Hierarchical Cluster Analysis of Rural Poverty Profiles and Its Policy Implications for Targeted Poverty Alleviation Programs in Akwa Ibom State, Nigeria

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DOI: https://doi.org/10.51244/IJRSI.2025.120800240

Received: 24 Aug 2025; Accepted: 31 Aug 2025; Published: 01 October 2025

ABSTRACT

This study utilizes hierarchical cluster analysis to identify distinct rural poverty profiles in Akwa Ibom State, Nigeria, and examines their implications for targeted poverty alleviation programs. Through the use of structured questionnaires, data on 28 multidimensional poverty indicators such as income, access to basic services, education, health, housing conditions, and asset ownership amongst others were obtained and analyzed from 400 households in 30 randomly sampled rural communities in the State. The analysis of the data using factor analysis model yielded eight principal dimensions of rural poverty which accounted for 76.87 percent of the variation in the original 28 primary indicator variables. The factor scores that arose from the analysis was employed to classify the communities into three groups viz-a-viz: the core/critically poor households consisting of 14 communities and the very poor households consisting of 15 communities, with the third group described as a single-member poor community based on their poverty profiles. The analysis reveals several varied poverty clusters which ranges from households experiencing extreme multidimensional deprivation across all indicators to those facing specific, localized challenges. The findings demonstrate that rural poverty in Akwa Ibom State is not uniform but consists of distinct profiles requiring differentiated policy approaches. The research suggests that effective poverty alleviation strategies must move beyond uniform interventions to embrace cluster-specific policies that address the unique combination of deprivations characterizing each group. This nuanced approach enables more efficient resource allocation and potentially greater impact in poverty reduction efforts, providing a framework for evidence-based policymaking in the state's poverty alleviation efforts.

Keywords: Hierarchical Cluster, Rural, Poverty Profiles, Alleviation Programs, Akwa Ibom State

INTRODUCTION

Poverty, particularly rural poverty, is a global concern carefully linked to human capital development. Rural poverty is a complex and multidimensional phenomenon categorized by a lack of income and opportunities to generate income, deprivation of necessities, inadequate infrastructure, and exclusion from social and political decision-making (Chronic Poverty Research Centre, 2004; Obayelu and Awoyemi, 2010; Samuels et al., 2011). Several studies (Esin, 2013, 2024, Mercy, 2019; UNU-WIDER, 2017) have shown that poverty remains one of the most persistent challenges in the developing countries, with a deepen severity of occurrence. Currently, poverty challenges have become a major development issue at the global policy discourse. The United Nations has intensified efforts in tackling the global poverty scourge by enunciating 'poverty eradication' as the leading goals of the 17 targets of the 2030 Agenda for sustainable development (UNDP, 2015). This initiative was collaborated by several allied institutions such as the World Bank, International Monetary Fund, World Poverty Clock, Brookings Institution and the Water Life Foundation to assist in

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue IX September 2025

fighting poverty menace in the world. Despite the efforts of these notable institutions, global poverty figures are still disturbing.

In Nigeria, the National Bureau of Statistics (NBS) (2022) projected that in 2021, 63% of Nigerians are multi-dimensionally poor, and the National MPI estimated at 0.257 with higher Multidimensional poverty projected at 72% in rural areas than the urban areas (42%). The figures portray that about 133 million Nigerians lived in poverty. Also, the World Bank reports that 38.9% of Nigerians were living below the poverty line in 2023, with an estimated 87 million people living in poverty, which makes the country the second-largest poor population in the world after India. Analysis of the poverty statistics by the National Economic Summit Group (NESG) (2022) indicated that the prevalence of multidimensional poverty in 2021 is ominously higher in rural communities (72%) than in urban centers (42%), with consequential MPI estimated at 0.302 and 0.155, respectively. Additionally, the report stated that about 41.9% and 36.9% of Nigerians dwelling in the rural and urban communities, correspondingly, fell below the national monetary poverty line as of 2021. The National Bureau of Statistics (2016) poverty report reveals that Akwa Ibom state has a poverty index of 23.8% with significant rural/urban differentials which makes it flash points of poverty in Nigeria. A study by Effiong, (2017) revealed that poverty and low socio-economic fortunes are higher in the rural areas of Akwa Ibom state compared to its urban counterparts. This accounted for the selection of Akwa Ibom State as one of the flagship states for World Bank's intervention programs.

In spite of the decades of development efforts, rural poverty remains a persistent and complex challenge in Nigeria and Akwa Ibom State in particular. While overall poverty trends in the country are monitored, a comprehensive, multidimensional understanding of rural poverty profiles – encompassing its spatial distribution, demographic characteristics, underlying causes, and evolving nature – is often lacking or outdated. This knowledge gap hinders the design, targeting, and effectiveness of poverty alleviation policies and programs. Consequently, resources may be misallocated, reaching non-poor populations or missing the most vulnerable, leading to inefficient use of scarce public funds and potentially perpetuating poverty cycles. A foremost constraint in the current policy responses to poverty alleviation in Nigeria lies in the dearth of detailed, localized, and dynamic poverty profiles that can inform targeted and context-specific interventions. Existing poverty alleviation strategies in the country often rely on cumulative data, downplaying the heterogeneity of rural populations and the structural drivers of poverty such as gender inequality, informal labor markets, and vulnerability to climate change. This gap impedes the efficacy of rural development policies and programs, leading to inefficient allocation of resources and, in some cases, unintended negative consequences. This study aims to analyze the detailed rural poverty profiles in Akwa Ibom State and critically evaluate the policy implications for designing more effective, evidence-based and targeted poverty alleviation strategies.

MATERIALS AND METHODS

Study Area

Akwa Ibom State is located at the south-east corner of Nigeria between latitudes 4^{o} 3^{0} and 5^{o} 32' North of the equator; and longitudes 7^{o} 25' and 8^{o} 30' east of the Greenwich Meridian. It is bounded on the north by Abia and Cross River States. In the south, the State is bordered by the Atlantic Ocean and on the south-west and west by Rivers and Abia States respectively. Figure 1 is the map of Akwa Ibom State (the study area).

Akwa Ibom State has a landmass of 8,412sq kilometres (Akwa Ibom State, 1989). The State, which was created on 23rd September, 1987 from the former Cross River State, Nigeria, is administratively divided into 31 Local Government Areas (LGAs) including Uyo, the State capital city. By this division, the State has 31 urban settlements as headquarters of the LGAs with Uyo, Eket, Ikot Ekpene, Abak, Etinan, Itu, Ikot Abasi and Oron being the oldest and more developed urban settlements (exception of Itu). The State is drained majorly by Cross River, Qua Iboe and Imo Rivers. With an endowed coastline of 129km out of Nigeria's 800km coastline, the State has many beaches yearning for development (Usoro and Akpan, 2010).

Akwa Ibom State is made up of Ibibio, Annang and Oron speaking people. Noah (1980) and Otoabasi (2004) noted that these three groups that make up modern Akwa Ibom State are culturally one and understand Ibibio

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue IX September 2025

language inspite of the dialectical differences found among them. Besides the three major ethnic groups, Akwa Ibom State has minor ethnic groups such as Eket, Ibeno and Obolo. They share similarities in culture with the major nationalities as they have the same source of origin and also understand and speak Ibibio language.

Settlement patterns in Akwa Ibom State are predominantly the dispersed type and rural in nature. They are made up of compounds that are scattered over the village landmass. This landmass consists of farmlands, bushes or forestlands. This pattern according to Inyang (1984) affected the traditional land holding as ownership is vested more in individuals or families than in village communities. This prevailing pattern "encourages scramble for land" by individuals and families.

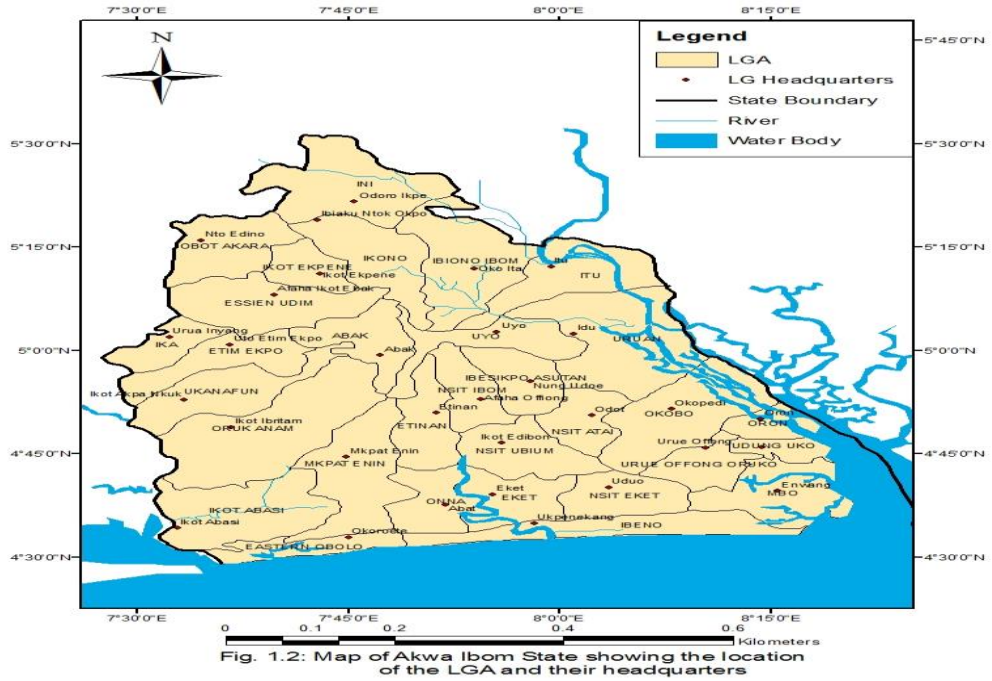

Fig. 1.2: Map of Akwa Ibom State showing the location of the LGA and their headquarters

Data Sources

The data for this study were sourced from two main sources: primary data through personal interviews with the aid of structured questionnaire and field observations, which was the major source of data for the study. Two sets of questionnaire were used: One (structured questionnaire) administered to the households while the other (unstructured questionnaire) was responded to by the field assistants on the basis of their observations. The primary data were supplemented by the secondary data especially the National Bureau of Statistics (NBS) (2022) report, the National Economic Summit Group (NESG) (2022) report, the National Consumer Survey, the Central Bank of Nigeria Poverty Assessment and Alleviation Study of 2019/21 report and the World Bank (2024) Report which were focused on poverty in Akwa Ibom State. The defined poverty indicator data used in this study cut across socio-economic and environmental attributes in view of the multi-dimensional nature of poverty (Table 1).

Table 1: List of indices (dependent variables) and units of measurement

S/N	Indices	Unit of measurement
1.	Water sources	Type
2.	Household energy	Type
3.	Predominant mode of transport	Type

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4.	Waste disposal facility	Type
5.	Clothing quality	Type
6.	Household furniture	Type
7.	Ownership of electronic devices	Type
8.	Household communication device	Type
9.	Ownership of alternative power generators	Type
10.	Ownership of business enterprise	Type
11.	Access to credit facility	Type
12.	Sources of credit facility	Type
13.	Monthly expenditure on food	Naira
14.	Monthly expenditure on education	Naira
15.	Monthly expenditure on clothing	Naira
16.	Monthly expenditure on transportation	Naira
17.	Monthly expenditure on health	Naira
18.	Meals / feeding per day	Number
19.	Nature of building	Type
20.	Nature of floor	Type
21.	Nature of walls	Type
22.	Number of household with toilets	Number
23.	Nature of toilet	Type
24.	Nature of bathing facility	Type
25.	Number of rooms occupied by household	Number
26.	Nature of kitchen	Type
27.	Tenure of housing units	Type
28.	Occupation of household head	Type

Source: Authors' Fieldwork (2024)

Sample and Sampling Technique

Data for this study were collected on village/community basis. Multi-stage sampling procedure was used in selecting the representative settlements and households. The first stage was the random selection of 19 LGAs from the 31 LGAs in the State. The second stage involved the selection of 30 settlements from the 19 LGAs.

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The sampled LGAs constituted the sampling frame. Through the table of random sampling numbers, 30 settlements were selected from all the settlements in the 19 LGAs. The thirty villages/ settlements constituted the units areas for the collection and analysis of data relating to the study objectives.

Sample Population Sampling Size

The target population covers all the head of households in the 19 sampled communities. Owing to this, the total population of the thirty selected villages constituted the study population after being projected from 2006 to 2024 using an annual growth rate of 2.83% (NPC, 2006). The projected population was used as a basis to determine the sample size. The total number of households selected for interview was determined by expressing the population of each of the selected villages/settlements as a percentage of the projected population of all the villages/settlements (Table 2).

Table 2: List of Settlements with their 2006 Projected Populations and Sample Size

S/N	Communities	LGA	District	2006 POP	2024 Projected	Households	Sample size
1.	Ikot Akpadem	Mkpat Enin	**	2239	3499	699	13
2.	Nung Udoe Itak	Ikono	*	3497	5465	1093	20
3.	Mbiokporo 1	Nsit Ibom	*	1424	2225	445	8
4.	Nung Atai Eta	Okobo	**	3477	5435	1087	20
5.	Ukana	Abak	***	1270	1985	397	7
6.	Nkari	Ini	**	1321	2064	412	8
7.	Eweme	Okobo	**	1760	2751	550	10
8.	Ikot Obio Odongo	Ibesikpo A	*	1995	3118	623	11
9.	Ekeya	Okobo	**	6011	9396	1879	33
10.	Nwot Ikono	Etim Ekpo	***	3179	4969	993	18
11.	Ikot Ibiok	Eket	**	3165	4947	989	18
12.	Use Offot	Uyo	*	3674	5743	1148	21
13.	Mbiaso	Nsit Ibom	*	539	842	168	3
14.	Ibaka	Mbo	**	1420	2219	443	8
15.	Ikot Uko	Oruk Anam	***	542	847	169	3
16.	Ito Ika	Ika	***	722	1128	225	4
17.	Mbiakpa Ibakesi	Ini	**	2372	3707	741	13
18.	Mbiabong Ikon	Ikono	*	1022	1597	319	6
19.	Unyenghe	Mbo Mbo	**	2919	4562	912	16

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20.	Uda	Abak	**	2300	3595	719	13
21.	Abak Ikot	Onna	***	1136	1775	355	6
22.	Mkpok	Uruan	**	2615	4087	817	15
23.	Ndom Ebom	Urue Offong	*	7189	11237	2247	40
24.	Oyoku	Urue Offong	***	1141	1783	356	6
25.	Eyulor	Ikot Ekpene	***	1736	2713	543	10
26.	Utu Edem Usung	Ukanafun	*	2857	4466	893	16
27.	Ikot Udo Obobo	Uruan	**	2183	3412	682	12
28.	Ituk Mbang	Ikot Abasi	***	4789	7486	1497	27
29.	Iqua	Etim Ekpo	**	1555	2430	486	9
30.	Utu Nsekhe	***Total***	***	1130	1766	353	6
				71179	***111244***	***22240***	***400***

Source: Authors Fieldwork (2024)

*Note: *Uyo Senatorial District,** Eket Senatorial District,***Ikot Ekpene Senatorial District*

The Yamane (1973) formula for finite population was employed to statistically determine the minimum sample size acceptable for generalization. Based on Yamane formula, a total of 400 households were selected for interview. The random sampling technique was employed in administering the questionnaires mainly to the household heads. However, other household members were allowed to provide relevant information which could not be adequately supplied by the household heads. Also, since the sampled settlements vary in population size, proportional representation was used to select the sample respondents in the thirty villages.

Analytical Techniques

Factor Analysis Model

In this study, 28 defined indicators of poverty among the sampled population were identified. It was necessary to collapse these variables into smaller dimension or factors which were interpreted as poverty indicators among households in the study area. Factor analysis, is therefore, the most suitable analytic technique for this concern.

Specifically, the R – mode, factor model was employed using the SPSS package (version 17.0) to reduce the 28 variables into smaller and more meaningful form. For the set of data supplied, the programme printed a range of statistical tables including the correlation matrix, factor loadings, rotated factor loadings and factor scores.

Eight factors with eigen values of 1.0 and above were selected and used in the description of the poverty indicators. Variables with loadings of 0.5 and above (negative or positive) were regarded as those associated with each factor and a variable was assigned to the factor on which it has the highest loading. The eight factors identified were regarded as defining the major poverty indicators in the study area. Factor analysis was preferred to the technique of principal components analysis because generally, it produces a clearer structuring of the variables (Schilderick, 1970).

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Factor analysis is a multivariate statistical technique which is generally applied in research to achieve parsimony in data description. It is suitable for examining the underlying patterns or relationship for a large number of variables and determines if the information can be condensed or summarised into a smaller set of factors. The factor analysis model can be expressed as follows:

$X_1 = b_{11}f_1 + b_{12}f_2 + b_{13}f_3 + \ldots\ldots\ldots\mu_1 + €_1\ldots\ldots\ldots\ldots\ldots$ equation (3)

$X_2 = b_{21}f_1 + b_{22}f_2 + b_{23}f_3 + \ldots\ldots\ldots \mu_2 + €_2$ etc $\ldots\ldots\ldots\ldots$ equation (4)

Where:

μ_1 = The mean of X_1

$€_1$ = The residual specific to the ith test after taking account of the contribution of the factors

f_1, f_2, f_3 = The value of the factors which vary from one subject to another but have zero mean and unit variance, and are assumed to be uncorrelated with one another and with the residuals.

bif = Constants, like regression coefficients, indicating how much that is affected by each factor. These bif are known as factor loadings.

Like other multivariate statistics, factor analysis has its pitfalls. This relates largely to abnormality of data, size of sample, error in measurement etc. These problems were summoned by working with large sample sizes and ensuring that data were measured on interval and ratio scale in order to reduce error to the barest minimum.

Hierarchical Cluster Analysis Technique

The hierarchical cluster analysis technique enabled the classification of all the 30 settlements under study into three groups according to their poverty profiles. The input data consisted of the settlements and the factor scores of the eight dimensions of poverty produced from factor analysis. According to Udofia (2011), the objective of cluster analysis is to group the attributes into clusters so that members of a cluster have a high degree of "natural association" among themselves while the clusters show relative distinction from one another. The technique therefore grouped the 30 communities into groups with similar characteristics. The hierarchical clustering procedure enabled different levels of poverty of all the sampled communities to be determined together with the implication of each group with respect to developing program was thus determined.

Hierarchical cluster analysis (HCA) offers several important advantages when applied to poverty classification. HCA identifies natural clusters in multidimensional poverty data without requiring predefined categories, allowing poverty profiles to emerge organically from the data patterns. Given the complex and multifaceted dimension of poverty, HCA can simultaneously analyse multiple indicators (income, education, health, housing, access to services) to create comprehensive poverty profiles rather than relying solely on income thresholds. The technique divulges relationships between different poverty clusters, showing how subgroups relate to larger categories (e.g., how extreme poverty relates to moderate poverty) which is significant in evolving anti-poverty policies. By identifying distinct poverty typologies (e.g., urban poor, rural poor, elderly poor), HCA enables more precisely targeted interventions that address the specific needs of each group. The Statistical Package for Social Science (SPSS) was employed in carrying out the analysis. The limitation of this technique is that it does not ensure optimal classification of the variables into groups.

Procedures for Hierarchical Analysis

Hierarchical cluster analysis is a method of cluster analysis that builds a hierarchy of clusters. The procedures for carrying out the analysis are:

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i) Data Preparation: This involves selecting relevant variables (defined poverty indicators) for clustering, standardizing or normalizing the data if variables have different scales, Handling missing values appropriately and considering the transformation of the data where applicable.

ii) Choose a Distance/Similarity Measure: This involves selecting suitable distance metric. The Euclidean distance was used in this study.

iii) Select a Linkage Method: At this state, the single linkage (nearest neighbour) was employed in selecting and estimating distances between clusters.

iv) Construct the Hierarchy: The study employs the agglomerative (bottom-up) approach starting with each object as its own cluster. This is followed by determining and merging the two closest clusters. The procedures were repeated until all objects were in a single cluster

v) Determine the Number of Clusters: At this stage, the dendogram (tree diagram) was examined and decision on where to 'cut' the dendogram made.

vi) Validate and Interpret Clusters: This process involves assessing the quality and validity of the cluster and interpreting the cluster characteristics. This is followed by profiling the clusters based on original variables while external criteria were used in validating the cases.

vii) Visualize Results: This is achieved by creating a dendrogram and using additional visualizations like scatter plots or heat-maps in presenting the cluster profiles

viii) Report and Apply Findings: A documentation of the methodology and results of the cases derived was made, while cluster assignments were used for further analysis or decision-making.

The choice of distance measure and linkage method was carefully made based on the nature of the data and research objectives.

Poverty Maps.

Poverty maps were produced in order to determine the spatial dimension of the poverty in the sampled communities. The extracted data from the factors scores generated from the factor analysis of the 28 defined indicators of poverty was imputed into a GIS technology in order to produce the poverty maps. All the major dimensions of the poverty indicators were summed up for each of the settlements. The summation was used in classifying the communities based on the level of their performance on the dimensions of poverty in each of the communities.

RESULTS AND DISCUSSIONS

Table 3: Factor Scores for the distribution of poverty indicator variables

		Dimensions of Poverty							
S/N	**Settlement**	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**
1	Ikot Akpadem	0.98757	0.61625	-0.99178	-0.74553	0.04503	0.42	0.42	-1.81
2	Nung Udoe Itak	0.36004	0.02683	-0.56852	-0.44525	-0.34608	- 0.69	- 0.69	-0.72
3	Nung Atai Eta	-1.71806	-0.09897	-1.61848	0.02790	0.04868	1.37	1.37	0.05
4	Ukana	-0.32805	0.05479	-1.10077	-1.23794	-0.17528	-0.21	-0.21	0.19

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5	Nkari	0.84030	-0.45470	0.27267	-1.55010	-1.57550	1.73	1.73	-0.17
6	Eweme	0.54344	0.51302	-084037	-0.39048	-1.14512	-0.40	-0.40	-0.05
7	Ikot Obio odongo	-1.22846	-0.24631	-0.60083	-0.46286	-1.43217	-0.44	-0.44	-0.42
8	Ekeya	-0.45757	-0.90007	-0.96505	0.57513	-1.18092	-0.06	-0.06	1.08
9	Nung Udoe Itak	-0.27057	0.02929	1.04717	1.44827	-0.94182	-1.47	-1.47	0.83
10	Nwot Ikono	-0.55500	0.14165	-0.27596	0.78881	0.70041	-0.09	-0.66	-0.92
11	Ikot Ibiok	0.80846	0.82683	-0.01300	0.38539	0.04148	1.88	2.55	0.89
12	Us e Offot	0.59630	2.37642	0.40251	3.03140	0.54187	0.15	0.66	-0.79
13	Mbiaso	0.68388	2.65984	-1.16452	-2.36525	0.18105	-0.52	-0.23	0.92
14	Ibaka	0.46320	-0.36909	-1.02576	0.38539	0.71478	-0.77	-1.10	0.87
15	Ikot Uko	0.00114	-126799	-1.00296	0.88199	-0.86086	-0.86	-2.08	0.63
16	Ito Ika	0.09886	0.83130	0.57633	-1.51118	2.12063	-0.36	-0.19	0.23
17	Mbiakpa Ibakesi	-0.14231	-0.88877	-0.06842	0.08366	0.92037	1.63	0.62	1.56
18	Nwot Ikono	-0.37207	-0.68267	0.16869	0.21473	1.22063	0.48	-0.09	2.86
19	Ikot Ibiok	-2.00530	1.01447	1.79857	0.68755	-0.67536	1.50	-0.28	-1.11
20	Mbiabong Ikon	-0.90748	1.11280	1.22506	-0.18284	-0.98706	-0.10	-1.08	0.79
21	Uda	1.11466	1.02789	2.55804	0.13627	-1.15902	-0.34	-1.15	1.16
22	Abak Ikot	0.88216	-1.45584	0.4479	0.14484	1.06640	1.51	-1.85	-1.00
23	Mkpok	0.96522	-0.49617	0.88305	0.09470	-0.45871	-0.73	1.67	-0.71
24	Ndom Ebom	-1.54394	-0.70933	-0.08003	0.84781	-0.44598	-0.91	1.22	-0.67
25	Oyoku	-1.38008	-0.43814	0.48622	0.60850	0.56153	-0.36	0.27	-0.89
26	Eyulor	1.39694	-1.00635	0.24688	0.08873	-0.44141	1.63	0.20	-1.07
27	Utu Edem Usung	-0.59189	-0.98197	-0.16171	-0.17896	0.15543	0.48	1.00	-0.35
28	Ituk Mbang	2.27314	-1.05500	0.32931	-0.26139	-0.18167	1.50	0.72	-0.29
30	Iqua	0.04931	-0.66325	0.34519	0.56873	2.09285	-0.10	0.89	-0.17

Source: Authors' Data Analysis (2024)

Table 3 shows the spatial pattern of the variation in poverty indicator levels among the communities on the eight dimensions of poverty extracted from the rotated factor matrix for the defined poverty indicators. It revealed that unit areas differ in their performance not only along a given dimension but from one dimension

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to another. The distribution of factor scores provided the means of classifying the sampled communities into their respective poverty profiles through the application of the hierarchical cluster analysis procedure to the grouping of the 30 communities. The analysis of the poverty profiles of the communities was done in order to determine their critical needs. The eight indicators were used to classify the communities based on their poverty profiles. This was carried out in order to provide a basis for evolving appropriate anti-poverty proposals to meet the needs of the study areas.

Hierarchical Cluster Analysis of the Settlements' Poverty Profiles

The Overall poverty profile which incorporated all the eight poverty indicators of the 30 communities was first determined. Using the matrix of factor scores obtained from the factor analysis of the dependent variables, the extracted scores for the eight indicators are summed up for each communities. Hierarchical cluster analysis procedure was then applied to the summations in order to classify all the communities into three groups on the basis of their overall performance. The three group profiles or clusters were named core/critically poor, very poor and moderately poor communities. The choice of these terms for the grouping of the 30 communities was just a convenient method of expressing the various characteristics of the three groups.

i) Group Profile 1 – Core/Critically Poor Settlements

The first cluster or group as shown in Table 4 contained 14 settlements with similar characteristics that can best be described as communities characterized by high poverty incidence. These communities represented 46.7% of the 30 communities covered in the study. The spatial distribution of the 14 communities is presented in Figure 2. Communities in this group had a strong negative performance on all the poverty indicators. As shown in Table 4, the group had negative total factor scores which range from -6.0 (in Oyoku in Urue Offong/Oruko LGA) to –O. O (in Ibaka in Mbo LGA) giving a group average of – 2.36. It could, therefore, be said that poverty incidence is very deep and severe among these group of communities. This is because the 14 communities are deficient in all the eight defined dimensions of poverty.

Table 4: Group Profile 1 – Core/Critically Poor Communities

Communities	**LGA**	**scores on major dimension**								**total scores**
		F1	F2	F3	F4	F5	F6	F7	F8	
Ikot Akpaden	Mkpat Enin	1	1	-1	-1	0	0	-1	-2	-3
Nung Udoe Itak	Ikono	0	0	-1	-0	-0	-1	-0	-1	-3
Mbiokporo 1	Nsit Ibom	-2	-0	-2	0	0	1	-0	0	-3
Nung Atai Eta	Okobo	-0	0	-1	0	-0	-0	-1	0	-2
Ukana	Abak	1	-1	0	-2	-2	2	-0	-0	-2
Nkari	Ini	1	1	-1	-0	-1	-0	0	-0	-0
Eweme	Okobo	-1	-0	-1	-1	-1	-0	1	-0	-3
Ikot Obio Odongo	Ibesikpo A.	-1	-1	-1	1	-1	-0	0	1	-2
Nwot Ikono	Etim Ekpo	-1	0	-0	1	1	-0	-1	-1	-1
Ibaka	Mbo	1	-0	-1	0	1		-1	1	-0
Ikot Uko	Oruk Anam	0	-1	-1	1	-1	-1	-2	1	-4

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Oyoku	Urue Offong	-2	-1	-0	-2	-0	-1	1	-1	-6
Eyulor	Urue Offong	-1	-0	1	-1	1	-1	0	-1	-1
Ikot Udo Obobo	Ukanafun	-1	-1	-0	0	0	0	1	-0	-3
TOTAL							-2			**-33**
MEAN										**2.36**

Source: Culled from Cluster Analysis Results (2024)

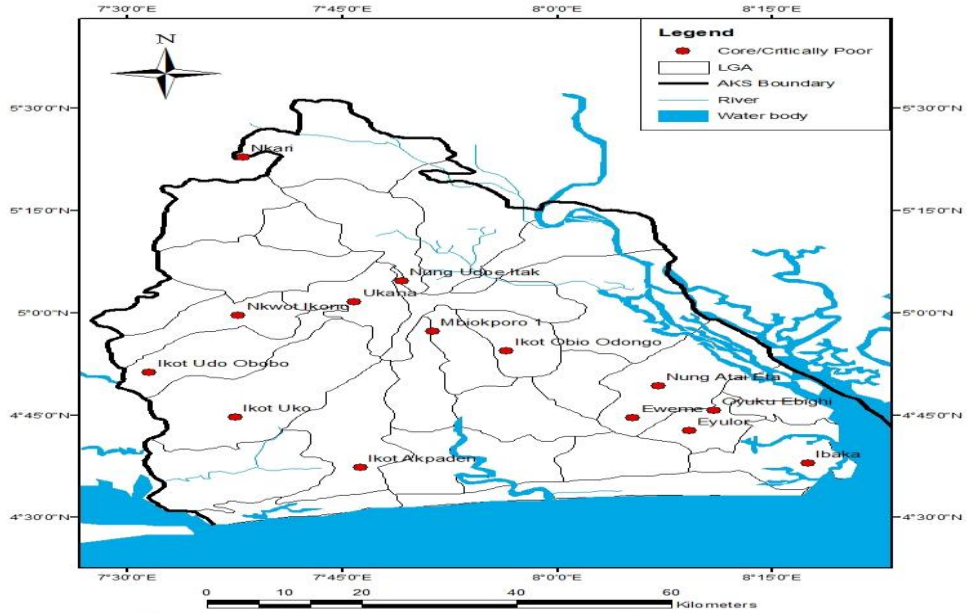

Fig. 4.10: Map of Akwa Ibom State showing core/critically poor settlements

ii) Group Profile Two – Very Poor Communities

This group comprised of 15 Communities. These communities represent 50% of the 30 communities studied. The group is shown in Table 5 while the spatial distribution of the 15 settlements is presented in Figure 2. The profile characteristics of this group included a strong above average performance on two dimensions of poverty, namely, housing quality/environmental sanitation and occupancy/feeding and ownership of durables. The group had deficiencies in six other areas – basic capabilities, human capital/productive asset, credit/financial capital, communication/clothing, floor type and ownership of business enterprise. Table 5 showed that the group had positive factor scores which range from 6.0 (for Use Offot in Uyo LGA) to 0.0 (for Mkpok and Ndon Ebom both in Onna and Uruan LGAs), and negative factor score of – 0 (for Uda in Mbo LGA), giving a group average of 2.27. Communities in this group may be regarded as very poor in terms of their poverty incidence.

Table 5: Group Profile 2 – Very Poor Settlements

settlements	**LGA**	**scores on major dimension**								**total** scores
		F1	F2	F3	F4	F5	F6	F7	F8	
Ekeya	Okobo	-0	0	1	2	-1	-2	1	1	2
Use Offot	Uyo	1	2	-1	3	1	0	1	-1	6

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Mbiaso	Nsit Ibom	1	3	-1	-2	0	-1	-0	1	1
Ito Ika	Ika	0	1	1	-2	2	-0	-0	0	2
Mbiakpa Ibakesi	Ini	-0	-1	-0	0	1	2	1	2	5
Mbiabong Ikoro	Okono	-0	-1	0	0	1	1	-0	3	4
Unyenghe	Mbo	-2	1	2	1	-1	2	-0	-1	2
Uda	Mbo	-1	1	1	-0	-1	-0	-1	1	-0
Abak Ikot	Abak	1	1	3	0	-1	-0	-1	1	4
Mkpok	Onna	1	-2	1	0	1	2	-2	-1	0
Ndon Ebom	Uruan	1	-1	1	0	-1	-1	2	-1	0
Utu Edem Usung	Ikot Ekpene	2	-1	0	1	-0	1	0	-1	2
Ituk Mbang	Uruan	2	-1	0	-0	-0	-1	1	-0	1
Ikwa	Ikot Abasi	0	-1	0	-0	2	-1	1	-0	3
Utu Nsekhe	Etim Ekpo	-1	1	1	1	2	-1	-0	-1	2
										34
Total Mean										**2.27**

Source: Culled from Cluster Analysis Results (2024)

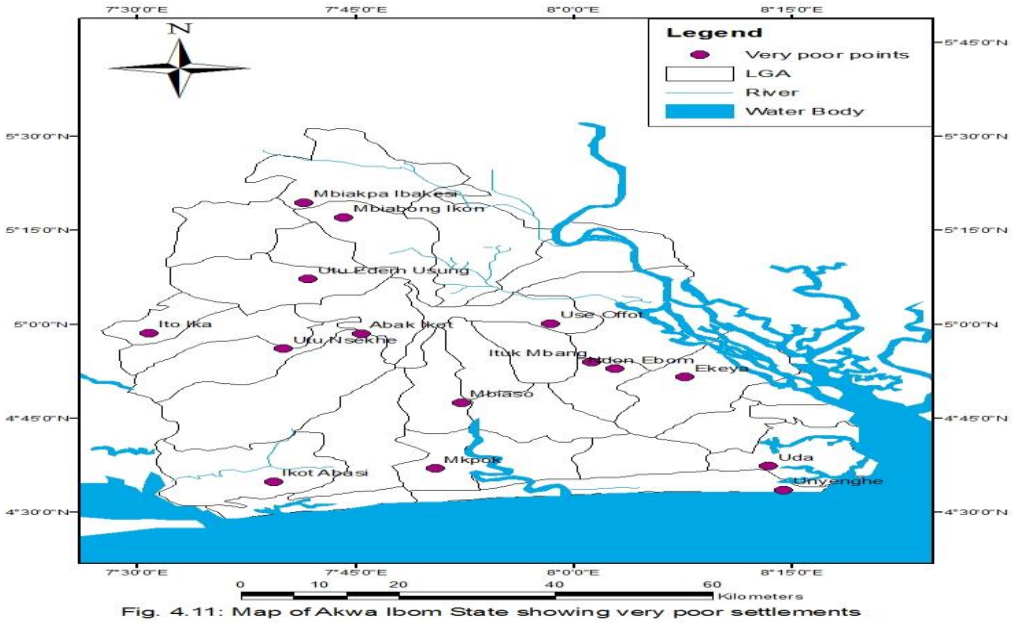

Fig. 4.11: Map of Akwa Ibom State showing very poor settlements

iii) Group Profile Three –Moderately Poor Communities

This group consisted of a single community – Ikot Ibiok (Table 6) and its spatial distribution is shown in Figure 4. This single member group accounted for 3.3% of the entire 30 communities studied. The characteristics of this single – member group included a strong performance (positive score) on seven of the

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dimensions of poverty. These were housing quality/environmental sanitation, basic capabilities, human capital/productive asset, credit/financial capital, communication/clothing, access to major road and ownership of business enterprise. Deficiency is only in occupancy/feeding and ownership of durables. Table 6 indicated that this single – member group had a positive total factor score of 8.0. This group could be said to have a low poverty incidence as it is only deficient in one out of the eight dimensions of poverty.

Table 6: Group Profiles 3- Moderately Poor Settlement

		Score on Major Dimension								
Settlement	**LGA**	FI	F2	F3	F4	F5	F6	F7	F8	**Total Scores**
Ikot Ibiok	Eket	1	1	-0	0	0	2	3	1	8
Total										8
Mean										8.0

Source: Culled from Cluster Analysis Results (2024)

Summary of Group Profiles

Three different groups of communities have been described using their average poverty profiles in the preceding section. Table 7 brings together the poverty profiles of these three groups. Analysis of average profile statistics on Table 7 revealed that the groups themselves can further be classified into two new groups on the basis of their performance on seven of the eight defined poverty dimensions. Groups 2 and 3 comprising 16 communities had positive scores, on the seven dimensions. These dimensions included: housing quality/environmental sanitation, basic capabilities or consumption/assets, human capital/productive asset, credit/financial capital, communication/clothing, access to major roads and business enterprise ownership. Settlements in this group can be said to be relatively poor. Tables 7 showed the distribution of these communities.

Table 7: Group Profile Summary

Group	***scores on major dimension***							
	F1	F2	F3	F4	F5	F6	F7	F8
1	-0.4	-0.2	-0.6	-0.3	-0.2	-0.2	-0.2	-0.2
2	0.3	0.1	0.5	0.3	0.3	0.1	0.2	0.2
3	1.0	1.0	-0.0	0.0	0.0	2.0	3.0	1.0

Source: Culled from Cluster Analysis Results (2024)

On the other hand, Group 1 had negative scores on all the eight dimensions (factors 1 – VIII) of poverty and can be described as the core or critically poor group. This group comprises 14 communities in all. The existence of both relative and absolute poverty in the study area is thus brought out by this analysis. Also, the fact that 14 communities belong to the critically poor group implied that considerable number of the households in the study area is trap in chronic poverty, as they lack available resources to escape from it.

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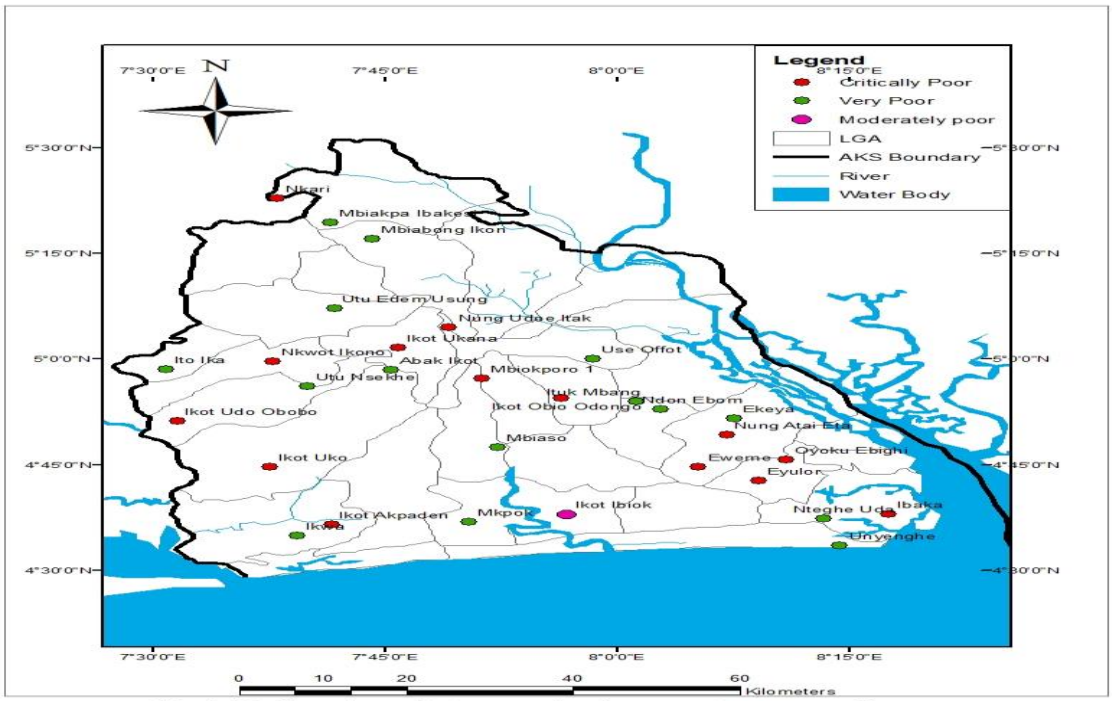

Fig. 4.12: Akwa Ibom State map showing poverty group profile summary

Cluster Analysis was applied to classifying the settlements on the basis of their poverty profiles. At the first level of classification, 3 distinctive groups of communities resulted. These were further collapsed into two broad groups – the poor and the core or critically poor communities. The first broad group comprised 16 communities with strong positive performance on seven of the eight dimensions of poverty, while the second group was made up of 14 communities with negative scores in all the dimensions of poverty. This pattern again confirmed the existence of spatial inequality in poverty incidence in the space economy of the study area.

Policy Implications of the Findings and Recommendations

The grouping of the communities aforementioned, together with their variation on the different dimension of poverty observed earlier have adequately highlighted spatial disparity in poverty levels in the study area. Given the spatial inequality in poverty levels, it is possible to explore ways in which the poverty incidence can be reduced. In doing this, the two generalized communities will be considered one at a time.

i) The Poor Communities

In terms of general allocation of development resources, these communities required less attention compared to the critically poor communities. Planning measures should rather be directed towards promoting economic growth and stability, which are necessary condition for poverty reduction, especially when they translate into more and better jobs for the poor. A large number of more satisfactory employment opportunities are a prerequisite for the success of poor households' efforts to attain financial self-reliance. Poverty in the poor communities can be reduced by spreading economic development and expanding total production. This could be done through giving incentives, monetary and fiscal to new industries wishing to establish in this area. Adequate level of basic amenities such as water, education, health and electricity should, however, be provided and sustained.

A good development strategy should incorporate measures to stimulate agricultural production in these communities. These may include the provision of improved seedlings, storage and bulking facilities, fertilizer, agricultural procuring facilities and ago-based industries. This requirement is in line with the industrial policy of Nigeria that industries should source their raw materials locally. This fact could be utilized in stimulating food crops production by linking all section of the communities to consuming centers with a network of motor-able roads.

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Efforts should be made by the government to reduce not only the level of unemployment, but also the aberration of structural, frictional, voluntary and involuntary unemployment through an improvement in the organization of production techniques and a decrease in the marginal disutility of labor.

ii. The Core/Critically Poor Communities

These communities due to their negative scores on all the eight dimensions of poverty can clearly be described as communities that require greater attention in order to raise the standard of living of the vast majority who live here to the level of those that are better-off. The communities have the resources human and material as well as institutional which, if well utilized, could accelerate the pace of development. For these communities, the following proposals are made:

(a) Rural industrialization strategy.

One strategy which readily suggests itself as a sure way to rural poverty reduction is a radical approach towards rural industrialization. For rural poverty to be wrestled in the study area, rural industrialization remains the most viable option. This is because rural industrialization will, in addition to raising the income level of the rural household, provides necessary employment and transform the rural landscape. The employment so generated will boost the income earning capacity of the rural dwellers and, in a multiplier effect, impact positively on the lives of the ruralites. Any full scale war on poverty must embrace the industrialization of the rural areas for the empowerment of the rural poor. The envisaged industrialization can take any shape or form. The most important thing is that the industries should be located in the rural areas.

Rural industrialization strategy will automatically reduce the high incidence of chronic poverty very considerably if industries are cited in every rural autonomous community in the study area. The Japanese experiment which started with cottage industries most of which were family based should be embraced. Today, Japan is one of the strongest economies in the world. It is proposed that the industrialization of the rural communities can also start with cottage industries which may simultaneously be spread to many other communities. The National Economic Empowerment and Development Strategies (NEEDS) report (2004) acknowledges the importance of Industrialization in transforming the state's socio-economic landscape. The document proposes the developing of the industrial sector by relying more on local resources and less on import which could be guided by a strategy and technology-based small and medium enterprises. This will focus on food procuring, industrial chemicals, information and communication, biotechnology, and energy among others.

The importance of using industrialization as a weapon of reducing poverty in these critically poor communities cannot be overstressed. The issue raised here is that the establishment of an industry can create forward and backward linkages. Rural industrialization can also attract infrastructural facilities such as electricity, good roads, and water which can stimulate the growth of the economy.

Study by Esin (2014) showed that ownership of business enterprise in the sampled communities accounted for only 5.5% variation in the original primary variables, with an eigen value of 1.55 which suggests the need for a radical approach in transforming the rural economy through rapid industrialization. In this connection, in trying to bring about rural industrialization to the distressed areas, it is proposed that industrial estates be established in these communities on the basis of their population threshold and services range. This calls for the deliberate encouragement, upgrading and development of the existing rural district headquarters into rural towns. On this basis, industries should be sited in few of these communities at a time and allowed to mature unassisted before the consideration of another set of communities.

Every Local Government Council should set aside 20 percent of its allocation from the federation accounts as take-off grants for the rural industrialization programme. The benefiting community should be required to contribute 12 percent of the total cost of the industry to be sited in its jurisdiction. Community policing should be provided by the benefiting community to provide security against pilfering and vandalisation of the industry. Enabling environment, policy guidelines and technical know-how should be provided by the government. Government should also promote investment in the rural areas by providing incentives such as:

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free land, reduced bureaucracy and the provision of social infrastructure. NGOs with strong financial muscle should be encouraged to set up industries in the rural areas.

(b) The Cooperative Strategy Approach

Rural poverty is not always associated with poor or inadequate factor endowment. In some cases, it is, in part, the consequence of ineffective mobilization and utilization of existing resources. Several factors suggest explanation to this observed trend. First and foremost is the dearth of dedicated and popular leadership which is the consequence of migration of able people to the urban areas. Second, is the structural problem – the fact that many local communities – villages or local councils are too small to undertake projects which have appreciable impact on the people. Third is the individualism of rural people which pose problems where group action is needed in areas of cooperatives and other joint ventures such as the construction of village schools, access roads and pooling of labor and other resources in improving the well-being of the rural households. A way out of this trend is through the adoption of the cooperative strategy approach to development.

Cooperative movement is viewed as efficient tool for mobilizing resources including the motivation of the "small man" to initiate and sustain the development of his community so as to extend the benefits of development. In Guyana, for example, the entire economy is based on sugar cane production using the cooperative strategy. Similar natural and socio-economic conditions that have led to the success of the cooperative strategy in Guyana also exist in rural Akwa Ibom State. Esin (2014) identified the conditions to include: (i) the existence of an important cash crop that has high demand both in the international and local markets which can be cooperatively produced. This cash crop in the case of rural Akwa Ibom is the oil palm tree. (ii) The existence of capitalist economy that encourages both private and group enterprises based on free competition and profit maximization. (iii) Low income per capita makes it necessary for individuals to pool their resources together to provide the necessary investment capital. (iv) The lack of modern processing and production technology means that individuals group, and institutions can work together to acquire one. (v) The existence of a favorable climate in government and non-government circles for the adoption of the cooperative strategy.

Though the cooperative movement has existed in Nigeria and indeed in Akwa Ibom State over the years, its impact on development has been negligible. Cooperative societies are generally small in membership, with a major function of providing credit facilities to members in need. In Akwa Ibom State, cooperative societies such as Consumer Trade Cooperative Societies, Farmer Cooperative Societies, and Multi-purpose Cooperatives etc abound. In the adoption of the envisaged cooperative strategy in the study area is that emphasis should be placed on production. Accordingly, cooperative societies should focus on the production of specific commodities such as oil palm, rice, rubber, livestock, and aquaculture production. In trying to bring about the cooperative strategy, government and ministries could facilitate this orientation by tying grants to these societies. Encouragement should be given for all types of economic activities, production, distribution, and marketing to be organized on Cooperative basis. The benefits of cooperative strategy result from having organized units of production. Such units can easily raise investment capital, purchase and sell in bulk and attain overall efficiency in production. It is said that any community that does not stimulate the productive base of its economy will perpetually remain an appendage of an external and more productive economy.

Empirical evidence in this study shows that reducing the army of those without formal education and increasing the proportion of those that go beyond primary education can go a long way to reduce the level of poverty at least in the long run. Since higher level of education and indeed, qualitative education produce low, middle, and high-level professionals which negatively and significantly impact on poverty, it is imperative that both the quality of education and the availability of educational opportunities in the rural communities be improved upon and given adequate attention. This is even more important given the findings that the incidence of poverty is greater for those without access to secondary schools than those with access.

Population enlightenment programme and population–related activities geared towards reducing on voluntary basis, household size should be accorded greater attention. The study has revealed that small household size has negative but very significant effect on poverty while large household size aggravates poverty.

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It is indeed very significant to add that in designing anti-poverty programme for the rural poor, government may borrow from the experiences of other countries that are at almost the same level of development. In India, for example, some specialized institutions are established to cater for the rural poor. These include:

i. Small Farmer Development Agency (S.F.D.A)

ii. Agency for Marginal Farmers and Agricultural Labour (M.F.A.L.)

iii. Drought Prone Area Programme (D.P.A.P.)

iv. Crash Scheme for Rural Employment (C.S.R.E).

Of the above institutions, the small Farmer Development Agency (S.F.D.A) and the Agency for Marginal Farmers and Agricultural Labor (M.F.A.L) are the most effective. They are both autonomous institutions, registered under the Registration of Society Act. They include representatives of district level functionaries and nominees of the Central Government and they are not accountable to any state or district level authority. They are provided with a skeleton staff at the headquarters, but for actual operations and implementation of the programs, they depend entirely on existing extension staff in the block and other development departments. The principal functions of the agencies are:

i. To identify the eligible participants for the programme, and to identify their problems and potential, and to prepare a scheme for helping them.

ii. To locate the institutional helps and induce the institution (through subsidy etc) to aid the identified activities and,

iii. To create infrastructural facilities that may prove conducive for better performance in the activities followed by the participants.

It is, therefore, suggested that detail studies of these and other similar institutions in other countries be carried out with a view to determining their suitability and applicability to the Nigerian conditions.

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