Socio Economic and Income Returns of Poultry (Egg) Production in Owerri North and Ikeduru Local Government Areas of Imo State, Nigeria

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Abstract

The study examined the socio economic and income returns of poultry (egg) Production in Owerri North and Ikeduru local government area of Imo state, Nigeria. The economic analysis performed in this context describes clearly the socio economic life style of the respondents; and the obtained data was applied in solving economic problems. The results obtained from the study carried out to determine the economic analysis of poultry (egg) production in Owerri North and Ikeduru LGAs of Imo State, Nigeria showed that the farmers on average 300 poultry birds farm. They spent ₦ 54000.00 per farm rent in a year. The poultry (egg) farmers in the study area incurred total expenditure of ₦ 4660900.00 per farm on an average respectively. A gross income of ₦ 16160000 .00 was generated which gives an average net income of ₦ 11499100.00. The results obtained show that he gross income is greater than the net expenditure incurred by the farmers. This is profitable and shows that poultry (egg) farm production is economically profitable and viable. Most of the respondents complained of shortage and inconsistent supply/price of poultry live birds and egg in the market as the most challenging constraints for the growth and development of their business. It is recommended that an agency be set up by government to check and balance this negative occurrence that may deter potential farmers from developing much interest in poultry farming.

Keywords — *Poultry, Farm, Economic, Egg, Income*

I. INTRODUCTION

Among the ten fastest growing economies in the world in 2013, six were in Africa. International Monetary Fund (IMF) estimated an average annual growth of 5% in gross domestic product (GDP) for African between 2010 and 2014. Agriculture and agro-industries is responsible for more than 30% of national incomes on average in Africa, and also contributes to the bulk of revenues generated from export [9]. The African population that is dependent on agriculture for their livelihood is approximately three-quarters [13],[14] Agriculture has witnessed rapid growth, and employs about two-thirds of Nigeria's total labour force [1].

The growth of African economy can be projected in line with the contribution of agriculture to the socio-economic life style and standard of living of the population. A vast majority of rural people derive their livelihood from agriculture. Therefore, it can be said that the most direct and effective means of improving the standard of living and reducing poverty level, hunger and malnutrition is by increasing the productivity and incomes of small-scale farming. In addition to that is the greater participation of farmers in large-scale farming by effective agrarian reforms.

Poultry have existed on earth for over 150 million years. Research has shown that almost all country in the world takes part in poultry farming. Poultry farming is growing rapidly in Africa and has witnessed an increasing demand for poultry in all areas and this has resulted into appreciable increase in the number of birds reared for meat and eggs. Today, poultry farming is becoming a household occupation and sole means of livelihood in South Eastern Nigeria. The poultry farming that is becoming increasingly common today in this part of the country is the semi-commercial type. This is gradually taken over the traditional village scavenging poultry farming.

In order to established sustainable poultry farming, higher poultry productivity plays a key role for growth and development. Though there are many ways to increase productivity, technicality and economic efficiency of Nigerian poultry producers, Nigerian farmers are already making profits in poultry production [15],[11]. There is reason to hope that even more farmers can improve their financial condition through poultry farming [9].

Despite the profit making by poultry farmers in Nigeria, a powerful tool which serves as a

means of handling relatively low production and added value is innovation. Consequently, the understanding of how innovation takes place and developing policies and institutions that facilitate improved innovation are central to the growth and development of agriculture in African [12]. Markets for farm products are provided by innovation in agribusiness; and at the same time, gives room for new inputs, expertise, and services needed for farm production [. Hence, it increases employment and entrepreneurial opportunities in rural and urban areas and can add to the growth of micro and small enterprises (OECD, 2007).

The potential benefits enjoy by Nigerian farmers notwithstanding, poultry producers still operates at low level of innovation. Nigeria government in recent time has decided to encourage full participation in agribusiness among young people especially the unemployed graduates, by introducing new innovation that will interest the farmers. This can be attributed to the liberalization of economies and globalization of trade, which makes the growth and development of agribusiness to largely depend on international private sector initiatives or public policies [17]. To support the export of farm produce, the Nigerian government has therefore decided to liberalize competitive international trade [16].

Research Objectives:

- To examine the socio-economic characteristics of the poultry farm in the study area
- To determine the scale of operations of the poultry farm production marketing in the three agricultural zones of Imo State, Nigeria
- To determine cost returns and profitability of poultry farm production in the study area.
- To provide suggestions that will aid improvement of the productivity of the poultry farm in the study area.

***Scope*:** The study will focus only on poultry farming in the three agricultural zones in Imo State. The poultry egg production is considered in this context.

In this paper, the focus will be on economic of poultry farming in the study area. The numerous profits poultry farming has provided in supporting the economy of the study area. The challenges and recommendations for improving poultry farming in Imo Sate, Nigeria. This paper is organized as follows: a review of the previous works carried out by other authors, the method. adopted, and analysis of poultry production in Imo State, Nigeria, challenges, recommendations, and conclusion.

II. LITERATURE REVIEW

Innovation serves as a powerful means of increasing poultry productivity and income generation. Ladele A.A. [10] stated that the innovation level adopted among poultry farmers in Nigeria is still quite low. Aboki et al. [15] in their work, show that innovation index adopted has an inverse relationship with the inefficiency of family poultry production in parts of Nigeria. Policy and company triggered innovations can improve the level of efficiency and improve the situation of poultry farmers [9].

Heise et al [9] revealed the opportunities and threats of a market entry for private investors based on a PESTEL analysis and a SWOT analysis. They stated that the demand for poultry production in Nigeria is increasing due to high population growth and growing income. They went further to state that though poultry farming still faces many problems, it has emerged as the most commercialized and fastest expanding segment in the animal husbandry subsector.

Mengesha [5] reviewed the socio-economics of poultry production. He stated that about 33% of the meat consumed globally is accounted by poultry and that this figure is expected to grow at 2 to 3% each year in the world. He stated that there is prediction that technology favours the intensification of poultry production in developing countries, but village poultry is still profitable and contributes to poverty alleviation and has no market problems. It went further to state though poultry meat and egg production is the most environmentally efficient animal protein production, its production faces the problem of food-feed competition and other critical gaps that needs to be filled by research and development institutions. It finally concluded by stating that poultry production has so many socio-economical advantages in satisfying the demands of animal source foods.

Yusuf et al [8] performed a financial analysis of poultry production in Kwara State, Nigeria, using budgetary and profit index analysis. In their study, primary data were collected through a set of structured questionnaire from 80 registered poultry farmers using a systematic random sampling technique. The results of the study showed that 72.5% of the respondents were youth with mean age of 38.7 years and 63.8% choose poultry farming as main occupation. They further performed analysis of cost and returns which revealed that production of poultry was profitable in the area with gross income and net income for production of eggs being ₦4,062,422 and ₦1,255,965 respectively. The gross and net incomes for broilers production were ₦1,683,209 and ₦499,187 respectively. The

regression analysis that was performed showed that stock capacity, variable and fixed costs with labour, feed, and equipment inclusive were factors that significantly affect poultry farm business in the study area. They observed that these costs increase as the size of the business increases, and suggested that the poultry producers would have to stem down cost of production so as to have optimum output and maximize profit. They also suggested that the provision of technical education through extension agents would greatly help in realizing this lofty goal.

Esiobu et al. [3] evaluated the determinant of income from poultry egg production in Imo State, Nigeria. A multistage random sampling technique was employed for the selection of the respondents. Sixty poultry egg producers were taken as sample size. A set of structured questionnaire was used for data collection. The collected data were analyzed using descriptive statistical tools, gross income analysis and econometric regression model. They stated that the average farm income was ₦77,300.00 while the mean farm size was 488.00 birds. It stated that greater proportion (96.67%) of the farmers keep Cinnamon Queen as their breed of layers. It also stated that result revealed that under suitable condition (feeds and water Ad -libitum), A Cinnamon Queen was efficient and capable of producing between 25-30 quantities of eggs per month. Their finding showed that cost of feeding (₦126,000.00) was the highest total variable cost recorded. And that producers earned a positive net return of (₦ 180,320.00) and return per capital invested was ₦0.36. Their estimated econometric analysis showed that farm size (4.346), education (2.567), farming experience (5.495), farm income (5.029), household size (4.910), extension contact (2.696) and membership of cooperative (2.834) were found to be the significant determinant of output and income. The relationships were statistically significant at 1% level of probability. They claimed that an F-ratio (37.968) revealed the overall significant of the model. They finally asserted that poultry egg production is efficient and lucrative in the area of study but that farmers complained of high cost of feeds and poor feeder roads. They therefore recommended that farmers be encouraged to form agricultural co-operatives to eliminate the exploitative and dubious activities of some input agencies and to enable them to access credit loan from government and other credits institutions. And that government should put effort to address high cost of poultry feeds in the area as well as address the feeder roads to reduce egg spoilage.

Sulaiman et al. [7] looked at the introduction of the water-bed incubation technology to rural poultry farmers in Bauchi state, Nigeria. They asserted that there is an obvious and effective strategy for improving the capacity of the rural poultry keepers which is the introduction of enhanced techniques that are simple, appropriate, affordable and reliable. This they said would invariably have impact on the health status of the citizens.

Ibekwe et al [4] performed a profit function analysis of small scale broiler producers in Imo State Nigeria. A multi stage sampling technique was adopted for the selection of broiler producers whose total number is 60. Descriptive statistics and Least Square Regression model were the major tools used for the analysis. Their result showed mean household size of 4 for broiler farmers with 90% of them learned. A mean age of 44 with 74% male dominance in broiler farmers was obtained from the study area. N31, 282.04 was the mean net farm income obtained with a benefit cost ratio of 1.08 linear function, which was the lead equation on the basis of highest R^2, F-value and number of significant variables. They further state that 0.848 was the value obtained from Coefficient of Multiple Determination (R^2) and 28.67 F value. They concluded that age, educational level, farm experience, farm size and cooperative membership were significant whereas household size, gender and marital status were not. They cited lack of production facilities and inadequate capital as major constraints.

Malarvizhi and Geetha [2] conducted a study on economic cost and profit assessment of farming in Namakkal district. They sated that the study was intended to examine the socio-economic background of the poultry farmers; to analyze the investment, cost and profit of the farmers and to identify the problems faced by the farmers. The study was conducted base on primary and secondary data collected from 120 poultry producers using purposive sampling with the period of November 2013 to January 2014. They attributed cost of feeding as the major challenge facing the poultry farmers because of the large percentage of its effect on the cost of production.

Ngozi and Chinonso [6] investigated the profitability of broiler production in Orumba South local government area of Anambra State, Nigeria. Respondents were selected from various villages that made up Orumba South L.G.A of Anambra State. Among these respondents were small-scale, medium scale and large-scale broiler producers. Forty three producers were selected by randomly sampling. Data collected were based on socio-economic characteristics, costs and returns and problems associated with broiler production in the study area. A well structured questionnaire was administered to each respondent for data collection. Percentages, gross margin and regression model were used as analytical tools. Percentages were used to describe the socio-economic variables and problems associated with broiler production. The gross margin

model and multiple regression model were used to determine the profitability and economic analysis of broiler production. The result obtained showed that more than half of the broiler producers were women with small-scale, medium-scale and large-scale in the following percentage proportion of 27.91%, 25.58% and 23.26% which were mostly of middle ages 41-50 years. They stated that the major problems facing broiler production were lack of capital, inadequate feed supply, drugs, diseases, poor transport network, medications and labour. They suggested feed subsidies by government, provision of adequate incentives and supporting services to broiler producers and releasing of loans to farmers without regard to their production scale as well as increasing the profitability of broiler production by organizing training workshops. They concluded that by doing this the broiler production industry will be developed and thereby boosting productivity in production.

III. MATERIALS AND METHODS

This research study was carried out in Imo State, Nigeria. The state has three senatorial zone and 27 Local Government Areas. The senatorial zones are used in dividing the state into agricultural zones namely: Owerri, Orlu and Okigwe. It lies between latitudes 40.75° and 60.25° North and longitudes 60.5° and 80.15° East. It has a population of about 3,934,899 million people (National Population Commission, 2006).

Data collection was done randomly for the selection of poultry farmers from Owerri North and Ikeduru Local Government Areas (LGAs). A total of 60 poultry farmers were selected and sampled for the research study. Data collection was done based on structured questionnaire using interview schedule so as to enable some farmers who could not read or write to participate fully and provide required answers. The data collection was carried out late last year (2016).

A. *Descriptive Statistics*

In order to analyze the data collected, a descriptive statistical method was employed to obtain the mean and frequencies of different quantities used and price of inputs and outputs. The arithmetic mean ($\bar{x}$) was computed as follow.

$$\bar{x} = \frac{\sum x}{n} \qquad (1)$$

where, x = value of variable, n =no. of observations, $\sum$ = summation of variables

Percentages(%): This is the proportion of fraction expressed in hundredth. It was calculated as follows:

$$\% = \left(\frac{f}{n_r}\right) \times 100 \qquad (2)$$

where f = desired class frequency, n_r = algebraic sum of respondents

B. *Multiple Linear Regression Models*

By this, it refers models with just one dependent and two or more independent variables. The dependent variable whose value is to be predicted is defined as a function of the independent variables which is also known as exploratory variables.

In order to determine the physical relationship between inputs and outputs obtained in poultry egg production, production function model was used. The model is implicitly given as:

$$Y = \beta_0(X_0) + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \beta_4(X_4) + \beta_5(X_5) + u_i \qquad (3)$$

where Y is the output of poultry egg production, X_o is the family labour in man-day/hour, X_1 is the hired labour man-day/hour, X_2 is the flock size (number), X_3 is the feed (kg), X_4 is the depreciation cost of equipment (₦), X_5 is the other operating expenses (₦), and u_i is the error term.

Four functional forms were used in the analysis and include: linear function, semi-log function, double-log function and exponential functions, and the double log function was selected and used as the lead equation. The functional form used was selected based on both statistical and econometric criteria (T-test, F-statistics, and R^2), number of significant variables and prior expectation of the signs of the coefficients. The prior expectation for coefficients X_o, X_3 and X_4 was positive while those of X_1, X_2 and X_5 was negative.

IV. RESULTS AND DISCUSSION

The study was conducted on poultry farmers in Owerri North and Ikeduru LGAs in Imo State Nigeria. The following two subsections were used for result analysis: (a) socio-economic characteristics and Physical productivity and net returns on poultry eggs production.

A. *Age of respondents*

Table 1 presents the age associated with the number of respondents considered in this context with the percentage of poultry (eggs) farmer age group. Age-group of 21-30 has 23.33%, 31-40 has

25%, 41-50 has 33.33%, and 51-60 has 11.67% and poultry farmers with age group from 61 and above has 6.67%.

Table 1: Respondents Distribution According to Age

Age group(years)	Frequency	Percentage
21-30	14	23.33
31-40	15	25.00
41-50	20	33.33
51-60	07	11.67
61 and above	04	06.67
Total	60	100

Source: field survey 2016

B. Education level

Table 2 presents the education level associated with the number of respondents considered in this context with the percentage of poultry farmer (eggs) farmer literacy. The result for the literacy or educational level of the poultry (eggs) farmers shows that 16.67% had no formal education, 25% had primary education, 35% had secondary education, and 23.33% had higher education.

Table 2: Respondents Distribution According to Education Level

Education level	Frequency	Percentage
No formal education	10	16.67
Primary education	15	25.00
Secondary education	21	35.00
Higher education	14	23.33
Total	60	100

Source: field survey 2016

C. Farming Experience

Table 3 presents the relationship between farming experience among poultry (eggs) farmers. The farmers having experience of 4 years and below were 41.67% of the respondents. Those with farming experience from 5-9 years were 25%. Those whose farming years of experience were between10-14 had 20%. For farmers whose years of experience are 15-19 had 13.33%. For those with years of experience between 20 and above, they had 3.33%.

Table 3: Respondents Distribution According to Year of Farming Experience

Years of farming experience	Frequency	Percentage (%)
4 and below	25	41.67
5-9	15	25.00
10-14	12	20.00
15-19	08	13.33
20 and above	02	03.33
Total	60	100

Source: field survey 2016

D. Sex

Table 4 presents respondents according to their sex. 36.67% of the respondents were male while the remaining 63.33% were female.

Table 4: Respondents Distribution According to Year of Farming Experience

Sex	Frequency	Percentage (%)
Male	22	36.67
Female	38	63.33
Total	60	100

Source: field survey 2016

E. Marital Status

In table 5 the number of respondents whose say they were married as expressed in percentage were 66.67 and those who were singles were 33.33%.

Table 5: Respondents Distribution According to Marital Status

Marital Status	Frequency	Percentage (%)
Married	40	66.67
Single	20	33.33
Total	60	100

Source: field survey 2016

F. Major Occupation of Farmers

Table 6 shows the number of respondents associated with their occupations. 30% engage in trading, 20% are civil servants, 33.33% involving crop farming, and 16.67% are artisans.

Table 6: Respondents Distribution According to Major Occupation

Occupation	Frequency	Percentage (%)
Trading	18	30
Civil Service	12	20
Farming (crop)	20	33.33
Artisan	10	16.67
Total	60	100

Source: field survey 2016

G. Hygienic Condition

Table 7 shows the categorization of the respondents on the basis of hygienic state of their farms. 41.67% had good hygienic condition, 36.67% had satisfactory hygienic condition and 21.67% had poor hygienic condition.

Table 7: Respondents Distribution According to Hygienic Condition

State	Frequency	Percentage (%)
Good	25	41.67
Satisfactory	22	36.67
Poor	13	21.67
Total	60	100

Source: field survey 2016

H. Birds

Table 8 shows that 63.33% had birds less than 300, 30% had birds greater than 300, and 6.67% had bird less than 600.

Table 8: Respondents Distribution According to Hygienic Condition

Number of birds	Frequency	Percentage (%)
Less than 300	38	63.33
Greater than 300	18	30
Less than 600	04	6.67
Total	60	100

Source: field survey 2016

I. Equipment Expenditure

Table 9: Respondents Distribution According to Major Occupation

Equipment	Rate per Unit	Mean
4 electric/Gas/Diesel Brooders	300	1200
18 chick guard sheets	200	3600
35 Chick feeders/trays	200	7000
30 chick drinkers	70	2100
62 feeders	200	12400
16 automatic drinkers	700	11200
2 buckets	450	900
3 electrical pump	4500	13500
3 spray pump	6000	18000
25 lying nest	1800	4500
80 egg trays (plastic)	50	4000
28 curtains	350	9800
Miscellaneous expenditure		15000
Total (₦)		103200

Source: field survey 2016

J. Rearing Expenditures

Table 10: Expenditure rearing of egg farm in the study area

Items	Rate per Unit	Mean
Cost of 1000 day-old chicks (300)	150	45000
Cost of feed 30kg/bird	2400	720000
Cost of vaccination and medication	50	15000
Electrical and fuel usage charges	5000/month	60000
Miscellaneous expenditure		12000
Total (₦)		852000

Source: field survey 2016

K. Charges for Labour

Table 11indictates that ₦1304000 cost of production is spent on labour on an average poultry farmer.

Table 11: Labour inputs of poultry egg farm in the study area

Items	Rate per Unit	Mean
Feedings/month (500)	2400	1200000
Cleaning/month	4000	48000
Security	4000	8000
Drinkers/month	4000	48000
Total (₦)		1304000

Source: field survey 2016

L. Costs of Marketing

Table 12 shows that a total of ₦ 42000 was spent on average on poultry (egg) marketing in the study area.

Table 12: Marketing cost of poultry egg farm in the study area

Items	Rate per Unit	Mean
Loading	2500/month	15000
Transportation	2000	12000
unloading	2500	15000
Total (₦)		42000

Source: field survey 2016

M. Total Expenditures Cost

Table 13 shows that the selected poultry farmers from the study area considered in this context spent a total cost of ₦ 2305700.00 for production on average.

Table 13: Total Expenditure of egg farm in the study area

Items	Mean
Farm rent	54000
Equipment expenditure	103200
Rearing expenditure	852000
Labour charges	1304000
Marketing cost	42000
Total (₦)	4660900

Source: field survey 2016

N. Physical/ Revenue Productivity

Table 14 shows that each selected poultry farmer in the study area earned ₦16160000.00 as an average revenue per year.

Table 14: Physical/Revenue Productivity of egg farm in the study area

Items	Rate per Unit	Mean
Sale of 20 dozen eggs/bird for 100 birds	650	16000000
Sale of 100 spent hens weighing 1.5kg each	1500	150000
Sale of poultry manure	25000	10000
Total (₦)		16160000

Source: field survey 2016

O. Net Farm Income

Table 15 presents the net income of a poultry farm for egg production in the study area. It can be seen that an average income of ₦ 13854300.00 is generated per year.

Table 15: Net farm income of egg farm in the study area

Items	Mean
Gross income, G ((₦)	16160000
Total expenditure, T ((₦)	4660900
Net income, N (₦): N = G - T	11499100

Source: field survey 2016

P. Productivity Ratio and Cost Benefit Ratio

A productivity ratio is the output to input ratio in production. It is a measure of the average of the efficiency of production. From table 15, the productivity ratio is taken between gross income and the total expenditure with respect to the study area. This gives a ratio of input-output is 1:1.4.

A benefit cost ratio (BCR) is defined as the ratio of a business or project, usually expressed in monetary terms, to its cost, also expressed in monetary term. The benefit ratio in this context is greater than 1 as can be seen from table 15. This is good.

V. DISCUSSION

This study presented a number of factors that is assumed to be influential when determining the poultry egg production in Owerri North and Ikeduru LGAs. It shows that the economic analysis performed in this context describes clearly the economic behaviour; and the obtained data was applied in solving economic problems.

The results obtained from the study carried out to determine the economic analysis of poultry (egg) production in Owerri North and Ikeduru LGAs of Imo State, Nigeria showed that the farmers on average 300 poultry birds farm. They spent ₦ 54000.00 per farm rent in a year.

The poultry (egg) farmers in the study area incurred total expenditure of ₦ 4660900.00 per farm on an average respectively. A gross income of ₦ 16160000 .00 was generated which gives an average net income of ₦ 11499100.00.

The recommendations made in this context are as follows:

- Most of the respondents complained of shortage and inconsistent supply/price of poultry live birds and egg in the market as the most challenging constraints for the growth and development of their business. It is recommended that an agency be set up by government to check and balance this negative occurrence that may deter potential farmers from developing much interest in poultry farming.
- Institutions of higher learning and research in Nigeria should pay adequate attention to enhancing and promoting chicken fast food recipes as part of their research programmes in line with modern day genetic improvements of local breeds.
- Infrastructural development with good road network will serve well for the ease of practice of poultry farming and movement of poultry farm produce in the study area and the country in general.
- Government at all level should support farmers in the study area and in the country in general by providing subsidy for poultry farmers through soft loan intervention and compelling banks to give soft loans to young school leavers and graduates who are interested in taking up poultry farming as a means of earning a living. This will reduce unemployment in the study areas.
- Seminar and work shop should be organized for farmers especially in the use of internet and cell phones to enable them access latest technological information on poultry (egg) farm production. As majority of the respondents still use outdate poultry farming system, which reduces egg production performance of the layers.

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