DETERMINANTS OF LOAN AND PROFITABILITY OF CASSAVA PROCESSING AMONG WOMEN CO-OPERATORS IN YEWA DIVISION, OGUN STATE, NIGERIA

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Abstract: The research was carried out to examine the **effects of cooperative loan on cassava processing among women in Yewa Division**, Ogun State, Nigeria. Survey data were collected from 120 women cassava processors in the study area and Multi-stage random sampling was used in selecting the sample size. Descriptive and Inferential statistical tools were used to characterize their socio – economic characteristics. Also, Ordinary Least Square and Probit Regression model were used to analyze the profitability and the access to loan of the women cassava processors in the study area. The results on profitability showed that the years of experience and loan obtained by the processors positively affect their level of profit. The results on access to loan showed that the years of experience and the level of education of the cassava processors positively affect their access to loan while dependency ratio negatively affects their access to loan. From the findings, it can be concluded that loan obtained and years of experience are factors that determine the profitability level of the respondents in the study area. Therefore, the study recommended that Cooperatives should also endeavor to reduce interest rates so that there would be greater ease in carrying out economic activities and at the same time pay back loans without too much stress.

Keywords: Cooperatives, loan, cassava processing, women, profitability

Introduction

Credit or loanable fund is regarded as more than just another resource such as land, labor and equipment, because it determines access to most of the farm resources required by farmers. The explanation is that farmers' adoption of new technologies necessarily requires the use of some improved inputs which may be purchased. Loan also acts as a catalyst for rural development by motivating latent potential or making under used capacities functional (Oladeebo and Oladeebo, 2008). In response to this need, the government of Nigeria established amongst others, the Nigerian Agricultural and Cooperative Bank (NACB) in 1973 (now Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) to cater for the financial needs of the agricultural sector. The usefulness of any agricultural loan program does not only depend on its availability, accessibility and affordability, but also on its efficient allocation and utilization for intended purposes by beneficiaries (Oboh, 2008).

In Nigeria, processors face a lot of problem in the acquisition, management and repayment of agricultural loans. According to Akerele (2003) and Awoke (2004), the sustainability and resolvability of most public agricultural loan schemes in Nigeria have been threatened by high rate of default arising mainly from poor management procedures, poor loan acquisition and utilization (leading to loan diversion) and reluctance to repay loans. Loan plays a vital role in economic transformation and rural development. Agricultural or farm credit is a crucial input required by women cassava processors to establish and expand their enterprise with the aim of increasing the income of the households and the nation in general while augmenting the individual borrower's ability to repay borrowed funds. .

Access to loan is regarded as one of the key elements in raising cassava processing. The perceived benefits and problems of cooperative societies in the financial sector is worthy of exploration. Studies carried out by Izekor and Alufohai, (2010) and Ajah *et al*. (2014) on the effectiveness of cooperatives societies in agricultural loan delivery in Ikpoba Okha Local Government Area, Edo and Cross River State respectively have shown that cooperative carry out the function of loan delivery to farmers but there is ample evidence that farmers still face difficulties in obtaining loans.

Moreso, the problem of sourcing for capital by agricultural enterprises still lingers. This may be unconnected to cooperative society's efficiency in credit delivery.

Cassava is an important crop in Africa. It survives in poor soils, has a high yield of carbohydrates and good resistance to pest infestations, diseases and drought (Akinguola and Onayemi, 2010). Cassava roots are processed and eaten by 500 million people a day in Africa where it is a staple for 40% of the population (Oluyombo, 2018). Cassava grows well in west, east, central and South African countries. The western countries include Nigeria, Benin and Ghana; eastern countries include Uganda, Kenya, Zambia and Tanzania, southern Mozambique and Zimbabwe and in the central Africa; the Democratic Republic of the Congo. Cassava is a versatile crop; all parts of the plant including its root have been processed into a number of products.

Cassava is grown throughout the tropic and could be regarded as the most important root crop in terms of area cultivated and total production (Chukwuji, 2006). It is a very important staple food consumed in different forms by millions of Nigerians. Cassava roots are rich in energy, containing mainly starch and soluble carbohydrates, but are poor in protein. Cassava is a crop of the poor people and occupies mainly agriculturally mineral environments. These and other features endowed it with a special capacity to bridge the gap in food security, poverty alleviation and environmental protection (Clair *et al.*, 2000; Akerele and Aihonsu, 2014).

Cassava can be grown on a wide range and can yield satisfactorily even in acidic soils where most other crops fails (Hahn, 1984), the crop has continually played very vital roles, which include income for farmers, low cost food source for both the rural and urban dwellers as well as household food security (Nweke 1996). In Nigeria, Cassava is generally believed to be cultivated by small scale farmers with low resources (Mgbada, 2002). It also plays a major role in the effort to alleviate the food crisis in Africa, the Food and Agricultural Organization of the United Nation estimated cassava production in Nigeria as at 2002 to be 34 million tonnes. Nigeria is the largest producer of cassava in the world. Its production is currently put at about 33.8 million tonnes a year. Total area harvested of the crop in 2001 was 3.1 million hectare with an average yield of about 11 t/ha

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(FAO, 2010). Cassava plays a vital role in the food security of the rural economy because of its capacity to yield under marginal soil conditions and its tolerance to drought. It is the most widely cultivated crop in the country; it is predominantly grown by smallholder farmers and dependent on seasonal rainfall.

Rural and urban communities use cassava mainly as food in both fresh and processed forms. The meals most frequently eaten in the rural areas are cassava-based food. Data from the Collaborative Study of Cassava in Africa (COSCA) showed that 80% of Nigerians in the rural areas eat a cassava meal at least once weekly. Per capita consumption of cassava of 88 kg/person/year between 1961 and 1965 increased to 120 kg/person/year between 1994 and 1998. Nweke *et al*. (2002) maintained that cassava performs five main roles: famine reserve crop, rural food staple, cash crop for urban consumption, industrial raw material, and foreign exchange earner, also that Nigeria is the most advanced of the African countries poised to diversify the use of cassava as a primary industrial raw material and livestock feed.

Objectives of the Study

The main objective of this study is to examine the determinants of loan and profitability of cassava processing among women cooperators in Yewa Division, Ogun State, Nigeria.

The specific objectives of the study are to:

i.   describe the socio-economic characteristics of cassava processors in the study area,
ii. describe the cost and return structure of cassava processing,
iii. determine the determinants of profitability of the investment among cassava processors,
iv. estimate the determinants of access to loan among cassava processors.
v.   describe the constraints being encountered by cassava processors in obtaining loan in the study Area.

Materials and Methods

Study area

The study area is Yewa division of Ogun State, Nigeria. Ogun State is located in the south Western part of Nigeria with Latitude 6^0N and 8^0N and Longitude $2\frac{1}{2}^0$E and 5^0E. It is bordered by the Republic of Benin on the West, Ondo State on the East, Oyo State in the North, while Lagos state and Atlantic Ocean are to the south. Ogun State covers about 16,762 square meters that's approximately 1.82% of Nigeria land mass and with actual population figure of 2,358,570 in 2005 and it accounts for about 2.46% of Nigeria total population being the 19th largest State (NPC, 2006). The area is endowed in terms of natural resources located in the ecological zone of Nigeria. They are predominantly Yewa, Awori and Egun speaking Yoruba and they are predominantly farmers, while the communities are noted for production of arable crops like cassava, maize, cocoyam, yam, melon, tomatoes and many others.

Sources and methods of data collection

Survey data were collected from women cassava processors, who acquired loan from the cooperative society. The study made use of both primary and secondary data. Primary data were collected using well-structured questionnaires to obtain information from the respondents in the study area and through oral interview. While, secondary data were sourced from journals, statistical publications, textbooks, articles, past projects, and the internet.

Sampling techniques

Multistage random sampling technique was used in selecting the sample size. In the first stage, two (2) Local Government Areas were randomly selected from five (5) LGAs in Yewa Division, namely: Yewa North, Yewa South, Ipokia, Imeko-Afon and Ado-Odo/Ota. The second stage involved random selection of six (6) towns from each Local Government Area. While in the third stage, ten (10) women agro-processors were randomly selected from each selected towns making a total of one and hundred and twenty (120) respondents in all.

Methods of data analysis

The tools used for data analysis include both the descriptive analytical tools and inferential statistical tools. Descriptive statistics such as frequency table and percentages were used to characterize the socio-economic characteristics of the women and to identify the problems encountered by the women cassava processors in obtaining loans in the study area. The socio-economic characteristics include their age, household size, marital status, educational level, processing experience and so on. Ordinary Least Square (OLS) method of analysis was employed to examine the effect of socio-economic characteristics on women cassava processors' output level. The Probit Regression model was used to check the effect of cooperative loan on the output level of the women cassava processors in the study area.

The ordinary least square method (OLS)

The model is implicitly specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + U \dots\dots\dots\dots\dots\dots\dots\dots \text{ (i)}$$
$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, U_i) \dots\dots\text{(ii)}$$

Where: Y = Net Income (₦); X_1 = Age (years); X_2 = Education (Years); X_3 = Processing Experience (Years); X_4 = Household Size (Number); X_5 = Marital Status (1= single, 0 if otherwise); X_6 = Loan Obtained (₦); X_7 = Occupation (1= farming, 0 if otherwise); U_i = Error Term

Probit regression model

The Probit regression model was employed to analyze the determinants of access to loan among the women cassava processors in the study area.

$$P(Y) = X_1\beta + U_1 \quad \dots\dots\dots\dots\dots\dots \text{ (i)}$$
$$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8) \dots\dots\text{(ii)}$$

Where: Y = Access to loan; β = Vector of Independent Variables defined as follows:

X_1 = Age (years); X_2 = Marital Status (1=married, otherwise, 0); X_3 = Processing Experience (years); X_4 = Household Size (number); X_5 = Education (years); X_6 = Income (₦); X_7 = Occupation; X_8 = Religion; X_9 = Dependency ratio

Results and Discussions

The age of the respondents is an important factor that affects their level of productivity, adoption of improved processing techniques and improved varieties of cassava and overall coping ability within the business. Age is believed to influence the level of physical work. Data in Table 1 showed the distribution of the respondents, it could be seen that substantial percentage (50.8%) of the respondents had their age fall within 31-40 years age bracket this implies that the respondents are in their prime working age. Also, 34.2, and 15.0% of the sampled farmers had their age fell within 41-50 and above 0 years respectively. This implies that cassava processing in the area was embarked upon by men and women who were physically strong and mentally alert to face challenges which cassava processing in the developing countries like Nigeria requires.

The marital status of respondents helps to reduce labour cost especially when the respondents are married in which they can supply labour from their household. This in turn increases their income considerably. The finding revealed that majorities (78.3%) of the respondents were married. Besides, 12.7% of the respondents were widowed. The implication of this finding is that majority of the respondents can be considered to be responsible in taking rational decision that can improve productivity and income.

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Years of experience is expected according to *a priori* expectation, to increase productivity. The number of years in which the respondents have been involved in cassava processing could be used to measure their efficiency. Experience is expected to have a significant positive impact on the managerial ability of the respondents. Therefore, the more experienced they are, *ceteris paribus*, the more efficient they would be in management because the acquired experience over the years would be brought to bear on their activities. The many years of farming experience showed that the farmers are relatively experienced and there is some level of specialization and this would help in cost minimization and achieving greater efficiency. The result revealed that 42.5 % of the sampled cassava processors had between 5-10 years experience in cassava processing, 21.7% had between 16-20 years of experience, while only 15.0% had below 5 years of cassava processing experience. This implies that the experience gathered over the year will help in improving the cassava processing and thus increase their profit.

Household size may not only determine whether the respondents will use credit or not but also determine what the credit so obtained will be expended on. Respondents with large household sizes are expected to require credit and high proportion of the credit is expected to be spent on consumption. The finding showed that majority (44.2%) of the respondents had between 7 – 9 persons as household size while 5.0% of the respondents had between 4 and 6. This implies that the cassava processors have considerably moderate household size, which consequently decreases their expenditure on food consumption and save some money.

Main occupation of respondents is expected to influence their level of commitment to farming and eventually, farmers' productivity. The study revealed, as shown in Table 1, that majority (67.5%) of the respondents predominantly engage in cassava processing as their main occupation. The cassava processors whose main occupation is not cassava processing represents 32.5% of the respondents. This implies that most of the income realized for family development by the sample respondents came from cassava processing.

Formal education is a widely known avenue for improving knowledge and rate of skill acquisition Formal education is also important in business because it determines the degree of level of adoption of innovation and new technologies. It also determines the degree of excellences in any activity Education has been found to influence the level of adoption of improved processing techniques which can lead to improved productivity (Akerele *et al.,* 2016). The study revealed that substantial percentage (63.3%) of the cassava processors in the study area possessed formal education while 36.7% of the respondents had no formal education. Efforts should be made by government to give adult literacy education to the illiterate among cassava processors in the study area.

Table 1: Socio-economic characteristics of cassava processors

Variables	Frequency	Percentage
Age (years)		
31 - 40	61	50.8
41 - 50	41	34.2
Above 50	18	15.0
Marital Status		
Married	94	78.3
Widowed	26	21.7
Years of Processing Experience		
Below 5 years	18	15.0
5-10 years	51	42.5
11-15 years	25	20.8
16-20 years	26	21.7
Household Size (persons)		
1 - 3	6	5.0
4 - 6	49	40.8
7 - 9	53	44.2
10 - 12	12	10.0
Major Occupation		
Cassava processing	81	67.5
Other occupation	39	32.5
Educational Level		
Primary education	49	40.8
Secondary education	25	20.8
NCE/HND	8	6.7
B.Sc/B.Agric	38	31.7
Total	**120**	**100**

Source: Field Survey (2019)

Table 2: Showing cost and return structure of cassava processing in the study area

Variables	Mean Amt(₦) Fufu	Mean Amt(₦) Garri	Mean Amt(₦) Lafun
Labour cost	9000.0000	18877.5795	9070.8235
Transportation	43200.0000	26372.7273	42635.2941
Water	1440.0000	3425.4545	1552.9412
Firewood	5000.0000	1405.6818	4835.2941
Total variable cost	**58640.0000**	**111450.2159**	**58094.3529**
Knife	300.0000	365.3409	270.5882
Sieve	80.0000	404.0909	87.0588
Nylon	5000.0000	778.4091	4470.5882
Stirrer	110.0000	103.6364	100.0000
Frying pan	5000.0000	4044.3182	5023.5294
Basket	2300.0000	1165.9091	2135.2941
Sack	455.0000	568.6364	455.0000
Scale	120.0000	120.0000	120.0000
Bowl	4941.0000	1352.3636	4517.4706
Drum	13850.0000	6537.5000	12908.8235
Frying pan	4500.0000	3930.6818	4523.5294
Total fixed cost	**26796.0000**	**14421.7955**	**25267.7647**
Total Cost	85436.0000	125872.0114	83362.1176
Total revenue	**180000.0000**	**409022.7273**	**187588.2353**
Gross Margin	121360.0000	297572.5114	129493.8824
Net income	**94564.0000**	**283150.7159**	**104226.1176**

Source: Data analysis (2019)

Cost and return structure of cassava processing in the study area
The estimated gross margin analysis of cassava processing enterprises for fufu, garri and lafun is shown on Table 2.
All products
The estimated costs and return of production on the average in the Zone were ₦17,101.13 and ₦356,373.91 per year, respectively. Revenue from production on the average was ₦356,373.91, while the gross margin and net income or returns to the processors were ₦257,403.28 and ₦240,302.12, respectively. These measures of performance indicate that cassava processing business in the study area is viable and profitable.
Fufu
The estimated costs and return of production on the average in the zone were ₦85,436.00 and ₦180,000.00 per year, respectively. Revenue from production on the average was ₦180,000.00, while the gross margin and net income or returns to the processors were ₦121,360.00 and ₦94,564.00, respectively. These measures of performance indicate that cassava processing business in the study area is viable and profitable.

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Garri

The estimated costs and return of production on the average in the zone were ₦125,872.01 and ₦409,022.73 per year, respectively. Revenue from production on the average was ₦409,022.73 while the gross margin and net income or returns to the processors were ₦297,572.51 and ₦283,150.72, respectively. These measures of performance indicate that cassava processing business in the study area is viable and profitable.

Lafun

The estimated costs and return of production on the average in the zone were ₦83,362.12 and ₦187,588.24 per year, respectively. Revenue from production on the average was ₦187,588.24 while the gross margin and net income or returns to the processors were ₦129,493.88 and ₦104,226.12, respectively. These measures of performance indicate that cassava processing business in the study area is viable and profitable.

Determinants of profitability of cassava processing in the study area

The Ordinary Least Square regression analysis was used to determine the factors responsible for cassava total output among the women cassava processors in the study area. The estimated parameters and the relevant statistical test results obtained from the analysis are presented in Table 3. The exponential result was interpreted being the leading results. It had an adjusted R^2 value of 0.733. This implies that about 73.3% of the variation in (Y) is accounted for by the variables (X_1-X_7) included in the model, while the remaining 26.7% is as a result of non-inclusion of other explanatory variables in the model. The F-value is positive and statistically significant at the 1%, indicating that the variables included in the model adequately explain the net income in the survey area.

Out of the 7 variables modelled, only years of experience in business as a processor and loan obtained are statically significant in determining the profitability level of the respondents in the study area.

The coefficient of the years of experience in cassava processing was statistically significant at 5% in determining the profit level of the cassava processors in the study area. This implies that there is a positive relationship between the years of experience in cassava processing and their profit level in the study area. This implies increase in the experience in cassava processing will lead to increase in their profit.

The coefficient of the loan obtained by cassava processors is statistically significant at 5% in determining the profit level of the cassava processors in the study area. There is direct relationship between the loan obtained by cassava processors and their profit level. This implies increase in the loan obtained by cassava processors will lead to increase in their profit in the study area.

Table 3: Ordinary least square estimates of determinants of profitability of the investment among cassava processors

Variables	Coefficient	T-value
(Constant)		0.260
Age	-0.093	-0.351
Education	-0.021	-0.848
Processing experience	0.010**	2.090
Household size	0.019	0.770
Marital status	-0.092	-0.259
Loan obtained	0.136**	2.279
Occupation	0.003	0.110
F-value	16.178	184.061
R Square	0.570	0.738
Adjusted R Square	0.534	0.733

1% Significance level= ***, 5% Significance level= ** and 10% Significance level= *
Source: Data analysis (2019)

Table 4: Analysis result of determinants of access to loan among cassava processors

Variables	Coefficient	T-value	Marginal Effect
(Constant)	-128.32	-1.394	-19.56
Age	42.47	1.413	6.475
Marital status	0.360	0.650	0.549
Processing experience	0.499*	2.327	0.761
Household size	-0.532	-1.085	-0.814
Education	2.104**	2.474	0.320
Income	-3.064	-1.418	-0.467
Occupation	-0.478	-0.313	-0.729
Religion	0.264	1.486	0.402
Dependency ratio	-0.259**	-4.024	-0.395

1% Significance level= *, 5% Significance level= ** and 10% Significance level= ***
Source: Data analysis (2019)

Analysis result of determinants of access to loan among cassava processors

As shown in Table 4, the coefficient of the years of experience in cassava processing was statistically significant at 5% in determining the cassava processors access to loan in the study area. This implies that there is a positive relationship between the years of experience in cassava processing and their access to loan in the study area. This implies increase in the experience in cassava processing will lead to increase in their access to loan in the study area.

The coefficient of the years of education was statistically significant in determining the cassava processors access to loan in the study area. This implies that there is a positive relationship between the years of education of the cassava processors and their access to loan. This implies increase in the educational level of the respondents will lead to increase in their access to loan.

The coefficient of the dependency ratio was statistically significant in determining the cassava processors access to loan in the study area. This implies that there is a negative relationship between the dependency ratio of the cassava processors and their access to loan. This implies increase in the dependency ratio of the respondents will lead to decrease in their access to loan.

Constraints encountered by cassava processors in obtaining loan

The problems being faced by the cassava processors in obtaining loan in the study area were highlighted in the Table 5.

Table 5: Constraints encountered by cassava processors in obtaining loan

Constraints	Freq.	%
High interest rate on loan	49	40.8
Poor disbursement and repayment arrangement	49	40.8
Loan utilization for social activities	14	11.7
Investing in unprofitable business	6	5.0
Ineffective supervision of loan	2	1.7
Total	**120**	**100.0**

Source: Data analysis (2019)

Major among the constraints was high interest rate on loan and poor disbursement and repayment arrangement which accounted for (40.8%), respectively. Next to this was loan utilization for social activities (11.7%), investing in unprofitable business which constitute (5.0%) and ineffective supervision of loan (1.7%), respectively.

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Conclusion

From the findings, it can be concluded that loan obtained and year of experience in business as processors are the factors that determine the profitability level of the respondents in the study area. Also, year of experience and level of education play an important role in determining the respondents' access to loan in the study area. The most prevalent constraints encountered by the respondents in the study area is high interest rate and poor disbursement and repayment arrangement of loans. Therefore, women agro-processors must be educated on the need for loan acquisition, utilization and prompt repayment for effective improvement in their business performance and to increase their standard of living.

Recommendation

Based on the findings from the results, the following recommendations are suggested:

(i) Government should promote investment in agricultural processing industries in the country through appropriate credit facilities, infrastructural facilities and quantity of fertilizer supply.

(ii) Increase in educational level among cooperative members in order to facilitate a better understanding of cooperative and the benefits thereof.

(iii) Cooperative societies should reduce the rate of interest on loans considering the fact that the economy is steadily dwindling and economic activities are getting harder on a daily basis.

(iv) Cooperatives should ensure proper monitoring of loans disbursed to members. They should see to it that members use loans for stated reasons in the loan application and not on other frivolous endeavors.

Conflict of Interest

The authors declare that there is no conflict of interest related to this study.

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