GLOBAL JOURNAL OF SOCIAL SCIENCES VOL 1& 2, 2002: 87 - 92
COPYRIGHT(C) BACHUDO SCIENCE CO. LTD. PRINTED IN NIGERIA

THE INTRICATE WEB OF RELATIONSHIPS: THE CASE OF TRANSPORT INFRASTRUCTURE AND RURAL DEVELOPMENT IN JOS ENVIRONS

J. U. OBOT and F. I. OKPILIYA

(Received 16 March 2002; Revision accepted 16 March 2002)

ABSTRACT

The objective of this study is to demonstrate the nature of the relationship between transport infrastructure and rural development in Jos environs. Primary and secondary sources of information were used to collect data on three variables of transport infrastructure (connectivity, quality and density) and five components of rural development (water supply, electricity, health services, postal services and education).

The level of transport infrastructural provision and rural development were measured using a theoretical measuring chart. The analysis of the relationship between the two variables using graphical and statistical techniques led to the conclusion that:-

a. The area of study has a low level of transport infrastructure and average level of rural development.
b. The relationship between transport infrastructure and rural development is positive.
c. The area, because of poor transport infrastructure, is inaccessible, deprived, has high emigration rate of the youth, poverty and the attendant lethargy.

Key Words: connectivity, infrastructure, density, relationship, and lethargy.

INTRODUCTION

A greater part of the world's population (about 76%) live in the rural areas (Haupt 1990). The spatial dimension of this account reveals that Africa has 69% of its entire population inhabiting the rural areas, Europe 25%, North America 24%, South America 46% and Asia 71% (WPDR, 2001). According to the demographic yearbook of 1983, the percentage rural populations of Ethiopia, Guatemala, and Bangladesh are put at 85%, 63% and 99% respectively. In Caracas, Emoy (1986) observed that about one-quarter of the population live in rural areas. Similarly, in Nigeria it has been argued that about 80% of the population still live in the rural areas (Olatunbosun, 1985).

These rural areas suffer generally from various disabilities in varying degrees of intensity. They include remoteness, inaccessibility, relative isolation, poverty, dullness and drabness, and therefore unbroken monotony of daily life, ignorance and attendant conservatism, loss of population through emigration, malnutrition, diseases and relative lethargy (Adefolalu, 1977). These deplorable conditions existing in the rural areas ultimately call for a set of transformations through rural development efforts. Rural development is therefore seen here as the transformation of the social, mental, economic and environmental conditions of the quality of life of the inhabitants (Adelemo, 1987).

An important aspect of rural development, which has been identified, is the provision of social amenities such as education, health services, electricity, recreation, postal services and water pipe network. These are often regarded as the basic necessities of life, which need to be provided at all times for the citizens by the government of any country.

Indeed, a fundamental crisis in the world over today is the imbalance in the provision of social amenities. At whatever scale it may be viewed, it invariably leads to marginalization of

J. U. OBOT, Department of Geography and Regional Planning, University of Calabar, Calabar - Nigeria.
F. I. OKPILIYA, Department of Geography and Regional Planning, University of Calabar, Calabar - Nigeria.

the poor and distorts the effective functioning of the space economy. A major factor that has been suggested in the literature as being responsible for the imbalance in the provision of social amenities in the rural areas is the state of transport infrastructure (Faruques, 1981; World Development Report 1994). Transport infrastructure has been viewed as perhaps the prime mover in the analysis of spatial structure and functions. It has been argued for instance that where good quality roads exist, it allows government and private companies the access into the remote areas for the establishment of social amenities. Consequently, areas with good state of transport infrastructure tend to benefit more from the provision of social amenities than their counterparts with bad road conditions.

Thus, taking the above facts into consideration, transport infrastructural development should be accorded priority in the catalogue of development projects by the administrative machinery of any country meant to transform the living conditions of the ruralites.

OBJECTIVES

This study has the following objectives

a. To determine the level of rural development in the area.
b. To provide information on the state of transport infrastructural development.
c. To determine the extent of association that exists between transport infrastructure and rural development.

METHODOLOGY

A base map to a scale of 1:50,000 indicating settlements, road layout and the distribution of social amenities, which are indices of rural development, was collected from the council headquarters at Jebbu Bassa.

Three indices of transport infrastructure, namely, connectivity, density and road quality were assessed. The road network was abstracted to a graph with junctions and terminals taken as nodes, and adjourning route as edge in conformity with graph theory. This was done with a view to determining the connectivity. In the consideration of road quality, certain variables which were deemed crucial in the vehicular capacity, period of motorability, width of bridge and liability to flooding. Also information on the size of each settlement coupled with the route length provided a guide as to the analysis of route density. The aggregations of these three variables provided a good accrue for measuring transport infrastructure.

On the other hand, development was assessed based on five indices of water supply, electricity, health services, postal services and educational establishments. Hence scores assigned to each of these five components of rural development in the area.

The nature of the relationship between transport infrastructure and rural development was determined in this study through the employment of graphical as well as statistical techniques. The graphical technique used here involved representing the two variables in a pair of co-ordinate axis. By convention, x (horizontal axis) represented transport infrastructure while y (vertical axis) stood in for rural development. The scatter of the points then provided a visual information on the relationship between the two variables.

This relationship was further analysed statistically using the Pearson product moment correlation analysis. A set of significance was carried out at 95% level.

DISCUSSIOS OF RESULTS

TRANSPORT INFRASTRUCTURE

Three variables were made use of in the assessment of transport infrastructure Having computed the variables for each of the settlements, score values were then assigned to them (see figure 1). The basis for the scoring was on the maximum values obtainable for the variable. The analysis gave a maximum value of four and a minimum of one for each variable. When all the scores are added together, they produce the transport infrastructural index for that settlement. (See table 1)

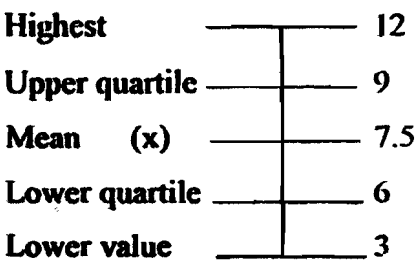


Fig (1) THEORETICAL MEASURING SCALE

Having aggregated the scores and measured on a chart to obtain the transport infrastructure level, the values obtained were three for the lowest and twelve for the expected highest level of transport infrastructure. Following the computation of the mean, upper and lower quartiles, the values were then charted (see figure 1) and indicated as zones of "hig", "averages" and "low" levels of transport infrastructural development. Table 2 illustrates this.

As seen above, all the settlements in the area fall in the low level of transport infrastructural development.

TABLE 1: SUMMARY OF TRANSPORT INFRASTRUCTURE DEVELOPMENT VALUES/SCORES.

District	Connectivity	Score	Density	Score	Quality	Score	Score total
Jere	0.40	2	0.20	1	6	1	4
Amo	0.66	3	0.05	1	5	1	5
Buji	0.42	2	0.19	1	5	1	4
Mafara	0.50	2	0.07	1	5	1	4
Kishika	0.66	3	0.13	1	5	1	5
Kakkek	0.42	2	0.13	1	6	1	4
Miango	0.40	2	0.15	1	7	2	5
Kwall	0.50	2	0.09	1	5	1	4
Buhit	0.42	2	0.18	1	6	1	4
							=39

TABLE 2: LEVEL OF TRAMNSPORT INFRASTRUCTURAL DEVELOPMENT

LEVEL	THEORETICAL SCALE	SETTLEMENTS
High	9-12	-
Average	6-8	-
Low	3-5	Jere, Amo, Kishika, Kakkek, Buhit, Buji, Mafara, Miango.

TABLE 3: RURAL DEVELOPMENT INDICES

Settlement	Health services	Postal services	School Primary & secondary	Water supply	Electricity supply	Total
Jere	18	1	17	8	2	46
Amo	4	1	8	5	0	18
Buji	10	0	13	5	2	30
Magara	4	0	2	-	0	6
Kishika	8	1	8	3	2	22
Kakkek	6	0	13	8	2	29
Miango	12	1	16	9	2	40
Kwall	6	0	10	3	2	21
Buhit	8	3	13	9	2	34
Total	76	7	100	50	14	246

RURAL DEVELOPMENT

Here, nine settlements were characterized based on the five indices of rural development. The rural development attributes were electricity, pipe-borne water, health services, postal services and educational establishments; and the summation of the scores produced the rural development index values for the nine settlements in the area (see table 3).

The determination of the level of rural development was done with a theoretical computation of rural development measuring chart. This was done with a view to understanding how the different facilities scale either high or low on the measuring chart. The summation of the values resulted in sixty-five representing the highest and five indexing the expected lowest levels of rural development. The derived values were then charted as seen in the figure (2). The levels of rural development in the nine settlements were measured along this chart.

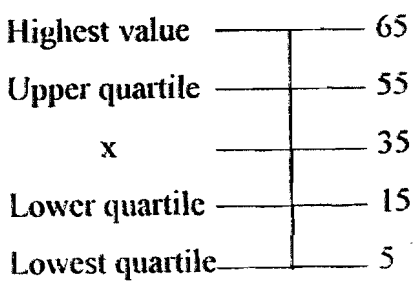


Fig 2: THEORETICAL MEASURING SCALE

From the table above, none of the settlements is in the high level of rural developments (88.9%) fall within the average level while only one (representing 11.1%) is in the low level.

RELATIONSHIP BETWEEN TRRANSPORT INFRASTRUCTURE AND RURAL DEVELOPMENT

GRAPHICAL ANALYSIS

An indication of the relationship between transport infrastructure and rural development in Jos environs was obtained by using a pair of co-ordinate axes to represent the two variables on the scattergram. Thus, based on the scatter gram as shown in figure 3, the general trend of the scattered dots shows a consistent tendency for the scores in one variable to increase as scores on the other also increase.

This is an indication that there is a strong positive relationship between transport infrastructure and rural development. In essence the dots trend upward from left to right indicating that the level of rural development increases as transport infrastructure levels increase.

A line was fitted to the points to give a more precise measure of the relationships. An equation expressing the relationship between the two variables was then derived to enable the insertion of a "best-fit" line that gives the closest approximation to the relationship.

In the study, the regression line slopes upwards from the left to right showing a positive relationship between the two data sets (see figure 3). In the same vein the cluster of points along the line indicates that the relations hip is a fairly strong one.

To ensure the best estimate of the values used in the regression, the residuals of the estimate were calculated from the observed values (see table 5).

TABLE 4: LEVELS OF RURAL DEVELOPMENT

LEVEL	THEORETICAL	SETTLEMENT
High	55-65	-
Average	15-54	Jere, Amo, Kishika, Kakkek, Buhit, Buji, Miango, Kwall
Low	5-14	Mafara

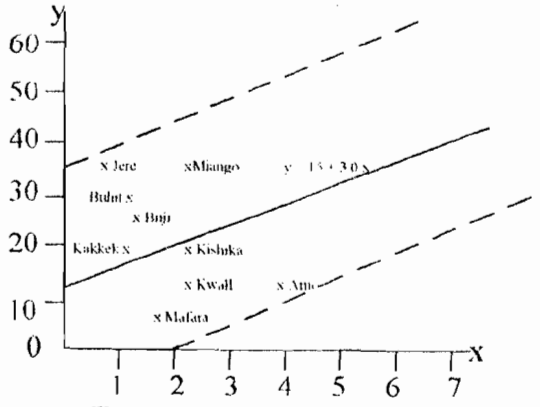
TABLE 5: RESIDUALS FROM THE REGRESSION EQUATION

Settlement	Observed rural development indices	Estimated rural development indices	Residuals y-y
Jere	45	27	+18
Amo	18	30	-12
Buji	30	27	+3
Mafara	6	27	-21
Kishika	22	30	-8
Kakkek	29	27	+2
Maingo	40	30	+10
Kwall	21	27	-6
Buhit	34	27	+8
Total			-6

From the table above, it could be seen that Jere, Buji, Kakkek, Miango and Buhit have positive residuals. What this implies is that despite the generally low level of transport infrastructure of the districts, the level of rural development tend to be higher than the rest of the other districts. Coincidentally, these districts were centers of former tin mining activities, which attracted a lot of population with concomitant increase in the demand for social amenities. Also, the location of the headquarters of the local government area and the third Armoured Division of the Nigerian Army at Jebbu BASSA (Buhit) and Rukuba (Kakkek) respectively have attracted great population to these places with a corresponding high demand for facilities.

On the other hand, Amo, Mafara, Kishika and Kwall have negative residuals. This implies these settlements have low levels of rural development that can be expected as predicted by the regression. This is however not surprising since these settlements have low levels of transport infrastructure and are therefore generally remote and inaccessible.

Generally, based on the results presented in table 5, it becomes clear that Bassa area has overall negative residuals-6. This has the indication that in as much as there is low level of transport infrastructure in the area, rural development level is equally low to the extent that it falls far below the expected level from the regression equation.



Transport Infrastructure

Figure 3

STATISTICAL ANALYSIS

From the scattergram, it can be observed that there is an association between transport infrastructure and rural development. Hence it has become very necessary to determine the forms of such relationships. This ultimately called for the computation of the correlation coefficient, which measures the degree of linearity of the relationship between variables. The analysis is summarily presented in table 6 below.

As indicated above, rural development has a positive and strong relationship with transport infrastructure yielding a coefficient value of 0.09, with the implication that as transport infrastructural development increases, so does the level of rural development.

TABLE 6: SUMMARY OF CORRELATION ANALYSIS BETWEEN TRANSPORT INFRASTRUCTURE AND RURAL DEVELOPMENT

Correlation coefficient	0.09
Level of significance	95%
Coefficient of determination	81%
Degree of freedom	7
Calculated value	0.74
Table value	2.36

A test of significance at 95% level revealed that the relationship is significant. The coefficient of determination (R2) indicated that about 81% of the variations in the level of rural development is caused by transport infrastructural development. This implies that the low level of transport infrastructure in the area explains the equally low to medium level of rural development. One may then argue that even though rural development hinges to a great extent as such factors as the threshold population, politics and the degree of awareness.

CONCLUSIONS

This paper sought to examine the intricate web of relationships between transport infrastructure and rural development in Jos environs. Transport infrastructure was assessed based on three variables of connectivity, density and quality while rural development was on such indices as educational establishment, health facilities, electricity, water supply and postal services.

The findings revealed that:

a. There is low level of transport infrastructural development in the area.
b. There is average level of rural development.
c. The relationship between transport infrastructure and rural development is positive. This trend has led to the conclusion that the level of rural development in the area can be explained in terms of the level of transport infrastructure.

Owing to the above facts, in as much as transport infrastructural development could come in the form of constructing roads, energy should be geared by the local council towards improving the quality of the existing roads. By so doing, it will facilitate the movement of the rural people. Also, a physical planning procedures recommended here to decentralize the rate of provision of facilities to certain settlements that have above a specified limit.

REFERENCES

Adefolalu, A. 1977 The significance of transportation in Rural Development in Adejuyigbe O. et al (eds) Environment and spatial factors in rural Development in Nigeria, University of Ife Press.

Adelemo, I. 1987 Rural Development- The New Imperative. Journal of Nigeria Institude of Town Planning vol. Viii 1987, 85p.

Emry, J. 19086 Towns and Cities. Oxford University press, London

Faruques, R 1981 Social Infrastructure and services in Zambabwe: Oxford University, Washington Dc.

Haupt, A. 1990 Population Handbook, Oxford university press, London.

Meredius, M. 1990 World population: Fundamentals of Growth, Oxford University press London.

Olatunbosun, .D.1975 Nigeria Neglected Rural Majority. oxford University press, Ibadan .

World Development Report, 1994 Infrastructure for Development, Oxford university press, New York.

World Population Data Report. 2001 of the population Reference Bureau.