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# ANALYSIS OF CREDIT ACCESS AMONG CASSAVA VALUE CHAIN ACTORS IN BENUE STATE, NIGERIA

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## ABSTRACT

The study examined credit access among cassava value chain actors in Benue State, Nigeria. Stratified random sampling technique was used to select 230 respondents, comprising 138 producers, 40 processors and 52 marketers. Primary data were collected using structured questionnaires. While frequency distribution, mean standard deviation and coefficient of variation were used to realise the objectives, Kruskal-Wallis (H) and one-way analysis of variance were used to test hypotheses one and two, respectively, for the study. The result showed that processors had more access to credit (75.00 %), while marketers obtained more average credit amount (N69,519.00) than the other actors. Findings further showed that the Chi-square statistic (25.56) of Kruskal-Wallis (H) was statistically significant ($p < 0.05$), indicating that there was statiscally significant difference in access to credit among cassava value chain actors in the study area. The difference was favour of the processors. In addition, the F-statistic (8.06) of one-way analysis of variance was statistically significant ($p < 0.05$), indicating that there was statistically significant difference in the amount of credit obtained among actors in the value chain. The difference was in favour of the marketers. It was recommended that actors in cassava value chain should have the same level of access and amount of credit.

**Contribution/ Originality:** This study is one of the very few studies which have investigated the difference in agricultural credit among cassava value chain actors in Benue State. The aspects of credit considered were access and amount. The purpose was to lend empirical evidence to presumed credit discrimination among actors in cassava industry.

## 1. INTRODUCTION

Cassava (*Manihot esculenta*) is a woody shrub native to South America. It is of the spurge family *Euphorbiaceae*. It is extensively cultivated as an annual crop in the tropical and subtropical regions for its edible starchy tuberous root, serving as a major source of carbohydrates [1, 2].

Nigeria is the world's largest producer of cassava, while Thailand is the largest exporter of dried cassava [1]. In 2016, global production of cassava root was 277 mt, with Nigeria as the world's largest producer, having 21% (about 58.17 mt) of the world total [1]. The major producing States in Nigeria include Anambra, Delta, Edo, Benue, Cross-River, Imo, Oyo and Rivers [1].

It is primarily produced for food especially in the form of *garri*, *tapioca* and *fufu* for human consumption. But the crop can be processed into several secondary products for industrial market value. These products include chips, pellets, flour adhesives, alcohol and starch, which are vital raw materials in the livestock feed, alcohol/ethanol, textile, confectionary, wood, food and soft drinks industries. They are also tradable in the international market [3]. Its other products are dry extraction of starch, glue or adhesives, modified starch in pharmaceutical industries as dextrines, as processing inputs, industrial starch for drilling, and processed foods [4]. Cassava is also an important source of dietary carbohydrate that provides food for over 60 million people in Nigeria [5]. According to Ezike, et al. [6] cassava supplied about 75 % daily calorie intake to over 50 million Nigerians in cassava growing zones. It plays a major role in the country's food security as 80 % of Nigerians in the rural areas eat a cassava meal at least once a week and majority eat cassava products, at least once a day. Coupled with maize, cassava is an important staple food, replacing native African crops [7].

The overwhelming importance of cassava to households, industries and the national economy informed the initiative of the government to develop a cassava policy to be backed by an act of parliament. The initiative was based on a transformation strategy that emphasized markets, collective action, the private sector, research and extension. This transformation strategy links all the major stakeholders in the cassava industry, culminating in the new concept of value chain. According to Odemero [8] a value chain is a connected string of companies, groups and other players working together to satisfy market demands for a particular commodity or group of products. In agricultural value chain, farming is a relatively small but important part of the agribusiness value chain. The value chain includes resource data processing, input provision, production, aggregating (covering bulking, cleaning and grading), processing and packaging, retailing and recycling. To make the value chain work efficiently, farmers are expected to be linked to markets. It follows that a typical agricultural value chain comprises input dealers, producers, processors, traders, and consumers. Along the value chain, there is demand for different financial requirements and services. It could be demand for working capital, which ranges from short to medium-term loan or the demand for long-term loan for capital investment. For these reasons, the Federal Government of Nigeria (FGN) and International Fund for Agricultural Development (IFAD) packaged and launched the Value Chain Development Programme.

Kapinsky and Morris [9] defined value chain as series of activities required to add value as a product moves from production through delivery to the final consumer. Odemero [8] noted that such value chain intensification creates diverse utilities in an acceptable form to the consumers at the right time and place, thereby creating sustainable livelihood through profit derivation and amelioration of unemployment crisis in Nigeria. The cassava value chain comprises the producers, processors and the consumers who obtain a given product from the marketers. The small-scale farmers constitute the bulk of the producers of cassava in Nigeria. This is taken off them by the processors who process fresh cassava into products like *garri* and *fufu* which are sold to local consumers [8].

The value chain actors and their activities require financing via equity or debt financing to remain sustainable. This assertion is axiomatic because small-scale operators in Nigeria face more financial constraints in their enterprises. Differential discrimination in financial packages often occurs along the chain, very often against the producers whose enterprise or chain is highly susceptible to losses of crop and market failure. It was partly to address the financial discrimination that the government has marshaled credit to the producers. Thus, the offer of agricultural financial services is expected to foster the development of the entire value chain. To achieve this goal, it is important to develop and adopt sound credit methodologies in the agricultural systems with respect to each segment of the chain.

Credit refers to being worthy of trust with other people's money or having the ability to obtain a loan when needed. Credit is a major component of financial services considered fundamental in all production units. It is a major input necessary for the sustainable application of superior technology to traditional agricultural production systems especially in a developing economy. It also confers the ability to buy or borrow in consideration of a

promise to pay within a given period of time. Credit is also the transfer of purchasing power from one party to another over an interval of time. The transfer is often made through a transaction in which, present purchasing power is made available by the creditor to the borrower in exchange for an instrument of debt, which would become an obligation of the debtor. The purchasing power made available to the debtor for the time being would enable him acquire productive inputs formerly beyond his reach [10, 11].

Njukwe, et al. [12] indicated that there is a need for smallholder farmers to improve their position in food value chains in order to improve their margins and as a strategy for coping with agricultural food price volatility through innovations within the chain. Kawano [13] observed that cassava production is mostly done by smallholders with poor access to credit and markets and the bulk of harvested cassava is sold at farm gate due to its bulky nature and short shelf life, causing major wastes at harvest. It has also been observed that the major and persistent challenge of the smallholder farmers is low productivity arising from poor access to modern inputs, scarce improved varieties, lack of access to credit, poor infrastructure, inadequate access to the market, land and environmental degradation, and inadequate research and extension services and technology. These challenges have been compounded by the volatile food and energy prices as well as the global financial crisis [12].

Asante-Pok [14] observed that although, Nigeria is the largest cassava producer in the world, 90 percent of cassava production still goes to domestic consumption. Jerumeh and Omonona [10] noted that despite all the efforts by successive Nigerian governments to increase the competitiveness of cassava, cassava production and profitability still vary widely. The authors attributed this shortcoming to various challenges experienced by cassava growers including hindered access to markets among others. Also, cassava farmers often scout for buyers who offer ridiculous prices based on their knowledge of the perishability of the tubers. That farmers sell off their produce at these ridiculous prices is a pointer to lack of equity or lack of access to credit facilities that have friendly repayment schedules. As noted by Odemero [8] poor access to finance by small-scale farmers constitutes the major challenge confronting the development of agricultural value chain. Coupled with the perishability and poor marketing of cassava in Nigeria, Jerumeh and Omonona [10] indicated that most small-scale cassava farmers are involved in panic selling.

Previous studies on the cassava sector have focused on profitability and socioeconomic determinants of productivity, financing, and the likes. No available study dwelt on credit administration among actors in the value chain. The foregoing makes it imperative to investigate the existence or otherwise of difference in credit access among actors in cassava value chain in Benue State. Thus, the objectives of the study were to describe the socioeconomic characteristics of cassava value chain actors in Benue State, examine credit access among the respondents, and analyse the amount of credit accessed by the actors. It was hypothesised that there is no significant difference in access to credit among cassava value chain actors in Benue State, and there is no significant difference in amount of credit among cassava value chain actors in Benue State.

## 2. MATERIALS AND METHODS

The study area was Benue State, Nigeria. It is located in the North-Central part of Nigeria. The State has 23 Local Government Areas, and its headquarter is Makurdi. Its geographic coordinates are longitudes 7° 47' and 10° 0' East, Latitude 6°25' and 8° 8' North. The State has abundant land estimated to be 5.09 million hectares. This represents 5.4 % of the national land mass. Arable land in the State is estimated to be 3.8 million ha Asante-Pok [14]. The State is predominantly rural with an estimated 75 % of the population engaging in rain-fed subsistence agriculture. Stratified random sampling technique was used to select 230 respondents, which comprised 138 producers, 40 processors and 52 marketers for the study. Data were collected from primary source with the aid of structured questionnaires, copies of which were administered to cassava value chain actors selected for the study. The instruments were administered with the aid of trained enumerators. The product of interest was *garri*, the commonest by-product of cassava.

Data for the study were analysed using descriptive statistics (frequency distribution, mean standard deviation and coefficient of variation) for the specific objectives, while Kruskal-Wallis (H) and one-way analysis of variance (ANOVA) were used to test hypotheses one and two, respectively. The analyses were run on E-stata 14 and SPSS 16. The models for analyses were specified as follows Equation 1:

Coefficient of variation

$$cv = \frac{\delta}{\mu} \quad (1)$$

where:

cv = coefficient of variation (%)

$\delta = standard\ deviation\ of\ amount\ of\ credit$

$\mu = mean\ amount\ of\ credit\ (N)$

The model for Kruskal-Wallis (H) was specified as follows Equation 2:

$$H = \frac{12}{N(N+1)} \Sigma \left( \frac{R_1^2}{N_1} + \frac{R_2^2}{N_2} + \frac{R_3^2}{N_3} \right) - 3(N+1) \quad (2)$$

## 3. RESULTS AND DISCUSSION

### *3.1. Socio-Economic Characteristics of Respondents*

The result in Table 1 shows the socio-economic characteristics of the respondents. Sex distribution of the respondents showed that most producers were males (58.7%), while most processors (52.5%) and marketers (53.5%) were females. This could be attributed to the fact that more males were engaged in cassava production while more females engaged themselves in the processing and marketing of the products. This corroborates Mohammed-Lawal *et al.* (2013) in Okwoche and Asogwa [2] that cassava processors in Edo and Kwara States were predominantly female (90%) and (88.1%), respectively. The male (58.7%) dominance in cassava production implied the laborious nature of cassava farming operations which their female counter parts cannot easily undertake.

Most respondents (41.3%) were between the ages of 30 and 39 years. This implies that cassava value chain actors were within their active working age. This finding is in line with Okwoche and Asogwa [2] that majority (57.78%) of the cassava farmers were in the age range of 30 and less than 50 years.

Majority (48.6%) of producers attained secondary education while (18.8%) and (14.5%) had tertiary and primary education, respectively. This means that cassava farming was dominated by the educated class who could decode and adopt effective innovative practices. However, the processors (42.2%) and marketers (44.2%) mostly had primary education. This is probably because the processors and marketers were dominated by women and perhaps the higher education of female gender within the study area is not a major family priority resulting in the low level of education among cassava value chain actors, as observed by Obinna [15].

Furthermore so, a high percentage (67.8%) of the cassava value chain actors were married, with a dominant household size of producers (50.7%), ranging from one to five persons, processors (55.0%) ranged from six to 10 persons, while the marketers had a household size (34.8%) between six and 10 persons, implying more labour availability for the processors and marketers than the producers. Enterprise experience also revealed that a higher percentage (38.4%) of producers had spent one to 10 years in farming. On the other hand, most processors (60%) and marketers (61%) had been in cassava enterprise between one and 10 years. This connotes that the actors would understand the need for and how to augment equity capital with debt capital.

**Table-1.** Socio- economic Characteristics of Respondents.

| Variable | Producers (n = 138) | | Processors (n = 40) | | Marketers (n = 52) | | Pooled | Pooled |
|---|---|---|---|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Sex | | | | | | | | |
| Male | 81 | 58.70 | 21 | 52.50 | 24 | 46.15 | 126 | 54.78 |
| Female | 57 | 41.30 | 19 | 47.50 | 2 | 3.85 | 104 | 45.22 |
| Marital Status | | - | | - | | - | | - |
| Married | 94 | 68.12 | 29 | 72.50 | 33 | 63.46 | 156 | 67.83 |
| Single | 44 | 31.88 | 11 | 27.50 | 19 | 36.54 | 74 | 32.17 |
| Age (yrs) | | - | | - | | - | | - |
| 20-29 | 14 | 10.14 | 4 | 10.00 | 5 | 9.62 | 23 | 10.00 |
| 30-39 | 52 | 37.68 | 18 | 45.00 | 25 | 48.08 | 95 | 41.30 |
| 40-49 | 47 | 34.06 | 12 | 30.00 | 15 | 28.85 | 74 | 32.17 |
| 50 and above | 25 | 18.12 | 6 | 15.00 | 7 | 13.46 | 38 | 16.52 |
| Level of Education | | - | | - | | - | | - |
| Non-formal | 24 | 17.39 | 7 | 17.50 | 4 | 7.69 | 35 | 15.22 |
| Primary | 20 | 14.49 | 17 | 42.50 | 23 | 44.23 | 60 | 26.09 |
| Secondary | 67 | 48.55 | 14 | 35.00 | 16 | 30.77 | 97 | 42.17 |
| Tertiary | 27 | 19.57 | 2 | 5.00 | 9 | 17.31 | 38 | 16.52 |
| Household size | | - | | - | | - | | - |
| 1 to 5 | 70 | 50.72 | 15 | 37.50 | 18 | 34.62 | 103 | 44.78 |
| 6 to 10 | 60 | 43.48 | 22 | 55.00 | 16 | 30.77 | 98 | 42.61 |
| 11 to 15 | 6 | 4.35 | 2 | 5.00 | 12 | 23.08 | 20 | 8.70 |
| 16 and above | 2 | 1.45 | 1 | 2.50 | 1 | 1.92 | 9 | 3.91 |
| Enterprise experience | | - | | - | | - | | - |
| 1 to 10 | 53 | 38.41 | 24 | 60.00 | 32 | 61.54 | 109 | 47.39 |
| 11 to 20 | 31 | 22.46 | 16 | 40.00 | 20 | 38.46 | 67 | 29.13 |
| 21 to 30 | 36 | 26.09 | 0 | - | 0 | - | 36 | 15.65 |
| 31 and above | 18 | 13.04 | 0 | - | 0 | - | 18 | 7.83 |

**Source**: Computed from Field Survey (2017).

### *3.2. Credit Access among Cassava Value Chain Actors*

The result of the analysis of credit access among cassava value chain actors in Table 2 showed that more processors (75.00%) had access to credit than the other actors. This implied that lenders lent more credit to cassava processors than the marketers (42.31%) and producers (30.43%). A plausible reason for this disparity or discrimination is that the processors were exposed to relatively less risk than the other actors. This is a fact because processors do not maintain stock of product but provide technical labour by grating cassava for those who would eventually fry the grated product into *garri* for the marketers.

**Table-2.** Credit Access among Cassava Value Chain Actors.

| Credit Access | Producers (n = 138) | | Processors (n = 40) | | Marketers (n = 52) | | Pooled | Pooled |
|---|---|---|---|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Had access | 42 | 30.43 | 30 | 75.00 | 22 | 42.31 | 94 | 40.87 |
| Had no access | 96 | 69.57 | 10 | 25.00 | 30 | 57.69 | 136 | 59.13 |

**Source**: Computed from Field Survey (2017).

### *3.3. Credit Amount among Cassava Value Chain Actors*

The analysis of the amount of credit extended to cassava value chain actors is presented in Table 3. The result showed that marketers had more average amount of credit (₦69,519.23) than the processors (₦38,125.00) and producers (₦23,279.00). The result implied that the quantum of credit available to the marketers of *garri* exceeded those of the other actors in the value chain. *Garri* marketers had access to more markets and could sell at better prices than the producers, who were constrained by the bulky nature of the tubers, and the processors, who have their machines fixed in a particular location and depend only on the quantity of peeled cassava supplied for grating. In addition, *garri* marketers can more easily vary the price of their product and obtain higher returns. In addition, the price signal for cassava entrepreneurs are obtained and disseminated by the marketers. Thus, lenders are disposed to advancing larger quantum of credit to the marketers in the cassava value chain.

These relative advantages of the marketers notwithstanding, the marketers had greater variability (191.16%) in the amount of credit than the producers (167.68%) and processors (72.49%) as indicated by the coefficient of variation (CV). As noted by Everitt [16] the CV shows the extent of variability in relation to the mean of the population or sample. Thus, amount of credit varied more widely among the marketers than the producers and processors. As a measure of economic inequality, the result also indicated more inequality in the amount of credit among the marketers than the other actors. This position is in conformity with the Champernowne and Cowell [17], Bellu and Liberati [18] and Campano and Salvatore [19] who held that, as a measure of economic inequality, the CV is useful because the standard deviation of data must always be understood in the context of the mean of the data. They also noted that the actual value of the CV is independent of the unit in which the measurement was taken, and that for comparison between data sets with different units or widely different means, one should use the CV rather than the standard deviation.

**Table-3.** Credit Amount among Cassava Value Chain Actors.

| Actor/Credit Amount | Observations | Mean | Standard Deviation | Coefficient of Variation (%) |
|---|---|---|---|---|
| Producers | 138 | 23,279.00 | 39,033.90 | 167.68 |
| Processors | 40 | 38,125.00 | 27,635.16 | 72.49 |
| Marketers | 52 | 69,519.00 | 132,894.80 | 191.16 |

**Source**: Computed from Field Survey (2017).

### *3.4. Kruskal-Wallis Test of Difference in Credit Access among Cassava Value Chain Actors*

The result of Kruskal-Wallis test of difference in credit access among cassava value chain actors is presented in Table 4. The chi-square statistic (25.56) for the test was statistically significant ($p < 0.05$). Hence, the alternative hypothesis was accepted that there was significant difference in credit access among cassava value actors in Benue State. The result displayed mean rank, graduating from processors (76.12) through marketers (113.56) to producers (127.64). Based on the reverse order of assigning ranks [20] to the values, this result showed that the difference was in favour of processors with the highest number of beneficiaries accessing credit and producers having the least number having access to credit. The result confirmed the discrimination in credit access against cassava producers.

**Table-4.** Kruskal-Wallis Test of Difference in Credit Access.

| | Actors | N | Mean Rank |
|---|---|---|---|
| Credit access/Actors | Producers | 138 | 127.64 |
| | Processors | 40 | 76.12 |
| | Marketers | 52 | 113.56 |
| | Total | 230 | |

Chi-Square statistic = 25.56*; * statistical significance at 0.05 level
**Source**: Computed from Field Survey (2017).

### *3.5. Difference in Credit Amount (N) among Cassava Value Chain Actors*

The result of the test of difference in credit amount (N) among cassava value chain actors is presented in Table 5. The F-statistic (8.06) was statistically significant ($p < 0.05$). Thus, the alternative hypothesis was accepted, implying that there was significant difference in credit amount among cassava value chain actors in the State. The post hoc test of homogenous subset, otherwise called the Duncan Multiple Range Test (DMRT) in Table 6 confirmed that marketers had the highest average credit amount (₦69,519.00).

**Table-5.** Difference in Credit Amount (N) among Cassava Value Chain Actors.

| Credit Amount (N) | Sum of Squares | Df | Mean Square | F-stat | Sig. |
|---|---|---|---|---|---|
| Between Groups | 80,910,000,000.00 | 2 | 40,460,000,000.00 | 8.06* | 0.001 |
| Within Groups | 1,139,000,000,000.00 | 227 | 5,019,000,000.00 | | |
| Total | 1,220,000,000,000.00 | 229 | | | |

**Source**: Computed from Field Survey (2017).

**Table-6.** Post Hoc Tests of Homogeneous Subsets.

| Actors | | Credit amount (N) | |
|---|---|---|---|
| | | N | Subset for alpha = 0.05 |
| Duncan | Producers | 138 | 23,279.00 |
| | Processors | 40 | 38,125.00 |
| | Marketers | 52 | 69,519.00 |

**Source**: Computed from Field Survey (2017).

The Post Hoc Tests of Multiple Comparisons, otherwise known as the least squared difference (LSD), in Table 7 shows that the mean difference (46,240.20) in amount of credit between the producers and the marketers was statistically significant ($p < 0.05$). In other words, producers had significantly less amount of credit than the marketers. Similarly, the mean difference (31,394.20) in amount of credit between the processors and the marketers was statistically significant ($p < 0.05$). In other words, processors had significantly less amount of credit than the marketers.

**Table-7.** Post Hoc Tests of Multiple Comparisons.

| | (I) Actor | (J) Actor | Mean Difference (I-J) | Std. Error | P-value |
|---|---|---|---|---|---|
| LSD | Producers | Processors | (14,846.00) | 12,721.40 | 0.24 |
| | | Marketers | (46,240.20)* | 11,527.40 | 0.00 |
| | Processors | Producers | 14,846.00 | 12,721.40 | 0.24 |
| | | Marketers | (31,394.20)* | 14,899.00 | 0.04 |
| | Marketers | Producers | 46,240.23* | 11,527.40 | 0.00 |
| | | Processors | 31,394.23* | 14,899.00 | 0.04 |

* mean difference is statistically significant ($p < 0.05$)
Dependent Variable: Credit amount (N)
LSD: Least squared difference
**Source**: Computed from Field Survey (2017)

## 4. CONCLUSION

The study showed that more processors (75.00%) had access to credit than the marketers (42.31%) and producers (30.43%). In addition, marketers had more average amount of credit (₦69,519.23) than the processors (₦38,125.00) and producers (₦23,279.00). Kruskal-Wallis (H) and one-way analysis of variance showed that the differences in agricultural credit access and amount, respectively were found be statistically significant. The study concluded that difference exist in agricultural credit access to cassava value chain actors in the study area. The amount of credit granted to the actors also differed.

## 5. RECOMMENDATIONS

It was recommended that agricultural credit lenders should give equal credit access to cassava value chain actors. In addition, the lenders should give equal or proportionate amount of credit to cassava value chain actors. These measures would ensure increased productivity through ease of purchase of necessary inputs, especially among cassava producers.

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