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X-RAYING POVERTY DYNAMICS OF HOMESTEAD BROILER ENTREPRENEURS IN NIGER STATE OF NIGERIA

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ABSTRACT

In recent times, the drive to eradicate extreme poverty in developing countries has become more urgent given the need to attain the United Nations Millennium Development Goals (MDGs). Thus, this empirical research investigated poverty dynamism among the homestead broiler entrepreneurs, the fastest growing enterprise in the studied. The multi-stage sampling design was used to enumerate 97 active broiler producers from the sampling frame obtained from Niger State Agricultural Mechanization and Development Authority (NAMDA) and well-structured questionnaire coupled with interview schedules were used to elicit idiosyncratic information from the respondents during the 2016 production period. Descriptive and inferential statistics were used to analyze the collected data. The empirical evidence showed that more than half of the broiler farming population was poverty-stricken as they live below the poverty line of two-third postulated by World Bank. Furthermore, the major poverty vulnerability driving forces were old age, abuse of indemnity advantage of insurance attached to risk and uncertainty, and possession of title of ownership of the farm enterprise. Therefore, in lieu of these, the study recommended provision of safety net which should target the identified poor household in the studied area. Also, the poverty strategies design should be multi-dimensional such that it would address and focus on the identified determinants in order to achieve the target set by the Millennium Development Goals.

Keywords: Poverty; Dynamics; Broiler entrepreneurs; Homestead; Nigeria

INTRODUCTION

As the world's total urban population is increasing rapidly, so too is the number of people who are poor and hungry (UNICEF, 2013). People are considered poor when their measured standard of living in terms of income or consumption is below the poverty line, a measure that separates the poor from the non-poor (Foster, Greer and Thorbecke, 1984; Okunmadewa *et al.*, 2005).

The devastating impact of poverty has caused policymakers to propose various policies directed towards its reduction. The situation is most severe in developing regions, where a significant proportion of the populace still lives below the recommended FAO poverty line i.e. $1.6 per head/day. The urgency in minimizing poverty is evident in the Millennium Development Goals (MDGs), which have strong targets focused directly or indirectly on poverty reduction. For instance, while economic growth is generally expected to translate into improved welfare and poverty minimization, this has not always been the case in Africa.

Poverty is multifaceted and characterized by a lack of purchasing power, exposure to risk, insufficient access to social and economic services and limited opportunities for income generation (World Bank, 2009). The multidimensionality of the subject not only considers the absolute but also the relative positions as it relates to people's level of poverty, so the concept of defining who is poor by standard tools used to measure poverty in both its absolute and relative terms needs to be addressed concisely and precisely (World Bank,2013).

Sadiq and Kolo (2015) reported that about two-thirds of rural households in Nigeria are engaged in crop and livestock production as their main source of livelihood with most of these households vulnerable to chronic poverty. The authors linked the near failure of various programmes and strategies by successive governments in Nigeria to the improper diagnosis of poverty as a static concept. Furthermore, they reported that there are growing concerns that poverty is not reducing due to the lack of understanding of its dynamic nature and vulnerability to poverty.

While poverty reduction in itself is crucial, the concept is complex and requires a holistic approach, thus the reason behind conceptualization of this research with special reference to the fastest expanding broiler poultry enterprise in the study area. However, poultry sub-sector has shown to offer a practical and micro level step in rural poverty alleviation (Assa, 2012). There is ample proof that investments in small-scale poultry enterprise generate handsome returns and contribute to poverty reduction, and increased food security in areas where a large share of the population keeps some poultry birds (Jensen and Dolberg, 2003; Mack *et al*., 2005; Pica-Ciamarra and Otte, 2010). Area-specific empirical evidence on poverty dynamics among small-scale farmers and how poultry production affects poverty is imperative for appropriate policy choices, program or reform management towards welfare shift in Nigeria rural agrarian economy.

Liverpool-Tasie *et al.* (2017) reported that poultry production in northern Nigeria appears to be very important to small-holders. Farmers in the hinterland of northern Nigeria, who are far from major markets, have twice as many birds as those far away from markets in the Southern part of Nigeria. With such high poverty rates in the Northern hemisphere of Nigeria, support for these homestead poultry producers could improve their living conditions and address food security concerns. Therefore, this evidence is brought on the surface by determining poverty dimensions of homestead poultry broiler producers with the scope of the research limited to Niger State located in the Northern part of Nigeria. The specific objectives of this research were to describe the demographic profile of the broiler producers in the study area; to determine the poverty status of the producers in the study area; and, to determine the poverty causal factors in the study area.

RESEARCH METHODOLOGY

The study was conducted in Niger state of Nigeria, and the coordinates of the state are latitudes 8°20'N and 11°30'N of equator and longitudes 3°30'E and 7°20'E of the Greenwich Meridian time. The vegetation of the state is northern Guinea savannah with sparse of southern guinea savannah. Agriculture is the major occupation in the study area complemented with civil service jobs, artisanal, craft work, *Ayurveda* medicine and petty trade. The research relied on undated data obtained from 97 active homestead poultry broiler farms drawn from the sampling frame obtained from the Niger State Agricultural and Mechanization Development Authority (NAMDA) using multi-stage sampling design. The sampling procedure stages followed were: convenient selection of Kuta agricultural zone out of the 3 existing agricultural zones in the state due to time and costs constraints of the researchers; purposive

selection of two Local Government Areas (LGAs) *viz.* Chanchaga and Bosso due to high preponderance of poultry entrepreneurs coupled with readily available demand driven-market; a proportionate sampling of 50% of the respondents across the board of the selected LGAs in the sampling frame; and, simple random selection of a representative sample size of 97 active broiler farmers for the study. The instruments for data elicitation were structured questionnaire complemented with interview schedule which was conducted on a fortnight basis during the 2016 production period. The collected data were analyzed using descriptive and inferential statistics. The first, second and third objectives were achieved using descriptive statistics, Foster-Greer-Thorbecke (FGT) model and a logistic regression model.

Table 1: Sampling frame of active poultry broiler producers

LGAs	Population	Sample size
Bosso	93	47
Chanchaga	99	50
Total	**192**	**97**

Source: NAMDA, 2016

Empirical model

1. Construction of the Poverty Line:

Poverty line has been defined as the minimum or the cut-off standard of expenditure on food or per capita income below which an individual or household is described as poor (Sadiq and Kolo, 2015). According to Federal Office of Statistics (FOS) (2013), as reported by Sadiq and Kolo (2015), there is no official poverty line in Nigeria and as such many earlier studies have used poverty lines which are proportions of the average per capita income. However, in this study per capita income which is considered more appropriate in past studies because it is consistent and does not change over a period of time when compared to expenditure was adopted. Therefore, the poverty line was defined as the two-thirds (2/3) of the mean value of per capita income in the study area. The farm households were categorized into a poor and non-poor group using the two-third mean per capita income as the benchmark (World Bank, 2011). Households whose mean per capita income falls below the poverty line are regarded as being poor while those with their income above the benchmark are non-poor.

$$PCHMI = {}^{THMI}/_{HHS} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$MPCHMI = {}^{TPCHMI}/_{TNR} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

$$PL = {}^{2}/_{3} \times MPCHMI \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where:

PCHI = Per Capita Household Monthly Income

THMI = Total Household Monthly Income

HHS = Household Size

MPCHMI = Mean Per Capita Households Monthly Income

TNR = Total Number of Respondent

TPCHMI = Total Per Capita Households Monthly Income

PL = Poverty Line

2. FGT Poverty Index:

Following Sadiq and Kolo (2015) the FGT poverty index developed by Foster *et al.* (1984) was adopted to measure the extent of poverty among poultry broiler entrepreneurs. The FGT poverty index is given as:

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(Z - \frac{Y_i}{Z}\right)^\alpha \quad \text{..... (4)}$$

Where:

P = Poverty index

n = Total number of households in the population

q = The number of poor households

z = The poverty line for the household

y_i = Household income

α = Poverty aversion parameter and takes on value 0, 1, 2

$\left(Z - \frac{Y_i}{Z}\right)^\alpha$ = Proportion shortfall in income below the poverty line

α takes on the value of 0,1,2 to determine the type of poverty index.

When α = 0 in FGT, the expression reduces to

$$P_0 = \frac{q}{n} \quad \text{..... (5)}$$

This is called the Incidence of poverty, describing the proportion of the population that falls below the poverty line.

When α =1 in FGT, the expression reduces to

$$P_1 = \frac{1}{n}\sum_{i=1}^{q}\left(Z - \frac{Y_i}{Z}\right)^1 \quad \text{..... (6)}$$

This is called the Poverty depth

When α =2 in FGT, the expression becomes

$$P_2 = \frac{1}{n}\sum_{i=1}^{q}\left(Z - \frac{Y_i}{Z}\right)^2 \quad \text{..... (7)}$$

This is called Poverty Severity Index. This index weighs the poverty of the poorest household more heavily than those just slightly below the poverty line. It adds to the poverty depth an element of unequal distribution of the poorest household's income below the poverty line.

3. ***Logit regression model***:

The logit model assumes:

$$P_r(Y = 1/X) = \Phi\left(X'\beta\right)\text{.....} \quad \text{(8)}$$

$$P_r(Y = 1/X) = \frac{exp(X'\beta)}{1+exp(X'\beta)} \quad \text{..... (9)}$$

An equivalent form can be stated as:

$$\frac{exp(X'\beta)}{1+exp(X'\beta)} = \frac{1}{1+exp(X'\beta)} \quad \text{..... (10)}$$

This can be expressed as

$$\frac{P}{1-p} = f(X) \quad \text{..... (11)}$$

And re-written as

$$Y_{it} = \beta X_{it} + \varepsilon_i \quad \text{..... (12)}$$

Where Y_{it}= an unobservable latent variable for household poverty status (Poor =1, Otherwise = 0)

Xit = Vector of explanatory variables

X_1 = Gender (Male =1, Female= 0)

X_2 = Marital status (Married =1, Otherwise = 0)

X_3 = Age (years)

X_4= Household size (numbers)

X_5= Education (Formal =1, Otherwise = 0)

X_6= Experience (years)

X_7= Ownership status (Owned =1, Otherwise = 0)

X_8= Occupational status (Poultry keeping only =1, Otherwise = 0)

X_9 = Extension contact (Yes =1, No= 0)

X_{10} = Co-operative membership (Yes =1, No = 0)

X_{11}= Source of capital (Equity =1, Otherwise = 0)

X_{12}= Access to credit (Yes =1, Otherwise = 0)

X_{13}= Disease outbreak (Yes =1, Otherwise = 0)

X_{14}= Farm location (Urban =1, Rural = 0)

β = Vector of parameter to be estimated

ε = error term

RESULTS AND DISCUSSION

Socio-Economic Profile of Broiler Entrepreneurs in the Studied Area

A perusal of Table 2 showed that most of the labour force that participated in the enterprise were active and economic virile; maintained fair family size typical of African setting and have few years of poultry management experience as indicated by the mean age of 35.22± 7.34; mean family size of 7± 3.9 and mean experience of 5 ± 4.2, respectively. Female farmers' participation in the enterprise was very marginal when compared to their male counterpart which may be attributed to economic and religious constraints and married people were the majority in the sampled population that relied on the enterprise for livelihood sustenance. The literacy level of the farming population was very high with the majority holding title of ownership of their farms i.e. owned the farmers they raised their birds in and few were full-time poultry entrepreneurs. The farmers' access to credit, extension contacts and social participation were found to be very poor and most of the farmers solely used their equity capital for the poultry investment during the period of study. A slight difference in the results was observed between the number of farms located in the rural and urban area with most of the farms been hit by an outbreak of poultry diseases during the study period. With the exception of the source of capital, discrepancies were observed in the distribution proportion of each of the socio-economic characteristics considered as evident by their chi^2 statistics probability levels which were different from zero at 10% probability level.

Table 2: Socio-economic profile of the broiler farmers

Variables	Frequency	Percentage	Variables	Frequency	Percentage
Age			**Total**	**97**	**100** [$\mathbf{38.36}^{***}$]
≤ 19	1	1.0	**Occupation**		
20-29	27	27.8	Farmer	26	26.8
30-39	39	40.2	Farmer Artisanal	38	39.2
40-49	28	28.9	Farmer/Civil servant (CS)	5	5.2
50-59	2	2.1	Farmer/Artisanal/CS	28	28.9
Total	**97** ($\mathbf{35.22 \pm 7.3}$)	**100** [$\mathbf{59.65}^{***}$]	**Total**	**97**	**100** [$\mathbf{23.78}^{***}$]
Household size			**Access to credit**		
≤ 3	8	8.2	Yes	17	17.5
4-6	52	53.6	No	80	82.5
7-9	25	25.8	**Total**	**97**	**100** [$\mathbf{40.92}^{***}$]
≥ 10	12	12.4	**Extension contact**		
Total	**97** ($\mathbf{6.8 \pm 3.9}$)	**100** [$\mathbf{48.86}^{***}$]	Yes	31	32
Experience			No	66	68
≤ 3	49	50.5	**Total**	**97**	**100** [$\mathbf{12.63}^{***}$]
4-6	25	25.8	**Social participation**		
7-9	9	9.3	Yes	22	22.7
≥ 10	14	14.4	No	75	77.3
Total	**97** ($\mathbf{4.9 \pm 4.17}$)	**100** [$\mathbf{39.21}^{***}$]	**Total**	**97**	**100** [$\mathbf{28.96}^{***}$]
Gender			**Farm location**		
Male	84	13.4	Urban	47	48.5
Female	13	86.6	Rural	50	51.5
Total	**97**	**100** [$\mathbf{51.97}^{***}$]	**Total**	**97**	**100** [$\mathbf{0.09}^{NS}$]
Marital status			**Disease outbreak**		
Married	73	75.3	Yes	70	72.2
Single	24	24.7	No	27	27.8
Total	**97**	**100** [$\mathbf{142.79}^{***}$]	**Total**	**97**	**100** [$\mathbf{19.06}^{***}$]
Education			**Source of capital**		

Non-formal	16	16.5	Own savings	92	94.8
Formal	81	83.5	Formal credit	5	5.2
Total	**97**	**100** [**43. 56*****]	Total	97	100[78.03***]
Farm ownership					
Owned	79	81.4			
Rented	18	18.6			

Source: Field survey, 2016 Note: *** NS; are 1% risk level and Non-significant; while values in ( ) and [ ] are mean and standard error; and, Chi^2 respectively

Poverty Status of Poultry Producers in the Studied

A perusal of Table 3 showed that 54.64% of the poultry enterprise farming population in the studied area had their monthly income below the poverty line of ₦ 5221.03kobo per month, approximately $20.88 ($1 equivalent to ₦ 250) during the studied period. Therefore, it can be inferred that marginally above the average of the enterprise farming population in the studied area hardly cope with their daily livelihood requirements. The decomposition analysis showed 40.21% of the sampled population to be extremely poor, an indication of difficulty to live from hand to mouth while a handful of 14.43% of the sampled population was moderately poor. However, marginally 4.12% of the sampled population was within the poverty vulnerability zone i.e. prone to poverty while 41.24% of the sampled population was within the safety zone. Furthermore, the poverty depth index of approximately 0.3229 implied that the average amount required by the poor entrepreneurs to exit from the poverty level is approximately ₦1686.39. The poverty severity index of 0.22 showed low inequality in the poverty status distribution of the producers in the studied area. However, literature showed studies on poverty to reference poverty severity index with the percentage of the poorest among the poor in a sampled population.

Relying on the FAO recommendation on poverty status of $1 per day per head all the producers within the safety zone live on $1.04per day. Therefore, it can be concluded that poultry producers within the safety zone in the studied area had a vibrant standard of living during the studied period.

In order to fight the poverty scourge among the producers in the studied area government and non-governmental agencies should provide a soft loan at a subsidized interest rate coupled with technical services to encourage producers to take advantage of economies of scale i.e. pecuniary advantages, thus boosting their income stream base. In addition, producers should be encouraged to form a viable co-operative association to maximize their economies of scale.

Table 3: Poverty profile of the broiler producers

Poverty parameters (Index)	Value	Percentage	Amount requirement
Poverty incidence (P_0)	0.5464	54.64	
Poverty depth (P_1)	0.3229	32.29	₦1686.39
Poverty depth (P_2)	0.22		

Source: Field survey, 2016

Determinants of Poverty Status among Poultry Producers in the Studied Area

Presented in Table 4 are the results of poverty determinants of poultry broiler producers in the study area. The estimated LR Chi^2 which is different from zero at 10% degree of freedom implied that the chosen model is the best fit for the specified equation and the estimated parameters have a significant influence on the poverty status of the broiler producers in the studied area. In addition, the poverty status of 87.4% (84 respondents) of the cases considered was correctly predicted. Furthermore, the diagnostic test results showed the absence of covariance or multicollinearity between the predictors as all the VIF index of the predictor variables were less than the benchmark of 10.0.

The idiosyncratic factors which influenced the poverty status of the broiler producers in the

study area were gender, age, household size, educational status, a title of farm ownership, occupation status and source of capital as indicated by their respective estimated coefficients which were different from zero at 10% degree of freedom. The idiosyncratic predictors which douse the poverty vulnerability status of the producers were the household size and occupation status, while those that trigger poverty vulnerability status of the producers were gender, age, educational status, title of farm ownership and source of credit.

The negative significance of household size estimated coefficient implies that a large household composed of able-bodied people with multiple income sources as against large household dominated by weaker section (old and children) is less likely to be vulnerable to poverty. In addition, the producers have access to cheap family labour which is substituted for hired labour, thereby reducing the operating cost in the production system, thus increasing the profit margin of the enterprise. Literature has shown labour cost to be the highest cost incurred in most of the studies (e.g Sadiq *et al*., 2017) conducted on broiler poultry enterprise production in Nigeria. Therefore, the marginal and elasticity implications of a unit increase in the broiler producer's household size would decrease its vulnerability to poverty by 0.07 and 3.82% respectively. The negative significance of the estimated coefficient for occupational status showed producers who did not rely solely on broiler entrepreneurs i.e. partake in other occupational activities are less likely to be vulnerable given that they have access to multiple streams of income to sustain their livelihood as compared to only one source which will enable them to withstand or absorb poverty shock. The marginal and elasticity implications of a broiler farmer engaging beyond poultry broiler enterprise being non-poor would be 0.289 and 0.865%.

The positive significance of the gender estimated coefficient means that female farmers are less likely to be vulnerable to poverty when compared to their male counterpart. This is not surprising as female producers are better poultry entrepreneurs or more workaholic as they have less activity to contend with (which is house choir) since they have more time to pay full and good attention to the management of their enterprise for better profit margin. Female producers in the studied area spend most of their time daily in the poultry yard with the majority going to bed and coming out (sleep and wake-up from the bed) with the farm's issue in their minds. In addition, their contribution to household expenditure is meager when compared to their male counterparts in the studied area. Therefore, the marginal and elasticity implication of a female broiler producer not being vulnerable to poverty would be 0.207 and 1.106% respectively.

The results showed that older farmers are prone to poverty as indicated by the negative significance of the estimated parameter of age. This is not surprising as efficiency and productivity at old age are likely to affect the farm efficiency, thus affecting the viability of the poultry enterprise which has a direct effect on the livelihood of the producers. Therefore, the marginal and elasticity implications of a unit increase in the producer's age would increase poverty by 0.021 and 4.46% respectively. The significant and direct relationship of education with poverty status means that educated farmers are prone to poverty as their quest for white collar jobs will affect the time devoted for efficient going concern of their poultry enterprise, thus affecting their livelihood survival strategy. This is contrary to the *a prior* expectation which stipulated that education enhance exposure to new ideas and managerial capacity in production and the perception of farmers on how to adopt and integrate innovations into the household's survival strategies. Thus, the marginal and elasticity implications of educated producers being prone to poverty would be 0.148 and 0.718% respectively. The significant positive coefficient of title of farm ownership showed that farmers

with title of farm ownership i.e. who owned their farms are likely to be prone to poverty when compared to those who lease their farms, as the latter will maximize the advantage of economies of scale to maximize profit, thus impacting positively on its survival strategy. Therefore, the marginal and elasticity implications of having title of poultry farm ownership will increase a producer's poverty by 0.177 and 0.879% respectively.

The direct significant relationship of source of capital with poverty status implies that producers with only formal credit are susceptible to poverty as they are likely to abuse the advantage of indemnity for insurance due to risk and uncertainty attached to formal credit, thereby affecting the viability of the enterprise, which in turn would affect their livelihood status. Therefore, the marginal and elasticity implications of farmers with only formal credit being prone to poverty would be 0.331 and 0.041% respectively.

On the other hand, the results showed that producers with access to credit and extension contacts were likely to be non-poor, though the estimated parameters were not significant. The non-significant of the estimated parameters for access to credit and extension contact may be attributed to credit bureaucratic procedures and lack of collateral; and, inadequate availability of extension personnel to match the high number of producers in the studied area respectively. Also, farmers with no case of a disease outbreak are likely not to be prone to poverty, though the estimated coefficient was not significant, an indication of less effect of pest and disease outbreak calamity in the studied. Weak co-operative support is likely to make members prone to poverty in the studied area, though the estimated parameter is non-significant.

Table 4: Factors determining poverty status among broiler producers

Variables	Coefficients	t-statistic	Marginal effect	Elasticity	VIF
Constant	−6.9730(2.8656)	2.433**			-
Gender	2.4693(0.9480)	2.605***	0.2065	1.1061	1.137
Marital status	−1.5457(1.1299)	1.368^{NS}	-0.1293	-0.5797	1.936
Age	0.2539(0.1003)	2.534**	0.0212	4.4608	1.949
Household size	−0.8641(0.2143)	4.033***	-0.0723	-3.8253	1.415
Education	1.7671(1.0195)	1.733*	0.1478	0.7179	1.408
Experience	0.0199(0.1219)	0.163^{NS}	0.0017	0.0585	1.563
Farm ownership	2.1113(0.8229)	2.566**	0.1766	0.8799	1.252
Occupation	−3.4589(1.2935)	2.674***	-0.2893	-0.8647	1.441
Extension contact	−0.0847(0.9085)	0.093^{NS}	-0.0071	-0.0132	1.211
Co-operative mem.	0.3712(0.9373)	0.396^{NS}	0.0311	0.0541	1.326
Source of capital	3.9526(1.5843)	2.495**	0.3305	0.0412	1.406
Access to credit	−0.1595(0.7429)	0.214^{NS}	-0.0133	-0.0399	1.201
Disease outbreak	0.0609(0.7509)	0.081^{NS}	-0.0759	-0.4063	1.334
Farm location	−0.9072(0.8015)	1.132^{NS}	0.0051	0.0133	1.258
McFadden R^2	**0.6134**				
LR chi^2	**81.23*** **				

Source: Field survey, 2016

Note: values in ( ) are standard error

CONCLUSION AND RECOMMENDATION

Based on the empirical findings it can be concluded that more than half of the broiler poultry farming population in the studied area were not only locally poor but also globally poor as they live below the FAO recommended $1 per day. However, old age, abuse of indemnity due to risk and uncertainty, and, title of farm ownership possession were the likely factors that would make poultry producers in the studied area to be prone to poverty. Therefore, study recommended the need for provision of social security for the ageing farmers, proper orientation on sustainability and viability of the going concern of the poultry enterprise without recourse to undue advantage for indemnity from insurance firms and enlightenment of poultry entrepreneurs who possess title of ownership to see poultry enterprise as a business entity which if well managed will go a long way in enhancing their livelihood status. In addition, provision of a timely formal soft loan at a subsidized interest rate and formation of viable and effective co-operative association are palliative measures that will alleviate poverty among the producers in the studied area. There is need to assist male household heads with information and support on the ways and importance of generating more income, in order to ensure poverty reduction among the producers in the studied area.

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