Influence of Social Capital Dimension on the Adoption of Organic broiler Production Practices in Anambra State, Nigeria

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ABSTRACT

Adoption of organic farming practices (OFP) is stimulated by adequate knowledge about the concept, resources, and access to markets. Social groups from where farmers draw their social capital play a critical role in awareness and adoption of (OFP) but have been underutilized over the years. Thus, this study examined influence of social groups on the adoption of organic broiler production in Anambra state, Nigeria. The three-stage sampling procedure was adopted to select 120 broiler farmers. Six Local Government Areas (LGAs) were selected based on their involvement in broiler production in the first stage. Two communities were randomly selected from each LGAs, and simple random sampling method was used to select ten farmers from each of the twelve selected communities. Data was collected on socioeconomic characteristics of farmers, social group participation and organic broiler production Data was analyzed using descriptive statistics and logit at α 0.05. A household belong to an average of 4.55 social groups with diversity index average of 37.73%. Meeting attendance index average was 86.74% and average monthly cash contribution was N 1,500.02/month. Years spent in school, experience, density index, training, meeting attendance index and aggregate social capital positively and significantly affect adoption of organic broiler production practices. Social capital improves the adoption of organic broiler production practices. This study therefore recommends that farmers should belong to more local level associations and attend meetings regularly.

INTRODUCTION

Proteins are essential nutrients required for the healthy body growth and repair of worn-out cells. Nigeria has a gap in its protein consumption in comparison with other global economies (Nigerian Protein Deficiency Report, 2020 as cited in Daily Trust, 2021; Komolafe, Umeh, Ositanwosu, and Ejeanobi., 2023). Nigeria's protein quality score is 32% indicating low protein content in the diets of Nigerians. This indicates a serious challenge in ensuring that the population accesses adequate and high-quality. Poultry contributed about 30% of animal protein consumed globally (AGRA, 2014). Global poultry population is about 16.2billion, out of this 71.6% were in developing countries, producing 67,718.544 metric tons of chicken meat and 57,861,747 metric tons of hen eggs. (Hundie, Goshu, Tamir,2019). There are large-scale commercial poultry farms in Nigeria that use modern technology for production, most of these farms use drugs and vaccines that has detrimental effect on human health. Therefore, the option available for safe poultry products is the use of organic practices in raising poultry table birds(Bamiro, 2008).

Organic food production holds great significance for human health, environmental sustainability, and ethical farming practices. It is produced without the use of synthetic pesticides, herbicides, and chemical fertilizers, reducing human exposure to harmful chemicals that are associated with health risks such as cancer, hormone

disruption, and developmental issues. (Benbrook, Butler and Latif 2017). Research by (Lusk, McCluskey 2018). . indicated that organic food has a higher level of essential nutrients such as vitamins, minerals, and antioxidants, which are important for boosting the immune system and preventing diseases and were void of artificial preservatives, flavor enhancers, and synthetic coloring, which can trigger the risk of allergies, food sensitivities, and long-term health conditions. Organic farming practices support humane treatment of animals. (Lusk, McCluskey 2018). Livestock in organic farms are given better living conditions, more space, and access to natural diets. They are raised without antibiotics or synthetic growth hormones, reducing health risks associated with antibiotic-resistant, bacteria and hormone consumption both by animals and humans (Ogundele, 2019). Organic farming also aligns with sustainable practices, ensuring that agricultural production does not deplete resources or damage ecosystems

The organic practices of broiler production in Nigeria involves raising chickens for meat consumption under guidelines that emphasize natural living conditions, organic feed, and the prohibition of synthetic chemicals. Broilers are fed organic feed, free from genetically modified organisms, synthetic pesticides, herbicides, and fertilizers, typically including organic grains and protein sources. Chickens have access to the outdoors to exhibit natural behaviors such as foraging and dust bathing, often provided through pasture. Health management focuses on natural methods, such as herbal treatments and probiotics, to support the birds' immune systems. Organic broiler production also aims to minimize environmental impact by using sustainable farming practices like rotational foraging (Ogundele, 2019).

Social groups significantly influence organic broiler production by fostering education, improving market access, enhancing bargaining power, and offering support during crises (Komolafe and Adeoti, 2018). These groups, such as farmers' associations, cooperatives, and organic farming networks, facilitate the dissemination of knowledge on organic broiler farming practices. They organize workshops, seminars, and demonstrations, where farmers learn about organic standards, animal welfare, sustainable feeding, and natural disease management practices. By providing training and technical advice, social groups help farmers adopt practices that align with organic certification requirements, which can be more complex than conventional broiler farming (FAO. 2018). They also play a pivotal role in improving market access for organic broiler producers by creating networks with buyers, processors, and retailers, they help farmers find more reliable markets for their organic products. This is particularly important since organic broiler products often target niche markets with specific consumer demands. In addition, these groups enhance the collective bargaining power of farmers, enabling them to negotiate better prices and contracts. This collective approach ensures fairer compensation for their organic products and helps farmers avoid exploitation by intermediaries or middlemen. In times of crisis, such as disease outbreaks or natural disasters, social groups provide a safety net for organic broiler farmers. They help in the form of emergency funds, veterinary services, and technical support to help farmers manage unexpected challenges. By sharing risks and pooling resources, social groups contribute to the stability of incomes and the overall resilience of the organic broiler farming community. These collective efforts ultimately help sustain organic broiler production, promoting both economic viability and environmental sustainability in the industry (FAO. 2021). All these advantages of social groups enable farmers to draw their social capital network. Few work are available on social network and adoption of technology, thus this work examines the influence of social groups on the adoption of organic broiler production practices in Anambra state, Nigeria with these objectives: (i) profile the social groups farmers belong to; (ii) profile the social capital dimensions of broiler farmers; and (iii) determine the influence of social dimension on adoption of organic broiler production.

METHODOLOGY

Multistage sampling techniquewas used. Four Local Government Areas (LGAs) were purposively selected. Two communities were randomly selected from each of the LGAs. Then random sampling of fifteen respondent farmers from each village was done. A total of 120 farmers were captured for this study. Data was collected using a well-structured questionnaire. Data was analyzed using descriptive: mean, frequency and percentage and logit regression model.

Social Capital Index

Farmers were classified in terms of their participation in the identified social capital dimensions using Social Capital Index which is an input-based index that qualifies each level of participation of farmer's priorities in terms of the degree of participation. This index showed the degree of participation of the farmers in the identified dimensions.

Composite indicator (I) for participation can take the following form:

I=$\sum_{i=.1}^{n} W_i\, x_i$ Where, $x_i$are normalized variables, $W_i$are weights assigned to x_i,

$\sum_{i=.1}^{n} W_i$=.1 with 0≤ $W_i \leq .1,\ldots\ldots\ldots n$

I is the typical composite indicator of social capital index of the farmers

$W_i$are weights assigned to degree of participation of farmers to social capital dimensions where n is the number of identified social capital dimensions

The social capital dimension measurement is explained as following (Okunmadewa, Yusuf and Omonona, 2005; Yusuf, 2008; Komolafe and Adeoti, 2018).

This study will focus on five aspects of Local Associations as described below:

Meeting attendance index: This is the percentage of farmers attending meeting scheduled per annum. (Yusuf, 2008; Komolafe and Adeoti, 2018).

Density of membership index: This is the share of farmers participation in existing associations in their locality scaled to 100. (Aker 2005; Yusuf, 2008; Komolafe and Adeoti, 2018).

Heterogeneity Index: This is the measure of proportion of similarities and differences in socioeconomic characteristics among members of the same social group in relation to three most important social groups a member belongs to.

Decision Making Index: This is the measure of farmer's involvement in decision making in association. The three most important associations to which the farmer belong is considered in generating the percentage involvement of a farmer. The expected sign is positive, (Okunmadewa, Yusuf and Omonona, 2005; Yusuf, 2008; Komolafe and Adeoti, 2018).

Cash Contribution Index: This is a measure of percentage cash contributed to association with respect to the maximum fee scheduled to be contributed. (Yusuf, 2008; Komolafe and Adeoti, 2018).

Aggregate social capital index: This is the multiplicative social capital index. The index was calculated using the products of density membership, heterogeneity index and decision-making index of household in their various social groups (Saxton and Benson, 2005).

Logit Model

According to (Greene, 200; Bewick *et al*, 2005) the logit model is quite applicable to studies where dependent variables are a dichotomous variable which are answer 'Yes' or 'No'. It is employed when individuals make a choice between two alternatives which are mutually exclusive. The advantage is that of not treating categories in any continuous form, making it to be different from ordered probit models. Logit models estimate the effects of the explanatory variables on a dependent variable with unordered response categories. The advantages above the ordinary least square model is that it eliminates heteroskedasticity in the error term, therefore, the error term becomes normally distributed and the predicted probabilities ranges between 0 and 1. Logit model is computationally easy and also it is relatively robust, as well as prediction accuracy (Greene, 2000).

The logit equation is written as (Greene, 2000)

$$P_r(\text{Y=1}) = \frac{e^{\beta x}}{1+e^{\beta x}} \qquad (1)$$

With the cumulative distribution function given by

$$\text{F}(\beta \text{x}) = \frac{1}{1+e^{\beta x}} \qquad (2)$$

Where β represents the vector of parameters associated with the factor x

Logit Model Specification

Objective (iii) was analyzed with Logit model which models relationships between a dichotomous response variable and set of regressor variables.

Assuming the probability that farmer n will choose to produce broiler using a particular technology (organic practices (OP) or conventional practices / scientific method (CP) is equal to proportion of broiler farmers using that technology, then the individual empirical models is estimated as:

$$OP = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots \beta_n X_n + \varepsilon_i \quad (3)$$

$$CP = \gamma_0 + \gamma_1 X_1 + \gamma_2 X_2 + \ldots\ldots\ldots\ldots \gamma_n X_n + \varepsilon_i \quad (4)$$

Where,
CP = conventional practices / scientific method
OP = organic practices
β and γ are vectors of respective parameters to be estimated.
X_i = vectors of explanatory variables.
ε_i = error terms
The Explanatory Variables include:

Farmers Characteristics:

X_1 = Years of formal education of the farmer (years)
X_2 = Age of the farmer (years)
X_3 = Sex of the farmer (Male = 1 female = 0)
X_4 = Household size
X_5 = Marital status (Married = 1 otherwise = 0)
X_6 = Experience in broiler production (years)
X_7 = Extension contact (Had contact = 1 otherwise = 0)
Enterprise Variables:
X_8 = Labour used (Man-days)
X_9 = Flock size (Ha)
X_{10} = Had training on organic technology (OT) of broiler production (yes = 1, no = 0)
X_{11} = Output price (₦/kg).
X_{12} = Distance between dwelling place and source of seed (Km)
Social Capital Variables:
X_{13} = Decision making index (%)
X_{14} = Membership density of farmer in association (%)
X_{15}= Heterogeneity index of associations (%)
X_{16}= = Meeting attendance index of farmer in association (%)
X_{17}=Volume of Loan from Social Group (₦)

RESULTS AND DISCUSSION

Farmers' participation in local level Institution to earn social capital

Respondents belong to associations from which they acquired their social capital. Table 1 shows the most prominent groups were the farmers group (0.17%), cooperative society (0.14%), religious group (0.14%), trader association (0.14%) and parent teacher association (0.13%), This agrees with the work of (Komolafe and Adeoti, 2018).

Table 1: Farmers' participation in local level Institution

Association/ institution	Frequency	Percentage
Community based association	22	0.032
Gender association	48	0.070
Health group	12	0.020
Age group	48	0.070
Trader association	92	0.135
Farmers association	115	0.169
Religious group	93	0.136
Parent teacher association	86	0.130
Occupation / professional group	26	0.040
Cooperative societies	97	0.142
Political group	40	0.059
Nongovernmental organization/ civic group	4	0.005
Total	**682**	

Note: Multiple responses
Source: Author's computation, 2025.

Distribution of Farmers by Social capital Dimension

Table 1 displayed the social capital dimensions of heterogeneity index, membership density, meeting attendance, decision making index, cash contribution and aggregate social capital index of farmers. A respondent farming household were members in an average of 4.55 social groups. Diversity level of farmers within the associations they belong was evaluated by heterogeneity index, which showed an average of 37.73%. The meeting attendance was well above average (86.74%). This indicates that household meetings attendance at the scheduled meeting was about 87%. Decision making index is high (61.60%), this corroborates the work of (Iyanda *et al.*, 2014; Komolafe and Adeoti, 2018). This is a sign that members' decisions on any matters were made collectively. The average monthly cash contribution to associations by households was N 1,500.02 per month. This amounted to an average of N 18,000.24 in a year.

Influence of social dimensions on adoption of organic broiler production practices (Logit Regression Result)

Table 3 showed the result of logit model used to investigate the influence of social dimension on adoption of organic broiler production practices. Fifteen variables were included in the model, but only five of them were significant at 5%, out of which 3 were social capital dimensions. The likelihood was -92.50 Prob > chi2= 0.000LR c, hi2(15) = 168.26, Pseudo R^2 = 0.57 with a p-value of 0.000 revealed that the model in totality was statistically significant. Years spent in school positively and significantly affect adoption of organic broiler production practices. This agrees with the findings of (Adeogun2008; Kudi *et al*). Meaning that with an increase in the years of education there is a likelihood that farmers will adopt organic broiler production practices. The marginal effect (0.035) shows that with years increase in school the adoption of organic broiler production practices has the likelihood of increasing by 5% ceteris paribus. Experience is significant at (5%) and has a positive effect on the adoption of organic broiler production practices. The marginal effect showed that as if experience increases there is a likelihood that farmers would adopt organic broiler production practices, and the marginal effect (0.002) showed that the adoption of organic broiler production practices increases 0.2% with 0.5%. increase in experience. This aligns with the findings of (Idrisa, Ogunbameru, and Madukwe, 2012; Komolafe and Adeoti, 2018) that experience aids adoption of innovations. Density of membership index has a positive and significant effect on adoption of organic broiler production practices. This implies that as with the increase in the number of associations a farmers belong to increase there is likelihood that farmer will adoption of organic broiler production practices. The marginal effect (0.085) showed that the adoption of organic broiler production practices is increased by 8.5% with 5% increase in density of membership. This supports the work of Sabo and Dia (2009), who indicated a significant influence of membership of socio-cultural groups on adoption. Training has a positive and significant effect on the adoption of organic broiler production practices. This implies that as the farmers receive training there is a likelihood that farmers will adoption of organic broiler production practices. The marginal effect (0.39) showed that with 5% increase in training of farmers the adoption of organic broiler production practices 3.9%. Social capital variables: meeting attendance index was positive and significantly influenced the

adoption of organic broiler production practices. This implies that as the meeting attendance index increased there was a likelihood that farmers will adopt organic broiler production practices. The marginal effect (0.67) showed that with a 5% increase in training of farmers the adoption of organic broiler production practices 6.7%. Density index and aggregate social capital was positive and significantly influenced the adoption of organic broiler production practices. This implies that as the Density index and aggregate social capital increased there was a likelihood that farmers will adopt organic broiler production practices. The marginal effect (0.85) and (0.95) respectively, showing that with 5% increase in Density index and aggregate social capital the adoption of organic broiler production practices 8.5%. and 9.5% respectively. The aggregate social capital effect of social capital dimension was approximately 10%. This result permits the rejection of null hypothesis that stipulated that social capital has no significant effect on the adoption of organic broiler production practices; hence the alternative hypothesis was accepted.

Table 2: Membership density, heterogeneity index, meeting attendance index, decision making index, Cash Contribution, Labour Contribution and Aggregate social Capital Index.

Social capital variable	%	Mean
Density index		
1	1.5	4.55
2	4.4	
5	41.3	
6	62.9	
Total	100.0	
Heterogeneity index		
1-20	0.4	37.73
21-40	64.40	
41-6	34.7	
>60	0.5	
Total	100.0	
Meeting Attendance index		
1-20	2.00	86.74
21-40	16.00	
41-60	4.10	
61-80	16.20	
81-100	62.00	
Total	100.0	
Decision making index		
1-20	4.00	61.60
21-40	34.60	
41-60	7.5	
61-80	8.8	
81-100	45.10	
Total	100.0	
Cash contribution index		
5000-1000	3.50	1500.02
1001-1500	7.30	
1501-2000	11.50	
>2001	77.7	
Total	100.0	
Aggregate social capital	0.40	
1-20	20.80	66.80
21-40	2.80	
41-60	53.20	
61.-80	23.60	
81-100	100.0	
Total		

Source: Author's computation, 2025

Table 3: Influence of social dimensions on adoption of organic broiler production practices (Logit Regression Result)

Logit Regression Result			**Marginal effect**	
VARIABLES	Coefficient	P>|z|	Coefficient	P>|z|
Age	-0.065	0.359	-0.021	0.132
Sex	-0. 049	0.761	-0.302	0.760
Marital status	1.848	0.017	0.104*	0.016
Household size	-0.091	0.954	0.0053	0.974
Education	0. 606	0.003	0.035**	0.004
Experience	0.037	0. 006	0.002**	0.003
Extension contacts	0.125	0.746	0.007	0.76
Volume of loans from association	0. .005	0.025	0.542	0.40
Flock size	-0.103	0.078	-0.006	0.083
Training in OT of broiler production	0.00025	0.005	0.39**	0.002
Aggregate social capital	0. 890	0.002	0.095**	0.004
Meeting attendance index	0.033	0.015	0.067**	0.009
Heterogeneity index	0.004	0.838	0.0002	0.838
Decision making index	0.002	0.802	0.001	0.801
Density index	0.087	0.002	0.085**	0.005
Constant	27.73	0.003		
Log likelihood = -92.50 Prob > chi2 = 0.000 LR chi2(15) = 168.26 Pseudo R2 = 0.57 No of obs = 120				

Source: Author's computation, 2025.

CONCLUSION

This study gives an empirical study on the social capital the adoption of organic broiler production practices. Respondents belong to associations from which they acquired their social capital, the most prominent groups were the farmers group (0.17%), cooperative society (0.14%), religious group (0.14%), trader association (0.14%) and parent teacher association (0.13%), The study revealed that the respondents belonged to an average of 4.55 social groups with diversity level of an average of 37.73%, meeting attendance average of (86.74%), decision making index of (61.60%) and an average monthly cash contribution of N 1,500.02 per month. The result of the logit model revealed that the model in totality was statistically significant. Years spent in school positively, experience, density index, meeting attendance index and aggregate social capital positively and significantly influenced the adoption of organic broiler production practices. This is in line with the work of Husen, Loos, and Siddig, (2017) who reported that adoption of innovation is aided by these variables

RECOMMENDATIONS

The study made the following recommendations based on the findings:

i. Social capital improves the adoption of organic broiler production practices. This suggests that farmers should be encouraged to belong to more local level associations

ii. Farmers' attendance in meetings index is important in promoting adoption of organic broiler production practices, therefore, local level associations should attach stringent sanction to non-attendance in meetings.

iii. Education and training influence the adoption of organic broiler production practices. This suggests agricultural training programmes that will enhance farmers' awareness of the importance of organic broiler production therefore, the extension agents should collaborate with local level associations to train farmers in organic broiler production

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