Resource Use Efficiency of Yam Production in Ekiti State, Nigeria.

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Abstract

The study examined the resource use efficiency of yam production in Ekiti State, Nigeria. Multistage sampling techniques were used to select 120 respondents and were interviewed using a well structured questionnaire. The study described the socio-economic characteristics of the farmers; indentify the system of land ownership and the constraints that yam farmers faced; and analyze the technical efficiency of the farmers. Descriptive statistics such as; frequency counts, mean and percentage was used while the inferential statistics used to estimate technical efficiency was stochastic frontier function. The findings revealed that the study area is dominated by male, married, experienced and small holder farmers with almost secondary school level of education. The mean and maximum technical efficiency was 0.87 and 0.99 respectively thus showing a high level of how yam farmers are technically efficient in the study area. The study recommended that government should provide adequate extension and supportive services with a view to improving farming techniques with technological innovation and farm inputs should be made available at highly subsidized rates through adequate and efficient distribution to the farmers.

Keywords:- Resource, Efficiency, Yam, Production, Ekiti.

INTRODUCTION

Nigeria's socio-economic history and development has been very closely tied to its agricultural sector (Egbuna, 2008). Agriculture holds the key to rural development, poverty alleviation and overall economic development (Oluwafemi et al., 2010). The sector accounted for about 31-42% of Gross Domestic Product (GDP) between the year 2005 and 2008. In addition, it provided paid and self employment for over 70% of the nation's population (Nigerian Export Promotion Council (NEPC), 2009). The Food Crop Sub-sector (with maize, sorghum, millet, rice, yam, cocoyam and cassava as the main food crops grown in the country) contributed about 28% to GDP representing about 75-76% of the share of the agricultural sector's contribution to GDP (CBN, 2012).

Root and tuber crops comprise crop covering several genera. They are staple food crops, being the source of daily carbohydrate intake for the large populace of the world. The term root and tuber crop refers to any growing plant that store edible materials in the subterranean root, corm or tuber (Oke, 1990). Yam is a member of this important class of food.

Yams (Dioscorea spp) are annual or perennial tuber-bearing and climbing plants with over 600 species out of which six are economically important in terms of food and medicine (IITA, 2007). Yam belongs to the genus "Dioscorea" and family "Dioscoreaceae". It is an important tuber crop of the tropics. Yam is a tropical crop with many species, which originated from South East Asia and was brought to West Africa in the 16th century. It is one of the principal tuber crops in the Nigeria economy, in terms of land under cultivation and in the volume and value of production (Bamire and Amujoyegbe, 2005). FAO (2002) reported that Nigeria accounted for about 71% (26 000 000 tons) of the total world production of yam harvested from 2,760 ha. Yam production in Nigeria has more than tripled over the past 45 years from 8.7 million tons in 1961 to 31.3 million tons 2006. This increase in output is attributed more to the large area planted to yam than to increased productivity (Izekor and Olumese, 2010). Though the area cultivated to yam production is still being increased, production growth rate declined tremendously from average of 27.5% between 1986 and 1990 to 3.5% in the period between 1991 and 1999 (FAO, 2002). However, between 2001 and 2006 production growth rate increased by 31.3%. Record of yield showed similar trend during the same period. Average yield per hectare dropped from 14.9% between 1986 and 1990 to 2.5% in the period between 1991 and 1999. However, the period between 2001 and 2006 recorded 23.4% increase in the average yield (Izekor and Olumese, 2010).

On the basis of quantity of root and tuber crops produced in Nigeria, yam ranks second to cassava. Yam is the perfect staple food appreciated in its state and cultural role. It is a major source of energy in diet of Nigeria people. Yam can be eaten when boiled, roasted, baked or fried. It can also be processed into crude flour by drying thin slices in the sun and then pound or ground into flour. Yam can further be processed into instant flakes producing a food similar to instant potato and can also be made into fried chip. Most of starch industries also make use of yam as one of their important raw materials. It provides job opportunities and income to both the producers and the marketers. Yam peels serve as feed for livestock and as a good component of farm yard manure. It is used as laboratory crop for scientific investigations.

According to Okenwe, Orewa and Emokaro (2008), yam contains a high value of protein (2.4%) and substantial amount of vitamins and minerals than some other common tuber crops. It is also comparable to any starchy root crops in energy and the fleshy tuber is one of the main source of carbohydrates in the diet of most Nigerians. Yam also plays vital roles in traditional culture, rituals and religion; as well as local commerce of African people (Izekor and Olumese, 2010). Medicinally, yam tubers are used for various traditional medicines in China, Korea and Japan (USDA, 2009). It contributes more than 200 dietary calories per capita daily for more than 150 million people in West Africa and also an important source of income generation and trade (Reuben and Barau, 2012).

The study of efficiency in agriculture is based or found on certain economic theories. These theories serve as the framework for this study.

The production function stipulates the technical relationship between inputs and output in the production process (Olayide and Heady, 1982). The modern theory of efficiency dates back to the pioneering work of Farrel (1957), who drew extensively from the earlier works of Debreu (1951) and Koopmans (1951) to define a simple measure of firm efficiency, which could account for multiple inputs. Farrel identified two components of firm efficiency as technical and allocative efficiencies and the combination of these two components provides a measure of economic efficiency (Udoh, 2005). Technical efficiency, the main issue in this study can be

measured either as input conserving oriented technical efficiency or output expanding oriented technical efficiency. Output expanding oriented technical efficiency is the ratio of observed to maximum feasible output, conditional on technical and observed input usage (Jondraw et al., 1982; Ali, 1996; Udoh, 2005).

Technical efficiency is based on expressing the maximum amount of output obtainable from given bundles of production resources with fixed technology. It is the attainment of production goods without wastage (Amaza and Olayemi, 1999). This is regarded as estimating average production function (Olayide and Heady, 1982).

Allocative efficiency on the other hand relates to the degree to which a farmer utilizes inputs in optimal proportions, given the observed input prices (Coelli et al., 2002; Ogundari et al, 2006). According to Adesina and Djato (1997), economic efficiency occurs when a firm chooses resources and enterprises in such a way as to attain economic optimum. The optimum implies that a given resource is considered to be most efficiently used when its marginal value productivity is just sufficient to offset its marginal cost. Thus, economic efficiency refers to the choice of the best combination for a particular level of output which is determined by both input and output prices. This would lead to increase in the farmers output as well as its income invariably leading to poverty reduction, providing food security, improved living condition and wellbeing.

Measurement of farm efficiency via frontier approach has been widely utilized and studied. The term frontier involves the concept of maximality in which the function sets a limit to the range of possible observations (Forsund et al., 1980). 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. Frontier studies are however classified according to the method of estimation. Kalaizandonakes et al. (1992) grouped these methods into two broad categories – parametric and non-parametric methods. The parametric method can be deterministic, programming and stochastic depending on the specification of the frontier model.   Many researchers including Schmidt (1976) have argued that efficiency measures from deterministic models are affected by statistical noise. This however led to the alternative methodology involving the use of the stochastic production frontier models. The major feature of the stochastic production frontier is that the disturbance term is a composite error consisting of two components; one symmetric, the other one-side component. The symmetric component, Vi. captures the random effects due to measurement error, statistical noise and other influences, and is assumed to be normally distributed. The one-sided component Ui. Captures randomness under the control of the firm. It gives the deviation from the frontier attributed to inefficiency. It is assumed to be either half-normally distributed or exponentially distributed.

By definition, stochastic frontier production function is

$Y_i = F(X_i; \beta) \exp(V_i - U_i) \quad i = 1, 2, ., N \quad (1)$

Where Y_i is the output of the ith firm; X_i is the corresponding (MX2) vector of inputs; b is a vector of unknown parameter to be estimated; F(.) denotes an appropriate form, V_i is the symmetric error component that accounts for random effects and exogenous shock; while $U_i < 0$ is a one sided error component that measures technical inefficiency.

Several empirical applications have followed the stochastic frontier specification. The first application of the frontier model to farm level data was by Battese and Coelli (1995) who estimated deterministic and stochastic Cobb-Douglas production frontier for the economics of scale in sheep production in Australia. The variance of the farm effects was found to be in a highly significant proportion of the value of sheep production in Australia. Their study did not, however, directly address the technical efficiency of farms. Similarly, Bagi (2004) employed the stochastic frontier Cobb-Douglas production function model to investigate differences in technical efficiencies of sole and mixed enterprise farm in West Tennessee. The study found that the variability of farm effects was highly significant. The mean technical efficiency of mixed enterprise farms was found to be smaller (0.76) than for sole crop farms (0.85). The study show that, mixed enterprise farms were inefficient as compare to the sole crop farms as demonstrated by their various efficiency ratios.

The use of the stochastic frontier analysis in the study of agriculture in Nigeria is a recent development. Such studies include that of Udoh (2003), Okike (2006) and Amaza (2000). Udoh (2003) used the Maximum Likelihood Estimation of the stochastic production function to examine the land management and resource use efficiency in South–Eastern Nigeria. The study found a mean output –oriented technical efficiency of 77% for the farmers, this indicates that farmers can still expand production by 23%. The 0.98 indicates 98% for the most efficient farmers and 0.11 indicating 11% for the least efficient farmers. Okike (2006) investigated crop livestock interaction and economic efficiency of farmers in the Savanna Zones of Nigeria. The study found average economic efficiency of farmers are higher in the low-population –low Market domain; Northern Guinea Sudan Savanna ecological zones; and crop –based Mixed Farmers farming system. Also Amaza (2000) work on small scale farm size and resource use efficiency in Kwara state, opined that, one of the means of proper utilization of farm inputs for greater efficiency is through farm size adjustment. The result was collaborated by the mean cost efficiency of 1.161 obtained from the data analysis which shows that an average farm in the sample area is about 16% above the frontier cost, indicating that they are relatively efficient in allocating their scarce resources.

PROBLEM STATEMENT

In Nigeria, yam cultivation still depends largely on traditional hoes and cutlass techniques of production. Many aspect of production like clearing, planting, weeding, stalking and harvesting which require considerable inputs of labour are still been done manually.

Although, Nigeria is a global leader in yam production, most of the yams produced are also consumed within Nigeria with little or no exportation at all. In Ekiti State, yam production is of high economic benefit to the people due to amount of resources committed to its production and the proportion of their income which it represents. Prevalent food scarcity is becoming common problem in Nigeria because as a developing nation which is tending towards industrial economy from agricultural economy. Nigeria is said to be experiencing a progressive and rapid population growth with the attendant increase in the demand for food crops.

Resources are considered to be at its highest and best use when it is put into use with highest comparative advantage to other uses. Efficiency of resource use can therefore be assessed from the productivity of the output. This is an important issue of the present time, because resource use efficiency issues are the core elements of sustainable crop production of small-scale farming activities. Inefficient use of inputs can jeopardize food availability and its security. It is

therefore imperative to know whether resources are used efficiently in yam production in the study area.

OBJECTIVES OF THE STUDY

The main objective of this study is to determine how efficiently resources are used in the production of yam in the study area. The specific objectives are:

- to describe the socio economic characteristics of yam farmers in the study area
- to determine the system of land ownership by the farmers
- to identify the major constraints to yam production in the study area and proffer a possible solution; and
- to determine the technical efficiency of resource used in yam production in the study area.

METHODOLOGY

The study Area

The study was carried out in Ekiti State Nigeria. The state was created on 1st October 1996 out of the former Ondo State. The State is bounded on the south and on the East by Ondo State, on the west by Osun State and on the northern side by Kwara and Kogi State. The State is presently made up of 16 Local Government Areas. The State is situated entirely within the tropics.

Ekiti state is located between longitude 400 51' and 500 451' East of the Greenwich meridian and latitude 700 151'and 800 51' North of the equator. It has an area of 58,887.890sqkm and temperature of between 210 c and 280 c with high relative humidity. The vegetation of Ekiti state is guinea forest including all forms of fauna and flora with an annual rainfall of 1,400mm.

The climate of the State is tropical with two distinct seasons, the rainy season which last from April to October and dry season from November to March. The main occupation of the people are farming and trading. The major agricultural crops include yam, cassava, maize, cocoyam, tomato among others.

Method of Data collection

The data used for this study were essentially from primary sources. The data was collected through the use of well structured questionnaire.

Sampling Techniques

A multistage simple random sampling technique was used to select 120 respondents from the state. Three (3) local governments' areas were selected randomly from the state, five (5) villages were also selected from each of the selected local government areas, and this was followed by another selection of eight (8) respondents in each of the selected villages. Therefore a total of 120 respondents were considered during the study.

Analytical Technique

The data collected were subjected to descriptive analysis. Tools such as mean, median, frequency distribution, percentage were used to analyze and categorize the socio – economic characteristics of the respondent and problems militating against them in the study area.

Stochastic frontier 4.1 version model developed by Battese and Coelli (1995) were used to analyze the technical efficiency and inefficiency of farmers in the study area.

Model Specification

The stochastic frontier model makes use of Cobb-Douglas model estimate (double log). It comprises both efficiency parameter and inefficiency parameter. The model is explicitly specified as;

$Ln\ Y_i = \beta_0 + \beta_1\ lnX_1 + \beta_2\ ln\ X_2 + \beta_3\ lnX_3 + \beta_4\ lnX_4 + \beta_5\ lnX_5 + \beta_6\ lnX_6 + \beta_7\ lnX_7 - (U_i)$

Where

Y= Revenue from yam produce (₦)

β_0 = Constant estimate for efficiency model

X1- X7 =Efficiency parameters

X1 = Land area cultivated (ha)

X2 = Labour cost (₦)

X3 = Cost of land preparation (₦)

X4 = Cost of yam sett (₦)

X5 = Cost of weeding (₦)

X6 = Harvesting cost (₦)

X7 =Transportation cost (₦)

Where

μ_i are the inefficiency parameters

$\mu_i = \delta_0 + \delta_1 Z_1 + \delta_2 Z_2 + \delta_3 \delta_3 + \delta_4 Z_4 + \delta_5 Z_5 + \delta_6\ Z_6 + \delta_7 Z_7$

Where

δ_0 = Constant estimate for inefficiency model

1= Gender (male = 1, female = 0)

2 = Age of farmers (years)

3 = Marital status (single 0, married 1, widowed 2)

4 = Household size

5 = Farming experience

6 = Level of education

7 = Government support (Yes = 1, No = 0).

RESULT AND DISCUSSION

Socio-economic Characteristics of the Respondents

Table 1 revealed the age categorization of respondents. 5% of the respondents falls below the age of 31 years while 16.7% are above 60 years. The mean age was 49.1 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.

The table also shows the distribution of farmers according to their gender. The table revealed that 83.3% of yam farmers were male while 16.7% 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.

The marital status of the respondents shows that 84.2% of yam farmers were married, only 12.5% were single and 3.3% were widow. The very high percentage of the married yam producers can be attributed to the fact that respondents require helping hands to carry out the processes of yam production.

The table also revealed that 44.2% of the respondents had household size below 5, 50% of the respondents had household size between 5-10, while 5% of the respondents had households size between 11-15 and 0.8% of the respondents had household size above 15. 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

From the table, 38.3% of the farmers had no formal education, 12.5% had informal education, 22.5% had primary education, while 15% had secondary education, and the remaining 11.7% had tertiary 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.

The farming experience of respondents shows the number of years the farmers had been into yam production. 45% of the respondents had farming experience below 11 years, 25% had farming experience ranges from 11-20 years, 14.1 had farming experience ranges from 21-30 years, while 11.7% had farming experience ranges from 31-40 years and 4.2% had farming experience above 40 years. There could be increase in yam production as the average farming experience was 16.5 years.

The distribution of respondents on the basis of farm size shows that the respondents that cultivated between 1-4ha were 45%, 20% of the respondents had farm size ranges from 4.1-8ha and 11.7% had farm size above 12ha. The mean farm size cultivated was 3.6 ha. This implies that majority of the respondents are small farm holders.

Table 1: Socio-economic Characteristics of the Respondents

Variables	Frequency	Percentage
Age (years)		
<31	6	5
31 – 40	19	15.8
41 – 50	42	35
51 – 60	33	27.5
>60	20	16.7
Gender		
Male	100	83.3
Female	20	16.7
Marital Status		
Married	101	84.2
Single	15	12.5
Widow	4	3.3
Household Size		
<5	53	44.2
5 – 10	60	50
11 – 15	6	5
>15	1	0.8
Educational Level		
No Formal Education	18	15
Informal Education	15	12.5
Primary Education	27	22.5
Secondary Education	46	38.3
Tertiary Education	14	11.7
Farming Experience (years)		
<11	54	45
11 – 20	30	25
21 – 30	17	14.1
31 – 40	14	11.7
>40	5	4.2
Farm Size (Ha)		
1 – 4	54	45
4.1 – 8	24	20
8.1 – 12	28	23.3
>12	14	11.7

Source: Field Survey, 2014.

Farming Related Activities of the Respondents
Table 2 shows the farming related activities of the respondents. From the table, it was revealed that 52.5% of the respondents were fulltime farmers while 47.5% of the respondents were part time farmers. In Nigeria, most farmers engage in other income generating activities apart from farming. This is a way of generating additional income in order to ensure food security for the family.

However, it cannot be ruled out that several other farmers still depends solely on agriculture. Therefore it is relevant to categorize the respondent into either full time or part time occupation.

The table also shows the labour utilized by the yam Farmers. Finding reveals that 65.0% of the farmers used hired labour to work on the farm, while 24.2% used family labour and 10.8% used both family labour as well as hired labour.

The system of land ownership of respondents revealed that 57.5% acquired their farm land through inheritance, 20% had theirs through purchase, 15.8% through rents, while 6.5 was through gift. The results revealed that majority of the farmers owned their land through inheritance in the study area. Land is a fixed asset and constitutes a great limitation to Nigeria farmers.

The table in addition shows that 61.7% of the respondents planted different varieties of yam, while 38.3 planted only one variety of yams. Planting different varieties could be a strategy to avert production risk, crop failure and the infestation of pest and diseases confronted by farmers in the study area.

Also from the table, 34.2% of the respondents intercropped yam with maize on their farms. 20.8% (with cassava), 13.3% (with rice), 11.7% (with cocoyam), 8.3% (with plantain), in the same vein, 5.0% practice mono-cropping, while 4.2% (with vegetables) and 2.5% (with tomatoes). It was observed that most of the farmers practice intercropping as a result of scarcity of land. Those farmers that intercropped their farm are likely to have less risk; since multiple cropping is a risk minimizing strategy. They derive other sources of income in case yam production fails.

Finally, the table shows that 45.0% of the respondents had their source of yam setts from their previous production, 30.0% from market, while 18.3% from agric inputs agencies like ADP and 6.7% from friends and relatives. This implies that most farmers set aside part of their produce for planting, while the role of input supplier in the study area was minimal.

Table 2: Farming Related Activities of the Respondents

Variables	Frequency	Percentage
Mode of Farming		
Full time	63	52.5
Part time	57	47.5
Type of Labour Utilized		
Hired Labour	78	65.0
Family Labour	29	24.2
Both	13	10.8
Ownership of Farm Land		
Gift	8	6.7
Inheritance	69	57.5
Purchase	24	20.0
Rent	19	15.8
Cultivate Varieties of Yam		
Yes	74	61.7
No	46	38.3
Intercropping of Yam with Other Crops		
Tomatoes	3	2.5
Vegetables	5	4.2
Plantain	10	8.3
Cocoyam	14	11.7
Rice	16	13.3
Cassava	25	20.8
Maize	41	34.2
None (Sole Crop)	6	5.0
Sources of Yam Sett		
Previous Production	54	45
Market	36	30.0
Agric Input Agencies	22	18.3
Friends & Relatives	8	6.7

Source: Field Survey, 2014.

Constraints Encountered in Yam production

Table 3 reveals the constraints faced by farmers during yam production process. These constraints were lack of government assistance, pest and diseases, lack of credit facilities, inadequate labour supply and poor extension services to mention but few.

Table 3: Distribution of the constraints encountered in Yam Production

Constraints	Frequency	Percentage
Lack of govt. assistance	19	15.8
Pest and diseases	24	20
Lack of credits/ loaning facilities	38	31.7
Inadequate labour supply	16	13.3
Poor extension services	23	19.2
Total	120	100

Sources: Field Survey, 2014.

Respondents' perception of solution to problem faced

Table 4, reveals the perception of solution to the problems by the respondents. The problems could be ameliorating through the use of resistance varieties, extension agent stimulation, provision of rural amenities and provision of credit facilities. This could reduce rural- urban drift, and then the interest of youth in agriculture would be revamped, hence improve the availability of farm labour.

Table 4: Respondents perception of solutions to problems faced

Ways	Frequency	Percentage
Using resistance varieties	27	22.5
Rural infrastructure	19	15.8
Extension Agent Stimulation	20	16.7
Provision of credit facilities	54	45.0
Total	120	100

Source: Field Survey, 2014.

The Final Maximum Likelihood Estimate

Table 5, below showed the stochastic frontiers result on respondents using frontier 4.1 according to Battese and Coelli (1995). Variables that were significant among the efficiency parameters were cost of yam sett (1%), cost of land preparation (1%) and cost of land area (5%). These significant variables exhibited positive coefficient. This implies a direct relationship between these variables and the returns on yam output. However, the more the area of land cultivated, consequently leading to higher cost of land preparation and increased planting cultivars, the more will be the output or returns on yam produced. These were however, the most significant variable that determines the technical efficiency among yam producers in the study area.

Although cost of labour was not significant but exhibited a negative sign of coefficient. This implies an inverse relationship between costs of weeding and output of yam produced. Harvesting cost and transportation cost had positive signs but not significant. The increasing

cost on harvesting and transportation will also provide more returns for farmers. The produce could be moved to more areas attracting good prices for yam sales (place utility).

Educational levels and gender variables were significant at 1% and 5% respectively. These significant variables exhibited positive signs too. The implication of this is that male farmers were more efficient and derive higher returns than their female counterparts. Also, the more the level of education of farmers the higher his returns. This could be due to increased technical knowhow, accessibility to new innovation and marketing information. Age variable had an inverse relationship with output returns on yam production although not significant. This implies that production tends to decline as farmers grow older.

Household size exhibited positive sign and not significant. Production could be increased if farmers employ their families to participate in farming activities, thus decreasing the cost of hired labour and consequently increases return. Likewise, farming experience exhibited positive sign of coefficient, although not significant. This implies that the more the farming experiences of the farmers the more their returns.

In addition , the estimated sigma $(\delta 2)$ of 0.106 which was significant at 10% level indicated a good fit of the model, while the estimated gamma (g) of 0.15 obtained about 15% of the variation in yam farmers productivity was due to differences in farmers practices rather than random variables.

Table 5: Distribution of the final Maximum Likelihood estimate

Variables	Parameters	Coefficient	T- value	Stand. Error
Production factor				
Efficiency constant	β_o	0.717375	0.709 970	0.101043
Land (ha)	β_1	0.180430**	0.245173	0.735927
Labour (₦)	β_2	-0.130254	-0.951152	0.136943
Land preparation (₦)	β_3	0.882488***	0.103589	0.851910
Cost of yam setts (₦)	β_4	0.165678***	0.135551	0.122225
Cost of weeding (₦)	β_5	-0.894622	-0.622359	0.143747
Harvesting cost (₦)	β_6	0.112526	0.886545	0.1269258
Transportation cost	β_7	0.403395	0.4599013	0.877133
Inefficiency effects				
Inefficiency model constant	δ_o	0.249145	0.279034	0.8928827
Age (years)	δ_1	-0.165362	-0.670462	0.2466395
Household size (No)	δ_2	0.344599	0. 3145701	0.109549
Farming experience (years)	δ_3	0.552083	0.960061	0.575050
Educational levels	δ_4	0.48231919***	0.126393	0.381601
Gender	δ_5	0.333865**	0.236589	0.141116

Marital status	δ_6	-0.537590	-0. 400098	0.134365
Government support	δ_7	-0.232045	-0.6427308	0.361029
Diagnostic statistics				
Sigma- square	δ^2	0.105549*	0.684697	0.1541545
Gamma	γ	0.147443**	0.243391	0.6057878

Asterisk indicate significance 1% (***, x≥ 2.617), 5% (**, 2.617 > x≥1.960), 10% (1.645-1.959)

Source: Field Survey, 2014.

Technical Efficiency

Table 6, presents the distribution of technical efficiency of yam farmers. The average technical efficiency score was 0.87. This implies that average yam farmers in the study area could increase their productivity by 13% with improving technical and allocative efficiency in their yam production. Only 13% of yam farmers were technically inefficient, while 87% allocated their resources efficiently.

Table 6: Distribution of Technical Efficiency

Technical Efficiency	Frequency	Percentage
70-80	33	27.5
81-90	49	40.8
>90	38	31.7
Total	120	100
Mean Efficiency	0.87	
Minimum Efficiency	0.74	
Maximum Efficiency	0.99	

Source: Field Survey, 2014.

CONCLUSION

The study measured the resource use efficiency in yam production using the stochastic parametric estimation method.

The study area is dominated by aged male, married, experienced and small holder farmers who mostly attained secondary level of education. Most of the farm cultivated was inherited.

RECOMMENDATION

In line with the findings of this study, the following recommendations are made:
- Farmers should be provided with improved planting materials to boost productivity in the area
- Provision of adequate extension and supportive services of government with a view to improving farming techniques with technological innovations
- The use of farm- level simple machine that the farmers can easily adopt should be encouraged.
- Farm inputs should be made available at highly subsidized rates and make them available timely, through adequate and efficient distribution.

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