AEXTJ
AGRICULTURAL EXTENSION JOURNAL
ISSN 2582- 564X

Available Online at www.aextj.com
Agricultural Extension Journal 2021; 5(1):11-18

RESEARCH ARTICLE

Empirical Determination of Socioeconomic Status Categories of Agropastoralists in North-Central, Nigeria

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Received: 01-01-2021; Revised: 15-01-2021; Accepted: 01-02-2021

ABSTRACT

Socioeconomic status (SES) categories of agropastoralists were identified to contribute to better decision-making regarding social intervention among the respondents. Four-stage sampling technique comprising simple random sampling and cluster sampling was employed to select respondents from the three states of North-Central Nigeria. This comprises 9 Agricultural Development Program, 9 local government areas, and 36 agropastoralist clusters to arrive at the sample size of 557. Data were collected through the use of questionnaire containing 40 validated indicators of SES. The descriptive analytical tools (mean, median, and standard deviation) were used to arrive at the classification. Three categories "lower," "middle," and "upper" SES were identified for better inferences on certain characteristics and behavioral tendencies of agropastoralists in North-Central Nigeria. The result shows that 50.8% and 17.1% of the respondents were in lower and upper SES categories respectively. Pearson reveals that there was a significant positive relationship between SES and cosmopoliteness, attitude to innovation, leadership, and adoption of innovation. Since there existed relationship between SES and these characteristics, development agencies and agricultural extension experts should utilize any of these characteristics for improvement of the lower class among the respondents.

Key words: Agropastoralist, socioeconomic status, socioeconomic status categories, North-Central Nigeria, adoption of innovation

INTRODUCTION

Agropastoralism is a system which combines farming with pastoral stock, by having permanent homestead, while maintaining herd mobility (Blench, 2001; Daramola, 2007).[1,2] Therefore, agropastoralists are settled pastoralists who cultivate sufficient areas of land to feed their families and for marketing purposes alongside their reared livestock. Nigerian agropastoralists are made up of various ethnic groups such as *Kenembu, Bodani, Shuwa Arab, Koyo, Manga, Fulbe,* and *Bororo* among others. Fulani or Fulbe is the largest of the country's agropastoralists and constitutes about 95% of the nomadic herders in Nigeria (Awogbade, 1983; Iro, 1995; Fabusoro, 2007).[3-5] Nigerian pastoralists are thought to be around 12 million, accounting for a quarter of Sub-Saharan Africa's (SSAs) 50 million pastoralists (Rass, 2006; Ibrahim, 2012).[6,7]

Poverty situation in Nigeria has a strong spatial dimension between the north and south of the country. It is higher in the north and considered to be prevalent in the rural area. In north-central alone, 60.7% of the population was in poverty

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with about 43% in rural areas (Oxfam, 2017).[8] Economic inequality coupled with low, unequal, and inefficient provision of essential services gives rise to high levels of multidimensional poverty. This implies that several deprivations occur in the same household with respect to health, education, and social welfare. However, as it occurs in every society, there is a significant differentiation within pastoral communities. Some households are rich while others are poor. This is due to unequal access to resources or social position and unequal utilization of resources or advantage in the market.

Socioeconomic status (SES) is the term used to evaluate this social and economic inequality in a given society, household, individual, family, or group. SES is a concept which reflects a person's access to jointly/commonly desired good such as material resources, leisure time, money, socially valued positions, and so on. This can be defined as the position of a household, individual, family, or group in a community with respect to the amount of cultural possession, economic possession (wealth), material possession, level of education, and social participation (Busari, 2019).[9] It equally refers to economic and social position of individual, group of individuals, or household within a larger society (Mark *et al*., 2000).[10] SES can be used to evaluate success or achievement across household, individuals, families, or community (Rose *et al.*, 2001).[11]

In order to characterize a family, household, or individual into particular class or group based on certain attribute, SES can be categorized as "high," "middle," and "low" (Olaniyi, 2013; Ovwigho, 2011; Oladipo and Adekunle, 2009; Adegboye, 2016).[12-15] Households with high SES often have resources to acquire household assets such as mattress, mobile phone, and radio among others. They are equally able to deploy resources for training their children to school while reverse is the case for households with low SES which lack wherewithal to acquire as much assets as needed and are unable to give financial support for the training/education of their children.

Statement of the problem

The Nigerian government's determination to eradicate poverty is targeted at growth in agricultural sector for self-sufficiency and food security. This is because the sector employs about 80% of the population and comprises majority of poor who reside mainly in the rural areas. Livestock transformation is a component of this targeted growth and for holistic development in the sector, social intervention is also important. The pastoral areas are typified by few resources, low income, low level of social and human capital, inadequate access to market, and service institutions such as credit institutions, extension information, and services.

Furthermore, unavailability of information on SES categories of agropastoralists in North-Central Nigeria makes it difficult to make an objective inference of their characteristics and developmental trends. Therefore, evaluation of the impact of different interventions in the rural sectors, particularly in the agropastoral rural subtype, requires empirical evidence and baseline information. It is against this background that this research was designed to provide SES categories as socioeconomic benchmarks for better targeted actions and implementation of robust social interventions in favor of agropastoralists in North-Central Nigeria.

The specific objectives were to:

i. Examine the socioeconomic characteristics of the respondents
ii. Identify the SES categories of the respondents
iii. Examine the relationship between SES and selected personal characteristics (i.e., leadership, cosmopoliteness, attitude to innovation, and adoption) of agropastoralists.

The following hypothesis was set up to address objective three:

$H_{01:}$ There is no significant relationship between SES and selected personal characteristics (leadership, cosmopoliteness, attitude to innovation, and adoption).

MATERIALS AND METHODS

Area of study

This study was conducted in North-Central Nigeria (Figure 1). It is located in the moist savannah agro-ecological zone of the country. The total land area is 296,898 km^2 representing about 32% of Nigeria total land mass. The north-central is located between latitude 6°30'N to 11°20'N and

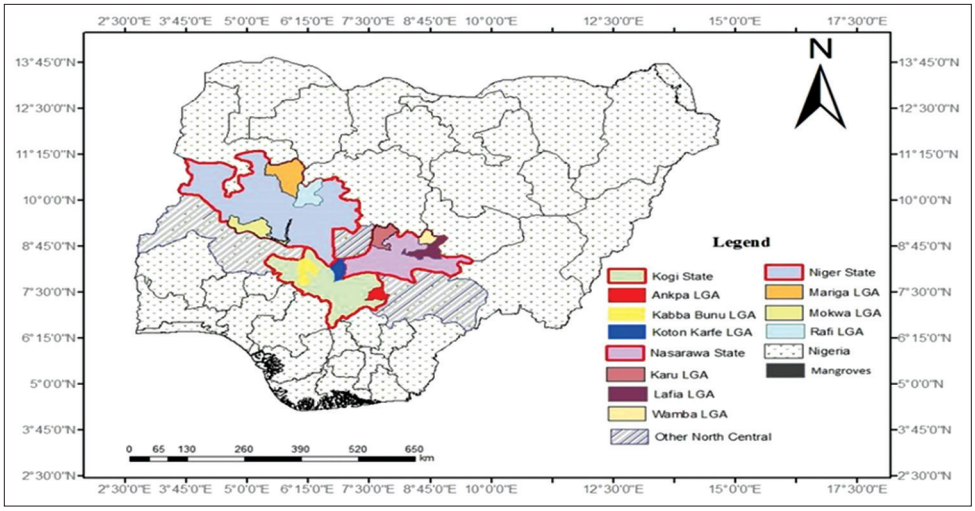

Figure 1: Map of Nigeria showing the study area

longitude 2°30'E to 10°30'E. The zone has two main distinct seasons: Dry and wet seasons. The wet season begins toward the end of March and stop at the end of October, while the dry season is from November to March. The annual rainfall of the region ranges from 1500 mm to 2000 mm with average of 187–220 days and it has an average temperature range of between 21°C and 37°C. The vegetation of the zone consists of the Forest Savannah Mosaic, Southern Guinea Savannah, and the Northern Guinea Savannah. Geographically, the zone is characterized by varying landforms, such as extensive and swampy features, which are common in the lowland areas along valley of Niger and Benue Rivers. Along the side of these rivers are deep valleys, large hills, and mountains (Tologbonse, 2004).[16]

The main activities for sustenance in the study area are farming, livestock rearing, fishing, hunting, trading, weaving, blacksmithing, tying and dying, mat making, and other minor petty trading across the region. The predominance of farming, fishing, and animal husbandry in the study area is as a result of the fertile nature of the land and the presence of rivers Niger and Benue around Kogi, Niger, Benue, Plateau, Nasarawa, and Kwara states and valleys which produce green lurch especially during the dry season. North-Central Nigeria comprises six states and the federal capital territory (FCT), Abuja. The states are Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau. The north-central pastoralists were mainly of *Fulbe*, *Bokolo,* and *Bororo* origin

Determination of sample size

The population of the study comprised all the agropastoralists in North-Central Nigeria. However, there were no reliable data on the actual population of agropastoralists in the zone. Consequently, the study adopted the formula from Triola (2010)[17] as follows: $|Z\alpha/2|\frac{\sigma}{\sqrt{n}} = E$. He stressed that the formula is remarkable because it shows that the sample size does not depend on size (N) of population but on the desired confidence level (Z), allowable error (E), and sometimes on sample proportion or estimated sample standard deviation. Scott and Gerald (2010) [18] and Baltagi *et al*. (2003) defined an allowable error (E) as half the length of a given confidence interval.[19] Thus, the error must be less than $|Z\alpha/2|\sigma_{\bar{x}}$ at a confidence interval 1-α, if we construct say 95% confidence level for μ, it means that we are 95% confident that $1.96\frac{\sigma}{\chi} > E$. The left term of the inequality is called the risk of an interval estimate which is defined as the probability that the error of estimation will be equal to or greater than $|Z\alpha/2|\sigma_{\bar{x}}$, that is, $P(E \geq |Z\alpha/2|\sigma_{\bar{x}})$. The relationship between the error and the risk of estimation is important in that it gives a clue to the determination of sample size that is required in a given survey (Baltagi *et al*., 2003).[19] Given the assumed sample size (n) as (600 ≤n≥500) ∴ (500 + 600 = 1100/2= 550), E was calculated to be 0.025. Then, the least sample size from the equation was 553. This means that the study must use at least 553 questionnaires to

scientifically minimize the level of sampling error, ensure the sample is randomly distributed, ensure adequate conclusion of the survey within the time limit, and enhance the integrity and reliability of the result from the exercise.

Sampling technique and sample size

This study adopted four-stage sampling technique which involves simple random sampling (SRS) and cluster sampling techniques as follows: (i) Random selection of three states of Kogi, Nasarawa, and Niger and then selection of any three Agricultural Development Program (ADP) agro-ecological zone from each state to give a total of nine ADP zones. (ii) From each of the three agro-ecological zones in each state, one local government area (LGA) having preponderance of agropastoralists was purposively selected for the study. Thus, a total of nine LGAs were sampled. (iii) From each LGA selected, four clusters of agropastoralists were randomly selected for the study to give a total of 36 clusters. (iv) Simple random sampling technique was employed in selecting 60% of respondents from each cluster to give a total of 557 respondents.

Data collection

Data were collected with the use of questionnaire to elicit information from the respondents (Head of House hold) on their SES indicators. The SES was measured through the use of 40 SES indicators that were validated out of initial 79 indicators for agropastoralists in north-central (Busari, 2019).[9] The indicators were characterized into five, namely, cultural possession; material possession; economic possession (wealth); social participation; and highest educational level. Standard scores were fixed for each of the indicator while the respondents were asked to tick from the list those indicators possessed and/or not possessed by them.

Data analysis

The objective of the study was to categorize and characterize the agropastoralists in North-Central Nigeria. To achieve this objective, the discriminant analysis and descriptive analysis (SPSS 16 software) were used. The scores/weights of each correspondent were summed up to give maximum score of 144 and minimum of 92. Thereafter, the respondents were categorized into "lower," "middle," and "upper" SES (Table 1). This choice has been guided by the descriptive analysis (mean, median, and standard deviation), indicating that the entire sample was fairly normally distributed when the histogram of the total sample was superimposed with normal curve (Figure 1). The discriminant analytical procedure was based on the algorithm that can handle large sample. The advantage of this is that the class to which each agropastoralist belongs can be saved and be used for tracking of changes in SES of each respondent after any social intervention. The discriminant analysis is very useful tool for building a predictive model of group membership based on the characteristics of each individual/class. The process produces discriminant functions based on linear combinations of indicators that provide the best discrimination among classes. Consequently, the class whose membership is known and characteristics defined can be applied to new individuals with the characteristics considered but whose classes are unknown.

Relationship between SES and selected personal characteristics

The personal characteristics considered were respondents' attitude to innovation, cosmopoliteness, adoption, and leadership.

Attitude to innovation

This was measured through 5-point Likert-type scale of strongly agree, agree, disagree, strongly disagree, and undecided (SA, A, UD, D, and SD). Twenty attitudinal statements were generated to test the respondents' attitude toward innovation.

Table 1: Socioeconomic status categories of agropastoralists

Score range	Value	Frequency	Percentage	(SES) Classes
≤119.3	1	283	50.8	Lower SES
120–130	2	179	32.1	Middle SES
≥131	3	95	17.1	Upper SES

Source: Field Survey, 2019

Table 2: Sigma scoring method for visit to veterinary clinic

Response category	F	CF	CFM	CPM	Z	(Z+2) × 2	Standard score
VO	204	204	102	0.183	–0.90	2.2	2
O	189	393	298.5	0.536	0.09	4.18	4
sNO	111	504	448.5	0.805	0.86	5.72	6
NA	53	557	530.5	0.952	1.66	7.32	7

Cosmopoliteness

Cosmopoliteness which is the rate at which individual exposes or mix with people outside his/her immediate environment was measured by asking question regarding their extent of traveling for information on livestock diseases management, buying livestock drugs, attending training on milk production, and so on. This was measured with number of frequency such as very often, often, not often, and not at all (VO, O, NO, and NA).

Adoption of innovation

This contained attitudinal statements used to elicit information from respondents on their decision on some new techniques of livestock management. Some of the recommended practices included bone meal/potash, salt lick, cotton seed, groundnut cake supplement, and molatus/corn supplement among others.

Leadership position

Leadership position was used to elicit information regarding the social position of respondents within the community. These positions were community leader (Jauro), family leader (zurria modon), household leader (saa're modon), traditional chief (Ardido), and no leadership position (Ardiido na). Sigma scoring method was used to calculate the standard scores for all these variables and was later used in the analysis. Table 2 shows the example of sigma measuring method.

RESULTS AND DISCUSSION

Socioeconomic characteristics of respondents

Table 3 reveals that out of 557 respondents, 35.7% were within the age range 40–49, while 18.5% were within 30–39 years. Furthermore, 16.3% were within the age range of 50–59 years. Thus, majority of respondents' age were between 30 and 49 years representing 54.2%. The mean age of 41.3 years ± 13.7 indicates that the respondents were within the economically active age for productive activities and resembles rural sedentary population. Majority of respondents (89.2%) were male, while 10.8% were female. The lower number of female respondents was due to cultural factor in which the female was not allowed access to unknown male visitors. Furthermore, 84.7% were married while

Table 3: Socioeconomic characteristics of respondents

Variable	Frequency	Percentage
Age group (years)		
≤19	34	6.1
20–29	85	15.3
30–39	103	18.5
40–49	199	35.7
50–59	91	16.3
60–69	29	5.2
≥70	16	2.9
Gender		
Male	497	89.2
Female	60	10.8
Marital status		
Married	472	84.7
Single	46	8.3
Widowed	17	3.1
Divorced	22	3.9
Secondary income generating activities		
Trading	331	59.4
Okada riding	114	20.5
Transportation	60	10.7
Others	52	9.4
Position of respondent in the household		
HHH	388	69.7
Wife of HHH	26	4.7
Father to HHH	34	6.1
Mother to HHH	61	11
Son to HHH	35	6.3
Daughter to HHH	13	2.3

Source: Field Survey, 2019. HHH: Head of household

Table 4: Relationship between socioeconomic status and selected characteristics

		SES	Cosmopoliteness	Leadership	Attitude	Adoption
SES	Pearson correlation	1	0.202**	0.195**	0.302**	0.273**
	Sig. (two tailed)		0.000	0.000	0.000	0.000
	N	557	557	557	557	557

**Correlation is significant at the 0.01 level (two tailed). Source: Field Survey, 2019

8.3% were single. More than half of respondents (59.4%) were engaged in trading as their secondary income generating activity besides cattle rearing. Similar findings were reported by Kiema *et al.* (2013).[20] Furthermore, majority of the respondents (69.7%) were heads of households (HHH). This result was in agreement with the previous findings by Ifejika (2006).[21] About 49% of the agropastoralists sampled had settled for more than 16 years. The result concurs with Iro (1995)[4] who opined that most of the pastoralists were adopting sedentary lifestyle.

SES categories of agropastoralists in North-Central Nigeria

Seventy-nine variables were initially collated for the SES indicators of the agropastoralist which were later pruned to 40 valid variables through discriminant analysis as a pre-diagnostic test to ensure that only variables that significantly discriminate were used for the model. These valid variables/items were weighted using Sigma method as employed by Akinbile (2007), Oladipo and Adekunle (2009), and Olaniyi (2013).[12,14,22] Each respondent's score was calculated by summing up all his/her possessed items/responses. Minimum score obtainable by a respondent was 92 while maximum score was 144. The mean and median estimates were 119.3 and 119, respectively. This shows that they are fairly close to each other. This implies that the distribution of SES scores of 557 respondents in this study is fairly close to normal distribution curve. Consequently, the items were then categorized under-five indicators which form the SES.

Categorization of agropastoralists has resulted into three classes of households depending on the extent of indicators possessed. Five indicators, which included cultural possession, material possession, economic possession (wealth), social participation, and educational qualification, were considered. Table 2 presents the final classification of the agropastoralists household in North-Central Nigeria. Agropastoralist households in low SES category constituted about 50.8% of the total sample and this includes 283 households. The second category is middle SES with 32.1% with 179 households. The third category, upper SES has 17.1% with 95 households. The classes were later given value of 1, 2, and 3 representing lower, middle, and upper SES, respectively. An agropastoralist category with a score below sample average (≤119.3) is described as poor (resource inadequate) and it is represented by 1. The class with scores slightly above sample average (120–130) was described as moderate (resource adequate) and represented by 2. The third class includes households whose scores were largely above the sample average was rich (resource abundant) and represented by value 3. This, therefore, means that among the agropastoralists in the North-Central Nigeria, three distinctive classes can be identified: Lower class; middle class; and upper class. This result is consistent with the findings of Akinbile (2007), Olaniyi (2013), and Adegboye (2016).[12,15,22] It also concurs with the result of Kiema *et al.* (2013)[20] which showed that the poor are the preponderant among the rural agropastoralists. It, therefore, implies that more developmental/intervention projects need to be channelled toward the lower class which constituted the majority so as to lead to reemergence of the middle class and consequently rural transformation. Thereafter, Pearson product moment correlation was used to examine the relationship between SES and these characteristics using the SPSS (16).

Table 4 shows that there is a significant positive relationship between SES and selected personal characteristics of respondents. The table shows the following result as: cosmopoliteness ($r = 0.202$, $P < 0.001$), leadership position ($r = 0.195$, $P < 0.001$), attitude to innovation ($r = 0.302$, $P < 0.001$), and adoption of innovation ($r = 0.273$, $P < 0.001$). This implies that the higher the SES, the more a respondent tends to be cosmopolitan in nature, hold a leadership

position, have positive attitude to innovation, and be among the early adopters of innovation. Conversely, the lower the SES, the less the ability of a respondent to possess these characteristics.

CONCLUSION

The fundamental goal of this study was to contribute to better identification and categorization for decision-making in terms of agricultural and rural social intervention, particularly, among the agropastoralists. Two important conclusions were drawn from this study. First, the study revealed that agropastoralists in North-Central Nigeria were heterogeneous in their SES. Three classes of SES have been identified and categorized based on the predetermined indicators. The three classes were statistically different when compared with the average sample size and resources available. Agropastoralist households whose scores were below the sample average (≤119.3) were described as poor (resource inadequate) while those whose scores were slightly above sample average (120–130) were considered moderate (resource adequate). The third class whose scores were largely above sample average (≥131) was described as rich (resource abundant). Second, agropastoralists in low SES class constituted the majority (50.8%) and most important strata of the rural society. Therefore, improving the living standard of this segment of the society is the main goal of agricultural extension/rural development experts.

RECOMMENDATION

Since there exists significant relationship between SES and selected characteristics, it is recommended that the government and development/extension experts should:

- Ensure that the respondents are exposed to well-established farms to see how some of the livestock practices were being done. This will positively change their attitude to innovation
- Establish groups with leaders to coordinate and enhance adoption of innovation among members.

Some modern livestock management practices such as bone meal, salt lick, and groundnut cake supplement were recommended for improved milk and meat production for the respondents. Once they are adopted, more income would be generated to cater for family need and thus enhancement of their SES.

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