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IMPACT OF COVID-19 ON COST AND RETURNS OF CASSAVA PRODUCTION IN CENTRAL CROSS RIVER STATE, NIGERIA

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Abstract

This research was motivated in view of the inherent challenges perpetrated by the Covid-19 pandemic and an information gap on the cost/returns on investment of cassava production as a sustainer of livelihood in Central Cross River State. The major objectives were to examine the perceived impact of Covid -19 pandemic and determine the cost and returns on investment of cassava production. The study examined the socio-economic variables influencing cassava production, the perceived effect of Covid- 19 pandemic, and determined the returns on capital invested in cassava production as well as the challenges militating against cassava production in the spike of the pandemic in the study area. 120 cassava farmers were sampled and data collected with the aid of questionnaires. Descriptive statistical tools, budgetary analysis approach, Cost and Returns analysis as well as Likert scale technique were used to analyze the data. The result showed that socio-economic variables such as education level (44.1%), age (29.2%), farming experience (35%), and gender (75%) played significant roles in cassava production in the area. The cost and returns showed that ₦240,000 could be generated as net return in every ₦820,000 invested in cassava production. The profitability indicator revealed 0.413 as return on investment signifying that cassava is a profitable venture in the study area. In spite of all these, 70.8% of cassava farmers strongly agreed that their productivity was reduced because of covid-19 pandemic, 15.0% agreed that marketing their produce was a major constraint due to restrictions. Other constraints faced by cassava farmers include; high cost of labour and lack of price information. It was recommended that, vulnerable cassava farmers be supported to step up their resilience for farm productivity and other areas in the cassava value chain.

Key words: Cost and returns, Cassava production, Covid-19, Resilience

INTRODUCTION

Cassava (*Manihot esculenta)* is known as an edible root crop and a perennial woody shrub which grows in tropical and subtropical area of the world like Africa. As an important root crop it is cultivated in Sub-Saharan Africa (SSA). It is of the genus *Manihot*, species *esculentus* and the family *Euphorbiaceae.* The varieties of the species of cassava plant are divided into two groups. Namely: Sweet and bitter cassava which are cultivated in tropics for their starch, tuberous roots (Hahn, 2004). The cassava crop requires at least eight (6) months of warm weather to produce and does not tolerate flooding or freezing conditions. It tolerates a wide range of soil P^H 4.0 to 8.0 and is most productive in conducive weather above 3.5m in height, has broad canopy leaves, which are also eaten in some parts of Africa and used as animal feed in parts of Asia. The roots are 25 – 35% starch and the leaves contains significant amount of protein and other nutrients (Hahn, 2004).

Cassava is a major staple food in virtually all parts of Nigeria. It is a key food security and income generating crop and Nigeria is the world's largest producer of the crop (F.A.O., 2002). In fact, the crop has continually played a very important role, which includes; food for man, feed for animals, raw materials for industries, income for farmers, low cost food source for both the rural and urban dwellers as well as household food security (Nweke, 1996).

In Nigeria, the importance of cassava is based on its ability to provide about 15% of all the food energy and 10% of all the protein content of the daily diet of tropical Nigeria (F.A.O, 1990). Jerry (1995), added that, the production and trading of this crop offer employment to about 60% of the rural dwellers. It is a major source of energy with high food security value similar to most cereal crops (Achinewu and Owuamanam, 2001). Cassava is rich in calcium, vitamin B and C and essential minerals. However, the nutrient composition differs according to the variety and age of the harvested crop and soil conditions, climate and other environmental factors during cultivation. Cassava is a major source of income in Central Cross River State and Nigeria at large Africa. The cash income from cassava is substantial compared to other major staples like yam and potatoes because of cassava's low cash input cost (Nweke, 2004). Apart from income generation, cassava when compared to other crops owing to its ability to perform well across a wide spectrum of ecological zones, cassava is resistant to pest and adverse conditions (Nweke, 2004). These, thus explains the reasons for the wide adoption of cassava production by farmers in Nigeria as posited by the Food and Agricultural Organization of the United Nation (F.A.O., 2019) which estimated cassava production in the country to be 64 million tonnes in 2019.

Conceptual framework

Production theory attempts to examine the relationship between resources and how they are transformed into output. In this context, it tries to uncover factors which are relevant in the production of given input(s) to output. Several definitions in production theory relate input(s) to output, (Doll and Orazem, 1978; Koutsoyianis, 1997; Lipsey, 1979; Whitehead, 1986). These factors must contribute in a positive way to the production of output, but the decision on how much of each to use is dependent on economic theory. Increase in output may be as a result of three forces.

The first is when resources are increased and output increases by more than the

proportionate increase in inputs that were added to the production process;

The second is when production increases by less than, proportionate increase in the resource used in production, and

Third is when increase in output is proportionate with increase in input. This is the reason the concept of efficiency is central to the field of production economics.

The agricultural problem in Nigeria has been known to centre on the manner with which resources are used by the small holder resource poor farmers. It also borders on how the various factors that explain farm resource use efficiency could be examined so as to improve the crop production and enhance household food security (Nweke, 2004).

In attempt to provide solutions to these problems, cropping systems that favour farm level production from research stations are disseminated by the State Agricultural Development Programme (Cross River ADP) to farmers for use. The most prominent among these systems is cassava – based crop mixture (Nnadi, 2007). The Nigerian government, following the expanded significance, which the cassava crop has recently assumed in the international trade circles, made a bold policy shift that gave cassava production an unprecedented attention with particular emphasis on its large-scale production. It is however, not certain if this concern of government to reposition the status of cassava production can be realized in the state given the level of inefficiency in resource used by the farmers as reported by Onyenweaku *et al.*, and Oguoma (2005).
The situation is particularly worrisome in view of the fact that despite the good and fertile land in this geographical location for cassava production, productivity has continued to be on the decline due largely to resource use inefficiency as asserted by Onyenweaku *et al.*, (2000). Findings from the studies conducted by Onyenweaku *et al.*, (2000) and Oguoma (2005) suggested that existing scales of operational markets for cassava production are limited. In spite of the existing challenges, Cassava farmers are faced with the severe Covid-19 world pandemic which started in 2019 and resulted in serious human health issues. Quarantines and physical restrictions have been implemented to combat pandemic causing negative economic effects linked also with functioning of agriculture systems responsible for food supply (Siche 2020).

The Covid-19 has created threats to the sustainability of agricultural sector which is sensitive because of food supply security needs. Based on literature review, Covid-19 effects on agricultural sector can be classified in terms of Farms resilience, labour regulation, agricultural goods demand and supply and overall economic and social consequence (Cranfield, 2020). Thus, the analysis of Covid-19 effects is based on risk, vulnerability and resilience.
FAO 2020 ground survey indicates that small-scale producers are facing mounting challenges accessing inputs such as fertilizer because of rising prices of these inputs; severely reduced household incomes as return on investment is not clearly spelt out. If planting is reduced, harvest too are reduced. Which means farming families themselves will have acute food insecurity and their communities will not be able to access sufficient nutritious food down the line.

This study however, intends to investigate if cassava production is a profitable venture

in spite of the challenges imposed by the Covid-19 pandemic.

Objectives of the study

The major objective of the study was to examine the economics of cassava production in the area of study.

The specific objectives are to:

i. determine the socio-economic characteristics of cassava farmers in Central Cross River State;
ii. determine the cost and returns in cassava production in Central agricultural area of Cross River State;
iii. ascertain the perceived effect of Covid-19 pandemic on cassava production in the study area;
iv. determine the constraints in cassava production in Central agricultural area of Cross River State.

Hypothsis of the study

Ho_1: the level of output is not influence by the Covid-19 pandemic.

Ho_2: production cost has no significant effect on output of cassava

METHODOLOGY

This research was conducted in Cross River Central agricultural zone, Cross River State Nigeria. The zone lies between Latitudes 40 and 60 N and Longitudes 60 and 9 0 E (Essoka and Esu, 2003). It is bounded to the North by Yala and Ogoja local government areas, to the South by Biase local government area and Abia state, to the East by the Republic of Cameroon and to the West by Ebonyi state. It has a land mass of 8,762 square kilometers, with a rainfall of between 2,942mm to 3,424mm per annum and an average temperature of 290c (FMARD, 2010).

The Central Agricultural Zone comprises of six local government areas which are Abi, Boki, Etung, Obubra, Ikom and Yakurr. Essoka and Esu (2003) noted that this zone has extensive arable land which favours the growth of crops such as cassava, yam, maize melon, pepper, vegetables and fruits. Cash crops like cocoa, oil palm and rubber are also grown in the area. Obubra, Abi and Yakurr Local Government Areas however produce cassava in greater quantities by small scale farmers than the other Local Government areas in the zone.

Sampling procedure

A multistage sampling technique was employed to select the respondents in the study area. Firstly, four local government out of six were purposively selected. They include Obubra, Yakuur, Ikom and Abi. Secondly, Three (3) villages were randomly selected from each of the local government; Ofodua, iyamoyong and ogada for obubra local government, Nko, Ugep and Idomi for Yakuur local government, Edor, Ikom town and Akparabong for Ikom local government and finally Itigidi, osumutong and Igbo Imabana for Abi local government respectively. The third stage involves the selection of ten registered cassava farmers from each of the villages from a sample frame of 1200 registered cassava farmers using a proportionality factor of 10% to make a sample size of 120 cassava growing farmers. The essence of sampling is to ensure that farmers are given equal chance of being selected.

L G A	VILLAGE	SAMPLE FRAME	SAMPLE SIZE
Obubra	Ofodua	110	11
	Iyamoyong	100	10
	Ogada	80	08
Yakuur	Nko	100	10
	Ugep	180	18
	Idomi	120	12
Abi	Itigidi	60	06
	Osumutong	80	08
	Igbo Imabana	120	12
Ikom	Edor	90	09
	Ikom town	70	07
	Akparabong	90	09
TOTAL		1200	120

Analytical technique

For the various objectives earlier stated, different analytical tools were used for this study. Objectives one (1) and four (4) were analyzed using descriptive statistical tools such as percentages, frequency tables and means. Objective two (2) will be analysed using budgetary technique analysis such as gross margin and profitability ratio to estimate net returns, total cost of product and determination of profitability of cassava production.

Model specification

NR = TR – TC ……..(1)

TR = QP…….(2)

Ri = $\frac{NR}{TC}$……...(3)

Where; NR = Net return on cassava produce
TR = Total revenue from cassava production (₦)
Ri = Return on capital invested in cassava (₦)
Q = Quantity of cassava produced (kg)
P = Price of cassava (₦)
TC = Total cost of cassava production (₦)

Gross Margin is given as:

GM=TR-TVC
Where;
GM=Gross Margin
TR=Total Revenue
TVC=Total Variable Cost

The profitability ratio used is benefit-cost ratio (BCR) = Gross benefit/Total cost

While objective three (3) was analyse using the likert scale approach.

RESULT AND DISCUSSION

The result of the survey on socio-economic variables is presented in table I, reveals that 29.17% of cassava farmers were aged between 21-50years and 75% were males. The years of farming experience reveal that 35% of the respondents had farming experience between 11-20years. This tends to agree with the observation of (Adegeye and Dittoh 1982), that expertise and mastery can be attended through experience. The educational level of the respondents, indicates that, about forty-four (44%) of the respondents had Senior School Certificate (SSCE). This implies that the cassava farmers had some form of education, only 12.5% of the farmers had no form of educations. This goes to confirm Haruna *et al.,* (2006), that technical and commercial education broadens farmers' intelligence and enables cassava farmers to perform farming activities/task intelligently to improve their income. Table I also reveals that 49.17% of respondents financed their businesses through personal savings, 29.17% of respondents financed their farm businesses through borrowing form relatives, only 22% of respondents were financed through loans from co-operative groups. This is so because farm expansion depends majorly on capital.

Table 1: Socio-economic variables of cassava producers in Central CRS

Age Group (Yrs)	Frequency	Percentage (%)
21-30	34	28.33
31-40	35	29.17
41-50	25	20.83
51 and above	26	21.67

Gender		
Female	30	25
Male	90	75
Farming Experience (Yrs)		
1-10	37	30.83
11-20	42	35.00
21 and above	41	34.17
Educational Attainment		
Tertiary Institution	16	13.3
Secondary School	53	44.16
Primary school	36	30.00
No Education	15	12.5
Source of Capital		
Relatives	35	29.17
Personal Savings	59	49.17
Cooperatives	26	21.66

Source: *field Survey,2021.*

Cost and Returns of cassava production

Table 2 shows the cost and returns cassava production in Cross River central agricultural zone. The table reveals that, the average profit for the enterprise is ₦ 240,000.00 per 820kg of cassava produced by sampled farmers and sold at ₦ 100 per kilogram from March, 2020 to March, 2021. This result confirms similar findings of (Haruna 2006) that cassava production is a profitable venture that can alleviate rural poverty and put food on the table of rural dwellers.

Table 2: cost and Return of Cassava Production in CR central agricultural zone

ITEM	QUANTITY (KG)	UNIT PRICE (₦)	TOTAL VALUE
Quantity of cassava produced	8,200		
Retail price per kg of cassava		100	
Sale (Total Revenue TR) (₦)			820,00
Variable Cost:			
Miscellaneous expense (₦)			120,000
Cost of labour (₦)			100,000
Cost of planning material (₦)			25,000
Fixed Cost:			
Cost of land			250,000
Cost of equipment (knives, hoes, shovel, diggers			60,000
Interest charged for loan for one year			25,000
Total cost			585,200
Net return (TR-TC) (₦)			240,000

Source*: Field survey 2021*

Return on Capital Invested in Cassava Production

The return on capital invested is presented in table 3, it indicated that, the net return on capital invested in cassava production in Cross River central agricultural zone is ₦240,000 with return on every naira invested of ₦0.413 is positive, indicating a profit from the business enterprise. This profit could have been more in the absence of Covid-19.

Table 3: Analysis of return on capital invested in cassava production in CR central agricultural zone

Profitability Indicator	Total Value (₦)
Net Return (TR – TC) (₦)	240,000
Total Cost (TC)	580,200
Return on Investment (Ri = $^{NR}/_{TC}$)	0.413

Source: *Field survey, 2021.*

Perceived effect of Covid-19 pandemic

The perceived effects of Covid-19 pandemic on cassava production are presented in table 4. The survey reveals that among several effects of the Covid-19 pandemic, 70.8% of cassava farmers strongly agree that their productivity was reduced because of Covid-19 pandemic since social relationship was restricted as enshrine in Covid-19 protocols (NHIS 2020). 15% of cassava farmers agreed that, marketing their produce was a challenge as access to markets was equally restricted hence sold below expected price. The fear of speculated future prices also affected 14.2% of cassava farmers in the study area. Thus, the null hypothesis is rejected in preference of the alternative and state that; the level of output is greatly influence by the Covid -19 pandemic. This is in line with FAO 2020 ground survey, who indicated that small-scale producers are facing mounting challenges accessing inputs such as fertilizer because of rising prices of these inputs has severely reduced household incomes as return on investment is not clearly spelt out. Siche (2020) also stated that; Quarantines and physical restrictions have been implemented to combat pandemic causing negative economic effects linked also with functioning of agriculture systems responsible for food production and supply.

Table 4: Perceived effects of Covid-19 pandemic on Cassava production in CR central agricultural zone

Perceived effects	Frequency	Percentages
Reduced productivity	85	70.8
Poor access to markets	18	15.0
Fear of the unknown	17	14.2
Total	120	100

Source*: Field survey 2021*

Constraints to Cassava Production in Cross River central agricultural zone

The study revealed in table five that severe constraints are militating against cassava production in central Cross River agricultural zone. The table five reveals that high cost of labour accounts for 15% of the total cost, lack of access roads accounts for 8.33%, lack of price information 9.17%, lack of capital to finance the cassava farm enterprise 14.17%. The table also shows that most cassava farmers 11.6% lack accessibility to formal credit sources due to lack of collateral. Inaccessibility of formal credit source because of high interest rate was also another constraints that accounted for 9.17%.

The short repayment periods of loans collected from cooperative by cassava farmers also hindered accessibility of credit and accounted for 6.66%. It also reveals that extension services were poor 9.17% and these were no adequate storage facilities 6.66% in the study area. This result agrees with (Adinya, I. B., Kuye, O. O. (2008) reveals that several constraints such as poor road network, high cost of labour, lack of capital and other variables work against cassava production.

Table 5: Constraints against cassava production in CR central agricultural zone

Constraints	Frequency	Percentage (%)
High cost of labour	18	15
Lack of access roads	10	8.33
Lack of price information	11	9.17
Lack of capital	17	14.17
Lack of collateral to access loans	14	11.67
Lack of accessibility of credit due to high interest rate	11	9.17
Short repayment of loan period	8	6.66
Poor extension service	11	9.17
Lack of storage facilities	8	6.66
High government charges on tickets	12	10.00
Total	**120**	**100**

Source: *Field Survey, 2021.*

Conclusion and Recommendations

From the findings of the study, one can safely conclude that cassava production is a profitable business in Cross River Central agricultural zone. This is so because the return on investment is quite sizeable considering the present economic situation and the national minimum wage in Nigeria. Despite the fairly high profit level, there is reduction in productivity bedevilled by the Covid-19 pandemic. The study also reveal other factors that militate against cassava production in the study area. Based on these findings the following recommendations were made; Cassava farmers should be exposed to continuous education (formal and informal) so they can be updated on current trend to boost their capacity of improving productivity. It is also important to address the issue of extension services to educate rural cassava farmers especially in times of distress such as Covid-19 pandemic. Facilities such as good access roads should be put in place so farmers can sell their products to industrial markets for better pricing and price information. Extreme taxation and high revenue collection from farmers as well as other over-bearing market related policies should be considered.

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