



Production efficiency of yam producers in Oyo State, Nigeria

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Abstract

The study was undertaken to examine the production efficiency of yam producers in Iseyin Local Government Area of Oyo State, Nigeria. Specifically the study described the socio-economic characteristics of yam producers; estimate the technical efficiency level of yam production; determine the profitability status of yam production and identify the major problems associated with yam production in the study area. Primary data were collected from ninety (90) yam farmers. Descriptive statistics, stochastic production frontier function and profitability (gross margin) analysis, were used as analytical tools. The empirical results indicated that area cultivated with yam, planting materials and fertilizer were the major factors that influenced changes in yam output. Farmer-specific demographic variables such as age, marital status, household size, education level and farming experience were found to have significant effects on the observed variation in technical efficiency among the yam producers. The technical efficiency of farmers varied from 0.058 to 1.00 with a mean of 0.718. The implication of the study is that efficiency in yam production among the farmers could be increased by 28.2% through better use of land, planting materials and fertilizer in the short term given the prevailing state of technology. The cost and returns analysis showed that yam production was profitable in the study area with the average income of N2, 564,666.67 and a mean gross margin of about N1, 539, 914.21 with the income expenditure ratio of 2.5. The result suggests that farmers could increase output through more intensive and efficient use of available resources (land, planting material and fertilizers) given the current state of technology. Farmers should be encouraged to keep records also, they should be taught the recommended quantities of agrochemicals and improved seed to use on their farms in order to achieve optimum yield. This will help the farmers to make better farm plans in the future so as to increase output as well as profit.

Keywords: technical efficiency, income, expenditure, technology, yam production

Introduction

Depending on the country, the term "yam" is used to embrace many tubers, including the sweet potato. Yams were successfully grown in Europe to relieve the distress caused by the potato famine of the 1840s, but it never became very popular. Yam is the common name applied to plants of about 500 species of the genus *Dioscorea* of the *Dioscoreaceae* family. The yam plants are climbing perennial vines with heart-shaped leaves. Underground tubers vary in size and shape, averaging 3-8 pounds but sometimes reaching 60 pounds or more. Aerial tubers may develop in the axils of the leaves, especially when vines run on the ground. The species occur rather abundantly in tropical and subtropical regions of the world. Several species occur here in Florida and in temperate regions as wild plants (Stephens, 2009) [27].

Yam (*Dioscorea spp*) is among the oldest recorded crop (Orkwor, *et al.* 1998) [21]. Apart from cereals, yam is the most important staple food in West Africa. Yam is a highly valued staple food crop in Nigeria, with the bulk of it consumed boiled or pounded. The common species grown in the country are *Dioscorea rotundata* (white yam) and *Dioscorea alata* (water yam). The crop is of great nutritional and economic importance to mankind. The tuber can be eaten boiled,

roasted, fried, mashed or pounded (Osunde 2008) [22]. It is also acknowledged to provide some 200 calories of energy per capita daily in Nigerian and West African diet. It is one of the principal tuber crops in Nigeria economy, in terms of land under cultivation and in the volume and value of production (Bamidele and Amujoyegbe, 2005) [6]. World yam production amounted to 30 million tons annually and 90% are grown in the yam production regions of West Africa (FAO 2002) [9].

Yam production in Nigeria has more than tripled over the past 45 years from 6.7 million tonnes 1961 to 39.3 million in 2006 (FAO, 2007) [10]. This increase in output is attributed more to the large area planted with yam than increase in productivity (Nwosu and Okoli; 2010). Though the cultivated area to yam increased production, growth rate declined tremendously, from the average of 27.5% between 1986 and 1990 to 3.5% in the 1996 to 1999 periods (Ekunwe *et al.* 2008) [8]. Amegbeto and Asiedu (2000) [3] reported that, the international trade of yam originated from Jamaica as the leading exporter in Central America, Brazil leads in South America while Japan leads the production in Asia. The dominant yam production zones stretches from Cote d'ivoire through Ghana, Togo, Benin, Nigeria, Cameroon, Gabon, Central African Republic and the Western part of the democratic republic of Congo.

Ethiopia and Sudan are the major yam producers in East Africa.

Efficiency in the use of available resources determines the output realized in the business venture. It is achieved by maximizing the production inputs and ensuring that wastes are significantly minimized. Efficiency is concerned with the relative performance of the processes used in transferring given input into outputs. Measurement of farm efficiency via frontier approach has been widely utilized and studied. The term frontier involved the concept of maximality in which the function sets a limit to the range of possible observations (Forsund *et al.*, 1980)^[13]. The observation of points below the production frontier for firms producing below the maximum possible output can occur, but there cannot be any point above the production frontier given the available technology. Deviations from the frontier are attributed to inefficiency.

In Nigeria, yam is becoming more expensive and relatively unaffordable in urban areas as production growth has not kept pace with population growth leading to demand exceeding supply (Kushwaha and Polycarp, 2001)^[15]. Production of yam in Nigeria is believed to be constrained mostly by high cost of seed. In spite of the tremendous importance attached to the yam, in the West African Sub-region, the crop has hitherto been neglected in policy decisions related to research, production and marketing (Babaleye, 2003)^[5]. According to Laudia and Olajide (2012)^[16], the production of yam in Nigeria is grossly inadequate and cannot meet the ever increasing demand under present level of input use. In order to meet the level of demand there is a need to assess the resource use efficiency and its determinants among yam producers.

Iseyin Local Government Area in Oyo State is located in one of the yam producing areas in Nigeria. Over time, farm productivity has begun to decline and this has affected the production of yam in virtually all the yam producing areas in Nigeria. The decline in productivity could be due to decline in the unit output from the various agricultural inputs. These are capital, land, labour and management. Also, there are likely constraints in yam production that would have significant effect on overall yield (Ekunwe *et al.*, 2008)^[8]. Such constraints would include factors such as soil fertility decline, soil borne pest and diseases, inadequate planting materials, high cost of labour, labour intensive operations and the marketing of the product. A recent study by Scott, *et al.*, (2000)^[26] on yam has shown that the absolute level of production in West Africa and the world globally have remained static for the last three decades. This static or declining trend may not be unconnected with productive resources, which are not being efficiently utilized, leading to low productivity (Fasasi, 2006)^[11]. Inefficient resource allocation could limit the level of returns to an enterprise and in turn affect its attractiveness for resource allocation (Ajijola *et al.*, 2014)^[2]. Parikh and Mirkalam, (1995)^[23], in a study carried out discovered that inefficiency in developing country agriculture is as a result of the subsistence needs, socioeconomic and demographic characteristics of the farmers. According to him, other factors are experience, accessibility to information, supervision contact and credit availability to the farmers.

The most recent food crisis in Nigeria needs serious attention most especially problems affecting the production of staple

food crops. Although, some research work on efficiency have been done by other researchers from different areas in Nigeria. For instance, Ayinde, *et al.*, (2005)^[4] examined insecticide use efficiency in cowpea production in Kano and Ogun States. The application of stochastic frontier production function in efficiency analysis has been employed by Battese and Coelli (2004)^[7], Umoh (2006)^[28], to mention a few. However, little or no work has been done on the resource use efficiency of yam production in Iseyin Local Government Area of Oyo State, Nigeria. It has thus, become necessary to know the existing efficiency level of farmers in using the inputs to increase yam production up to the maximum level.

This study examines the importance of yam in the socio economic life of yam farmers in the study area. It intended to promote regional crop specialization and gives baseline information for decision making. It also intended to identify the causes for the decline in the growth rate in yam production in the study area and the problems farmers are faced with and how they affect their levels of productivity, amongst others. This research focused on resource-use efficiency in yam production with a view to making some comparison. It is expected that the findings would help in providing solutions to the declining productivity and yield of yam per hectare and encourage yam producers to export some of their produce.

Objectives of the Study

The broad objective of the study is to examine the resource use efficiency in yam production in Iseyin Local Government Area in Oyo State. The specific objectives of this study are as follows:

To estimate the technical efficiency level of yam production; and determine the profitability status of yam production in the study area.

Research Methodology

Study Area

The study was carried out in Iseyin Local Government Area of Oyo State. Iseyin Local Government Area is one of the Local Government Areas that constitute Oke-Ogun Region of Oyo State. Iseyin Local Government Area geographically lies between Latitude 7°57'N and 8°17'N with longitude 2°45'E and 3°37'E. Iseyin Township is approximately 100 Kilometers north of Ibadan. It shares boundaries with Ojogbodu, Kajola, Ifedapo and Ibarapa Local Government Areas of Oyo State. Agriculture is the main occupation in this area and some of the food crops cultivated include; maize, okro, yam, cassava and various leaf vegetables. Their secondary occupations are trading, craftworks, soap making, gaari and oil palm processing (Oladeji *et al.*, 2006)^[18].

Data Sources and Types

Study Data were collected from both primary and secondary sources. Information on the resource sources, quantity of resources used, input and output quantities, cost of input and income from output were collected through the use of well-structured questionnaire and interview were done for respondents who are illiterates. The secondary data were sourced from textbooks, periodicals, journals, internets and other relevant sources.

Sampling Technique

A Two stage sampling technique was adopted in selecting the yam farmers to be sampled in the study area. The first stage was a random selection of 9 communities where yam farmers are prominent. The second stage involved the random selection of 10 yam farmers from each of the communities selected in Local Government Area making a grand total of 90 yam producers sampled.

Methods of Data Analysis

Both descriptive and inferential statistics were used to analyse the data from this study. Descriptive statistics such as (Mean, Standard deviation, frequency counts and percentages) were used to analyse the socio-economic characteristics of the yam farmers in the study area. The stochastic frontier production function was used to analyse the efficiency of inputs used in the production of yam in the study area. A production frontier is defined in terms of the maximum output that can be achieved from a set of inputs given the technology available to the farm. The production technology of the farmers was specified by the Cobb-Douglas frontier production function defined by Coelli (2004)^[7] as:

$$\log Y = \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + (V_i - U_i)$$

Where:

Log = Natural logarithm

Y = Quantity of yam produced in kg ha-1

X1 = Area cultivated with yam (ha)

X2 = Planting materials (seed yam) kg ha-1

X3 = Labour (man-days ha-1)

X4 = Fertilizer (kg ha-1)

β_s = Regression coefficients

V_i = Random variables which are assumed to be independent of U_i , identical and normally distributed with zero mean and constant variance $N(0, \sigma^2)$.

U_i = Non-negative random variables which are assumed to account for technical inefficiency in production and are often assumed to be independent of V_i such that U is the non-negative truncated (at zero) of half normal distribution with $|N(0, \sigma^2)|$.

The inefficiency of production, U_i was modeled in terms of the factors that are assumed to affect the efficiency of production of the farmers. Such factors are related to the socio-economic variables of the farmers. The determinants of technical inefficiency are defined by Coelli (2004)^[7]:

$$\mu = \delta_0 + \delta_1 Z_{1i} + \delta_2 Z_{2i} + \delta_3 Z_{3i} + \delta_4 Z_{4i} + \delta_5 Z_{5i} + \delta_6 Z_{6i}$$

Where:

μ = Technical inefficiency

Z1 = Sex (1= male; 0 otherwise)

Z2 = Age (years)

Z3 = Marital status (1 = married; 0 otherwise)

Z4 = Family size (number)

Z5 = Educational level (years spent in school)

Z6 = Farming experience (years)

δ = Inefficiency parameters

These variables are assumed to influence technical efficiency of the farmers. The gamma ($\gamma = \delta_u^2 / \delta^2$) which is the ratio of the variance of U (δ_u^2) to the Sigma squared (δ^2) which is a summation of variances of U and V ($\delta_u^2 + \delta_v^2$) were also determined. The Maximum Likelihood Estimate Method using the computer FRONTIER version 4.1 was used to estimate the parameters of the Stochastic Frontier Production Function (Coelli, 1994).

Profitability Status of Yam Production

The farm budgetary technique, as used by Olukosi and Erhabor, (2005)^[20], stated that the gross margin is the difference between gross farm income and the total variable cost of production. It was used in this study to estimate the profitability level of yam production in the area. This tool was used because in subsistence farming the fixed cost is assumed to be negligible (Olukosi and Erhabor, 2005)^[20].

The model is specified as:

$$GM = TR - TVC$$

$$NFI = GM - TFC$$

Where:

GM = Gross Margin per hectare (N)

GI = Gross Income per hectare (N)

TVC = Total Variable Costs per hectare (N)

NFI = Net Farm Income per hectare (N)

TFC = Total Fixed Costs per hectare (N)

The results of the budgetary analysis was used to obtain the following ratios.

$$\text{Income Expenditure Ratio} = \frac{TR}{TC}$$

$$\text{Gross Ratio} = \frac{TC}{TR}$$

$$\text{Percent Profit} = \frac{NFI}{TC} \times 100$$

$$RRVC = \text{Rate of Return on Variable Cost} = \frac{TR}{TVC} \times 100$$

Results and Discussion

Socio-economic characteristics of yam producers

Socio-Economic Status (SES) usually refers to components of economic and social status that distinguished and characterized people. Indicators of SES are meant to reflect variation in the access to and the use of opportunities that present themselves.

Table 1: Socio-Economic Characteristics of the Respondents

Variable	Frequency	Percentage
Age (years)		
30 - <40	10	11.1
41 - <50	31	34.4
51 - <60	35	38.9
> 60	14	15.6
Sex		
Male	78	86.7
Female	12	13.3
Education		
No formal education	27	30.0
Primary education	37	41.1
Secondary education	26	28.9
Household Size (members)		
1 - <4	20	22.2
5 - <8	50	55.6
9 - <12	12	13.3
> 12	8	8.9
Religion		
Christianity	33	36.7
Islam	49	54.4
Traditional	8	8.9
Marital Status		
Single	5	5.6
Married	75	83.3
Divorced	5	5.6
Widow	4	4.4
Separated	1	1.1
Farm Size (hectares)		
1.0-<4.0	16	17.8
4.1-<8.0	41	45.6
8.1-<12.0	27	30.0
>12.0	6	6.7
Farm Experience (years)		
1 - <10	23	25.6
11 - <20	42	46.7
21 - <30	19	21.1
31 - <40	4	4.4
41 - <50	2	2.2
Total	85	100

Source: Field Survey, 2017

Age is an important factor that affects level of productivity and level of productivity has strong link with the profitability. Data in Table 1 revealed the age categorization of respondents. 11.1% of the respondents fall below the age of 40 years while 15.6% are above 60 years. The mean age was 52.7 years revealing that majority of the farmers are quiet mature. The implication of this is that most of the farmers were adult with much energy and as such could be so efficient in their farming activities, hence their output or productivity will be quite high, compared to that of the old- age because the adult are still vibrant and has energy to cope with stress of farming.

Sex has been found to influence access to productive resources (Yahaya *et al.*, 2011) ^[29]. Data in Table 1 also showed the distribution of the yam farmers according to their sex. The findings revealed that 86.7% of yam farmers were

male while 13.3% were female. This could be attributed to the energy demanding activities involved in yam production which require men who are naturally endowed with abundant strength necessary for such jobs.

Education is of great importance in decision making. It can indirectly influence the respondents' understanding of farming dynamics and ways to maximize gains. The finding revealed that 30.0% of the farmers had no formal education, 41.1% had primary education, while 28.9% had secondary education. The educational level is expected to have a positive influence on the adoption of improved technologies such as farm mechanization, which would have high potentials to increase farm productivity.

Household size may determine the family labour at the disposal of a yam farmer. The table also revealed that 22.2%

of the respondents had household size below 5, 55.6% of the respondents had household size between 5-8, while 13.3% of the respondents had households size between 9-12 and 8.9% of the respondents had household size above 12 persons. The implication is that as the household size become larger, the efficiency could increase because what needed to be done on the farm was done on time since large household size increases the opportunity for family labour usage. Analysis of the religion of the farmers revealed that majority (54.4%) of the respondents practised Islam as religion while 36.7% of them were Christians and only 8.9% practiced traditionalism. This implies that yam farmers in the study area are dominated by Muslims.

Marital status is expected to influence respondents' level of responsibilities which could have positive or negative influence on their disposition to economic activities. The marital status of the respondents showed that 83.3% of yam farmers were married, only 5.6% were single and divorced while 4.4% were widow and 1.1% were separated. The very high percentage of the married yam producers can be attributed to the fact that respondents required helping hands to carry out the processes of yam production.

Farm categorization is justified only in the context of the particular environment. The distribution of respondents on the basis of farm size shows that 75.6% of the respondents had farm size ranges from 4.1 - 12ha, while only 6.7% had farm size above 12ha. The mean farm size cultivated was 8.27ha. The result implies that most of the farmers in the study area had relatively small farm holdings and hence were small scale farmers. This result lends further credence to an assertion by Olawepo (2010) [19] that over 90% of the country's local food production comes from small scale farms and about 60% of the population earns their living from small farms which are usually of the size of about 0.10-5.99 ha.

The farming experience of respondents showed the number of years the farmers had been into yam production. Farming experience is used as a measure of management ability, the more experienced the farmer is, the more his ability to make farm decision. 46.7% of the respondents had farming experience ranges from 11-20 years as the highest percentage while the lowest percentage 2.2% had farming experience above 40 years. There could be increase in yam production as the average farming experience was 18.3 years. This result showed that most of the farmers had experience, implying that such farmers are likely to make decisions that would increase their output.

Resource use efficiency of yam production

The Maximum Likelihood Estimates (MLE) of the resource use efficiency of yam production is presented in Table 2. The variance parameters, sigma-square (δ^2) and gamma (γ) were significant at 1% and 5% respectively. The sigma-square attests to the goodness of fit and correctness of the distributional form assumed for the composite error term while the gamma indicates the systematic influences that are unexplained by the production function and the dominant sources of random errors. The inefficiency variables were specified as those relating to farmers' socio-economic characteristics. The estimated coefficient of the inefficient function provides some explanation for the relative efficiency levels among individual farmers. Since the dependent variable of the function represents inefficiency, a positive sign of an estimated parameter implies that the associated variable has a negative effect on efficiency and a negative sign indicates the reverse.

The production function estimates indicated the relative importance of factor inputs in yam production. From the results, all except labour had the expected positive sign. This suggested that more output of yam would be obtained from the use of additional quantities of these variables, *ceteris paribus*. The estimated coefficient of area cultivated with yam was positive and significant ($P \leq 0.01$). This is in line with the finding of Umoh (2006) [28]. The significance of the variable could be attributed to its importance in crop production in the sense that its shortage would not only have a direct negative effect on production but also an indirect negative effect on output by reducing the marginal productivity of non-land inputs. The coefficient of planting materials was positive which conforms to *a priori* expectation and significant ($P \leq 0.01$). This indicated that higher planting material rate would result in high yam population and subsequently higher yield except where there is overcrowding leading to competition of available nutrients which will consequently lead to lower yield. Fertilizer input was positive as expected and significant ($P \leq 0.01$). This implied that fertilizer was a significant factor that influences change in the output of yam. The significance of the fertilizer variable derives from the fact that it is a major land augmenting input in the sense that it improves the productivity of land thus leading to increased yield.

Table 2: Maximum likelihood estimates of Cobb-Douglas frontier production function

Variable	Parameter	Coefficient	Standard-error	T-ratio
Constant	β_0	2.8895	1.9397	1.4896
Area cultivated with yam	β_1	4.5562***	0.7574	6.0153
Planting materials	β_2	7.6661***	1.4322	5.3525
Labour	β_3	-0.4300	0.2987	-1.4395
Fertilizer	β_4	3.4029***	0.3773	9.0183
Inefficiency variables				
Constant	δ_0	-2.1195	2.4976	-0.8486
Sex	δ_1	0.0197	0.0674	0.2927
Age	δ_2	-12.2620***	1.0956	-11.1925
Marital status	δ_3	-0.4267**	0.1854	-2.3013

Family size	δ_4	5.3030***	0.7467	7.1023
Educational level	δ_5	-3.2650***	0.2236	-14.6031
Farming experience	δ_6	0.6124*	0.3687	1.6608
Sigma-squared	δ^2	0.2635***	0.0398	6.6192
Gamma log likelihood function	γ	0.0100**	0.17128988E+03	0.0045

*** implies sig at 1%, and ** implies sig at 5%.

Source: Field Survey, 2017

Age was found to be statistically significant at 1% and also contributed negatively to farmers' inefficiency. This implies that as the yam farmers' grow older, their respondents' efficiency increases. Marital status coefficient was also negative and statistically significant at 5% level implying that it has the effect of reducing the farmers' technical inefficiency. Household size exhibited positive sign to inefficiency and statistically significant at 1%. This implies that production increases when farmers employed their families to participate in farming activities, thus decreasing the cost of hired labour and consequently increases return.

The coefficient for educational level of respondents was negative and significantly related to technical inefficiency at 1% level of significance. This implies that farmers with more years of education tend to be more technically efficient in yam production. The reason may be that educated farmers are more receptive to improved farming techniques. This result agreed with the findings of Pius and Odjuvwuederhie (2006), Ekunwe *et al.* (2008)^[8] and Ojo *et al.* (2009)^[17]. The result asserted that more years of formal education is imperative to better understanding and adoption of new technology. Furthermore, educated farmers are expected to be more receptive to improved farming techniques and therefore should have higher level of technical efficiency than farmers with less education (Ajibefun and Aderinola, 2003)^[1].

The positive coefficient of experience which was significant at 10% level indicates that any increase in years of experience increases inefficiency. This indicates that more experienced farmers tend to be less inefficient in yam production in the study area. This conforms to the findings of Ajewole and Folayan (2008).

Yam farmers' technical efficiency indices

The estimated technical efficiency (TE) indices of the yam farmers in the study area are presented in Table 3. The distribution showed a high technical efficiency variation among the respondents. The technical efficiency indices of the respondents ranged from 0.058 to 1.000 with a mean of 0.718. The average technical efficiency index of 0.718 suggests that an average yam farmer in the area still has the capacity to increase technical efficiency in yam production by additional 28.2% to achieve the maximum possible level. It therefore shows that there is efficiency gap but with scope for improvement in yam production among yam farmers in the study area. These results compare favourably with the findings

of Ekunwe *et al.* (2008)^[8] and Ojo *et al.* (2009)^[17] that observed efficiency gap from the optimum efficiency level among yam farmers in Nigeria and with scope for increased efficiency.

Table 3: Distribution of technical efficiency indices among yam farmers in study area

Technical Efficiency Range	Frequency	Percentage
0.00-<0.10	1	1.1
0.21-<0.30	2	2.2
0.31-<0.40	6	6.7
0.41-<0.50	15	16.7
0.51-<0.60	14	15.6
0.61-<0.70	7	7.8
0.71-<0.80	6	6.7
0.81-<0.90	6	6.7
0.91-<1.00	33	36.7
Total	90	100.0
Mean 0.718		
Minimum 0.058		
Maximum 1.000		

Source: Field Survey, 2017

Profitability Level of Yam Production

Profitability measures of yam production with respect to the Gross Margin and the Net Returns estimated for this study are reported in Table 4. With the annual gross margin (GM) and net farm income (NFI) of N1,627,389.30 and N1,539,914.21 respectively. The result therefore implies that yam production in the study area is a profitable venture. The Income Expenditure Ratio, Gross Ratio, Percent Profit and Rate of Return on Variable Cost were computed as 2.5, 0.4, 150.27% and 273.63% respectively. The Income Expenditure ratio, Gross ratio, Percent profit and Rate of Return on Variable Cost were also favourable showing that yam production in the study area is profitable. The cost ratio showed that every N1 a farmer invested on yam production would yield N2.5 as revenue or gain of N1.5k on each naira expended, which further confirms the profitability of yam production in the study area. This study further supported the findings of Reuben and Baran (2012)^[25]; Ibitoye and Onimisi (2013)^[14] and Fatuase, *et al.* (2015)^[12]: who stated that Yam production is a profitable enterprise in the previous studies conducted in South Western Nigeria, Edo, Taraba, and Kogi States, Nigeria respectively.

Table 4: Returns to yam farming per year

Variables	Calculated values (mean)	
Total Revenue (TR)		2,564,666.67
Hired labour	720,200.00	
Family labour	1,555.56	
Variable implements used	9,397.73	

Fertilizer	97,314.61	
Herbicides	10,033.33	
Insecticides	98,776.14	
Total Variable cost (TVC)		937,277.37
Total Fixed cost (TFC)		87,475.09
Total Cost (TC = TVC+TFC)		1,024,752.46
Gross Margin (GM = TR – TVC)		1,627,389.30
Net Farm Income (NFI = GM – TFC)		1,539,914.21
Income Expenditure ratio (TR/TC)	2.50	
Gross ratio (TC/TR)	0.40	
Percent profit (NFI/TC * 100)	150.27%	
Rate of Return on Variable Cost (RRVC)	273.63%	

Source: Field Survey, 2017

Major problems associated with yam production

The finding showing the constraints in yam production is presented in Figure 1. This result shows that high cost of labour constituted the major problem (82.2%) of yam production in the study area. This was followed by lack of effective management (74.4%). 42.2% of the yam farmers were constrained by high cost of fertilizer. While a good number of farmers, (41.1% and 40.0%) faced the problem of

low capital and pest. The result suggests that, the problems of yam farmers were those of inadequate supply of inputs, including; inadequate knowledge of new farming techniques, storage, improved varieties of yam, capital, and a host of others. Generally, appropriate technology induces increase in the production of staple food by reducing the cost and increasing returns of producers while consumers ultimately benefit through low and stable food prices.

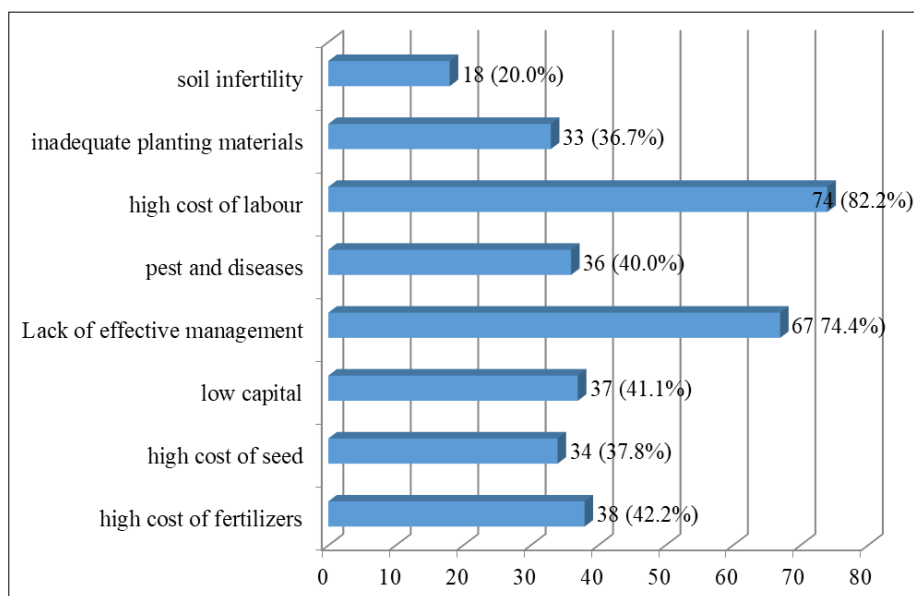


Fig 1: Distribution of yam farmers by problems faced in yam production

Conclusion and Recommendations

In conclusion, the study was designed to investigate resource-use efficiency in yam production in Oyo State. Specifically, the study described the socio-economic characteristics of yam producers; estimate the resource use efficiency level of yam production; determine the profitability status of yam production and identify the major problems associated with yam production in the study area. The socio-economic characteristics had significant effect on the yam farmers' technical inefficiency. Few of the sampled respondents operated at the maximum efficiency level indicating that there was efficiency gap hence there is still scope for improvement in yam production in the study area. The attainment of an average technical efficiency of 71.8% indicated that efficiency of the farmers could be increased by about 28.2% to attain maximum possible output to bridge the efficiency gap in the

usage of farm inputs employed by yam producers in the study area. Based on the findings, it is recommended that increase productivity and improvement in their resource efficiency can be achieved by addressing the factors responsible for the inefficiency. These include a more intensive use of land, increased use of planting material and fertilizer input given the prevailing state of technology. The farmers should be encouraged to increase their yam production by making available improved and disease free varieties of yam sett at affordable price.

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