

ECONOMICS OF CASSAVA CULTIVATION AND ITS COMPETING CROPS IN IBADAN METROPOLIS, OYO STATE, NIGERIA

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ABSTRACT

Cost studies are backbone in the field of research in agricultural economics which is quite evident of the fact that all systematic research in our discipline started with cost studies not only in Nigeria but at abroad also. These studies went through various stages and were refined every time with the experience, looking to the nature and limitations of agricultural business. Cassava has a great worldwide significance due to its diversified uses. Being grown over 60 million hectares of land in Nigeria, it is cultivated though in almost all the states in Nigeria, the major cassava growing areas of the country is Ibadan metropolis which were chosen for conducting the study. The selected state account for 22 per cent of the country cassava area but contribute only 6 per cent to national cassava production due to low productivity.

Keywords: Economics, Cassava Cultivation, Competing Crops, Nigeria

INTRODUCTION

Cassava is a very important crop to Nigeria. It has comparative production advantage over other staples serves to encourage its cultivation even by the resources poor farmers. The estimated cassava output from Nigeria was approximately 34 million tonnes. This production performance had rated Nigeria as the largest cultivator of cassava in the world. Cassava suddenly gained prominence in Nigeria following the pronouncement of the presidential initiatives on the crops. This initiative was aimed at using cassava production as engine of growth in Nigeria. Farmers have been using various farm resources for growing cassava and other crops, however their productivity is relatively low due to lack of appropriate technology and inefficient use of scarce resources. Proposed study would provide a guide line for making adjustment in the use of farm resources in rational direction. The study is seeks to diagnose the crop production activities regarding existing level of technology adoption, costs and returns, intensity of resource use pattern, productivity of resources and possible resource adjustment etc.. Such is essential to examine the farm business activities of the farming community so that the hidden obstacle could be focused in some definite term and some suggestions could be given.

METHODOLOGY

The present study has been confined to the traditional cassava growing state of the Nigeria namely: ajibode, eleyele and ijokodo. The data required for the study were primary in nature for which survey of 150 households comprises 50 each from small, medium and large farm,

spread over the three areas namely:ajibode, eleyele and ijokodo were conducted using pre-tested interview-schedule and pertains to the agricultural year 2010-11. A multistage random sampling were employed to draw a representative sample, component analysis, cost of cultivation, profitability concept, break-even point, technology adoption index, resource use efficiency etc techniques were employed to analyzed the collected data.

RESULT AND DISCUSSION

Table 1. Economics of Cassava and its Competing Crop on Small Farm

Particulars	Cassava		Yam
	Traditional	Hybrid	
Total Cost	135244	205324	101470
Gross Income	287250	614500	355000
Net Income	152006	541170	253530
Benefit-Cost Ratio	2.12:1	2.99:1	3.49:1

Under the present circumstances of prices of inputs and outputs which prevailed in the study area. It is comparatively to grow hybrid cassava in small farm as it gives the maximum net return (#541170) as compared to other crops. In terms of Gross Income, the highest income was obtained again by hybrid cassava and lowest by traditional cassava followed yam (#152006).So far as output-input ratio was concerned it was more favorable to grow hybrid cassava and least favour was to yam.

Table 2. Economics of Cassava and its Competing Crop on Medium Farm

Particulars	Cassava		Yam
	Traditional	Hybrid	
Total Cost	122690	167684	98726
Gross Income	226900	533050	385000
Net Income	104210	365366	286274
Benefit-Cost Ratio	1.84:1	3.17:1	3.8:1

As shown in table 2 hybrid cassava also performed better on medium farm not only gave a maximum of #365366 per hectare of net return but also yielded higher benefit-cost ratio 3.17 as compared to 1.84 in respect of traditional and need special attention by agricultural scientists against 3.8 in case of yam. In terms of gross income, the highest income was obtained from hybrid cassava and by yam viz #533050 and 385000 respectively. Thus, next to hybrid cassava, traditional cassava during wet season was found to be the best options in the study area under prevailing market conditions. The net income level is quite low in case of yam and calls for concern to the planner to find out ways to increase the income level.

Table 3. Economics of Cassava and its Competing Crop on Large Farm (#/ha)

Particulars	Cassava		Yam
	Traditional	Hybrid	
Total Cost	111400	154810	94324
Gross Income	207350	453050	354000
Net Income	95950	298240	259676
Benefit-Cost Ratio	1.86:1	2.92:1	3.75:1

The table 3 shows that hybrid cassava gave maximum return in terms of gross income (#453050) and net income (#395836) respectively. Yam crop has (#354000) gross income and (#259676) net income, followed by traditional cassava with lowest amount of #207350 gross incomes and #95950 net incomes respectively. Also, based on output-input ratio, it was favorable to grow hybrid cassava because of the high multiplier effect in return as compared to traditional cassava and yam.

Table 4. Economics of Cassava and its Competing Crop on Overall Farm (#/ha)

Particulars	Cassava		Yam
	Traditional	Hybrid	
Total Cost	123110	63991	98173
Gross Income	228550	530150	324000
Net Income	105440	466159	225827
Benefit-Cost Ratio	1.85:1	8.28:1	3.30:1

The table 4 shows that the net income per hectare for traditional cassava was #105440, hybrid cassava #477369 and yam #50305 respectively. It was noted that output-input ratio was highest (8.28) from hybrid cassava followed by traditional cassava (1.85) and yam (3.30). Thus, hybrid cassava turned out to be attractive in terms of net return and benefit-cost ratio from business point of view, one may conclude that the rate of return on traditional cassava is quite low and it really yam and hybrid cassava where one gets quite a high return. But one should keep in mind that rising of the crops under Nigeria condition is a way of life and not on business principle.

Table 5. Technological Adoption Index

Size of farmers	Low (Up to 33 %)	Moderate (33 to 66%)	High (66 % and Above)	Adoption index (%)	Total
Small	32	11	7	42	50
Medium	28	13	9	50	50
Large	20	14	16	50	50
Total	80(53)	38(25)	32(22)	47	150(100)

In small size farmers, 32 adopted new technology at low and 11 adopted at medium rate while only 7 adopted the new technology at high rate. The case was different in medium category because 9 farmers adopted the technology at high level and 28 farmers adopted at low level while only 13 adopt new technology in moderate level. The situation is reverse in

large category of farmers, 16 farmers adopted the new technology at high level, followed by moderate 14 and low 15 farmers respectively.

Table 6. Break- Even On Cost (CASSAVA)

Particular		Small	Medium	Large	Overall
Traditional	Market Price(#/tons)	20,000	20,000	20,000	20,000
	Break- even(#/tons)	9142	10696	10548	10128
	Difference(#)	10858	9304	9452	9872
	Percentage (%)	54	47	47	49
Hybrid	Market Price(#/tons)	20,000	20,000	20,000	20,000
	Break- even(#/tons)	6361	5560	6420	6113
	Difference(#)	13639	1440	13580	13887
	Percentage (%)	68	72	68	69

The break- even level of cost of production as shown in above table means that with the given cost of cultivation and physical output of traditional and hybrid, cassava would remain in profit. It implies that market price of cassava gave sufficient profit to farmer over cost.

The table 7 reveals that the selected farmers will not be at loss even if their actual yield of both traditional and hybrid cassava is lowered by 6.3 and 9.5 tons per hectare. The same condition occurs to both medium and large size holdings. It implies that the existing cost of cultivation and physical output of the crop yielded sufficient profit to the same farmers.

Table 7. Brakes-Even on Yield (CASSAVA)

Particular		Small	Medium	Large	Overall
Traditional	Actual yield(tons)	14	11.2	10.15	11.21
	Break- even(tons)	6.3	5.9	5.3	5.4
	Difference(tons)	7.7	5.3	4.85	5.81
	Percentage (%)	55	47	22	51.8
Hybrid	Actual yield (tons)	30	26	22	26
	Break- even(tons)	9.5	7.9	7.0	8.1
	Difference(tons)	20.5	18.1	15	17.9
	Percentage (%)	68.3	69	68	68

Table 8. Impact of Technology on Yield (tones/ha) And Reduction in Cost of Production

S. No.	Particular	Size Group			
		Small	Medium	Large	Overall
Yields(tones/ha)					
1	Traditional	14	11.2	10.15	11.21
2	Hybrid	30	26	22	26
	Difference	16 (186)	14.8 (132)	11.85 (117)	14.79 (132)
Cost of Production(#/tons)					
1	Traditional Cassava	9142	10696	10548	10128
2	Hybrid Cassava	6361	5560	6420	6113
Reduction in cost due to					
	Hybrid over traditional	30.42	48	39	40

Note: The Figures in Parenthesis Show Percentage of Hybrid Over Traditional.

It is expected that with the adoption of improved production technologies, the efficiency would improve. Therefore, improvement in yield will reduce the unit cost of production of the crop and the farm efficiency will increase. The above shows that cassava yield has increased significantly with the adoption of hybrid variety of cassava irrespective of the categories of farm size. It is expected that with the adoption of improved production technologies, the efficiency would improve. Therefore, improvement in yield will reduce the unit cost of production of the crop and the farm efficiency will increase. The above shows that cassava yield has increased significantly with the adoption of hybrid variety of cassava irrespective of the categories of farm size.

Improvement in yield is only one aspect of depicting the improved technologies. In general, the improved technologies push the yield frontier by utilizing either more inputs or utilizing the resources more efficiently. In case of cassava crops, it is clear that increase in yield due to hybrid variety has not come free of cost; the cost of cultivation with these varieties has increased considerably in all categories of farmers. For example, the farmers who spent nearly ₦12310 on cultivation of one hectare of traditional varieties of cassava had to spend about ₦52781 to cultivate hybrid cassava.

Also, expenditure on fertilizer, plant protection, seed and irrigation mainly contributed to the additional cost of cultivation. Also, farmer had to buy every year new seeds from market in case of hybrid variety, all these serve as extra burden during production. The concept of efficiency, however, suggests that the objective of technological improvement should be shifted from more production to more efficient production. This implies a focus on lowering the cost of production per unit output.

The cost of production when used hybrid declined by 30.42 per cent in small group farmers, 48 per cent in medium and 39 per cent in large group. In total, it reduced by 40 per cent compared with traditional variety. The result calls for higher emphasis to boost the adoption of improved variety by the selected farmers in Ibadan Metropolitan Area of Oyo State.

Resource Use Efficiency

The regression coefficient of different inputs in the production function was estimated separately for each size group and for overall farms. The value of coefficient of multiple determination (R^2) were found to be quite high in all farm sizes (0.82 to 0.92) which indicate that the selected form of the production function was the best fit.

The return to scale is the sum of the elasticity of resources which indicate the changes in total return to changes in total inputs. The values of return to scale for small, large and overall were greater than one (1), indicating increasing return in output as result of inputs use during production. While only medium farm size is less than one (1), indicating decreasing return to scale as given in table 9.

Table 9. Resource Use Efficiency according to Farm Size

Economic Parameter	Farm Groups			Overall
	Small	Medium	Large	
No of farmers(N)	50	50	50	150
Intercept(a)	0.9	1.4	1.7	1.2
Regression coefficient of variable(b)				
Seeds/Stalk(X_1)	0.410389	0.646446	0.9616	0.3101***
Farm size (X_2)	0.589811*	0.107361	0.1519	0.4937***
(PPM cost) (X_3)	0.715980	0.141822	0.7916	0.0484***
Agrochemical (X_4)	0.092156***	0.064356	0.1280	0.4320
Labour (X_5)	0.041858	0.033320	0.7882	0.2562
R ²	0.824	0.92	0.95	0.87
Return to scale	1.83	0.97	2.72	1.43

Note: *** 1%, **5%, * 10: Significant Levels

The overall results show that Seeds/Stalk(X_1), Farm size (X_2), (PPM cost) (X_3), were significant at 1% level and their coefficient were positive, indicating that increase in inputs leads to increased in output and it is vice versa. Also, only Agrochemical (X_4) were positive and significant at one percent while Farm size (X_2) also positive and significant at 10% level.

Table 10. Constraints reported by the Cassava Farmers

Constraints	Size Groups			Overall (150)
	Small(50)	Medium (50)	Large (50)	
Production Constraints				
High wage of Labour.	34	49	39	128
High Cost of Rent on Land	45	36	22	102
Scarcity of inputs	24	41	20	98
High Cost of Transportations	40	30	29	90
Shortage of Capital	49	48	39	137
Lack of technical know-how	48	42	35	127
Lack of infrastructure facilities	46	41	33	120

The table above shows that problems confronting Cassava farmers in Ibadan Metropolis area of Oyo State, Nigeria. The results show that most of the respondents are facing more than one problem in their farming activities. High cost of labour and shortage of capital are considered to be the greatest constraint faced by all the sampled farmers, followed by high cost of labour and others constraints. The shortage of capital and high cost of rent on land are the major problems facing small and medium farmers. Scarcity of inputs is one of the challenges confront the medium size farmers but the problem is minimized in small and large farmers despite high cost of labour in all the size groups. Transportations problem is high in small size farmers but quite low in medium and large group.

Lack of technological know-how about recommended package of practices was among the production constraints reported by the selected respondents. Also, the pattern and rate of adoption of improved cassava technology were found to vary from one farm to farm. This could be due to a number of factors such as late or non information to farmer about improved seeds, non-availability of desired seeds, fertilizers and other inputs. Even, the economics condition of the farmer were bad due to problem of shortage of capital and It caused them a lot when they were unable to recharge their mobile and the communication gap increased between the extension agent and the targeted farmers.

High cost of transportation was a great disappointment factor to the cassava growers and this resulted higher level of lose during post harvesting period because of hindrance in the movement of farm products to the point of final consumption.

CONCLUSIONS

Cost and return of cassava and its competing crops revealed that on overall farm total cost per hectare incurred in cassava production was to the extent of #87800 which varied between #79220 in large farm to #96560 in small farm. Thus, physical output was produced more on small farm (14tones/ha) followed by medium farm (11.2 tones/ha) and large farm (10.1 tones/ha) revealing inverse relation with farm size. Similarly, cost of cultivation of competing crop yam estimated to be #29251 per hectare with maximum amount incurred on small farm and minimum (27248#/ha) in case of large farm revealing inverse relation with farm size.

About two-third of the total cost was shared by operational cost leaving the balance position by fixed cost. Likewise cost of cultivation, productivity also negatively correlated with the farm size. Maximum productivity level was on small farm and minimum was achieved in large farm. Break-even analysis indicated that actual market price of cassava was 49 per cent more than its break-even price. Thus, farmers are gaining substantial profit from the existing cassava output and actual price prevailed in the market in the study area. Similarly respondents are not in a losing position if traditional and hybrid cassava production declined by 52 per cent and 68 per cent respectively. Under the present circumstances of prices of inputs and output prevailed in the study area, it is comparatively to grow hybrid cassava in all three sized farms i.e. small, medium and large farm as it gives the maximum net return per hectare and benefit-cost ratio as compared to traditional cassava and yam.

More than half of the selected respondents adopted recommended cassava technology at low level (unto 33 per cent) while 25 percent adopted technology to moderate level (33 per cent to 66 per cent). Only one-fifth of the respondents adopted cassava production technology at high level which revealed positive relation with farm size. Cassava yield has increased enormously with the adoption of hybrid cultivar irrespective of farm size. The cost of production when used hybrid cultivar reduced by 40 per cent in compare with traditional cultivar.

Resource use efficiency of included variables in cassava production revealed that value of coefficient of multiple determinations (R^2) was estimated to be 0.87 on sample farm which varied between 0.92 to 0.96 on different farms indicating best fit of production function value of return to scale on small, large and overall farm was more than one indicating cassava output increase at increasing rate by using included variables while on medium farm cassava production increased at decreasing rate. Regression coefficient of selected variables across farm size was found to be positive but significantly contributed only by variable

X_2 and X_4 in small farm and X_1 , X_2 and X_3 variables on sample farms. Lack of capital, lack of technical know-how, infrastructures facilities, high wage of labour, high rent on land, scarcity of inputs, high transportation cost e.t.c are important socio-economic constraints reported by the sample respondents in cassava production.

RECOMMENDATION / SUGGESTIONS

Some suggestions for higher and equitable production of cassava are given below:

- The socio- economic backwardness of farmers in the study area is a major obstacle in acceptance of the improved technology .it is suggested that frequency of extension visits should be increased to encourage wider spread and adoption of farm technology.
- Improved cassava may be cultivated intensively by adoption full package of practices, provision of cheap credit followed by marketing and processing facilities is an urgent need of the study area.
- Also, adequate farm inputs like agro- chemicals must be made available at cheap price to the farmers and government must follow a clear cut linkage supply system of inputs.
- The functional analysis of included variables indicating that regression coefficient of seed (X_1) and plant protection (X_3) are only positive but also significant at overall sample farm. It is suggested that timely availability of these inputs at reasonable price to cassava growers be made and their outlets be established at village level.

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