IMPLICATIONS OF SPATIAL PATTERN OF SOCIAL INFRASTRUCTURE STOCK IN THE DEVELOPMENT OF RURAL AREAS OF AKWA IBOM STATE

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Abstract
Social infrastructure is essential for achieving objectives of diversifying production, expanding trade, coping with population growth, reducing poverty and improving human welfare especially in developing economies. The level of stock of social infrastructure and the spatial pattern of distribution determine the level of regional growth and development. This study examines the levels of stock of social infrastructure and the spatial pattern of development in rural areas of Akwa Ibom State. Empirical and theoretical approaches were employed in the investigation and data on 21 social indicator variables/surrogates were collected from 50 villages in the state using questionnaire, field observation and oral interview as research tools. An index of social infrastructure stock was evolved and hierarchical cluster analysis statistics was applied on the stock of social infrastructure in order to group the communities on the basis of social infrastructure profiles. The single linkage cluster analysis was employed to illustrate the linear combination of the communities and the rural areas were found to fall into high, moderate, fair and low patterns of social infrastructure stock. The result shows that the study area is characterized by many vulnerable communities that are very weak in stock of social infrastructure. The mapping of the patterns of development provided a veritable tool for policy makers attempting to balance the distribution of social infrastructure in order to enhance and spread development in all areas of Akwa Ibom State.

Key words: Social infrastructure, stock, spatial pattern, rural areas, population growth

Introduction

Akwa Ibom State is one of the states in the Niger Delta Region of Nigeria. Generally, the region is characterized by rising waves of restiveness due to low levels of development in the face of increasing oil exploration and exploitation activities. The State is a major oil producing state and thus, contributes significantly to the total revenue base of the nation. Above all, Akwa Ibom State is the second most densely populated state in the Niger Delta, with average density as high as 634 persons per kilometer square (NPC 2007). Interestingly, about 87.9 percent of the population in the state is rural. Ajala *et. al (2005)* and Olayiwola (2005), asserted that one of the major factors responsible for low level of rural development is the imbalance in infrastructure distribution. In Akwa Ibom State, preliminary investigation has indicated that the level of rural development is indisputably low, although the pattern of rural development from the perspective of social infrastructure distribution has not been substantially established. Apparently, there is an existing research gap in this regard.

Social infrastructure development was one of the cardinal issues raised during the convention in 2000, of 147 heads of state and government involving 187 countries, including Nigeria, to fashion out ways of achieving realistic development through a comprehensive and coordinated strategy that would address simultaneously the special needs of the world's poorest countries (UN2000, UN2001, World Bank

2002). The outcome of the meeting was the declaration of the millennium Development Goals (MDGs) which have indicators ranging from halving extreme poverty, increasing access to safe drinking water, halting the spread of preventable diseases to providing access to basic education, all by the year 2015. If it is considered that half of the target period for achieving the MDGs is spent, then it is expedient to analyze the levels of access to basic social infrastructure in the rural areas where the majority of the population is resident. This is because access to such basic needs is customary or at least widely encouraged and approved in both developed and developing world. Besides, such analysis would showcase the trend of development in the social sector and thus, reveal the extent of government commitment towards meeting the Millennium Development Goals. Studies on social infrastructure in the State especially from the rural angle are thin and thus, severely limit accuracy and adequacy of rural spatial analysis, and consequently narrow the understanding of the pattern of social infrastructure provision in rural communities. It is therefore content to investigate the levels of access to basic social infrastructure in the rural communities of the State, which contributes significantly to the revenue base of Nigeria.

Concept of Social Infrastructure

Specifically, social infrastructure cover such basic services as education, health, water, electricity, communication and transportation services, housing and other social services needed to facilitate industrial, agricultural and other socioeconomic development (Owei 2003, Crump 1991, and Ingram and Kessides 1994). Social infrastructure is an umbrella term for many activities referred to as social overhead capital by development economists such as Paul Rosenstein Rodan, Ragnar Nurske and Albert Hirschman (World Bank 1994, Adger 2004, Adger 2001, Woolcock and Narayan, 2000).

Social infrastructure services are central to the activities of households and to economic production. This reality becomes painfully evident when natural disaster or civil disturbances destroy roads, culverts, bridges, electricity lines, water mains etc. In such circumstances, communities' quality of life and productivity becomes radically reduced. Conversely, adequate provision of social infrastructure services enhances welfare and fosters economic growth. Thus, providing infrastructure services to meet the demands of households, businesses and other users is central in contemporary development discourse. This is because adequacy of social infrastructure helps determine one country's success and another's failure in diversifying production, expanding trade, coping with population growth, reducing poverty, improving standards of living and environmental conditions (Maria 2006, Lusting 2005, UN 2001, Parkin and Sharma 1999, World Bank 1994,). Despite the multiplier effects of social infrastructure, most communities in developing countries still lack improved access to social infrastructure. Poor access to social infrastructure could add a new challenge towards new jobs creation and poverty alleviation (Iqbal, 2006). However, from a global perspective, many international conventions and summits including the Earth Summit and World Summit for Social Development have emphasized the importance of social equity in the treatment of individuals and groups (UN, 1996). In the year 2000, social infrastructure development was a cardinal issue in the millennium development challenges. Most of the Millennium Development Goals (MDGs) are evident in the Nigerian economy. For instance, over seven million children of primary school age are out of school, about seventy two million Nigerians do not have access to safe drinking

water (Ibrahim, 2005 & 2006) while 54.4 percent of Nigeria's population (Ibrahim, 2005) or seven out of every ten Nigerians live on less than one US dollar per day (NPC, 2004). The CBN's (1999) Survey on Poverty Assessment and Alleviation in Nigeria revealed that 82% of the rural population had no access to safe drinking water with only 14.7 percent and 26.9 percent having access to educational and health care facilities. Although the federal and state governments have adopted various measures of meeting the basic needs of the people, the results lacked far reaching effects as the majority of the people still lack access to basic necessities of life. There is the need to focus on social planning framework as a purposeful and result oriented planning style. This may be because existing strategies adopted for regional planning have not been satisfactory.

Study Area and Method

Akwa Ibom State is the study area. It is one of the oil rich states in the Niger Delta Region of Nigeria. Located in the southeastern coast of Nigeria, the State is wedged between Rivers, Abia and Cross river States and the Republic of Cameroon to the Southwest, North, East and Southeast respectively while the Bight of Bonny bordered the State to the South. It lies between latitudes 4°32' and 5°32' North of the Equator, and longitudes 7°28' and 8° 25' East of the Greenwich Meridian (see Figures 1.1 and 1.2).

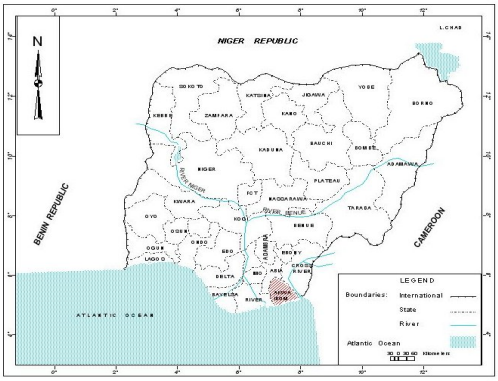


Fig. 1.1 : Nigeria Showing Akwa Ibom State

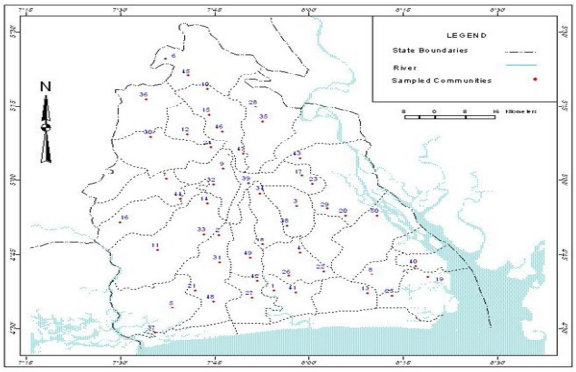


Fig. 1.3 : Akwa Ibom State showing Sampled Communities

According to NPC (1998), Akwa Ibom State has a total land area of 6,187 km^2, which represents 0.67% of the total land mass of Nigeria. The State has 31 Local Government Areas with Uyo, Eket, Ikot Ekpene, Abak, Etinan, Ikot Abasi and Oron being the most developed urban centres. According to the 2006 National Population Census result, Akwa Ibom State had a total population of 3920208 persons out of which 87.89% constituted rural population while 12.11 percent formed the urban population (NPC 2007). The large rural component of the population makes it expedient to assess the levels of stock of social infrastructure in rural areas of the state. To achieve this, map of Akwa Ibom State drawn on a scale of 1 cm represents 2.5km was divided into grid squares (quadrates) of 0.5cm sq to provide a framework for selection of units of observations. The use of grid squares is not new as Abiodun (1981) applied grid squares as units of observations to analyze industrial growth patterns in Nigeria between 1962 and 1974 and had valid conclusions. A total of 500 quadrates were subsequently numbered serially and sampled using table of random numbers. A total of 50 rural communities were sampled. Data on 21 social indicator variables or surrogates were obtained from each community using direct field observation (see table 1).

Table 1: Indicator Variables of Social Infrastructure

Sector		Variables	Unit of measurement	Standard required (expected)
1	Water	(a)Major source	Borehole(3), well(2), stream/river/pond(1)	Borehole (FGN, 2000)
		(b)Distance	Time	30 minutes (FGN, 2000)
		(c)Borehole	Number / community	1/250 population
2	Health	(a)Types	Hospital(4), Health centre(3), Clinic(2), Disp.(1)	Base on population of community
		(b)Ownership	Government(3), community(2), private(1)	Government ownership
		(c)Hospital beds	Number / health facility	Base on population of community
		(d)Doctors	Number / health facility	Base on population of community
		(e)Nurses	Number / health facility	Base on population of community
		(f)Distance	Kilometers	Base on type of health facility/community
3	Education	(a)Primary	Number	1/3000 population
		(b)Secondary	Number	1/12000 population (Mabogunje, 1974)
		(c)Distance to primary	Kilometers	2.5 kilometers as maximum
4	Road	(a)Category	Federal(3), State(2), Local(1)	Federal
		(b)Types	Paved(1), unpaved(0)	Paved
		c)Mode of transportation	Motorized(3), bicycle(2), on foot(1)	Motorized
		(d) Usage intensity	High(3), Moderate(2), Low(1)	High
5	Others	(B)Nearness to bank	< 500m(5), 500-1km(4), 1.1km-3kms(3), 3.1kms-5kms(2), > 5kms(1)	< 500m
		(P)Nearness to police		
		(M)Nearness to market		
		(E)Electricity supply	Available(1), not available (0)	Availability
		(T)Telephone (GSM)	Available(1), not available (0)	Availability
Water Index		of achievement for a, b, c = observed ÷ expected x 1. Index = levels of achievement for a , b, c ÷ 3		
Health Index		Level of achievement for a, b, c, d, e, f = observed ÷ expected x 1. Index = levels of achievement for a, b, c, d, e, f ÷ 6		
Education Index		of achievement for a, b, c = observed ÷ expected x 1. Index = levels of achievement for a , b, c ÷ 3		
Road Index		. Index = summation of levels of achievement for a, b, c ÷ 10		
Others Index		Index = summation of scores for B, P, M, T, E ÷ 17		

The spatial pattern of social infrastructure stock was depicted using data evolved to measure levels of development in 5 social sectors as shown in table 1. The levels of development in the 5 social sectors were subsequently summed up to obtain the stock of social infrastructure in each community. The hierarchical cluster analysis was applied on the stock of social infrastructure in order to group the communities on the basis of their social infrastructure profiles using version 13.0 Statistical Package for Social Science (SPSS). One of the simple forms of cluster analysis is the single linkage cluster analysis which offers a simple way of summarizing relationship in the form of a dendrogram. This was employed to illustrate the linear combination of the communities on the basis of their stock of social infrastructure.

Spatial Patterns of Development

In order to determine the spatial patterns of development of social infrastructure in the study area, the result of preliminary analysis of levels of access to social infrastructure were integrated into one as shown in Table 2. Specifically, the index values on water supply, education, health care facilities, road network and other facilities are summed up into one index which defines the overall level of development of the communities on the basis of stock of social infrastructure. Thus, the general performance of the study area in terms of stock of social infrastructure, ranges from -0.07 as the least score to 18.43 as the highest score. A total of 17 sampled communities have total performance scores of 10 and above while 33 communities representing 66% score less than 10 points.

Table 2: Social infrastructure stock in the study area

Communities	W	E	H	R	O	Stock	Mean
1. Ikot Abia	0.49	5.40	6.20	1.0	0.5	13.59	2.72
2. Ikot Ekpaw	-0.56	2.10	-1.02	0.60	0.6	1.72	0.34
3. Ikot Obio Odongo	1.59	1.50	2.70	0.60	0.5	6.89	38
4. Ndukpoise	-0.67	3.90	3.20	0.60	0.1	7.13	1.43
5. I qua	-0.67	0.60	-1.10	1.0	0.1	-0.07	-0.01
6. Nkari	0.44	2.20	6.80	0.70	0.4	10.54	2.11
7. Nwot Ikono	-0.41	1.30	-1.20	0.70	0.4	0.79	0.16
8. Mbokpu Eyekan	0.47	1.70	8.50	0.70	0.5	11.87	2.37
9. Ukana	2.40	2.00	3.70	0.70	0.7	9.50	1.90
10. Mbiabong Ikon	-1.67	3.40	-2.50	0.70	0.4	0.33	0.07
11. Ikot Udo Offong	1.67	3.40	-0.30	0.60	0.4	2.43	0.49
12. Utu Edem Usung	2.30	0.60	4.10	1.0	0.7	8.70	1.74
13. Etibe Afaha	-1.67	1.70	4.20	1.60	0.4	5.23	1.05
14. Ikot Uko	1.64	3.20	-0.50	0.70	0.5	5.54	1.11
15. Ukpom Usung Ubom	1.89	2.70	1.50	0.70	0.7	7.49	1.50
16. Ikot Udo Obobo	-1.67	0.60	1.10	1.0	0.4	1.43	0.29
17. Use Offot	2.70	5.0	6.42	0.70	0.7	15.70	3.14
18. Mbiaso	1.96	2.90	4.10	1.0	0.4	10.36	2.07
19. Okobo Ebughu	1.50	4.80	7.60	1.0	0.5	15.40	3.08
20. Ndon Ebom	0.45	3.9	0.10	1.0	0.4	5.85	1.17
21. Ikot Etefia	-1.67	2.9	0.30	0.60	0.4	2.53	0.51
22. Ikot Ubo	1.47	2.00	6.50	0.90	0.5	11.37	2.27
23. Mbak Ikot Abasi	-0.60	1.40	8.30	0.60	0.4	10.1	2.02

24. Ito Ika	-1.67	2.20	-2.00	1.0	0.4	-0.07	-0.01
25. Urukim	-0.32	0.10	0.50	0.60	0.4	1.28	0.26
26. Ikot Akpabim	1.80	1.10	4.50	0.80	0.7	8.90	1.78
27. Mkpok	2.38	2.10	1.40	0.60	0.5	6.98	1.40
28. Ikot Odube	1.21	2.40	-2.00	0.70	0.5	2.81	0.56
29. Ituk Mbang	1.18	5.50	8.20	1.0	0.8	16.68	3.34
30. Nsasak	0.64	1.50	-0.00	0.90	0.4	3.44	0.69
31. Ikot Umiang	-1.67	1.20	0.50	0.90	0.3	1.23	0.25
32. Abak Ikot	1.78	2.60	8.80	1.0	0.6	14.78	2.96
33. Ekparakwa	0.51	2.10	6.50	0.80	0.4	10.31	2.06
34. Mbiokporo 1	0.93	1.70	14.00	0.80	0.7	18.13	3.63
35. Ikot Inyang	-1.67	1.50	-0.9	0.60	0.5	0.03	0.00
36. Ikot Ukana	-1.67	1.90	8.10	0.60	0.4	9.33	1.27
37. Okoro Inyang	1.86	3.30	1.40	0.80	0.6	7.96	1.59
38. Akpa Utong	1.60	1.90	7.20	0.90	0.4	12.0	2.40
39. Ikot Oku Ikono	1.61	2.80	9.10	0.90	0.6	15.01	3.00
40. Eyo Nsek	-0.37	2.80	0.60	0.90	0.4	4.33	0.87
41. Ikot Ibiok	2.27	5.10	6.70	1.0	0.6	15.67	3.13
42. Atiamkpat	1.44	4.1	8.30	0.70	0.4	14.94	2.99
43. Ibiaku Uruan	0.22	3.90	8.00	0.70	0.4	13.22	2.64
44. Utu Nsekhe	2.60	1.40	-0.50	0.70	0.4	4.60	0.92
45. Mbiakpa Ibakesi	-0.60	1.20	6.20	0.50	0.4	7.68	1.54
46. Aka Ekpeme	1.78	1.50	-2.50	1.0	0.6	2.38	0.48
47. Nung Udoe Itak	0.43	6.9	9.50	0.90	0.7	18.43	3.69
48. Ikot Akpadem	1.41	1.40	-0.00	1.0	0.6	4.41	0.88
49. Ikot Ibok	-1.67	1.70	3.20	0.50	0.2	3.91	0.78
50. Ekeya	-0.64	4.40	8.40	0.80	0.7	13.66	2.73

Source: Culled from Tables 5.1 – 5.8 of Atser (2008)

Key:
W = Index for Water supply infrastructure
E = Index for Educational infrastructure
H = Index for Healthcare services infrastructure
R = Index for Road network
O = Index for other facilities, Stock of social infrastructure (summation of W, E, H, R, O)
Mean stock = Total Stock ÷5

Figures 4.1 to 4.5 show cartographically the spatial pattern of development of the indices as reflected in table 2.

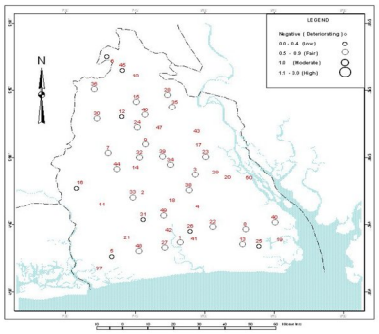
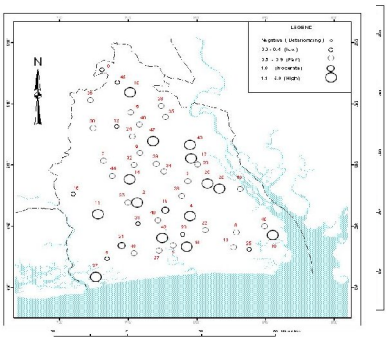


Fig. 4.1: Levels of Access to Water Supply



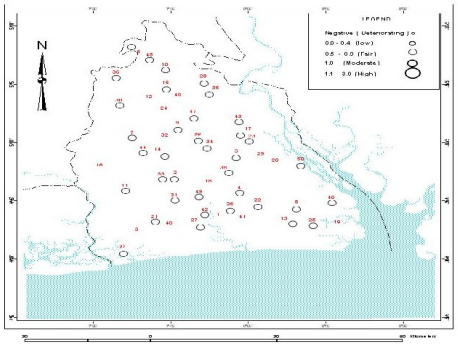


Fig. 4.5 : Levels of Access to Other facilities

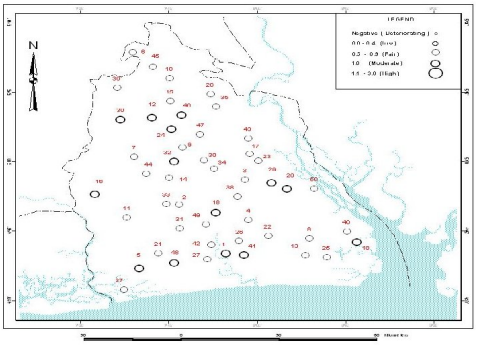


Fig. 4.4: Levels of Rural Road Network

Further analysis is performed on the stock of social infrastructure using cluster analysis model. This is to aid the classification of communities under study on the basis of their infrastructural profiles. From the result of the cluster analysis, four groups of communities emerged as shown in Table 3.

Table 3: Summary Statistics of Cluster Analysis

Cluster	Number of Cases	Range of stock	Cluster total Stock	Mean stock/ Community	Status
1	21	–0.07 – 5.99	54.13	2.58 *(0.5)*	Low
2	14	6.00 – 10.99	121.87	8.71 *(2.5)*	Fair
3	6	11.00 – 13.99	75.71	12.62 *(1.7)*	Moderate
4	9	14.00 -18.99	144.74	16.08 *(3.2)*	High
Total	50	–0.07-18.99	396.45	7.93 *(1.5)*	

Source: Atser (2008) (*0.5*) = Mean stock/facility

From Table 3 the cluster analysis has grouped the communities into 4 clusters or categories based on their levels of performance on stock of infrastructure. This implies that the initial 50 communities could be adequately classified into 4 groups. In order to further determine the critical need-gap levels among the four categories of settlements, the social infrastructure profile of each group is analyzed. The first group consists of 21 communities. The characteristics of this group include a very weak positive performance score on social infrastructure stock as Table 4 shows. With a total cluster

stock of 54.13 points and an average of 2.58, the overall performance score for the group is very weak. Water supply sector records the weakest performance as exemplified by its negative mean score of -0.36. This is followed by the health sector with a negative mean score of –0.19. The education infrastructure has the strongest positive score in this group as indicated by its mean score of 1.94. Among the 21 communities, Iqua and Ukana have the weakest mean score (-0.01) while Ndon Ebom records the highest score of 1.17. This group is deficient in almost all the social infrastructure indicators. The negatives mean scores observed in the water supply and health sectors, implies the magnitude of the need gap. Thus, this group of communities is the least developed in terms of levels of access to basic social infrastructure and could be termed the most vulnerable communities.

Table 4: Characteristics of Group One

Communities		W	E	H	R	O	Total	Mean
1	Nsasak	0.64	1.50	-0.00	0.9	0.4	3.44	0.69
2	Ikot Ibok	-1.67	1.70	3.20	0.5	0.2	3.99	0.78
3	Eyo Nsek	-0.37	2.8	0.60	0.9	0.4	4.33	0.87
4	Ikot Akpadem	1.41	1.40	-0.00	1.0	0.6	4.41	0.88
5	Utu Nsekhe	2.60	1.40	-0.50	0.7	0.4	4.60	0.92
6	Ikot Odude	1.21	2.40	-2.00	0.7	0.5	2.81	0.56
7	Etibe Afaha	-1.67	1.70	4.20	0.6	0.4	5.23	1.05
8	Ikot Uko	1.64	3.2	-0.50	0.7	0.5	5.54	1.11
9	Ndon Ebom	0.45	3.9	0.10	1.0	0.4	5.85	1.17
10	Ikot Ekpaw	-0.56	2.10	-1.02	0.6	0.6	1.72	0.34
11	Ikot Inyang	-1.67	1.5	-0.9	0.6	0.50	0.03	0.00
12	Ukana	-1.67	2.20	-2.00	1.0	0.40	-0.07	-0.01
13	Iqua	-0.67	0.60	-1.10	1.0	0.10	-0.07	-0.01
14	Mbiabong Ikon	-1.67	3.40	-2.50	0.7	0.40	0.33	0.07
15	Urukim	-0.32	0.10	0.50	0.6	0.40	1.28	0.26
16	Ikot Udo Obobo	-1.67	0.60	1.10	1.0	0.40	1.43	0.29
17	Nkari	-0.41	1.30	-1.20	0.7	0.40	0.79	0.16
18	Ikot Udo offong	-1.67	3.40	-0.30	0.6	0.40	2.43	0.49
19	Aka Ekpeme	1.78	1.50	-2.5	1.0	0.60	2.38	0.48
20	IkotEtefiaMinya	-1.67	2.9	0.30	0.6	0.40	2.53	0.51
21	Ikot Umiang	-1.67	1.20	0.50	0.9	0.3	1.23	0.25
Total		-7.63	40.80	-4.02	16.30	8.70	54.13	10.83
Mean		-0.36	1.94	-0.19	0.78	0.41	2.58	

Key: W, E, H, R, O = same as Table 2

The composition of group two is summarized in Table 5. This group has fourteen-cluster membership with a combined cluster total stock of 121.87 and a mean of 8.71. The overall performance of this category of communities studied is weak as only 4 out of the total cluster membership recorded positive mean scores that are slightly above 2 points.

Table 5: Characteristics of Group Two

S/n	Communities	W	E	H	R	O	Total	Mean
1	Ikot Obio Odongo	1.59	1.50	2.70	0.6	0.50	6.89	1.38
2	Mkpok	2.38	2.10	1.40	0.6	0.50	6.98	1.40
3	Ndukpoise	-0.67	3.90	3.20	0.6	0.10	7.13	1.43
4	Mkpom Usung Ubom	1.89	2.70	1.50	0.7	0.70	7.49	1.50
5	Mbiakpa Ibakesi	-0.60	1.20	6.20	0.5	0.40	7.70	1.54
6	Okoro Inyang	1.86	3.30	1.40	0.8	0.70	8.06	1.61
7	Utu Edem Usung	2.30	0.60	4.10	1.0	0.70	8.70	1.74
8	Ikot Akpabim	1.80	1.10	4.50	0.8	0.70	8.90	1.78
9	Ikot Ukana	-1.67	1.90	8.10	0.6	0.40	9.33	1.27
10	Ukana Abak	2.40	2.00	3.70	0.7	0.70	9.50	1.90
11	Nkwot Ikono	0.44	2.20	6.80	0.7	0.40	10.54	2.11
12	Ekparakwa	0.51	2.10	6.50	0.8	0.40	10.31	2.06
13	Mbiaso	1.96	2.90	4.10	1.0	0.40	10.36	2.07
14	Mbak Ikot Abasi	-0.47	1.70	8.30	0.6	0.40	10.10	2.02
Total		13.57	28.90	62.50	10.00	6.9	121.87	24.37
Mean		0.97	2.06	4.46	0.71	0.49	8.71	

Key = W, E, H, R, O = same as on Table 2

Table 6 shows the composition of the third group which results from the cluster analysis. There are only 6 communities in this group with a combined cluster stock of 75.71 and a mean score of 12.62. The overall performance of this group of communities is moderate as its mean score of 12.62 is above 7.93 representing the mean score for the entire study area (Table 3).

Table 6: Characteristics of Group Three

s/n	Communities	W	E	H	R	O	Total	Mean
1	Ikot Abia	0.49	5.40	6.20	1.0	0.50	13.59	2.72
2	Mbokpu Eyekan	0.47	1.70	8.50	0.7	0.50	11.87	2.37
3	Ikot Ubo	1.47	2.00	6.50	0.9	0.50	11.37	2.27
4	Akpa Utong	1.60	1.90	7.20	0.9	0.40	12.00	2.40
5	Ibiaku Uruan	0.22	3.90	8.00	0.7	0.40	13.22	2.64
6	Ekeya	-0.64	4.40	8.40	0.8	0.70	13.66	2.73
Total		3.61	19.30	44.80	5.0	3.0	75.71	15.14
Mean		0.60	3.22	7.47	0.83	0.5	12.62	

Key: W, E, H, R, O, = same as on table 2

Group four comprises nine-cluster membership. It features prominently as the group with a very strong positive performance scores on stock of social infrastructure. The group has a total of 144.74 cluster stock scores and an average of 16.08 points and thus stands out above all other groups in levels of performance (Table 7).

Table 7: Characteristics of Group Four

S/N	Communities	W	E	H	R	O	Total	Mean
1	Abak Ikot	1.78	2.6	8.80	1.0	0.6	14.78	2.96
2	Atiamkpat	1.44	4.1	8.30	0.7	0.4	14.94	2.99
3	Ikot Oku Ikono	1.61	2.8	9.10	0.9	0.6	15.01	3.00
4	Okobo Ebughu	1.50	4.8	7.60	1.0	0.5	15.40	3.08
5	Ikot Ibiok	2.27	5.1	6.70	1.0	0.6	15.67	3.13
6	Use Offot	2.70	5.0	6.42	0.9	0.7	15.70	3.14
7	Ituk Mbang	1.18	5.5	8.20	1.0	0.8	16.68	3.34
8	Mbiokporo I	0.93	1.7	14.00	0.8	0.7	18.13	3.63
9	Nung Udoe Itak	0.43	6.9	9.50	0.9	0.7	18.43	3.69
Total		13.84	38.50	78.62	8.20	5.6	144.74	3.22
Mean		1.53	4.27	8.73	0.91	0.6	16.08	

Key: W, E, H, R, O, = same as on table 2

On the whole the distribution of the performance scores among the communities studied provides a means of easy identification of spatial variations in levels of access to basic social infrastructure in the study area. While three communities have the least mean performance scores of less than 0.01, seven other ones are outstanding among the 50 communities with average performance scores of above 3 points. Generally, a majority of the communities as well as the people in the study area have poor access to social infrastructure development. Figure 4.8 is a map of the study area showing the various patterns of stock of social infrastructure.

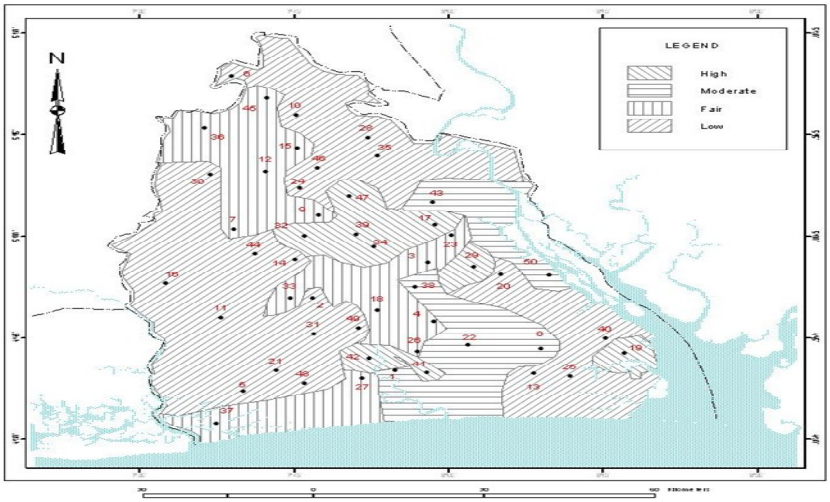


Fig. 4.8 : Spatial Patterns of Social Infrastructure in Akwa Ibom State

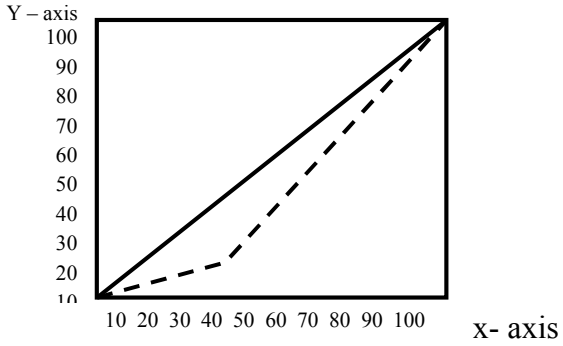
Implications of the Result

The overall result of the study has some implications for the sustainability of the study area. Table 8 and the Lorenz curve illustrate the relationships between the levels of social infrastructure stock and population in the study area. The Lorenz curve is a graphic illustration of the relationship between the population and stock of infrastructure, depicting the degree of concentration of stock of infrastructure. The cumulative percentage of stock is plotted along the y-axis while that of population is scaled along the x-axis. The straight line is a line of equal distribution, which determines the extent to which the actual distribution deviates from the ideal distribution that is represented by the straight line. The further away the curve from the straight line, the greater the degree of concentration (Udofia, 2006).

Table 8: Relationship between levels of social infrastructure and population

Infrastructure Stock							Population			
S/N	Cluster	Size	Range	Total	CT	%CT	Range	Total	CT	%CT
1	1	10	-0.07 – 2.38	9.05	9.05	2.3	1063-3624	22867	22867	12.9
2	1	11	2.43-5.85	45.08	54.13	13.7	567-12266	48348	71215	40.1
3	2	8	6.89-8.90	61.73	115.86	29.2	793-5097	20443	91658	51.6
4	2	6	9.33-10.54	60.14	176.0	44.4	583-4256	18603	110261	62.0
5	3	6	11.37-13.66	75.71	251.71	63.5	2190-8884	30111	140372	79.0
6	4	6	14.78-15.70	91.50	343.21	86.6	1672-5408	23078	163450	92.0
7	4	3	16.68-18.43	53.24	396.45	100.0	2096-7049	14293	177743	100.0

CT = Cumulative total



Lorenz Curve showing percentage of population against social infrastructure stock.

From the Lorenz curve, it is observed that there is unequal concentration of stock of social infrastructure in the study area. This implies that some communities are in disadvantaged positions while others are advantageous in terms of stock of social infrastructure. Generally, the overall stock of social infrastructure in the study area is low, however the unequal concentration of stock that is observed among the 50 sampled communities indicates that some communities are more vulnerable than others. The consequent is that many individuals and families in the most vulnerable communities cannot attain minimum standards of living due to very poor access to supportive social infrastructure. Thus, the study area presents a discernible imbalance in the relationship between communities and stock of social infrastructure. The Millennium Development Goals (MDGs) are the most recent attempts at improving the standards of living. According to NISER (2003), most of the indictors of the millennium development goals are not likely to be achieved by the target date of 2015 in Nigeria. The result of this study has further supported this claim. The observed deficiency in the distribution of social infrastructure in the study area is counter productive towards poverty alleviation.

Conclusion

This study has examined the levels of stock of social infrastructure and depicted their spatial patterns of distribution in the rural areas of Akwa Ibom State. The result indicates that the state is characterized by many vulnerable communities that are very weak in basic social infrastructure. The study has highlighted the existence of inequalities in the stock of social infrastructure among the rural communities in Akwa Ibom State. Poor access to basic social facilities that are essential for welfare of the people negates the spirit and purpose of the much desired and publicized regional integration. Beside, inequitable access to life supportive facilities also is at variance with the national philosophy of social justice and equity and ideals of freedom and opportunity as clearly enunciated in Nigeria's constitution. This concern is justified in view of the multiplier effects of social infrastructure on development in any society. Inequality in access to basic social infrastructure in rural communities has serious consequences for rural development and regional integration. There is need for government at all levels and other development agencies to direct attention to the most vulnerable communities in their welfare development efforts. Although the mapping of the patterns of development provided a veritable tool for policy makers attempting to balance the distribution of social infrastructure in order to enhance and spread development in the region, the study also provided a premise for investigation of the

causal factors exacerbating inequality in stock of social infrastructure in the study area and thus, constitutes the perspective of our subsequent investigation on this subject matter.

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