International Journal of Physical and Human Geography

Vol.3, No.4, pp.1-26, December 2015

Published by European Centre for Research Training and Development UK (www.eajournals.org)

SPATIAL INEQUALITY IN DEVELOPMENT: A CASE STUDY OF ANAMBRA STATE, NIGERIA.

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ABSTRACT: *This work examined the spatial inequality of development in the twenty one Local Government Areas of Anambra State. To determine the extent of the inequality in state's development service, Gini co-efficient procedures, factor analysis and cluster analysis procedures were employed. The data used were collected on 17 variables indexing various aspects of development for the 21 Local Government Areas. From the Gini co-efficient analysis, using the 17 original development indicator variables, the result shows that there are inequality in health, M.D.G water, and transportation variables. With the composite standard deviate, several patterns of inequality were revealed. Development is found to be continuous in scale among the areas, and the areas can be categorized into different groups; but on the basis of the technique of analysis adopted, a structure of privileged and under privileged areas were revealed. Eleven out of the 21 Local Government Areas were privileged while 10 areas were deprived. Six variables with eigen-value greater than unity were extracted from the factor analysis. Six variables explained about 78.16 percent of the variation in the original variables. It shows that 4 Local Government Areas have a comprehensive development while many other areas are deprived in terms of development. Conceptually, development is seen in terms of social and economic opportunities available to a community for its welfare and progress. The principles of equity and social justice therefore form the bases of determining the relative privilege or under-privilege of a unit area in the overall development of the study area. From the cluster analysis result, it shows that while the privilege group exhibits random pattern, the underprivilege group has some tendency towards clustering.*

KEYWORDS: Spatial Inequality, Development, Community, Social Justice, Nigeria

INTRODUCTION

Background to the Study

Spatial inequality is typically thought of as a construct arising out of variations in economic endowments, geography and socio-political structure (Adefila, 2012). The imbalance in terms of spatial distribution of essential goods and services is widely recognized in Nigeria. The phenomenon of inequality is epitomized in the use of terms as "developed" 'under-developed', 'advantaged' and disadvantaged to described places that are comparatively better or lagging behind in certain socio-economic benefits.

Statement of Problem

Admittedly, spatial inequality exists almost everywhere irrespective of level of development or ideological disposition. It is present in the developed countries where it has long been a focus of public policies (Smith, 1979). However, inequality is very common in the developing countries (Renkow, 2006). In these countries, there are diverse forms of inequality, but the

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

imbalance in development among different spatial units in the same country is more striking and serious. Although the developing countries were late to recognize the defects of regional imbalance, most of them are now implementing several policies directed at achieving balanced development in their space economies.

In Nigeria, for example, official concern about inequality abounds in the pages of policy papers. For instance, it is declared in the Third National Development Plan (1975-1980) that: A situation where some parts of a country are experiencing rapid economic growth while other parts are lagging behind can no longer be tolerated. (Nigeria, 1975)

Since 1970s, part of the broad national objectives contained in the National Development Plans are "to establish the country firmly as a just and egalitarian society" and to make the country "a land of bright and full of opportunities for all citizens" (Nigeria, 1970). Moreover, an integral aspect of the short term objectives designed to ensure the realization of the broad objectives mentioned above is "to achieve more even distribution of income and balanced development". In addition, social and distributive equity is one of the three fundamental objectives under the general policy measures toward which the development policy is directed.

Apart from the government policy actions, it could be observed that Anambra State citizens too have some awareness of spatial inequalities. They are reacting to the phenomena in several ways. Incessant demand for creation of more Local Government Areas and more autonomous communities, are some of the reactions of the people.

Among other things, the consequence of all these social problems is political instability. Without political stability, economic progress is difficult to achieve. This is because an appropriate climate is not created for local and foreign investors.

Aim and Objectives

The aim of this study is to examine the pattern of inequality in levels of socio - economic development among different local government areas of Anambra state. The specific Objectives of the study are as follows

1. To identify the spatial patterns of inequalities in level of socio –economic development in Anambra state.

2. To investigate the spatial pattern of inequality in the state by identifying objectively, the specific privileged areas and the specific deprived areas.

Research Hypotheses

The major hypotheses set out to be tested in the study are as follows:

1. There is no significant difference in the distribution of the facilities for socio-economic development over space in Anambra State.

2. There is no significant privileged or deprived area in the study areas.

Area of Study

The study area is Anambra State. Anambra State is a state in south- eastern Nigeria. Anambra is the eight most populated state in the Federal Republic of Nigeria and the second most density

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

populated state in Nigeria after Lagos state (N.P.C, 2006). The stretch of more than 45km between Oba and Amorka contains a cluster of numerous thickly populated villages and small towns giving the area an estimated average density of 1,500 – 2,000 persons per square kilometer (UN- Habitat.2009).

Fig1: Map of Nigeria Showing Anambra State

Figure 2: Map of Anambra State showing Local Government Areas.

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

LITERATURE REVIEW

The issue of spatial inequality is of such importance that it has attracted the attention of researchers in different disciplines. The interest of geography as a regional and social science in such a matter cannot be doubted. Regional problems are geographical problems. Furthermore, the need for geographical work to focus on man's living condition as connoted in the subject of Applied Geography is fairly old, but it has been re-emphasized in the recent call for social relevance in human geography (Shilpi, 2008). From this call has emerged the welfare and radical orientations in geography which have 'inequality' as one of their interests. The trend emanates from the concern of human geographers for human welfare (Kanbur and Venables, 2005).

Traditionally, spatial analyses in human geography have been largely erected on the foundation of efficiency maximization alone(Kilroy, 2007). This is reflected in the theories, models and other quantitative techniques adopted. They are not adequately addressed to realities of life in terms of social problems such as domination, exploitation and deprivation which are evident at different spatial scales.

The need to give more 'human' emphasis to geographical research was caused by the rising social problems particularly the urban riots of North America in the 1960s and similar conflicts in other places. These events made it mandatory for human geographers to address themselves to such issues as urban and regional poverty, minority groups, apartheid, accessibility to social services, and so on. (Morrill, 1966, Albaum, 1973). In the ensuring research efforts, 'deprivation' as it results from the relative distribution of the benefits and penalties of development has become an important concept.

The importance of this new orientation lies in what it emphasizes: that academic work must seek to abate social problems; that human geography must be truly human if it is to be considered relevant; that the concern of the generality of the people rather than that of the few (firms and entrepreneurs) should be the focus of attention; and that social and political variables should be incorporated into the geographical studies of development. Hitherto, such studies have tended to over-emphasize economic factors (Harvey, 1972). Inequality is described as a situation in which remarkable disparities are observed in the opportunities available to individuals, groups or regions in a society (Berliant, 2007).

METHODOLOGY

The study adopted a survey method. As a study aimed at examining the patterns of spatial development; the approach to this work is to analyse and describe in detail the degrees and the patterns of the spatial inequalities.

The data used relates to the development indicators. Indicators of development and the explanation of their distribution were considered with respect to their locations in different local government areas. Thus, the local government area being the smallest administrative units in Nigeria at present is adopted as the units of analysis.

There are a number of well-developed statistical techniques which can be used in the description, explanation and evaluation of variations in levels of development in any society or country. As a first step in the description of the general pattern of variations in of development

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

among the local government areas of Anambra state, the descriptive technique – the co-efficient of spatial variation (CSV) was used. The co-efficient of spatial variation measures the performances or variations of the chosen variables among observations or the cases. The co-efficient is used both to assess the scope of relative variations between the local government areas and to show the general trend of inequalities. That is, the performance of the local government areas on the 17 variables. Specifically, the study employed the Gini co-efficient (GX) procedure given by

$$GX = \frac{\sum_{i=1}^{n} |X_i - P_i|}{2}$$

Where, GX = Gini co-efficient

X_i = Percentage of a variable in the state shared by local government areas

P_i = Percentage of the total population in the state shared by local government area.

The Gini co-efficient has a range from zero to one hundred percent (i.e., 0-100%).The larger the value, the grater the inequality. The co-efficient is zero where inequality is nil i.e. where perfect equality exists. A co-efficient of 100 shows a situation of extreme or maximum inequality.

The further step from the above is the utilization of more rigorous techniques in the analysis of the data. Two of such technique that is used describe the performances of the observation on some measures of development. The two techniques are the factor analytic technique and the non-hierarchical cluster analysis. Both the factor analytic technique and the cluster analytic technique have been extensively used in the literature and they have severally and jointly produced very illuminating results, Ita et al (2012).

The technique of factor analysis attempts to quantitatively identify the characteristics which the variables have in common and which result in their inter-correlation. One basic assumption of the technique is that in the matrix of inter-correlated variables, there will be some common factors running through the common factors that are extracted and expressed by factor analysis. Thus, the factor analytic technique is used in this study to collapse the 17 variables into fewer factors that describe closely related variables. Each variable has a factor loading for each factor. The factor loading represents the amount of correlation of that particular variable with the corresponding factor. In the search for simple structures, the varimax rotation produced is used, the idea being to relate the results (the factors) to the original input (the variables) and to aid the comparison of factors. The factor scores which give the values for new variables – the factors on the original observation is used as the input into the next stage of the analysis, that is, the non- hierarchical grouping technique. The factor score is also used to rank the cases. From the ranking, the best and worst cases were extracted for detailed discussion.

The non hierarchical technique, on the other hand, groups observations using the criterion of Euclidean proximity in a p- dimensional vector space. The main advantage of the technique is that it attempts to produce optimum clustering for a given number of clusters, regardless of previous stages in the analysis.

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

DATA PRESENTATION AND ANALYSIS

Gini Co-Efficient Analysis

Table 1: Gini coefficient of the Development variables in Anambra State

S/N	DEVT. INDICATOR	VARIABLES	TOTAL	MEAN	STD. DEV.	GINI INDEX	RANK
1	**Health**						
		No. of Hospital beds	1072	51.0	172.7	77.93%	2
		No. of Maternity beds	11658	555.0	506.0	42.27%	7
		No. of Inpatients	7064	336.4	332.9	55.67%	5
2	**Education**						
		No. of primary schools	997	47.48	20.26	24.19%	16
		No. of secondary schools	242	11.52	5.05	24.22%	15
		Primary schools enrolment	829717	39510	34438	33.67%	11
		Secondary schools enrolment	128115	6101	4068	33.51%	12
		No. of primary school teachers	14518	691.3	358.8	24.26%	14
		No. of secondary school teachers	4915	234.0	152.6	30.07%	13
3	**MDG water**						
		No. of boreholes	109	5.1900	2.3790	23.40%	17
		No. of solar boreholes	2	0.0952	0.3008	91.83%	1
		No. of water scheme, 2009	8	0.3810	0.7400	75.21%	4
		No. of water scheme, 2011	59	2.8100	1.9400	38.62%	9
4	**Transportation**						
		No. of registered vehicles	36312	1729	4704	75.95%	3
		No. of road accidents	513	24.43	23.44	53.66%	6
5	**Bus. Establishment**						
		Establishments employing 4 persons and above	95	4.524	2.294	33.75%	10
		Establishments employing 8 persons and above	69	3.286	2.795	39.22%	8

From the co-efficient shown in Table 1 above, it is clear that spatial inequality exist in all the variables. The range of the inequality is from 24.19 in the No. of primary schools to 91.83 in the No. of solar boreholes. Six variables representing a wide range of development indicators have Gini coefficients above 50; one has between 40 to 50, six between 30 and 40, three have between 20 and 30. There is no variable with co-efficient below 20.

The inequality as represented by the Gini co-efficient is better appreciated with the use of a graphical device known as Lorenz curve. Lorenz curve demonstrates graphically the magnitude of inequality. The same data in appendices ix – xiii are used in calculating the Gini co-efficient and are also used for constructing the Lorenz curve. In the Lorenz curve, a straight line diagonal of 45^0 indicates perfect equality. This is equivalent to zero Gini co-efficient. For the purpose

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

of illustration, the Lorenz curve for a number of representative variables are shown in figures 3, 4, 5, 6, 7 and 8. Among the variable shown are the number of solar boreholes representing the highest Gini co-efficient, number of primary schools representing the smallest.

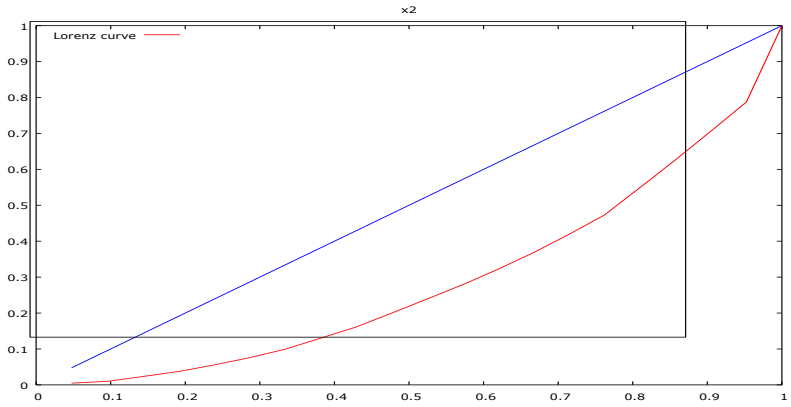

Fig.3 Lorenz curve of spatial inequality in number of maternity beds in Anambra state.

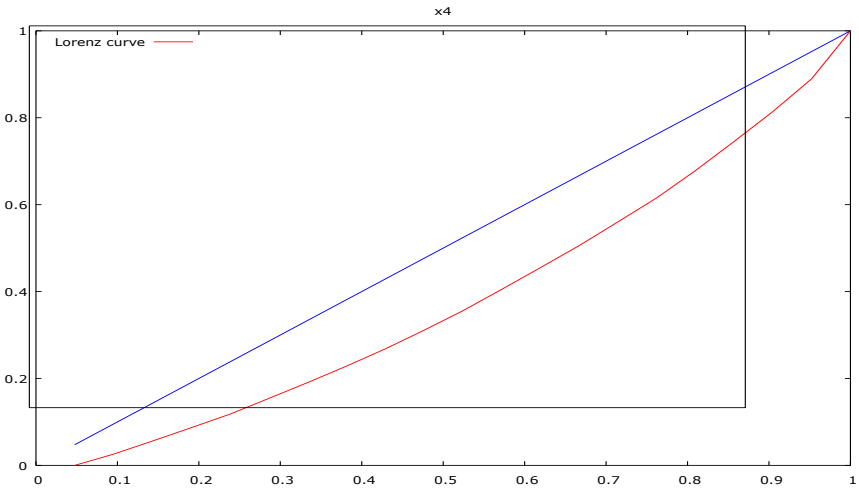

Fig. 4 Lorenz curve of spatial inequality in number of primary schools per L.G.A in Anambra state.

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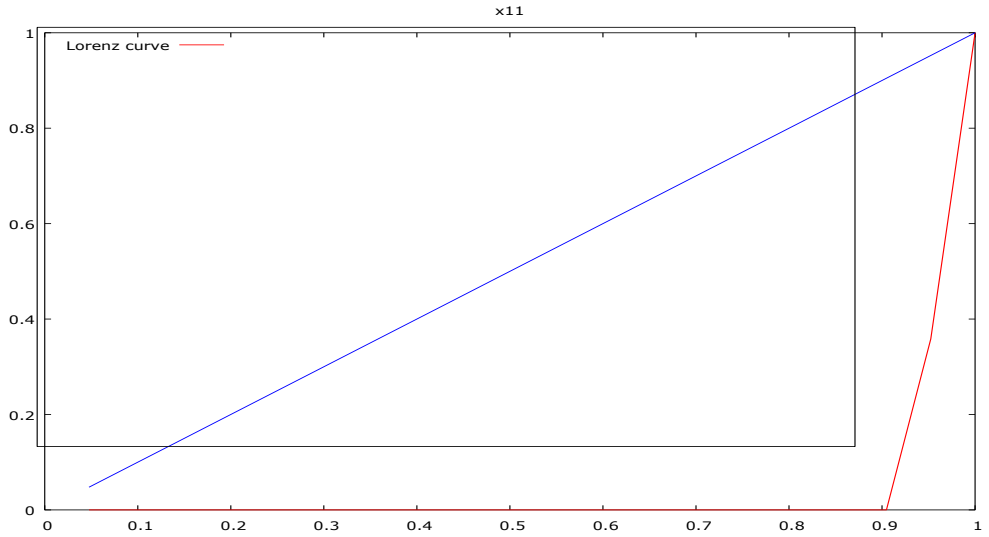

Fig. 5 Lorenz curve of spatial inequality in number of solar boreholes 2008 per L.G.A in Anambra state.

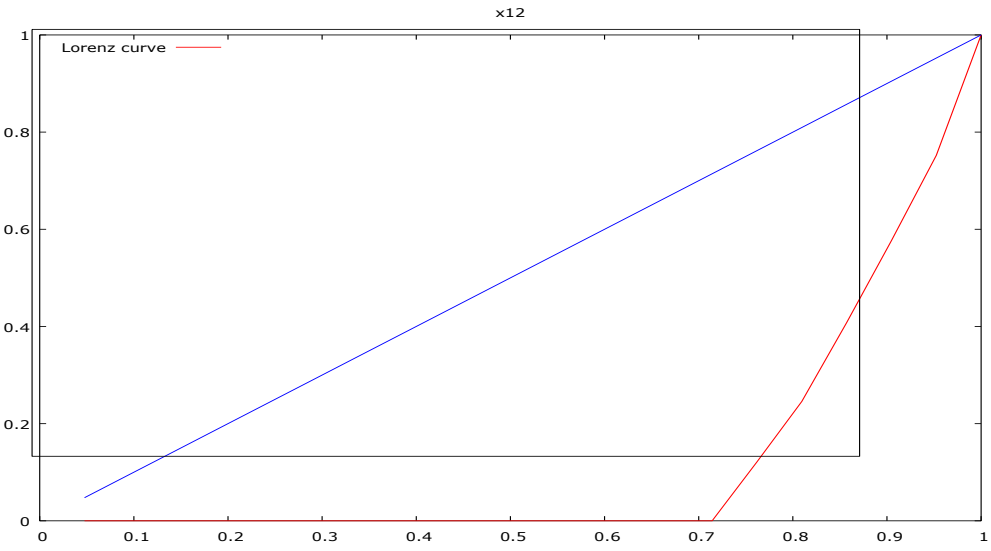

Fig. 6 Lorenz curve of spatial inequality in number of water scheme 2009 per L.G.A in Anambra state.

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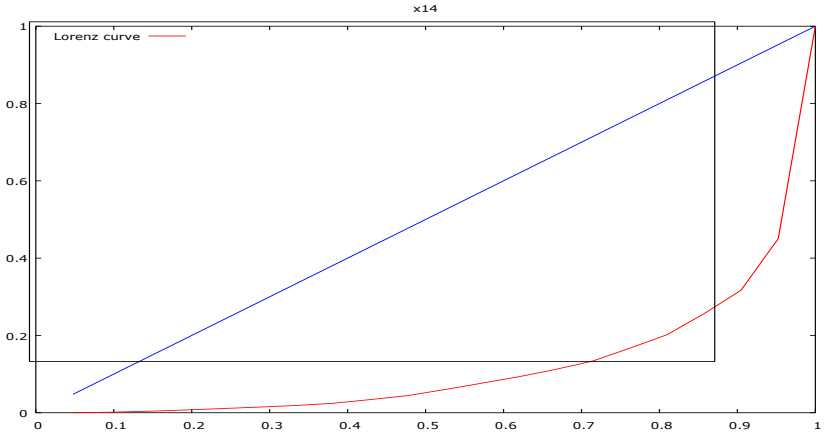


Fig.7 Lorenz curve of spatial inequality in number of registered motor vehicles per L.G.A in Anambra state.

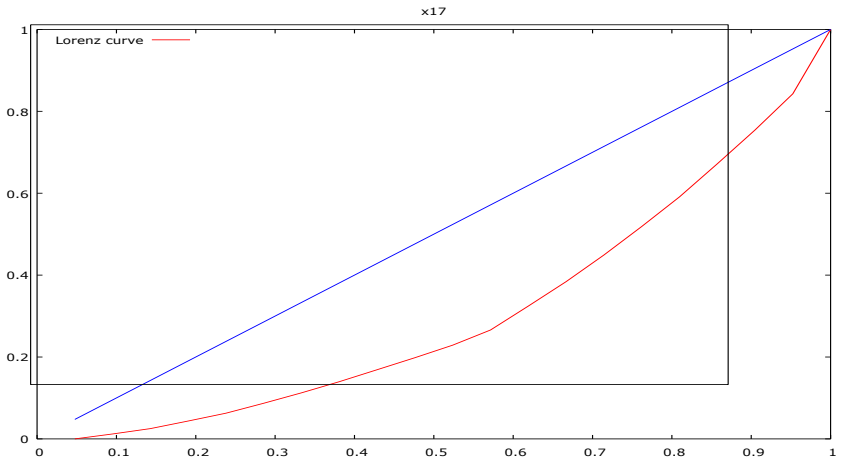


Fig.8 Lorenz curve of spatial inequality in number of business establishment employing 8 persons and above per L.G.A in Anambra state.

Standardization of the Development Indicators

From appendices xiv - xvii, the score of every variable of measurement in each indicator was standardized (transformed) to Z-score using the estimated mean and standard deviation for each of the indicator variables.

The standard scores (Z_i) for each variable of the indicators were then summed up to get an aggregate score (A_i) which was then used in the factor analysis.

That is, $A_i = \sum_{i=l}^{n} Z_i$ - - - - - - - - 5.1

Where,

A_i = Aggregate (composite) measure for the variable i.

Z_i = Standardized score for the variable i, and is given by $Z_i = \frac{X_i - \bar{X}}{\sigma}$

In which x_i = score for variable i in indicator i

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

$\bar{x}$ = Average score of the variables in indicator i

σ = Standard deviation of all the variables in indicator i

The reason for transforming the variables was to ensure that they were all in same unit of measurement. Therefore, the scores obtained from computations are used in the aggregate composite values and factor analysis. It must be noted however, that the essential attribute of the technique is that the standard scores for the areas in the individual variables as well as in the aggregate index must add up to zero.

Table 2: Aggregate (or composite) Values of Development Indicators in 21 L.G.A in Anambra State within the study period

S/N	L.G.A	Health	Education	MDG Water	Transportation	Business Establishment
1	Aguata	4.11513	446.2135	-0.67829	-0.15467	-0.33075
2	Anambra East	-0.67154	216.1522	-1.74909	-0.7654	-2.35407
3	Anambra West	1.09855	186.6068	-2.16943	-1.4098	0.02704
4	Anocha	-0.83291	276.7468	1.5738	-1.24397	0.43005
5	Awka North	-1.50054	157.1428	-0.39774	-1.09536	-1.99629
6	Awka South	0.07713	196.486	5.83408	1.34563	-0.68853
7	Ayamelum	-2.32756	123.8753	-2.26935	-0.75142	0.89888
8	Dunukofia	0.52694	81.43572	-0.29782	-1.27551	0.97701
9	Ekwusigo	-0.50334	125.0927	-0.58797	0.60177	-0.33075
10	Idemili North	2.16137	457.4309	4.31157	1.28789	0.02704
11	Idemili South	-0.23312	131.3821	2.40969	-0.24789	4.27519
12	Ihiala	0.35857	310.5638	1.05834	0.46698	0.33959
13	Njikoka	-0.45106	155.2223	1.76562	0.1789	-0.61039
14	Nnewi North	-0.63214	203.0861	-1.74909	0.75299	1.05515
15	Nnewi South	-0.25808	192.4975	0.02741	3.38486	-1.04631
16	Ogbaru	-1.42113	176.8648	-1.33354	-1.23803	0.02704
17	Onitsha North	2.8028	1114.673	-0.29782	1.26359	0.61923
18	Onitsha South	-1.80934	366.4066	-3.01012	-0.42561	-0.61039
19	Orumba North	-0.62393	209.9864	-0.39293	-1.36792	-0.48702
20	Orumba South	-1.07374	212.8146	-0.81328	-0.83457	-0.61039
21	Oyi	1.20844	-10.7285	-1.23362	1.52686	0.38482

The scores in **table 2** reveal that there is gross inequality in the distribution of health amenities in the local government areas in Anambra state. Thirteen areas are disadvantaged in this regard as eight areas were privileged in varying degrees. The privileged areas include Aguata, Anambra West, Awka south, Dunukofia, Idemili north, Ihiala, Onitsha north and Oyi. Other 13 areas are deprived. Only Oyi Local Government Area is deprived in the distribution of education facilities in the State. Aguata is the most privileged in the areas followed by Onitsha South Local Government Area.

The analysis of inequality in water development variables above shows that seven of the areas are privileged as far as water supply in the State is concerned. The areas include Anocha, Awka South, Idemili North, Idemili South, Ihiala, Njikoka, and Nnewi South while Others are

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

deprived. The privileged areas have the highest of water supply in Awka South followed by Idemili North with composite standard values of 5.83408 and 4.31157 respectively.

The spatial distribution of transport facilities shows that nine Local Government Areas are privileged while twelve is underprivileged. The underprivileged areas include Aguata, Anambra East, Anambra west, Anocha, Awka North, Ayamelum, Dunukofia, Idemili South, Ogbaru, Onitsha South, Orumba North and Orumba South. The table also shows that Nnewi South constitutes the core area under the privileged areas while Anambra West is the most disadvantaged among the deprived areas.

Considering business establishments in Anambra State, table 2 shows that eleven local government areas are privileged. Among those advantaged areas, Idemili South is the most privileged. This means that business establishment are localized in the area. However, ten local government areas are disadvantaged with the most disadvantaged area being Anambra East local government area.

Table 3: Composite Measures of Spatial Inequalities in Anambra State

S/N	L.G.A	Composite Std Deviates of the Development Indicators	Rank	Condition
1	Aguata	449.1649	3	P
2	Anambra East	210.6121	7	P
3	Anambra West	184.1532	13	D
4	Anocha	276.6738	6	P
5	Awka North	152.1529	16	D
6	Awka South	203.0543	10	P
7	Ayamelum	119.4259	19	D
8	Dunukofia	81.36634	20	D
9	Ekwusigo	124.2724	18	D
10	Idemili North	465.2188	2	P
11	Idemili South	137.586	17	D
12	Ihiala	312.7873	5	P
13	Njikoka	156.1054	15	D
14	Nnewi North	202.513	11	P
15	Nnewi South	194.6054	12	D
16	Ogbaru	172.8991	14	D
17	Onitsha North	1119.061	1	P
18	Onitsha South	360.5511	4	P
19	Orumba North	207.1146	9	P
20	Orumba South	209.4826	8	P
21	Oyi	-8.842	21	D

P = Privileged and D = Deprived

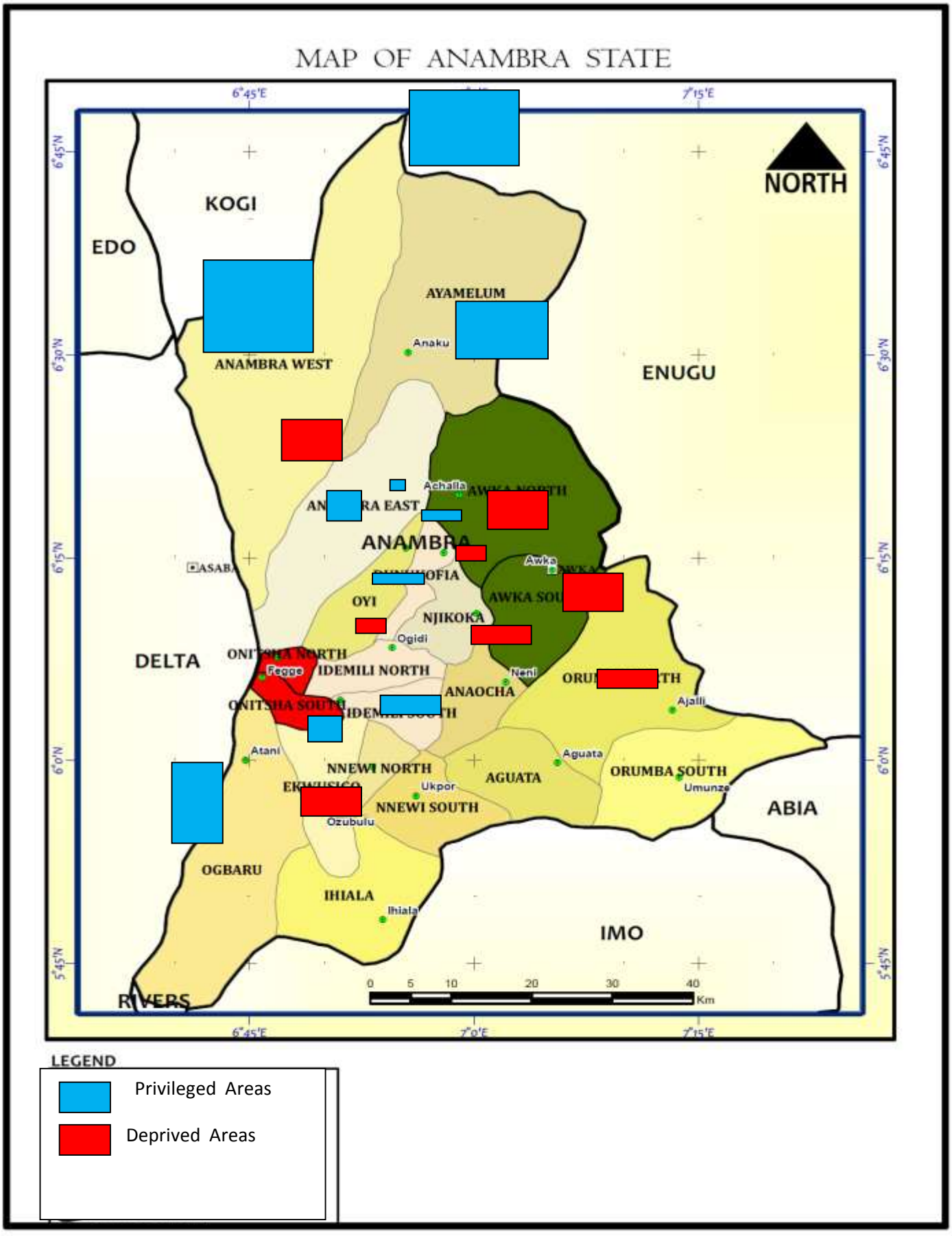
Ranks range of 200 and above is graded as privileged while ranks range of 1 to 200 is graded as deprived. Hence, eleven (11) of the local government areas are privileged while ten (10) are deprived. It must be noted that no group is internally homogenous since scores of different areas are hardly the same. Thus, broadly speaking there exists a peripheral (under-developed) region occupied by many LGAs. It shows that Aguata area constitutes the core area. It pre – eminence is shown in several respect. The area has the highest score 449.1649. Other areas in

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

the privileged group are Anambra East, Anoch, Awka South, Idemili North, Ihiala, Nnewi North, Onitsha North, Onitsha South, Orumba North, Orumba South.

In the group of the deprived areas are, Anambra West, Awka North, Ayamelum, Dunukofia, Ekwusigo, Idemili South, Njikoka, Nnewi South, Ogbaru, and Oyi. Although, heterogeneity is very small in this group, yet distinction may be made within it. For example, a difference may be seen between the seven areas having scores above 100 and the other 2 areas scoring below 100. While the former could regarded as suffering ordinary deprivation, the latter could be said to be in worse condition.

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)



ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

Factor Analysis

This analysis here is in order to collapse the larger number of variables of our indicator into fewer, more homogeneous groups, each defining the underlying dimension in the contributing variables forming the group

Table 4: Correlation matrix of the development indicator variables

Interpretation: The correlation matrix generally shows that the development indicators have low correlation among themselves.

		X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17
Corr	X1	1.000	-.051	-.202	-.181	-.078	.013	-.106	-.110	-.065	-.184	.086	-.150	-.276	-.113	.013	-.212	-.257
	X2	-.051	1.000	-.232	-.238	.254	.719	.530	.398	.626	.137	.105	.129	.198	.096	.527	.312	-.131
	X3	-.202	-.232	1.000	.109	.045	-.121	-.083	-.073	-.008	.386	.029	-.162	.433	-.258	.080	.166	.212
	X4	-.181	-.238	.109	1.000	.673	.124	.291	.399	.091	.323	.099	.140	.105	.040	-.196	-.009	-.158
	X5	-.078	.254	.045	.673	1.000	.428	.557	.598	.569	.595	.385	.136	.541	.104	.034	.176	-.113
	X6	.013	.719	-.121	.124	.428	1.000	.781	.649	.788	.062	-.021	.224	.151	-.134	.270	.094	-.271
	X7	-.106	.530	-.083	.291	.557	.781	1.000	.755	.844	.063	.300	.143	.260	-.139	.307	.240	-.191
	X8	-.110	.398	-.073	.399	.598	.649	.755	1.000	.743	.136	.445	.138	.426	-.143	.267	.207	-.306
	X9	-.065	.626	-.008	.091	.569	.788	.844	.743	1.000	.313	.276	.174	.461	-.133	.332	.217	-.151
	X10	-.184	.137	.386	.323	.595	.062	.063	.136	.313	1.000	-.050	.251	.453	.028	.154	.080	.208
	X11	.086	.105	.029	.099	.385	-.021	.300	.445	.276	-.050	1.000	-.188	.538	-.071	.428	.201	-.195
	X12	-.150	.129	-.162	.140	.136	.224	.143	.138	.174	.251	-.188	1.000	-.256	-.037	.063	.042	.312
	X13	-.276	.198	.433	.105	.541	.151	.260	.426	.461	.453	.538	-.256	1.000	-.094	.229	.338	.125
	X14	-.113	.096	-.258	.040	.104	-.134	-.139	-.143	-.133	.028	-.071	-.037	-.094	1.000	-.235	-.016	-.122
	X15	.013	.527	.080	-.196	.034	.270	.307	.267	.332	.154	.428	.063	.229	-.235	1.000	.214	-.173
	X16	-.212	.312	.166	-.009	.176	.094	.240	.207	.217	.080	.201	.042	.338	-.016	.214	1.000	.177
	X17	-.257	-.131	.212	-.158	-.113	-.271	-.191	-.306	-.151	.208	-.195	.312	.125	-.122	-.173	.177	1.000

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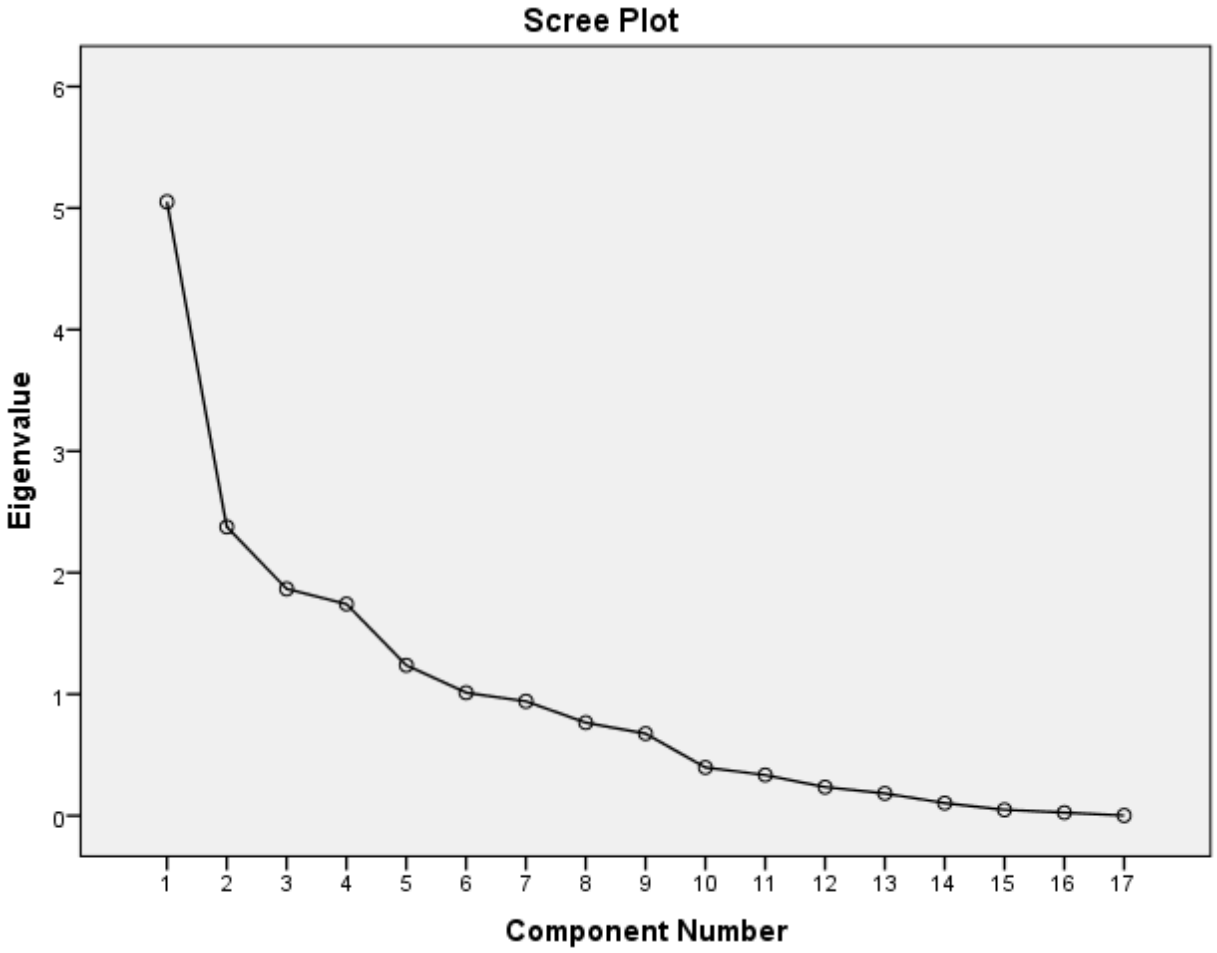

Fig. 10: Scree plot of the eigenvalues versus the component number of the variables.

Interpretation: Six principal components were kept since the graph levels off after the sixth component number. Thus, it can be infered that only six components have their eigenvalues greater than or equal to 1.0.

Table 5: Indicator components and corresponding percentage of variances Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.052	29.716	29.716	5.052	29.716	29.716	4.586	26.974	26.974
2	2.377	13.980	43.696	2.377	13.980	43.696	2.034	11.962	38.936
3	1.866	10.977	54.673	1.866	10.977	54.673	1.915	11.265	50.201
4	1.742	10.246	64.919	1.742	10.246	64.919	1.784	10.494	60.696
5	1.238	7.282	72.201	1.238	7.282	72.201	1.625	9.558	70.254
6	1.012	5.956	78.157	1.012	5.956	78.157	1.344	7.903	78.157
7	.942	5.539	83.696						
8	.766	4.505	88.200						
9	.675	3.973	92.173						
10	.397	2.335	94.508						

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11	.335	1.969	96.477						
12	.235	1.385	97.862						
13	.184	1.080	98.941						
14	.104	.610	99.551						
15	.049	.287	99.838						
16	.026	.151	99.989						
17	.002	.011	100.000						

Extraction Method: Principal Component Analysis.

Interpretations: From table 5, it is seen that the first component extracted explains about 29.72 percen of the total variance; the second component extracted explains about 13.98 percent of the total variance; the third component extracted explains about 10.98 percent of the total variance; the fourth component extracted explains about 10.25 percent of the total variance; the fifth component extracted explains about 7.28 percent of the total variance and the sixth component extracted explains about 5.96 percent of the total variance in the model. Jointly, the six components extracted explain about 78.16 percent of the total variance explained by the components (selected variables) of development indicators in Anambra state. Hence, the six components extracted are considered the most important among the components.

Table 6: Un-rotated Component Matrix of the Extracted Variables

	Component					
	1	2	3	4	5	6
Number of hospital beds per L.G.A in %	-.150	-.441	.098	-.333	-.313	.414
Number of maternity beds per L.G.A in %	.645	-.412	.171	.391	.293	.223
Number of inpatients per L.G.A in %	.043	**.683**	.323	.032	-.303	.094
Number of pri. sch per L.G.A in %	.330	.393	-.613	-.403	-.126	-.158
Number of sec. sch. per L.G.A in %	**.751**	.343	-.357	-.265	.089	.152
Number of pri. sch. enrol per L.G.A in %	**.769**	-.410	-.176	.197	-.148	.027
Number of sec. sch. enrol. per L.G.A in %	**.859**	-.223	-.108	.016	-.096	-.232
Number of pri. sch. teachers per L.G.A in %	**.853**	-.091	-.103	-.194	-.088	-.230
Number of sec. sch. teachers per L.G.A in %	**.899**	-.136	-.006	.128	-.071	.057
Number of Borehole 2007 in %	.374	**.626**	-.190	.195	-.026	**.578**
Number of solar Boreholes 2008 in %	.448	.085	.459	-.499	.111	-.125
Number of water scheme 2009 in %	.163	-.005	-.475	**.596**	-.168	-.027
Number of water scheme 2011 in %	.573	.558	.400	-.148	.145	.050
Number of registered motor vehicles per L.G.A in %	-.117	-.042	-.329	-.107	**.844**	.214
Number of road accidents per L.G.A in %	.451	-.181	**.559**	.161	-.073	.249
Number of Business est. employing 4 persons and above in %	.346	.217	.332	.269	.338	-.372
Number of Business est. employing 8 persons and above in %	-.205	.487	.040	.614	-.034	-.159

Extraction Method: Principal Component Analysis.
a. 6 components extracted.

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Table 7: Rotated Component Matrix of the selected indicator variables

	Component					
	1	2	3	4	5	6
Number of hospital beds per L.G.A in %	-.033	-.094	.106	.177	-.739	-.082
Number of maternity beds per L.G.A in %	**.685**	.075	-.052	**.577**	.096	.289
Number of inpatients per L.G.A in %	-.222	**.554**	.184	-.025	.221	-.485
Number of pri. sch per L.G.A in %	.263	.250	.034	-.842	-.007	.021
Number of sec. sch. per L.G.A in %	**.589**	**.543**	.187	-.443	.041	.194
Number of pri. sch. enrol per L.G.A in %	**.896**	-.004	-.168	.111	-.090	-.011
Number of sec. sch. enrol. per L.G.A in %	**.910**	-.037	.083	-.088	.115	-.078
Number of pri. sch. teachers per L.G.A in %	**.843**	.035	.255	-.235	.083	-.078
Number of sec. sch. teachers per L.G.A in %	**.880**	.230	.059	.112	.068	-.042
Number of Borehole 2007 in %	.126	**.942**	-.162	-.066	.056	.057
Number of solar Boreholes 2008 in %	.276	.056	**.778**	.005	.075	-.072
Number of water scheme 2009 in %	.285	.095	-.716	-.067	.166	-.045
Number of water scheme 2011 in %	.244	**.563**	**.562**	.027	.378	-.097
Number of registered motor vehicles per L.G.A in %	-.142	.034	.016	-.069	.068	**.928**
Number of road accidents per L.G.A in %	.382	.181	.250	**.607**	-.027	-.179
Number of Business est. employing 4 persons and above in %	.210	.013	.212	.187	**.691**	.012
Number of Business est. employing 8 persons and above in %	-.301	.221	-.401	.086	**.569**	-.231

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 9 iterations.

Table 8: Component Score Coefficient Matrix

	Component				
	1	2	3	4	5
AGU	.278	-.251	-7.234	-7.734	-5019755.652
ANAM EAST	.273	-.249	-4.994	-1.200	92130.655
ANAM WEST	.333	-.320	-5.971	-12.004	1132227.953
ANOCHA	.071	-.012	-1.414	-1.564	6124249.526
AWKA NORTH	.134	-.084	-3.567	1.872	1788684.169
AWKA SOUTH	-.136	.242	-5.837	7.248	349136.990
AYAMELUM	.280	-.275	15.775	7.564	2884833.009
DUNUKOFIA	.155	-.107	-3.083	-17.600	-679859.827
EKWUSIGO	.284	-.266	3.583	6.935	-10670839.216
IDEMILI NORTH	.129	-.075	-4.209	-.629	-5998835.598
IDEMILI SOUTH	-.097	.181	15.526	1.271	-5879131.261
IHIALA	.177	-.135	-.305	.945	-8687832.167
NJIKOKA	.045	.020	-3.891	2.981	7604214.240
NNEWI NORTH	.326	-.323	5.442	3.220	2910510.207
NNEWI SOUTH	.342	-.337	2.336	13.948	-5042115.176
OGBARU	.199	-.167	3.490	.166	-1221299.686
ONITSHA NORTH	.231	-.202	-2.946	-2.217	3590799.278

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ONITSHA SOUTH	.275	-.259	1.362	1.257	3974316.050
ORUMBA NORTH	.160	-.115	-1.506	-2.502	-4303187.865
ORUMBA SOUTH	.194	-.162	-2.577	-1.705	17212428.469
OYI	2.942	-3.607	-.028	.255	167170.063

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Results of the Factor Analysis

Six (6) principal factors are extracted from the data. These are the factors whose eigenvalues are greater than or equal to a unity (1). The eigenvalues of each factor and the proportion of variance in the original data accounted for by the factors are shown in **table 5.** The six factors explain about 78.16% of the total variance. This figure is quite high. Factor 1 alone accounts for about 29.72 percent of the variance. Factor 2 accounts for about 13.98% of the variance; factor 3 accounts for about 10.98 percent of the variance; factor 4 accounts for about 10.25 percent of the variance; the other two factors (factor 5 and 6) account for 7.28 percent and 5.96 percent of the variance respectively.

Table 7 shows the component matrix of the six factors obtained after the rotation. The PCA was performed using varimax and Kaiser Normalization method. Rotation converged in nine (9) iterations. The values indicate how the variables load on each factor. Six (6) variables load highly on the factor I as they have loadings of not less than 0.50 on this factor. The variables are number of maternity beds per L.G.A, number of secondary schools per L.G.A, number of primary school enrolment per L.G.A, number of secondary school enrolment per L.G.A, number of primary school teachers per L.G.A and number of secondary school teachers per L.G.A. In addition, it can be observed that only four (4) variables out of the selected seventeen (17) variables have negative loadings on factor I. This is a reflection of the type of indicators used in the analysis which are mostly on the positive side of development. These characteristics and the high variance which the factor accounts for emphasize the importance of factor I in describing spatial inequalities in Anambra State. It is also noticed that in the group of variables that load highly on factor I, education variables are well represented. As a result of this, factor I can be named as the Education Development factor.

On factor 2, number of Borehole 2007 has the highest loading. Number of inpatient per L.G.A, number of secondary schools per L.G.A and number of water scheme 2011 also load highly on the factor. All variables of transportation and business and most variables that are educational have low loadings on the factor. Water variables have the highest and the all-imposing loading on factor 3. All other variables have relatively low loadings on the factor, thus factor 3 is a water factor. As regards the 4th factor, two main variables load highly on it, namely the number of maternity beds and number of road accidents.

Factor 5 is a business factor. Many variables have numerous low loadings apart from business variables. On factor 6, we have the transportation variable (number of registered motor vehicles) recording highest of all loadings and many of other variables having negative loadings.

The factor scores as shown in **table 8** indicate the ratings of areas on the factors (or indicators) I through 5. The score of an area on a factor is indicative of the importance of the area as regards the variables that load highly on the original factor. There are other deductions that can

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be made from the scores of areas on the factors. For the purpose of this study, deductions can be made regarding spatial inequality which is the subject matter of the work. In this respect, signs of the scores are accepted as indicators of the position of the areas. Areas with positive signs in almost all the variables are seen as advantaged in the case of each factor. Those with negative signs in almost all the variables are seen as disadvantaged.

In the case of areas in factor I which is the health development factor, nineteen (19) areas are privileged while two (2) areas are deprived. In the scores on factor 2 which is the education development factor, three (3) areas are privileged while eighteen (18) areas are disadvantaged. This is like opposite of results of factor 1. On factor 3 which is the water development factor, seven (7) areas are advantaged while fourteen (14) areas are disadvantaged. On factor four (4) which is the transportation development factor, twelve (12) areas advantaged while nine (9) areas are disadvantaged. Lastly, on the factor 5 which is the business development factor, the same number of (12) advantaged areas and nine (9) disadvantaged areas are obtained. It can be observed that a few areas, for instance Awka South, Ayamelum, Nnewi North, Nnewi South,Onitsha South have high scores on the several factors; thus indicating how comprehensive their privilege is. In contrast, many areas have low scores across the factors. This demonstrates their comprehensive deprivation.

The Non-Hierarchical Analysis

As stated earlier, the factor/component scores obtained from the component score correlation matrix serve as input to the analysis. The method employed here is the K-Means method which divides the items into K = 2 Clusters, starting with initial groups.

Table 5.9: Initial Cluster Centers

	Cluster	
	1	2
AGUATA	-7.23400	-5019755.65200
ANAMBRA EAST	-4.99400	92130.65500
ANAMBRA WEST	-5.97100	1132227.95300
ANOCHA	-1.41400	6124249.52600
AWKA NORTH	-3.56700	1788684.16900
AWKA SOUTH	-5.83700	349136.99000
AYAMELUM	15.77500	2884833.00900
DUNUKOFIA	-3.08300	-679859.82700
EKWUSIGO	3.58300	-10670839.21600
IDEMILI NORTH	-4.20900	-5998835.59800
IDEMILI SOUTH	15.52600	-5879131.26100
IHIALA	-.30500	-8687832.16700
NJIKOKA	-3.89100	7604214.24000
NNEWI NORTH	5.44200	2910510.20700
NNEWI SOUTH	2.33600	-5042115.17600
OGBARU	3.49000	-1221299.68600
ONITSHA NORTH	-2.94600	3590799.27800
ONITSHA SOUTH	1.36200	3974316.05000
ORUMBA NORTH	-1.50600	-4303187.86500
ORUMBA SOUTH	-2.57700	17212428.46900
OYI	-.02800	167170.06300

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Table 10: Iteration History

Iteration	Change in Cluster Centers	
	1	2
1	18.874	.000
2	.000	.000

a. Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 2. The minimum distance between initial centers is 27797625.455.

Table 11: Final Cluster Centers

	Cluster	
	1	2
AGUATA	-3.73525	-5019755.65200
ANAMBRA EAST	-1.54250	92130.65500
ANAMBRA WEST	-4.49050	1132227.95300
ANOCHA	-.72975	6124249.52600
AWKA NORTH	-.41125	1788684.16900
AWKA SOUTH	.37925	349136.99000
AYAMELUM	5.83600	2884833.00900
DUNUKOFIA	-5.15875	-679859.82700
EKWUSIGO	2.63400	-10670839.21600
IDEMILI NORTH	-1.19600	-5998835.59800
IDEMILI SOUTH	4.22025	-5879131.26100
IHIALA	.17050	-8687832.16700
NJIKOKA	-.21125	7604214.24000
NNEWI NORTH	2.16625	2910510.20700
NNEWI SOUTH	4.07225	-5042115.17600
OGBARU	.92200	-1221299.68600
ONITSHA NORTH	-1.28350	3590799.27800
ONITSHA SOUTH	.65875	3974316.05000
ORUMBA NORTH	-.99075	-4303187.86500
ORUMBA SOUTH	-1.06250	17212428.46900
OYI	-.10950	167170.06300

Table 12: Number of Cases in each Cluster

Cluster	1	4.000
	2	1.000
Valid		5.000
Missing		.000

Report of the Cluster Analysis

Each of the two groups (privileged and deprived) into which the 21 areas have been divided in the analysis made so far is not internally uniform. The spatial pattern can be shown better by a grouping of the areas in which members in the different groups are dissimilar. In the previous analysis, deductions about privileged and underprivileged areas have been based on results

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given in a simple vector. With the emergence of several dimensions of spatial inequalities represented by the factors obtained in the last section, the grouping would be better based on the scores of all the areas on the five (5) factors. The method that is appropriate for the grouping, given an (n x n) matrix of areas and factor scores, is the cluster analysis which is based on Euclidean distances, separating the n-points representing individuals in a p-dimensional space assumed to be proportional to dissimilarities between the observations. Thus, in the cluster analysis, the areas are successfully merged into groups on the basis of the mathematical distances between the observations within each group and observation between groups.

However, the scores of the 21 areas in the five factors obtained in **table 8** serve as inputs. From the results, it is clear that in the first cluster, there are four (4) areas/cases while in the second cluster, we have one (1) case. From **table 11** which displays the ratio of within/between distances against the cluster levels shows that at the point where the value rises sharply is accepted as the optimal level of grouping. Also, results from **table 11** shows that Awka South, Ayamelum, Nnewi North and Onitsha South constitute a highly privileged group. Ekwusigo, Idemili South, Ihiala, Nnewi South and Ogbaru are fairly privileged. The next group which can be described as the "average group" is made up of Anambra East, Anambra West, Anocha, Awka North, Njikoka, Onitsha North, Orumba South and Oyi. Finally, Aguata, Dunukofia, Idemili North and Orumba North form the highly deprived areas.

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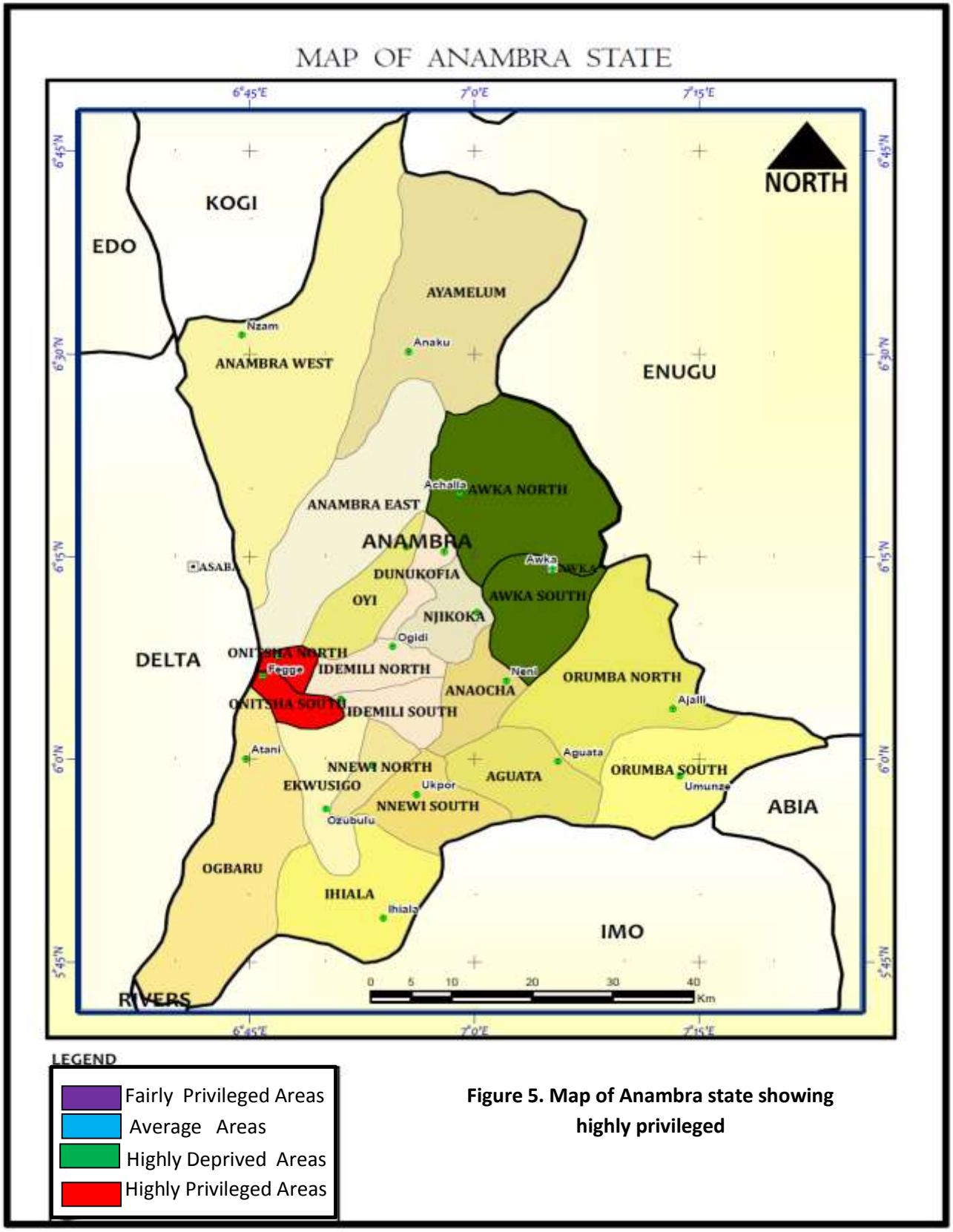

Figure 5. Map of Anambra state showing highly privileged

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SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

As a broad summary, the inequality patterns identified at the descriptive level in this study show how human welfare is bound up with the spatial development in the form of privilege for some areas and deprivation for others. However, the inequality patterns of regional development reflect what the models and the theories of regional development refer to as development nuclei or core areas on one hand and lagging regions or peripheries on the other. It shows clearly however, that the forces behind the process that create the pattern is purely economic factors. In effect, the regional development theories have proved to be efficient descriptive tools and may be regarded as real theories capable of making effective contribution to planning and development control

It is found in this study that the distribution of development facilities among the twenty one local Government Areas of Anambra State exhibits spatial inequalities. It is discovered further that the degree of inequality varies among the development indicators used in the analysis. Nonetheless, every indicator shows some element of spatial inequality. However, the degree of inequality is high in few indicators such as water. It is low in such others like Education.

For the comparison of the performances of the twenty one areas shows that, in each variable used in the analyses, some areas have above average shares. The areas and the people living in them are then seen as privileged in the variable concerned. There are others whose shares are below average and they are considered deprived in that respect. The picture of advantage and disadvantaged among the areas is not similar for all the development variables. This means that the comparative welfare of the people and the development of the areas, when different development facilities are considered are complex. In spite of the complexity however, it is found that there are areas which show favourable scores in almost all the variables considered. Such areas in this study include Awka South, Ayamelum, Nnewi North, Nnwi South and Onitsha South. In contrast, there are some areas which have negative scores in almost all the variables. The areas include, Aguata, Dunukofia, Idemili North and Orumba North

In terms of composite analysis, polarized development of the space economy was found in the study area. The polarized pattern is manifested in several ways. Shares of areas in the aggregate socio-economic facilities show the pattern. In accordance with the technique of comparison adopted, a privileged–under privileged structure is found. Eleven (11) out of 21 local Government in the study area are privileged. Their privileged position is recognized through their high scores in the composite indicator of spatial inequalities. The other ten (10) areas are identified as deprived and their deprivation is evident in their low scores.

From the result obtained from the cluster analysis, it can be deduced that in the spatial distribution of the privileged areas and the deprived areas in Anambra state, the privileged group exihibits random pattern while the deprived group has some tendency towards clustering. The meaning of these overall results is that development advantage cannot be found in clustered form. This implies that in the study area, a single factor cannot explain spatial variation in development.

Again, from the results of the composite analysis of the data, a core periphery spatial structure is found. It indicates the pattern of space economy which Friedmam postulates to be acute in the developing countries. However, it is noticed that apart from the core area, a few other well

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developed areas can still be indentified among the peripheral areas. In this study, Awka South, Onitsha North and Onitsha South are the leading areas of the periphery.

From these basic findings, by and large , it is clear that in the space economy of a developing country, there is a tendency for local areas even within a relatively small region to be grossly unequal in terms of socio-economic or development facilities available to people. In other words, spatial inequality in human welfare is not only a problem of large territories. It can be found at the sub-regional level. Therefore, it implies that in finding solutions to the specific regional problem of inequality or the general problem of national development, the common emphasis on the states for planning may not be effective if intra-state patterns are excluded. This is so, irrespective of the level of development of the sub-region. For instance, Anambra State which is the study area in this study is recognized as one of the economically advanced states in Nigeria. That inequalities are now found among different areas of the state lends credence to the well known fact that the problem of spatial inequality can exist at any spatial scale no matter the level of growth of the territory.

CONCLUSION

In conclusion, it is pertinent to conclude that development being a human issue, its bedrock must be how to effectively raise the practical skills of the people to enable them cope with their environment and the changing circumstances of their lives. There is the need to integrate a high degree of physical and regional planning into the overall planning of the state. It is through such an effort that the objective of, for instance, establishing Anambra as a just and egalitarian society can be achieved. Thus, the efforts of the present governor Wille Obiano at opening up the state's hinterland should not only be commended but also encouraged. All hands need to be on deck to ensure that the objectives of the government are realized, all with a view to improving the lives of Anambrarians.

RECOMMENDATIONS

Efficient utilization of a state's assets is crucial if the state development is to be achieved. In addition to the efficiency motive of dispersing development from the initially advantaged areas, increasing information flows, higher educational levels and other factors raise demand in the less developed areas for just shares of a state's wealth. Thus, appropriate policies to achieve the best balance of efficient and equitable development strategies must rely on some assessment of the interregional inequalities that exist at a given time.

In essence, the state had adopted the 'centre-down' approach to achieve development - an approach that: is characterized by

a. Excessive centralization of the planning machinery in government ministries providing little or no scope for popular participation;

b. Centralization of development efforts on some selected sectors of the state without any appropriate linkage among the sectors and with the rest of the state;

c. Concentration of socio-economic activities in the urban centres hoping that this would generate the 'trickle-down' effects that might improve and sustain conditions for the

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

virtual neglected rural majority.

An approach strongly advocated here is the "bottom up" approach or development from below" approach as a replacement for the "centre-down" approach.

The central objective of development from below approach is the full transformation of a regions natural and human skills for a people-centred development process. The approach emphasizes development programmes which are deeply rooted in the people's indigenous resources and the creative capacities of the people. Instead of the usual heavy reliance on foreign aid and external capital, development Tasks are to be accomplished by the people themselves with their collective energies and organizational talents. Development from below would require that the greater part of any surplus generated by the people should be invested regionally for effective diversification of the state economy. Through the retention of regional surplus, "integrate" economic circuits within less-developed region would be promoted and development impulses would be expected to successfully pass 'upwards' from the community through, local government to state level. Policy emphasis therefore will need to be oriented toward: territorially, organized basic needs services; rural and village development; labour intensive activities; small and medium sized projects; and technology permitting the full employment of state, human, natural and institutional resources on a territorially integrated basis.

The essential components of a development from below strategy would include the following:

1. A fundamental restructuring of rural space and settlements so as to improve the physical and social access of producers to vital state resources;

2. The creation of new rural structures that would facilitate substantial re-investment of financial resources in the rural sectors.

3. Rural industrialization whereby agricultural development should create viable base for agro-allied industries in rural areas. Such industries should effectively be rooted in local resources so as to generate a matrix of beneficial backward linkages in the rural economies. Such industrial growth in the rural areas would create employment opportunities for excess rural labour. In such a way, the volume of rural-urban migration would be considerably reduced;

4. Integrated development planning. An important feature of the development from below involve a wide ranging mobilization process and which would include:

a. Raising mass consciousness, a committed leadership that trusts the people, participatory democracy, decentralization of decision-making and, a continuous self correcting mechanism which the people themselves will devise;

b. Collective participation in production involving participation in decisions about production;

c. The allocation and distribution of local resources in response to felt needs and not through the dictates of market mechanisms.

ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)

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ISSN: 2052-6377(Print), ISSN: 2052-6385(Online)