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Construction of a Socio-economic Status Scale for Heads of Rural Farm Families in the North Agricultural Zone of Delta State, Nigeria

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KEYWORDS Socio-economic Status. Indicators. Standardisation. Construct Validity. Concurrent Validity. Social Stratification

ABSTRACT The main objective of the study was to construct a socio-economic status scale to measure the socio-economic status of heads of rural farm families in the Delta north agricultural zone of Delta State, Nigeria. The specific objectives were to standardise validated socio-economic status indicators into a scale, determine the construct and concurrent validity of the scale, and ascertain the reliability of the scale. Stratified and multi-stage simple random sampling techniques were used in selecting the towns and respondents. Twelve percent (12%) of the heads of farm families in Aniocha South (41), Ika South (47), Ndokwa West (55) and Oshimili North (31) were sampled. This gave a sample size of 174 heads of farm families. Data were collected by the use of structured interview schedule. The variables were measured by the use of sigma scoring method and analysed by the use of Pearson Product Moment Correlation and t-test. Sixty-nine (69) valid items were standardized into a socio-economic status scale. There was a significant and positive correlation between socio-economic status and adoption ($r=0.76$, $P<0.01$); there was a statistically significant difference between high and low socio-economic status heads of farm families ($t=78.82$, $P<0.01$). A Pearson r ($r=0.89$,$P<0.01$) showed that the scale was reliable. The scale is therefore recommended to development intervention agencies for measuring the socio-economic status of heads of farm families in the study area.

INTRODUCTION

The family or an adult individual occupies a social and economic position in relation to other members of the society. This position could be high or low depending on the possession and non-possession of those socio-economic status indicators adjudged important by members of the society.

According to Chapin (1933) as cited by Rogers (1983), Akinola and Patel (1987), Tubbs (1988), Onwueme and Ugbor (1994), Akinbile (2007), and Marriage and Family Encycyclopedia (2010), socio-economic status was the position an individual occupies in a society with respect to the amount of cultural possession, effective income, material possession, prestige and social participation. It implied the two dimensions of social and economic inequality.

The terms socio-economic status and social stratification are often used interchangeably. However, it should be understood that social stratification is an empirical process which leads to assignment of socio-economic statuses to members of a society. Otite and Ogionwo (1979), and Ekong (2003) stated that social stratification was an unequal distribution of members of human societies into available social positions. They maintained that the criteria for social stratification included authority, power (democratic and military), ownership of property in relation to the means of production and control over land, income (amount, type and sources), consumption pattern and styles of life, occupation or skill, education and wisdom, morality, place in high society, kinship connections and ancestry (inherited position), associational ties and connections, ethnicity, states, religion and race.

The family is the main unit of any social stratification. Goode (1974) noted that it was the family that was ranked in the class structure and not the individual. Socio-economic status scales are important in the stratification of human societies. They equally serve as useful tools in evaluating changes resulting from development intervention programmes. Many rural development intervention programmes have been implemented in Nigeria without the in-built monitoring and evaluation instrument. This situation has resulted in failure of many of the development intervention programmes. Many researchers shy away from constructing evaluation devices particularly socio-economic status scales because of the apparent difficulties and lack of technical know-how.

According to Akinola and Patel (1987), very few studies have been carried out in the area of socio-economic status scaling in Nigeria. This situation has persisted over the years. The two

major studies in the area of socio-economic status scale construction in Nigeria were the socio-economic status scale constructed by Akinola and Patel (1987), and Akinbile (2007). Socio-economic status measurement is an empirical procedure which should be devoid of subjective measures. The measurement scale adopted by Lundberg (1940) in measuring socio-economic status was rather subjective. He made use of six-point rating scale to measure the socio-economic status of 219 homes in a village community in England. The six-point rating scale consisted:

Upper Class ———— 1 ——— Upper part
———— 2 ——— Lower part
Middle Class ———— 3 ——— Upper part
———— 4 ——— Lower part
Lower Class ———— 5 ——— Upper part
———— 6 ——— Lower part

The results he got were compared with Chapin social status scale. Gupta (2005) stated that measures of a social fact, phenomenon and psychological facts was often found difficult and the outcome viewed subjectively. It is possible to develop empirical instrument for the measurement of socio-economic status. The present study is aimed at constructing a socio-economic status scale from the socio-economic status indexes developed by Ovwigho (2009) for rural farm families in the north agricultural zone of Delta, Nigeria. The specific objectives, therefore, were to:

i. standardise validated socio-economic status indicators into a scale;
ii. determine the construct and concurrent validity of the scale; and
iii. ascertain the reliability of the scale.

METHODOLOGY

Sampling Techniques and Sample Size

Stratified and multi-stage simple random sampling techniques were used to select towns and respondents from the nine (9) Local Government Areas in the Delta north agricultural zone. The Local Government Areas were stratified into urban and rural areas based on the degree of being rural. A town where over 50% of the inhabitants were farmers lacks a clinic/ hospital, and an industry, and with a population size of less than 20,000% persons was regarded as a rural area. These procedures agreed with the major elements of the definition of rural area offered by Olawoye (1983), and Ovwigho and Ifie (2009.) The selection procedure was done in three (3) stages. First four Local Government Areas namely Aniocha south, Ika south, Ndokwa west and Oshimili north were randomly selected. Second, 40% of the rural towns and villages corresponding to Aniocha south (6), Ika south (6), Ndokwa west (6), and Oshimili north (4) were randomly selected. Third, 12% of the heads of farm families corresponding to Aniocha south (41), Ika south (47), Ndokwa west (55), and Oshimili north (31) were randomly selected. This gave a sample size of 174 heads of farm families.

Data Collection

Sixty- nine (69) valid socio-economic status indicators constructed by Ovwigho (2009) were used to standardise the socio-economic status scale. Data on adoption were collected by the use of interview schedule. Data were collected in 2008. The respondents were tested on five technologies which were disseminated by the Delta Agricultural Development Programme (DADP) in 2008. These technologies were application of chemical fertilisers, improved cassava varieties, cowpea inter-planted with other crops, yam minisett and vegetable production. The respondents were asked whether they were aware of the technology, whether they have applied the technology on their farms, to state duration of use, and intention to continue the use. The responses were scored using Sigma scoring method (Appendix 1). The scores for the 5 technologies were added for each respondent to make up the adoption score.

Standardisation of Valid Socio-economic Indexes and Data Analysis

The valid socio-economic indexes derived from the study conducted by Ovwigho (2009) were standardised using Sigma scoring method. The Sigma scoring method assigns scores in reverse proportion to ranks or position in a population. In other words, a “yes” response or 1 would yield a higher score than “no” response or 2 in a distribution. A zero score in Sigma scoring has an arbitrary origin. Akinbile (2005) also made use of the Sigma scoring method in standardization of a socio-economic status scale Data on construct and reliability test were

analysed by the use of Pearson. Data on concurrent validity were analysed by the use of t-test.

RESULTS AND DISCUSSION

Standardisation of Socio-economic Status Indicators

The 69 valid socio-economic status indicators were converted to standard scores by the use of Sigma scoring method. The Sigma scoring methods for quantitative and dichotomous responses are presented in Tables 1 and 2 respectively.

Table 1: Children in higher institutions

Response categories	*F*	*CF*	*CFM*	*CPM*	*Z*	*(Z+2) x2*	*Z rounded*
0	78	78	39	0.224	-0.759	2.48	3
1	57	135	106.5	0.612	0.285	4.57	5
2	28	163	149	0.856	1.063	6.13	6
3	8	171	167	0.960	1.751	7.50	8
>3	3	174	172.5	0.991	2.366	8.73	9

F = Frequency of Response
CF = Cumulative Frequency
CFM = Cumulative Frequency to Mid – Point
CPM = Cumulative Proportion to Mid – Point
Z = Sigma score (Got by checking the corresponding CPM from the table of Z – normal deviates) See appendix 1

Table 2: Ownership of cement house in the village

Response categories	*Frequency*	*Percentage*	*Proportion*	*Z*	*(Z+2) x2*	*Z rounded*
Yes	79	45.40	$100-\frac{45.40}{2}$ = 100-22.70 = 77.30 =0.773	0.749	5.50	6
No	95	54.60	$\frac{54.60}{2}$ = 27.3 = 0.273	-0.607	2.79	3

This scoring procedure was done for the 69 valid items to generate the standard scores. The standard scores were built into the socio-economic status scale (Table 3).

Construct Validity of the Scale

A Pearson r value (r=0.76, p< 0.01) was found between the socio-economic status and adoption scores. This meant that the scale had construct validity. Adoption has been hypothesised as a psychological construct related to socio-economic status. Ogunfiditimi (1981), Rogers (1983), Gartrell and Gartrell (1985), and Akinola and Patel (1987) also found a positive relationship between socio-economic status and adoption of recommended technologies. Ebel (1972), Kerlinger (1973), Gronlund (1976), Dane (1990) stated that construct validity was concerned with the psychological qualities which a test should measure.

Table 3: Socio-economic status scale for heads of farm families in the north agricultural zone of Delta State, Nigeria

S. No.	*Valid indicators*	*Response categories*	*Standard scores*
1	Children in primary school	0	0
		1	1
		2	2
		3	3
		4	4
		>4	5
2	Children in higher school	0	3
		1	5
		2	6
		3	8
		>3	9
3	Children in secondary school	0	1
		1	2
		2	3
		3	3
		4	4
		>4	5
4	Number of relatives trained by you up to secondary school	0	2
		1	3
		2	4
		3	5
		>3	6
5	Ownership of cement house in the village	Yes	6
		No	3
6	Ownership of cement house outside the village	Yes	7
		No	3
7	Traditional hats	1	2
		2	4
		>2	5
8	Traditional attires	0	0
		1	2
		2	3
		>2	5
9	Pair of shoes	0	1
		1	3
		2	5
		>2	7
10	George wrappers	0	2
		1	3
		2	5
		>2	6
11	Single wrapper	0	1
		1	3
		2	4
		>2	5

Table 3: Contd. .....

S. No.	Valid indicators	Response categories	Standard scores
12	Rooms with cemented floor	0	1
		1	2
		2	3
		3	4
		>3	5
13	Chieftaincy title	Yes	7
		No	2
14	Cutlasses	1-3	2
		4-6	4
		7-9	5
		>9	7
15	Spade/shovel	0	1
		1	3
		2	4
		3	5
		>3	6
16	Water cistern toilet	Yes	5
		No	2
17	Wash hand basins	Yes	5
		No	2
18	Cabinet beds	0	1
		1	2
		2	3
		>2	5
19	Wall hanger	Yes	5
		No	3
20	Framed photograph of yourself	0	2
		1	3
		2	4
		3	5
		>3	6
21	Axe	Yes	5
		No	2
22	Farm size	<1 ha	2
		1 ha	3
		1-2 ha	5
		3-4 ha	6
		>4 ha	7
23	Poultry birds	0	2
		1-10	3
		11-20	4
		21-30	6
		31-40	7
		41-50	8
		>50	8
24	Local fish ponds	0	1
		1	3
		2	4
		3	5
		>3	6
25	Goats	0	3
		1	4
		2- 4	5
		>4	6
26	Hired labourers	Yes	7
		No	3
27	Yam barn	Yes	6
		No	3
28	Plots of land owned in the village	0	3
		1	4
		2	5
		>2	6
29	Plots of land owned outside the village	Yes	7
		No	2

Table 3: Contd. .....

S. No.	Valid indicators	Response categories	Standard scores
30	Personal bore-hole	Yes	7
		No	3
31	Motor cycle	Yes	6
		No	3
32	Motor cars	Yes	7
		No	3
33	Turn table/speakers	Yes	6
		No	3
34	CD/DVD player	Yes	5
		No	3
35	Television	Yes	6
		No	2
36	Ceiling/table fans	0	3
		1	4
		2	5
		>2	7
37	Executive chairs	Yes	6
		No	3
38	Lantern	0	0
		1	2
		2	3
		<2	4
39	Store	Yes	5
		No	2
40	Personal generator	Yes	7
		No	3
41	Wheel barrow	Yes	5
		No	3
42	Floor carpet	Yes	7
		No	3
43	Rug	Yes	6
		No	3
44	Wardrobe	Yes	5
		No	2
45	Rain coat	Yes	5
		No	2
46	Umbrella	0	1
		1	2
		2	4
		<2	6
47	Book shelves	Yes	6
		No	3
48	Refrigerator	Yes	7
		No	3
49	Standing mirror	Yes	5
		No	2
50	Dining table	Yes	6
		No	3
51	Metal buckets	0	1
		1	3
		2	4
		>2	6
52	Plastic buckets	1	1
		2	3
		3	4
		>4	5
53	Electric blender	Yes	7
		No	3
54	Frying pan	Yes	6
		No	3
55	Tumblers	1-5	2
		6-10	3
		11-15	4
		>15	6

Table 3: Contd. .....

S. No.	*Valid indicators*	*Response categories*	*Standard scores*
56	Kettle	0	3
		1	4
		2	5
		>2	6
57	Bicycles	Yes	5
		No	2
58	Electric/ coal iron	Yes	5
		No	2
59	Metal spoons	1-3	2
		4-6	4
		>6	5
60	Suitcases/travelling bags	1	1
		2	3
		>2	4
61	GSM handset	Yes	7
		No	3
62	Glass plates	1-3	2
		4-6	3
		7-9	4
		10-12	5
		13-15	6
		>15	7
63	Wrist watch	Yes	6
		No	3
64	Can you read in English	Yes	6
		No	3
65	Can you write in English	Yes	6
		No	3
66	Can you read your native dialect	Yes	7
		No	3
67	Membership of social clubs	Yes	5
		No	2
68	Official in a Christian organization	Yes	6
		No	3
69	Membership of cooperative societies	Yes	5
		No	2

Concurrent Validity of the Scale

The difference between upper 25% and lower 25% of the socio-economic status scores was compared by the use of t-test. A t-value (t=78.82, p< 0.01) showed that there was a statistically significant difference between the low and high socio-economic status scores. This meant that the scale had concurrent validity. Concurrent validity could be found by using the known group techniques of comparing the upper and lower socio-economic status categories (Akinola and Patel 1987; Adekunle 2000).

Reliability Test of the Scale

A test-retest reliability conducted after one month using the same respondents confirmed that the scale was reliable (r=0.89, p< 0.01). Asika (2001) defined reliability as the consistency between independent measurements of the same phenomenom. He noted that test-retest reliability was used to take two separate measurements on the same population at different times.

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APPENDIX I

Measurement of Adoption Scores

Table 4: Awareness of chemical fertiliser application

Response categories	*Frequency*	*Percentage*	*Proportion*	*Z*	*(Z+2) x2*	*Z rounded*
Yes	151	86.78	100-$\frac{86.78}{2}$ = 100-43.39 = 56.61 =0.566	0.166	4.332	4
No	23	13.22	$\frac{13.22}{2}$ = 6.61 = 0.070	- 1.476	1.048	1

Table 5: Application of chemical fertiliser

Response categories	*Frequency*	*Percentage*	*Proportion*	*Z*	*(Z+2) x2*	*Z rounded*
Yes	72	41.38	100 – $\frac{41.82}{2}$ 100-20.91 = 79.09 = 0.791	0.810	5.62	6
No	102	58.62	$\frac{58.62}{2}$ = 29.31 = 0.293	-0.545	2.91	3

Table 6: Duration of chemical fertiliser application

Response catagories	*F*	*CF*	*CFM*	*CPM*	*Z*	*Standard value (Z+2) x2*	*Z rounded*
0	102	102	51	0.293	0.545	2.91	3
< 5 months	5	107	104.5	0.601	0.256	4.512	5
6-10 months	9	116	111.5	0.641	0.361	4.722	5
11-15 months	6	122	119	0.684	0.479	4.958	5
16-20 months	11	133	127.5	0.733	0.622	5.244	5
21-25 months	4	137	135	0.776	0.759	5.518	6
26-30 months	27	164	150.5	0.865	1.103	6.206	6
>3 years	10	174	169	0.971	1.896	7.792	8

Table 7: Intention to continue application of chemical fertiliser

Response Categories	*Frequency*	*Percentage*	*Proportion*	*Z*	*(Z+2) x2*	*Z rounded*
Yes	67	38.51	100 – $\frac{38.51}{2}$ 100-19.26 = 80.74 = 0.807	0.867	5.734	6
No	107	64.49	$\frac{64.49}{2}$ 32.25 0.323	-0.459	3.082	3