



ESTIMATION OF COSTS AND RETURN OF SWEET POTATO PRODUCTION IN OFFA LGA, KWARA STATE, NIGERIA

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ABSTRACT

Offa is the second largest town in Kwara State, located in central Nigeria with geographic coordinates 8°9'N 4°43'E. With a population of about 120,100 inhabitants. Located in a savanna vegetation region, Offa is well known for cultivation of sweet potatoes and maize. Offa LGA was purposively selected as it is the major sweet potato producing areas in the State. A two-stage sampling procedure was used in random selection of 120 sweet potato farmers for the study. Data collected were analyzed using descriptive statistics and budgetary technique. The results showed that the estimated costs and return for one hectare of sweet potatoes enterprises were ₦64,100.00 and ₦121,700.00, respectively, with the labour cost having the highest share of 39.78% of total cost followed by seed cost (11.7%) and fertilizer cost (10.06%). The profit margin percentage of 47.3% and return per capital outlay of 0.9 was noted, impliedly that for every ₦1 invested in sweet potato production enterprise there is a return of ₦0.90k to the enterprise. An operating cash expenses ratio of 39.5% was obtained along with benefit cost ratio (BCR) of ₦1.89k implying that the enterprise is profitable even with little capital invested into it. A positive gross margin (₦73,600) and net farm income (₦57,600) was also obtained indicating a profitable sweet potato production enterprise. The study concluded that with the values of all the performance indicator used, sweet potato enterprise could be said to be profitable, and profitability can still be increased under improved management practices.

Keywords: Sweet potato, Profitability, Costs, Return, Budgeting techniques.

INTRODUCTION

Nigeria is the first largest producer of sweet potato (*Ipomoea batatas* (L.) Lam) in Africa with 3.46 million metric tons annually (FAO, 2008). Sweet potato is one of the most important staple carbohydrate foods in sub-Saharan Africa. As a crop that requires low inputs of land, labour and capital and less management in its production; it does well on marginal soils and erratic rainfall, giving reasonable yield than most other crops (Ogbonna *et al.*, 2005; Attaliru and Ilangantileke, 2007).

Sweet potato currently ranks as the fifth most important food crop after rice, wheat, maize and cassava in developing countries like Nigeria and it is also the seventh most important food crop in the world in terms of production (Adekoya *et al.*, 2010). The adapted local varieties of sweet potato from the early introductions by colonial masters and early Christian missionaries before the advent of improved varieties can be found all over Nigeria (Ogbonna *et al.*, 2013). Improved varieties were developed by National Root Crops Research Institute (NRCRI), Umudike and International Institute for Tropical Agriculture (IITA), Ibadan. In spite of these improved varieties that were developed with desirable traits such as high yielding



potential, most rural farmers in Nigeria are conservative and still cultivate the local varieties (Onwuene *et al.*, 2018).

The importance of sweet potato is increasing in Nigeria's farming and food systems because its production has recorded good profit margin and is suitable for income generation. It has the potential for food security as well as serving as a cash crop (Adekoya *et al.*, 2010).

Sweet potato prices fluctuate over the year, at the peak of harvest between July and January prices are lower. Between February and June when sweet potato is scarce the prices are higher. Orange fleshed sweet potatoes are now sell at higher prices than white fleshed because of its nutritional value (Bose *et al.*, 2020). The importance of sweet potato is increasing in Nigeria's farming and food systems because its production has recorded good profit margin and is suitable for income generation (Sunusi and Adesogan, 2014).

Sweet potato is crop with high adaptability to adverse environmental condition, which enable the crop to perform well even on a poor soil with little or no fertilizer application. Despite this, the crop has received little attention by the Government perhaps because of its bulkiness, perishability with low shelf lives after harvesting which limit its economic viability (Omoare *et al.*, 2015).

From the foregoing, it has been established that sweet potato once efficiently produced, it would yield high income and contributes to the development of the country. It is from this background that the study intends to estimate the cost and returns on sweet potato production in Offa Local Government Area, Kwara State. Thus, the study intends to determine the cost and returns incur in sweet potato production and also factors influencing the cost and returns of sweet potato production.

Kasali (2011) worked on the economics of sweet potato production. The findings showed that Cost and returns analysis indicates that labor accounted for 68% of total cost of production and that sweet potato production is profitable. Yield had a greater impact in improving profitability and capital inputs had the least impact in reducing profit. Experience, planting material, output transportation to market, adoption of new varieties, fertilizer level, and full-time farming positively influenced sweet potato output. There is scale inefficiency, and no input was used efficiently. Fertilizers and transportation were underutilized; rent, farm implements, planting material, chemicals, and labor were overused.

Paraiso *et al.* (2012) examined the Analysis of Sweet Potato (*Ipomoea batatas* L.) Production in the Commune of Gogounou, Benin. The result showed that production of sweet potato is economically and financially profitable. Ogbonna *et al.* (2009) worked on Income and factor analysis of sweet potato landrace production in Ikom agricultural zone of Cross River state, Nigeria. The result showed that it was found that a profit of ₦2.71 was realized for each ₦1.00 invested in the production of the crop. The Cobb Douglas regression model results showed that costs of planting material and other inputs were positive and significantly related with gross return from Otere-two variety production. While human labour was found to have negative but significant relationship with gross return from Otere-two variety production. It was also found that factors like cost of fertilizer and transport cost were positive and negative but has no significant relationship with gross return from Otere-two variety production. Finally, it was found from the regression that the production of Otere-two variety of sweet potato by the farmers was decreasing suggesting that the production is within subsistence level.

Bose *et al.* (2020) opined that the challenges hindering sweet potato production are how/instability in market price; pest and diseases as well as poor/inadequate storage facilities, among others. In the work of Sanusi *et al.* (2016), the major production constraints were insufficient land (66%), insufficient labour (51%), pest and diseases (82%) as well as mechanization (98%).



MATERIALS AND METHODS

Offa is the second largest town in Kwara state, located in central Nigeria with geographic coordinates 8°9'N 4°43'E. With a population of about 120,100 inhabitants. The vegetation in Offa is savanna vegetation. Offa is well known for cultivation of sweet potatoes and maize which also formed part of the favourite staple foods of the indigenes in the town.

Sampling

Offa LG was purposively selected as it is the major sweet potato producing areas in the State. A two-stage sampling technique was used. In the first stage, 10 communities in Offa LGA were selected. While in the second stage 12 sweet potato farmers was randomly selected from each of the communities given a sampling size of 120 farmers for the study. Data collected were analyzed using descriptive statistics and budgetary technique.

The specific type of budgetary technique used was the gross margin analysis as well as the net farm income. The model is stated thus:

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

where;

GM = Gross Margin.

GI = Gross Income.

TVC=Total Variable Cost

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

where;

NFI = Net Farm Income.

GM = Gross Margin.

TFC = Total Fixed Cost

The model used for estimating net farm income can be expressed by the equation:

$$NFI = \sum_{i=1}^n P_{yi} Y_i - \sum_{j=1}^n P_{xj} Y_{ij} - \sum_{k=1}^k F_k \quad \dots(3)$$

where;

Y_i = Enterprise's Product(s) (where $i = 1, 2, 3, \dots, n$ products)

P_{yi} = Unit price of the product

X_j = Quantity of the variable inputs (where $j = 1, 2, 3, \dots, m$ variable inputs)

P_{xj} = Price per unit of variable inputs.

F_k = Cost of fixed inputs

$\sum$ = Summation (addition) sign

The total variable costs (TVC) include items like total cost of labour, herbicides, fertilizer, and seedlings. The total fixed cost (TFC) includes the depreciation on Irrigation equipment and the cost of renting land.

RESULTS AND DISCUSSION

The cost and returns of sweet potato production was calculated using farm budgeting. The variable cost consists of cost of seedling, pesticide, herbicide, fertilizer and labour while the fixed cost contains depreciated value of cost of irrigation and cost of land. The estimated costs and return for one hectare of sweet potatoes enterprises were ₦64,100.00 and ₦121,700.00, respectively (Table 1). Cost of labour had the highest share of 39.78% of total cost followed by seed cost (11.7%) and fertilizer cost (10.06%). Labour contributes the highest



share of the total cost. This could indicate that labour is an important input and may be attributed to frequent harvesting of sweet potato vines. It could also be an indication that most farm operation was done by labour under small-scale farming system while using little or no machinery equipment for the operations. The total variable costs and total fixed costs constituted 75.03% and 24.97% of the total cost of production, respectively, suggesting that the enterprise is flexible. This agrees with the findings of Baruwas (2016) on performance analysis of small-scale potato farms in Oyo State.

The profit margin percentage of 47.3% and return per capital outlay of 0.9 implied that for every ₦1 invested in sweet potato production enterprise there is a return of ₦0.90k to the enterprise and the operating cash expenses ratio of 39.5% implied that 39.5% of gross revenue was to cover the operating expenses. The benefit cost ratio (BCR) obtained was ₦1.89k implying that the enterprise is profitable even with little capital invested into it. It is therefore possible to have higher value of BCR with increased capita, skilled labour. A positive gross margin (₦73,600) and net farm income (₦57,600) was also obtained which indicates a profitable sweet potato production enterprise. This corroborates the work of Libago (2017) which stated that sweet potato production is a profitable enterprise. Bose *et al.* (2020) also reported a positive gross margin and net farm income in their work on profitability of sweet potato production in Niger State. The result thus, summarizes that with the values of all the performance indicator used, sweet potato enterprise could be said to be profitable, and profitability can still be increased under improved management practices.

Table 1: Farm Budgeting of sweet potato production per hectare

Inputs	Price/unit (₦)	Percentage of total cost
Variable inputs		
Seedling	7550	11.7
Pesticide	3100	4.83
Herbicide	5500	8.58
Fertilizer	6450	10.06
Labour	25500	39.78
Total variable cost	48100	75.03
Fixed Cost		
Irrigation	5500	8.58
Land	10500	16.38
Total fixed cost	16000	24.97
Total cost	64100	100
Revenue	121,700	
Gross margin	73600	
Net farm income	57600	
Profit margin (%) = NI/TR*100		47.3
Rate of return-on-investment RORI =		0.90
NI/TC		39.5
Operating expense ratio = TVC/TR*100		1.89
Benefit cost ratio = TR/TC		



CONCLUSION AND RECOMMENDATIONS

The study estimated the cost and returns of sweet potato production in Offa LGA of Kwara State. The result revealed that sweet potato production in the study area is very profitable. The profit margin percentage of 47.3% and return per capital outlay of 0.9 implied that for every ₦1 invested in sweet potato production enterprise there is a return of ₦0.90k to the enterprise. Also, an operating cash expenses ratio of 39.5% and BCR of ₦1.89k, implying a 39.5% of gross revenue covering the operating expenses and the enterprise is profitable even with little capital invested into it.

Given the profitability of sweet potato production in the study area, it was recommended that more land and resources be put into sweet potato cultivation. It is also suggested that sweet potato production be increased by empowering sweet potato farmers and mobilizing them to enable them acquire production resources necessary to expand their farmland, have easy access to planting material, fertilizer and labour inputs. Farmers, particularly youths should be encouraged into potato production as a little capital is required to be invested into it and could yield more income.

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