CONSTRUCTION AND STANDARDIZATION OF A SCALE TO MEASURE SOCIOECONOMIC STATUS OF HEADS OF RURAL HOUSEHOLDS (GANDU) IN THE FUNTUA ZONE OF KADUNA STATE

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ABSTRACT

The paper reports the methodology of the development of a scale to measure socioeconomics status of heads of rural households (*Gandu*) in the Funtua Zone in Kaduna State of Nigeria.

A universe of interest containing about 105 items of socioeconomic significance was made up by selection from observation in a typical village setting in the study area. After pre–testing the instrument with 105 items, ambiguous items were dropped leaving 90 items.

In validating the items, item analysis procedure was carried out on the 90 items in order to select the items that best differentiated between high and low possession of socioeconomic status among the farmers. Consequently, 38 items were selected from the item validation process. These items being those in which significant difference were found between proportions in the highest and lowest 25 per cent of the farmers possessing the items.

Weighting of the item was carried out using the Sigma method of scoring which assigned greater scores to valid items which were possessed by only few farmers and expressing such items scores in standard units. Results of validity and reliability tests carried out on the constructed standardized scale indicated that the scale was quite vaild and reliable.

Introduction

Measurement and scaling techniques have been used in social science research for a number of reasons which include; (i) reduction of complexity of data, (ii) calculation of a single score that represents several variables for simplified sta-

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tistical analysis and (iii) to reduce error in measurement and thereby increase reliability of the final measures used in the analysis of data (Selltiz *et al.* 1976).

Further, there is no gainsaying in the fact that research in the social sciences would be advanced by greater attention being paid to developing sharp measuring techniques as well as their validation.

Problem of Measurement in Social Research

A common problem in social science research and particularly in developing countries like Nigeria however has been the difficulty encountered by researchers when certain characteristics such as level of living, state of affluence, wealth, social status etc. are to be measured. This probably stems up from the fact that respondents do not feel too comfortable to reveal information bearing on their wealth and social status directly to investigators for various reasons, most of which are personal.

This situation has necessitated the need for carrying out research aimed at developing instruments to measure these types of characteristics. However, very few studies have been carried out in this direction in Nigeria. A pioneer effort in this direction was that of Patel and Anthonio (1974) who developed a scale to measure socioeconomic status of farmers in South Western Nigeria. Efforts by Chapin (1933), Sewell (1940) and Skirpurkar (1967) among others however have been reported in literature.

This present investigation on the other hand reports the development of a similar scale to measure socioeconomic status of farmers, who were also heads of households (*Gandu*)in the Funtua Agricultural Development Project (FADP)—a World Bank assisted project in Kaduna State, Nigeria by adapting the methodolgy of Patel and Anthonio, taking into consideration the peculiar social, cultural and economic circumstances of the people living in this area. The socioeconomic status scale developed in this study is largely based on the definition of Chapin (1933) in which socioeconomic status is seen as the position that an individual or family occupies with respect to the prevailing average standards of cultural possession, effective income, material possession and social participation.

Area of Study and Sampling Procedure

The study was carried in the three selected districts of, highest, average and lowest intensities of agricultural development—namely, Funtua, Kankara and Faskari in the FADP between 1982 and 1983.

Two hundred and sixteen (216) farmers who were also heads of the *Gandu* [1] —selected were through a multi-stage process employing simple random and

[1] The *gandu* has been defined as a farm family unit of members of a kinship group who combine their farming operations under a common leadership and organization which in turn normally forms the basis for a common domestic economy (Goddard 1969).

stratified sampling process.

Universe of Interest

The items considered for the measurement of socioeconomic status included those selected from observation in a typical village setting in Northern Nigeria, a review of literature and items of a previously standardized scale by Patel and Anthonio.

Out of the initial 105 items that were considered, 90 items of socioeconomic significance were retained after the pre–test when ambiguous items were dropped. Farmers were consequently asked to give information as regards possession and/or non–possession of the 90 items.

Validation of Items

In order to select the items that best differentiated between high and low possession of socioeconomic status among the farmers, a validation process was carried out. Farmers were scored on the possession and non possession of the various items using the uniform scoring technique of assigning a value of 2 to a farmer for possession and 1 for non–possession. For some quantitatively measurable items, possession was taken to include having over the median value for a particular item and non–possession to be less or equal to the median value of the items. For some other items and non quantitatively measurable ones, some descriptions were considered for possission and others for non–possession.

Fifteen items that were ambiguous or that were found localised only in one or two district areas of the project were dropped giving a total of 75 items considered in further development of the scale.

Total score on the scale, calculated by adding 2 or 1 for possession and non–possession respectively for the 75 items were ranked from the highest to the lowest. Consequently, the highest and the lowest 25 per cent of the farmers were then compared to see if there existed any significant difference in the proportions of farmers possessing the items at 0.01 level of significance with the t–test.

From the t–test analysis, 38 items were selected to make up the scale—being those items in which significant differences were found between proportions in the highest and lowest 25 per cent of the farmers possessing the items.

Weighting of the Items

The sigma method of scoring used by Patel and Anthonio (1974) was also used in this study. The method assigned higher scores to valid items which were possessed by only few farmers and expressed such in standard units. The sigma values representing z–deviates from the mean of the areas of the normal distribution corresponding to proportions were then looked up from a table of the areas under the normal curve. In the case of graduated items like the example given in Table 1, the mid–point of the cumulative frequency distribution was

TABLE 1 **Example of Sigma Scoring for Graduate Item "Wives"**

No. of wives	No. of farmers possessing	% frequency	Cumulative % frequency	Cumulative % frequency to the midpoint	z-value (sigma values)	Standard score(values +2)2
0 - 1	53	24.54	24.54	12.27	−1.160	2
2	96	44.44	68.98	46.76	−0.088	4
3 and above	67	31.02	100.00	84.49	1.015	5

considered in looking up the sigma values. For the item 'wives', in finding out the sigma value for one wife, the value of z corresponding to 24.54/2 as read from the table of the normal curve was −1.160 and for two wives, the value of z corresponding to 46.76(24.54 + (44.44 / 2) was −0.088.

In the case of a non–graduated item like "arabic literacy" however, which was possessed by 39.35 per cent of the respondents and not possessed by 60.65 per cent, sigma value for possession therefore was 100−(39.35/2)=80.33 and the value of z corresponding to 80.33 as read from the table of areas of the normal curve was 0.853 and the sigma value for non–possession was simply

60.65 / 2 = 30.325

and the value of z corresponding to 30.325 was −0.526. The sigma values were consequently transformed into positive whole numbers by adding a constant 2 and multiplying by another constant 2 to obtain standard score values that were positive. The final socioeconomic status score was taken as the sum total of scores for the selected 38 items (see Appendix 1).

Determining the Validity of the Socioeconomic Status Scale

In addition to content validity, concurrent and construct validity tests were also carried out on the scale.

Concurrent Validity

Concurrent validity using the known group method as the criterion was carried out. Ten farmers of very low socioeconomic status and 10 farmers with very high socioeconomic status as identified by 10 villagers serving as judges were compared to test for discriminating power of the known contrast groups using the t–test formulae used by Jha and Singh (1973) to calculate the 'critical ratio'.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\Sigma (X_H - \bar{X}_H)^2 + \Sigma (X_L - \bar{X}_L)^2}{n(n-1)}}}$$

where $$(X_H - \bar{X}_H)^2 = \Sigma X_H{}^2 - \frac{(\Sigma \bar{X}_H)^2}{n}$$

and $$(X_L - \bar{X}_L)^2 = \Sigma X_L{}^2 - \frac{(\Sigma \bar{X}_L)^2}{n}$$

Where ΣX_H^2 = sum of the squares of the individual in the high scores group (10 farmers with very high socioeconomic status)

and ΣX_L^2 = sum of the squares of the individual socores in the low group (10 farmers with very low socioeconomic status),

where $\bar{X}_H$ = mean score of the 10 farmers with very high socioeconomic status,

and $\bar{X}_L$ = mean score of the 10 farmers with very low socioeconomic status.

When scores were substituted into the formulae, t-value from the t-test analysis was found to be, 2.44 significant at the 0.01 level.

This indicated that the socioeconomic status scale was valid in that it had been able to discriminate between the two extreme groups of very low and very high socioeconomic status farmers.

Construct Validity

High socioeconomic status and or level of living is hypothesized to influence increased adoption. Many researchers have found that the socioeconomic status of farmers was positively related to the adoption of recommended practices; i.e. Fliegel(1956), Copp *et al.* (1958) in the U.S.A., Jha and Shaktawalt(1972), Choukidar and George(1972) in India, and in Nigeria, Basu(1969), Rogers *et al.*(1970) and Voh (1979) have among many others also corroborated this general findings of positive relationship between level of living/socioeconomic status and adoption of recommended practices.

In this study, the validity of the construct—socioeconomic status was determined by examining its relationship to the adoption of recommended agricultural practices in the study area.

The Pearson–r value of 0.35 obtained was significant at the 0.01 level. This finding, being in line with those of other researchers made it possible to conclude that the socioeconomic status scale developed was valid. Further, the distribution of the socioeconomic status of 216 farmers interviewed in the study was close to that of a normal distribution (see Table 2). The location estimate of the mean and median were also found to be very close to each other i.e.

TABLE 2 **Distribution of Socioeconomic Status Scores of Heads of Households(Gandu)**
N = 216

Socioeconomic status scores	Frequency	Percentage	Mean	Standard deviation
Below 121	13	6		
121 - 140	63	29.2		
141 - 160	64	29.6		
161 - 180	41	19.0		
181 - 200	26	12.0		
Above 200	9	4.2	152.6	25.0

Location estimates

Mean = 152.6, Standard error 1.7.

Median = 149.0, Standard error 2.0.

Mode = Not unique.

152.6 and 149.0 respectively indicating that the distribution is very close to that of the normal distribution where location estimates tend to cluster or are found close to each other.

Determining the Reliability of the Socioeconomic Status Scale

In determining how reliable the constructed socioeconomic status scale was, reliability test was carried out in the following manner using a test–retest method.

Test – Retest Reliability

The socioeconomic status scale was administered to 40 farmers and the total score for each farmer calculated on the 38 selected items on the scale. Another administration of the scale was carried out on the same set of 40 farmers, 28 days after the first administration and the total score for each farmer calculated.

The agreement between the scores obtained from the two administrations of the scale was consequently determined by calculating the correlation coefficient between the two sets of farmer scores. The Pearson–r value of 0.70 obtained indicated that the socioeconomic status scale was quite reliable and stable.

Conclusion

The problem of lack of precisc/sharp measurement of key variables in social science research and in agricultural extension research particularly makes the objective of developing scales to measure these variables very imperative in developing and bringing about reliable research outcomes.

Developing a scale to measure socioeconomic status have implications for the development of research in the areas of measurement and scaling techniques in agricultural extension. Further, policy makers and extension administrators, development workers amongst others would find useful, standardised instrument in identifying socioeconomic groupings of their target population in development/change programmes.

Recommendation

The socioeconomic status scale developed in this study is recommended for use by researchers, agricultural development project authorities and other development workers in measuring socioeconomic status of farmers who are heads of household(*Gandu*)in the FADP project area specifically, and in Kaduna State and neighbouring parts of Sokoto and Kano States (North Central Nigeria). Validity test of the scale prior to use is however suggested from time to time.

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APPENDIX 1 **Heads of Rural Households(Farmers)**

Serial No	Description of item	Number of items possession or non possession	Standard score	Assigned score
1	Wives	0 - 1	2	
		2	4	
		3 and above	5	
2	Work bull	0	3	
		1	4	
		2	6	
3	Cattle	0	3	
		1 - 4	4	
		4 - 10	5	
		11 and above	7	
4	Labourers	0	1	
		1 - 5	4	
		6 and above	6	
5	Sheep	0	2	
		1 - 5	3	
		6 - 10	4	
		11 and above	6	
6	Goats	0	1	
		1 - 5	3	
		6 - 10	4	
		11 and above	6	
7	ULV Sprayer	0	3	
		1	6	
		2 and above	8	
8	Knapsack sprayer	0	4	
		1 and above	7	
9	Craneries / Silo	0	1	
		1	3	
		2	4	
		3 and above	6	
10	Ox-ploughs	0	3	
		1 and above	6	
11	Poultry	0	1	
		1 - 10	4	
		11 and above	6	
12	Hand Hoes	0 - 2	2	
		3 - 5	4	
		6 and above	6	
13	Cutlas	0	2	
		1 - 4	4	
		5 and above	6	

Socioeconomic Status Scale

Serial No	Description of item	Number of items possession or non possession	Standard score	Assigned score
14	Bicycle	0	2	
		1	4	
		2 and above	6	
15	Radio	0	2	
		1	4	
		2 and above	7	
16	Metal Spoons	0	1	
		1 - 10	4	
		11 and above	7	
17	Glass Plates	0	3	
		1 - 5	5	
		6 and above	7	
18	Kettle	0	2	
		1	3	
		2 and above	5	
19	Buckets	0	0	
		1	2	
		2 - 4	5	
		5 and above	8	
20	Farm size	Below 11 acres	3	
		11 - 20 acres	5	
		21 - 30 acres	6	
		Above 30 acres	7	
21	Laterine	No	4	
		Yes	7	
22	Spade / Shovel	No	4	
		Yes	7	
23	Tractor	No	4	
		Yes	8	
24	Cars	No	4	
		Yes	8	
25	Motorcycles	No	4	
		Yes	7	
26	Education	No	3	
		Yes	6	
27	Hausa Literacy	No(speak only)	3	
		Yes(speak, read & write)	5	
28	Arabic Literacy	No (Don't speak read or write)	3	
		Yes(speak, read or write)	6	

APPENDIX 1 **Heads of Rural Households(Farmers) Socioeconomic Status Scale(continued)**

Serial No	Description of item	Number of items possession or non possession	Standard score	Assigned score
29	Personal well	No	3	
		Yes	6	
30	Raincoats	No	3	
		Yes	5	
31	Tables	No	2	
		Yes	5	
32	Wristwatches	No	2	
		Yes	5	
33	Umbrella	No	3	
		Yes	6	
34	Rooms with floor cemented	No	3	
		Yes	5	
35	Roofs with corrugated iron sheets	No	3	
		Yes	6	
36	Wals cemented	No	3	
		Yes	6	
37	Adviser to the Emir	No	4	
		Yes	8	
38	Member Village Council	No	4	
		Yes	7	

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