Assessment of Some Road Infrastructural Variables in Akwa Ibom State, Nigeria

UMOREN, V.[1*] SULE, R. O.[2] and ENI, D. D.[2]

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Abstract

It has been recognized that a good quality road infrastructure attract socio-economic development than the bad road condition. From this study, it was revealed that the study area has a total length of 6288km of roads. A total of 1272.6km (20%) constituted paved or tarred roads while about 5015.4km (80%) constituted unpaved or untarred roads. Information on road transport infrastructure variables was collected using field survey, questionnaire and data from relevant agencies. Factor analysis technique was applied to the fourteen variables to achieve a parsimonious description and identify the major factors which act as a pivot of road infrastructure quality development. From the analysis, two major factors were identified. Factor 1 identified and named as paved road and Factor 2, identified and named as unpaved road. The total variance for the factors is 55%. The study revealed that a greater percentage of the roads in the area are unpaved and it is recommended that efforts should be made to increase the length of paved roads in the area to attract socio-economic development.

KEYWORDS: Road, Paved, Unpaved, Socio-economic, Development.

Introduction

The spatial differences of phenomena on the earth's surface indicate that the different part of the earth provides various products that the people needs. Goods and Services can only be obtained by moving to the point of demand and supply and this can only be possible through transport (Akpoghomeh, 2003).

The transport infrastructure network in Nigeria is made up of all modern modes including air, pipeline, water, road, and rail. These constitute the major features of economic development in the country. This is primarily because the vast hinter-land of Nigeria provides comparatively higher opportunities for road infrastructure development than other modes of transport (Adesanya, 1999). The road infrastructure has continued to grow much more than other mode in terms of size of the road network and associated infrastructure.

According to Onakomaiya (1997), the length of motorable roads in Nigeria was 3,200km in 1914.In 1957 it rose to about 44,000km and by 1962 the length of all category of roads have risen to 71,870km . And later on to 114,768km in 1980 (First National Rolling Plan 159). By 1998, the total lengths of roads in Nigeria were estimated to be 193,200km out of which the federal government controls 34,123km. In Akwa Ibom State, the total road length as at 2006 was about 6288km.(Umoren, 2008).

The spread of development in Akwa Ibom State may be promoted or otherwise, and to some extent inequalities in socio-economic development addressed when there are adequate linkages among the regions as good road infrastructure leads to even development and growth. The absence of good road infrastructure may undermine productive process and may further retard economic expansion.

[1]*Department of Urban and Regional Planning University Of Uyo, Nigeria. Corresponding author's email: vicmoor2000@yahoo.com*
[2]*Department of Geography and Regional Planning University Of Calabar, Nigeria*

Transport infrastructure has been viewed as perhaps the prime mover in the analysis of spatial structure and functions. Consequently, areas with good road infrastructure tend to benefit more from the provision of social amenities than their counter parts with bad road conditions.

Ezirim (2003) observed in Nigeria about 26% of the paved road network was in poor condition requiring rehabilitation and reconstruction while 42% was in fair condition that requires resurfacing to prevent further decline to poor conditions. The conditions of unpaved roads were even worsening.

In Akwa Ibom State, heavy investment has and is still being made by government on the construction of new roads and rehabilitation of existing ones(Umoren,2008). Most of the bitumen surfaced roads are in very poor condition, with potholes, cracks and other signs of pavement distress showing at many places reflecting lack of sustained maintenance causing problems to the free flow of traffic and resulting in increased travel time and transport cost. Akwa Ibom State is connected with a network of Federal, State and Local roads having a total length of about 6,288km, of this 602km (9.6%) are under Federal control, 2159.2km (34.3%) under State roads and the remaining 3526.8km (56.1%) are earth/local roads constructed by local government (Umoren, 2008). A further breakdown on the quality of the road network in the state indicates that of the 6,288km of roads, a total of 1272.6km (20%) constituted paved or tarred roads in the state while about 5015.4km (80%) constituted unpaved or untarred roads. A fraction of 20% which is tarred/paved road is the all weathered road in the state while the remaining 80% are roads which cannot be used in all seasons because of their condition (Umoren, 2008).

Unsurfaced roads which form the greater length of all roads in the study area , have many disadvantages as not all of them can be use in all seasons, maintenance costs are high and they reduce the economic life of vehicle. The neglect of road transport infrastructure in the study area has been obvious and the existing road transport infrastructure is deficient and poor accessibility is prominent. In terms of the quality, a greater number of the roads in the area are single lane and narrow. Potholes, depressions and sagging surfaces are common features on the roads which impede free flow of traffic. The study is aim at assessing some road infrastructure variables and the dimension of road development in the study area.

Methodology

The data for this study was collected from two main sources, the primary and secondary sources. The Primary sources consist of data collected from field survey and questionnaire administered to respondents (i.e. head of household). The other sources consist of data collected from relevant agencies. A two stage sampling method (Uzoagulu, 1998) was used to draw up the sample areas or nodes and the respondents which the structured questionnaire was administered. In the first stage, a sample of 24 areas or nodes was selected out of a total of 31 areas or nodes identified in the study area. A random sampling technique was employed to select the 24 areas or nodes from 31 areas or nodes using the first two columns of the table of random numbers.

A sample size of 400 (0.01%) from the total population of 2.8m from the 24 sample areas constitute the respondents for the study. The population of chosen sample areas was expressed as a percentage of the total population of the 24 sample areas and this was used to determine the number of questionnaire for each area. The final selection of the number of respondents to be interviewed in each of the 24 sample areas was carried out randomly but the total number in each was based on the percentage of population of each sample areas as compared with the total sample population. The road transport infrastructure development variables measured within the study area includes; accessibility index of nodes, road density, length of roads in sample areas, percentage of tarred and untarred roads in sample areas, road signs/furniture, road maintenance equipment/machine, road quality rating, kilometers of tarred and untarred surface roads per population, total budget on transport (2006) and actual

expenditure on road transport (2006). These variables were measured in the field converted to rate and mean as shown in table 1. A factor analysis technique was applied to the fourteen variables to achieved a parsimonious description and identify the major factors, which act as a pivot of road transport infrastructure development quality within the area.

Findings and Discussion

A factor analysis technique (Udofia, 2005) was carried out on the 14 variables measured in the area to identify major dimensions of road quality in the area. Two of such factors were identified. Details of the factor loadings, the Eigen values and the proportion of variance accounted for by each factors are shown on table 2. The two factors as indicated in table 2 accounts for 55 percent of total variance in the original primary variables and may be seen as composite indicators defining patterns of road transport quality in the study area. This solution thus confirms the notion that differences in road quality accounted for by differentiating between paved and unpaved road affect development.

The first factor defined by five items related to paved road. This factor is referred to as paved road quality factor. The variables loading on factor one are between 0.680-0.942. The variables are paved roads, percentage of paved roads, maintenance equipment/machine, tarred surface road per population and tarred surface road per sq.km. The second factor is identified as unpaved road quality factor. The variables loading ranges from 0.400-0.995. Unpaved road and total length of roads are highly significant. Road density and percentage of unpaved roads load moderately.

Conclusion/Recommendations

The study attempted an analysis of the road quality dimensions in Akwa Ibom State, Nigeria. From the factor analysis result, it classified the road quality in the study area into two main dimensions. The paved road quality which accounts for 23.2% of the total variance and the unpaved road quality which account for 31.7%. For factor 1 these variables were significance paved roads(0.942),percentage of paved roads (0.816),percentage of unpaved roads(0.816). Road maintenance equipment/machine (0.680).Tarred surface road per population (0.808) and tarred surface road per sq.km(0.891) and for factor 2 the variables include road density(0.594), unpaved roads(0.995) and total length of roads(0.978). From the analysis, it was revealed that a greater number of the roads in the study area were unpaved. There is an urgent need for the development of the unpaved road infrastructure to paved roads if an even socio-economic development is to be achieved in the area. Efforts should be concentrated more on improving the quality of existing roads by increasing the length of paved roads which now stands at 20% of the total length of all roads in the state to at least 60% within the next five years. There is need for objectivity in road infrastructure development in a more spatial terms in order to address the present neglect experienced in the area to benefit from multiplier effects of good location decision and to generate further socio-economic development.

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Table 1: Road Transport Infrastructure Variables

	Areas	Accessibility index of nodes	Road density	Paved roads (km)	Unpaved Roads (km)	Total length of Roads	% of paved roads	% of unpaved roads	Road signs/ furniture	Road maintenance, equip/machine	Road quality rating	Tarred surface Road per Pop.	Tarred surface road Per (sq.km)	Total budget on transport (₦m)	Actual expenditure on road transport (₦m)
1	Abak (AB)	2.3	0.6	37.7	114.7	152.4	24.7	75.3	2.0	2	1.5	0.2	0.14	30	20
2	Eastern Obolo (EO)	3.2	1.2	20	121	141	14.2	85.3	0	0	1.0	0.9	1.17	32	12
3	Eket (Ek)	2.7	1.2	132	86.5	218.5	60.4	39.6	2.3	2	1.1	1.0	0.75	25	5
4	EssienUdim (EU)	4.2	1.2	55	309	364	15.1	84.9	0	1	1.0	0.3	0.18	65	40
5	Esit Eket (EE)	3.1	0.2	26	15	41	63.4	36.6	0	0	1.1	0.4	0.16	35	25
6	Etinan (ET)	3.1	1.1	63.3	151	214.2	29.6	70.4	0.8	0	1.0	0.5	0.34	10	5.6
7	Ibeno (IB)	3.6	0.1	3	16	19	15.8	84.2	0	0	0.8	0.05	0.01	13	3.8
8	Ibesipo Asutan (IA)	2.8	2.6	70	431	501	14	86	1.1	1	1.5	0.6	0.36	15	6.5
9	Ibiono Ibom (BM)	3.3	0.8	11	262	273	4.0	96	0.9	0	1.2	0.07	0.03	53.9	13
10	Ikono (IK)	4.3	0.3	4	146.3	150.3	27	97.3	0.8	0	1.2	0.03	0.01	10	7.2
11	Ikot Abasi (IA)	3.3	0.9	62	256.6	318.6	19.5	80.5	1.1	2	1.5	0.6	0.18	22	11.2
12	Ini (IN)	4.0	0.4	30	99	129	23.3	76.7	0	1	0.8	0.3	0.09	14.5	8.2
13	Itu (IT)	3.6	0.7	23	170	193	11.9	88.1	0.1	0	1.0	0.2	0.08	9.8	5.3
14	Mbo (MB)	3.8	0.2	20	63.6	83.6	23.9	76.1	1.1	0	1.4	0.2	0.05	8.5	5.2
15	Mkpat Enin (ME)	2.9	1.1	47	346	393	12	88	1.1	1	1.2	0.3	0.14	12.3	8.2
16	Nsit Ibom (NI)	2.3	1.7	15	179.1	194.1	7.7	92.3	0.1	1	1.5	0.2	0.13	10	2.3
17	Nsit Ubom (NU)	2.9	0.8	5	197.5	202.5	2.5	97.5	1.1	0	1.1	0.04	0.02	8.5	4.2
18	Obot Akara (OA)	3.5	0.3	25.2	49.8	75	33.6	66.4	0	0	1.1	0.3	0.11	14	6.2
19	Okobo (OK)	3.5	0.2	27.9	49.6	77.5	36	64	0.6	0	1.0	0.3	0.07	12	4.2
20	Onna (ON)	3.4	1.6	147.3	144	291.3	50.6	49.4	2.1	2	2.0	0.9	0.84	13.5	5.3
21	Oruk Anam (OA)	2.8	0.8	117	332.9	449.9	26	74	0.3	3	1.0	0.6	0.22	29.3	6.3
22	Udung Uko (UU)	3.9	1.7	7	106.5	113.5	6.2	93.8	0.8	0	1.2	0.2	0.10	20.7	5.1
23	Ukanafun (Uk)	3.8	0.8	52	171.4	223.4	23.3	76.7	0.8	1	1.4	0.4	0.20	15.8	5.9
24	Uruan (UR)	3.3	0.8	15	341	356	4.2	95.8	1.1	0	1.3	0.1	0.03	15.5	6.5

Source: Author's Data Field Survey (2006)

Table 2: Factor analysis and dimensions of road infrastructure quality in Akwa Ibom State, Nigeria

Factor	1	2
Eigen value	3.245	4.451
Percentage of variance	23.179	31.794
Cummulative % of total variance	23.179	54.975
Variables Factor Loading		
Accessibility index of nodes	-0.225	-0.213
Road density	0.190	0.594*
Paved roads	0.942*	0.323
Unpaved roads	0.095	0.995*
Total length of roads	0.207	0.978*
% of paved roads	0.816*	-0.400
% of unpaved roads	-0.816*	0.400
Road signs/furniture	0.456	0.178
Road maintenance equipment/machine	0.680*	0.401
Road quality rating	0.290	0.263
Tarred surface road per population	0.808*	0.117
Tarred surface road per sq.km	0.891*	0.140
Total budget on transport	0.049	0.218
Actual expenditure on road transport	-0.006	0.115

Source: Authors Data Analysis, (2007).* Indicate statistical significance of the variables.