Factors Influencing Profitability Of Yam Production By Small-Scale Farmers In Anambra State, Nigeria

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Abstract: This paper analysed the factors affecting the profitability of yam production by small-scale yam farmers in Anambra State, Nigeria. Specifically, the paper described the socioeconomic features of yam farmers, estimated the profitability of yam production and assessed the factors that affected the profitability of yam production in the study area. Primary data were collected from a total of 50 yam farmers from two LGA in the State using purposive sampling technique. Data were analyzed using descriptive and inferential statistics such as mean, frequency count, percentages, profitability and multiple regression analyses. The paper revealed that yam production in the study area was marginally profitable; farm size, cost of fertilizer, cost of pesticides, sorting as well as transportation cost were the significant factors that affected the profitability of yam production in the study area. The study recommended that farmers could be encouraged to be more involved in the marketing of their tubers by sorting of the yam tubers into similar lots as this has been seen to increase profitability. Also, the cost of production in general and specifically costs of fertilizer and pesticides could be subsidized by the government in order to increase profitability.

Keywords: yam production, small scale, cost of production, profitability, factors.

I. INTRODUCTION

Yam (Dioscorea spp) is a premium crop in the Nigerian food system and also one of the major tuber crops in the economy in terms of land under cultivation as well as the volume and value of production (Bamire and Amujoyegbe, 2005). It is one of the major staple foods which is very valuable to the Nigerian household, can serve as livestock feed and also has potential for industrial starch production (Ayanwuyi et al., 2011).

There are over 600 species of yam worldwide but six species can be considered as the edible ones in the tropics. These are white yam (Dioscorea rotundata), yellow yam (D. cayenensis), water yam (D. alata), trifoliate yam (D. dumentorum), arial yam (D. bulifera) and Chinese yam (D. esculenta). Yam tubers are eaten boiled, roasted, fried and pounded and could be chipped, dried and produced into yam flour (Ayanwuyi et al., 2011).

The importance of yam as a crop in rural South Eastern Nigeria is more than its economic value. This is because considerable amount of ritualism has been attached with its production and utilization. Worthy of note is the fact that many important cultural values are attached to yam, especially during wedding and other social and religious ceremonies. In many farm communities in Nigeria and other West African countries, the size of the yam enterprise that one has is a reflection of the person’s social status. Its consumption is also relatively high in urban areas in spite of the competition from
other products like maize, cassava, rice and sorghum (Food and Agriculture Organisation (FAO), 2001; International Institute of Tropical Agriculture (IITA), 2001; Izekor and Olumese, 2011).

Nigeria is the world’s largest producer, producing about 38.92 million metric tonnes per annum and its production has more than doubled over the years (CBN, 2009; FAO, 2007; FAO, 2008). Nwosu and Okoli (2010) however attributed this increase in output more to the large area planted with yam than increase in productivity. Although Nigeria is the largest producer of yam in the world, there has however been a general decline in its production over the years (Idumah et al., 2014).

Yam production is confronted with myriads of problems which include high labour demand, sources of credit which are not reliable, menace of pests and diseases, declining soil fertility, haphazard weather conditions as well as inadequacy of planting materials (Tetteh and Saakwa, 1994; IITA, 2008). These problems had been adduced to lead to increasing cost of yam production which continue to force many farmers out of production (NRCRI, 2008), or reduce investment funds into yam farming resulting in an increase in demand over supply.

Though, yam’s significant contribution to the food security in the sub-region has been well documented (Maroya et al., 2014), however the need to quantitatively investigate the factors influencing the profitability of yam production in the study area becomes of utmost importance. Hence, this study described the socio economic features of yam farmers, estimated profitability associated with yam production, and examined the factors affecting the profitability of yam production in Anambra State.

HYPOTHESIS OF THE STUDY

H0: No factors affect the profitability of yam production.

II. METHODOLOGY

The study was carried out in Anambra State. A multi-stage sampling procedure was used for the study. Two LGAs namely Oyi and Anambra East were purposively selected because of their prominence in yam production. Thereafter, three towns were purposively selected from each of the two LGAs namely Njete, Umunya, and Akwusu in Oyi LGA; while Aguleri, Umuleri, and Umuoba-anam were selected from Anambra East. Finally, 25 yam farmers were randomly selected from each of the LGAs. Thus, a total of 50 yam farmers were sampled for this study. Primary data were collected using pretested structured questionnaire. Data on personal profile, educational background, problems encountered during production, storage and marketing were collected. Descriptive statistics were used to analyze socio-economic features of the farmers. Profitability analysis was used in analyzing cost and returns in yam production per hectare. Multiple regression analysis was used in determining the factors affecting the profitability of yam production. Using the ordinary least squares in estimating the regression model, four functional forms namely the linear, semi-log, double-log and exponential were tried out and the one that gave the best fit in terms of the magnitude of $R^2$, Adjusted $R^2$ and the significance of the overall regression as judged by the F-ratio and the significance of the individual coefficients was chosen.

The multiple regression model was implicitly stated as:

$$ Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, U) $$

Explicitly, the estimated function was:

$$ Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + U $$

Where; $Y =$ Profitability ratio

$X_1 =$ size of farmland

$X_2 =$ cost of seedling/yam sett

$X_3 =$ cost of staking

$X_4 =$ cost of harvesting

$X_5 =$ cost of fertilizer

$X_6 =$ cost of pesticide

$X_7 =$ cost of transportation

$X_8 =$ sorting

$U =$ error term.

Gross Margin is the difference between the Total Revenue (TR) and the Total Variable Cost (TVC). The net revenue or net profit is the difference between Gross margin and Total fixed cost or between Total revenue and Total cost.

III. RESULTS AND DISCUSSION

SOCIOECONOMIC CHARACTERISTICS OF THE RESPONDENTS

The socioeconomic characteristics of yam farmers directly or indirectly affected their farming operations as presented in table 1. The result revealed that majority of the yam farmers were mostly males (76.0%) and majority (88%) of about 50 years and above in age with their mean age of 61 years. This implies that the yam farmers in the study area were relatively old, more experienced, but this could pose a major problem for increased yam production and marketing as the youth were not much involved in yam production. This result is similar to Ike and Inoni (2006) who also reported that farmers in their study area were relatively old. Also, majority of the respondents (54%) were not educated which could make it difficult for adoption of new technologies for production and marketing of their output. The results further revealed that majority of the farmers (80%) were small sized farmers with mean farm size of 2.6 acres which is approximately 1 hectare with an average farming experience of 16 years. The average start-up capital for yam production in the study area was ₦31,800.00.

<table>
<thead>
<tr>
<th>Socioeconomic characteristics</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 – 39</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>40 – 49</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>50 – 59</td>
<td>17</td>
<td>34.0</td>
</tr>
<tr>
<td>60 – 69</td>
<td>16</td>
<td>32.0</td>
</tr>
<tr>
<td>Above 70</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>76.0</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>24.0</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not educated</td>
<td>27</td>
<td>54.0</td>
</tr>
</tbody>
</table>
The Ordinary Least Squares (OLS) regression analysis was carried out to determine factors which influence the profitability of yam production in the study area. The results of the estimations are presented in Table 3. The linear functional form was found to be the lead equation of the regression.

The regression results were significant at 1% level and coefficient of determination (R²) was 0.9835 with an adjusted R² of 0.9803. This implies that the included variables were able to explain about 98% of the total variations for the determinants of the profitability of yam production. The F-ratio was 312.34 and is significant at 1% level, implying that the joint effects of all the included variables were significant.

The result revealed that five out of the eight variables included in the model were significant. The coefficient of farm size was negative and significant at 0.001 (1%) levels which indicate an increase in the profitability of yam as the size of farm decreases. This means that as the farm size increases, the cost component of the profitability index increases or the benefit component reduces. Either way, the farmers would not be interested in investment in yam production. This result is however different from the results of Anigbogu, Agbasi and Okoli (2015) and Maikasuwu and Ala (2013) who analysed the relationship between farm size and output and got the results that showed positive significance. Whilst their analyses focused on productivity, the profitability index revealed more information about the concept of costing which farmers consider before making investment decisions. The coefficient of the variables of cost of fertilizer was negative and significant at 0.015 (5%) levels suggesting an increase in yam profitability as the cost incurred in using fertilizer decreases and vice versa. The possible reason for this is that as cost incurred in fertilizer decreases, farmers would be able to use the extra fund for other profitable farming activities. This result is also contrary to Maikasuwu and Ala (2013) whose result showed positive significance because productivity was their focus. The coefficient of cost of pesticide was positive and significant at 0.030 (5%) levels suggesting an increase in profitability as cost of pesticide increases. This is so because once the pests that affect yam have been destroyed, yam would grow well which would hence translate to better yield and more profit. The coefficient of transportation cost was positive and significant at 0.000 (1%) levels suggesting an increase in profitability as transportation cost increases. This could be adduced to the fact that the yam marketing

### FACTORS AFFECTING PROFITABILITY OF YAM PRODUCTION

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commands higher prices away from the production sites. The coefficient of sorting was positive and significant at 0.002 (1%) levels. This indicates an increase in profitability as sorting increases. This is because sorting helps in separating the yam tubers of similar sizes for better and higher pricing.

The results in table 3 showed some of the factors that influenced the profitability of yam production in the State.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Standard error</th>
<th>t</th>
<th>Significant level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm size</td>
<td>-1.554592</td>
<td>0.3248227</td>
<td>-4.79</td>
<td>0.000</td>
</tr>
<tr>
<td>Cost of seedling</td>
<td>-8.76E-08</td>
<td>2.76E-07</td>
<td>-3.2</td>
<td>0.075</td>
</tr>
<tr>
<td>Cost of staking</td>
<td>7.59E-06</td>
<td>0.075E-06</td>
<td>0.28</td>
<td>0.038</td>
</tr>
<tr>
<td>Cost of harvesting</td>
<td>2.56E-06</td>
<td>2.14E-06</td>
<td>1.20</td>
<td>0.237</td>
</tr>
<tr>
<td>Cost of fertilizer</td>
<td>-0.00000256</td>
<td>0.00000101</td>
<td>-2.5</td>
<td>0.015</td>
</tr>
<tr>
<td>Cost of pesticide</td>
<td>0.0000813</td>
<td>0.0000361</td>
<td>2.25</td>
<td>0.030</td>
</tr>
<tr>
<td>Transportation cost</td>
<td>9.83E-06</td>
<td>2.60E-06</td>
<td>3.78</td>
<td>0.000</td>
</tr>
<tr>
<td>Sorting</td>
<td>0.0000581</td>
<td>0.0000178</td>
<td>0.00</td>
<td>0.252</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.9935</td>
<td>0.9903</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>312.34***</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Data Analysis, 2017

Table 3: Factors influencing profitability of yam production in Anambra State, Nigeria

IV. CONCLUSION AND RECOMMENDATIONS

This paper investigated the factors influencing the profitability of yam production by small scale yam farmers in Anambra State, Nigeria. From the findings, it was revealed that majority of the yam farmers were males and relatively old and uneducated (54%). Also, yam production in the study area was profitable but marginal as also revealed by the profitability index. The key factors that affected yam production in the study area were farm size, cost of fertilizer, cost of pesticides, transportation cost and sorting. Farmers could be encouraged to be more involved in the marketing of their tubers by engaging in sorting the tubers into similar lots as this would increase profitability. Finally policy interventions aimed at encouraging production of yam through subsidising the costs of fertilizer and pesticides by the government could improve the profitability of the enterprise.

REFERENCES


