IOSR Journal of Economics and Finance (IOSR-JEF)
e- ISSN: 2321-5933, p-ISSN: 2321-5925. Volume 9, Issue 2 Ver. II (Mar-Apr .2018), PP 36-45
www.iosrjournals.org

Economic Efficiency in Table-Egg Agribusiness Enterprises in Akwa Ibom State, Nigeria.

Ekaette, M. N, Ohen, S. B & Idiong, I.C.
Department of Agricultural Economics, University of Calabar. Calabar

Abstract: *This study investigated the economic efficiency in table egg agribusiness enterprises in Akwa Ibom State. The specific objectives were to; describe the socioeconomic characteristics of table egg entrepreneurs in Akwa Ibom State, analyze the level of economic efficiency in table-egg production and examine the determinants of economic efficiency in table egg production in the State. Simple random sampling was used to select 210 table egg entrepreneurs from a sampling frame of 1,051 table egg firms in the State. Structured questionnaires were used to elicit information from respondents while descriptive and inferential statistics were used for data analysis. Findings from the study showed that 70% of the respondents were males. Most (77.04%) of the respondents were in the age bracket between 30 and 50 years. The distribution of respondents by marital status showed that most (81.7%) of table-egg entrepreneurs were married, 16.67% were singles while 1.67% were widowed with 48.89% having household sizes of 1-4. Also, 52.2% of the respondents were employed in table egg production on full- time basis. Eighty percent (80%) of table egg enterprises in the study area were sole proprietors. Medium sized firms with flock sizes between 1,001 and 5,000 were predominant (40%) in the study area. Furthermore, the study showed that table egg entrepreneurs were economically inefficient with mean economic efficiency level of 15.32% and standard deviations of 18.97. Age, marital status, access to credit, years of schooling and firm size were the significant determinants of economic efficiency in the study area. The study recommended that deliberate policies to address the socio-cultural and economic factors that limit the participation of women in the business of table egg production in particular and agribusiness generally should be put in place by the State government. Finally, the State government should take advantage of existing windows in the Central Bank of Nigeria to finance table egg firms in the State. This will mitigate the problem of accessibility to credit facilities by table egg producers. This effort should be backed up by the establishment of Monitoring and Evaluation (M&E) Teams to ensure that beneficiaries do not diverted such funds to other uses.*

Keywords: *efficiency, table egg, entrepreneurs*

Date of Submission: 26-03-2019 Date of acceptance: 09-04-2018

I. Introduction

Agribusinesses in developing economies face the challenges of limited resources, low technology and inelastic demand for its products. Since producers have more control over inputs rather than output levels, cost reduction in input usage becomes a better means of increasing profitability and productivity than output growth (Binuomote, Ajetomobi & Ajao, 2008). Economic Efficiency is therefore described as a major driver of productivity growth and competitiveness. Efficiency of agribusiness enterprises is considered essential in achieving sustainable economic growth and significant level of food security. The gaps in growth resulting from inefficiency are usually bridged through policy interventions and relevant programmes to enable entrepreneurs attain maximum outputs with available inputs with a view to maximizing profit (Adepoju, 2008).

The livestock sector, with the poultry subsector being a major contributor is vital to the socio-economic development of Nigeria. The sector contributes about 9-10% of agricultural GDP (FAO, 2006). The business of poultry farming comprises chickens, turkeys, geese, ducks, quail and guinea fowls. The major poultry products are eggs and meat. Effiong and Onyeweaku, (2006) and Binuomote *et al.* (2008), asserted that poultry has a shorter life cycle and therefore more prolific than other livestock. Also it provides quick employment opportunities, reduces poverty through income generation while products from this sub-sector provide direct cash and other sources of livelihood as well as a source of organic manure. In recognition of the importance of poultry industry and table egg in particular, successive governments in Nigeria have sought to rejuvenate the subsector since the late 1990s by investing in research and development projects.

Livestock industry in Nigeria falls short of its aim of self-sufficiency in animal protein consumption which is put at 5gm/caput per day which is far cry from F.A.O recommended level of 35gm/caput per day (Ojo, 2005). This has been attributed largely to high cost of feeds which constitutes about 50 per cent of total production cost (Ojo and Ajibefun, 2000; Udom, 2003). More so, Okike (2009) observed that the potential for egg consumption was enormous in the country but most people eat less than 40 eggs in a year. He argued that if

the farmers can produce at affordable prices, the consumption rate will rise and called on the government to rise to create the enabling environment that would help the farmers reduce their production cost.

Ebong (2007) and Uchendu (2008) identified the problem of low or inadequate skills, knowledge, and non-scientific approaches to agricultural production as major impediments to agricultural productivity in Nigeria. They attributed the persistent low productivity to inefficient use of resources and poor managerial skills despite efforts by Nigerian Agricultural Research Institutes to make available improved crop varieties and breeds of livestock and technologies to farmers who find it difficult to understand, patronize and apply the technological innovations.

Many authors have also reported that farmers in developing countries fail to explore the full potential of technology and make allocative errors (Taylor and Shonkwiller, 1986; Ali and Flinn, 1989, Kalirajan and Shand, 1989; Bravo-Ureta and Evenson, 1994; Shanmugan and Palanisami, 1994; Sharma and Datta, 1997; Thomas and Sudaresan, 2000, IWMI, 2002; and IRRI, 2010).

According to the Resources Inventory and Management Limited (RIM, 1992), the inability of Nigeria to meet production targets to the fact that Livestock industry is dominated by poor-resource farmers who have very low level of education, poor capital base and inability to manage resources efficiently.

Afolabi, (2012), Iyangbe & Orewa, (2009) and Adepoju (2008) reported that poultry industry has performed below expectation in recent times. They attributed this development to inefficiency in resource use. They also described the business environment of egg producing enterprises as hostile due to: high cost of feed, poor management, diseases and pests, poor extension and training facilities, marketing problems, lack of credit facilities, poor logistics and lack of regulatory institutions to ensure that farmers comply with established rules for quality, products safety and standard.

Akwa Ibom State has a comparative advantage in poultry production and exports poultry products especially table egg to neighboring States like Abia and Cross River. (Akwa Ibom State Year Book, 2001). However, there is dearth of information on the economic efficiency in table egg agribusiness enterprises in the State, yet, information on this is very critical to achieving a highly efficient and competitive table egg business in the State, hence the need for this research.

The broad objective of this study was to analyze the economic efficiency in table-egg agribusiness enterprises in Akwa Ibom State.

The specific objectives were to:

1. describe the socioeconomic characteristics of table egg entrepreneurs in Akwa Ibom State,
2. analyze the level of economic efficiency in table-egg production and
3.examine the determinants of economic efficiency in table egg production in the State.

II. Theoretical Framework & Review of Related Studies

Economic efficiency is concerned with the relative performance of the process used in transforming inputs into output. The concept of efficiency goes back to the pioneering work of (Farell, 1957) who distinguishes between three types of efficiencies: (i) Technical efficiency (TE), (ii) Allocative or price efficiency (AE); and (iii) Economic efficiency (EE). Technical efficiency in production is the physical ratio of product output to the factor input, the greater the ratio, the greater the magnitude of technical efficiency. The overall measure of technical efficiency can be desegregated into three components: (1) pure technical efficiency (PTE) due to production within an isoquant frontier; (2) congestion due to over-utilization of inputs, and (3) scale efficiency, due to deviations from constant returns to scale (Worthington. and Dollery, 2000). Allocative efficiency is concerned with choosing optimal sets of inputs. A firm is allocatively efficient when production occurs at a point where the marginal value product is equal to the marginal factor cost. Economic efficiency is a situation where there are both technical and allocative efficiencies (Coelli, 1996). Several studies have been carried out on economic efficiency using different approaches and methodologies. Ojo *et al*. (2012), examined the non-parametric analysis of production efficiency of poultry eggs farmers in the Delta State Nigeria. Structured questionnaires were administered to 120 randomly selected poultry farmers in four Local Government Areas of the State. Data envelopment analysis and Cobb- Douglas production function were used to analyze the data. The result showed that 30% of the poultry farmers in the study area were operating at frontier and optimum level of production with mean technical efficiency of 1.00. This implies that 70% of the poultry farmers in the study area can still improve on their level of efficiency through better utilization of available resources, given the current state of technology. The results of the Cobb-Douglas analysis of factors affecting the output of poultry farmers showed that stock capacity (number of birds), feed and medication cost positively and significantly affected the output of the poultry farmers in the study area. The study further showed that most of the poultry farms could reduce total expenditures on the number of birds purchased, feed, labour, medication and capital inputs by 20.43%, 3.20%, 3.53%, 7.10% and 31.80% respectively without reducing their current level of production.

Jatto *et al*. (2014) assessed the technical efficiency level of poultry egg producers in Ilorin, Kwara state using Data Envelopment Analysis. A stratified random sampling technique was adopted in selecting 150 poultry egg producers. The data for the study were collected from poultry farmers with the use of well structured questionnaires. The result showed that poultry egg farmers were relatively technically efficient in their use of resources, with a mean technical inefficiency of 26%. The mean input slack for numbers of birds, feeds and labour have slacks of 6.936, 91.021 and 0.334 respectively implying that inputs could be decreased by those units and still produce the same level of output. The study concluded that, the poultry egg farmers were relatively technically inefficient and recommend that reducing excess amount of inputs on one hand and raising output on the other hand, efficiency level can be improved and farmers could benefit economically. Also, Jatto *et al*. (2014) examined the technical efficiency of poultry egg production in Ogun state using Data Envelopment Analysis (DEA) and OLS regression. The data for the study were collected with the use of well structured questionnaires from poultry farmers. Average number of birds for small farm size is 301, for medium farm size is 740, while that of large size is 2288. The corresponding net returns were x589, x464.46 and x739.56 per bird per farm respectively. Majority of the farmers were relatively technical efficient in their use of resources, with mean technical efficient being 0.873. Farmers with large farm size are most technical efficient with a mean of 0.8877 followed by medium farm size with a mean of 0.8687 while small farm size has the least mean of 0.8638. The mean input slack for stock, labour and feed are 3.032, 8.942, 0.482 respectively, while the output slack is zero. Years of experience and education have positive effect on technical efficiency at 1 percent while household size negatively affects efficiency at 1 percent.

III. Materials And Methods

3.1 Study area

The study was conducted in Akwa Ibom State. The State lies between Latitude 4^{o} 32^{1} and 5^{o} 32^{1} North and Longitude 7^{o} 25^{1} and 8^{o} 25^{1} east of the equator. Akwa Ibom State shares borders with River State in the West, Abia and Imo State in the North, Cross River State in the East and Atlantic Ocean forming its southern boundary with a land area of 8,412 square kilometers. The population of the State is 3.9million with average population density of 350 inhabitants per square kilometer and 85 percent of the population living in rural areas (NBS, 2008). The State is known for the production of crops such as cassava, yam, cocoyam, maize, rice, cowpea and melon while cash crops - oil palm, coconut, rubber, cocoa, raffia palm, plantain, banana, pineapple, leafy vegetable, okro, pepper and tomatoes.. It also produces livestock such as sheep, goats, rabbits, snails and has a comparative advantage in poultry production. Consequently, the State exports poultry products especially table egg to neighboring States like Abia and Cross River. (Akwa Ibom State Year Book, 2001). About 80 percent of the working population is engaged in agricultural production.

3.2 Sampling procedure and sample size

Simple random sampling technique was adopted in the selection of 210 table egg entrepreneurs from a sampling frame comprising one thousand and fifty one (1,051) table egg firms in the 6 agricultural zones in Akwa Ibom State obtained from the Livestock Department, Ministry of Agriculture and Natural Resources, Akwa Ibom State. Twenty per cent of table egg producers in each of the LGAs across the 6 agricultural zones in the State were selected proportional to the number of firms. The sample size was determined using the sample size formula for finite population as recommended by Krejcie & Morgan, (1970).

$$S = \frac{X^2NP\,(1-P)}{d^2\,(N-1) + X^2P\,(1-P)}$$

Where:

S = Required Sample size
X = Z value (e.g. 1.96 for 95% confidence level)
N = Population Size =1051(obtained from the State Ministry of Agriculture)
P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%)
d = Degree of accuracy (3%), expressed as a proportion (.03); It is margin of error

3.3 Data collection

Structured questionnaire were used to illicit information from table egg entrepreneurs. Information collected were on the socio-economic characteristics of table egg entrepreneurs, factors that affect economic efficiency in table egg agribusiness enterprises, variable and fixed costs of table egg production, revenue from sales of table egg amongst others. A total of 210 questionnaires were distributed among the 6 zones selected. However, 180 questionnaires were retrieved at the end of the exercise representing a retrieval rate of 85.7%.

3.4 Data analysis

The study used descriptive statistics such as frequency counts, percentages, mean and standard deviation to describe the socio-economic characteristics of respondents. Data Envelopment Analysis (DEA) model was used to determine the economic efficiency in table egg production. While a tobit regression model was specified to analyse the determinants of economic efficiency in table-egg agribusiness enterprises.
The DEA model was specified as follows:

$$\max W_P = \sum_{r=1}^{s} u_r y_{rp}$$

$$\text{s.t:} \quad \sum_{i=1}^{m} v_i x_{ip} = 1$$

Model 1

$$\sum_{r=1}^{s} u_r y_{rj} - \sum_{i=1}^{m} v_i x_{ij} \leq 0 \quad \forall j,$$

$$u_{r,} v_i \geq 0 \quad \forall i, r.$$

Likewise, the BCC model is formulated as follows (Model 2):

$$\max W_P = \sum_{r=1}^{s} u_r y_{rp}$$

Subject to : Model 2

$$\sum_{r=1}^{s} u_r y_{rj} - \sum_{i=1}^{m} v_i x_{ij} \leq 0 \quad \forall j,$$

$$u_{r,} v_i \geq 0 \quad \forall i, r.$$

Model 1 (input oriented CCR model) allowed table-egg enterprises [otherwise referred to as Decision Making Units (DMUs) in DEA terminology] that had low inputs to come up with increasing returns to scale whereas model 2 (BCC model- output oriented model) allowed DMUs that had high inputs would come up with decreasing returns to scale. Input-oriented model focuses on reducing inputs in order to have a 100% efficient DMU while the output-oriented model focuses on increasing outputs to have an efficient DMU. Variables used in measuring the economic efficiency in table egg agribusiness enterprises in the DEA model are represented by:
n= Number of table egg enterprises otherwise called decision-making units (DMUs)
m= Various amounts of inputs used in the production of table egg. In other words, (**m**) represents the cost of various inputs (feed, drugs, water, pullets and labour) used to produce table egg.
s= Quantity of outputs (table-egg) from each Decision making Unit (DMU)
Specifically, DMUj consumes amounts xij (i = 1, ... , m) from inputs and produces amounts yrj (r = 1, ... , s) of outputs (table-eggs).

The tobit regression was specified as follows:
The efficiency scores were regressed against farm specific and socioeconomic characteristics of table egg entrepreneurs. Efficiency scores that were below 0.5 were adjudged inefficient and thus given the value zero. The socio-economic characteristics of respondents that could affect their efficiency levels were considered as stated in the model below:

$$\text{Eff} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + \mu i \quad .(5)$$

Where,

Eff = is the economic efficiency score for each production unit (respondent).
Xji = independent farm specific characteristics.
μi = error term.
Where:
X_{1i} = Age of the farm manager (years)
X_{2i} = Sex of the manager (Dummy: Male =1; Female 2)
X_{3i} = Marital Status (Married =1, single=2, widowed =3)
X_{4i} = the education level of the ith farm manager/Supervisor (years in schooling)
X_{5i} = Years of Experience (years)
X_{6i} = Membership of a Cooperative Society (No=0, Yes=1)
X_{7i} = Number of Extension contacts (weekly=1, monthly=2, quarterly=3, not regular=4)
X_{8i} = Credit use by the ith farm unit (No=0, Yes=1)
X_{9i} = Flock size of the ith farm (number of birds).
μi = the error term.

Research of Hypotheses

The hypotheses stated below in its null form were tested in this study:

H_{o1}: Table egg producers in Akwa Ibom State are not economically efficient

$Ho_{3:}$ Some socioeconomic variables have no significant effect on economic efficiency of table egg producers in the State.

IV. Results And Discussion

4.1 Socioeconomic characteristics of table egg entrepreneurs in the study area

The sex distribution of the respondents showed that majority (70%) were males. This implies that majority of the table egg farms in the State were owned or managed by men. FAO, IFAD, UNCTAD & the World Bank Group. (2010), attributed low participation of women in agriculture to constraints to land, capital, labour, credits and modern inputs. FAOSTAT (2011), disclosed that socio-cultural and economic conditions as well as provision of supports such as credits and training could promote ownership and control of resources, gaining access to and retaining control of improved technologies and the use of resources (Table 1).

The Result on age of respondents showed that the ages of most (77.04%) respondents fell between 30 and 50 years while, respondents above 60years of age accounted for only 1%. However, those within the youthful age of 30 years and below accounted for 12.8%. This finding shows that table-egg production in the State was mostly carried out by active farming population and portends a great potential for the business in the State if appropriate enabling business environment is provided (Paria *et al*., 2013). This finding also debunks the erroneous beliefs that poultry business is dominated by retired civil servants who use it to earn a living after their active years of service.

Respondents' level of education was captured by years of schooling. The result shows that all the table-egg producers attained one level of formal education or the other. However, majority of them (49.4%) had between 7 and12 years of schooling while those who spent (1-6) years and (>15) years in school accounted for 12.8% each. The mean schooling years and standard deviation was 10.7 and 4.87 respectively (Table 1). The implication of these findings is that table-egg entrepreneurs in the area of study were literate enough to manage their farms if given the necessary supports or exposures through capacity building programs (seminars/workshops) or regular extension contacts. Farmers who are educated have a great ability to adopt new technology and innovation to become efficient in managing their farms (Effiong & Onyenweaku, 2005; and Latruffe, Guyomard, & Le Mouel, 2008).

Furthermore, the distribution of respondents by marital status showed that most (81.7%) of table-egg entrepreneurs were married, 16.67% were singles while 1.67% were widowed. In terms of household size, the study revealed that 48.89% of respondents had an average household size of (1-4), 42.78% had (5-8), 3.33% had (9-12), 2.78% had (13-16) while 2.22% respondents had household size above 17. Large or small household sizes have implications on efficiency of agribusiness firms (Okike, 2000; Latruffe *et al*., 2008). They attributed the reason of economic inefficiency among farmers with large household sizes to the fact that the value of farm products that could have been sold to generate revenue to the firms are often consumed directly by the household. They further explained that in a situation where the family size is larger and only a small proportion of farm labour is derived from it, the inefficiency effects are expected to be much greater.

The respondents' occupation was grouped into two (major and minor occupations). Findings show that 52.2% of the respondents were employed in table egg production as a major occupations (full- time) while 47.8% were engaged in the business as a minor occupation or (part - time). The effect of farmers engaging in minor occupations on their economic efficiencies could be positive or negative depending on the nature and profitability of such business (Amaza, 2000). He posited that additional engagements could have positive effect

if such business generates substantial revenue for the sustenance and expansion of the primary occupation – (table-egg production) (Table 1).

The ownership structure of table-egg enterprises in the study area shows that 80% of the table- egg enterprises were owned by individuals or sole proprietors, 10% as Partnership, 4.44% as Corporate while 5.56% were operated as Limited Liability companies. The implication of this finding is that the process of decision making on the planning, organizing, directing, coordination and control of 80% of the firms were carried out by only one individual (manager). Olayide and Heady (1982), enumerated the disadvantages of sole proprietorship to include: unlimited liability for debts due to lack of legal distinction between private and business assets, low and limited capacity to raise capital, all business decision is borne by only one person, difficulty in retaining high caliber employees amongst others. This undoubtedly will impact negatively on the economic efficiency in table-egg enterprises in the study area (Table 2).

Findings also showed that majority (55%) of the respondents had less than 11 years of experience while those with experience ranging from (31 – 40) years and above 41 years accounted for only 0.6%. It also shows the mean and standard deviation for years of experience of table egg producers in the area of study as 8.5 and 3.48 respectively. These result revealed a higher proportion of new entrants (55%) into the business of table-egg production in the State (Table 2). One of the reasons for higher share of new entrants could be attributed to the profitability and quick returns on investments (ROIs) which characterize this business despite the hostile business environment faced by this industry (Afolabi, 2012; Iyangbe & Orewa, 2009; Adepoju, 2008). It underscores the need for some capacity building programmes to educate this group of table egg producers on how best to manage the business to ensure efficient utilization of resources. Studies on the effects of farming experience on efficiency have given mixed results (Paria, Shahin & Asadollah, 2013).

Using the firm size as a criterion for the classification of poultry firms, Adokpeju (2008) and Aedo and Brummer (2011), grouped farms with chicken population (< 500) as micro, while those with chicken population ranging between (501 – 1000) and (1001- 5000) were grouped as small and medium enterprises respectively. This study adopted these intervals in classifying table-egg firms in the study area into micro, small and medium. The distribution of sampled table-egg entrepreneurs by farm size showed that medium sized farms with number of birds between (1,001-5,000) were owned by 40% of respondents while micro and small sized farms with the population of birds (<500) and (501-1000) respectively were owned by 29.4% and 28.9% of respondents respectively. This distribution shows that most of the poultry table-egg producers had medium sized farms, followed by micro and small sized farms. The high concentration of medium sized table-egg farmers in the study area indicates the great potential of the firm to grow into large farms if resources are effectively and efficiently managed. It also explains the reasons for the speculation that Akwa Ibom State is the second largest producer of poultry products in Nigeria after Ogun State (Table 2).

In terms of extension contacts, the result indicates that most (43.9%) farmers did not get regular extension contacts. About 23% received weekly extension contacts, 13.3% experienced monthly visits while 11.1% recorded quarterly extension contacts (Table 2). An extension agents provide informal mode of training (education) to farmers on best farming technologies and innovation and such services have been reported to have great impact on farmers' managerial skills and firm-level efficiency (Latruffe *et al*., 2008) and (O'Nto and Mbanasor, 2011). This finding revealed that most of the table egg producers in the area of study were not benefitting from this important service that can improve the economic efficiency of their enterprises.

TABLE 1: Distribution of respondents based on sex, age, years of schooling, marital status and household size

Variables	Frequency	Percentage
Sex		
Male	126	70.0
Female	54	30.0
Total	180	100.0
Age		
<20	11	6.1
21-30	22	12.2
31-40	86	47.8
41-50	53	29.4
>60 Mean	8 37.05(21.56)	4.4
Total	180	100.0
Years of Schooling		
1-6	23	12.78
7-12	89	49.44
13-15	45	25.0
>15 Mean	23 10.7(4.87)	12.78
Total	180	100
Marital Status		

Married	147	81.67
Single	30	17.67
Widowed	3	1.66
Total	180	100.0
Household size		
1-4	88	48.89
5-8	77	42.78
9-12	6	3.33
13-16	5	2.78
17 and above	4	2.22
Mean	5(1.43)	
Total	180	100

Figures in parentheses are Std. deviations **Source:** Field Survey, (2016)

TABLE 2: Distribution of respondents based on status of operation, ownership status. Years of experience, firm size and extension contact

Variables	Frequency	Percentage
Status of operation		
Full time	94	52.2
Part time	86	47.8
Total	180	100
Type of ownership		
Sole	144	80.00
Partnership	18	10.00
Cooperative	8	4.44
Limited Liability company	10	5.56
Total	180	100
Type of ownership		
Sole	144	80.00
Partnership	18	10.00
Cooperative	8	4.44
Limited Liability company	10	5.56
Total	180	100
Firm size		
Micro	53	29.44
Small	52	28.89
Medium	75	41.67
Total	180	100
Extension contact		
Weekly	40	22.22
Monthly	22	12.22
Quarterly	20	11.12
Not regular	80	44.44

Figures in parentheses are Std. deviations **Source:** Field Survey, (2016)

4.2 Economic efficiency in table-egg agribusiness enterprises

The distribution of the economic efficiency scores of the respondents showed that majority (85%) of table-egg enterprises had efficiency scores below 26%, while only 3.3% recorded efficiency scores between (76-100%). The maximum and minimum efficiency levels of the table egg entrepreneurs were 2 percent and 100 percent respectively. The result also showed that the mean economic efficiency and standard deviation of table egg entrepreneurs were 15.32% and 18.97 respectively (Table 3). This suggests that most table-egg entrepreneurs in the study area were not economically efficient and that there is a possibility for table-egg farmers to increase their current output capacity by about 84% given the available technology. This result accepts the null hypothesis (Ho_1) that table egg producers in the State were not economically efficient.

TABLE 3: Economic Efficiency levels of table egg producers

Efficiency Levels	Frequency	Percentage
0-0.25	153	85.00
0.26-0.5	18	10.00
0.51-0.75	3	1.67
0.76-1.00	6	3.33
Total	180	100.00
Mean	15.32(18.97)	

4.3 Determinants of economic efficiency of table egg producers

This analysis was used in testing hypothesis three (Ho_3) of this study which was to determine whether some socioeconomic variables had significant effects on economic efficiency of table egg producers in the State. The results on the determinants of economic efficiency in table egg agribusiness enterprises in the study showed that age of the respondents (egg entrepreneurs) was a significant determinant of economic efficiency. It shows that farmers who were less than 21 years of age were more efficient than farmers within other ages. Farmers within age bracket of 21 -30 will be 0.125 times less economically efficient than farmers who were below 21 years. Similarly farmers whose ages ranged from 31- 40 and 41- 50 years will be 0.135 and 0.15 times respectively, less efficient compared with farmers who were less than 21 years of age (Table 4).

TABLE 4: Tobit regression results of determinants of economic efficiency of table egg producers in Akwa Ibom State.

Variable	Coefficient	Std. Err.	t-statistics	P-value
Age: 21 to 30	-0.125*	0.066	-1.88	0.062
Age: 31 to 40	-0.135**	0.059	-2.27	0.024
Age: 41 to 50	-0.15**	0.062	-2.4	0.017
Sex:	-0.026	0.031	-0.84	0.4
Years of experience: below 10	0.005	0.143	0.04	0.972
Years of experience: 11 to 20	0.014	0.145	0.1	0.923
Years of experience: 21 to 30	-0.134	0.155	-0.87	0.386
Marital status: Married	0.251**	0.119	2.11	0.036
Marital status: single	0.304**	0.127	2.40	0.018
Extension contacts: weekly	0.05	0.054	0.93	0.353
Extension contacts : monthly	0.006	0.06	0.11	0.915
Extension contacts: quarterly	0.042	0.064	0.66	0.512
Extension contacts: not regular	0.05	0.05	0.99	0.324
Access to credit	-0.078**	0.035	-2.24	0.026
Cooperative society member	0.001	0.03	0.05	0.962
Years of schooling	0.144**	0.015	2.788	0.015
Firm size	0.234**	0.105	2.228	0.028
Constant	-0.032	0.233	-0.14	0.89
LR chi2(16)	26.20 (0.0512)			
Log likelihood	49.232421			
Sigma	0.171701***			

Note: *,** and *** represents statistical significance at 10%, 5% and 1% respectively

This result suggests that economic efficiency of table egg farmers in the study area will decline as farmers grow older. The result is in tandem with the findings of (Ojo, 2005), who contended that profit efficiency of farmers in Egba division of Ogun declines as farmers grow older in age. On the contrary, this finding refutes the works of Onyenweaku and Nwaru (2005) and Jatto, Maikasuwa, Jabo and Gunu (2014) who recorded a positive relationship between age and efficiency.

The result also showed that marital status is a significant factor affecting farmer's efficiency. From the analysis, married entrepreneurs were more efficient than widowed entrepreneurs and single entrepreneurs were more efficient than widowed entrepreneurs. Specifically, efficiency will increase by 0.25 for married farmers compared to single farmers. Similarly, efficiency will increase by 0.31 for single farmers compared to widowed farmers. This is possible as married and single farmers may exercise much commitment in farming compared to widowed farmers. This result is consistent with the findings of Ashagidigbi *et al*. (2011) who reported that marital status is a significant factor that determines efficiency of farmers in Jos.

Access to credit significantly affects the economic efficiency of table egg producers in the state. The result however shows that farmers that have access to credit are less efficient compared with farmers with no access to credit. This finding contradicts apriori reasoning and does not agree with some previous studies such as Ashagidigbi *et al*. (2011). However, the result is in line with the findings of Okike (2009), who reported that receiving credit contributed to farmers' technical inefficiency. A simple explanation of the above result could be that entrepreneurs did not invest the credit in their poultry business.

Years of schooling was also significant in determining the economic efficiency in table egg agribusiness enterprises in the study area. The implication is that farmers who are educated have a great ability to adopt new technology and innovation to become efficient in managing their farms (Effiong & Onyenweaku, 2005; and Latruffe, Guyomard, & Le Mouel, 2008). Finally, the study showed that firm size is a positive significant dactor that affects the economic efficiency of enterprises in the study area. Effiong & Onyenweaku (2005), Yusuf & Malomo, (2007) and Binuomote *et al.* (2008) reported that firm size has a positive and significant impact on the efficiency of poultry egg firms as the output of table-egg farm is partly dependent on the number of birds in the farm (Table 4).

V. Conclusion And Recommendations

Table egg entrepreneurs in the study area were economically inefficient. This is evident in the result of this study which shows that 85% of table-egg firms in the State recorded economic efficiency scores below 26% with 15.32% and 18.97 as the mean and standard deviation respectively Some socioeconomic variables which affected economic efficiency in table egg agribusiness enterprises were: age, marital status, years of schooling and access to credit. In the light of these findings, the study recommends that deliberate policies to address the socio-cultural and economic factors that limit the participation of women in the business of table egg production in particular and agribusiness generally should be put in place by the State government. Finally, the State government should take advantage of existing windows in the Central Bank of Nigeria to finance table egg firms in the State. This will mitigate the problem of accessibility to credit facilities by table egg producers. This effort should be backed up by the establishment of Monitoring and Evaluation (M&E) Teams to ensure that beneficiaries do not diverted such funds to other uses.

References

[1]. Adepoju, A.A. (2008). Technical efficiency of egg production in Osun State. *International Journal of Agricultural Economics and Rural Development. 8:7-14*

[2]. Aedo, E. R, Lakner, S, and Brummer, B (2011). Technical Efficiency in the Chilean Agribusiness Sector, Forum for Trade and Growth, June 23-24

[3]. Afolabi O. I. (2012).Credit Constraints and Production Efficiency in Poultry (Egg) Farming in Ogun State. Nigeria. An Unpublished M. Agric. Dissertation Work Submitted to the Department of Agricultural Economics and Farm Management. College of Agricultural Management and Rural Development. Federal University of Agriculture Abeokuta, Ogun State. Nigeria,.34-35

[4]. Ajani, O.I.Y., (2000). Resource productivity in food crop farming in the Northern Area of Oyo state Nigeria. Unpublished Ph.D Thesis, Department of Agricultural Economics, University of Ibadan, Nigeria. 74-79.

[5]. Akwa Ibom State Year Book, (2001), Ministry of budget and economic development. 34-36.

[6]. Alabi, R. A. and Aruna, M. B. (2005) Technical efficiency of family Poultry Production in Niger Delta, Nigeria', *Journal of Central European Agriculture,* 6(4): 531- 538.

[7]. Amaza, P.S., (2000). Resource-use efficiency in food crop production in Gombe State Nigeria. Unpublished" Ph.D Thesis, Department of Agricultural Economics, University of Ibadan, Nigeria, 47-47

[8]. Ashagidigbi, W.M., Sulaimon, S.A & Adesiyan A. (2011). Technical efficiency of egg production in Osun State. *International Journal of Agricultural Economics and Rural Development. 4 (6):120-131*

[9]. Awoyemi, T.T., (2000). A gender analysis of economic efficiency in cassava-based farm holdings in Southern Nigeria. Unpublished Ph.D Thesis, Department of Agricultural Economics, University of Ibadan, Nigeria, 26-27

[10]. Bravo-Ureta, B., & Evenson, R. (2007). Efficiency in agriculture production: The case of peasant farmers in eastern paraguay. *Agricultural Economics, 62(2)*, 178-191.

[11]. Effiong, E.O & Onyeweaku, C.E. (2006). Profit efficiency in broiler production in Akwa Ibom State, Nigeria. *International Journal of Agriculture and Rural Development. 7(1): 72-79*

[12]. Ekunwe, P.A., Soniregun O.O and Oyedeji, J.O. (2006). Effiong, E.O & Onyenweaku, C.E. (2005). Stochastic Frontier Production function analysis in broiler

[13]. Economics of small scale deep litter system of egg production in Oredo Local Government Area of Edo State. Nigeria. *International Journal Poultry Science, 5:81-83.*

[14]. Emeka, E C. & Mbanasor J.A.(2013), Relative efficiency of small and medium scale agribusiness enterprises in Imo State, Nigeria". *Asian Journal of Agriculture and Rural Development*, 3 (3):127-134.

[15]. Farrell, M., *(1957).* The measurement of productive efficiency, *Journal of the Royal Statistical Society* (Series A), 120(m), 253-290.

[16]. FAO, (2008) Food and Agriculture Organisation, Household metal silos key allies in FAO's fight against hunger. Rome: Agricultural and Food Engineering Technologies Service, FAO., 456-478

[17]. FAO, IFAD, UNCTAD & the World Bank Group. (2010). *Principles for responsible agricultural investment that respects rights, livelihoods and resources.* A discussion note prepared by FAO, IFAD, UNCTAD and the World Bank Group, January 25, 2010. http://siteresources.worldbank.org/intard/214574-1111138388661/22453321/ principles_extended.pdf

[18]. FAOSTAT, (2006) Food and Agriculture Organization, Statistics, 2006, 67-68

[19]. IRRI, (2010) Institute of International Rice Research. *GAPs fill the Gap.* Manila: IIRR, 59.

[20]. IWMI, (International Water Management Institute. 2002) International Water Management Institute. Irrigation sector in Sri Lanka: Recent investment trends and the development path ahead. Colombo: International Water Management Institute (IWMI), 57-59.

[21]. Iyangbe, C. O., & Orewa, S. I. (2009). Determinants of daily protein intake among rural and low-income urban households in Nigeria. *American-Eurasian Journal of Scientific Research, 4*(4), 290–301.

[22]. Jatto, N.A., Maikasuwa M.A, .Jabo, M.S.M. & Gunu U.I. (2014). Assessing the technical efficiency level of poultry egg producers in Ilorin, Kwara State: A Data Envelopment Analysis approach**,** *European Scientific Journal*, 8 (27): 24-33.

[23]. Kalirajan, K., & and Shand, R. (1989). A generalized measures of technical efficiency. *Applied Economics, 21*, 25-34.

[24]. Krejcie, R.V and Morgan, D.W. (1970). Determining sample size for research activities. educational and Psychological Measurement, 30, 607-10.

[25]. Latruffe, L., Guyomard, H. and Le Mouel, C. (2008): Impact of CAP direct payments on French farms' managerial efficiency. Available from (http://purl.umn.edu/44144).

[26]. Llewelyn, R.V., & Williams, J.R. (1996) Nonparametric analysis of technical, pure technical, and scale efficiencies for food crop production in East Java, Indonesia. *Agricultural Economics*, 15:113–26.

[27]. Meeusen, W. & van den Broeck, J. (1977). Efficiency estimation from Cobb-Douglas production functions with composed error. *International Economic Review*, 18(2):435-444.

[28]. Morgado, A. (2008). Ceeman case study logoplaste: Innovation in the global market from packaging to solution. *Journal of Management Decision*. 46(9): 1414-1436.

[29]. Morisson, J. (2000): Resource use efficiency in an economy in transition": An investigation into the persistence of the cooperative in Slovakian agriculture. Ph.D. Thesis, Wye College, University of London, unpublished.

[30]. NBS, (2008) National Bureau of Statistics, Statistical Bulletin, 2008.

[31]. Okike, I. (2009) Crop Livestock interaction and economic efficiency of farmers in Savannah Zone of Nigeria. Unpublished Ph.D thesis, Faculty of Agriculture, University of Ibadan, Nigeria, 171-75

[32]. Ojo M.A., Ojo A.O., Jirgi A.J. & Ajayi O.J. (2012), Non-parametric analysis of production efficiency of poultry egg farmers in delta state, Nigeria. *British Journal of Poultry Sciences*, 1(2): 18-24

[33]. Ojo, S.O. & Ajibefun, I. (2000). Effects of training on labour productivity and efficiency in oil palm production in Ondo State, Nigeria. *Journal of Sustainable Agriculture and Environment*, 2, 275-279.

[34]. Ojo, S.O. (2005). Analysis of productivity and risk factors in commercial poultry production in Osun State. *Journal of Sustainable Agriculture and Environment*. 3(1):130 -133.

[35]. Okike, I. (2009) Crop Livestock interaction and economic efficiency of farmers in Savannah Zone of Nigeria. Unpublished Ph.D thesis, Faculty of Agriculture, University of Ibadan, Nigeria, 171-75

[36]. Olayide, S.O. & Heady, E.O.(1982). *Introduction to agricultural production economics.* Ibadan: Ibadan University Press, 68.

[37]. O'Nto P. O., and Mbanasor J. A.(2011).Productivity in agribusiness firms and its determinants in Abia State, Nigeria, *Journal of Economics and International Finance.* 3(12): 662-668.

[38]. Onyenweaku, CE and Nwaru, J.C. (2005), Application of a stochastic frontier production function to the measurement of technical efficiency in Imo State, Nigeria, *The Nigeria Agricultural Journal*, 36, 1-12.

[39]. Paria S., Shahin R. & Asadollah, A. (2013). Identifying sustainable and efficient poultry farms in the light of energy use efficiency: A data envelopment analysis approach, *Journal of Agricultural Engineering and Biotechnology*, 1 (1): 1-8

[40]. RIM (Resource Inventory and Management (1992). *Nigerian livestock resources: Executive summary*, Atlas publications.

[41]. Rozelle, S. and Swinnen, J. F. M. (2004) Success and failure of reform: Insights from the transition of agriculture. *Journal of Economic Literature*, 42(2): 404-456.

[42]. Shanmugam, T., & Palanisami, K. (1994). Measurement of economic efficiency-frontier function approach. *Journal of Indian Society of Agricultural statistics, 45(2)*: 235-242

[43]. Sharma, V., & Datta, K. (1997). Technical efficiency in wheat production on reclaimed alkali soils. *Productivity, 38(2)*, 334.

[44]. Taylor, G., & Shonkwiler, J. (1986). Alternative stochastic specification of the frontier production function in the analysis of agricultural credit programme and technical efficiency. *Journal of development Economics, 21*, 149-160.

[45]. Uchendu, B.C. (2008) The role of research in agricultural development, *The Sun of Newspaper*, Feb 13th. 2-3.

[46]. Udom, D.S. (2003) An explanatory analysis of livestock production and policy implication, Calabar: Peniel Publshers, Nigeria.

[47]. Worthington, A. C. & Dollery, B. (2000). An empirical survey of frontier efficiency measurement techniques in local government. *Local Government Studies,* 26(2):23—52.www.gaif08.org/ www.oecd.org/daf/internationalinvestment/investmentpolicy/2506900.pdf

[48]. Yusuf, S.A. & Malomo, O. (2007). Technical efficiency of poultry egg production: A Data Envelopment Analysis (DEA) approach. *International journal of Poultry Science, 6:622-629*

Ekaette, M. N "Economic Efficiency in Table-Egg Agribusiness Enterprises in Akwa Ibom State, Nigeria.." IOSR Journal of Economics and Finance (IOSR-JEF) , vol. 9, no. 2, 2018, pp. 36-45.