MDP – IFAD PROJECT RESEARCH REPORT

EVALUATION OF IFAD-VCDP PROCESSING STRATEGIES AND MARKETABILITY OF CASSAVA PRODUCTS IN OGUN STATE, NIGERIA

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ABSTRACT

Cassava *(Manihot esculenta* Crantz) is a tuber crop that serves as a staple food for over 400 million people in African. Cassava is an important agricultural product. To reduce human labour and enhance the quality and nutritional value of cassava into various output such as, industrial starch, ethanol, and cattle feed. Nigerian living in rural area rely on agriculture for livelihood options, however majority are poor owing to low production, inadequate processing methods and low returns on investment. This study evaluated IFAD-VCDP processing strategies and marketability of cassava products in Obafemi Owode and Ifo, Ogun State, Nigeria

A multi- Stage random sampling technique was used to select 253 cassava processors and marketers in Obafemi Owode and Ifo, Local Government Areas in Ogun State. Purposive selection of two (2) LGAs from the five (5) implementing LGAs (Ijebu North-East, Ijebu East, Obafemi Owode, Yewa North and Ifo) was sampled due to the prevalence of cassava processors and marketers in the area. Data was collected using questionnaire and key informant interviews. The descriptive (Means, Percentages, Frequencies) and inferential statistics (t-test) were the methods used to analyse the study objectives.

The results showed that most of the respondents were ages 31-50 years, most had their household sizes of 4 to 6 persons. About 87.4% of the respondents were married, and 52% had at least primary education. About 75.8% of the respondents were processors, and 24.2% were marketers. About 82.2% of the respondents used sack as packing materials, 50.5% indicated garri was the main cassava product marketed and 86.9% of them sold cassava products in local markets, 11.3% use the farm gate. It was concluded from this study that IFAD-VCDP intervention through the provision of infrastructures and modern cassava processing equipment has increased the quantity and quality of cassava products. Also, the provision of modern cassava processing machines (peeling, frying, grating, pressing and sieving machine) has some positive effect on the processors. Also IFAD should invest in Ethanol production plants for processors that uses cassava as a raw material. This will encourage farmers to produce more cassava, as they will get more value from cassava tubers. Ethanol gives twice the income from production of garri and fufu, thereby increasing the livelihood status of farmers.

 Keywords: IFAD-VCDP, Modern Cassava Processing Techniques, Cassava Processors

CHAPTER ONE

1.0   Introduction

1.1   Background of the Study

The agricultural sector is the backbone of many economies in the developing countries. Cassava *(Manihot esculenta* Crantz) is a root and tuber crop. It serves as a staple food for over 400 million people in the African continent (Marissa Fessenden, 2014). It has been therefore identified as important to food security, especially in Africa, because of its year-round availability and tolerance to extreme stress conditions. In areas where cassava is the main staple, people have developed different strategies for processing the crop into storable products such as tapioca, starch, fufu, lafun, ethanol, and garri.

From the estimated 195 million population of Nigeria, according to (World Bank 2018), about 65 percent access means of livelihood from based agricultural activities. In Nigeria, cassava production is well-developed as an important agricultural crop. It has well-established multiplication and processing techniques for food products, industrial starch, ethanol, and cattle feed. Even though cassava is produced in 24 of the 36 states in the country (United States Agency for International Development (USAID), 2015), cassava production dominates the southern part of the country, both in terms of area covered and number of farmers growing the crop. Cross River, Delta, Edo, Rivers and Akwa Ibom States dominates in the South-South Zone, Benue, and Kogi States dominate in the North Central Zone, Enugu, and Imo States dominate in the South East Zone and Ogun, Ondo and Oyo dominating in the South West Zone. (International Institute of Tropical Agriculture (IITA) 2004).

Cassava occupies a prominent position in foreign exchange earnings following the presidential initiative on cassava, which was formed in July 2002 by the federal government of Nigeria. The initiative had as its goal the promotion of cassava as a viable foreign exchange earner and also the development of the production system to sustain the national demand (Sann*i et al.,* 2009). Nigeria has been recognized as one of the leading producers of cassava in the world since 2002 (FAO, 2004).

Cassava is grown throughout the year, making it preferable to the seasonal crop of yam, beans, or peas. It displays an exceptional ability to adapt to climate change (Consultative Group for International Agricultural Research (CGIAR) 2013) with tolerance to low soil fertility, resistance to drought conditions, pests and disease, and sustainable to store its roots for long periods

underground even after they mature. Use of fertilizer is limited, and it is also grown in fallow lands (Adeniyi 2013). Harvesting of the roots after planting varies from 6 months to 3 years. The landholding for farming in Nigeria is between 0.5- 2.5 hectares (1.2- 6.2 acres, with about 90% of producers being small –scale farms (Adeniyi 2013).

Nigeria leads the world in cassava production (Food and Agriculture Organization (FAO), 2017). Going by the available FAO data (FAO, 2017), the country's production volume for 2015 was 57.64 million metric tonnes, representing 37.3% of Africa's or 20.8% of the world's total production for that year. However, increasing output is driven largely by increases in land area cultivated rather than by yield growths (Ojiako *et al*., 2013). The national average yield of cassava is low at about 13.63 metric tons per hectare reflecting a shortfall of 65.9% from the potential global yield at about 40.0 metric tons per hectare (FAO, 2017). In 1999, Nigeria produced 33million tonnes of cassava, while a decade later, it produced approximately 45 million tonnes, which is almost 19% of the total production in the world (IITA, 2013). The average yield per hectare is 10.6 tonnes (IITA, 2013). Cassava production increased from 45,721,000 tonnes in 2009 to 57,134,478 tonnes in 2016 with 6,261,047(ha) area harvested (FAOSTAT, 2016). Other cassava producing countries like Thailand in 2015 produced 30million tonnes of cassava with an average yield of 40 tonnes per hectare, Brazil produced 21 million tonnes of cassava with an average yield of 13 tonnes per hectare, and Congo produced 14.6 million tonnes of cassava with an average yield of 80 tonnes per hectare (FAOSTAT, 2016). Cassava is rich in carbohydrates, it has multiple uses and can be consumed in many processed forms, and its raw material also can be used as livestock feed (Adeniji *et al*., 2013).

Government intervention and the efforts of non-governmental organizations have led to several measures that support the production, processing, and marketing of cassava. Through this effort appreciable progress has been made in the development of processing technologies to support rural development (Ijigbade *et al*., 2014) Several labor-intensive operations in processing notably, grating, dewatering, and milling have been mechanized (FAO, 2004). According to IITA (2014) engineering research in Nigeria and other African countries results in successful mechanization of some of the labour and time-consuming cassava processing operations. Thus, the use of appropriate technologies or machinery is essential to provide cassava for home consumption and industrial uses.

Marketing is one of the vital aspects of agriculture since agriculture entails the production of goods for end-users (Kaplinsky, 2001). Production is not completed until the commodity produced reaches the final consumer (Kaplinsky, 2001). Hence, there is need for efficient marketing channels and systems. Market performance measures how well the process of marketing is carried out and how successful the marketing aims are accomplished (Kaplinsky, 2001). Specifically, market performance in agricultural sector is concerned with technological progressiveness, growth orientation of agricultural firms, efficiency of resources use, as well as product improvement and maximum market service at the least possible costs (Adegeye and Dittoh, 2014). Marketing efficiency is a measure of market performance and is defined as the movement of crops and livestock from the producers to consumers at the lowest cost consistent with the provision of the services desired by consumers.

In conclusion, cassava contributes to the development of both national and state development of the economy through trade. Post-harvest activities like processing, packaging, marketing, storage, distribution, and transportation enhance sustainable cassava production creating substantial benefits and food security in terms of dietary calorie consumption. Therefore, this study aims to evaluate the determinants of market participation, compare the profitability levels of different processed cassava products and characteristics of different cassava processors in Obafemi Owode and Ifo, Ogun State, Nigeria.

1.2 Problem Statement

About 51% of Nigerians living in rural areas rely on agriculture for livelihood options. However, majority of the stated population is poor owing to low production, inadequate processing methods and low returns on investments (World Bank 2016). This situation is further worsened by food losses that occur as a result of inadequate processing facilities (Kotze, 2003). Poor processing is a major cause of post-harvest losses in the world with special emphasis on developing countries such as Nigeria (FAO, 2004). According to IITA (2018) about 63% of harvested cassava in Africa is processed into dried chips and flour. Cassava is the most perishable of the roots and tuber crops and can deteriorate within two or three days after harvest. So there is a need to process it within the shortest time after harvest. More so, cassava contains a poisonous substance called cyanogenic glucoside, which is usually removed during processing. It is for this reason that instead of being sold as fresh produce like other roots and tubers, cassava is mostly sold as a processed product.

Cassava farmers have low or inadequate knowledge of the cassava value chain involving the conversion of the production into a large number of products ranging from traditional and innovative food products to livestock feed, ethanol, starch, and its numerous derivatives. (Nang'ayo 2007). Cassava farmers in Ogun state have been involved in cassava production for centuries, but their production output seemed to have been declining in recent years. A vigorous campaign has been mounted by the International Fund for Agricultural Development (IFAD) and other agricultural-related agencies and organisations over the years to educate the cassava farmer on the production of cassava.

However, increased production without a sustainable structure to market the end product will lead to a glut. From the principle of demand and supply, excess supply leads to lower prices and low returns on investment. Research on cassava over the years is focused on productivity processing methods, derivatives at the detriment of the marketability of the products for sustainable rural development. Therefore, this study is designed to evaluate processing strategies and marketability of cassava products in Obafemi Owode and Ifo, Ogun State, Nigeria.

1.3 Justification of the Study

Adequate food production, processing, and marketing are very important in boosting food availability and ensuring food security. Cassava is a staple crop in Nigeria that is not only used as food it also serves as raw material for manufacturing industries and as livestock feed. According to National Fadama Development Project (2009), Ogun State is the tenth largest producer of cassava in Nigeria, with a production figure 1.097 million tonnes. The state also implemented the Root and Tuber Expansion Programme (RTEP), whose major goal is to facilitate increased production of cassava, yam, and cocoyam as well as processing and marketing of these products. In addition to the efforts of Ogun State to boost cassava production, the International Institute of Tropical Agriculture (IITA), Ibadan, Federal Agricultural Research Center, National Root Crops Research Institute (NRCRI), and many other research institutions have developed appropriate cassava technology packages aimed at promoting cassava production, processing and improvement on cassava yield in the state.

The study, if conducted, will provide knowledge to the cassava farmers on the various factors that affect market participation and the benefits of marketing processed cassava products. It will provide useful information to the cassava farmers on the profitability levels of the processed cassava products and on those elements that are key drivers processing costs. It will provide useful

information on areas that need further investigation especially in the field of cassava processing and marketing.

1.4 Research Questions

i.   What is the determinate of the marketability along the cassava value chain from harvesting to final products?

ii. What is the efficiency of processing strategies and implication on marketability?

iii. What are the predominant process of cassava outputs and their potentials of alterative outputs for rural sustainability and industrial development?

iv. How does IFAD-VCDP programme support on cassava processing and marketability?

v.   What are the major constraints encountered in cassava processing?

1.5 Aim and Objectives of the Study

The study aims to evaluate the processing strategies and marketability of cassava products in Obafemi Owode and Ifo, Ogun state. The specific objectives of this study are to:

- Determine the marketability along the cassava value chain from harvesting to final products.
- Determine the efficiency of processing strategies and implication on marketability.
- Identify the predominant process of cassava outputs and examine the potentials of alternative outputs for rural sustainability and industrial development
- Examine the support of IFAD-VCDP programme on cassava processing and marketability
- Identify the constraints faced in cassava processing in the Obafemi Owode and Ifo.

1.6 Review of Value Chain Development Programme, Ogun State, Nigeria

The IFAD VCDP in Ogun state is co-financed by the Federal Government of Nigeria, the Ogun State Government (OGSG) which is overseen by Ogun State Development Programme (OGADEP) and the five participating Local Government Councils.

The target groups selected for value addition program are categorized into two; Primary target group

i.   Poor rural households engaged in cassava and rice value chain (not more than 5ha).

ii. Small scale processors (processing capacity of 2mt/day for cassava and 4mt/day for rice.)

iii. Marketers (with reasonable volume of produce) with emphasis on women and youths.

Secondary target group

i. Downstream operators linked to large number of primary target group.

ii. Local government councils

iv. Communities strengthened to sustainably manage marketing infrastructure supported by the program

v. Private sector operators strengthened to provide quality services.

Ogun state VCDP focuses on three dimensions:

1. Agricultural market development

2. Smallholders enhancement and Productivity: Sensitizations are organized for stakeholders and farmer organizations across Local government areas

3. Programme Management and coordination

According to International Fund for Agricultural Development, 2013, Global agriculture needs to meet estimated 60 per cent increase in demand for food by 2050 while addressing the challenges presented by climate change and natural resource degradation. Africa's capacity in rice and cassava research is very limited and mainly conducted by national research institutes, universities and international research institutes. The general disinterest in agriculture in the 1990s has led to a desperate lack of capacity at all levels in the rice and cassava value chain and gross neglect of Africa's agricultural research and extension capacity, which jeopardizes progress toward developing Africa's agricultural sector. Given these realities, it is clear that it is imperative to invest in the next generation of farmers.

Plates 1: Researcher at the IFAD-VCDP State Programme Management Unit in Abeokuta, Ogun State

1.7 IFAD in Nigeria

Nigeria is the most populated country in Africa, having over 200 million inhabitants with an annual growth rate of 3%. Approximately 105 million Nigerians (59%) are under the age of 35. Nigeria covers 92.4 million hectares, and 53% of the population lives in rural areas. GDP growth averaged 3.8% a year from 2009 to 2014 as Nigeria became a middle-income country before the economic recession, which slowed down GDP growth in 2016. Amid falling oil prices, security risks, and policy uncertainty, growth subsequently slowed sharply. The Government aims to reduce the overdependence on oil and diversify the economy. Poverty is especially severe in rural areas, at 44.9%. Young people lack economic opportunities, and sporadic civil unrest worsens poverty and malnutrition. Poor rural women and men depend on agriculture as 70% of rural people are subsistence smallholder farmers who produce 90% of Nigeria's food on un-irrigated plots completely dependent on rainfall. (IFAD, 2019).

Agriculture contributed to approximately 23% of gross domestic product (GDP) in 2018 but is underdeveloped because of numerous impediments. Only 46% of arable land is cultivated. Farmers have no title to 95% of agricultural land, so there is a general lack of access to finance or credit facilities to bring about the needed improvement in agriculture. Poor rural roads undermine farm profitability, increases waste, and impedes access to markets, inputs, equipment, and new technology. Rural schools, healthcare, and clean water supplies are inadequate. Land degradation and erosion arising from over-cultivation, deforestation, and overgrazing are increasing, and drought has become common in the north.

Since 1985, IFAD has been Nigeria's trusted partner for reducing rural poverty and has invested a total of US$317.6 million in ten projects and programmes in Nigeria, benefiting more than 3,700,000 households. IFAD loans improve outreach, and its impact has led to building the capacity, productivity, and market participation of rural people. In line with IFAD's Strategic Framework 2016-2025, IFAD's approach encourages involvement in reducing rural poverty at all levels of government; sets up and strengthens farmers' organizations; and supports the empowerment of poor rural people, especially women and young people. IFAD's current strategy, in agreement with the Nigerian government, covers the period 2016-2021.

The goal is a rural economy in which those we help can benefit from economic growth, in line with two strategic objectives:

- Developing the sustainable, climate-resilient economic and financial inclusion of young people in profitable agribusiness; and

- Strengthening institutions at state and community levels to work with private companies in key value chains.

IFAD continues to partner with the Nigerian Government in building rural institutions, establishing community-driven development initiatives, developing profitable smallholder agri-businesses, and pursuing financial inclusion for poor rural households. (IFAD, 2019)

Plates 2: IFAD-VCDP Agbelere Baara Cassava processing center in Obafemi Owode, Ogun state

1.8 IFAD- VCPD Improved Cassava Processing Technologies

In a bid to overcome the inherent problems of the traditional cassava processing, giant strides have been made towards mechanizing several labor-intensive operations, notably grating, water expression, and milling. Various agro-engineering centres such as Rural Agro-industrial Development Scheme (RAIDS), Product Development Agency (PRODA), Federal Institute of Industrial Research (FIIRO),National Root Crop Research Institute (NRCRI) and International Institute for Tropical Agriculture (IITA), as well as the Agricultural Engineering Departments in several universities in the country, have developed many mechanized units designed to remove the constraints that processors face at the household level (FAO, 2005). The application of improved Cassava processing technology results in reduced processing time and labour (Nweke, 2002).

Under the transformation regime, wide yielding cassava varieties have been developed to improve yield while labour saving and improved processing technologies have been put into place thus reducing the cost of producing and processing cassava products (Nweke *et al.,* 2002).

Mechanical grater: Processing of cassava into garri by the improved method involves using the mechanical grater to grate cassava instead of using hand graters. The mechanical graters have blades that grate cassava faster because they are motorized. They are either powered by diesel or petrol. Different kinds of pressers are used to dehydrate the grated cassava. The commonly used grater is the screw press. The grated cassava is poured into sack and kept under the steel frame. The screw is then turned, and in the process, moisture (or water) is pressed out of the cassava paste.

Mechanical Sifter*:* This consists of an iron mesh attached to iron bars. It is rectangular and raised above the ground level. As the mesh tray moves left and right, it sieves the grated and pressed cassava into a fine and uniform consistency ready for frying.

The fryer (toaster): The fryer or toaster takes care of the grated, pressed, and sieved cassava. It consists an aluminum pan molded roundabout with clay and raised above the ground level. Firewood is commonly used to supply heat. There is an iron pipe which serves as exhaust for the smoke. So when frying the garri there is no side effect of smoke and fumes on the people involved.

Plates 3: Mechanical Grater and Sieving machine constructed by IFAD-VCDP at Agbelere Baara Cassava Processing center in Obafemi Owode, Ogun state

2.0 METHODOLOGY

2.1 Timeframe of the Survey

The researcher had a timeframe of three months to carry out the survey as it is the period of internship program.

2.1 Research Study Area

Ogun State is in Southwestern Nigeria. It was created in February 1976 from the former Western State. It borders Lagos State to the south, Oyo and Osun states to the north, Ondo to the east and the Republic of Benin to the west. Abeokuta is the capital and largest city in the state. The state is also known as the "Gateway to Nigeria".

Table 2.0 Socio-economic characteristics of the study area

Features	Statistics
Land area	16,980.55km2
Population from 2006 census	3,751,140million
Gross domestic product	$10.47billion
GDP per capita	$2,740
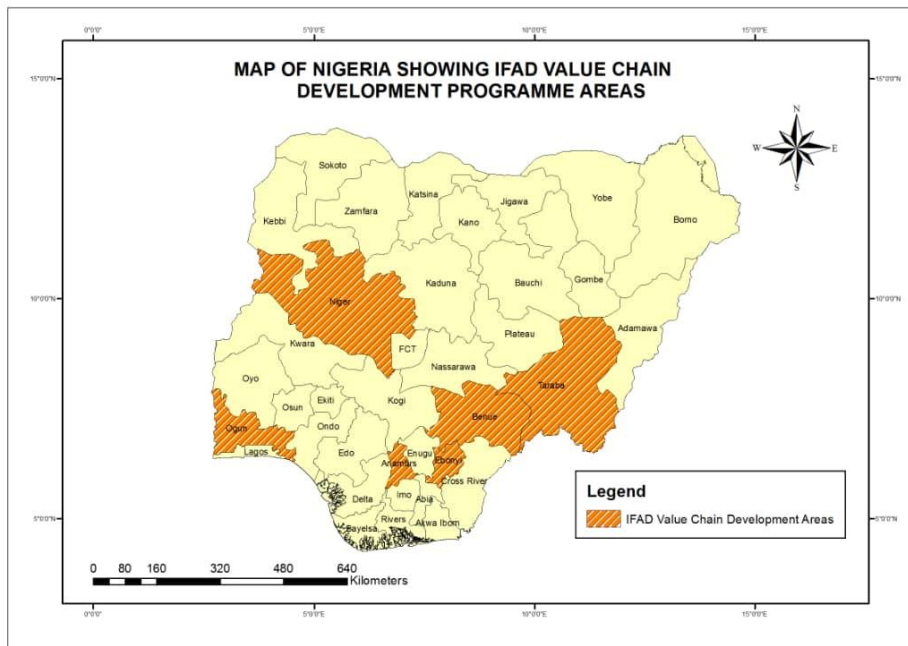
Fig 2.1: Showing the IFAD Value Chain Development Programme areas in Nigeria

Source: IFAD-VCDP Abeokuta Office, 2019
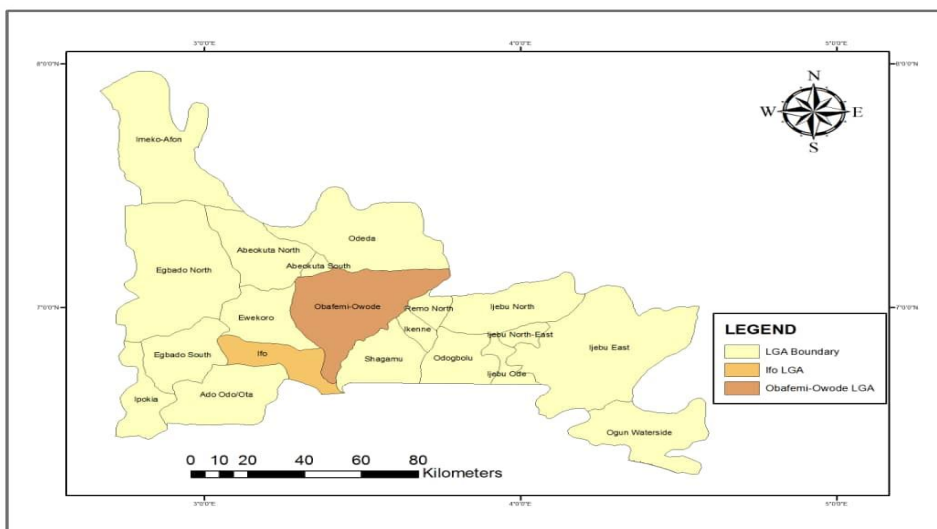
Fig 2.2: Map of Ogun State
Source: Ogun State VCDP Abeokuta Office, 2019.

2.2 Study design

A cross-sectional survey design was used to collect both qualitative and quantitative data from both cassava processors and Marketers.

2.3 Sources of data.

This study used primary and secondary data to obtain information for the research. Primary data was collected through the use of structured questionnaires and key informant interviews (KII) as well as observations. Secondary data was sourced through publications, VCDP progress report, Ministry of Agriculture, policy documents and past research findings on processing and marketing of cassava.

2.4 Sample size and sample size determination

The survey target two selected LGAs (Obafemi Owode and Ifo) in Ogun State out of the five LGAs participating in the Value Chain Development Programme. Asides primary data that was used for the research, secondary data was also used such as the baseline study and mid-term review conducted by the FG/IFAD. The choice of sample selection was informed based on Qualtrics' online sample size calculator, with 95% confidence level and margin error (confidence interval) of +/-5% *(www.qualtrics.com)*.

Table 2.1: Sample Frame for the Local Government Areas

LGA	Enterprise Unit	Population Size	Sample Size
Obafemi Owode	Processors	115	89
	Marketers	26	25
Ifo	Processors	139	103
	Marketers	39	36
Total		319	253

Sources: Ogun IFAD VCPD Office

Population size total (N) = 319

Confidence interval = 95%

Margin error = 5%

Population proportion = 50 %

Ideal sample size (n) = 253

2.5 Sampling and Data Collection

In the administration of the structured questionnaire, a multi- Stage random sampling process was adopted. The first stage was purposive selection of two (2) LGAs from the five (5) afore-listed implementing LGAs due to the prevalence of cassava processors and marketers in the area. The second stage was random selection of cassava processors and key informants for interviews. The third stage would be the random selection of respondents for the questionnaire. A total of 253 respondents was randomly selected from the two (2) target LGAs in Ogun State. The population was purposively drawn from these two LGAs: Obafemi Owode and Ifo.

2.6 Study Population

The study respondents are cassava processors, value addition, and marketers of processed cassava products. These farmers were selected to give household information because previous studies have shown that they have knowledge on the various processes of cassava processing and value addition, costs incurred and marketing information. (Achem *et al*., 2013; Ijigbade *et al*., 2014). The inclusion criteria are that the cassava farmer had to be the one responsible for processing, value addition, and marketing of the processed cassava products, willing to participate in Obafemi Owode and Ifo, Ogun state.

2.7 Data Analysis

Qualitative and quantitative data will involve the use of descriptive statistics (chart, cross-tabulation, frequencies, and percentages) and inferential statistics (T-test). Data was presented in illustrative tables and graphs (bar chart and pie chart).

Table 2.2: Analysis of Objective, Data Collection, and Method of Analysis.

S/N	Objectives	Data Collection	Method Of Analysis
1	Determine the marketability along the cassava value chain from harvesting to final products.	Questionnaire	Descriptive Statistics (Means, Frequencies, and Percentages)
2	Determine the efficiency of processing strategies and implication on marketability.	Questionnaire	Descriptive Statistics (Frequencies) and Inferential Statistics (T-test)
3	Identify the predominant processing cassava outputs and examine the potentials of alternative outputs for rural sustainability and industrial development	Questionnaire and Key Informant Interview	Descriptive Statistics (Means, Frequencies, and Percentages)
4	Examine the support of IFAD programme on cassava processing and marketability.	Questionnaire and Key Informant Interview	Descriptive Statistics (Means, Frequencies, and Percentages)
5	Identify the constraints faced in cassava processing in the Obafemi Owode and Ifo.	Questionnaire	Descriptive Statistics (Means, Frequencies and Percentages)

The t-test model used to analyse objective II is specified below.

(ii) **T-test model:**

$$t = \frac{(x_1 - x_2)}{\sqrt{\dfrac{(s_1)^2}{n_1} + \dfrac{(s_2)^2}{n_2}}}$$

Where:

x_1 is the mean of sample 1 x_2 is the mean of sample 2
s_1 is the standard deviation of sample 1 s_2 is the standard deviation of sample 2
n_1 is the sample size of sample 1 n_2 is the sample size in sample 2

3.0 RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of Respondents

The result presented in Table 3.1showed that most of the respondents (79.4%) were female while the remaining (20.6%) were male. This implies that the VCDP is female gender inclusive. More female participation in Agriculture has been encouraged. One of the main focus of VCDP is to empower poor rural people, especially women in all steps of the value chain (IFAD 2019). This implies that cassava processing is primarily dominated by the women in the study area.

Majority of respondents (34.4%) were between the ages 41 and 50 years. This implied that majority of the cassava processors and marketers were at the middle age and active; thus age has been found to determine how active and productive the individual would be, which implied that majority of the beneficiaries in the studied area were energetic and still able to do manual work. It was concluded that the beneficiaries were in their working age and as such the likelihood of moving out of poverty and food insecurity is high. Most of the cassava processors and marketers (52%) in the study areas had their household sizes between 4 to 6 persons. Also (35.9%) had household sizes between 7 to 9 persons. This signified that the families have more members engaged in cassava production probably because they have more mouths to feed. According to Asmelash (2014) the number of people in a household is a major factor that influences the adoption of the processing technology; the bigger the size of the family in a household the higher the chance of adoption; as labour accessibility increases, adoption is also expected to increase.

In addition, the study revealed that majority (87.4%) of the respondents were married. Others were single, divorced, or widowed. There was very low record of divorced and separated beneficiaries which buttressed the fact that marriage, in the African culture is a hallmark of responsibility and also that the various religious faiths adduced to the fact that marriage is the foundation for household development. This corroborates the findings of earlier researches such as Odediran *et al.* (2015) on cassava processing among rural households in the Southwest, Nigeria. Majority of the respondents (52%) had at least primary education, and only a few (10.5%) had no formal education. It was observed that most of the respondents had one form of formal education or the other from the primary level (52%) to secondary (35.9%) and tertiary (1.6%) level. Education opens the mind of the farmer to knowledge about sustainable agricultural practices. High education status of farmers will enable them acquire knowledge and skills and also embrace extension services. VCDP therefore, is a programme that is relevant to the targeted rural farmers.

Table 3.1: Socio-Demographic Information

Characteristics		Respondents	Percentage
Local Government	Obafemi Owode	114	45.1
Area	Ifo	139	54.9
Sex	Male	52	20.6
	Female	201	79.4
Age	21-30	21	8.3
	31-40	81	32
	41-50	87	34.4
	50 and above	64	25.3
Household size	1-3	29	10.5
	4-6	179	52
	7-9	31	35.9
	10 and above	12	1.6
Marital status	Single	2	0.8
	Married	216	87.4
	Divorced	15	6.1
	Widowed	14	5.7
Level of Education	No formal (Adult/Arabic)	26	10.5
	Primary	129	52
	Secondary	89	35.9
	Tertiary	4	1.6

Source: Field Survey, 2019

3.2 Cassava Value Chain

The result presented in Table 3.2 showed the type of cassava products marketed by respondents in the study areas. More than half (50.5%) of respondents indicated that Garri was the main cassava product they market. This was followed by fufu, and tuber as 44.5% and 5% marketed these cassava products, respectively. However, results confirmed that most processors prefer to process a large proportion of their cassava roots into Garri followed by Fufu. A possible reason for the processors' preference for Garri may be as a result of the ease in production, as pointed out by 50.5% of the processors.

In addition, the study revealed that almost half of the respondents (49.3%) in the cassava value chain were processors, a few (29%) were marketers, a very few (18.4%) were farmers and (3.3%) were identified as farmers and processors. This implied that the processors dominate the cassava value chain and the processed products are marketed by almost one-third of the value chain. Majority of the respondents (82.2%) used sack as their main packing material for processed

cassava products. Only a very few of them indicated they used Polythene bag (8.2%) and both sack and Polythene bag (9.6%).

Table 3.2: Cassava Value Chain

Characteristics		Respondent	Percentage
Type of Cassava Products	Tuber	11	5
	Garri	110	50.5
	Fufu	95	44.5
	Local flour	2	1
Cassava Value Chain	Farmer	45	18.4
	Processor	122	49.8
	Marketer	71	29
	Famer and processor	5	2
	Processor and marketer	2	0.8
Type of Packaging	Sack	120	82.2
	Polythene bag	12	8.2
	Sack and polythene bag	14	9.6
Source of Cassava Products	Personal processing	148	67.9
	Purchase	58	26.6
	Both	12	5.5

Source: Field Survey, 2019

Also, in the result presented in Fig 3.1, the majority of the respondents (86.9%) indicated that they market cassava products in the local market, while very few marketers (11.3%) indicated use farm gate to market cassava products. Other respondents indicated they use agro industries (0.5%).
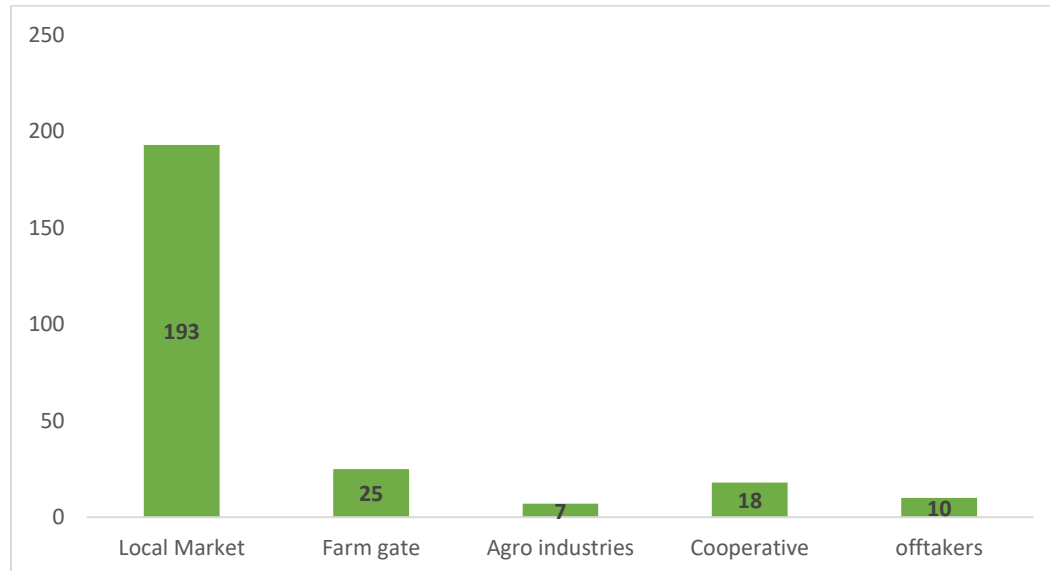
Fig 3.1 Respondents Disaggregated By Market for Cassava Products
Source: Field Survey, 2019

As shown in Table 3.3, majority of the respondents (67.9%) revealed that the source of their cassava products were from personal processing while a few (26.6%) purchased cassava products from other farmers. Only very few (5.5%) revealed that they got their cassava products through personal processing and purchasing cassava products. Also, further enquiries were made to find out the farmers' sources of information on the use of improved techniques of cassava production. Up to 46.2 % of the respondents indicated they learnt about the improved techniques through the Agricultural extension workers; about 47.4% indicated they learnt about the improved technique from neighbours; 2.7% and 3.2% stated they learnt about the modern techniques through Radio and Telephones respectively. This result showed that agricultural extension workers and neighbours were the major sources of information in the study areas.

However, the benefits the respondents derived from using the IFAD-VCDP promoted production techniques. Majority of the respondents (71%) indicated that the intervention of IFAD-VCDP through the provision of improved production techniques had led to increased production, a few (19.4%) indicated increased cassava yield. Other results showed that a very few respondents

(7.3%) indicated that they experienced reduced labour and others (2.4%) indicated that the promoted production techniques were easy to use.

Table 3.3 Source of Cassava Processing, Information and Techniques

Variable	Respondents	Percentage
Source of Cassava		
Personal processing	148	67.9
Purchase	58	26.6
Both	12	5.5
Source of Information		
Neighbors	108	47.4
NGOs	1	0.4
Radios	6	2.7
Phones	7	3.2
Extension Agents	105	46.2
Benefit from Production Techniques		
Easy To Use	6	2.4
Reduced Labour	18	7.3
Increased Yield	49	19.4
Increased Production	180	71

Source: Field Survey, 2019

Also, the result presented in Table 3.4 revealed the ease of accessing local buyers, main extension services providers, how processed cassava products were marketed and the registered members of market association. The majority of the marketers (97%) found it easy to locate buyers of cassava products while only very few (3%) found it hard to access buyers. due to the fact most of the marketers are in registered association. Furthermore, majority of the respondents (90%) indicated IFAD Agriculture Development Projects as extension services provider while others mentioned NGOs (8.5%) and University (1.5%). This finding agrees with the findings in Bahta (2012) where the author found out that extension services had positive impact on the extent of market participation. Majority of the respondents (69%) market their processed cassava products individually while only a few (31%) market theirs in group. This implied that with group marketing, processors were able to have collective responsibilities and strong bargaining powers,

shared costs, and enjoyed other benefits associated with social organization and networking. This finding concurs with the results of Sigei *et al.* (2013) who reported that group marketing had positive impact on the extent of market participation Also, (91.5%) of the respondents were registered members of the marketers association while only (8.5%) were not registered members.

Table 3.4 Marketability of cassava products along the value chain

Areas of Marketability	Respondents	Percentage (%)
Ease of locating buyers		
Easily	59	97
Not easy	2	3
Extension services provider		
NGOs	6	9.9
University	1	1.6
IFAD Agriculture development project	54	88.5
Market for processed cassava products		
Group	22	36
Individually	39	64
Registered Member of Marketers Association		
Registered	55	90.2
Not Registered	6	9.8

Source: Field Survey, 2019

The result presented in Table 3.5 showed the marketing strategies the respondents used in selling their cassava produce and its effectiveness. Majority of the respondents (82.6%) indicated that farm gate was a strongly effective marketing strategy, only a few of them (16.1%) indicated farm gate was effective and 1.3% of them indicated that farm gate was not an effective marketing strategy. Furthermore, majority of the respondents (96.8%) indicated the agro industries was a strongly effective strategy, while 1.4% and 1.8% of the respondents indicated that agro industries was just effective and not effective respectively. 99.1% of the respondents revealed that off-takers was a strongly effective marketing strategy while 81.6% of the respondents revealed that farmer's cooperative was a strongly effective marketing strategy. However, the majority of the respondents (72.8%) indicated that local market was not an effective marketing strategy, only a few of them (24.68%) indicated that it was effective, and 2.9% indicated it was strongly effective.

Table 3.5 Effectiveness of Marketing strategies used for cassava produce

Variable	Respondents	Percentage
Farm Gate		
Strongly Effective	185	82.5
Effective	36	16.1
Not Effective	3	1.3
Local Market		
Strongly Effective	6	2.9
Effective	55	24.68
Not Effective	163	72.8
Agro Industries		
Strongly Effective	210	96.8
Effective	3	1.4
Not Effective	4	1.8
Farmer's Cooperatives		
Strongly Effective	177	81.6
Effective	16	7.4
Not Effective	24	11.1
Off-takers		
Strongly Effective	212	99.1
Effective	2	0.9

Source: Field Survey, 2019

The result presented in Table 3.6b showed the significant difference between the mean amount of cassava wasted by respondents during processing before and after IFAD-VCDP intervention. It revealed that the mean difference of 2.3003kg was recorded and statistically at 0.05 level of significance as shown in appendix 1. The t-test statistic gave a value of 4.033 at 148 degrees of freedom, with a p-value of <0.002. Therefore the Paired Samples Test is significant. Hence, conclusion can be made that there is a significant difference between Amount of Cassava Wasted during Processing Before and After Joining the Project

Table 3.6a Efficiency of Processing Strategies in terms of amount of cassava wasted before and after IFAD-VCDP

Cassava wasted during processing before VCDP?			Cassava wasted during processing after VCDP?		
Kg	Frequency	Percentage	kg	Frequency	Percentage
0-5	35	23.5	0-5	130	87.2
6-10	96	64.4	6-10	12	8.1
11-15	12	8.1	11-15	4	2.7
16-20	6	4	16-20	3	2
Total	149	100	Total	149	100

Table 3.6b Association of Processing Strategies in terms of amount of cassava wasted before and after IFAD-VCDP

	Average (Kg/pp)	Std. Dev.	t-value	df	P-Value
Cassava wasted during processing before IFAD-VCPD	5.2735	5.5685	4.033	148	<0.002
Cassava wasted during processing after IFAD-VCPD	2.9732	4.2600			

Source: Field Survey, 2019

The result presented in Table 3.7b showed the significant difference between the mean yield of cassava before and after using improved variety introduced during the IFAD-VCDP programme. It revealed that the mean difference of 13.58ton/ha was recorded and statistically at 0.05 level of significance as shown in appendix 2. The t-test statistic gave a value of 11.804 at 114 degrees of freedom, with a p-value of <0.001. Therefore the Paired Samples Test is significant. Hence, conclusion can be made that there is a significant difference between Mean Yield of Cassava Before and After Using Improved Variety Introduced by IFAD Value Chain Development Program.

Table 3.7a Yield of Cassava before and after using Improved Variety Introduced by IFAD-VCDP

Yield before IFAD VCDP			Yield after IFAD VCDP		
Ton	Frequency	Percentage	Ton	Frequency	Percentage
10- 15	12	8.1	10- 15	4	2.7
16- 20	75	50.3	16- 20	15	10.2
21-25	58	38.9	21-25	19	12.6
26-30	4	2.7	26-30	25	16.8
31-35	-	-	31-35	86	57.7
Total	149	100	Total	149	100

Source: Field Survey, 2019

Table 3.7b T-Test Association of Yield of Cassava before and after using Improved Variety Introduced by IFAD-VCDP

	Average (ton/ha)	Std. Dev.	t-value	df	P-Value
Yield of cassava before IFAD-VCPD improved Variety	19.96	1.75	11.804	114	<0.001
Yield of cassava after IFAD-VCPD Improved Variety	33.54	12.19			

Source: Field Survey, 2019

Similarly, as shown in Table 3.8, majority of the respondents (90.6%) indicated that since IFAD intervention, the primary source of water for cassava processing was borehole. International Funds for Agricultural Development supported the beneficiaries' by constructing a borehole in each of the cassava processing plants of the study areas which was just 100m away from the processing plant. This greatly relieved the stress of processors who usually walk far distance to fetch water from the river and well. This result also showed a positive impact of the intervention on the livelihood of the cassava processors in the study area. This result is in line with the findings of Onyeneke (2017) and Adika *et al*. (2018), and who reported that improved cassava processing techniques have a positive impact on the livelihood and empowerment of cassava processors. However, even though more than half of the respondents (55.1%) still used traditional methods to process their cassava, the rate at which the respondents adopted improved cassava processing increased from 23.6% before IFAD intervention to 42.9% after IFAD intervention. However, 2%

of the respondents indicated that they used both traditional and IFAD-improved cassava processing techniques since the intervention. This showed that there was still low level of adoption of improved processing techniques even though the level of awareness has increased among the respondents.

Table 3.8 Respondents Source of Water and Method of Cassava Processing

Variable	Respondents	Percentage
Source of Water		
Well water	3	1.3
Borehole	229	90.6
Stream or River	19	7.4
Rain	2	0.7
Method of Cassava Processing		
Traditional Method	110	55.1
Improved Cassava Processing	86	42.9
Both	4	2.0

Source: Field Survey, 2019

The IFAD-VCDP is designed to improve the status of targeted beneficiaries, the beneficiaries includes rural farmers and other agro-based enterprise operators in Ogun State and Nigeria as a whole. The result presented in Table 3.9 showed that majority of the respondents (98.6%) benefited from the IFAD-VCDP programme on improved productivity, profitability and marketability of cassava value chain from production to consumption. This implied that the activities of IFAD-VCDP products had been having impact on the economic activities in the study areas. The result presented below showed that since IFAD intervention, majority (98.7%) of the respondents experienced increase in sales output while only very little of them (1.3%) indicating that there had been no improvement in terms of sales output. This result implied that the IFAD-intervention led to a positive impact in terms of the production value of cassava and its processed products in the study areas as the respondents can process and sell more cassava products. Furthermore, result revealed that almost all of the respondents (99.3%) experienced an increase in profit since IFAD intervention. The support from IFAD-VCDP programme led to increased profit among the respondents of the cassava value chain. From this development it could be inferred that the respondents (farmers) had higher bargaining power and socioeconomic status.

Table 3.9 Respondents Beneficiary Status, Sales Output and Profit since IFAD intervention

Variable	Respondents	Percentage
Improved Status		
Benefitted	143	98.6
Not benefitted	2	1.4
Sales output		
Increased output	148	98.7
No improvement	2	1.3
Profit		
Increased Profit	147	99.3
No Improvement	1	0.7

Source: Field Survey, 2019

The result presented in Table 3.10b showed the significant difference between the mean income per production before and IFAD-VCDP intervention. It revealed that the mean difference of ₦5,582 was recorded and statistically at 0.05 level of significance as shown in appendix 3. The t-test statistic gave a value of 9.005 at 145 degrees of freedom, with a p-value of <0.001. Therefore the Paired Samples Test is significant. Hence, conclusion can be made that there is a significant difference between Income before joining the project and Income during the project.

Table 3.10a Respondents' mean income per production before and during IFAD Intervention

Income before IFAD VCDP			Income after IFAD VCDP		
Income (₦)	Frequency	Percentage	Income (₦)	Frequency	Percentage
0-5,000	96	62.4	0-5,000	14	9.4
5,000- 10,000	36	24.2	5,000- 10,000	97	65.2
11,000- 15,000	13	8.7	11,000- 15,000	13	8.7
16,000- 20,000	4	4.7	16,000- 20,000	14	9.4
21,000– 25,000	-	-	21,000– 25,000	4	2.7
26,000- 30,000	-	-	26,000- 30,000	2	1.3
31,000- 35,000	-	-	31,000- 35,000	1	0.7
36,000- 40,000	-	-	36,000- 40,000	2	1.3
41,000- 45,000	-	-	41,000- 45,000	2	1.3
Total	149	100		149	100

Source: Field Survey, 2019

Table 3.10b T-Test association of Respondents' mean income per production before and during IFAD Intervention

	Average (₦/PP)	Std. Dev.	t-value	df	P-Value
Income before joining IFAD-VCPD	5,958.53	4070.01			
			9.005	145	<0.001
Income during IFAD-VCPD	11,540.41	8520.93			

Source: Field Survey, 2019

As shown in Table 3.11, Majority of the respondents (68.7%) opined that they received adequate support from the IFAD-VCDP programme through their activities while the remaining (31.3%) revealed they had not received sufficient support from IFAD-VCDP intervention. This calls for more action into the IFAD to ensure all of the targeted beneficiaries receive adequate support as it could transform their lives. The Table below also showed that 73.7% of the respondents believed that barriers and bottlenecks along the cassava value chain had been adequately addressed while 26.3% believed that barriers and bottlenecks such as inadequate credit facilities, high cost of land, high cost of transportation and lack of access to processing machines existed along the cassava value chain. However, this calls for further action to eliminate the existing bottlenecks along the cassava value chain. Furthermore, 88.9% of the respondents found IFAD-VCDP training in the adoption of improved cassava techniques very useful. Only a very few 10.4% found the training just useful and 0.7% of the respondents found the training not useful. This implies that IFAD-VCDP has not only provided improved processing machines and marketing information but also ensured that the beneficiaries are trained on how to use modern machines to process harvested cassava. The result presented revealed that the majority (79.7%) of the respondents were not aware of the alternative outputs of cassava processing while only a few (20.3%) of the respondents were aware of the alternative outputs of cassava processing. This could be due to several impeding factors like inadequate information, and research findings on the alternative outputs of cassava.

Table 3.11 Respondents Perceptions from IFAD VCDP

Variable	Respondents	Percentage
Support from IFAD VCDP		
Adequate	103	68.7
Not Adequate	47	31.3
Barriers		
Addressed	98	73.7
Not Addressed	35	26.3
IFAD Training		
Very Useful	128	88.9
Useful	15	10.4
Not useful	1	0.7
Alternative outputs		
Aware	32	20.3
Unaware	123	79.7

Source: Field Survey, 2019

The result presented in Table 3.12 revealed the respondents' perceived access to services provided by IFAD-VCDP. Majority of the respondents (98.6%) indicated they received human capital development training. Improved input supply was ranked second with respect to access to services provided by IFAD-VCDP. Other services like dissemination of improved processing techniques, provision of processing facilities, linkage and market information, and provision of credit ranked third, fourth, fifth and sixth, respectively. This calls more action on more accessible market information to respondents and more provision of credit facilities.

Table 3.12: Respondents' Perceived Access to Services Provided by IFAD-VCDP Programme

Services	Frequency	Percentage	Mean Rank
Human Capital Development	146	98.6	1st
Improved input supply	129	87.2	2nd
Dissemination of processing techniques	120	80.5	3rd
Provision of processing facilities	100	67.1	4th
Linkage and market information	36	25.7	5th
Provision of credit	3	2.1	6th

Source: Field Survey, 2019

As shown in Fig 3.2, Majority of the respondents (43%) recognized fufu as dominant cassava outputs, and a significant portion of the respondents (29%) recognized garri. This was followed by starch, flour and chips as 13.8%, 8.7% and 5.5% as the main cassava outputs. None of the respondent recognized ethanol or pharmaceutical grade starch as their output because it requires high capital for processing. Moreover IFAD VCDP has not explored the opportunities around ethanol production. Nigeria is the largest producer of cassava in the world. Ethanol is part of end produces and volume produced per year is about 9 million liters and we import close to 400 million liters (FAO 2019). However, compared to Brazil, the largest producer of ethanol produces about 35 billion liters yearly (Sergio Barros 2019). One ton of fresh cassava produces 150 liters of ethanol or 5 (50kg) bags of Garri. A ton of fresh cassava sells at ₦15, 000. Ethanol sell at ₦ 500 per liter while Garri sells at ₦150 per kg. This implies that One ton of cassava give an income of ₦75,000 for ethanol production compared to Garri which gives ₦ 37,500 (FAO 2019). This implies that ethanol production will give twice the income from garri production. Furthermore, large-scale ethanol production will numerously benefit affected communities which includes employment creation, income generation, improved economy, improved infrastructure and lives will be affected positively by improving standard of living. (BioFuel Africa, 2008)
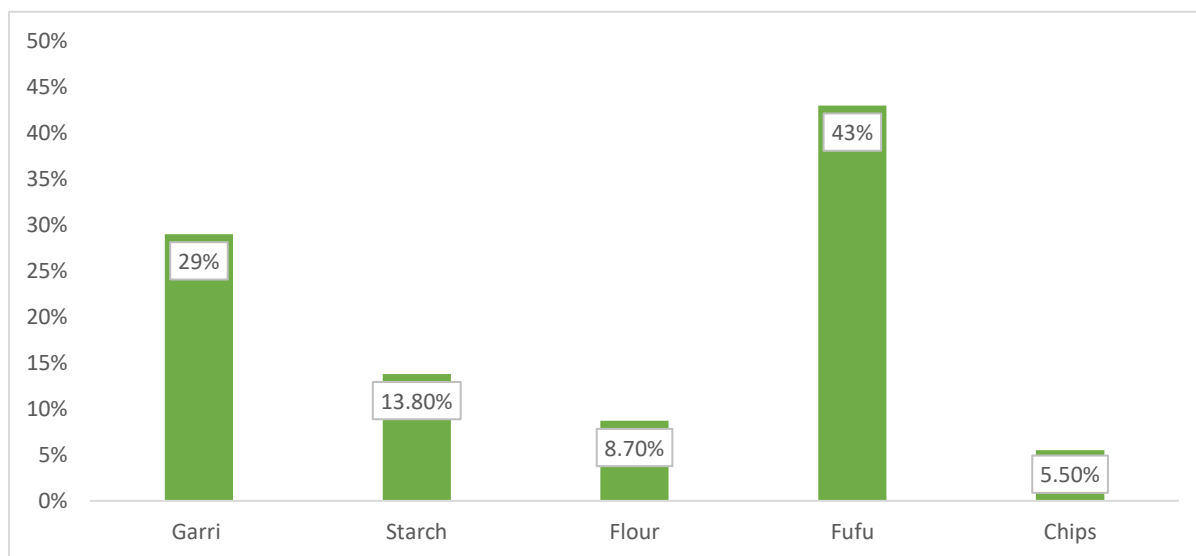
Fig 3.2 Respondent's Dominant Cassava outputs
Source: Field Survey, 2019

3.3 Constraints faced in Cassava Processing in the Study Areas

The result presented in Table 3.13 revealed that the majority (68.4%) of the respondents identified inadequate credit facilities, high cost of land (44.2%) and high cost of transportation (42.2%) as the major constraints faced in cassava processing. These will definitely impede the respondents in adopting IFAD-improved processing technologies. As regards other constraints in cassava processing, respondents also identified high cost of agrochemicals, lack of access to processing machines, high cost of labour, poor water supply, pest and diseases which ranked 4th, 5th, 6th and 7th respectively. This result is in agreement with the findings of Myunda (2009) that the major constraints limiting cassava processing include Pests and diseases, high cost of labour, high cost of land and lack of access to processing machine. According to a study carried out by Akinnagbe (2010), there are numerous challenges to cassava production that could be grouped under agronomic, institutional/technical and financial constraints.

Table 3.13: Constraints faced in Cassava Processing in the Study Areas

Constraints	Respondent	Percentage	Mean Rank
Inadequate credit facilities	106	68.4	1st
High cost of land	68	44	2nd
High cost of transportation	65	42.2	3rd
High cost of Agrochemicals	42	27.3	4th
Lack of access to processing machines	12	13.5	5th
High cost of labour	5	3.3	6th
Poor water supply	2	1	7th
Pest and Diseases	1	0.6	8th

Source: Field Survey, 2019

As shown in Table 3.15, many of the respondents (42.4%) suggested improved access to credit facilities, 28% of them suggested intervention in road infrastructure, 12% of them recommended reduction in processing cost, 9.6% of them suggested an intervention in equipment support, 4.8% of them suggested the government to focus on agro-processing industries and very few (1.6%) suggested government support for processors and increase in FGN-Assisted/IFAD-VCDP intervention.

Table 3.15 Respondents' suggestion of solutions to these constraints

Suggestion	*Frequency	Percentage	Mean Rank
Improved access to credit facilities	53	42.4	1st
Intervention in road infrastructure	35	28	2nd
Reduction in processing cost	15	12	3rd
Intervention in Equipment support	12	9.6	4th
Government focus on Agro-processing	6	4.8	5th
Government support for processors	2	1.6	6th
Increase in FGN-Assisted/IFAD-VCDP Intervention	2	1.6	7th

Source: Field Survey, 2019

5.0 SUMMARY

This study evaluated the processing strategies and marketability of cassava products in Obafemi Owode and Ifo, Ogun State, Nigeria. The study analysed the socio-economic characteristics of cassava processors and marketers in the selected LGAs, the marketability along the cassava value chain from harvesting to final products, the efficiency of processing strategies and implication on marketability, the predominant processing cassava outputs and examine the potentials of alternative outputs for rural sustainability and industrial development, the support of IFAD-VCDP programme on cassava processing and marketability and the constraints faced in cassava processing in the study areas.

A multi-stage random sampling technique was adopted, and a structured questionnaire was administered to 253 respondents using the Qualtrics' online sample size calculator, with 95% confidence level and margin of error. Primary and secondary sources of data were used for data collection, and descriptive and inferential statistics (means, frequencies, charts and t-test) were used as methods of analysis.

The results showed that most of the respondents were between ages 41-50 years, and most had their household sizes of 4 to 6 persons. About 87.4% of the respondents were married, and 52% had at least primary education. About 75.8% of the respondents were processors, and 24.2% were marketers. 82.2% of the respondents used sack as packing materials, 50.5% indicated garri was the main cassava product marketed and 47.4% of sold market cassava products in local markets, 11.3% used farm gate. About 67.9% of the respondents sourced cassava products from personal processing, 47.4% obtain production and marketing information from neighbours and 97% easily located buyers for cassava products. About 88.5% of the respondents indicated IFAD agricultural development projects as extension service providers while 90.2% were registered members of marketers association.

The result also showed higher efficiency in cassava processing strategies and a significant impact on the marketability of cassava products since the start of IFAD-VCDP programme. The amount of cassava wasted witnessed a 4% decrease from 5.27kg/pp before IFAD-VCDP to 2.97kg/pp after IFAD-VCDP. The results also revealed that IFAD-VCDP has greatly supported the processors and marketers through the provision of boreholes, improved techniques and training. About 90.6% of the beneficiaries indicated that since IFAD intervention, the primary source of water for cassava processing was borehole as 81.4% of the respondents used stream or river and well water as their

primary source of water before IFAD intervention. IFAD supported the beneficiaries' by constructing a borehole in each of the cassava processing plants of the study areas which is just 100m away from the processing plant. About 98.7% of the beneficiaries experienced increase in sales output, 99.3% experienced increase in profit and 49% increase in the mean income per cassava production and 98.6% indicated they received human capital development training. However, majority 79.7% of the respondents were not aware of the alternative outputs of cassava processing while only a few 20.3% of the respondents were aware of the alternative outputs of cassava processing. About 55.1% used traditional methods to process their cassava, even though the rate at which the respondents adopted improved cassava processing increased from 23.6% before IFAD intervention to 42.9% after IFAD intervention. Furthermore, result revealed that 43% of the respondents recognised fufu as dominant cassava outputs, and a significant portion of the respondents 29% recognised garri and starch as their main cassava outputs while just 13.8% of them recognised starch and ethanol to be their main cassava outputs. Majority 68.4% of the respondents identified inadequate credit facilities, high cost of land 44% and high cost of transportation 42.2% as the major constraints faced in cassava processing,

Consequently, lack of access to credit facilities, bad roads, high cost of lands, and transportation hindered the respondents in adopting IFAD-improved processing technologies.

5.1 Conclusions

It was concluded from this study that IFAD-VCDP improved the processing strategies and the marketability of cassava products through the provision of improved production and processing technologies, training and construction of processing plants, improved access to market information. Improvement was seen in cassava yield, profits, outputs, average mean income per production of the beneficiaries. This is a commendable step towards improving the socioeconomic status of cassava processors and marketers.

5.2 Recommendations

Based on the findings of this study, the following recommendations were made;

❖ Improving access to credit facilities, finance and creating more awareness of alternative outputs and encouraging the adoption of modern and improved technologies would have a significant impact in processing and marketing strategies of cassava products. Also, Access to small loans gives farmers opportunities to rely on another finance source apart from their income, and hence, reduce dependence on income. Accessing loans by smallholder farmers means that all

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extreme financial conditions should be removed or made favorable so the institutions can service the low-income earners according to their capability. Also improving access to market information, and the construction and rehabilitation of bad roads will improve marketability of cassava products.

❖ There should be sustainability plan in place to ensure continuity of the Programme after the completion of VCDP intervention. With consistent training, a model of Training of Trainers (ToT) would be in place so they can facilitate training of new farmers and continue to impact knowledge. IFAD should invest

❖ IFAD should invest in Ethanol production plants for processors that uses cassava as a raw material. This will encourage farmers to produce more cassava, as they will get more value from cassava tubers. Ethanol gives twice the income from production of garri and fufu, thereby increasing the livelihood status of farmers.

❖ Ministry of agriculture through research centers should make efforts on availability of improved technology to cassava processors to improve cassava processing.

❖ Government should facilitate support for cassava farmers by linking them viable cassava off takers to buy large quantities of cassava for commercial purposes thereby increasing cassava production and preventing glut.

❖ Establishing more processing centers will aid in the processing of cassava. Processors in Obafemi Owode suggested the creation of at least one more processing center in the LGA.

❖ Youth participation should be further encouraged through creating awareness, and organizing trainings, seminars, workshop, and symposiums. According to the national bureau of statistics (NBS), Nigeria's unemployed rate keeps rising to an unprecedented high. Encouraging youth participation in agriculture will help in the pursuit of a self-sufficient economy and also reduce unemployment rate in Ogun State and Nigeria as a whole.

References

Adeniji, A.A., Ega, L.A.,Akoroda, M.O., A.A. Adeniyi; B.O Ugwu; A, de Balogun 2005, "Cassava Development in Nigeria". Department Agriculture, Federal Ministry of Agriculture and Natural Resources Nigeria. F.A.O. Retrieved 22 September 2013.

FAOSTAT (2013). Food and Agricultural Organization of the United Nations Outline Statistics Database

Food and Agricultural Organization (FAO) (2004). Corporate Document Repository. The Global Cassava Development Strategy. Retrieved April 16, 2013, from http://www.fao.org/docrep007/ji255e00htm.

Food and Agricultural Organization (FAO) (2014). Food Outlook: Biannual report on global food markets. Food and agricultural organization. P 32-37

Ijigbade, J. O., Fatuase, A. I., & Omisope, E. T. (2014). Conduct and Profitability of Gari Production for Increased Food Security in Ondo State, Nigeria. *Journal of Humanities and Social Science*, *19*(7), 89–95

IFAD (2011): strategic framework 2011- 2015 –Enabling poor rural people to improve their food security, raise their incomes and strengthen their resilience

IFAD VCPD (2014). Value Chain Development Programme Implementation Manual.

International Institute for Tropical Agriculture (IITA) (2009). Cassava Production Expansion in Africa. International Institute for Tropical Agriculture. Ibadan, Nigeria. p 45.

International Institute for Tropical Agriculture (IITA) (2014). Nigeria's Cassava Industry: Statistical handbook. In the global Cassava Development Strategy. A 68 Cassava Industry Revolution in Nigeria. The potential for a new industrial crop. P 37

International Institute for Tropical Agriculture (IITA) (2018). Adopting improved cassava varieties reduces poverty.

Kaplinsky R., Morris. M (2001): A Handbook of Value Chain Research Paper Prepared for the IDRC.

Kotze, D. A. (2003). Role of Women in Household Economy, Food Production and Food Security, in Ogulela, Y. I. and Mukhtar, A. A. (2009). Gender issues in Agriculture and Rural Development in Nigeria: The Role of Women. *Humanityand Social Science Journal.* 4(1): 19-30.

Marissa Fessenden (2014). A Cassava Revolution Could Feed the World's Hungry

National Fadama Development Project (2009). Retrieved December 5, 2014, from http://www.faddama.org/kogi.htm.

Nweke, F, Spenser, D., Lyam, J. (2001). The cassava Transformation; Africa best Kept Secret Michigan State University Press, East Lansing, USA, 273.

Ojiako, I.A., Ezedinma, C., Okechukwu, R.U., and Asumugha, G.N. (2013). Spatial Integration and Price Transmission in Selected Cassava Products' Markets in Nigeria: A Case of *Garri. World Applied Sciences Journal,* 22 (9): 1373-1383

Sanni, L. O., Onadipe, O. O., Ilona, M. D., Mussagy, M. D., Abass, A., and Dixon, A.   G.   O. (2009). Successes and Challenges of Cassava Enterprises in West Africa: A Case Study of Nigeria, Benin, and Sierra Leone. International Institute of   Tropical   Agriculture (IITA), Ibadan, Nigeria. pp 7-15.

USAID New partners invest in Mozambique's Future. Washington, D.C.: USAID (2015)

World Bank (2016). World Development Report. Agriculture for Development. Washington, D.C.

APPENDIX 1

Survey Instruments

CENTER FOR SUSTAINABLE DEVELOPMENT
UNIVERSITY OF IBADAN

M.Sc. RESEARCH TOPIC: EVALUATION OF PROCESSING STRATEGIES AND MARKETABILITY OF CASSAVA PRODUCTS IN OBAFEMI OWODE AND IFO, OGUN STATE NIGERIA

The IFAD Value Chain Development Programme (VCDP) has so many different programs and functions, so the target group satisfaction helps to access if the IFAD-promoted cassava processing techniques adopted have led to poverty reduction and increase in gross margin and return on investment for cassava processors.

Number of Respondents Interviewed

The survey covers 253 respondents, across two (2) LGAs (Obafemi Owode and Ifo).

Questionnaire Design

Dear respondent,
I am Muez Damola Lawal, a Master's degree student of the Center for Sustainable Development (CESDEV), University of Ibadan, Nigeria. I am currently carrying out a research project on Evaluation of Processing Strategies and Marketability of Cassava Products in Obafemi Owode and Ifo, Ogun State Nigeria. In line with this, I seek your opinion on the questions below. You are not required to give your name. The information you give will remain confidential and will not be revealed to a third party. Thank you for your response.

Muez Lawal
Matric No: 210428

Questionnaire ID ……… Date …………. Local Government ……………………………..

Section A: Background Information of the respondent

Demographic and Socioeconomic Characteristics

1. Sex: a) Male   b) Female

2. Age: a) Below 18   b) 21-30   c) 31-40 d)41-50 e) over 50 years

3. Marital status: a) Single b) Married   c). Divorced   d) Widowed   e) Widower

4. Educational status: a) No Formal Education   b) Primary   c) Secondary   d) Tertiary education

5. What is your household size: a) 1 to 3   b) 4-6 c) 7-9   d) Above 10

6. Do you grow cassava: a) Yes   b) No

7. Farm size: ………………………….(ha)

8. Years of farming experience: ………………… (years)

9. What is your cassava value chain enterprise?   a)Farmer   b) Processor   c) Marketer

10. Do you belong to a value chain cooperative society?   a) Yes   b) No

11. If yes, name of cooperative society…………………………………………

12. Position in cooperative society…………………………………………

Section B: Cassava Product Marketing (For Marketers)

13. What type of cassava products do you market?   ………………………

14. Where do you market these cassava products? a) Farm gate b) Market c) Agro Industries
     d) Farmer's Cooperatives e) Off-takers

15. Do you export any of these cassava products?   a) Yes   b) No

16. How much do you sell your cassava products? Per kg   ………………………

17. How do you get your cassava product? a) Personal processing b) Purchase

18. Do you find it hard to locate your buyers?   a) Yes   b)No

19. Where do get your production and marketing information?

    (a) Neighbors (b) NGOs (c) Radios (d) Phones (e) Extension Agents f) Others

    (specify)……….

20. Who provides extension services to you?

    (a)NGOs (b) University (c) Agriculture Development Project (d) others

    (specify)………………

21. How do you market processed cassava products? (a) Group   (b) Individually.

22. What is the unit price of cassava product purchased for marketing? ……………………….

23. Are you a registered member of marketers association? a) Yes b) No

24. Which marketing strategies do you use to sell your produce and how effective are they.

	Variable	Strongly Effective	Effective	Not Effective
a	Farm Gate			
b	Local Market			
c	Agro Industries			
d	Farmer's Cooperatives			
e	Off-takers			

Section C. Determine the efficiency of processing strategies and implications on marketability

25. How much cassava do you think was wasted during processing before IFAD VCDP? …….%

26. How much cassava do you think is wasted during processing after IFAD VCDP? …….. %

27. Kindly give the estimate amount (N) you spent in processing a 5kg bag of garri. ………………….

28. Are you a beneficiary of IFAD Value Chain Development Program? a) Yes b) No

29. What was your previous yield using Traditional processing before IFAD VCDP? …….. (ton/ha).

30. What is your current yield using improved variety introduced by IFAD VCDP? …… (ton/ha).

31. What benefit have you derived from producing cassava?

   a) Animal feed b) Food for home consumption   c) Increasing household income

32. What benefits have you derived by using the improved cassava production techniques?

   a) Easy to use b)Reduced labour c) Increases yield d) Increased production e) Reduced pest and diseases

33. The type of packing materials used for processed cassava products ………………………….

34. What is the primary source of water for cassava processing?

   a) Well water b) Borehole   c) Stream or River d) Rain v) Tap water

35. Has your sales output increased during participating in this Value Chain Development Program? a) Yes b) No

36. Has your profit increase since your participation in the IFAD programme? a) Yes b) No

37. What benefit have you derived by using the improved cassava production technique?

a) Easy to use b) Reduced labour c) Increase yield d) Increases production e) Reduced pest and diseases

Section D: Cassava Processing and Alternative Outputs

38. Do you have cassava farm of your own or you buy tubers from other farmers?

a) I have cassava farm of my own   b) I buy tubers from other farmers

39. If you own a farm, how many Hectares do you cultivate to cassava best planting season? ………………ha

40. If you buy tubers to process what is the source of your tubers? a) Farmers   b) Open Market

41. How do you process your cassava?   a) Traditional method b) Improved cassava processing

42. Which of these improved cassava processing technologies are you aware of?

a) Mechanical grater b) Screw press c) Mechanical sifter   d) Fryer (toaster)   e) None

43. Which of the following products do you process from cassava? a) Garri b) Starch c) Flour d) Chips e) Ethanol f) Pharmaceutical grade starch g)Others (specify)

44. Are you aware of other alternatives outputs of cassava processing? a) Yes b) No

45. If Yes (Specify) …………………………………………………………………..

46. If you have cassava farm of your own what is the means of land ownership?

a) Inheritance b) Purchased c) Husband's farm d) Leasing e) Others (specify) ……..

47. Do you have your own processing enterprise or you work in group?

a) I have my own processing enterprise   b) I work in group

48. Do you have any processing machinery of your own or you use hired machinery?

a) I have machinery of my own   b) I use hired machinery

49. How do you transport processed cassava products to the market? (a) Carry on head (b)Bicycle (c) Sell from the processing site (d) use owned motor cycle (e) others specify………

Section E. Support of IFAD Programme on cassava processing and marketability

48. Do you participate in IFAD Value Chain Development Program? a) Yes b) No

49. Has your production capability been enhanced?   a) Yes   b) No

50. Is the support being given by IFAD been adequate?   a) Yes   b) No

51. Has the barriers and bottlenecks along value chain been adequately addressed? a) Yes b) No

52. Where u given improved cassava varieties? a) Yes   b) No

53. What was your income before joining the project? ……………... Naira

54. What is your income after joining the project? ………………… Naira

55. Have you ever received training concerning improved cassava production technology?

   a) Yes   b) No

56. How do you rate the usefulness of the training in your adoption of improved cassava production

   techniques?   a) Very Useful   b) Useful   c) Not useful

57. Please indicate whether you have equal opportunities with respect to access to the following

   services provided by IFAD Value Chain Development Program

		Yes	**No**
a	Improved input supply		
b	human Capital development(Training)		
c	Linkage and market information		
d	Provision of credit		
e	Provision of processing facilities		
f	Dissemination of improved processing techniques		

Section F: Constraints/Problems

58. Kindly rate the degree of the following constraint by ticking appropriate box.

	Constraints	Most severe	Very Severe	Severe	Less Severe	Not at all
a)	High cost of land					
b)	Inadequate of credit facilities					
c)	Lack of access to machineries					
d)	Problem of water supply					
e)	High cost of agrochemicals					
f)	Pests and diseases					
g)	High cost of transportation					
h)	Bad access roads					
i)	Poor yield of crops					
j)	High cost of labour					

59 Suggest a way of finding solutions to these constraints/problem. ……………………………