Case Study

The Underlying Factors of Rural Development Patterns in the Nsukka Region of Southeastern Nigeria

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Abstract

This case study analyzes the patterns and underlying factors of rural development in the Nsukka region of southeastern Nigeria. It identifies leading and lagging communities with a view to making appropriate recommendations for even development. To achieve this aim, 35 rural communities were randomly selected and their scores on selected infrastructural facilities were used to ascertain the pattern of rural development. The relative strength of the underlying factors was determined by factor analysis. The results reveal a disparity in the spatial distribution of rural development facilities, with communities on the central plateau fairing better. Factor analysis revealed 4 underlying factors that account for 71.3% of the total variance. One implication of the results is that achievement of spatially even rural development will require the adoption of an integrated governmental approach.

Key Words: Inequalities, Nsukka region, rural communities, rural infrastructure, spatial patterns.

1.0 Introduction

Development generally is concerned with the enhancement of individuals' ability to shape their lives (Sen, 1999). According to Stiglitz (1999), development can be regarded as a transformation of society, a movement from traditional ways of thinking and traditional methods of production to more modern ways. In other words, development must improve all aspects of peoples' lives. This is what Servaes (1999) calls multi-dimensional development.

Following the multidimensional nature of development, the South African Rural Development Framework (1997, p. 7) describes rural development as a means of helping rural people set the priorities in their own communities through effective and democratic bodies. These bodies provide local capacity, invest in basic infrastructure and social services, deal with past injustices, and ensure the safety and security of the rural population, particularly that of women. Madu (2003b) characterizes the essence of rural development as the improvement of the spatial and socioeconomic environment of rural space, which leads to the enhancement of the individual's ability to care for and sustain his or her well-being.

Various definitions of rural development underscore its multidimensional nature. Diverse indicators are used to measure the level of rural development in a community. In reality the number and scale of the indicators used are determined by available data. The indicators require frequent evaluation to ensure they accurately reflect changing conditions in rural areas (Reimer, 2002). Notwithstanding, access to infrastructural facilities is the most satisfactory yardstick of such assessment because it shows to what extent a community enjoys social amenities (Lebo and Schelling, 2001). The importance of infrastructure lies in its capacity to help sustain daily activities, quality of life, and an economic base in rural areas (Halseth and Ryser, 2006).

The spatial variation in availability and access to rural infrastructure results in spatial disparities in living standards both within and between regions and localities. Thus, inequalities exist between spatial units as they do between individuals (Anderson and Pomfret, 2004; Deichmann, 1999; Henderson, Shalizi, and Venables, 2001; Kanbur and Venables, 2005). The existence of disparities in living standards therefore makes the analysis of the patterns of rural development imperative in order to identify areas of deprivation. Only through such an analysis can the imbalance in the achievement of rural development be understood.

The analysis is particularly important in Nigeria, where inadequate and ineffective rural infrastructure is a major characteristic of rural areas (Madu, 2003a). Accordingly, the government has recognized the importance of infrastructure to rural development through policy statements and the provision of some basic infrastructure in many rural communities. However, institutional and articulated programmes for rural infrastructure development in the country are still lacking. Consequently, while some rural communities have made significant advancement, others have lagged behind in the provision and access to infrastructure.

The availability of rural infrastructure can therefore be effectively used as a proxy indicator of the level of rural development in Nigeria. However, the level of development across space depends on dynamic processes involving complex physical, economic, and social variables in each community and on the strength of each variable (The World Bank Group, 1998). This complexity makes it necessary to analyze the various factors contributing to development levels. Such analysis can explain the factors underlying the variations, providing a basis for policy intervention. The current body of literature on rural studies in Nigeria lacks such an analysis. The present study aims to help fill the gap.

2.0 Methods

2.1 Sample size and data used

The Nsukka region is located at the northern boundary of southeastern Nigeria. It has a total land area of 3,402 km^2 located within latitudes $6°30'$ and $7°54'$ north and longitudes $6°54'$ and $7°54'$ east. The region comprises 88 rural communities and the Nsukka urban centre, which is referred to as a university town because of the presence of the University of Nigeria. From the 88 rural communities, 35 communities were randomly selected and studied. The data for the research were obtained from both primary and secondary sources. Specifically, a census of rural infrastructure facilities was conducted in the 35 communities selected. The facilities enumerated are shown in Table 1. The primary data were supplemented

with published and unpublished materials, including maps and government documents.

Table 1. Facilities Used in Assessing the Level of Rural Development

Institution or Establishment	Facility
Administration	• Local government office • Magistrate court • Police station • Police post • Subtreasury
Agriculture	• Veterinary clinic • Extension service
Commercial	• Bank • Petrol/gas station
Education	• Tertiary educational institution • Secondary school • Primary school
Health	• Hospital • Health centre • Pharmacy
Industry	• Food grinding/processing mill • Bakery
Public utility	• Electricity • Piped water
Recreation	• Civic centre • Village hall • Television viewing centre • Restaurant • Hotel
Religious/social institutions	• Parish house • Church building • Social club secretariat
Transport and communication	• Express road • Tarred state or local government road • Untarred road • Motor park • Post office • Postal agency

2.2 Data analysis

The computation of rural development level was based on the availability of infrastructure facilities in each community. This was done for the following reasons. First, the research emphasizes the spatial pattern of rural development. Second, the more available that facilities are in an area, the greater is access to them. This is because the use of a facility is influenced by the distance between a household and the facility (Madu, 2004; Wanmali, 1992). Specifically, within a hierarchy of central places, access to services will vary according to distance from the service centre, since cost, time, and effort tend to increase with distance (Halseth and Ryser, 2006). Third, although infrastructural facilities are not ends in themselves, they are means to achieving broader development goals. Therefore, the more available they are in an area, the more they contribute to the goal of development, which invariably leads to greater living standards (Fishbein, 2001).

Using the availability of the infrastructural facilities, the score of rural development for each community was obtained as follows:

$$\text{LRD} = \sum_{}^{N} x_i \, x_{ij} \,\text{--------}1,$$

where LRD stands for the level of rural development and x_{ij} represents the weighted scores of the indicators (Madu, 2004).The weights were determined by assigning (1) to low-order facilities,(2) to higher order ones and (3) to the highest order facilities. The number of a facility in a community was used to multiply the weight of the facility and score summed up using equation 1 above. The relative rates of performance on the indicators were determined by location quotients (LQ) as follows:

$$\text{LQ} = \frac{X_1/X}{P_1/P} \,\text{-------}2,$$

where X_1 is the number of facilities for the ith community, P_1 is population of the ith community and

$$X = \sum_{j=1}^{N} x_i, \quad \text{while} \quad P = \sum_{j=1}^{N} P_i.$$

Population was used to determine the LQ in the study instead of areal extent since the facilities are meant to serve people. An LQ equal to or exceeding 1 indicates that the community has achieved a comparatively more significant level of rural development more using the development indicators, while an LQ less than 1 indicates that the community is disadvantaged.

SPSS was used to perform a factor analysis to determine the underlying factors and their relative strengths. Although many factors influence rural development, only the most important variables were considered. They are:

X_1 Distance to local government headquarters
X_2 Distance to the nearest urban centre

X_3 Accessibility
X_4 Total lengths of roads
X_5 Road density
X_6 Land area
X_7 Size of farmland
X_8 Population of a community
X_9 Level of education of household head
X_{10} Household income
X_{11} Number of social and economic organizations
X_{12} Range of goods and services in the community market
X_{13} Trade links the surrounding communities have with a community
X_{14} Magnitude of links from a community to outside communities
X_{15} Aggregate market interlinkages involving a community
X_{16} Use of electronic media

The relationships between the independent variables (X_1-X_{16}) and the scores on rural development (X_{17}), the dependent variable, (X_{17}) were therefore assessed using factor analysis. The relative contribution of the factors to each community was also obtained from the factor analysis.

3.0 Results

3.1 The spatial manifestation of rural development

The result of the analysis of the distribution of rural infrastructural facilities shows that disparity exists among the rural communities (Table 2). The table shows that the leading communities are Obollo-Afor, Adani, Ogrute, Ibagwa-Aka, Eha-Alumona, and Orba, while Umualor, Ozalla, Ohodo, Nimbo, Ugbene, and Abbi are the least developed communities.

The six leading communities account for 42.1% of the total score. However, Obollo-Afor alone with a score of 536 accounts for 15.9% of the total score. Based on its distinctive position on the development ladder and the number of urban functions in the community, it has been described as an emerging urban centre (Madu, 2000). The table also shows that the local government headquarters, namely Ikem, Umulokpa, Ibagwa-Aka, Obollo-Afor, and Ogrute all have LQs above 1. This is a result of government investment in infrastructural facilities for the maintenance of the secretariats. Other communities had LQs up to 1 as a result of small populations, which were used as the denominators. Accordingly, some communities like Orba and Eha-Alumona that were initially classed as high performers recorded LQs less than 1 because of relatively large population bases, which share available facilities. The implication is that more facilities are needed to satisfy the large number of people in these communities.

Other communities with LQs less than 1 have both small populations and a limited number of rural development facilities and so are equally disadvantaged. On the whole, a majority of the rural communities are disadvantaged in terms of population per share of facilities since only 34% of the communities have LQs up to the threshold value of 1.

The results of the factor analysis (Varimax rotated) produced a simple structure that can easily be interpreted. The 16 independent variables were reduced to 4 underlying dimensions or factors of rural development, with a cumulative

percentage variance of 71.3%, thus leaving only 28.7% of the total variance in the original variance unexplained (Table 3). The factor loadings identified 4 underlying dimensions of rural development (Table 4).

Table 2. Rural Development Indicators for Communities in the Nsukka Region, in Descending Order of Aggregate Score

Community	Aggregate Score	Location Quotient
Obollo-Afor	536	3.50
Adani	227	2.35
Ogrute	192	2.36
Ibagwa-Aka	171	1.47
Eha-Alumona	154	0.78
Orba	140	0.79
Eha-Amufu	129	0.45
Ikem	127	1.56
Ukehe	127	0.63
Opi	124	0.89
Mbu	118	1.62
Aku	102	0.35
Itchi	89	1.90
Umulokpa	81	1.55
Ekwegbe	72	0.96
Obukpa	70	0.64
Ovoko	70	0.75
Lejja	67	0.80
Ede-Oballa	64	0.82
Imilike	64	0.76
Iheaka	59	0.86
Iheakpu Awka	57	1.79
Ette	54	0.71
Aji	53	1.51
Amufie	48	1.75
Obollo Eke	47	0.62
Obollo Etiti	42	0.53
Neke	42	0.63
Uda	40	1.28
Umualor	39	0.58
Ozalla	38	0.43
Ohodo	36	0.45
Nimbo	34	0.45
Ugbene	33	0.49
Abbi	29	0.54

Table 3. Matrix of Factors Influencing Rural Development in the Nsukka Region (Varimax Rotated)

Variable	Factor 1	Factor 2	Factor 3	Factor 4
X_1	-0.780	0.119	*-0.841	-0.018
X_2	-0.157	0.643	-0.258	0.488
X_3	-0.332	0.551	-0.548	0.397
X_4	-0.363	-0.004	0.276	*0.732
X_5	0.682	-0.276	0.122	0.442
X_6	0.107	*0.828	0.329	0.120
X_7	-0.055	*0.744	-0.257	-0.030
X_8	*0.727	-0.008	0.214	-0.109
X_9	0.636	-0.013	0.503	-0.147
X_{10}	*0.797	-0.019	0.136	0.347
X_{11}	*0.749	-0.228	0.208	0.180
X_{12}	0.642	-0.067	-0.208	-0.035
X_{13}	*0.717	0.204	0.186	-0.005
X_{14}	0.009	-0.199	0.124	*-0.831
X_{15}	*0.813	-0.267	0.186	0.217
X_{16}	0.564	-0.002	0.614	0.209

* Significant loadings

Table 4. The Underlying Dimensions of Rural Development in the Nsukka Region

Factor	Description	Eigenvalue	% of Variance	Cumulative % of Variance
1	Rural market development	5.951	37.193	37.193
2	Land resources	2.932	18.326	55.519
3	Influence of local government administration	1.319	8.241	63.760
4	Accessibility	1.215	7.592	71.352

3.2 Interpretation of the underlying factors of rural development in the Nsukka region

The factor analysis succeeded in reducing the 16 independent variables to 4 underlying factors of rural development with a cumulative percentage variance of 71.3%, thus leaving only 28.7% of the total variance in the variables unexplained. Factor 1 has significant loadings on 4 variables, namely X_8 (household income), X_{11} (number of socioeconomic organizations), X_{13} (trade links with surrounding communities have with a community), and X_{15} (aggregate market interlinkages), and accounts for 37.2% of the total variance.

Population size is an important factor in rural development. In particular, rural development in the Nsukka region is achieved mainly through a community development approach whereby the resources of the people are mobilized and

harnessed for the provision of basic community needs. In addition, when the government provides social amenities, communities with large populations are usually favoured because it is more economical and viable to establish them in populous communities (Madu, 1993) with large demands for goods and services. More importantly, the emergence or establishment of a service in a locality depends on whether the locality can produce the population threshold for that service. This threshold is the minimum population size required to support the existence of a service.

Similarly, higher income is associated with monetization of the economy, which is associated with the development of a market economy and formation of socioeconomic organizations. This, together with the high factor loadings on trade links that surrounding communities have with a particular community and the aggregate market interlinkages, indicates the importance of market development. Therefore, Factor 1 has been identified as rural market development.

Factor 2 has significant loadings on 2 variables with an eigenvalue of 2.932 and explains 18.3% of the total variance. The variables are X_6 (land area) and X_7 (size of farmland). Both variables stress the importance of land resources, which include agricultural land, forest, and food resources. The underlying factor is therefore labeled availability of land resources.

Factor 3 has a significant loading on only 1 variable, namely, X_1 (distance to local government headquarters). It has a factor loading of 0.841, explains 8.2% of the total variance, and has an eigenvalue of 1.319. The variable emphasizes the importance of government influence on rural development, since a local government headquarters is the centre of administration in a given area. The nearer a community to a local government headquarters, the more administrative influence the community receives and the greater the tendency for it to develop. Consequently, the factor is described as influence of local government administration.

Finally, Factor 4 has high factor loadings on two variables, namely, X_4 (total length of roads) and X_{14} (magnitude of links from a community to outside communities). Variable X_4 is a general indication of the availability of road transport. Variable X_{14} is a measure of the degree of the spatial linkages a community has with outside communities, which in turn is dependent on accessibility and relative location of the community. In the Nsukka region, road transport provides the major medium of this spatial interaction. The underlying factor is, thus, accessibility. This factor has an eigenvalue of 1.215 and explains 7.6% of the total variance

3.3 Relative importance of the underlying factors

The factors identified do not have equal influence on all the communities studied. The magnitudes of the influence of the factors in each community are shown in Table 5. The table shows that the highest scores for Factor 1 (level of rural market development) are for Orba (4.982), Adani (4.428.), Eha-Alumona (4.128), Aku (3.973), Obollo-Afor (3.883), and Ibagwa-Aka (03.838). These scores imply that market development contributes more to rural development in these communities than in others.

Factor 2 (land resources) has greatest influence at Abbi (3.989), Umulokpa (3.634), Adani (3.521), and Nimbo (3.204). These communities are located in the

Uzo-Uwani local government area, which is characterized by large farm sizes and fertile soils. The local government area is noted for large production of agricultural products, particularly rice, yam, cassava, and vegetables. Accordingly, availability of fertile lands and high agricultural productivity has been responsible for much of the rural development in the local government area. Factor 3 has the greatest influence on communities that are local government headquarters. This influence is due to the concentration of most of the development facilities and local government activities within the headquarters. This concentration is thought to promote the diffusion of development activities from the headquarters regarded as growth centres to the surrounding communities. Therefore, the nearer a community is to the growth centre, the greater the influence of government activities. This explains why communities like Ogrute (1.970), Obollo-Afor (1.678), Ibagwa-Aka (1.582), and Umulokpa (1.213), which are all local government headquarters, have high scores on the factor as shown in Table 5.

Factor 4 (accessibility) indicates that Obollo-Afor ranks first. This is understandable since it is a nodal community with roads linking it with other parts of the region and country. In fact much of the development of the community is attributed to road network development. This community serves as a breaking point to travelers to the north from southeastern Nigeria and vice versa. Other communities with high scores on this factor are Eha-Amufu (1.913), which is linked to Enugu, the state capital, by road and railway, Orba (1.530), located along the Enugu-Makurdi road, and Obukpa (1.119), located close to the university town of Nsukka. Also, Ibagwa-Aka (1.660) and Umulokpa (1.364), which have high scores on the factor, are local government headquarters and have benefited from road transport development. On the other hand, areas with low scores on the factor are mostly communities that have suffered from long years of neglect with respect to road development. One outstanding example of such a community is Lejja (0.021), only 2 km from the city of Nsukka, yet isolated because of the lack of a good road.

4.0 Discussion

The pattern of the factor loadings indicates that rural development is multidimensional and therefore requires an integrated approach. The overall implication is that the achievement of rural development in the region hinges on the adoption of an integrated strategy. There is also the need for the establishment of a relevant institutional framework to articulate and coordinate the various facets of rural development in the area. This institutional framework is currently lacking not only in the region but in the country in general.

While the need exists to improve and upgrade existing infrastructure facilities in the region, there is equally the need to reduce inequality between the communities in the provision of such facilities. Inequality produces an unfavourable environment for economic growth and development (Oyekale, Adeoti, and Ogunnupe, 2004). Even development in the region cannot be achieved without reducing inequalities in development between the rural communities. The social cohesion and stability of the region, or any region, depend on the extent to which the constituent communities consider that they belong and the extent to which the disparities are reduced between them (Madu, 2006). Government failure to address inequalities can result in social unrest, agitation and conflicts, which will hinder further rural development.

Table 5. Standardized Factor Scores of Variables Influencing Rural Development in the Nsukka Region by Community

Community Name	Factor Scores			
	1	**2**	**3**	**4**
Abbi	2.786	3.989	0.740	0.186
Adani	4.428	3.521	1.347	0.076
Aji	3.081	1.899	0.324	0.089
Aku	3.373	2.551	1.480	0.393
Amufie	3.058	1.930	0.453	0.121
Ede-Oballa	3.151	1.125	0.283	0.328
Eha-Alumona	3.128	1.433	0.969	0.573
Eha-Amufu	3.301	2.518	1.114	1.913
Ekwegbe	3.607	2.450	1.057	0.583
Ette	2.869	2.352	0.783	0.577
Ibagwa-Aka	3.838	2.201	1.582	1.660
Iheaka	2.611	1.684	0.059	0.823
Iheakpu-Awka	2.726	1.659	0.898	0.360
Ikem	2.736	2.645	1.819	0.861
Imilike	2.460	1.942	0.187	0.545
Itchi	2.589	2.246	0.604	0.540
Lejja	2.486	1.390	0.690	0.021
Mbu	3.000	2.377	0.799	0.327
Neke	2.956	2.210	0.660	0.230
Nimbo	3.792	3.204	1.003	0.077
Obollo-Afor	3.883	2.254	1.678	2.234
Obollo-Eke	2.424	2.356	0.706	0.556
Obollo-Etiti	2.829	2.149	0.815	0.506
Obukpa	2.824	1.743	0.425	1.119
Ogrute	3.360	2.210	1.970	0.360
Ohodo	2.558	1.425	0.744	0.199
Opi	3.507	1.995	0.954	0.833
Orba	4.982	2.153	1.615	1.530
Ovoko	3.137	1.963	0.023	0.471
Ozalla	3.318	2.850	0.488	0.458
Uda	3.009	1.807	0.486	0.190
Ugbene	2.830	3.445	1.207	0.618
Ukehe	3.360	2.410	1.470	0.300
Umualor	2.910	2.750	0.825	0.474
Umulokpa	2.219	3.634	1.213	1.364

The concentration of both population and infrastructure in a few communities has specific implications for agriculture and rural development in the region. One consequence of the concentration is the overuse and impoverishment of land in some localities while much of the land on the fertile lowlands continues to lie fallow. Deliberate efforts should be made to increase population movement into the lowlands. Measures should be introduced to increase land acquisition by outsiders in the lowland areas as this will attract farmers and investors from within and outside the region into the areas. This would call for the spatial reorganization

of settlements through policies and programmes that would help spread population and development to the less densely populated but fertile plains in the region.

5.0 Conclusion

Rural development is multifaceted and thus requires an integrated approach for its achievement. This analysis of rural development patterns and the assessment of the underlying factors are important for identifying gaps and recommending appropriate policies to address them. The methods used herein and the suggested policy remedies can be applied in other regions with similar geographical settings and socioeconomic levels of development.

6.0 References

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