Asian Journal of Agricultural Extension, Economics & Sociology
4(1): 75-85, 2015; Article no. AJAEES.2015.009
ISSN: 2320–7027

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Construction of a Socio-economic Status Scale for Rural Dwellers in Northern Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author MAA designed the study performed the statistical analysis, managed the analyses of the study, wrote the first draft of the manuscript and produced the final draft of the manuscript. Author OBO designed the study with author MAA and vetted the draft of the manuscript. Author EOO vetted the draft to get better output for the final draft. All the authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2015/8548
Editor(s):
(1) Anthony N. Rezitis, Department Business Administration of Food and Agricultural Products, University of Western, Greece.
Reviewers:
(1) Anonymous, Haramaya University, Ethiopia.
(2) Anonymous, Institute for Tropical and Sub-tropical Crops, South Africa.
(3) Anonymous, University of Ibadan, Ibadan, Nigeria.
(4) J. O. Adefila, Department of Geography, Ahmadu Bello University, Zaria-Nigeria.
Complete Peer review History: http://www.sciencedomain.org/review-history.php?iid=658&id=25&aid=6391

Original Research Article

Received 20th December 2013
Accepted 6th May 2014
Published 8th October 2014

ABSTRACT

Actual assessment of the socio-economic status (SES) is best carried out through a well constructed SES scale in line with the dynamic nature of SES indicators in every community. Therefore, this study was carried out to construct a standardised SES scale for rural dwellers in northern Nigeria. A multi-stage sampling technique was used for this study. Simple random sampling technique was used to select a state from each of the 3 geo-political zones of northern Nigeria. Random sampling technique was used to select 30% of the Local Government Areas (LGAs) in each selected state; to have 3 from 11 LGAs in Gombe, 7 from 23 in Kaduna and 5 from 16 in Kwara states. Purposive sampling technique was used to select 2 villages from each LGA to ensure that the selected villages were not from the same side of any LGA. Then, random sampling technique was used to select 13 household heads from each of the villages given a total of 390 respondents. Interview schedule was used to collect data for the study. Sigma scoring method was

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used to measure the variables while Pearson Product Moment Correlation (PPMC) and t-test were used for data analysis. Only 28 of the items collated were discovered valid, to be standardised into SES scale, when item analysis was conducted with r≥0.30 considered good for assessing SES of the rural dwellers in the northern Nigeria. There was a significant difference between high and low socio-economic status rural dwellers (t=2.33, p=0.03); indicating that the scale was valid. Similarly, high correlation (r=0.69; p=0.02) of the split-half score of the respondents for the reliability test shows that the scale was reliable. Therefore, the scale is recommended for the researchers in rural sociology, rural development agencies and policy makers towards better life for rural dwellers in the study area.

Keywords: Socio-economic status scale; standard score; rural dwellers' socio-economic status; rural dwellers in northern Nigeria.

1. INTRODUCTION

1.1 Background of the Study

Every individual within a community occupies a social and economic position in relation to others. This position could be high or low depending on the possession or non-possession of certain socio-economic indicators adjudged as important in that society [1]. Such social and economic position or ranking in the society is known as socio-economic status (SES). [2,3] defined socio-economic status as the position an individual occupies with respect to the amount of cultural possession, effective income, material possession, prestige and social participation. According to [4], socio-economic status is the position that an individual or family occupies with reference to the prevailing average standards of cultural possession, effective income, material possessions and participation in the group activities of the community.

Socio-economic status is typically broken into three categories, high SES, middle SES, and low SES describing the three areas into which a family or an individual may fall. According to [5], families with high socio-economic status often have more success in preparing their young children for school because they typically have access to a wide range of resources to promote and support young children's development. However, families with low socio-economic status often lack the financial, social, and educational supports that characterize families with high socio-economic status. When placing a family or individual into one of the three SES categories any or all of the three variables (income, education, and occupation) can be assessed. A fourth variable, wealth, may also be examined when determining socio-economic status. Additionally, income, occupation and education have shown to be strong predictors of a range of physical and mental health problems, ranging from respiratory viruses, arthritis, coronary disease and schizophrenia [6-8]. Hence, the main factors considered in the issue of SES are income, educational attainment, occupation and wealth.

According to [9] the socio-economic status scale provides an instrument for actual assessment of the socio-economic status of rural dwellers. If the actual socio-economic status can be known certain characteristics and behavioural tendencies of the rural dwellers could be inferred. Availability of the scale of measurement gives an empirical basis for ascribing socio-economic status position to individuals instead of mere arbitrary description. The construction of socio-economic status scale would stimulate more studies in the area of socio-economic status scaling [9]. Similarly, there is no doubt that availability of the SES scale will be very useful in evaluating the impact of intervention programmes in rural areas.

1.2 Problem of the Study

[10] worked on construction and standardization of a scale to measure socio-economic status of Heads of rural households (Gandu) in Funtua zone of Kaduna state. This was published and has been a useful tool for that part of northern Nigeria since then. However, the indicators of SES change with time in every community because of the dynamics of human existence [11,4]. Most of the indicators used in the past are no longer valid for assessing the socio-economic status of rural dwellers. Similarly, some items such as cell phone and video player that were not seen as SES indicators before are now useful indicator of SES for rural dwellers as a result of changes in social amenities in many rural areas. Hence, it becomes necessary to develop a scale that will serve the need of the

moment. Consequently, this study was designed to construct a socio-economic status scale for rural dwellers in northern Nigeria, which will serve as an instrument for actual assessment of the socio-economic status of rural dwellers. The scale will also give an empirical basis for ascribing socio-economic status position to individuals instead of mere arbitrary description. Similarly, it will be a good instrument for evaluating the impact of intervention programmes in rural areas.

2. METHODOLOGY

2.1 Area of the Study

The research was carried out in the northern Nigeria. This comprises states in North-Central (Benue, Kogi, Kwara, Nasarawa, Niger, Plateau, and Federal Capital Territory); North-East (Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe) and North-West (Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara).

Most of the cities and towns in northern Nigeria are predominantly occupied by Hausa-Fulani except the north central region. Amongst these main cities are Kano, Zaria, Katsina, Abuja, Bauchi, Birnin Kebbi, Damaturu, Dutse, Gombe, Gusau, Jalingo, Jebba, Jos, Kaduna, Lafia, Maiduguri, Makurdi, Sokoto, Suleja and Lokoja. There are many indigenous tribes of northern Nigeria. The major ones are the Hausa, Fulani, Kunuri, Tiv, Jukun, Ebira, Nupe, Berom, and Igala. As a result of economic activities, many other tribes from the west, south and eastern part of the country now reside in different cities, towns and villages of northern Nigeria.

Major occupation of the people in the area is farming. As a result of the wide range of climate and vegetation of the area, different kinds of arable crops (such as maize, millet, rice, sorghum, beans, soyabeans, yam, cassava, cocoyam, irish potato and sweet potato) and tree crops (such as citrus, mango, pears and cashew) are grown. There are other sources of income in the area such as trading, crafts and civil service work.

2.2 Sampling Technique and Sampling Size

A multi-stage sampling technique was used for this study. Simple random sampling technique was used to select a state from each of the 3 geo-political zones of northern Nigeria (North-East, North West and North Central) producing Gombe, Kaduna and Kwara states (Fig. 1). Also, a random sampling technique was used to select 30% of the Local Government Areas (LGAs) in each state. Hence, 3 of the 11 LGAs in Gombe, 7 of the 23 in Kaduna and 5 of 16 in Kwara states were selected to have a total of 15 LGAs. Purposive sampling technique was used to select 2 villages from each LGA to ensure that the selected villages were not from the same side of the LGA. Then, random sampling technique was used to select 13 household heads from each of the villages given a total of 390 respondents.

2.3 Developing and Pre-testing the Experimental Schedule

A preliminary research survey was conducted to collate items that enhance individual's socio-economic status in the rural areas. This was done through information from literature, personal survey and observation, discussion with experts in rural sociology and community development, and interaction with some rural dwellers in different zones of northern Nigeria to identify items that could enhance the socio-economic status of rural dwellers in the area. Up to 184 items were collated and subjected to initial pruning using the criteria of [12] of including only items that are objectively observable, suitable for the area, scorable and being good indicators of socio-economic status. Items which were non-specific, redundant, vague and repetitive were rejected; reducing the 184 items to 91.

The schedule was pre-tested with 30 heads of rural households sampled from the three senatorial zones of Bauchi state. The distribution was 10 households from a local government area of each senatorial zone. The heads of households were selected as most of the information required pertains to them. Through the result of the pre-test, necessary modification and rearrangement of the items were made. These processes gave rise to the final draft of the schedule containing 47 items used for the study.

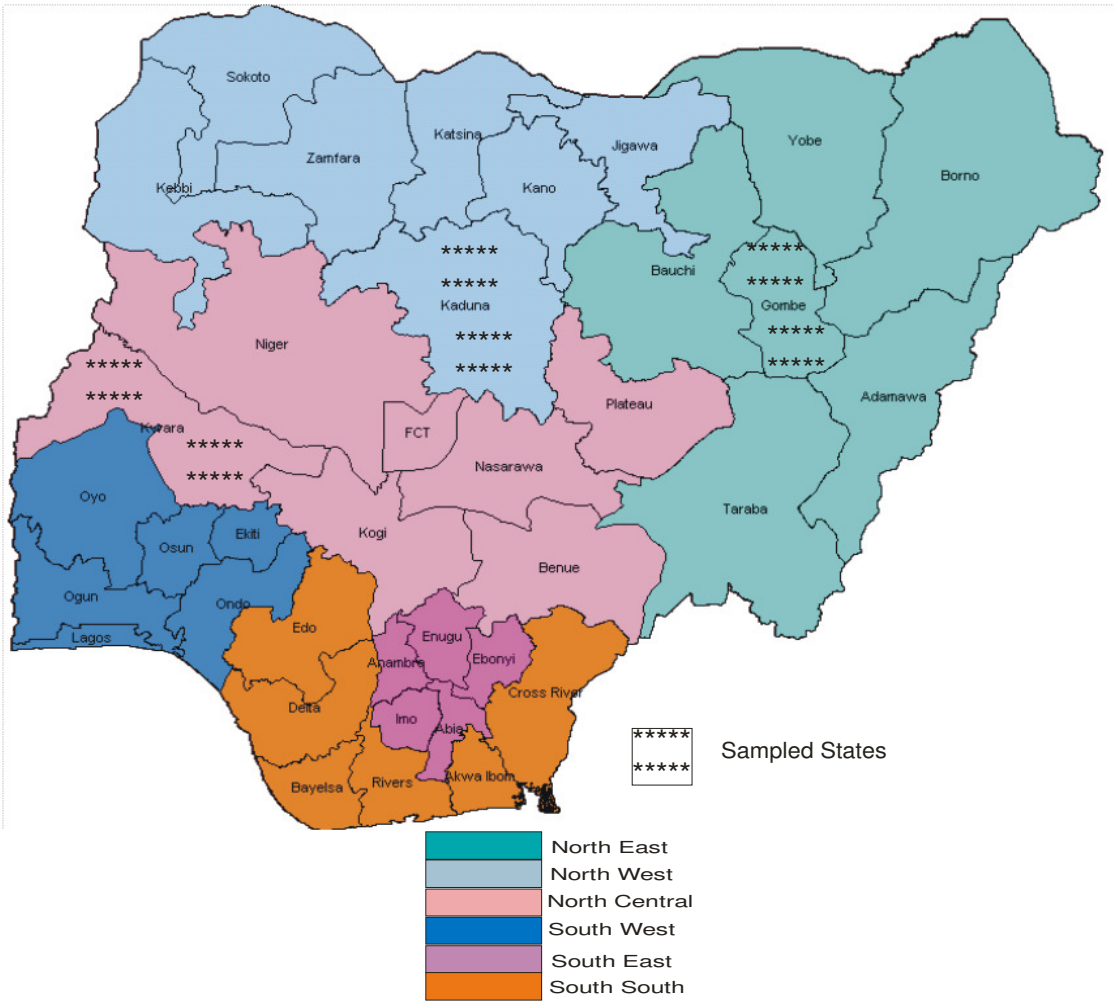


Fig.1. Map of Nigeria showing location of the study

2.4 Conducting Item Analysis (To Determine Valid Ones)

The purpose of conducting item analysis is to identify items that are valid for predicting socio-economic status. According to [4], the three common methods in use for item validation were correlation of scores of test items with those of an external criterion, the use of factor analysis and correlation of scores of test items of the whole item (i.e. internal criterion). The third method, correlation of scores of test items of the whole item (i.e. internal criterion) was used in this study. Pearson Product Moment Correlation Coefficient was used to determine items that are valid for measuring SES. A high correlation, that is, when it is statistically significant indicates that the item is valid for measuring SES. Adopting the [13] discriminating index evaluation method, items with r=0.30 and above were considered valid in this study because of the wide coverage of the study.

2.5 Determination of Standard Scores for Valid Socio-economic Status Indicators

The standard score of an item in the list of valid socio-economic status indicators is the value attached to the item showing its importance in determination of people's socio-economic status. Sigma scoring method was used for assigning weights to valid items as applied by [4]. Weights were assigned to items in reverse relation to their frequency of possession in the population. Those valid items that occur rarely in the population are more important and were given highest scores.

2.6 Standardisation of the Developed Scale

Standardisation of a scale is necessary to ensure its appropriateness for what it is meant to measure. Standardised scale is one which is satisfactorily valid and reliable [12]. Hence, the process of standardisation involves taking the scale through validity and reliability tests. According to [14], the process involves the field testing of a scale or test for the purpose of collecting data for measuring validity and reliability to have normative standards to be used in interpreting scores. [4] affirmed that the process involves field testing a scale on a representative sample of the population for which the test is designed, referred to as the test's norm group. The scores of the people in the norm group becomes the standard to which the results of subsequent administrations of the test are compared once the test is certified valid and reliable.

3. RESULTS AND DISCUSSION

3.1 Result of Item Analysis

Based on [12] discriminating index evaluation method that items with r=0.30 were reasonably good, 28 of the 47 items having r=0.30 (Table 1) and above were discovered to be valid to be standardised into socio-economic status scale (Table 2).

Table 1. Evaluation of discrimination index after item analysis

Index of discrimination	Item evaluation
0.40 and above	Very good items, accept
0.30 to 0.39	Reasonably good but subject to possible improvement
0.20 to 0.29	Marginal items that need being subjected to improvement
Below 0.19	Poor items to be rejected or improved by reversion

Source: Ebel, R. L. [13]

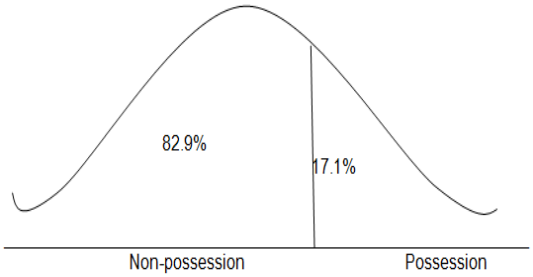
Table 2. Correlation coefficient of items selected for the socio-economic scale

S/N	Item	Correlation coefficient (r)	Significance (p)
1	Total numbers of children	0.70	0.00
2	Children in primary school	0.50	0.00
3	Children in secondary school	0.50	0.00
4	Children in the higher institution	0.43	0.00
5	Deep well	0.33	0.00
6	Pit toilet (latrine)	0.34	0.00
7	Plot of land for building	0.41	0.00
8	Farmland (in hectare)	0.63	0.00
9	Poultry birds/fowls	0.57	0.00
10	Goat	0.59	0.00
11	Sheep	0.51	0.00
12	Cattle	0.42	0.00
13	Grain rhombus/ store	0.43	0.00
14	Bicycle	0.45	0.00
15	Motorcycle	0.45	0.00
16	Transistor radio	0.36	0.00
17	Cassette player	0.30	0.00
18	VCD player/video player	0.38	0.00
19	Television	0.30	0.00
20	Ceiling/standing/table fan	0.39	0.00
21	Cushioned/executive chair	0.32	0.00
22	Wrist watch	0.42	0.00
23	Umbrella	0.33	0.00
24	Standing mirror	0.30	0.00
25	Breakable plates	0.36	0.00
26	Cell phone	0.37	0.00
27	Relative living under same roof	0.46	0.00
28	Chieftaincy/religious title	0.30	0.00

Source: Field survey (2011)

3.2 Assignment of Weights to Valid Items

Weights were assigned to valid items as shown in Tables 3 and 4. Table 3 shows a non-graduated item where a respondent obtained a score of 4 for non-possession of cell phone and 7 for possession of cell phone. However, number possessed was considered in graduated items. Hence, a respondent obtained a score of 0 for having no child, 1 for having 1 child but 2 for 2 or 3 children (Table 4).



Normal distribution curve for possession and non-possession of valid items

F = Frequency (percentage of those who agreed to each response category)
CF = Cumulative frequency
CFM = Cumulative frequency to mid-point i.e. $\frac{x+y}{2}$ where x and y are the 2 extreme points

i.e. Non-possession (NP) = $\frac{0+82.9}{2}$ = 41.45

Possession (P) = $\frac{82.9+100}{2}$ = 91.45

CPM = Cumulative proportion to mid-point (CPM)

= $\frac{\text{CFM}}{\text{N}} = \frac{\text{CFM}}{100}$

Z = Sigma score
Standard score = (Z+2) x 2
(Z+2) x 2 = a constant used in transforming the Z values to standard scores. The Z value is added to 2 and then multiplied by 2 to get the standard score.
Standard score rounded: This column contains standard scores approximated to whole numbers.

F = Frequency **(**number of respondents who chosed a particular response category)
CF = Cumulative frequency. The frequency of the first response category was used as its cumulative frequency. The process was continued by adding the frequency of the least response category to the next to get cumulative frequency of the second response category. The cumulative frequency of the second response category was then added to the frequency of the third response category. The process was continued in that manner until the cumulative frequency of the highest response category was obtained.
CFM = Cumulative frequency to mid-point. The cumulative frequency of the lease response category was divided by 2 to get the cumulative frequency to mid-point for first response category. The cumulative frequency of the least and next response categories were added together and divided by 2 to get the cumulative frequency to mid-point for the second response category. The cumulative frequency of the second and third categories were added and divided by 2 to get the cumulative frequency to mid-point for the third response category. The process continued in that manner until the highest response category was obtained.
CPM = Cumulative proportion to mid-point. This is obtained by dividing the cumulative frequency to mid-point of each response category by the total number of the respondents which in this case is three hundred and ninety (390)
Z = Sigma score. It is obtained by checking the Z value that corresponds to the cumulative proportion to mid-point from the table of normal deviates.
Standard score = (Z+2) x 2
(Z+2) x 2 = a constant used in transforming the Z values to standard scores. The Z value is added to 2 and then multiplied by 2 to get the standard score.
Standard score rounded: This column contains standard scores approximated to whole numbers.

Table 3. Assignment of weights to non-graduated items (e.g. possession of a cell phone)

Possession of the item	F	CF	CFM	CPM	Z	Standard score	Standard score rounded
Non-possession	82.9	82.9	41.45	0.415	-0.22	3.56	4
Possession	17.1	100	91.45	0.915	1.37	6.74	7

3.3 Developed Socio-economic Scale

Table 5 shows the developed socio-economic scale comprising the 28 valid items. The scale has both graduated (number possessed mentioned) and non-graduated (possessed or not possessed) items earlier processed to the level of standard score rounded up to the nearest whole number. The table reveals item's number possessed under response categories and corresponding value (weighted score) of each number possessed under standard score. The result shows that some items had weighted score of greater than zero for non-possession; indicating how important they were. This observation is in line with that of [4,1] who also recorded greater than zero for non-possession of some items. Score of non-possession of children in higher institution was greater (3) than non-possession of children in secondary school (2) indicating more importance of having children in tertiary institution than having children in secondary school. Only the total number of children and chieftaincy/religious title had '0' as weighted score for non-possession of all the 28 valid items; showing their less importance compared to other items. Different possession number of an item with the same weighted score is an indication that there is no difference between those number possessed.

3.4 Validity and Reliability Test of the Scale

3.4.1 Validity test of the scale

Norm group method was used to determine the concurrent validity of the scale. This involved the sampling of 30 people of high socio-economic status and 30 people of low socio-economic status as identified by members of the community. There was a significant difference between those considered to be of high SES and those considered to be of low SES in the rural community ($t=2.33$, $p=0.03$). The significance obtained is an indication that the scale was valid.

3.4.2 Reliability test of the scale

Split-half method of reliability was used to ensure internal consistency of the scale. The items on the scale were divided into odds and even numbered items; each group treated as a whole. Scores of the two sets of the items obtained from 30 respondents were computed and correlated. A correlation coefficient of $r=0.69$ was obtained which was high enough to adjudge the scale as reliable.

Table 4. Assignment of weights for graduated items (total number children)

No of possession	F	CF	CFM	CPM	Z	Standard score	Standard score rounded
0	15	15	7.5	0.019	-2.075	-0.2	0
1	11	26	20.5	0.053	-1.616	0.8	1
2	35	61	43.5	0.112	-1.270	1.5	2
3	48	109	85	0.218	-0.779	2.4	2
4	76	185	147	0.377	-0.313	3.4	3
5	49	234	209.5	0.537	0.093	4.2	4
6	37	271	252.5	0.647	0.377	4.8	5
7	21	292	281.5	0.722	0.586	5.2	5
8	34	326	309	0.792	0.813	5.6	6
9	09	335	330.5	0.847	1.024	6.0	6
10	12	347	341	0.874	1.146	6.3	6
>10	43	390	368.5	0.945	1.598	7.2	7

Table 5. Socio-economic status scale for the rural dwellers in northern Nigeria

S/No	Valid indicators	Response categories	Standard scores
1	Total number of children	None	0
		1	1
		2	2
		3	2
		4	3
		5	4
		6	5
		7	5

S/No	Valid indicators	Response categories	Standard scores
		8	6
		9	6
		10	6
		>10	7
2	Children in primary school	None	2
		1	3
		2	4
		3	5
		4	7
		5	8
		6	8
		7	9
		8	10
3	Children in secondary school	None	2
		1	4
		2	5
		3	6
		4	7
		5	8
		6	9
		7	10
		8	10
		9	10
4	Children in higher institution	None	3
		1	6
		2	6
		3	7
		4	8
		5	9
		6	10
5	Deep water well	No	3
		Yes	6
6	Pit toilet	No	3
		Yes	5
7	Plot of land for building (hectare)	None	3
		1	4
		2	5
		3	7
		4	7
		5	8
		6	8
		7	8
		8	8
		9	8
		10	8
		>10	9
8	Plot of land for farming	None	2
		1	3
		2	4
		3	5
		4	5
		5	6
		6	6
		7	6
		8	7
		9	7
		10	7
		>10	8
9	Poultry birds/fowls	None	2
		1	3
		2	3
		3	4

S/No	Valid indicators	Response categories	Standard scores
		4	4
		5	4
		6	5
		7	5
		8	5
		9	5
		10	5
		>10	6
10	Goats	None	2
		1	3
		2	3
		3	4
		4	5
		5	6
		6	6
		7	6
		8	6
		9	7
		10	7
		>10	8
11	Sheep	None	3
		1	4
		2	5
		3	5
		4	6
		5	6
		6	6
		7	7
		8	7
		9	7
		10	7
		>10	8
12	Cattle	None	3
		1	5
		2	6
		3	7
		4	7
		5	8
		6	8
		7	8
		8	8
		9	9
		10	9
		>10	9
13	Grain rhombus/store	No	3
		Yes	6
14	Bicycle	No	3
		Yes	6
15	Motor cycle	No	3
		Yes	6
16	Transistor radio	No	3
		Yes	5
17	Cassette player	No	3
		Yes	5
18	VCD player/VHS video player	No	3
		Yes	6
19	Television	No	3
		Yes	5
20	Ceiling, standing or table fan	No	3
		Yes	6
21	Cushion/executive chair	No	3
		Yes	5

S/No	Valid indicators	Response categories	Standard scores
22	Wrist watch	No	3
		Yes	5
23	Umbrella	No	2
		Yes	5
24	Standing mirror	No	3
		Yes	6
25	Breakable plates	No	3
		Yes	5
26	Cell phone	No	2
		Yes	5
27	Relative living under same roof	None	3
		1	5
		2	6
		3	7
		4	7
		5	8
		6	8
		7	8
		8	9
		9	9
		10	9
		>10	10
28	Chieftaincy/religious title	No	0
		Yes	4

Source: Field survey (2011)

4. CONCLUSION AND RECOMMENDATION

Only 28 of the socio-economic status indicators collated were discovered valid when item analysis was conducted. Consequently, they were standardised into the socio-economic status scale of the rural dwellers in the northern Nigeria. There was a significant difference between high and low socio-economic status rural dwellers; indicating that the scale was valid. Similarly, high correlation of the split-half score of the respondents for the validity test shows that the scale was reliable. Therefore, the scale is recommended for the researchers in rural sociology, rural development agencies and policy makers towards better life for rural dwellers in the study area.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=658&id=25&aid=6391