EXTENT OF ADOPTION OF NEW CASSAVA TECHNOLOGY, IMPACT ON YIELD, COSTS AND IDENTIFIED CONSTRAINTS TO ADOPTION OF NEW TECHNOLOGY IN IBADAN METROPOLIS, OYO STATE, NIGERIA

O.O. Olayiwola

Research Fellow, Development Policy Centre (DPC), Nigeria
Email: olaniyi_2008@yahoo.com

ABSTRACT

Taking into consideration the importance of the cost studies for farm planning and policy decisions at the micro level, the study was conducted to analyze the adoption pattern of new technologies and their impact on cassava yield , reduction in cost of production and resource-use efficiency. An attempt has also been made to examine the constraints in cassava production.

Keywords: Adoption, Cassava, Technology, Constraints, Costs and Resource-Use

INTRODUCTION

A study as this has become necessary since cassava farms in the form of the cassava intercropped with other crops called the cassava-based production systems has from time immemorial been the prevalent arable cropping system in the large guinea savannah vegetation agriculture in Nigeria.

The predominance of the system has been occasioned by Nigeria's climate which is basically tropical and favourable for cassava production, farmer's level of technology and their socio-economic situations. Though cassava when cultivated as a sole crop results in high outputs, the greatest disadvantage of sole cropping is that in instances of pest or disease outbreaks that attacks the sole crop, the farmer usually looses a significant part of his crops and sometimes even loose all. The cassava based form of producing cassava is therefore preferred by farmers, as it insures them against total crop losses.

However, producing cassava under different mixed cropping conditions will definitely impact on resource use in cassava production and consequently crops 'yields. It is therefore necessary to examine the productivity of resource use in these cassava-based Systems as this will help highlight those areas or variables that could be better managed to improve the productivity of cassava farms in Nigeria.

According to IFPRI (2000), urban agriculture can have a beneficial impact on food security for low – income urban residents. It can also be highly productive Rabinovitch et.al, (1997) reported that in the United States, 70% of fruits, vegetables, and ornamental plants are grown in urban land. VonBraun, 1997 reported that while poverty and food storage remain predominantly rural problems, the proportion of undernourished people living in cities is on the rise due to rural – urban migration.

Therefore, urban farming is a food production strategy that has been employed since Roman times to secure close – at – hand basic and supplementary food supplies. Importance of urban and Peril – urban agriculture cannot be down played. It is regarded as a practice that is growing out of its ability to assist, resolve or cope with diverse development challenges. Urban agriculture and peril-urban agriculture has been employed since Roman times. Despite the importance of urban agriculture it has not been given its rightful place. This is because it has not been officially recognized; rather it is merely tolerated as response to the socio-economic conditions faced by many poor-individuals (Olofin et al., 1997).

However, several studies on urban agriculture have been carried out in Nigeria. Among these studies include water, Land and health in urban and Peril–urban food production (Bines et.al, 2003) and urban agriculture under threat (Lynch et.al, 2001). Others are workers' participation in urban agric (Dixon, 2001) and highlights of the field production (Olofin, 1996) and All of these studies considered roles and importance of some resource-use in urban agricultural production, but did not consider resource use efficiency of the urban farming.

RESULTS AND DISCUSSIONS

In the farm management studies, costs are viewed from different angles for different purposes. Cost of cultivation data are used by the Agriculturist and Price Commission for fixation of prices of agricultural commodities. Besides this, they are also useful in farm planning and policy making. Therefore, due consideration should be given to cover both operational and fixed cost to operate agriculture as a business and not as a way of life only.

Traditional Cassava

It is observed from the Table 5.12 that the total cost incurred in cultivation of traditional cassava at the overall level was 123110 per hectare which was highest in small farm(#135244) followed by medium farm (#122690) and large farm (#111400) although the difference was not quite extra-ordinary between the different size farms.

The total operational cost incurred was #87800 which varied between #79220 in large farm to #87640 on small farm. The component of fixed cost was shared between the small, medium and large farms respectively and fixed cost increased with increase in size of holdings. Also, among various items of materials cost, the major items of expenditure was seed, which was found lowest on large and medium farm whereas it was highest in case of small farm. Thus, conclusion may be drawn from foregoing discussion that the cost of labour increases as the size of holdings.

Hybrid Cassava

Sample farmers dented significant proportion of the total cropped area under this particular situation table 5.12 speaks that the total cost per hectare was lowest (#57214) on large farm

whereas in small and medium farm it accounted #73330 and #61430 respectively. The cost per hectare for average of all size farms was #52781and among material cost, seed cost was high as compared with other inputs such as fertilizers. The table 5.12 also shows the increasing trend of total cost per hectare with respect to the size groups. Although, there was no extra-ordinary difference. The level of main and by product shows inverse relation with farm sizes

Competing Crop (Yam)

The total cost incurred by small farm was #101470; medium farm incurred total cost of #98726 while large farm spent #94324. The overall cost was #273695.Despite huge cost incurred overall, the total cost decrease based on farm holdings. The same condition occurred with respected to operational and fixed cost incurred during the production year. Maximum production was observed in medium farm (24tones/ha), followed by small and large farm (22tones/ha) showing no trend with the farm size.

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 5.14 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 9.5tons per hectare. The same condition applicable 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.

Technological Adoption Index

Table 5.19 shows that half of the farmers in medium, small and large farm categories adopt new technology farming system. The overall adoption level index was 47 percent, indicating that inverse trend with farm size which range between 42 and 50 percent.

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.

Impact of Technology on Yield (Tones/Ha) and Reduction in Cost of Production

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

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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 improve 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 to cultivate hybrid #52781cassava.

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 serves as extra burden during production.

The concept of efficiency, however suggest that the objective of technological improvement should be shift 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 decline by 30.42 per cent in small group farmers, 48per cent in medium and 39 per cent in large group. In total, it reduces by 40 per cent in compares with traditional variety. The result call for higher emphasis to boost the adoption of improved variety by the selected farmers in Ibadan Metropolis Area of Oyo State.

Constraints Production

Cassava farmers in the study area are faced with various constraints and they are:

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

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.

RECOMMENDATIONS

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 potential to expand output is simple if government and other related institutions pay more attentions to agriculture sector.
- Government must find solution to problem of land fragmentation through embarked on effective policies that will militate against this problem.

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Table 5.12: Cost of Cultivation of Cassava Production and its Competing Crop

S. No.	Particular	Traditional Cassava			
		S	M	L	O
1	Operational	96560	87640	79220	87800
2	Fixed cost	38664	35050	32180	35310
3	Total cost	135244	122690	111400	123110
4	Main Production (in tones)	14	11.2	10.15	11.21
5	By Production (in tones)	5	2	3	3

Note: S= Small, M = Medium, L = Large and O = Overall

Table 5.12: Cost of Cultivation of Cassava Production and its Competing Crop

S. No.	Particular	Hybrids Cassava			
		S	M	L	O
1	Operational	146660	118060	108440	124286
2	Fixed cost	58664	49624	46370	51552
3	Total cost	205324	167684	154810	175939
4	Main Production (in tones)	30	26	22	26
5	By Production (in tones)	10	9	9	7

Table 5.12: Cost of Cultivation of Cassava Production and its Competing Crop

S. No.	Particular	Competing Crop			
		S	M	L	O
1	Operational	20894	19306	17974	19391
2	Fixed cost	80576	79420	76350	58782
3	Total cost	101470	98726	94324	98173
4	Main Production (in tones)	22	24	22	20
5	By Production (in tones)	3	1	2	4

Note: S= Small, M = Medium, L = Large and O = Overall

Table 5.13: 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

Table 5.14 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 5.19: 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)

Table 5.20: 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.

Table 5.24: 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