



PAT June, 2013; 9 (1):73-80 ISSN: 0794-5213

Online copy available at

www.patnsukjournal.net/currentissue

Publication of Nasarawa State University, Keffi



Costs and Returns Analysis of Yam Production among Small Scale Farmers in Karu Local Government Area, Nasarawa State, Nigeria

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Abstract

Study was on the costs and returns analysis of yam production in Karu Local Government Area of Nasarawa State. A multistage random sampling technique was used in selecting respondents for the study. Primary data were collected with the aid of well structured questionnaire and interview schedule. Data were analyzed using descriptive statistics and gross margin analysis. The result of the analysis shows that, the total cost of yam production per hectare, returns per hectare, net farm income obtained per hectare and returns per naira invested were ₦124, 129.3, ₦ 271, 166.7, ₦147, 037.3 and ₦2.19 respectively. The major problems faced by the farmers included lack of access to inputs, high cost of inputs, poor producer prices, lack of capital, incidences of pests and diseases, poor transportation facilities and inadequate extension services. It was recommended that for improving production and earnings of farmers, there is need for government and nongovernmental organizations (NGO) to make inputs and capital available for farmers.

Keywords: Costs and returns, yam production, small scale farmers

Introduction

Yam (*Dioscorea spp*) is one of the principal tuber crops produced in large quantities in the country. It is a major staple food appreciated for its taste and cultural roles (Bamire and Amujoyegbe, 2005). It is widely cultivated in the humid rain forest and the guinea savanna. According to Bababeye (2003), yam contributes more than 200 dietary calories per capita daily for more than 150 million people in West Africa while serving as an important source of income to the people. Some of the common yam species are white yam (*Dioscorea rotundata*), water yam (*Dioscorea alata*), yellow yam (*Dioscorea cayanensis*), three leaf yam (*Dioscorea dumentonum*) and aerial yam (*Dioscorea bulbifera*).

The major yam producing areas in Nigeria include, the middle belt (Benue, Nasarawa, Kwara, Kogi and Niger), eastern parts of Nigeria (Imo and Anambra) and southwestern parts (Philip *et al.*, 2006). It is a very important food crop in African countries; the region alone represents about 90% of the total world production of edible roots and tubers (FAO, 2007).

The objective of Nigerian's food security programme of increasing agricultural production for food self-sufficiency is still far from being realized (Agbaje *et al.*, 2005). Agbaje *et al* (2005) further averred that major tuber crops have too low outputs to justify the increasing cost of modern farming inputs especially fertilizer. The last three decades have not only witnessed a decline in the role of yam production but also a decline in the traditional role of agriculture to drive the economy. Increased agricultural output is however required for reduction of widespread hunger and poverty. The bulk of agricultural outputs are presently being produced by resource poor farmers with low income and high incidence of poverty.

According to Ezeh (1998), among the inputs required in yam production, labour and planting material (seed yams) are the most demanding. In Nigeria, labour demand for yam production ranged from 300 to 400 man-days per hectare at costs of N30, 000.00 - N40, 000.00, which is equivalent to \$375-\$500. US Dollars. From empirical point of view, about 10,000 normal size (150-250g) seed yams are required to plant up an hectare for yam production. Hence, at N15.00 per seed yam, a total of N150, 000.00 (\$1875.00) was required for planting materials. However, under the minisetts as many as 60,000 minisetts of 25-30grams are required to plant one hectare for seed yam production. A study has shown that about 35-50% of the total production cost is constituted by planting material (Orkwor, 1998 and Spore, 2011). This implies that it will take about 5000-6000 seed yams of normal size of 200 to 250 grams to plant a hectare.

In recent times, the prices of seed yams have changed drastically with impending high cost. With the rising cost of farming inputs, there is likelihood that the price of seed yam might go up in the near future. It was against the high cost of seed yam that this study was undertaken to empirically ascertain the profitability of yam production in the study area. Specifically, the study examined the costs and returns associated with yam production in the study area.

Methodology

The study was conducted in Karu Local Government Area of Nasarawa State, Nigeria. The state lies between latitudes 7° and 9°45'N of the equator and longitudes 7° and 9°32'E Greenwich meridian. It shares common boundaries with Keffi to the East, Nasarawa LGA to the south, Kagarko LGA of Kaduna State to the North and Abuja municipal area council of FCT to the west (Binbol and Marcus, 2005). Majority of the indigenes of the area are farmers and some engage in petty trading.

Karu Local Government Area consists of five districts i.e. Aso, Gurku, Kabusu, Karu and Kodope. Three districts where yam is highly produced are Kabusu, Gurku and Aso, as such these districts were purposely selected and twelve villages that are well known for yam production were randomly selected. Ten yam producing households'

heads were selected at random from the twelve villages making the total number of 120 sampled yam farmers.

Data were collected using well structured questionnaire and interview schedules between January and April, 2012. Information collected include socio-economic characteristics of farmers such as age, gender, educational level, marital status, household size, access to credit, extension contact, costs and returns and constraints faced by yam farmers in the study area. Data were analyzed using descriptive statistics and gross margin analysis.

(a) Gross margin

This is the difference between the gross farm income (GFI) and the total variable cost (TVC). Algebraically,

$$GM = GFI - TVC \quad \dots\dots\dots (1)$$

Where GM = Gross margin, GFI = Gross farm income, TVC = total variable cost.

(b) Net farm income

It is the difference between the gross margin (GM) and total fixed costs (TFC). Notationally,

$$NFI = GM - TFC \quad \dots\dots\dots (2)$$

Where NFI = Net farm income, TFC = Total fixed cost and GM is as previously defined.

Results and Discussion

Socio-economic characteristics of farmers

The socio-economic characteristics of the respondents considered include age, gender, marital status, educational level, access to credit and extension contact. The results of the analysis are presented in Table 1.

The age distribution of respondents as presented in Table 1 revealed that 85% of the respondents were within the age bracket of 25 to 55 years. Only 1.7% of them were below the age of 25 years, while respondents in the age range of above 55 years accounted for 13.3% of the total number of respondents. This is an indication that most of the yam farmers in the study area are in their active years. This trend may have significant implication for the labour supply in the study area. Agricultural production requires able bodied active individuals; as such labour supply to some extent may not constraint production of yam farmers in the study area. This agrees with the findings of Tsado *et al* (2010) who found out in their study on costs and returns analysis of yam production in Yagba LGA of Kogi State that labour supply was not constraint as most of yam farmers were in their active years.

Gender distribution of respondents is also presented in Table 1. The result indicated that majority (95.8%) of the respondents were males with females constituting

only 4.2%. This reveals that a greater proportion of the yam farmers were male. This is in consonance with the findings of Adedoyin and Fapojuwo (2007) who also found that men dominate the work force in Nigerian agricultural communities. Results in Table 1 also revealed that majority (97.5%) of the respondents were married, while 2.5% were single. As is characteristics of rural communities, the women contribute immensely to the realization of household farm objectives. This implies that most of the respondents are responsible individuals, contributing directly or indirectly to household food security and national food availability.

Result in Table 1 also shows the distribution of respondents according to educational level. Education is a human capital asset required for increased production and productivity. Because an increase in educational level lead to increase in adoption of modern farming technologies by farmers. Result indicated that majority (86.7%) of the respondents had one form of education or the other. Only 13.3% of the respondents were non-literate. This also agrees with Tologbonse (2004) who also found that education affect the speed with which new technologies are being diffused and accepted by the farmers.

Table 1 also reveals that majority (90%) of the respondents did not have access to credit while only 10% of the respondents had access to credit in the study area. This is an indication that yam farmers may likely operate at level of profit inefficiency. Accessibility to credit can enhance profit efficiency. However corrupt practices of the administrations such as rent-selling, inadequate training programmes, lack adequate supervision of credit and inaccessibility of credit by the poor can hamper it (Zeller et al., 2002).

Extension contact distribution of the respondents is also presented in Table 1. The result shows that most of the respondents (74.2%) did not have access to extension service. Only 25.8% of respondents had access to extension agent. This implies that majority of the yam producers in the study area do not have access to recent technologies on the best practices in the study area. This will greatly affect the outputs level of the yam farmers.

Costs and Returns

The items of cost were classified into fixed and variables cost items. The return or revenue in the study area was realized from the sales of ware yams harvested from the farms by individual producers. The fixed costs items were depreciated over time while the variable cost items were determined by each producer based on the quantity used for yam production at a particular price. The profitability of yam production enterprise was examined using cost and returns analysis. The estimated costs and returns of small-scale yam farmers in the study area are presented in Table 2

Table 1: Socio-economic characteristics of yam farmers in the study area.

Variables	Frequency	Percentage
Age		
Less than 25	2	1.7
25 – 40	58	48.3
41 – 55	44	36.7
Greater than 55	16	13.3
Total	120	100.0
Gender		
Male	115	95.8
Female	5	4.2
Total	120	100.0
Marital status		
Married	117	97.5
Single	3	2.5
Total	120	100.0
Educational level		
Quranic	1	0.8
Primary	41	34.2
Secondary	35	29.2
Tertiary	24	20.0
Adult education	3	2.5
None of the above	6	5.0
Total	120	100.0
Access to credit		
Yes	12	10.0
No	108	90.0
Total	120	100.0
Extension contact		
Yes	31	25.8
No	89	74.2
Total	120	100.0

Source: Field Survey Data, 2012

The results in Table 2 indicated that a gross return realized by a typical small-scale yam farmer was ₦271, 166.7 per hectare. The total variable costs in yam production was ₦122,255.3 per hectare of total cost of production comprising of 7.13% of labour, 10.4% of yam seed, 6.6% of herbicide, 0.5% of insecticide and cost of fertilizer accounted for 9.7%. The total fixed cost of production per hectare was ₦1, 874.7, comprising of 0.4% of hoes, 0.3% of axes, 0.5% of cutlass and basket accounted for 0.4%. The total cost of production for a typical small-scale yam farmer was ₦124, 129.3. The net farm income was ₦147, 037.4. The return per naira invested was ₦2.19. This implies that production of yam is profitable in the study area. This implies that

yam farmers should expand the production to enhance food supply and poverty reduction.

Table2: Average costs and returns per hectare of yam produced in the study area

Costs and returns	Amount (₦/ha)	% of total cost
(A) Variable costs		
Labour	85,356.4	71.3
Yam seed	15,945.8	10.4
Herbicide	8,205.0	6.6
Insecticide	854.9	0.5
Fertilizer	11,893.2	9.7
Total variable cost	122,255.3	98.4
(B) Fixed costs		
Hoes	490.6	0.4
Axes	34.8.6	0.3
Cutlass	569.3	0.5
Basket	46.2	0.4
Total fixed costs	1,874.7	1.6
(C) Total costs	124,129.3	100.0
(D) Gross returns	271,166.7	
(E) Net farm income	147,037.4	
(F) Returns on investment	2.19	

Source: Field Survey Data, 2012.

Constraints faced by farmers

The results presented in table 3 revealed that all (100%) of respondents complained of lack of access to inputs, high cost of inputs, poor producer prices, lack of capital and incidences of pests and diseases. Majority (96%) also complained of poor transportation, while (92%) of respondents complained of inadequate of storage facilities. This indicate that lack of access to inputs, high cost of inputs, poor producer prices, lack of capital, incidences of pests and diseases and absence of good transportation facilities coupled with inadequate storage facilities as revealed by this study affected the production activities of yam farmers. This study agrees with Eze (2000) who identified inadequate infrastructure as a constraint for the development of agricultural production in southeastern Nigeria. Pilfering (86%) ranked fourth. This is an indication that, theft of farm produce was one of the factors hampering the production activities of yam farmers. Inadequate extension services (74%) ranked fifth. Extension services are sources of information on how to better organize production activities, and also extend improved technology to farmers. Lack of improved yam varieties (63%) and inadequacy of farm land (38%) ranked sixth and seventh respectively. This implies that low ranking of lack of improved varieties and inadequacies of farmland have least effect on yam farmers' outputs in the study area.

Table3: Distribution of respondent according to the constraints they faced in yam production.

Constraints	Frequency	Percentage	Rank
Lack of access to inputs	120	100	1
High cost of inputs	120	100	1
Poor producer price	120	100	1
Lack of capital	120	100	1
Incidences of pests and diseases	120	100	1
Poor transportation facilities	115	96	2
Inadequate storage facilities	110	92	3
Pilfering	103	86	4
Inadequate extension services	89	74	5
Lack of improved yam varieties	75	63	6
Inadequacy of farm land	45	38	7
	1134*		

Source: Field Survey Data, 2012.

Conclusion and Recommendations

From the findings of this study, it could be concluded that yam production is a profitable enterprise in the study area. However, its production and earnings can be improved if government and nongovernmental organizations (NGO) can make farming inputs available and affordable for farmers.

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