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CONSTRAINTS TO SUSTAINABLE RURAL TRANSPORT INFRASTRUCTURE DEVELOPMENT IN ENUGU STATE, NIGERIA

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ABSTRACT

The aim of this study is to determine the physical and socio-economic factors militating against a sustainable improvement of rural transport infrastructure (RTI) in Enugu State, Nigeria. To achieve the aim, a survey was conducted using 224 respondents comprising 14 Heads of Works Departments of the 14 Local Government Areas under this study and 140 chairmen of Works Committees from randomly selected town unions in the area At the end of the survey, 24-predictor variables were identified militating against the sustainable improvement of RTI in the study area. The major statistical technique adopted in the analysis is the Principal Component Analysis (PCA) which was able to reduce our 24-predictor variables to 8 major components that deter the sustainable improvement of RTI in the area. These eight major components together explained 88.71% of the cumulative variance of our PCA, and thus leaving 11.29% of the total variance unexplained. Based on our findings, recommendations are made on how a sustainable RTI improvement will be achieved in Enugu State.

Keywords: sustainable improvement; rural transport infrastructure; Enugu State; statistical techniques; Nigeria

INTRODUCTION

Rural Transport Infrastructure (RTI) consists of commonly referred to as rural roads, tertiary roads, district roads, local government council roads, feeder roads and access roads. (Lebo and Schelling, 2001). It also includes tracks, and paths commonly known as community roads. RTI is thus a broader concept than the conventional term "rural roads" because it includes both the lowest level of the designated network for which the government has direct responsibility and undesignated network.

The RTI network is the lowest level of the physical transport chain that connects the rural population and, therefore, connect the majority of the poor to their farms, local markets and social services such as schools and health centres, potentially increasing their real income and improving their quality of life (Lebo and Schelling, 2001). RTI is fundamental to the socio-economic transformation of rural areas. It provides link between the rural areas and urban centre, and facilitates the movement of goods, people and service between the rural communities and other villages. As a result, RTI should be sustainable so as to play its role in rural development. Sustainable RTI is transport infrastructure in rural area that is effectively and efficiently planned, designed, built, upgraded continuously and preserved by means of integrated policies respecting the environment and still providing the expected socio-economic services in terms of mobility, safely and accessibility. Socially, we mean that RTI should meet continuously the household needs in terms of mobility (improvement in rural households journeys and transport activities), safely (reduction in the numbers of deaths of and injuries to rural households) and physical accessibility to facilities and services such as health care, markets, farms etc, ensuring social cohension in rural communities. Economically, we mean that RTI should actively contribute to maximizing the overall competitiveness and productivity of rural economies, contributing to a sustained high level of GDP growth of the nation.

Sustainability is the capacity for continuance into the long term future. Anything that can go on being done on an indefinite basis is sustainable. Anything that cannot go on being done indefinitely is unsustainable (Centre for Sustainability, 2004).

In spite of the contribution of RTI to the rural economy, the condition of RTI in many states in Nigeria, especially in Enugu State is very pathetic and unsustainable and do not have adequate capacity for continuously meeting the needs of rural households into the long future in terms of mobility (improved households journeys and transport activities) and accessibility to facilities and services. Owen (1966) noted that where roads are impassable, transport costs are high and where marketing is uncertain, progress in agriculture and indeed rural development will be curtailed. Therefore, adequate and reliable RTI improves rural productivity, enhance physical access, reduce poor people's vulnerability to shocks and stress and enable them to build their livelihood assets (Ellis, 1999, Davies, 2000). Therefore, there is the need to ensure a sustainable RTI development and adequate regular improvement of it in order to facilitate the socio-economic transformation of rural area in Enugu State.

Enugu State is predominantly rural. Over 85 percent of the state population live and work in rural areas (Ugwuoke, 1996; Enugu State Government, 2006). Enugu State government with the knowledge of its rural environment and the need to

improve accessibility and mobility of rural dwellers, has embarked on many programmes to develop and improve RTI in the state to a sustainable level. For instance, from the inception of the civilian administration in Nigeria in 1999, Enugu State Government had committed billions of naira in the reconstruction, rehabilitation of RTI linking many rural communities (Estimates of Enugu State of Nigeria Capital Expenditure, 2010). The World Bank assisted Local Empowerment and Environment Management Project (Leemp) in Enugu State launched on July 27, 2004 is also involved in the provision and improvement of RTI in rural Enugu State in partnership with rural communities to enhance accessibility and mobility of rural dwellers (Ugwuoke, 2006) Furthermore, in the year 2000, Enugu State established community Development Coordinating Council (CDCC) to partnership with rural communities in Enugu State for the provision of RTI such as roads, bridges and other rural socio-economic facilities to improve the living standard of the rural dwellers (Nweze, 2003). The Local Government Councils (LGCs) of the seventeen Local Government Areas (LGAs) in the State are also the major shareholders in the provision of rural RTI like roads, bridges and culverts. Communities through self help project programmes have in different degrees contributed in the provision and improvement of RTI in rural Enugu State.

Despite the efforts of the shareholders (governments, NGOs and rural communities) concerned with the provision and improvement of RTI in rural Enugu State, the condition of RTI in the state is very deplorable and unsustainable. For instance, Ugwu (2009) identified that most of the farm access and rural roads leading to commercial poultry farms in Enugu State are inaccessible during the rain season which makes it difficult for poultry farmers to bring in production inputs and evacuation of poultry birds and products. Many rural areas in the state with high agricultural potentials, abundant natural resources and other rural enterprises remain cut off from major urban centres in the state due to inadequate and poor conditions of RTI (Eneje 2001; Ikejiofor, 2006; Madu, 2007; Ali and Obeta 2010). Then one could rightly ask why? Could the failure to have sustainable RTI development be due to human factors or due to environmental factors? Thus the focus of this paper is to determine the underlying factors responsible for the continuous worsening conditions and unsustainability of RTI in rural Enugu State, the efforts to sustain them by the stakeholders notwithstanding.

AREA OF STUDY

Enugu state is one of the 36 states of the Federal Republic of Nigeria. The State is located approximately between latitudes $5^{o}55^{'}$ and 7^{o} $08^{'}$ North of the Equator and longitudes 6^{o} $35^{'}$ and 7^{o} $55^{'}$ East of the Greenwich Meridian. The state is bounded in the East by Ebonyi State, in the West by Anambra State, in the North by Benue and Kogi States and in the south by Imo State (Fig 1). The state is presently made up of 17 Local Government Areas (LGAs). However, this study covers only 14 LGAs out of the 17 LGAS (Fig 1). This is because the remaining 3 LGAs – Enugu East, Enugu North and Enugu South LGAs – are largely urbanized and as a result, fall out of the scope of this study. The total population of the area according to 2006 population census was 2628625 persons.

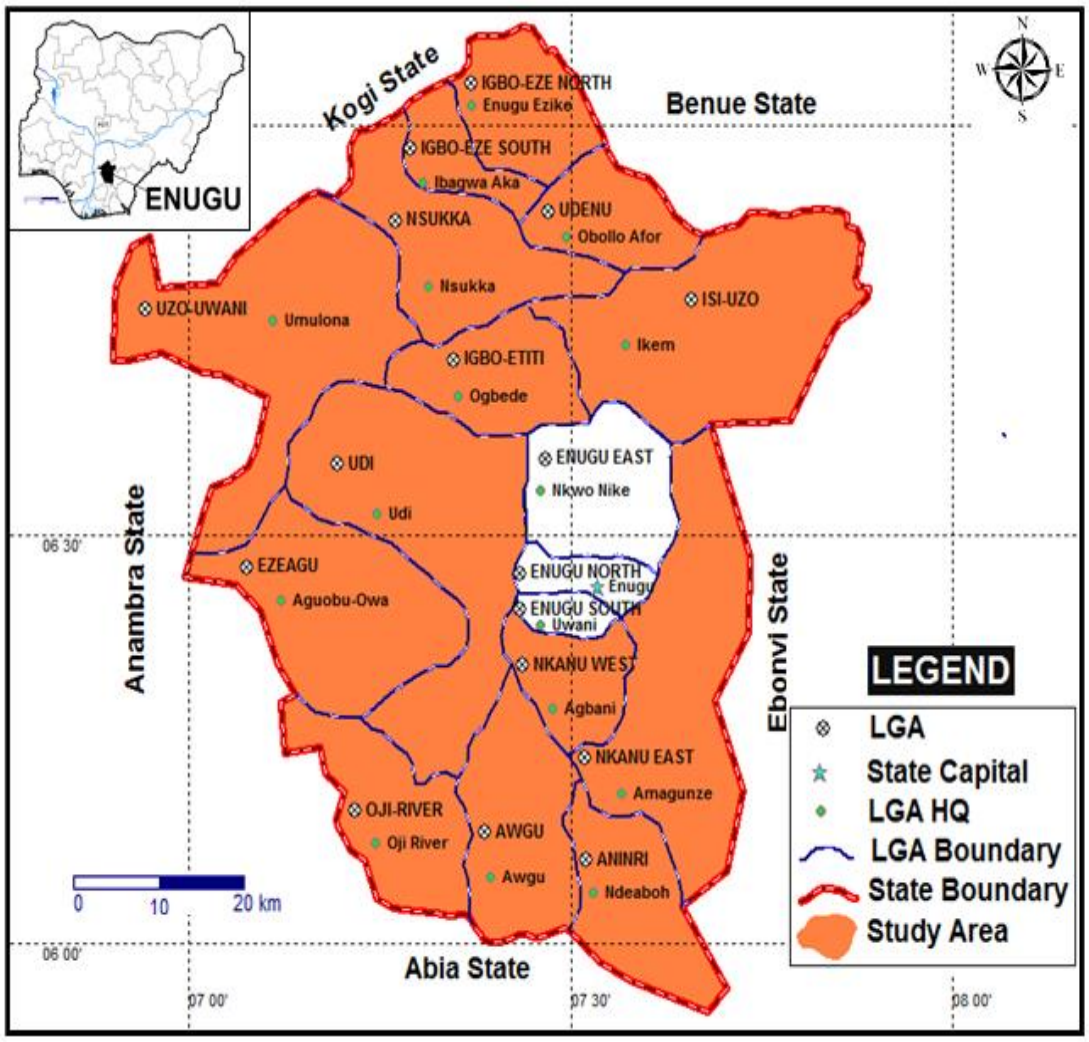

FIG.1: MAP OF ENUGU STATE SHOWING THE STUDY AREA (Source: State ministry land and survey Enugu,2010)

METHODOLOGY

Data Collection

Data were collected from the use of questionnaire and oral interviews between October 2010 and June 2011 using 14 Heads of Works Departments of the 14 LGAs involved in this study plus 140 chairmen of Works Committee of randomly sampled 140 Town Unions (ie a sample of 10 town unions from each of the 14 LGAs in the study area). The content of the questionnaire include whether human factors such as capacity to manage RTI, socio-economic and environmental factors are responsible for the poor condition of RTI in the area. Field observation was also used in the collection of data. A total of 24 socio-economic and environmental factors associated with the bad conditions of RTI in the area despite government, community and Non-governmental organizations efforts were collected and recorded in Table 1.

Data Analysis

In analyzing the parametized data presented in Table 1; Multiple Correlation Statistical Technique and Principal Component Analysis (PCA) were used. Multiple Correlation was used to establish relationship between the 24-socio-economic and environmental factors that are responsible for the poor state of RTI in the area which eventually resulted in a 24 x 24 matrix of inter-relationships as shown in Table 2. Furthermore, our field data were subjected to PCA because of the observed inter-correlations that characterize them. The PCA when performed with varimax rotation and Kaiser normalization, was able to produce a parsimonious number of clearly defined orthogonal factors that can best explain the variations in the observed data matrix.

Analysis was achieved with the aid of SPSS programme version 16 running under PC/windows 2007. PCA was mainly utilized in extracting the major underlying components responsible for the poor state of Rural Transport Infrastructure (RTI) in rural Enugu State. For the purpose of this study, our significant component loadings were considered from threshold value of $\pm$0.60. This cut off value of $\pm$0.60 is an arbitrary decision rule based on the size of the component loadings to ease interpretation (Johnson, 1991.)

RESULTS AND DISCUSSION

The data on 24 – predictor variables were transformed into a matrix of inter-correlations between the variables to know the strength of their inter-correlations. The lower diagonal of the correlation matrix is presented in Table 2

Table1: Variables Responsible for the Bad Condition of Rural Transport Infrastructure (RTI) in the Area

Label	Variable Description
X1	Lack or/and inadequate ability to manage RTI
X2	Lack of appropriate equipment for RTI works
X3	Inadequate implementation of routine and periodic maintenance work
X4	Few able bodied men in rural community.
X5	Poor quality at the time of original design and construction
X6	Nature of soils
X7	Encroachment on RTI by adjoining land owners.
X8	Multiple stakeholders in the planning and management of RTI
X9	Costs of construction and maintenance
X10	Influence of intra- and inter-community/village conflicts
X11	Weak data collection for RTI inventory
X12	Poor supervision of RTI projects
X13	Lack or inadequate private sector participation in the development of RTI
X14	Community expectations from the government.
X15	Erosional and flooding activities
X16	State and local politics
X17	Inadequate or/and lack of trained and skilled public workers for RTI works.
X18	Misappropriation and embezzlement of public funds
X19	Poor remuneration of staff of public works departments
X20	Inadequate funding of the local government for the development of RTI
X21	Nature of topography
X22	Poor systems of accounting and auditing of public funds.
X23	Choice of work methods for construction and maintenance of RTI
X24	Rural poverty

Table 2. Correlation matrix of the factors responsible for bad and deteriorating condition of rural transport infrastructure (RTI) in the area.

VA	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	B13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23	X24
X1	1.000																							
X2	-237	1.000																						
X3	.455	.123	1.000																					
X4	.639*	-.146	.482	1.000																				
X5	.550*	.203	.431	.534*	1.000																			
X6	-	.318	-.463	-	-.089	1.000																		
X7	.187	-.187	.407	.625*	.310	-.280	1.000																	
X8	-.046	.316	.022	-.118	.110	.323	-.134	1.000																
X9	-.175	-.146	.214	.001	-.068	.022	.264	.059	1.000															
X10	-.288	-.017	.016	-.073	.120	.184	.084	-.132	.057	1.000														
X11	-.090	.047	-.238	-.344	-.253	.416	-047	.274	.090	231	1.000													
X12	.051	.446	.500*	-.027	.048	.189	-.240	.291	-.091	-082	-.147	1.000												
X13	.385	.036	.066	.587*	.510*	-.232	.543*	-.165	-.037	-.176	-.018	-.386	1.000											
X14	-.091	.324	-.081	-.422	.040	.276	-	.466	.164	-.160	.262	.182	-.284	1.000										
X15	-.236	-.107	-.417	-.411	-.181	.513*	-.147	.214	.085	.242	.072	.098	-.399	.288	1.000									
X16	.410	-199	.419	.389	.459	.008	.548*	.326	.011	.264	.128	.313	.404	-.198	.027	1.000								
X17	.200	.438	.536*	.360	.466	.033	.160	.431	.173	.055	-.387	.670*	-.053	..104	.077	.572*	1.000							
X18	-.092	-.237	.247	.273	.255	.171	.515*	.124	.631*	-.097	-.096	.024	.140	.029	.143	.256	.292	1.000						
X19	.055	.451	.273	-.269	.154	.329	-.433	.239	.083	-.144	.016	.735*	-.438	.632*	.348	.068	.440	.110	1.000					
X20	.305	.372	.080	.365	.608*	.081	.359	.260	.147	-.109	.125	-.099	.737*	.284	.042	.510	.239	.235	.084	1.000				
X21	.043	.395	.229	.574*	.457	-.226	.321	.290	.129	.076	-.394	-.054	.510*	-.045	-.426	.168	.448	.206	.233	.508*	1.000			
X22	-.134	.395	-.247	-.113	-.072	.057	-.322	.210	-.453	.306	-.420	.264	-.269	.013	.380	-.020	.351	-	.108	-.049	.173	100		
X23	.151	.0708	.219	.267	.417	.096	.134	.538*	-.088	.016	.240	.231	.252	.388	-.073	.406	.410	-.112	.236	.656*	.542*	.275	1.000	
X24	.352	.302	.435	.133	.658*	.121	.044	.511*	-.115	.216	.096	.322	.194	.450	.019	.392	.341	.035	.342	.538*	.244	.027	.597	1.000

*** Significant coefficient ± 0.50 at 0.05 confidence level**

The correlation matrix in Table 2 shows that some of the independent variables are highly correlated with each other while others show very small or low correlation. For instance, variable X12 (Poor supervision of RTI projects) has strong correlations with variables X17 (Inadequate or/and lack of trained and skilled workers for RTI Works) and X19 (Poor remuneration of staff of public works departments). In other words, poor supervision of RTI projects has strong relationship with inadequate or/and lack of trained and skilled workers for RTI works (X17) and poor remuneration of staff of public works departments (X17). The interpretation of the above explained relationships is that the poor conditions of RTI in the study area could be attributed to poor supervision of RTI projects and poor remuneration of staff of public works departments. Conversely variables X10-Intra-and inter-community/village conflicts and X11-weak data collection of RTI Projects are sometimes negative coefficients with all the attributes assessed. This, therefore, means that X10 and X11 in the study area are in no way significantly related to the poor condition of RTI in the area.

Principal Component Analysis (PCA) was carried out using the SPSS programme version 16 running under PC/Window 2007. For the purposes of this research, our significant component loadings were considered from an arbitrary threshold of ∓ 0.60 based on the size of our component loadings and is thus chosen in order to ease interpretation. Our results of varimax rotation are presented in Table 3. Varimax rotation was applied to the components so that the loadings on some variables are either increased or decreased. This enables clearer interpretation of the components. From Table 3, it could be seen that our rotated component matrix have reduced the initial twenty-four variables responsible for the bad and worsening condition of RTI in the study area to eight (8) underlying components. These eight underling components together explain 88.7% of the total variance in the PCA, leaving only 11.3% of the total variance unexplained.

Table 3: Rotated Component Matrix for Rural Transport Infrastructure

	Component							
Variables	1	2	3	4	5	6	7	8
X1	0.802*	-2.39	0.127	0.009	-0.184	-0.226	0.009	-0.346
X2	-0.009	0.833*	0.298	-0.125	-0.206	-0.008	-0.001	0.005
X3	0.401	-0.006	0.633*	0.178	0.244	-0.541	0.005	0.111
X4	0.534	0.004	-0.003	0.490	0.128	-0.358	0.401	-0.147
X5	0.812*	0.255	0.007	0.100	0.103	-0.007	0.171	0.161
X6	-0.279	0.322	0.007	-0.112	0.105	0.613*	-0.420	0.231
X7	0.297	0.002	-0.121	0.765*	0.410	-0.123	-0.006	0.008
X8	0.009	0.585	0.256	-0.143	0.008	0.300	-0.128	-0.139
X9	-0.104	0.005	0.002	-0.006	0.876*	-0.003	-0.008	0.003
X10	0.008	-0.003	-0.004	0.005	-0.004	0.141	0.151	0.957*
X11	-0.005	0.144	-0.130	-0.004	0.001	0.009	-0.916*	0.157
X12	-0.002	0.186	0.922*	-0.007	-0.009	0.004	0.004	-0.005
X13	0.514	0.274	-0.509	0.423	0.008	-0.222	0.002	-0.175
X14	0.162	0.326	0.009	-0.839*	0.153	0.187	-0.183	-0.010
X15	-0.002	-0.118	0.103	-0.140	0.005	0.937*	0.005	0.101
X16	0.449	0.292	0.361	0.617*	0.006	0.168	-0.169	-0.275
X17	0.200	0.406	0.691*	0.235	0.167	0.113	0.412	-0.005
X18	0.120	-0.002	0.009	0.183	0.907*	0.162	0.007	-0.006
X19	0.129	0.136	0.700*	-0535	0.008	0.220	-0.006	-0.009
X20	0.637*	0.597	-0.243	0.008	0.205	0.145	-0.003	-0.131
X21	0.178	0.682*	-0.179	0.174	0.203	-0.315	0.515	0.005
X22	-0.145	0.302	0.156	-0.002	-0.604*	0.392	0.528	0.150
X23	0.361	0.853*	0.117	-0.001	-0.120	-0.004	-0.009	0.002
X24	0.720*	0.385	0.272	-0.187	-0.003	0.003	-0.202	0.297
Eigenvalue	**5.787**	**4.591**	**2.617**	**2.400**	**1.999**	**1.455**	**1.353**	**1.084**
%of variance	**15.07**	**14.76**	**12.73**	**11.12**	**10.36**	**9.79**	**8.73**	**6.15**
Cumulative%	**15.07**	**29.83**	**42.56**	**53.68**	**64.64**	**73.83**	**82.56**	**88.71**

- Significant loadings are $\pm$ 0.60

Interpretation of the underlying components for rural transport infrastructure.

From Table 3 component 1 has an eigenvalue of 5.79 and accounts for 15.1% of the total explained variance. The component has high loading on X1 (lack of/ and inadequate ability to manage RTI) which gives impression that the right workers are not employed to handle and manage RTI works, X5 (poor quality at the time of original design and construction of RTI) which makes the RTI, for example, roads to go bad soon after construction, X20 (inadequate funding of the local government for the development of RTI) which affects the quantity and quality of RTI and X24

(rural poverty) which limits the efforts of the rural communities to develop and maintain RTI in their areas. The underlying component then becomes **weak resource base of local government and rural community** .

Component II has an eigenvalue of 4.59 and accounts for 14.8% of the total explained variance. It has loadings which score highly on the two of the three variables involved – X2 (lack of appropriate equipment for RTI works) which hinders effective performance of the staff of the public Works Departments of LGAs and community efforts to improve the RTI in their areas, X_{21} (nature of topography) which determines to a great extent the design and technologies to be used in construction and maintenance of RTI and X23 (choice of work methods for construction and maintenance of RTI) which express itself in the durability and serviceability of RTI. If the wrong or inappropriate work methods are employed in the construction and maintenance of RTI like roads, tracks, paths and bridges etc. then, the life-span of such RTI will be shortened because they will be vulnerable to agents of denudation. This component II has therefore been identified as the **inappropriate use of technology in relation to topography/terrain.** Component III has eigenvalue of 2.62 and accounts for 12.73% of the total explained variance. It has high loadings on X3 (inadequate implementation of routine and periodic maintenance works) which affects the sustainability of the infrastructure of use after construction, X12 (poor supervision of RTI projects) which expresses itself in poor execution of construction and maintenance works, X17 (inadequate or/and lack of trained and skilled workers for RTI works at local level). This express itself in the wrong use of technologies and poor performance in design and execution of works by public works departments of LGAs in the state and X19 (poor remuneration of staff of the public works departments) which leads to low moral of the staff to work and inadvertently encouraged the staff to supplement their incomes through moonlighting and pilfering resulting in poor performance of their works. Therefore, component III has been identify as **the deficiency in managerial capacity**. This component highlights the fact that there is no managerial capability to manage RTI development to achieve their sustainability in the state.

Component IV has eigenvalue of 2.4 and accounts for 11.12% of the total explained variance. It has high loadings on X7 (encroachment on RTI by adjoining landowners) which is expressed in using part of RTI such as roads, tracks, paths for cultivation and as source of sand harvesting for construction purposes, X16 (state and local politics) which express itself in lack of political will by the politicians to develop RTI in the area and X14 (community expectations from the government). This is demonstrated by some communities in waiting for the government to come and do their "job" since they pay taxes and rates. Then, the underlying component of the three variables is **community perception of government projects and biased political influence.**

Component V has eigenvalue of 2. 0 and accounts for 10.36% of the total explained variance. It has high loading on X9 (costs of construction and maintenance). The costs of construction and maintenance of RTI such as roads, bridges etc. are high and limit to some extent the efforts of both the government and communities to execute such projects in the areas, X18 (misappropriation and embezzlement of public funds) which frustrate the efforts of both the governments, NGOs and the communities in sustaining the development of RTI in their area and X22 (poor systems of accounting and auditing of public funds) which creates ways and encourage the diverting of public funds meant for the development of RTI to private pockets. Therefore, the underlying component becomes **high costs and mismanagement of public funds.**

Component VI has eigenvalue of 1.46 and accounts for 9.79% of the total explained variance. It has high loadings on X6 (nature of soils). Some soils even if well compacted and drained, are still too weak to resist shearing under the intended traffic load or may be too slippery for steep gradient, and X15 (erosional and flooding activities) which manifest themselves in washing away and submerging of some parts or whole infrastructure such as roads, tracks, paths and bridges thereby rendering them impassable in rain season. Then component VI has been identified as **environmental constraints**. Component VII has eigenvalue of 1. 35 and accounts for 8.73% the total explained variance. It has a high negative loading on XII (weak data collection for RTI inventory) which express itself in poor and inadequate planning for execution of RTI works. Some stakeholders in the planning and execution of RTI works do not know for example, the length of roads under their care and the lengths of roads that are not motorable and vice versa. Component VII has been identified as **inadequate knowledge of RTI.**

Component VIII has eigenvalue of 1.10 and accounts for 6.20% of the total explained variance. It has only one high positive loading on X10 (intra-and inter- community/village conflicts).The development of RTI such as roads, bridges, tracks and paths linking many communities, requires adequate co-operation and understanding among the linked communities to maintain them if the need arises. But when there is misunderstanding or disagreement between them, then, the possibility of such communities coming together to jointly execute projects of common interest to them becomes very remote. Again even within some communities, lack of peace has frustrate their efforts to main RTI in their areas. This component VIII has been identified as **community/village conflicts**

The PCA model has successfully transformed our 24- predictor variables to eight (8) underlying dimensions explaining the unsustainable development of RTI in Enugu State. The relative importance of the eight underlying dimensions are presented in column three of Table 4. Of the eight underlying dimensions, weak resource base of local government and rural community has the highest contribution of 15.07% to the poor and deteriorating condition of RTI in Enugu State. This factor is closely followed by inappropriate use of technology in relation to topography/terrain. With relative contribution of 14.76%. The contribution of this second factor is only 0.31% less than the first. The same scenario is also found with the third, fourth fifth etc. The implication of this is that no factor in the poor state of RTI in Enugu state dominates the others very clearly. The explanation of the eight underlying components are offered as follows:

The first component of weak resource base of Local government and rural community is very important especially as it underscores the importance of proper skilled labour and adequate funding of the LGA system and financial empowerment of the local communities to enhance their abilities to employ the right skills necessary to participate in designing, executing and improving the RTI projects to provide all year round access in rural communities. The local government councils in the study area should establish road trust funds (RTF) as it is being done in Ejigbo Local Council Development Area of Lagos State (Kunle, 2012) to complement the financial resources of the LGAs to fix an it is being done in Ejigbo Local Council Development Area of Lagos State (Kunle, 2012) to complement the financial resources of the LGAs to fix and maintain the bad RTI in the area. Local Government Councils with the help of State and federal governments and donor agencies should train staff of Works Departments and some community representatives plus financial assistance to enable them to directly participate in the maintenance of RTI in their respective areas.

Table 4: The relative importance of the underlying dimensions of the factors responsible for bad and deteriorating conditions of RTI in Rural Enugu State

1	UNDERLYING DIMENSIONS	RELATIVE CONTRIBUTIONS %	CUMULATIVE %
1	Weak resource base of local government and rural community	15.07	15.07
2	Inappropriate use of technology in relation to topography/terrain	14.76	29.83
3	Deficiency in managerial capacity	12.73	42.56
4	Community perception of government projects and biased political influence	11.12	53.68
5	High costs and mismanagement of public funds	10.12	53.68
6	Environmental constraints	9.79	73.83
7	Inadequate knowledge of RTI	8.73	82.56
8	Influence of community/village conflicts	6.15	88.71
9	Miscellaneous (other factors)	11.29	100.00

Component II is also very important as it deals with inappropriate use of technology in relation to topography in construction and maintenance of RTI. Some of the plants and methods used in the construction, rehabilitation and maintenance of RTI help to worsen the bad state of RTI in the area. So there is need to procure appropriate equipment and use appropriate work methods in relation to the nature of terrain in construction and maintenance of RTI to enhance the durability and serviceability of such RTI. Labour- intensive method of RTI maintenance –aprogramme that is being propagated by the International Labour Organisation-- should be highly applied in the area.

Component III deals with deficiency in managerial capacity to manage RTI in the study area. This component highlights the fact that there is lack/inadequate skilled staff, funds and methods of work to manage development of RTI to achieve their sustainability in the study area. In all the LGAs visited during the field surveys, there was no trained staff in Works Departments to care of RTI works. We gathered during the surveys that qualified staff for road works were not employed and even those unskilled staff employed, are not paid regularly because of paucity of funds of the LGA councils in the area. The State Government in conjunction with the Federal Government have to attract foreign supports for the LGAs in form of training and technical advice for the staff in-charge RTI works in the works Departments of LGAs in the area, to enhance their efficiency

Component IV explains the community perception that government projects in their areas are entirely the responsibility of the government to maintain and not the communities coupled with biased political influence on the location and the execution of RTI. This component underscores the need for awareness campaign for communities to take RTI projects in their areas as their own and protect and maintain them to the best of their ability because they the end users of the RTI. Politicians should be made to know that they should play politics for the development of all communities in their area and not for particular communities.

Component V explains high costs and mismanagement of public funds for RTI works in the study area. Even though the costs of RTI development are very high, the available funds for RTI works are mostly mismanaged by corrupt government officials and disgruntled politicians. Government in conjunction with communities where RTI projects are being executed should set up anti – corruption committees to monitor the designs and implementation of RTI projects and the detection and prevention of corruption practices. Because of the spate of corruption in Nigeria, the committees should be headed by Rev. Fathers or Pastors to make them effective.

Component VI concerns the environmental constraints to effective development and management of RTI in the study area. Negative impact of erosion, flood and soil on RTI development should be tackled by taking proper considerations of the environmental properties of a place especially, soil types and terrain morphology in construction, rehabilitation and maintenance of RTI to avert or reduce erosional and flooding impacts on them.

Component VII which is the inadequate knowledge of RTI is another important factor militating against the improvement of RTI in the area. Most of the shareholders involve in the development and management of RTI in the area do not have a fair knowledge of the nature and extent of the poor conditions of the infrastructures. Many of LGA officials interviewed during the field surveys could not give us the exact length of rural roads under care. This is because of the dearth of research and data on the condition of available RTI. Local government councils of the 14 LGAs in the study area in conjunction with the state or the federal government should carry out research on the types, nature and conditions of RTI in the area so as to obtain relevant data for effective planning and execution of RTI projects for sustainability.

Finally, component VIII deals with community/village conflicts as one of the major factor contributing to the poor state of RTI in the study area. During the field survey, intra-and inter-community/village conflicts were identified deterring the execution of many rural infrastructures including RTI in the area. The state and local governments in conjunction with the Elders – In- Council and youths of the communities where conflicts exist, should make necessary efforts to resolve them (conflicts) to achieve peace and enhance the improvement of RTI in the study area.

CONCLUSION

Rural Transport infrastructures (RTI) in Enugu State are cardinal to socio-economic transformation of rural areas. They are important in the increase of agricultural productivity and facilitation of spatial interaction among members of rural communities in the state. Despite the efforts of the governments, NGOs and rural communities in the provision and improvement of RTI in the study area, the condition of RTI is very deplorable and unsustainable and has reduced their (RTI) utility to the generality of rural population. This study has highlighted the various factors that have contributed to the bad condition and unsustainability of RTI in Enugu State. The major underlying components were extracted and used to explain the relative importance of the identified factors. Thus efforts should be intensified to tackle the identified problems through public private partnerships (PPPs) involving the state and Local governments, Non-government organizations and the rural communities to improve the deplorable condition of RTI and enhance their utility to rural communities in the area.

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