassava grit) for HQCF (Sanni, n.d).

The implementers of the project in Ogun state are the Agricultural and Media Resources Centre (AMREC) and Ogun State Agricultural Development (OGADEP) who jointly rendered the extension services to farmers and are the links through which all the extension messages, TME 419 cassava variety stem cuttings and processing equipment got to the beneficiaries. The agencies are under the coordination of C:AVA country office at Federal University of Agriculture, Abeokuta (FUNAAB). AMREC is the extension arm of Federal University of Agriculture and it provides extension services to some villages in Ogun state. Some of these villages covered by AMREC are targeted for C:AVA project in the state. OGADEP is the state government agency in the state responsible for dissemination of information on improved technologies and production recommendations to farmers in the state. At OGADEP, the activities of the project is under the coordination of the C:AVA desk officer supervised by Director of Agro processing unit of OGADEP. This office coordinates training, delivery of cassava stem and processing equipment as well as monitoring the installation of the equipment and implementation of C:AVA project in the villages under their jurisdiction.. The extension officers involved in the project visit the farmers and processor and submit monthly report on the activities of processor and farmers to C:AVA office at OGADEP.

According to information made available by the agricultural extension agent and information from the respondents in the study area, cassava farmers in targeted groups received single delivery cassava stems each. 20 bundles of the TME 419 cassava stem consisting of 30 stems were given each group. The commencement and distribution of cassava stem and equipment by this project varies. In some villages it started in 2009, in others only in 2012. Although the actual amount is not known, C:AVA gave financial support for running the state office at OGADEP and payment of allowance for officers involved in the project.

### **2.3 Actors, collaboration, supporters, food security issues of cassava in Nigeria**

In order to undertake value chain analysis of High Quality Cassava Flour and other cassava product in Ogun state, the following questions need to be answered;

- Who are the major actors in the production, processing, marketing and consumption of high Quality Cassava Flour and other cassava products in Ogun state?
- Is the production of cassava in ogun state producers or consumer driven?
- What collaborations exist between the various actors in the different value chain?
- What are the supporting agencies and at what level of the chain is the support made?
- What are the implications of different actors and supporters roles for food security in ogun State?

#### **2.3.1 Actors involved in cassava value chain**

##### **Input suppliers**

The majors input for cassava cultivation in Ogun state are cassava cuttings and agrochemicals like herbicides and fertilizers. Improved cassava cuttings are obtained from existing farmers, Ogun state Agricultural Development Programme (OGADEP) and International Institute for Tropical Agriculture (IITA). Agrochemicals and fertilizers are purchased in the state agro services offices in the different part of the state and commercial dealers. The selling price of cassava cuttings is ₦200/bundle (\$1.5), a bundle of cassava stem contains about 30 stems. A bag of chemical fertilizer is sold at ₦5200 (\$33).

## **Producers**

Cassava is cultivated throughout the lowland tropics, typically between 30°N and 30°S of the equator, in areas where the annual mean temperature is greater than 18°C. It provides efficient carbohydrate production, while tolerant of low soil fertility. It is the sixth major staple crop in the world after rice, wheat, maize, potato, and sweet potato with an annual production of 185 million t (Nassar and Ortiz, 2006). Nigeria currently is the largest producer of cassava in the world with an annual output of over 34 million tons of tuberous roots and it plays a dominant role in the rural economy in the southern agro-ecological zones (Kehinde, 2007). Nigeria's production accounts for 19% of the world output and 34% of Africa's output (Okoro et al., 2005). Among the starchy staples, cassava gives a carbohydrate production which is about 40% higher than rice and 25% more than maize, with the result that cassava is the cheapest source of calories for both human nutrition and animal feeding (Agwu and Anyaeche, 2007). Cassava provides the livelihood of up to 500 million farmers and countless processors and traders around the world. It is the basic staple for hundreds of millions of people in the tropical and sub-tropical belt, as well as being a feedstock for numerous industrial uses including food, feed and starch (Donald, Truman, and Robert, 2000).

According to Nweke and Enete,(1999) cited in Agricultural Economics (2005), cassava's adaptability to relatively marginal soils and erratic rainfall conditions, its high productivity per unit of land and labour, the certainty of obtaining some yield under the most adverse conditions, and the possibility of maintaining continuity of supply throughout the year make it suitable for African farming systems.

Small scale farmers produced mainly for consumption and the surplus is sold in the market to traders and consumers to purchase other household needs. Medium and large scale farmers in Ogun state produced for industrial use and therefore produced to meet the set standard of cassava flour industries, ethanol companies and other large scale users. Improved varieties like N-R 8082 and TME-419 with higher starch content and less fibre are grown by these categories of farmers. The small scale farmers grow different cassava varieties like TMS 30572, TMS 30555 and local varieties but the TMS 30572 is the commonest variety planted in Ogun state (Tijani and Thomas, 2011).

## **Processors**

Cassava can be processed into household staple food like gari, Fufu, lafun and high quality cassava flour (a product used by biscuit and bread industries), and industrial starch. It is also the major raw materials in the ethanol industries. According to Komawa and Akoroda (2003) cited in FAO corporate repository, estimates of industrial cassava use suggest that approximately 16% of cassava root production was utilized as an industrial raw material in 2001 in Nigeria. 10% was used as chips in animal feed, 5% was processed into a syrup concentrate for soft drinks and less than 1% was processed into high quality cassava flour used in biscuits and confectionary, dextrin pre-gelled starch for adhesives, starch and hydrolysates for pharmaceuticals, and seasonings and the remaining 84% is for consumption. Actors in the processing are the farmers, fufu, gari, lafun traders who buy the tubers from the farmers to be processed into these products. In processing of cassava, the transporters also play major role because the tubers are heavy and difficult to convey from the farm to the processing shed on head which is the traditional way of transporting produce from the farms. IITA, 1990; Ugwu, 1996 cited in Taiwo, 2007 describes cassava tubers as being highly perishable after harvesting but can be kept in ground prior to harvesting for up to two years To forestall early deterioration, and also due to its bulky nature, cassava is usually traded in some processed form. The bulky roots contain much moisture (60–65%), making their transportation from rural areas difficult and expensive. Processing the tubers into a dry form reduces the moisture content and converts it into a more durable and stable product with less volume, which makes it more transportable. Over the years, cassava has been transformed into a number of products both for domestic use (depending on local customs and preferences) and industrial uses. Cassava in the fresh form contains cyanide, which is extremely toxic to humans and animals, and therefore needs to be processed to

reduce the cyanide content to safe levels (Taiwo, 2012, Eggelston, Bokanga, & Jean, 1992). Traditional cassava processing methods involve several steps including peeling, soaking, grinding, steeping in water or in the air to allow fermentation to occur, drying, milling, roasting, steaming, pounding, and mixing in cold or hot water. Specific combinations of these steps lead to a myriad of different cassava products with acceptable taste to a wide range of consumers (Taiwo, 2012, Bokanga & Otoo, 1991).

Cassava processing operations in Nigeria can be described at 5 levels of capacity. The common terms used to describe these capacity levels are household (or cottage), micro, small, medium and large. Household level processing typically does not employ any outside labour. The household consumes virtually all of the processed products and sells a small amount to raise income for additional household needs. At present, most Nigerian processors fall within this category. At the micro processing capacity the employment of one or two units of labour may take place while processing a variety of cassava products. This enterprise typically uses batch processing. Batch processing may take four hours per day and this would be sufficient for the owner/operator. Nigeria has a few cassava processors in this category of operation. The small and medium processing operations typically employ three to ten workers and are very sparse at present. Large scale cassava processing is virtually non-existent in Nigeria. Large-scale operations are defined as enterprises employing 10-30 or more labourers. Large-scale operations would also have the capacity for large tonnage processing with wider marketing opportunities. It is safe to say that medium to large scale cassava processing equipment and fabricators of this equipment are few and far between in Nigeria. Gari is the only product that is currently able to push the industry from a traditional to a semi-mechanized process

### **Cropping systems practiced by farmers**

Cassava is a common crop mostly grown by farmers in cassava growing areas. It is grown mainly as an intercrop and sometimes as a sole crop. In Nigeria cassava is produced either as sole crop or in association with other crops in inter cropping farming systems. The predominance of this system has been occasioned by Nigeria's climate which is basically tropical and favourable for cassava production. Intercropping cassava with other arable crops serves as an insurance against crop failure, which may occur due to infestation of pest and disease or natural hazards, it also make available stable and steady income for the farmer. It also provide balanced diet for farming households (Olasunkanmi, Bamiro and Daramola, 2012). In this work, these authors are of the opinion that, the optimal cassava based combination was cassava/maize and cassava/maize/vegetable because they contributed to the gross margin with no additional cost to the total cost of production. As a result Ogun State farmers will increase their net income per hectare by using these crop combinations. Cassava can grow and produce dependable yields in places where cereals and other crops fail. It tolerates drought, grows on soils with low nutrient capacity but responds to higher rainfall conditions and fertilisers.

Of all the resources used in agricultural sector, labour appears to be the most important especially in Africa. Labour as a factor of production is generally of overwhelming importance and makes up to 90% of the cost of production in many African farming systems. Labour is the most critical and most limiting resource in agricultural production when all the production factors including land, capital, technology and labour are considered (Enete, Nweke and Tollens, 2005).

### **Cassava Product marketers**

Marketing of cassava products in Ogun state is carried by many actors. Many traders are involved in in the buying and transportation of these products from farm gates to the final consumers in town and cities in Ogun state and the neighbouring Lagos and Oyo state. Sometimes the product like gari, lafun, wet fufu cake are transported by the farmers' wives to the popular market where they are sold to big traders as well as final consumers depending

on the size brought to the markets at higher price that covers the transport cost and still give better margins than selling at the farm gate. Marketing of high quality cassava flour is carried out by owners of flash driers as this could not be done at small scale farmers' level because of the huge investment involved. Small scale cassava processors supply cassava flour firms with wet cake or cassava grit which an intermediate product and earned higher income than selling gari and fufu.

### Consumers

In Nigeria, the consumption pattern varies according to ecological zones (table 1 below). Gari, a roasted granule is the dominant product and is widely accepted in both rural and urban areas. It can be consumed without any additives or it can be consumed with a variety of additives such as sugar, groundnut, fish, meat and stew. Gari is widely consumed in rural and urban areas in Nigeria, especially among poor households. It is a cheap and ready source of vital energy among these categories. Other cassava products offer for consumption in Ogun state are fufu and lafun and consumption pattern cut across income classes of the people in the state.

**Table 2.1: Consumption Pattern by Zone and Cassava Product**

<b>Zone</b>	<b>Order of importance</b>
South West	<i>Gari, Lafun, Fufu/Akpu</i>
South South	<i>Gari, Akpu</i>
South East	<i>Gari, Fufu/Akpu</i>
North Central	<i>Gari, Fufu/Akpu, Starch</i>

Source: (FAO, 2010)

Cultivation of cassava in Ogun state can be described as producer driven when the small farmers are being considered because the sole aim of production is for household consumption with the surplus offered for sale. There is no set standard both for the tuber and the final products. However medium and large productions are consumer driven as these categories of farmers produced for industrial use. Production standards are set for the varieties as well as harvesting period. However with growing importance of the cassava as an industrial crop, many small scale farmers are into contract arrangement with cassava flour firms and other industrial users which set some standard on type of cassava varieties planted as well as harvesting period.

### Price of Cassava root and products

Generally cassava roots (tubers) prices are lowest in the southern region of Nigeria. The exceptions are Bayelsa, Akwa Ibom and Lagos which have high root prices. The highest root prices are in the North East and North West of Nigeria. Cassava has a unique characteristic of being able to be harvested and marketed throughout the year. This provides a consistent supply of the product, available for immediate processing at a fairly predictable price throughout the year. This could be cassava greatest attribute, relative to competing commodities like maize (FAO, 2004). The lack of seasonality of gari pricing confirms the conclusion that the relatively consistent supply of cassava roots provides a fairly predictable price throughout the year and a relatively narrow gari price band across Nigeria. For cassava roots to be profitable, it must compete with the price of maize and this price can only be achieved when cassava roots is processed into ethanol or industrial starch.

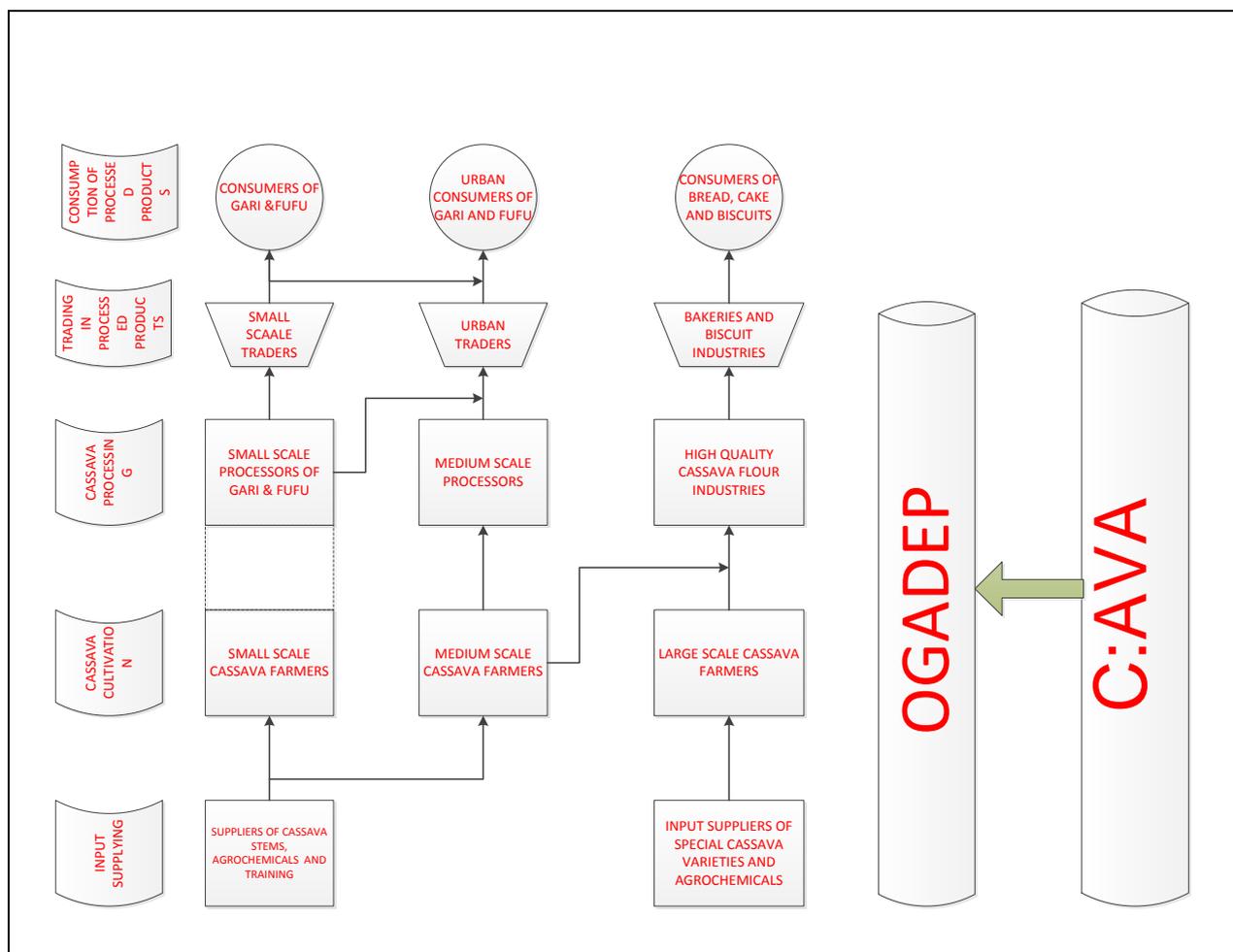
### **2.3.2 Collaboration among actors in cassava value chains.**

In the value chain analysis of cassava, some collaboration exists between different actors in the chain, depending on the scale of production as well as the availability of the product. Medium scale producers sometimes enter some agreement with specific industrial users who assist in partial funding of the cultivation and later buy the tuber based on the agreement signed. In the time of scarcity some traders can make partial payment for the processed gari to the local processors to guarantee the purchase of the product. Local processors also buy the tuber on credit from the small scale farmers and make payment on the market day after the finished product is already offered for sale.

### **2.3.3 Supporting Agencies**

The supporting agencies of the actors in the cassava value chain are the State Ministry of Agriculture, Ogun state Agricultural Development Programme (OGADEP), Root and Tuber Expansion Programme and IITA. These organisations assist the farmer to access improved cassava variety cuttings especially the commercial farmers. OGADEP also support the processors through the agro-processing unit to buy cost saving equipment as well as conducting training on hygiene in the processing. OGADEP is also one of the implementing agencies for Cassava Adding Value for Africa (C:AVA), an on-going project for high quality cassava flour in the state. C:AVA is offering support to small scale cassava farmers and processor. The key activities at these intervention points include enhancing access to finance, business skills, and appropriate technologies; ensuring quality of products and reliability of supply; and integration of activities within the value chain. International Fund for Agriculture (IFAD) is also offering support to farmer to boost their productivity on an economically and environmentally sustainable basis and the processors through their Root and Tuber Expansion Programme (RTEP). RTEP enhance the profitability of smallholder farmers and small/medium-scale agro-processors by improving their access to markets and their capacity to add value to their product.

**Figure 2.1: Cassava chain map showing actors, OGADEP (implementer) and C:AVA area of intervention in Ogun state**



### 2.3.4 Food security focus

All the actors in the cassava value chain play significant roles in food security of Ogun state. Food availability is ensured by the productive activities of the farmers, the processing function of the small scale and cottage processor who are involved in the value addition and processing of food stuffs like gari, fufu and lafun. The traders are involved in the transportation of the cassava products from the surplus area to city and town in the state and neighbouring state thereby ensuring steady supply.

Food accessibility is also guaranteed as a result of income generated by the activities of the different actors. Every value addition along the chains leads to income generation for the purpose of buying other food items needed by different actors in the chains. The possibility to process cassava into unfermented cassava flour for bakery and biscuit industries also provides an additional source of income to farmers involved in the production of cassava grit which serves as input for the flour processors. Food utilization is ensured by the activities of the processors in the chain who are involved in different activities which increase the nutrient composition of the finished products. OGADEP Women in Agriculture (WIA) sub-component is also involved in training and enlightening rural families on how to incorporate soya beans and other protein sources into their diet to increase the nutrient availability in their diets. Trainings on hygiene and care for the children are also part of their mandate. Stability of all these foregoing indicators of food security over time can only be ensured by stability in government policy on agriculture in Ogun state.

Cassava is a source of food security, not only because it can be grown on less productive land, but because it is a source of income for producers and generally a low cost source of food. Onabolu and Vlavinou as cited in Food Reviews International (2007), describes cassava as a staple food that provides carbohydrates, or energy, for more than 200 million people in the tropics and a higher producer of carbohydrates per hectare than the main cereal crops and can be grown at a considerably lower cost. Cassava also grows under suboptimal conditions: It is tolerant of soil infertility and drought stress and can be stored underground for several months after maturation. Agwu, and Anyaeche, in African Journal of Biotechnology, opines that among the starchy staples, cassava gives a carbohydrate production which is about 40% higher than rice and 25% more than maize, with the result that cassava is the cheapest source of calories for both human nutrition and animal feeding. 80% of Nigerians in the rural areas eat a cassava meal at least once a week and majority eats cassava at least once a day; hence it plays a major role in the country's food security.

#### **2.4 Cassava a food crop with much industrial potential**

According to African Agricultural Technology Foundation (2007), major studies conducted on cassava at the end of the 20th century have predicted the growing importance of this crop in Africa's economic development. Both the Global Cassava Development Strategy study commissioned by the International Fund for Agricultural Development (IFAD) and the Food and Agriculture Organisation (FAO), and the Vision 2020 study of the Consultative Group on International Agricultural Research (CGIAR) on root and tuber crops have stressed the great potential of cassava to spur rural industrial development, raise rural incomes and contribute to food security. In Nigeria, for instance, farmers have demonstrated the enormous potential for cassava production by propelling the country to the top position in cassava production worldwide. However, cassava production in Africa is still characterised by low yields compared to other cassava growing regions. Thus cassava production in Africa has not yet reached a maximum. If the demand for cassava and the income generated from cassava increase, farmers will be motivated to adopt productivity-enhancing technologies to increase yields and to expand cassava production even further. Cassava production in Africa is expected to continue to rise at an annual rate of 2.4% per year and to reach 109 million tonnes in 2005 (FAO 1997), accounting for over half of the world's production. In the past 20 years, cassava production in Africa has doubled compared to production in Asia and Latin America, which has increased by only 25% and 18% respectively during the same period. There are indications that this trend will continue up to the year 2020. Virtually all cassava produced in Africa is used for human consumption. 70% of the amount consumed is first processed into a large variety of products such as paste, flour and chips, and is cooked into foods serving both rural and urban populations as a basic daily source of dietary energy.

Demand for cassava as food is expected to grow at an annual rate of 2.5% per year and the demand for cassava as livestock feed at 5%. In the former case, there are observations indicating that cassava is increasingly being adopted as an ingredient in the manufacture of convenient fast foods and snacks for urban consumers. In several African countries, cassava is being more and more perceived not only as a food security crop, but also as a raw material for various types of industries. Indeed cassava can be converted into a large number of products ranging from traditional and novel food products, to livestock feeds, ethanol and starch and its numerous derivatives. In some countries, there are concerted efforts being initiated, sometimes with strong political support at the highest level. For example special presidential initiatives on cassava exist in Nigeria and Ghana to make cassava the engine for economic growth. The New Partnership for African Development (NEPAD) has also recognised cassava as a powerful poverty fighter in Africa and has recommended a Pan-African Cassava Initiative based on a broad based strategy which emphasises better markets, better organisation of producers for collective action, and better participation by the private sector investment.

## **2.5 The study area**

Ewekoro Local Government first came into existence on 22<sup>nd</sup> of May, 1981, but it was later merged with Ifo local government in 1989 by the military government. However, on December 16, 1996 Ewekoro Local Government was restored as an autonomous local government by the then Federal Military Government alongside five other in the state, thus increasing the number of Local Government in Ogun State from fifteen to twenty. The Local Government is bounded by Yewa South in the west, Ifo Local Government in the south, Abeokuta North and Obafemi Owode in the north and east respectively and it consists of ten wards. It has a land area of 63.5 square kilometres with an estimated population of about 55,000 people (2006 population census). The indigenous dwellers of Ewekoro Local Government area are mainly the Egbas, particular the Egba Owus. The people engage primarily in farming and trading, the local government area consists majorly rural settlements. Cassava, yam, cocoyam and rice are the most cultivated food crops in this area. Processing of the product is done by women who also own personal farms although farm sizes are smaller compared to men's farms in most cases. Cassava processing groups in the area consists of pure cassava farmer (men) and cassava processors who also cultivate cassava farms. Ownership of land in this area is by inheritance; therefore women also owned land like men.

### **Cassava farmers**

Cassava farmers in Ewekoro area consist of small scale (0.5ha – 2ha) and medium scale (2ha – 4ha). Cassava is grown as intercrop with maize, rice, melon and vegetables. Cassava cultivation is done by men and women in the study area but male farmers cultivates larger farm than their female although there some women with big farm sizes. Cassava is grown on rented or lease land as well as owned land. It is very easy to rent or lease a land in the area if the farmer is recommended by known indigene or if the farmer resides in the area.

### **Cassava processors**

Processing of cassava in Ewekoro area is mainly women occupation although cassava graters are owned by men and are pushed on a truck around villages. Cassava is processed into gari, fufu and lafun but gari and lafun processing is more prevalent than lafun because lafun requires sun drying for its processing. Processed products are sold in the local market (Wasimi) where traders from Lagos are the major buyers. Cassava processors in this area also cultivate personal cassava farms in addition to cassava processing.

### **Selection of participating groups**

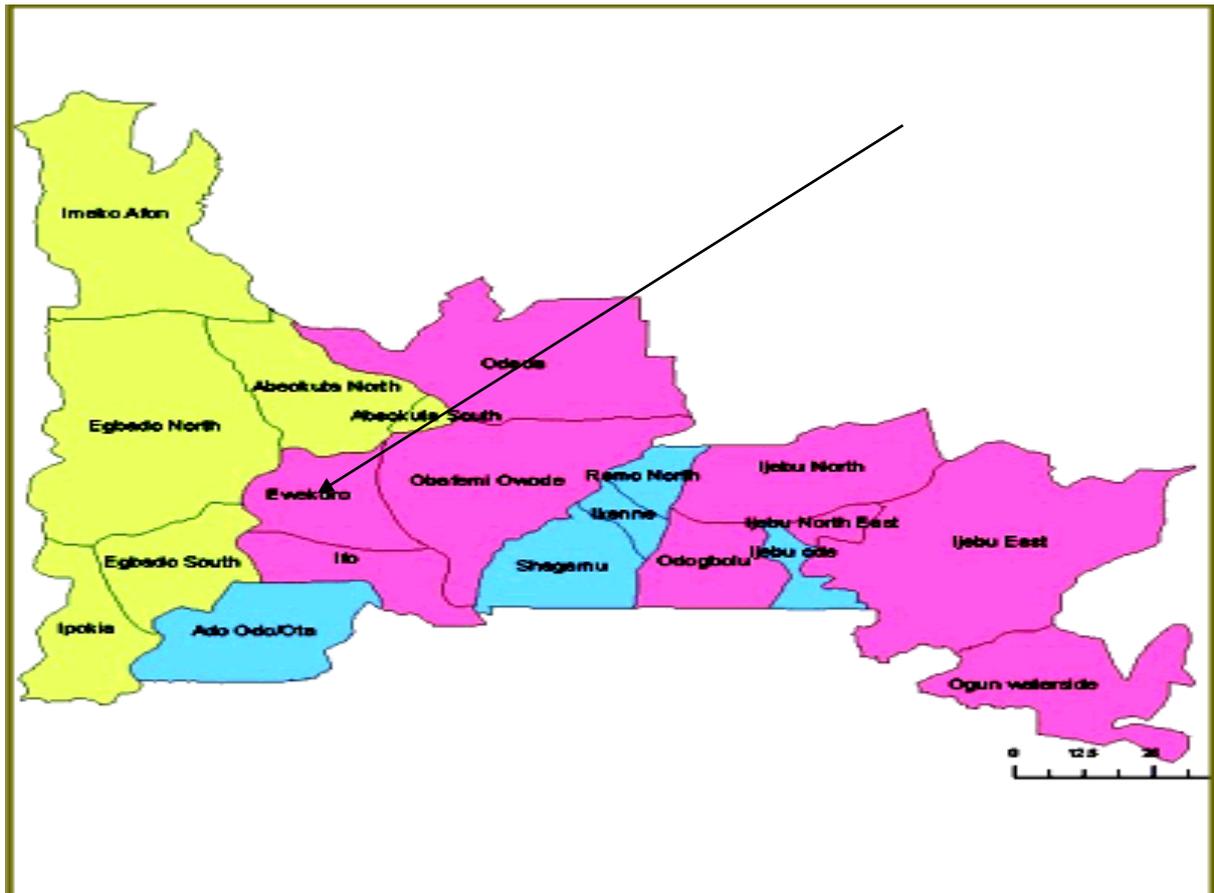
Selection of cassava farmers and processors that are benefitting from C:AVA project was done by Ogun State Agricultural Programme (OGADEP). 7 cassava processing groups consisting of cassava farmers and processors are benefitting from the project in the local government although more groups have shown interest in the project. Members of these processing groups are small scale farmers and processors. Selection criteria used for these farmers are based on the recommendation of OGADEP. OGADEP selected these groups based on the possession of registration certificate, regular meetings with good attendance of members and their willingness to participate. Each processing groups consists of 30 members who are pure cassava farmers or cassava processors for easy management and coordination.

## **2.6 Challenges involved in evaluating income effect of projects**

Evaluation of income effects of projects can be quantitative or qualitative. In quantitative evaluation, data collection and analysis are carried out, while economical models are used for data analysis in other. Qualitative analysis of income effect is also possible but does not enjoy the same acceptance and recognition as quantitative evaluation. Income evaluation also has other constraints such as under reporting, for a variety of reasons, income is often under-reported. Respondents perceive income-related questions as being invasive, fear tax-

related problems. In developing countries, income and expenditure surveys yield estimates of savings that are absurdly low compared with estimates derived from national accounts. Reported expenditure often exceeds reported income for the bottom deciles of the population, lack of information content in non-monetized subsistence economies, monetary income and expenditure data does not have meaning.

**Figure 2.2: Map of Ogun State showing Ewekoro the local governments (arrowed)**



Source: Google map

## CHAPTER 3: PROBLEM STATEMENT

### 3.0 Problem definition

The increasing popularity of cassava in production of high quality cassava flour has led to increased income of farmers involved. Diverse uses of cassava flour food products such as its glucose for pharmaceuticals products as well as food supplements to make alcohol and other beverages, would make farmers smile all the way to the bank. However, there is weak link between industrial processors and producers of cassava products. The Federal government of Nigeria's mandate to include 20% High Quality Cassava flour in all products of wheat flour for bread-making is the needed motivation for cassava farmers, and processing firms. Adebayo et al cited in Journal of Agricultural Extension, 2010 opines that cassava provides increased income for farming households; increased employment opportunities; potential to target development benefits to women; potential lower food prices for consumers and competitively priced raw materials for industries but the weak link between cassava farmers and processing groups on one hand and the industries using cassava as raw materials on the other, is depriving farmers and processors from earning the expected income.

### 3.1 Research problem

CAVA was launched in Nigeria in June, 2008 to develop value chain for high quality cassava flour. The implementation of C:AVA started in Ewekoro local government area in 2009. 7 cassava processing groups consisting of pure cassava farmers and cassava processors were selected as beneficiaries of the project in this area. Although recent researches on the impact of C:AVA e.g. Abdulsalam-Saghir, 2010, had discovered that incomes of smallholder households in some part of Ogun, Oyo and Ondo states had increased significantly by £50 (€60) per month, the effects of the project on the income at the levels of cassava farmers and processors in Ewekoro area are not known.

### 3.2 Objective

The thesis seeks to identify the effect of C:AVA project on income of cassava farmers and processors involved in the project in Ewekoro area of Ogun state, Nigeria.

### 3.3 Conceptual Framework

Evaluation of income effect of any project on farmers and processors is a very challenging task, especially when cost and revenues are not recorded down. This research has resolved this issue by looking on the effect of TME419 cassava variety on (1) change in output of cassava farmers in the study area (2) Change in assets and expenditure of cassava farmers that received the TME 419 cassava variety. The effects of the processing equipment donated by C:AVA on (1) Volume of cassava processed (2) Change in processing cost as result of equipment received by processors (3) change in asset and expenditure of processors who received processing equipment from C:AVA were used as indirect indicators of income effect of C:AVA on the benefiting groups in the study area.

Information on change in expenditure (expenses on children education, expenses on food and other household need and expenses on social obligation) is used because it is easier to recall than income data and it seems to be less prone to error because expenditures of household food, children education and other household needs are continuous and recurrent, so it is easily remembered but income is earned at a point in time and the information may be easily forgotten.

#### 3.3.1 Indicators for cassava farmers

Change in output of cassava farmers

Change in output was used to measure income of farmers. This indicator was used because cassava farmers experience increased output when they increase land size used for cassava cultivation or when they plant high yielding cassava variety or both. Cassava

farmers in the processing groups interviewed were given 100 bundles of TME 419 cassava stems free; the change in output that occurred as a result measured in the amount of money realised from sale of tuber represents increase in income when the prevailing price is favourable.

#### Change in assets and expenditure

Increase output and favourable cassava tuber prices will result in increased income. Increased income may lead to acquisition of new assets (e.g. bicycles, motor cycles, houses and livestock) and higher expenditures on food, children education, and other social obligations. These indicators are used to probe the change income of cassava farmers due to increased output as a result of planting the new cassava variety.

### **3.3.2 Indicators for cassava processors**

#### Change in volume of cassava processed

Cassava processors in the study area received processing equipment from C:AVA. This equipment was distributed to them through Ogun State Agricultural Development Programme (OGADEP). 2 Steel cassava graters and 2 hydraulic presses were given to gari processors at Eleyele and Awowo while fufu processors at Asipa-ilaho, Awowo and Gudugba received 60 processing drums for soaking fufu before sieving. The increase in volume of cassava processed by these processors will lead to more income and these indicator offer good measure of change in income of processors.

#### Change in processing cost

When the cost of processing increase or decrease, it will affect the income derive from processing activities. This indicator was used as a measure of change in income of processors. Cassava processors in the study area has benefitted from processing equipment like steel cassava grater, hydraulic press, processing drums and processing slab. These equipment were distributed by C:AVA through OGADEP to them free. The reduction in processing cost will lead to saving on expenses on processing which is unearned an income. This indicator was used in this research.

#### Change in asset and expenditure

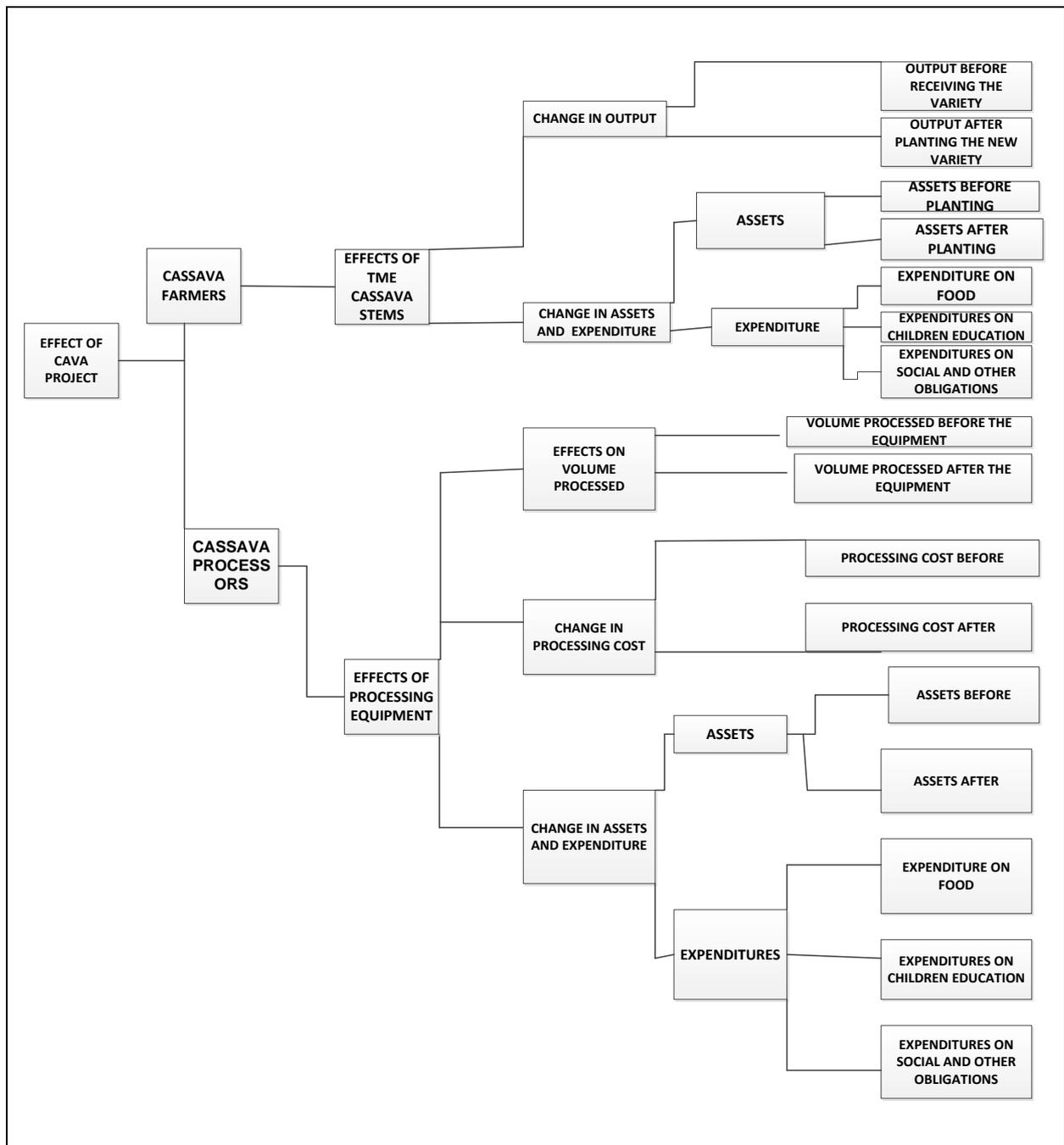
Similarly the changes that occur in the expenditures and asset of cassava processors who received the processing equipment indicate change in their income. Since the income of cassava processors is no easy to estimate, change in their expenditure on food, children education, assets (pepper milling machine, livestock, houses etc.) and social obligation was used to make fair judgement on their income. This indicator was used in this research to explore the change in income of cassava processors who received the processing equipment in the study area.

Assets in the study area include livestock like sheep and goat, motorcycle, bicycle, landed properties. The acquisition of processing machine like cassava grater, pepper milling machine is also some of the asset that farmers and processor strive to acquire when their income increase.

These indicators offer reliable measure of income of cassava farmers and processors in the study area although they may not be totally reliable.

All these indicators are shown in the diagram below which depicts the summary of the Conceptual frame work which is used to formulate the research and interview questions;

**Figure 3.1: Conceptual framework**



**3.4 Research Questions**

1. What effect does TME 419 cassava variety distributed to cassava farmers have on income generated?

Sub-questions

- a. To what extent has the cassava variety received by farmers affected their output?
- b. Is there any change in assets and expenditure of cassava farmers that received the TME cassava variety?

2. What effects does the processing equipment distributed to cassava processors have on their income generation?

Sub-questions

- a. Is there any change in volume of cassava processed by the processors' groups that received the processing equipment?
- b. What type of processing activities are cassava processors in the area involved in?
- c. What are the costs incurred by cassava processors in the study area?
- d. What are the changes in processing cost that occur as a result of processing equipment received by cassava processors?
- e. What changes had occurred in assets and family expenditure of cassava processors that received the processing equipment?

## CHAPTER 4: RESEARCH METHODOLOGY

### 4.0 Research Design

The research used a qualitative approach and case study was used as research strategy.

### 4.1 Research Strategy

Case study was used as strategy for this research because in-depth information is needed to be able to unravel the effects of this project on the beneficiaries. This strategy was also chosen because the respondents are mostly illiterate and will not be able to fill structure questionnaire themselves. The research was conducted in five villages in Ewekoro Local government in Ogun state namely Eleyele, Awowo, Asipa-ilaho Osupori and Gudugba. These villages were chosen because C:AVA project was implemented in all these villages and members of these processing groups are active farmers and processors because they will be able to provide relevant information of the effect of the project. Qualitative data on the effects of cassava variety distributed to cassava groups and processing equipment distributed to processing groups were collected in order to make inference about changes in income that occur to participants of the project. Case study was used in this research as a strategy in order to gain deep insight of the benefits of the C;AVA intervention among the respondents. This strategy was chosen because most small scale farmers in Nigeria hardly keep records of their operations therefore great insight can be obtained by involving them in discussion which can generate the needed information. In order to gain access to the study area, the agricultural extension officer was contacted before each interview was conducted. The extension officer help to make appointment based on the availability of the respondents and the appointment date was communicated to the researcher.

### 4.2 Research population

The total population of this research are the beneficiaries of C:AVA in Ewekoro area. These are the 210 cassava farmers and processor belonging to 7 groups in the local government. These groups were selected among existing cassava processing .groups in the local government. The processing groups usually consist of pure cassava farmers and cassava processors registered under the same name. Each processing group in the area consist of 30 members. It was observed that all the groups have more women than men in the ratio of 3:1. Respondents of this research were pure cassava farmers and cassava processors who are beneficiaries of the project because they will be able to provide in-depth information on the subject matter.

### 4.3 Selection Criteria

Selection of processing groups interviewed for data collection was done using purposive sampling. Cassava processors that have participated in the C:AVA project for more than 2 years were selected because they will be able to provide information of the effect of the project on their income. 5 out of the 7 cassava processing group in the area were thus selected because they have participated in the project for more than 2 years; the remaining 2 groups started participating in the project early this year. 4 respondents consisting of 3 women and 1 man were chosen per group making a total of 20 respondents for the 5 groups. Selection was done by telling the members to pick tallies with "yes" and "no" and respondents with yes were chosen for the interview. This method was chosen to reduce bias and misconception among respondents who are mostly female. The initial plan in the thesis proposal was 10 women and 10 men but the situation on the field revealed that there are more women in these groups than men in the ratio of 3:1 in all the groups interviewed. The researcher had no personal knowledge of respondents before the selection therefore issues of bias were minimal.

#### **4.4 Data collection**

Primary data and desk study were the sources of data. The desk study was done through reviewing of existing literatures on the study subject and relevant information from articles and journals from the internet as well as reports from related organisations. Primary data was collected from cassava farmers and processors in Ewekoro area through semi-structured interviews. Two different checklists with topics in line with the objectives and research questions were used to collect data from cassava farmers and processors belonging to 5 processing groups selected for the research. This was done in order to ensure that similar questions were posed to cassava farmers on one hand and cassava processors on the other. The farmers and processors were interviewed by the researcher but the extension officer in charge of the project in the local government assisted in identifying the groups as well as taking some photograph involving the researchers and the respondents. Each respondent was engaged in individual interview while the remaining three continue with their processing activities in the villages. Usually farmers were interviewed first to allow them to go to their farm because most women are usually engaged in the processing which is done in the villages. Each interview was conducted for 1 hour and the interview was conducted for five days based on availability of each group.

**Figure 4.1: The researcher and one cassava processor during field work.**



#### **4.5 Data Analysis**

Analysis of data extracted from the interview conducted was presented in descriptive and narrative form. Change in income of the participants was presented by comparing change in grating cost before and during the project as result of processing equipment received by groups from the project. Local measurement used for areas of land under cassava cultivation in the study area was converted to standard measurement in order to facilitate easy presentation of the findings and better understanding of the readers of this work. The findings were presented in written prose in order to be able to present detail accounts of data collected. Results and discussion on data collected formed the second part of the data analysis. The findings were compared with different or similar work available in the literatures to validate the work or present a different view observed on the field.

## CHAPTER 5: FINDINGS

### 5.0 Introduction

In this chapter, the findings of this research were presented. Twenty respondents consisting of five male and fifteen female belonging to five groups in the study area provided the responses for these findings. In the proposal the respondents were to be chosen on equal basis of male and female for five of the selected groups but the situation in the study area revealed that there are more female than male. All female respondents were involved in cassava cultivation and processing while male respondents were only involved in cassava cultivation. In some of the groups visited, the project just commenced early this year and the impact of the project is yet to fully manifest, hence the reduction in the number of groups selected for the study.

### 5.1 Effects of the cassava variety received by farmers on their output.

5 out of 20 respondents interviewed in the study area agreed that the implementation of CAVA project in the study area has contributed to higher output. These farmers consist of five cassava farmers selected for the interview and one processor who also cultivates cassava farm because she was also 5 bundles of the new cassava stems. 15 respondents could not benefit because the cassava stems were not sufficient for all the members.

### 5.2 Change in assets and expenditure of cassava farmers that received the TME 419 cassava variety

The 5 Cassava farmers interviewed did not report any change in asset as a result of increased output but their capability to meet their family expenditure on children schooling, food and social obligation increased. One female farmer reported that output from her farm supported her through her time of trial when her husband died. She processed the tuber herself and earned additional income as a result of high starch content of the TME419 variety.

### 5.3 Change in volume of cassava processed by the processors' groups that received the processing equipment

6 out of 8 gari processors interviewed reported increase in volume of cassava processed. They said they processed 2 baskets (500kg) of cassava tubers per week before but the amount processed has increased to 3-4 baskets (750-1000kg) of the raw tuber weekly. When asked the reason for change increase in volume, they said they have easy access to the processing equipment donated by C:AVA through OGADEP and also enjoy benefit to grate their cassava tubers on credit and make payment after the sales of their gari. This privilege is not available before they received the equipment.

2 gari processors interviewed said the volume of cassava processed did not change because their houses were located further away from the group's processing shed. 5 fufu processors reported increase in volume of fufu processed because of the twenty drums donated to them by C:AVA. They also reported that they earned higher income because of the increase in volume of their processing activities. Although the remaining 2 members also experience increase in volume of cassava processed, they are the owners of the processing drums used.

### 5.4 Type of processing activities of cassava processors in the study area

Participants of C:AVA in the study are engaged in processing of fufu and gari, the commonest food of the people of the state. 7 are out of the 15 processors interviewed were involved in fufu processing while 8 respondents processed gari. At the Agbedara group in Asipa village, the respondent interviewed said they were formally gari processors but due to the training and encouragement they received from C:AVA coupled with twenty drums donated to the group by C:AVA, they were motivated to engage in fufu processing which requires less labour and input than gari. At Fagbesoro fufu processing group in Osupori

village, one of the respondent engaged in gari and fufu processing said she will continue to process gari although it is labour intensive because it has a longer shelf life than fufu which must be sold immediately it is process whether the prevailing price is profitable or not. She also said gari is very important to women with children in the city because it can be consumed in more ways and can be used to support children in school as well. The fufu processors in the area offer their product for sale as wet fufu paste. The cassava grits which is an intermediate product of High Quality Cassava flour (HQCF), the topmost priority of C:AVA was not processed in all the villages visited and groups interviewed.

**Figure 5.1: Gari processor at work at Asipa-ilaho**



**Figure 5.2: Fufu Processor at Awowo involved in sieving operation**



**Figure 5.3: Cassava peeling at Awowo by hired labour**



### 5.5 Cost of labour for different operation of cassava processors

Cassava processors in the study area incurred various cost on different operation carried in processing activities. Transportation cost of ₦6000-₦8000 is paid for a pick-up van load (3ton) of cassava tubers depending on the distance of the farm to the village. Cost of harvesting of tuber is ₦200 for a basket ₦2500 (250kg) and this cost is paid by the farmer. Gari processor pay ₦250 for peeling cassava tuber that costs ₦2500, ₦600 for grating and and ₦400 for frying while fufu processors pay the same peeling cost and sieving cost of ₦500 for the same quantity of tuber. In practice, respondents in the study area perform some or all of these operations to be able to obtain some margin on their activities. Additional transportation cost is also paid on the gari and fufu to market centres. ₦150 is paid on a bag of gari or wet fufu for transportation to the market but lower cost can be paid if large numbers of bags are being transported by a processor through bargaining.

### 5.6 Change in processing cost that occur as a result of processing equipment received by cassava processors

Some of the cassava processors in the study area reported reduction in processing cost in their processing activities as a result of processing equipment they received from C:AVA project. 6 out of 8 gari processors interviewed reported that the reduction in cost was as result of reduction in grating cost from ₦150 to ₦50. However 2 out of 8 gari processors reported that they could not benefit from the reduction in grating cost because their house are located further away from the processing shed. 5 out of 7 fufu processors also reported reduction in processing cost due reduction in cost of hiring drums used for soaking cassava tubers before sieving from ₦250 to ₦100. This reduction occur as a result of twenty processing drums they received from C:AVA project. The remaining 2 respondents have individual processing drums. The hydraulic press also donated by C:AVA to gari processors were not used.

**Table 5.1 Estimation of Reduction in processing cost for 1 ton of cassava tubers for gari processors using the data from subsection 5.5.**

	Non-beneficiaries	C:AVA beneficiaries
<b>Transport cost</b>	<b>₦2000</b>	<b>₦2000</b>
<b>Cost of peeling</b>	<b>₦1000</b>	<b>₦1000</b>
<b>Cost of grating</b>	<b>₦2400</b>	<b>₦800</b>
<b>Cost of frying</b>	<b>₦1600</b>	<b>₦1600</b>
<b>Total</b>	<b>₦7000</b>	<b>₦54000</b>
<b>Reduction in grating cost</b>	<b>₦ (7000 - 5400) = ₦1600 = \$9.70 ( \$1 = ₦165.00)</b>	

This estimate shows that cassava processors participating in C:AVA project will save ₦1600 (\$100) on every ton cassava processed in the processing shed. This amount represents income as a result of participating in the project.

**Table 5.2 Estimation of reduction in cost of processing for 1 ton cassava tubers for fufu processors**

	Non-beneficiaries	C:AVA beneficiaries
Transport cost	₦2000	₦2000
Cost of peeling	₦1000	₦1000
Cost of renting drums	₦1000	₦400
Cost of sieving	₦2000	₦2000
<b>Total</b>	<b>₦6000</b>	<b>₦5600</b>
<b>Reduction in Processing</b>	<b>₦6000 - ₦5600 = ₦600 = \$3.64 (\$1 = ₦165.00)</b>	

Fufu processors enjoyed a reduction of ₦600 for every 1 ton of cassava tubers processed as using the processing drums donated by the C:AVA project. This saving on processing cost also represents income to fufu processors.

**Figure 5.4: Steel Cassava grater donated by C:AVA to Gari Processing group**



**Figure 5.5: Hydraulic press donated by C:AVA to processors (not in use)**



**Figure 5.6: Dug out well and processing drum donated by C:AVA at Asipa-ilaho village**



### **5.7 Change in asset and family expenditure as a result of processing equipment received by cassava processors**

11 out of the 15 cassava processors interviewed reported that the processing equipment received from C:AVA has increased their capability to meet family expenditures such as payment of children school fees, training of their children on crafts, provision of their food needs and social obligation because of reduction in their processing cost. One of the fufu processors interviewed said she benefitted from marketing linkage with a firm producing High Quality Cassava Flour (HQCF) in Nigeria. She was able to buy a milling machine and start a small petty trade in addition to fufu processing. All the interview members of Fagbesoro processing group at Osupori village unanimously agreed that the implementation of the project in their village had impacted positively on their capability to meet their family expenditure and social obligations. Another respondent, an elderly woman said the project increased her income generation because of higher turn-over and reduction in cost and hence was able to support the completion of her children higher education that was abandoned to her by her polygamous husband.

## CHAPTER 6: RESULTS

### 6.0 Introduction

In this chapter, an attempt will be made to analyse the findings to see the extent the research question were answered to fulfil the research objective.

### 6.1 Effects of the cassava variety received by farmers on their output

The 100 bundles of TME 491 cassava stems distributed to farmers among the 5 processing groups interviewed has increased their output but the quantity distributed to them is not sufficient for all the farmers. Only 5 members out of 20 respondents interviewed were able to derive increased income through increase in output by planting the high yielding, TME 419 cassava variety. The prevailing price in the study area encouraged the planting of the variety but it is not known whether the price can be sustained because cassava tubers and product experience price fluctuation and if the variety is supplied and there is increase output, the marketing of the surplus must be guaranteed for farmers to continue to enjoy increase income by planting the variety.

### 6.2 Changes in assets and expenditure of cassava farmers that received the TME 419 cassava variety

The distribution of TME 419 cassava variety to farmers did not result in acquisition of new assets although the beneficiaries reported increase in their capability to meet expenditure on food, children education, and meeting social obligation like naming ceremonies. This is an indication that planting of the variety at the moment has not increase farmers income to the extent of having surpluses to acquire new asset because the quantity of cassava stem received is not sufficient.

### 6.3. Change in volume of cassava processed by the processors' groups that received the processing equipment

The processing equipment donated by C:AVA to the 5 processors' groups has led to increase in volume of cassava processed. Although some members of these groups were not able to use the facilities, 11 out of 15 processors interviewed reported increase in volume of their processing activities as a result of the processing equipment they received. The processors reported that they do not have to compete with other villagers on the use of limited number of cassava grater and processing drums in the villages.

### 6.4 Type of processing activities of cassava processors in the study area

Processing of cassava grit used which an intermediate product for cassava flour processing was not observed in all the groups visited. Only one cassava processor reported that she was formally engaged in the processing when she was linked with a cassava flour firm but she stopped the processing when the firm no longer demand the product from her. The remaining 14 cassava processors did not process cassava grit at all although they reported that they benefitted from training on processing of cassava grits, cassava flour and the utilization of this product for making chin-chin, pies and other recipes. None of these processors were involved in the processing of the chin-chin, pies and sausages because of lack of demand. The cassava grits innovation could be said to be inappropriate in this area at the moment because there is no cassava flour industries in the area to use the product as existing ones are out of operation because of unstable power supply. The cassava processors in the study area are mostly involved in gari and fufu processing although they also process lafun when they have sunny weather. Eggleston et al, 1992 as cited in Kehinde, 2007, reported that of the main products obtained from processing cassava, gari, is the most common in West Africa agreed with this finding.

### **6.5 Cost of labour for different operation of farmers and processors**

Cost of labour in the study for farming operation and processing activities in the study area is expensive compare with the return the farmers and processor earned. Although the project provided processing equipment for the processors, there was no provision for farmers on herbicide which can reduce weeding cost as well as enhanced timely weeding. Labour cost also change with prices of cassava tuber and cassava products in the study area. Farmers sometimes pay huge labour cost on clearing, heaping and weeding only for them to sell their harvest tuber at a give-away price during harvest when there is glut in the market. Labour saving processing equipment for cassava processing like hand peeler for tuber peeling was not used by cassava processors although this project did not provide such to processors. Donald, Truman and Roberts, 2000 also reported similar finding by stating that Cassava is labour intensive and costs of production can be quite high, compared to other carbohydrate sources. Adeniji et al., Egyleston et al, 1992 cited in Taiwo, 2007 reported similar finding stating “cassava processing by traditional methods is labour-intensive but the application of improved processing technology has reduced processing time and labour and encouraged further production”, although most of these cassava processing technologies like mechanised cassava harvester and cassava peeling machine or cassava hand peeler were not in use in the study area.

### **6.6 Change in processing cost that occur as a result of processing equipment received by cassava processors**

₦1600\ton reduction in grating cost was reported by gari processors that benefitted from the 2 steel cassava grater donated by C:AVA in the study area. Similarly fufu processors reported ₦600\ton reduction in cost of hiring processing drums due 60 drums donated by C:AVA to 3 fufu processing groups. This reduction in cost is calculated based on processing of 1 ton of cassava tubers using the processing equipment and the prevailing processing cost presented in section 5.4. The saving on processing cost can be considered as an income though it is not earned. However 2 out of 8 gari processors interviewed could not benefit because their houses were located further away from the processing shed. The sustainability of the donation of processing equipment to cassava processors is not guaranteed because C:AVA project may end in 2013 and that may signify the end of the gesture unless the project is extended in another phase.

## **CHAPTER 7: CONCLUSION AND RECOMMENDATIONS**

### **7.0 Introduction**

This study has analysed the effects of Cassava Adding Value for Africa in Ewekoro area of Ogun state, Nigeria with the aim of investigating whether participation in C:AVA Project has contributed to better income generation among farmers involved in the project in order to make recommendations for similar intervention in the future. In order to achieve this objective, 2 research questions were formulated with sub-questions which were used to prepare an interview guide used on the field (see appendix1). The following conclusions can therefore be drawn from the findings presented in chapter 5 of this work.

### **7.1 Conclusions**

#### **7.1.1 Cassava farmers**

- The 100 bundles of TME 491 cassava stems distributed to farmers among the 5 processing groups interviewed has increased their output but the quantity distributed to them is not sufficient for all the members.
- The 100 bundles of TME 419 cassava variety distributed to farmers in the 5 processing groups interviewed did not result in acquisition of new assets although the beneficiaries reported increase in their capability to meet expenditure on food, children education, and meeting social obligation like naming ceremonies.

#### **7.1.2 Cassava Processors**

- The processing equipment donated to 5 cassava processors' groups in the study area has increased the volume of cassava processed by members.
- Cassava processors in the study area are not involved in the processing of cassava grits used for High Quality Cassava flour which is the topmost priorities of CAVA project, because of low demand for the product in the area but are rather engaged in gari and fufu processing.
- The steel cassava grater and processing drums distributed to Eleyele, Asipa-ilaho, Osupori, Awowo and Gudugba cassava processing groups have led to reduction in processing cost.
- The reduction in grating cost represents saving on processing cost which as indication of increased income.
- The hydraulic press and jack distributed to Eleyele and Awowo gari processors are not utilised because it cannot contain the sacs used for packaging grated cassava for dewatering and they are not willing to change the size of the sac used because the sac is used as scale of the expected gari processed.
- 2 out of 8 gari processors interviewed could not benefit from reduction in grating cost because their houses were located further away from the processing shed.

## **7.2 Recommendation**

Based on these findings and conclusion presented, I will propose the following recommendations to the implementer of CAVA project in Nigeria as well as cassava farmers and processors.

### **7.2.1 Recommendations for implementer of CAVA project in Nigeria**

- Multiplication of the TME419 cassava variety should be carried out in by OGADEP this area either by selecting some of the farmers' farms for multiplication or buying directly from IITA.
- Linking farmers with multiplication centers for purchase of TME419 cassava stem should be facilitated by OGADEP
- Cassava processors in the study area should be linked with credit sources so that they can increase the volume and quality of their product because there is ready market for these products in the local market as well as Lagos which is less than an hour journey to the area
- Processing of cassava grits should be encouraged in area where cassava processors have easy access to cassava flour industries and good demand for the product because there is no demand for the product in the area
- The hydraulic press should be withdrawn from processors by OGADEP and distributed to medium scale processors that show willingness to use it because the processors in the area did not show commitment and desire to change the sac used.
- Gari processors that show interest in the hydraulic press should be encouraged to use sac sizes that are compatible with the press by given them enough information on the sizes of sac that can be used and the minimum quantity of grated cassava that it can contain before distribution..
- C:AVA project should look into possibility of giving the processing equipment to processors on credit or at subsidized rate to make the project sustainable and allow more groups to benefit.
- Hand drawn or push truck should also be provided for processing groups to facilitate easy movement of the peeled cassava to the processing shed.

### **7.2.2 Recommendations for farmers and processors**

- Farmers must be willing to plant the cassava variety separately to facilitate easy identification during harvesting and to prevent confusion during distribution.
- Cassava processors must take good care of cassava grater, hydraulic press and drum received from CAVA project. They should also make use of the fund generated from the use of these facilities to obtain other equipment needed in the processing shed.

## **7.3 Reflection on Research Methodology**

The research was conducted in accordance with the stipulation of the research guidelines of this University to research an existing problem in researcher's organisation. The type of research at VHL is applied research. It is embedded in VHL professional domain and the primary objective is not to gain knowledge for its own sake but contribute to solving specific

question (problem) in that domain and/or to pursue action. In line with this objective, this researcher carried out the evaluation of C:AVA which is one of the project being implemented by OGADEP (the organisation, he works). He is an agricultural extension officer in Obafemi circle in Ogun State. He was involved in Root and Expansion Programme, an IFAD funded project before proceeding on study leave for this master course. He was not involved in C:AVA project and he has never work in this research area before this research and has no knowledge of respondents before the selection.

Looking back on the different steps taken before the research work is completed, it is justifiable to say the methodology used in selection of topics, respondents and the study area can be improved by future researchers in this type of evaluation study. The selection of the study area could have been made in two local governments because this will ensure comparison of the project results and it will increase the objectivity of the work. There is also a need to include focus group discussion in other to validate the data collected from the chosen respondents.

Furthermore, if the researcher was from another organisation, it may reduce the bias inherent in this type of work because this researcher works in OGADEP, the implementing agency of the project in the study area, although he is not directly involved in the project.

It is also possible to select two study area, one from AMREC jurisdiction and the other from OGADEP to see if there are differences in the methods used by the two implementing agencies of C:AVA in the state.

Notwithstanding, this researcher used all possible means to make sure that the findings were presented according to the report of the selected respondents.

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## APPENDIX

### APPENDIX 1: TOPIC LIST USED FOR THE INTERVIEW

#### For Farmers

- 1.0 Socio-economic Data that can affect participation in the project
  - 1.1 Age and household size,
  - 1.2 Cropping system practised by cassava farmers
  - 1.3 Farming experience
  - 1.4 Land ownership and
  - 1.5 Types of labour available for different operations of cassava farmers
- 2.0 Effects of the TME 419 cassava variety on the output from farm cultivated by cassava farmers.
  - 2.1 Output from farm cultivated before receiving the TME419 cassava cuttings
  - 2.1 Output from farm cultivated when they received the TME419 cuttings
3. Effects of cassava variety received on assets and expenditure of cassava farmers who received the TME419 variety. (For farmers)
  - 3.1 Assets before receiving the new cassava variety
  - 3.2 Assets after receiving the new cassava variety
  - 3.3 Expenses on children education
  - 3.4 Expenses on food and other household need
  - 3.5 Expenses on social obligation.

#### FOR PROCESSORS

- 1.0 Socio-economic Data that can affect participation in the project
  - 1.1 Age and household size,
  - 1.2 Processing experience
  - 1.3 Ownership of processing equipment.
- 2.0 Type of processing activities of cassava processors in the study area
- 3.0 Cost of labour for different processing activities
- 4.0 Change in volume of cassava processed
  - 4.1 Volume of cassava processed before the equipment
  - 4.2 Volume processed after receiving the equipment.
5. Changes in processing cost that occur as a result of processing equipment received by cassava processors
  - 5.1 Processing cost before receiving the equipment
  - 5.2 Processing cost after receiving the equipment

6. Changes in assets and family expenditure of cassava processors that received the processing equipment. (For processors)

6.1 Assets before receiving the equipment

6.2 Change in asset

6.3 Expenses on children education

6.4 Expenses on food and other household need

6.5 Expenses on social obligation.

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## **APPENDIX 2: PROCESSING EXPERIENCE OF RESPONDENTS**

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Processing experience	Frequency
1-5 years	5(31%)
6-10 years	4(25%)
11-20 years	2(12.5%)
21-3 years	5(31%)

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## **APPENDIX 3: RESPONDENTS' AGE AND HOUSEHOLD SIZES**

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Age groups	Frequency
30-40 years	8(40%)
41-50 years	3(15%)
51-60 years	3(15%)
60 and above	6(30%)

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**APPENDIX 4: LOCAL BASKET FOR SELLING CASSAVA TUBERS ON FARM AND CASSAVA TUBERS IN PLASTIC MEASUREMENT ALSO USED FOR SELLING TUBERS ON THE FARM**



**APPENDIX 5: SOME MEMBERS OF AGBELERE GROUP AND THE RESEARCHER AT ELEYELE VILLAGE**



**APPENDIX 6: THE RESEARCHER AND ONE OF THE CASSAVA FARMERS DURING FIELD WORK**



**APPENDIX 7: GRATED CASSAVA IN SAC**



**APPENDIX 8: THE RESEARCHER AND ONE PROCESSOR DURING FIELD WORK**



**APPENDIX 9: PROCESSED GARI IN PLASTIC MEASURE USED FOR RETAIL SALES**

