

Agriculture in Nigeria's Economic Diversification Process: A Study of a Poultry Outgrower Scheme

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ABSTRACT

Nigeria's current economic plan targets diversification through leveraging the power of the private sector in order to enable and fast-track business investments and job creation. This paper reports a study of a model of a poultry outgrower scheme - Akwa Prime, used in catalysing private investments in the poultry sector of Akwa Ibom State, Nigeria. The scheme shares the potential of combined strength of the state and that of the private sector in stimulating increased production and integrating of small livestock farmers to the national economy. The study's specific objectives were to examine the extent of smallholder farmer involvement in contract negotiations including price setting; the role of the key participants, particularly the regulatory function of the state in an out-grower scheme construct; and the impact of the scheme on socioeconomic improvement of smallholder farmers. This research was conducted with 42 smallholder independent broiler poultry farmers who are registered members of the Akwa Prime outgrower scheme and receiving a range of input support and good production practices aimed at optimization. Findings show a positive impact of the scheme on small independent poultry farmers' productivity, profitability and survival. Contract negotiations and key participants role were fully documented. Participating farmers were found to have high income and stocking density while the cost of day old chicks and other production inputs provided by the scheme accounted for 99.1% ($R^2=.991$) of the variation in farmers income. This positive change on the bottom line of small independent poultry farmers indicate the prospects for greater deployment of out-grower model to stimulate agriculture productivity and growth. However, despite some benefits there were major bottlenecks including compromised role of the state, imposed buyback price on farmers and late offtaking of the finished stock. The implication of this finding is that small poultry farmers left alone with their independent business choices may not stimulate much diversification driven by agriculture.

Keywords: *Outgrower Scheme; Off-takers; Economic diversification; Poultry farmers.*

1 Introduction

Nigeria's current economic recovery and growth plan (ERGP), targets economic diversification by unlocking the power of the private sector principally in agriculture in order to catalyse investment and job creation (MBCP, 2017). Various programmes of government such as the Central Bank of Nigeria, Anchor Borrowers' Programme (CBN, 2016) and some subnational outgrower schemes exist in line with this effort to drive the process of diversification, boost agriculture productivity and promote non-oil exports. The Anchor Borrowers' Programme is largely a private sector driven multi-stakeholder agriculture outgrower scheme involving government, banks and farmers, among others and aims to create a linkage between anchor companies involved in the processing, and small holder farmers of key agricultural commodities. Akwa Prime Hatchery and Poultry Ltd is a sub-national outgrower programme serving the poultry sector with the private sector/state equity participation. The driving philosophy of the scheme is to create linkages between the off-taker (needing aggregation for domestic, industrial and export markets) and the out-grower (needing quality inputs/cash for labour, innovation and market access), where the former supplies the inputs needed and assures a buy-back and the latter offers entry point infrastructure/farm site location, adherence to good production practice and avoidance of side selling. Understanding the agriculture landscape of Nigeria is important in envisaging the profound benefit of an outgrower scheme if effectively administered in the transformation of agriculture in the country. Nigeria is predominantly a smallholder agriculture system with 70% of farmers producing 90% of total nation's agriculture productivity using an average of 1.75 hectares of land. The remaining 30% farmers fall between large scale and medium scale operators. The 70% (smallholder farmers) lack the capacity to access critical inputs, technology and innovation to optimize production. Linkages of the 70% with 30% through outgrower schemes of any kind seem to offer Nigeria one of the best options for agriculture in order to drive diversification.

An extensive body of literature asserts that, in addition to mainstreaming gender and youths in agriculture, outgrower scheme which is a contractual arrangement between the public and private sectors, fundamentally has mutual benefits for partners in areas of shared risks, inputs, resources, market and technology (Ponnusamy, 2013; FAO, 2016). Due to successes recorded in various fields where dramatic changes would have been impossible outgrower scheme has been reported as an innovative approach in achieving public and private sector goals (Ponnusamy, 2013; FAO, 2016). Frank (2014) as well as Frank and Umoh, (2018) have reported that outgrower scheme involving public private partnership is at the experimental stage in the country. In the heart of Nigeria's current approach in achieving diversification, driven by agriculture transformation is a strong signal on strategic partnerships, private sector involvement and 'market led' agriculture demonstrated by the implementation of Anchor Borrower Scheme and ERGP focused Labs aimed at fast tracking private investment. The decline in Agriculture GDP contribution to Nigeria's economy from 50% (1960) to 24% (2016) is strongly attributed to lack of investment in agriculture sector and single pursuit of oil exploration; a situation that has seen Nigeria's strong agriculture base and food self sufficiency over a period decimated to low ranking in agriculture indices and current high import of food and agriculture products (Olayemi, 1989; Okunmadewa, 1993; Umoh, 2016; Adesina, 2011).

Estimates show that Nigeria has 176 million poultry birds (FAO, 2008), 10% of Nigerians are poultry farmers and more than 70% of the poultry in Nigeria is chicken (Ekunwe and Akahomen, 2015). These figures and the assertion that poultry production provides a quick financial turnover (Ajala *et al.*, 2007), imply that the poultry sector optimization through innovative and technological approach offers great potential as a vital source of income to a considerable number of Nigerians.

The assumption that poultry production provides great potential for Nigeria; as well as a model with which the entire food animal supply chain could be directed is advanced on three premises namely (i) The integrated nature of the sector, (ii) the global scale and acceptability and (iii) the sector lead in driving the evolving taste and technologies to achieve convenience (Yakovleva and Flynn, 2004; Essien and Umoh, 2016). This assumption seems to appropriately situate the poultry sector within the out-grower scheme development narrative of Nigeria's government.

Akwa Prime Outgrower Scheme

The Outgrower scheme of Akwa Prime Hatchery and Poultry Ltd based in Mbiaya Uruan is a sub-national initiative with equity participation of a private company and the state government of Akwa Ibom. It is an innovative arrangement which brings small scale poultry producers, corporate investors and government together. The partnership flagged off in 2016 by the sub-national government in its effort to diversify the economy, utilized the outgrower scheme on broiler production to integrate smallholder farmers with the aim of building their capacity and mainstreaming them into the daily market of poultry products. Under the scheme, agreement is established between Akwa Prime and a number of selected poultry farmers aimed at raising farmers optimum production capacity by supplying them with day old chicks, other inputs and training to empower and optimize productivity. Farmers under the scheme are selected based on their ownership of

approved poultry farm site equipped with a level of infrastructure. The day old chicks hatched and supplied by Akwa Prime are raised by the farmers to specified mature live weight at a maximum of six weeks, after which the company guarantees a buy back at an agreed live weight price for value addition and onward sale to the ready chicken market. In other words, the agreement sets out the terms for Akwa Prime to act as the inputs supplier as well as off-taker with a guarantee to buy back produce, while smallholder poultry farmers act as the outgrowers with responsibility for the growing of the broilers according to specified good production practice.

Our three overarching research objectives within this innovative sub-national scheme were to explore: the extent of smallholder farmer involvement in contract negotiations including price setting; the role of the key participants, particularly that of the regulatory function of the state in an outgrower scheme construct; and the impact of the scheme on socioeconomic improvement of smallholder farmers.

Our assumption is that deployment of out-grower scheme model to stimulate productivity, profitability and survival of small independent poultry farmers should provide positive change on the bottom line of these farmers, indicating the prospects for greater deployment of the model to stimulate agriculture productivity and growth whilst the opposite finding would prove that small poultry farmers independent business choices should be invested on, to stimulate agriculture development in Nigeria.

2 Conceptual Issues

Several business models have been proposed and practiced. These are often aimed at either raising enough funds for the venture or sharing business risks or harnessing the skills and capabilities required for the success and sustainability of the business. Such business models include the sole proprietorship, cooperative, the company, and partnership, among others (Akpan, 2010). An outgrower scheme aims at a more effective problem-solving mechanism and promises to increase the responsiveness of policies and create accountability by including other actors in decision making. Different models of outgrower schemes funding are characterized by a partner being responsible for owning and maintaining assets at different stages of the project.

3 Research Methodology

This study was carried out in Akwa Ibom State, Nigeria. The State is in the coastal southern part of the country, lying between latitudes 4°32'N and 5°33'N, and longitudes 7°25'E and 8°25'E. It is bordered on the East by Cross River State, on the West by Rivers and Abia States and on the South by the Atlantic Ocean and the southernmost tip of Cross River State. Akwa Ibom State has a population of 3,920,208 and a total land area of 7,249km². The State has 31 Local Government Areas and 6 Agricultural Zones namely: Uyo, Eket, Abak, Ikot Ekpene, Oron and Etinan. It has three distinct vegetation zones: the saline water swamp forest, the fresh water swamp forest and the rain forest. It has a tropical climate marked by two distinct seasons: the dry season (November- March) and the wet season (April - October). The main economic activities of the people are fishing, farming, trading and public service.

Dominant crops produced are cassava, yam, cocoyam, water yam, plantain/banana, maize, garden egg and vegetables including fluted pumpkin, waterleaf, okra, etc. Akwa Ibom State is a palm belt. Oil palm and coconut palm are cultivated, and the state is a major contributor to national palm produce output. Common livestock in the State are goat, sheep and pig. Akwa Ibom State is the hub of poultry in the south-south region of Nigeria. Many States in the zone such as Cross River, Rivers, Bayelsa obtain eggs and table birds from the State.

Population of Study: The population of the study consisted of all poultry business owners in Akwa Ibom State participating in the Akwa Prime Out-growers Scheme. The list of the participants (sampling frame) was obtained from Akwa Prime Hatchery located in Mbiaya, Uruan Local Government Area.

Sampling Procedure and Sample Size: Simple random sampling was used to select the respondents for the study. A total of 42 broiler producers were selected for in-depth study.

Instrument for data collection: The data for the study were collected through a set of structured questionnaires. The questionnaire had 4 sections each reflecting the specific objective of the study. Section A contained questions on the socio-economic characteristics of poultry farmers. Section B contained questions on the roles and functions of the various key actors in the Akwa Prime Outgrower Scheme. Section C asked questions about the relationship among the various key actors while the last Section D contained questions on the performance of participating poultry farmers and non-participants.

Methods of Data Collection: Interview schedule was used in collecting data for the study. In this method, some of the poultry farmers were interviewed and the responses given were filled into the questionnaire by the

researcher and trained enumerators. However, some of the farmers who were literate enough and willing to complete the questionnaire were encouraged to do so. This method gave a very high response rate.

Methods of Data Analysis: Both descriptive statistics and regression analysis were used in the study. The extent of performance of the roles and functions of key actors as well as the relationship among them were analyzed using descriptive statistics. A total of 3 key actors were identified in the Akwa Prime Outgrower Scheme. They are: (i) Akwa Prime (Company), (ii) Poultry farmers, (iii) Bank/Insurance Company. The farmers and the bank/insurance company have 4 and 3 roles respectively. Performance was rated on a 4 scale Likert Scale. 1 = poor, 2 = fairly good, 3 = very good and 4 = excellent. Mean scores were computed, and the performance of each actor was ranked from the highest to the lowest.

Test of Difference in the income of participants and none-participants was conducted using the statistical test of difference, popularly called t-test. It is given by the formula:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{SD_1^2}{n_1} + \frac{SD_2^2}{n_2}}}$$

Where

\bar{X}_1 = Mean income of Akwa Prime Out-growers Scheme Participants

\bar{X}_2 = Mean income of none-participants

SD_1^2 = Variance in income of participants

SD_2^2 = Variance in income of none-participants

n_1 = number of participants

n_2 = number of none-participants

Regression analysis was used to determine the factors influencing the performance of poultry farmers. The amount of income realized by each poultry farmer was used as measure (proxy) of performance. The assumption here is that every effort of the poultry farmer is directed towards optimizing his/her output which in turn is disposed of to generate income. The outgrowers scheme plays a crucial role here by providing the participants ready market through off-taking of their products. The opportunity may not be readily available to the none scheme participants. The implicit form of the regression equation is given as:

$$Y = f(X_1, X_2, X_3, X_4)$$

The explicit form of the equation is:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e_i$$

Where Y= Income of Akwa Prime Outgrower Scheme participants, X_1 = costs of day old chicks (in naira), X_2 = costs of feeds (in naira), X_3 = costs of medication (in naira) and, X_4 = costs of labour (in naira). b_0 = intercept, b_1, b_2, b_3, b_4 , are the coefficient of the respective variables, and e_i = stochastic error term. Four functional forms of the regression equation were estimated for exploratory purposes. These were linear, semi-log, double log and exponential functions.

The lead equation was selected based on theoretical justification (the sign and magnitude of the coefficients), econometric justification (the size of R^2 , standard error and F-value) and statistical justification (the t-values). Based on these criteria, the double log function was the lead equation. The linearized form of the function is:

$$\text{Log}Y = b_0 + b_1\text{log}X_1 + b_2\text{log}X_2 + b_3\text{log}X_3 + b_4\text{log}X_4 + e_i$$

Where, Y, X_1 - X_4 , e_i , b_0 , b_1 - b_4 are as explained earlier. Log is log to base 10.

4 Result and Discussion

4.1 Extent of Performance of Roles and Functions by Key Actors in Akwa Prime Outgrower Scheme:

As stated above, three key actors are involved in the Akwa Prime Outgrower Scheme namely Akwa Prime Company, poultry farmers and the bank/insurance. The result of the assessment of key actors' performance is presented in Table 1. Of the 7 roles/functions expected, Akwa Prime Company was ranked high on buying- back mature birds from the farmers. A total of 34.1% of the respondents rated the company's performance of this role as excellent. Nonetheless, some farmers (7.3%) rated the performance of this function by the company as poor. During the field study, some farmers complained of delay by the company to offtake mature birds causing them to incur more expenses in feeding and caring for the birds. Of concern, however, was the selection of farmers to participate in the scheme. This particular role had the least mean score as well as the least percent of respondents (4.9%) rating the performance of Akwa Prime as excellent. From the results obtained on the performance of Akwa Prime, it can be inferred that there is still room for improvement as far as their function is concerned if the scheme can serve as a private sector-driven economic diversification and poverty reduction model.

The views of the banks/insurance companies' officials and Akwa Prime of the performance of farmers were also sought. Out of the 4 roles/functions performed by farmers, the raising of birds to maturity for up-take was ranked as number one while record keeping ranked second. It is of interest to note that the scheme is encouraging farmers to keep records of their business. This is a commendable development as farmers, especially the small scale farmers are not known to be keeping farm records.

Supervision of grow-out was ranked as the best performed role of the Bank and Insurance Company. This was followed by booking of docs and feeds based on the advice of the Outgrowers' Management Team. A total of 29.3% and 34.1% of the respondents rated the performance of the banks of the two roles as excellent, respectively.

As earlier stated, essentially, outgrower schemes are usually assessed in five domains: (i) Extent of smallholder farmer involvement in contract negotiations including price setting (ii) Presence of essential services to support farmers and buyers (iii) Evidence of clear role of Local Government Authorities (iv) Evidence of regulatory role for that particular commodity (poultry) and (v) Impact of the scheme on socioeconomic improvement of smallholder farmers. However, it was observed that in Akwa Prime Outgrower Scheme, the government holds some equity in the business which distorts the role of government, given that they should be serving as facilitators and regulators of the market sector. This raises a fundamental question on the regulatory compliance of products from the scheme if a regulator was serving as a market actor.

Table 1.
Role Performance Rating of the Key Actors in Akwa Prime Outgrower Scheme.

Key Actors/ Roles	Performance Rating				Mean	Rank
	Poor	Fairly Good	Very Good	Excellent		
Akwa Prime						
1. Select farmers qualified to participate in the scheme	3(7.3)	11(26.8)	25(61.0)	2(4.9)	2.63	7
2. Visit and inspect farms of prospective Out-growers	2(4.9)	9(22.0)	22(53.7)	8(19.5)	2.88	3
3. Organize training session for prospective Out-growers	4(9.8)	11(26.8)	18(43.9)	8(19.5)	2.73	6
4. Supplies Day Old Chicks and other inputs to the farmers	1(2.4)	14(34.1)	20(48.8)	6(14.6)	2.75	5
5. Supervises grow out through Out-growers Management Team.	3(7.3)	11(26.8)	19(46.3)	8(19.5)	2.78	4
6. Provides record cards to the farmers.	5(12.2)	3(7.3)	20(48.8)	13(31.7)	3.00	2
7. Buys back matured birds from the farmers.	3(7.3)	7(17.1)	17(41.5)	14(34.1)	3.02	1
Outgrowing Farmers						
1. Provides Akwa Prime with information and access into the farm	1(2.4)	6(14.6)	24(58.5)	10(24.4)	3.05	4
2. Receives Day Old Chicks and other inputs from Akwa Prime	1(2.4)	7(17.1)	21(51.2)	12(29.3)	3.07	3
3. Raises birds to acceptable table size		4(9.8)	18(43.9)	19(46.3)	3.37	1
4. Keeps proper records of all farm activities.	1(2.4)	8(19.5)	13(31.7)	19(46.3)	3.22	2
Bank/Insurance Company						
1. Books for Day Old Chicks and feeds based on the advice of the Outgrowers' Management Team.	3(7.3)	11(26.8)	26(63.4)	1(2.4)	2.61	2
2. Bank pays agreed premium to the insurance company	3(7.3)	20(48.8)	16(39.0)	2(4.9)	2.41	3
3. Bank and Insurance Company supervises grow-out	5(12.2)	9(22.0)	17(41.5)	10(24.4)	2.78	1

Source: Field Study, 2017

4.2 Relationship among Key Actors in Akwa Prime Outgrower Scheme:

Relationship among key actors in an Outgrower Scheme is a major factor for its success or failure. Table 2 contains the responses of participants of Akwa Prime Out-growers Scheme to the statements made to show the relationship amongst the various key actors in the Scheme. Over 90% of the participants (farmers) fully understood their business relationship with Akwa Prime and the Insurance Company and 85.4% of them said that their relationship with Akwa Prime and the Insurance Company was based on a written agreement. This suggests that a greater percentage of the participants had a clear knowledge and understanding of their transactions with Akwa Prime and the Insurance Company. The result also reveals that 39.0% of the farmers were satisfied with the buy-back price fixed by Akwa Prime. Less than a half of the respondents (36.6%) were compensated by the Insurance Company in cases of diseases outbreak and losses, only 29.3% reported that buy-back of mature birds was timely.

Untimely sales of mature birds imply more expenditure to the farmer in the form of feed and medication to the farmer. This could result in reduction in the income and profit of the farmers. Only 17.7% of the farmers were

satisfied with the quality of inputs supplied to them by Akwa Prime Company. This implies that the quality of inputs supplied to them may not have been up to standard, thus, their dissatisfaction. Low quality inputs could cause an increase in the mortality rate, late maturity of birds and increase in farmer's expenditure, thus leading to a reduction in the income of the poultry farmer. It was not clear if the issue of quality and standards of inputs were thoroughly discussed and whether the farmers have the capability to ascertain input quality and ensure compliance by the company.

While farmers seem to be satisfied on a number of relationship factors, the fact that the price for input as well as product (mature birds) are fixed by Akwa Prime goes to confirm earlier report by Essien and Umoh (2016) that poultry farmers in Akwa Ibom State are not being involved in price negotiations indicate a worrying lopsidedness in supply chain power relations reducing them to just price-takers. Timely buy-back of birds from the farmers should be given priority attention so as not to discourage farmers who may be induced by such circumstance to engage in side-selling. Such practice could be a real threat to the scheme success as a model for economic diversification in Nigeria.

Table 2.
Akwa Prime Participants' Opinion on the Relationship amongst Key Actors.

Relationship Statements	Responses		Relationship Rating+
	Yes	No	
1. I fully understand my business relationship with Akwa Prime and the Insurance Company.	37(90.2)	4(9.8)	Strong
2. Each transaction is negotiated individually with each farmer.	17(41.5)	24(58.5)	Weak
3. My relationship with Akwa Prime and the Insurance Company is based on a written agreement.	35(85.4)	6(16.4)	Strong
4. I am satisfied with the quality of inputs supplied to me by the Outgrower Scheme.	7(17.1)	34(82.9)	Weak
5. Outgrowers' Management Team monitors grow-out regularly.	24(58.5)	17(41.5)	Strong
6. Buy-back of mature birds is timely.	12(29.3)	29(70.7)	Weak
7. I am satisfied with the buy-back price fixed by Akwa Prime.	16(39.0)	25(61.0)	Weak
8. Akwa Prime makes payment for mature birds within the agreed time.	24(58.5)	17(41.5)	Strong
9. Akwa Prime responds promptly to emergencies on my farm.	21(51.2)	20(48.8)	Strong
10. I am duly compensated by the Insurance Company in cases of outbreak and loss.	15(36.6)	26(63.4)	Weak
11. Akwa Prime, bank and the Insurance Company keep to the terms and conditions of the contract at all times.	24(58.8)	17(41.5)	Strong

Source: Field Study, 2017. + = Authors assessment. NB: Figures in parentheses are percentages while figures not in parenthesis represent frequencies.

4.3 Impacts of Akwa Prime Outgrower Scheme on farmers' socioeconomic improvement.

One of the criteria for assessing outgrower schemes is their impacts on the farmers' socioeconomic improvement. In this study we did not conduct quantitative assessment of the impacts of Akwa Prime Outgrower Scheme on the well-being of the participants but relied on the qualitative information provided by respondents during field study. The focus was on improvement in income, and ability to provide household basic needs such as food, payment of children school tuition, among others. Information on the impacts of the scheme on the farmers' socioeconomic improvement was obtained through testimonies by participants in the scheme. In general, the scheme's participants testified to enhanced income which enables them to better take care of various household demands. Farmers also claim that with regular income, bills such as medical, rents, etc are easily paid.

However, most farmers are still dissatisfied with the quality of input supplied, timing of output buy-back, buy-back price fixing process and the handling of compensation by insurance company in case of outbreak of diseases. Thus, farmers hold the opinion that the social and economic conditions of farmers can be better than it is.

Stocking Density: The stocking density could be an indicator of the scale of operation of a poultry business firm; and, it could be a result several factors which influence production such as amount of business capital, infrastructure, the market/demand, among others. We proceeded in this study to assess the impacts of poultry farmers’ participation in the outgrower scheme by looking at the stocking density of both the scheme participants and none participants. The result presented in Table 3 indicates that both outgrower farmers and none scheme farmers are small in their scale of operation. Among the scheme participants, slightly less than a half of the respondents keep about 500 birds per batch, and almost equal percentage have progressed to keeping up to 1000 birds in a single batch. A higher concentration of none participants than participants is found in the 500 or less stocking density group. Previous study by Essien and Umoh (2016) highlighted the fact that commercial poultry production in Akwa Ibom State ranges from small scale to large integrated poultry farms. Our finding tends to confirm this assertion. It also reveals that the State outgrowers scheme captures the small-scale poultry farmers. Interestingly, that more scheme participants than none participants are progressing to higher stocking density which may as well be due to the supports they receive through the scheme, thus showing out-growers scheme as an opportunity to grow the poultry sector of the state.

Stocking Density and income: Another way we tried to gauge the effect of out-growers scheme on income was to relate income to the stocking density of both the participants and none-participants of the scheme. The result is presented in Table 4. As expected, income was found to increase as the stocking density, thus showing economies of scale (size). This points to the need for farmers to grow beyond the small holding that majority presently have in order to enjoy the advantages of economy of sclae. On comparative basis, participants in the scheme recorded higher mean income from their poultry business than the none-participants. Further test of difference using the student’s t-test was carried out. This test revealed that there is statistically significant difference in the income of scheme participants and none scheme participants at both 5% and 1% level of significance. With this result it can be inferred that the outgrowers scheme has some salutary effects on poultry farmers’ income.

Table 3.
Distribution of Respondents Based on Stocking Density.

Stocking Density (Number of Birds)	Akwa Prime Participants		None-Akwa Prime Participants		All Respondents	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
≤500	19	46.3	35	83.3	54	65.1
501-1000	17	41.5	5	11.9	22	26.5
1001-1500	1	2.4			1	1.2
1501-2000	4	9.8	1	2.4	5	6.0
>2000			1	2.4	1	1.2
Total	41	100	42	100	83	100

Source: Field Survey, 2017

Table 4.
Average Income per stocking density

Stocking Density	Average Income (Nigerian Naira ₦)
≤500	75000
501-1000	112575
1001-1500	187,575
1500-2000	262,575
>2000	300,000
Average Income:	(i) Participants: ₦187,500 (ii) None participants : ₦135,000

t-cal = 3.90 , t-tab = 1.99 at 5% level, 2.64 at 1% level.

Source: Field Survey, 2017

4.4 Determinants of the performance of participants in Poultry Outgrowers Scheme (Regression Analysis):

In addition to assessing the impacts of the scheme on farmers' socioeconomic improvement, further step was taken to analyze the factors which determine the performance of the farmers. Farmers' income was used as a performance indicator in analyzing the determinants of performance. Multiple regression analysis was carried out on the factors affecting the income of participants in the scheme. The result of the analysis is presented in Table 5.

Table 5.
Result of Multiple Regression Analysis on the Factors Affecting the Income of Akwa Prime Participants.

Explanatory variables	Linear function	Semi-log function	Double log function	Exponential function
Constant	30840.982 (0.626)	-385346.285 (-1.333)	0.223 (1.089)***	10.566 (14.459)***
Cost of day old chicks(x_1)	3.237 (6.748)***	78182.073 (2.176)**	1.105 (43.465)***	3.272E-6 (0.460)
Cost of feed(x_2)	0.032 (0.197)	-77416.399 (-1.136)	0.026 (0.547)	1.979E-6 (0.812)
Cost of medication(x_3)	3.249 (2.226)**	81766.855 (0.959)	-0.019 (-0.311)	1.850E-5 (0.855)
Cost of Labour(x_4)	0.717 (0.428)	28150.539 (1.518)	-0.003 (-0.239)	1.958E-5 (0.788)
R ²	0.879	0.353	0.991	0.276
Standard Error	129080.07224	298688.65223	0.21136	1.91403
F-value	65.536	4.920	1009.751	3.422
N	41	41	41	41

NB: Values in parenthesis represents t-ratios. ***= t-ratio significant at 1%, **= t-ratio significant at 5%

Of the four functional forms tried for exploratory purposes, the double log function gave the best fit and was therefore selected as the lead equation and used for the discussion on the performance of Akwa Prime participants. It has the lowest standard error of regression (SE) which is a measure of the precision of the Ordinary Least Square estimators and a summary of measure of the "goodness of fit" of the estimated regression line (Gujarati and Sangeetha, 2007). Similarly, the double log function also has the highest F value which suggest significant relationships between income (Y) and the explanatory variables included in the model (Xs) (see Koutsoyiannis, 1977: p159). And, more important, of all the functions, the double log has the highest coefficient of multiple determination (R²) which is a summary measure of which tells how well the sample regression line fits the data. It measures that proportion or percentage of the total variation in Y explained by the regression model. The value lies between 0 and 1. The closer the R² lies to 1, the better the fit. None of the other functional forms satisfy these criteria as much as the double log.

The estimated equation is:

$$\text{LogY} = 0.223 + 1.105\text{LogX}_1 + 0.026\text{LogX}_2 - 0.003\text{LogX}_4 + e_i$$

$$(1.089)*** \quad (43.465)*** \quad (0.547) \quad (-0.003)$$

The coefficient of multiple determination (R²) was 0.991. This implies that about 99 percent of the variations in the income of Akwa Prime poultry farmers is accounted for by the joint action of the variables included in the model while the remaining 1 percent was accounted for by the joint action of other variables not included in the model. The cost of DOCs was found to be a major determinant of the income (performance of the farmers). The positive sign carried by the coefficient of the cost of day old chicks (DOCs) could be interpreted to mean that at the current level of production, increase investment on DOCs would increase the farmers' income. Specifically, the result shows that one unit change in the cost of DOCs will raise farmers' income by ₦1.105. Thus, it pays for the farmers to keep increasing their investment on DOCs. Over all, it could be said that the poultry industry in the State is not yet saturated, there is room for expansion of production and gaining higher income.

5 Conclusion and Recommendations:

This research has provided robust results on the effect of a state Outgrower Scheme on small independent poultry farmers' productivity, profitability and survival. Results showing a positive change on the bottom line of small independent poultry farmers indicate the prospects for greater deployment of outgrower model to catalyse investments, diversification and growth potentials for the sector. It also suggests that small poultry farmers left alone with their independent business choices can only go so far in stimulating agriculture development in Nigeria.

It is estimated that 10% (that is 18 million) of Nigerians are poultry farmers and more than 70% of poultry in Nigeria is chicken (Okonkwo and Akubo, 2001; Ekunwe and Akahomen, 2015). If outgrower scheme is to operate successfully, 18 million Nigerians would be in progressive business within none oil sector. This translates to millions of people being engaged in activity other than oil and gas. However, the fact that most farmers are still dissatisfied with the quality of input supplied, the timing of output buy-back, buy-back price and the handling of compensation by insurance company point to the need to inculcate efficiency to the operation of outgrower scheme if it must ensure the fulfillment of the current government plan of diversified growth anchored by agriculture.

Again, the construction of Akwa Prime Outgrower Scheme as a model is a complex one, a misnomer where Government is a shareholder of the scheme rather than a stakeholder. The implication is that the state's implicit role of regulating is compromised in shareholding participation. In other words, state could still play a critical transparent role as a regulatory stakeholder of outgrower scheme. The broader implication is that the regulatory role of government was moribund and ill articulated in facilitating the scheme. Our submission is that monitoring and regulating power relations of big players in contractual affairs with small holder farmers is the domain of government in a functioning outgrower scheme. Observation that all contract documents were developed by the off taker and given to farmers or through facilitators for signing without representation highlights absence of pivotal role of state in outgrower scheme. Consequently, the farmers were not involved in negotiating the price for their table birds with Akwa Prime. This again compromises the normal practice of collective negotiation by participants in an outgrower scheme. It is recommended that the state plays a vital regulatory and monitoring role of a power broker between big players (off takers) and smallholder farmers in a more negotiated environment. The monitoring and regulatory role of the state will ensure that the off taker effectively trains smallholders in the scheme toward optimization and ensures that there is power balance in price and contract negotiations. It is through these efficiencies that an outgrower arrangement can act as an effective tool in catalysing private investments, diversifying economy and creating jobs within the sector.

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