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Knowledge Sharing and Allocative Efficiency of Poultry Farmers in Southwest Nigeria

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Abstract

Poultry farmers struggle to operate at cost levels that provide profit to sustain continuous production in Nigeria. Many studies have therefore been done to determine the efficiency levels of farmers, most of which are on technical efficiency. Few considered allocative efficiency (cost inefficiency), in relation to farmers' socio-economic variables excluding knowledge sharing. This study, determined the effect of knowledge sharing and other socio-economic variables of poultry farmers on their cost inefficiency. The questionnaire was created by the researchers and an expert group in the Lagos State Polytechnic. Three states out of six: Lagos, Ogun and Oyo were purposively selected and 400 farmers were administered with questionnaire through convenience sampling but 336 were successful at 108, 107 and 121 in the three states respectively. Descriptive statistics and stochastic cost frontier were used to analyse the data. The results showed that majority, 63.99%, did not share government support knowledge and majority fairly shared other production knowledge types. Age with coefficient of -3.199 negatively affect cost inefficiency and is statistically significant at 1%. Non-sharing of knowledge is positive and significant at 1%; the farmers that did not share knowledge had higher cost inefficiency of 2.563, on the average, than those that share knowledge. Poultry farmers should be encouraged to share production knowledge especially through informal means. Government should boost its trust among farmers so that they can share knowledge relating to government supports towards boosting poultry production in southwest Nigeria.

Keywords

Knowledge Sharing, Cost Inefficiency, Poultry Farmers, Southwest Nigeria

1. Introduction

Commercial poultry production in Nigeria dates back to early 1960s [8]. Since then, poultry production has been gaining wide acceptance due to many reasons. Poultry keeping have some benefits over other livestock as poultry are good converter of feed to usable protein in meat and eggs. Return on investment of poultry enterprise is high with adequate and proper care while production cost per unit is low. Poultry production has short production cycle so capital is not tied down over a long period compared with other livestock such as cattle.

With increasing population and the need to meet the egg and meat needs of the people, poultry business is therefore important and poultry farmers in the pursuit of their output maximising or cost minimising goal, do combine and transform inputs to outputs through improved efficiency. Reference [10] reported that since the removal of subsidies on poultry production inputs in 1986, their prices have been rising and the development requires poultry farmers to be resource use efficient. If efficiency increases, cost can be reduced and output increased for an input. To achieve this, some farmers could interact with others to share knowledge that will enhance their efficiency and production while some access different information sources to acquire production and marketing knowledge to improve efficiency with varying limitation of capacities and abilities which in turn affect their

efficiency and productivity. Reference [28] stated that poultry production efficiency depends on the knowledge of all production and management aspects and their adoption.

The objective of this study therefore was to determine the effect of knowledge sharing of poultry farmers and other socio-economic variables on their allocative efficiency otherwise called cost inefficiency. Also, the study aimed to provide answers to the following questions: what types of knowledge do the farmers share among themselves and to what extent? What are their means of knowledge sharing? Is there any difference in the cost inefficiency level of those that share knowledge and those that do not? The study hypothesised that there is no significant relationship between the farmers' cost inefficiency level and their socio-economic features which included knowledge sharing.

2. Literature Review

Despite various government supports for agriculture in Nigeria, farmers struggle to operate at cost levels that allow for profit to sustain continuous food production. Price may fluctuate to the disadvantage of the farmers. Disease outbreak could occur that would make farmers to lose all or part of their birds. These problems along with high production cost have caused many poultry farmers to shut down while those still in production are facing input supply shocks and high cost of production [1]. Consequently, the high cost is passed onto the consumers of poultry products and with low income of the people, protein nourishment through poultry products, tends to decline. But knowledge acquisition on production challenges could make a famer do better in any changing business environment.

If a poultry farmer has total understanding of the production information he possesses and uses it, one would expect him to have a higher output and lower cost than the farmer that does not have total understanding of same or that have but does not use it. Reference [29] identified some poultry farmer's knowledge providers as farmer himself, nearest expert farmers, veterinary chemist, company, feed seller, poultry consultant, doctors and nutritionist. Other sources of knowledge according to [23] are community library, newsletter, posters, exhibition, radio, television, leaflets and extension workers. He also identified livestock disease treatment and control as well as introduction of new vaccines and drugs as relevant source of knowledge in poultry production.

However, many studies including [6, 13, 22, 32], have been done on farm efficiency but mostly on arable farmers while those on poultry [1, 11, 15, 25], were limited to technical efficiency in egg or broiler production in relation to socio-economic features and credit access without considering the effect of knowledge sharing on the poultry farmers efficiency and only few such as [7] studied allocative (cost) efficiency.

Knowledge is recognised to be one of the determinants of any farm business success particularly when it is shared among farmers. Knowledge sharing (KS) is an activity through which knowledge (i.e. information, skills or expertise) is exchanged among professionals [30]. This suggests collaborating with others to solve problems, develop new ideas, or implement policies or procedures [14, 26]. Sharing of knowledge, therefore, is more than simple communication process as it involves extending learning processes. The idea to be shared must be made applicable to the business objective. Reference [28] stated that knowledge is the entirety of the understanding of information possessed by an individual while [17] defines KS as the transfer and communication of knowledge, it is the connection of people with the knowledge they need rather than collecting and compiling documents. The sharing of knowledge can be in two ways. It can be formal or informal. The former takes place through official channels like meetings, memos, e-mail, and seminars etc while the later among friends or fellows. KS in this study refers to giving and receiving of production and marketing information among farmers freely bearing all odds. The study assumed that poultry farmers have and do share knowledge on production within and between farms but not all share such knowledge with other farmers. Also, that farmers use the shared knowledge in production process to increase efficiency. However, the present era of knowledge management in production poses a serious challenge to farmers in the acquisition of knowledge on improved production methods and output marketing.

Some studies have shown the relationship of KS and farmers' socio-economic features. Reference [32], the use of information and knowledge by farmers is associated with their age and that the output of farmers increases with age. Also that age of farmers positively influence their efficiency as it improves farmers assimilation and understanding of relevant information more effectively, making the farmer more equipped and empowered gradually with age increase. Through information, farming knowledge is acquired either to reduce cost or improve output through production method. It is therefore necessary to account for knowledge sharing in technical efficiency study among egg and broiler poultry farmers.

2.1. Theoretical and Conceptual Frameworks

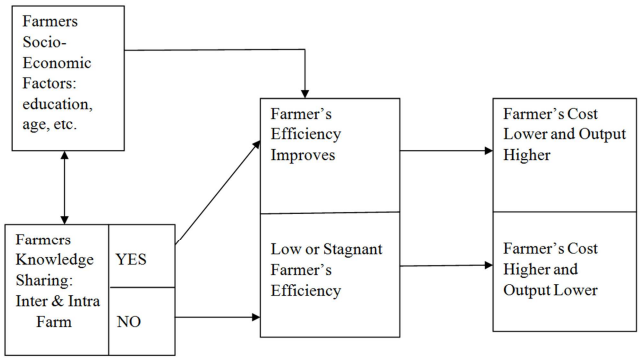
Theoretical frameworks: Allocative efficiency and stochastic frontier model

According to [6] production efficiency is of two parts; technical efficiency and allocative efficiency. The combination of the two is called economic efficiency. Technical efficiency refers to input-output relationship. In production economics, efficiency pertains to resource use to give possible maximum output at least cost (allocative efficiency) or technical efficiency which is obtaining highest possible output level with a given set of inputs [20].

Farm efficiency study in Nigeria heightened in the last decade both for arable crops and livestock farms. Among the farm livestock studies are [1, 10, 12, 15 and 24]. But farm efficiency study actually began in the 1970s when stochastic production function (SPF) methodology was developed by [4] and [12]. Reference [24] applied SPF in analysing the

technical efficiency (TE) of poultry egg production in Osun State, Nigeria. The study reveals that poultry egg production was in the rational stage of production. All the mentioned authors used SPF methodology for its advantage as stated by [12, 19and 32], that a stochastic frontier model seems to be the most appropriate approach in studies of efficiency related to the agricultural sector instead of non-parametric approach like data envelopment analysis because of its ability to deal with stochastic noise, accommodate traditional hypothesis testing, and allow for single-step estimation of the inefficiency effects.

The stochastic frontiers assume that part of the deviation from the frontier is due to random events which reflect measurement errors and part is due to firm specific inefficiency. The stochastic frontier approach makes allowance for stochastic errors arising from statistical barrier or measurement errors and decomposes the error term into a two-sided random error that captures the random effects outside the control of the firm (the decision making unit) and the one-sided efficiency component [13]. This study takes advantage of the SPF, using cost approach and added knowledge sharing among poultry farmers as one of the socio-economic factors on which efficiency depends. The interpretations of the coefficients and other diagnostic figures of the production function will similarly fall in line with some of the earlier mentioned past studies. The coefficients of the efficiency variables are interpreted opposite to those of inefficiency variables and a study applying SPF can use either of the two.



Source: Authors' construction

Figure 1. *Knowledge Sharing and farm output.*

2.2. Multi-Step Flow Theory

This study also anchors on the multi-step theories of information flow [27]. The farmers share knowledge or information by receiving it from the source directly or through another person vertically or horizontally within the farmer's social system. This is a multi-directional and –dimensional approach to knowledge sharing. Though the theory is weakened by external influence and possible distortions through interpersonal channels, it is more appropriate for the study than a theory like two-step theory which stipulates uni-directional and –dimensional approach to knowledge sharing. One of the dimensions as reported by [21] is that farmers do share knowledge through electronic, print, traditional and composite media within their environment.

2.3. Conceptual Framework

Relationship between knowledge sharing and cost/output of farmers

The relationship between knowledge sharing and cost of farmers is as shown in figure 1. A farmer may share knowledge within his farm (intra-farm knowledge sharing) and or with other farmers (inter-farm knowledge sharing). Knowledge sharing of a farmer is affected by his socio-economic features like age and level of education. A farmer that is involved in either intra- or inter-farm knowledge sharing is considered to be sharing knowledge. Such farmer's efficiency is assumed to be higher with lower cost of production and higher output than those famers that do not share knowledge characterised by low(er) efficiency, higher cost and lower output.

2.4. Purpose and Specific Objectives

The purpose of this study was to establish the impact of knowledge sharing on the cost inefficiency of southwest Nigeria poultry farmers. Specific objectives were to:

1. determine the types of knowledge shared and extent of knowledge sharing among the poultry farmers.
2. determine the medium of knowledge sharing among the poultry farmers.
3. (a) analyse the effect of knowledge sharing and other socio-economic characteristics of the poultry farmers on their cost inefficiency. (b) determine if there is difference in the cost inefficiency level of the poultry farmers that share knowledge and those that do not.

3. Methods/Procedures

The study was done in the southwest Nigeria comprising Ekiti, Ondo, Ogun, Osun, Oyo and Lagos States. Multistage sampling technique was used. The first stage involved the purposeful selection of three states, Lagos, Ogun and Oyo, based on population and market availability. The selection of these states, particularly Lagos, is based on the advantage of participation in World Bank/State Commercial Agriculture Project. The second stage is the convenience sampling of 400 commercial poultry farmers in the three states but 336 were successful at 108, 107 and 121 in the 3 states respectively. Descriptive statistics such as frequency table and percentage as well as stochastic cost frontier were used to analyse the data.

3.1. The Analytical Framework

Following the parametric approach of stochastic production frontier in line with [1, 12 and 31]; the stochastic frontier model is arrived at as follows:

Assuming that the poultry farmer has a production function $f(z_i, \beta)$ and if there is no error level of inefficiency,

the ith farmer would produce

$$q_i = f(z_i, \beta) \quad (1)$$

However, stochastic frontier analysis assumes that each farmer potentially produces less than he might due to a degree of inefficiency. Specifically given as

$$q_i = f(z_i, \beta)\varepsilon_i \quad (2)$$

where ε_i is the level of efficiency for farm i; ε_i must be in the interval (0, 1]. Ifε_i = 1, the farm is achieving the optimal output with the technology embodied in the production function qi = f(z_i, β). When ε_i< 1, the farmer is not making the most of the inputs z_i given the technology contained in the production function f(z_i, β). Since the output is assumed to be strictly positive (i.e., q_i> 0), the degree of technical efficiency is assumed to be strictly positive (i.e., ε_i> 0)

Assume also that output of farmer is subject to random shocks, which implies that

$$qi = f(z_i, \beta)\varepsilon_i \exp(v_i) \quad (3)$$

If we take the natural log of both sides, the equation becomes

$$\ln (q_i) = \ln \{f(z_i, \beta)\} + \ln (\varepsilon_i) + v_i \quad (4)$$

If it is assumed that there are k inputs and that the production function is linear in logs, defining $u_i = -\ln(\varepsilon_i)$ gives

$$\ln(q_i) = \beta_o + \sum_{j=1}^{k} \beta_j \ln(z_{ji}) + v_i - u_i \quad (5)$$

Since u_i is subtracted from ln(q_i), restricting $u_i \geq 0$ implies 0 <ε_i> 1, as specifies above.

where,

q_i = the output of farmer, i (Naira)

z_{ij} = input j quantities; j = 1, ... , n

Equation (4) can be re-written as

$$Y_i = \beta_o + \sum_{j=1}^{k} \beta_j x_{ji} + v_i - su_i \quad (6)$$

For production function s = 1, x_i = quantity input i, Y = farmer's output and u_i is the inefficiency effects which can be specified as

$$u_i = \alpha_0 + \alpha_i m_i \quad (7)$$

where,

m_i = socio-economic characteristic i

i = 1, ... , n

α_i= coefficient of socio-economic characteristic i that affects inefficiency; shown as$\delta_i$in the results.

α_0 = intercept

For the stochastic cost frontier, variables in equation (6) are defined as Y= Total Variable Cost, X_{ji} (value of input) capturing input price (P_{ji}) and quantity (Q_i); and s = -1. This negative sign makes the cost inefficiency effect to raise expenditure.

The independent variables of interest for the cost function are:

X_1 = Total Product (Naira)

X_2= Cost of Stock (Naira)

X_3 = Total Feed Cost (Naira)

X_4 = Total Medical Cost (Naira)

X_5 = Total Labour cost (Naira)

For the allocative efficiency model, with the farmers' cost inefficiency levels as the dependent variables, the explanatory variables are:

m_1 = Gender of farmer (Dummy: Female = 1, Male = 0)

m_2 = Age of farmer (years)

m_3 = Marital status of farmer (Dummy: Married = 1, otherwise = 0)

m_4 = Farmers level of education (years) (Primary school: 6 years, Junior Secondary: 9 years; Senior Secondary 12 years, ND/NCE: 15 years; HND/Bachelor's degree: 17 years; Postgraduate Diploma/Master's degree: 18 years; PhD: 21 years)

m_5 = Farmers years of poultry experience (years)

m_6 = Main production (Dummy: Chicken meat (Broiler) =1, otherwise = 0)

m_7 = Group membership (Dummy: Non-membership = 1, otherwise = 0)

m_8 = Main occupation (Dummy: Non farming = 1, farming = 0)

m_9 = Land ownership type (Dummy: Rent/Lease = 1, otherwise (Purchased/Inherited) = 0)

m_{10} = Production system (Dummy: Battery cage = 1, otherwise = 0)

m_{11} = Knowledge Sharing Status (Dummy: Non-Sharing of knowledge = 1, otherwise = 0; that is, Sharing of knowledge, if No = 1 and Yes = 0)

A priori expectations of coefficients

The expected signs of coefficients of relationship between farmers' cost inefficiency and their socioeconomic variables are presented in table 1.

3.2. Results/Findings

The survey approach that was used for the study provided quantitative and qualitative data that accomplished the mentioned objectives of the study. The findings are therefore presented by objective.

3.2.1. Objective 1: Types of Knowledge Shared and Extent of Knowledge Sharing Among the Poultry Farmers

Table 2 shows the relationship between the types of knowledge shared by the respondents and the extent to which they were shared. The table reveals that 63.99% of the respondents do not share government support knowledge which is needed for tapping into institutional supports for the farmers. This may be due to the apathy that some businesses have for the concern of government in promoting business growth over the years as most of the reported supports do not get to the farmers. Other knowledge types were averagely shared by the majority of the respondents. Between 39.58%

and 43.15% of the respondents reported their extent of knowledge sharing on marketing, feeds, medication, record keeping, health and transportation at good level. A closer look at Table 2 shows that production knowledge was averagely shared by the respondents.

Table 1. *Expected signs of coefficients.*

Input Variables:	Sign of Coefficient & Author(s)
Total output (Output level)	+[7]
Cost of Stock	+[1], +[15], +[16], +[22], + [24]
Total Feed Cost	-[1], +[7], +[10], +[15], +[31]
Total Medical cost	+[6], +[10], +[15]
Total Labour Cost	+[10], - [15], +[34]
Cost Inefficiency Factors: Socio-economic variables	
Gender	- [5], +[8], + [15]
Age (Years)	-[1], -[15], - [24]
Marital Status	-[7], + [33]
Farmer's Education in Years	-[1],-[10], +[15], -[24]
Poultry Experience (Years)	–[1], -[10], -[15], -[24]
Main Product	+/-
Membership of farmers' group	-[15]
Main Occupation	-/+
Land Ownership	+/-
Production System	-[10]
Knowledge Sharing: Share Knowledge	[18]

Table 2. *Distribution of the relationship between Knowledge types and sharing extent of the respondents.*

Type Of Knowledge	Extent of Knowledge Sharing: Frequency (Percentage)					
	Not at all	Fairly	Good	Very Good	Excellent	Total
Government Support	215 (63.99%)	75 (22.32%)	32 (9.52%)	9 (2.68%)	5 (1.49%)	336 (100)
Marketing and Sales	14 (4.17%)	120 (35.71%)	145 (43.15%)	44 (13.10%)	13 (3.87%)	336 (100)
Poultry Housing	15 (4.46%)	83 (24.70%)	164 (48.81%)	55 (16.37%)	19 (5.65%)	336 (100)
Feeds and Feeding	10 (2.98%)	71 (21.13%)	159 (47.32%)	74 (22.02%)	22 (6.55%)	336 (100)
Medication and Drugs sources	11 (3.27%)	77 (22.92%)	144 (42.86%)	85 (25.30%)	19 (5.65%)	336 (100)
Record Keeping	37 (11.01%)	78 (23.21%)	133 (39.58%)	71 (21.13%)	17 (5.06%)	336 (100)
Source of Birds	25 (7.44%)	75 (22.32%)	142 (42.26%)	66 (19.64%)	28 (8.33%)	336 (100)
Pen Caring	23 (6.85%)	81 (24.11%)	135 (40.18%)	67 (19.94%)	30 (8.93%)	336 (100)
Medication and Drugs Application	8 (2.38%)	72 (21.43%)	142 (42.26%)	86 (25.60%)	28 (8.33%)	336 (100)
Poultry Health and Diseases	4 (1.19%)	78 (23.21%)	143 (42.56%)	90 (26.79%)	21 (6.25%)	336 (100)
Rearing Knowledge	4 (1.19%)	63 (18.75%)	148 (44.05%)	89 (26.49%)	32 (9.52%)	336 (100)
Transportation of Birds	24 (7.14%)	91 (27.08%)	139 (41.37%)	72 (21.43%)	10 (2.98%)	336 (100)

Source: Field Survey, 2015

Table 3. *Media/Means of knowledge sharing.*

	Knowledge sharing media/means by frequency (Freq.) and percentage (%) of respondents													
Response	Library		News Letter		Television		Religious group		Radio		Extension agent		Opinion leader	
Yes (Freq. %)	65	19.35	74	22.02	98	29.17	103	30.65	106	31.55	110	32.84	123	36.61
No (Freq.%)	271	80.65	262	77.98	238	70.83	233	69.35	230	68.45	225	67.16	213	63.39
Total (Freq. %)	336	100.00	336	100.00	336	100.00	336	100.00	336	100.00	336	100.00	336	100.00
	Knowledge sharing media/means by frequency (Freq.) and percentage (%) of respondents (Cont'd)													
Response	Leaflet		Symposium		Posters		Conference		Seminar		Association		Informal discussion	
Yes (Freq.%)	126	37.50	143	42.56	150	44.64	162	48.21	171	50.89	177	52.68	315	93.75
No (Freq.%)	210	62.50	193	57.44	186	55.36	174	51.79	165	49.11	159	47.32	21	6.25
Total (Freq. %)	336	100.00	336	100.00	336	100.00	336	100.00	336	100.00	336	100.00	336	100.00

Source: Field survey (2015)

3.2.2. Objective 2: Medium of Knowledge Sharing Among the Poultry Farmers

The Table 3 shows the respondents usage of medium of knowledge sharing. The farmers used electronic-media (television and radio), print-media (newsletter, leaflet and posters), oramedia other-wise called folk-media or traditional-media (extension agent, opinion leader, association and informal discussion) and composite media (library, symposium, conference and seminar) as means of knowledge sharing. 93.75% of the respondents got their knowledge sharing done through informal discussion, while 52.68% through association or group discussion followed by seminar and conference of 50.89% and 48.21% respectively.

19.35, 22.02, 29.17, 30.65, 31.55, 32.84, 36.61, 37.50, 42.56 and 44.64 per cents reported the use of library, news letter, television, religious group, radio, extension agent, opinion leader, leaflet, symposium and posters respectively as means of knowledge sharing.

Table 4. *Maximum Likelihood Estimates of parameters of stochastic cost function.*

Variables	Parameters	Coefficient	Std. Error	t-ratio
Constant	β_0	1.676*	0.164	10.245
Total product (X_1)	β_1	0.000	0.031	0.004
Cost of stock (X_2)	β_2	0.657*	0.041	16.162
Total feed cost (X_3)	β_3	0.180*	0.008	22.680
Total medical cost (X_4)	β_4	0.017**	0.008	2.062
Total labour cost (X_5)	β_5	0.015	0.015	0.987
Inefficiency Model:				
Gender (m_1)	δ_1	-0.865	0.957	-0.905
Age (m_2)	δ_2	-3.199***	1.678	-1.906
Marital status (m_3)	δ_3	5.314***	3.153	1.685
Educational status (m_4)	δ_4	-0.558	0.758	-0.737
Poultry experience (m_5)	δ_5	1.618**	0.780	2.076
Main production (m_6)	δ_6	2.927**	1.445	2.025
Group membership (m_7)	δ_7	-0.959	0.975	-0.984
Main occupation (m_8)	δ_8	0.855	0.927	0.923
Land ownership (m_9)	δ_9	-0.230	0.842	-0.273
Production system (m_{10})	δ_{10}	-0.421	0.844	-0.499
Sharing of Knowledge (m_{11})	δ_{11}	2.563***	1.436	1.784
Sigma Square	δ^2	0.556**	0.224	2.486
Gamma Υ		0.920*	0.032	28.908
Log likelihood function		L/F	-29.762	
Log likelihood Ratio		L/R	52.595	

Source: Computer Output from Frontier Analysis
*** - significant at 1%, ** - significant at 5%, * - significant at 10%,

3.2.3. Objective 3(a): Effect of Knowledge Sharing Status and Other Socio-Economic Characteristics of the Poultry Farmers on Their Cost Inefficiency

The maximum likelihood estimate (MLE) of cost parameter of the respondents is presented in Table 4. The result shows a sigma square (δ^2) value of 0.556 which is positive and significant at 5%. It is different from zero, implying that a one sided error term dominated the symmetry error term indicating a good fit and the correctness of the specified distributional assumption. The significant value of gamma (Υ) shows the presence of inefficiency effect in the observed output, and its value of 0.920 implies that 92% of the variation in cost efficiency of the respondents can be attributed to inefficiency, while 8% was due to random effect. The ratio of log likelihood test was also significant, which implies a presence of cost inefficiency among the respondents.

The maximum likelihood coefficient for cost of stock (0.657) and feed cost (0.180) are positive and statistically significant at 10%, while medical cost (0.017) was significant at 5%. This implies that an increase in the cost of stock and cost of feed by 100% will increase the total variable cost of respondents by 65.7% and 18.0% respectively.

Table 4 also shows the result of inefficiency coefficients depicting the relationship between respondents' socio-economic factors and cost inefficiency in poultry production. The dependent variable of the function represents cost inefficiency. Age, marital status, poultry experience, main production and sharing of knowledge were found to be statistically significant at different levels. Age with coefficient of -3.199 is negative and statistically significant at 1%. This indicates that an increase in age has negative effect on cost inefficiency, implying that the older the respondent becomes, the more efficient he is cost-wise. This could be due to the acquisition of valuable experience as a farmer grows older. Married status (5.314), poultry experience (1.618) and main production (2.927) are statistically significant at 1%, 5% and 5% respectively and have positive effect on cost inefficiency.

3.2.4. Objective 3 (b): Difference in the Cost Inefficiency Level of the Poultry Farmers That Share Knowledge and Those That Do not

The result as contained in Table 4 shows that Non-sharing of knowledge (2.563) is significant at 1% and has positive effect on cost inefficiency. From the definition of the dummy variable, knowledge sharing status (m_{11}) in equation (7), the farmer that did not share knowledge received value of 1 while those that shared knowledge received value of 0 as the benchmark category. The significant and positive coefficient value of 2.563 therefore implies that farmers that did not share knowledge have cost inefficiency higher by 2.56, on the average, than those that share knowledge. The extent of

knowledge sharing among the farmers which is on the average as presented in Table 2 is also supportive of this finding. Most of the farmers do not share knowledge at excellent extent which negatively affects their efficiency. The farmers that share knowledge were more cost efficient than the farmers that did not share knowledge. This result agrees with the finding of [18] that revealed a positive effect of knowledge sharing in cost inefficiency reduction.

4. Discussion, Conclusions and Recommendations

The study linked knowledge sharing and socio-economic features of poultry farmers with their cost inefficiency and four objectives and a hypothesis were set for achievement. The conclusions are discussed based on these objectives and we made recommendations that would assist poultry farmers in achieving minimum costs production and the spreading of government institutional supports knowledge for the farmers.

The poultry farmers in the southwest Nigeria share knowledge on government support, marketing and sales, production inputs such as housing, feeds, health and medication and birds transportation. But only few, less than 2%, share government support knowledge at excellent extent and majority, 63.99%, do not share knowledge on government support. The reason for this is not far-fetched, in most of African countries; government supports to farmers are fraught with corruption [9, 16]. Often times, the support that should be given to farmers do not get to them. Farmers generally share all the production knowledge at an average extent. Few share knowledge at excellent level ranging from 1.49 to 9.52 per cent. Also, 8.33, 8.93 and 9.52 per cents of the farmers reported that they share knowledge on source of bird, pen caring and birds rearing at excellent extent.

The use of symposium, posters, conference and seminar are on the increase nowadays in Nigeria as government and non-governmental organisations do organise farmers forum like conference and seminar which are attended by farmers during which both oral and poster presentations are employed for knowledge sharing and information dissemination. Library resources, followed by newsletter and television, are the least patronised by the farmers. This may be that the farmers do not have time to visit or have access to the library. They may not as well have access to newsletter and time for farmers' television programmes. The use of television programmes at home and on the farm is restricted due to inadequate and epileptic power supply in the country. The use of informal meeting by over 90 per cent of the respondents buttresses the emphasis on multi-step flow theory of information dissemination. The results shown in Table 3 supports [21] that reported ways through which farmers in Cuba share their knowledge as cooperative meetings, workshops, conferences and multimedia involving television and radio. In Africa, due to low level of education and income of farmers as well as inadequate extension services, informal means of knowledge sharing will continue to be relevant for improved agricultural productivity as most of the farmers are in the rural areas.

On production costs, particularly total variable cost, inputs that lead to increase production cost were costs of stock, feed, and medical as they significantly and positively affected total variable cost of production. The results agree with [10, 7 and 15]. This result also substantiates the findings of [24], that increase in stock and feed increases output cost in poultry production. Also, a 100% increase in medical cost will increase the total cost by 1.7%. This shows a positive and significant relationship between drugs, medication and output in poultry production in line with [10, 7 and 15]. In Nigeria, stock and feeds costs contribute greatly to total cost of production. Farmers and intending farmers would have to continue to share knowledge on the two inputs to be more efficient in terms of cost.

The effect of age on cost inefficiency was negative and significant. This negates the findings of [24, 1 and 15] which revealed that as a farmer grows older his efficiency reduces. One expected an older farmer to be of higher experience except if such farmer started poultry business late. Experience on any job is often times stated in number of years. Therefore, with age increase, the farmer has higher experience and would have known more about poultry production which should have negative effect on his cost inefficiency level. This result indicates that, in terms of cost, age makes a farmer to be of higher efficiency. Farmers that were married have cost inefficiency higher by 5.31 than the unmarried which agrees with [7] but not with [33]. To be married implies having a companion with which the farmer can share knowledge and apply same if convinced about the production and cost saving knowledge. It can also make the farmer to be in a tight corner in a case where the knowledge shared is not applied if he/she does not agree with his/her partner on the veracity of the knowledge. However, the result on poultry experience deviates from that of [24, 10, 1 and 15] that reported positive relationship between efficiency level and experience. Poultry experience is expected to reduce cost inefficiency but perhaps the farmers might have over-stated their costs to suppress their profit levels during the interview.

The analysis on the effect of knowledge sharing on cost inefficiency reveals that the farmers that did not share knowledge had cost inefficiency higher by 2.56 per cent, on the average, than those that share knowledge. This result is in tandem with what is expected that farmers that share knowledge would operate at higher cost efficiency and output levels than those that did not share knowledge [18]. It is therefore concluded that knowledge sharing status and socio-economic features of poultry farmers have significant relationship with the cost inefficiency level of the farmers in southwest Nigeria.

Based on the underlying assumption of the study that all the poultry farmers have knowledge to share and emanating from the findings, the study recommends that the farmers should be encouraged to increase their production knowledge sharing through every means possible especially informal medium. The farmers should be supported to join farming

group as an avenue to share knowledge so as to explore and exploit the informal means of knowledge sharing. Government institutions should enhance their trust among farmers so that they can share knowledge relating to government supports for sufficient poultry egg and meat production. Focus should not be shifted from older farmers in farming supports to boost production cost-related knowledge sharing. This study had operationalised knowledge sharing, a key element in business information management, and established its effect on poultry farmers cost inefficiency in southwest Nigeria. The study should therefore be repeated on a national level or in the other five geo-political zones in Nigeria. It could also be replicated for other farmers in other agricultural enterprises that are of importance to the economy of the zones or country for improved communication efforts at promoting agricultural productivity.

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