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The Impact of Road Infrastructure on Socio-Economic Development in Enugu State (2018-2022)

¹Anikeze Nnaemeka Hillary, ²Abonyi Jonas Uchenna and ¹Ugwunwangwu Maria Gloria Chinyereugo

¹Department of Public Administration, Faculty of Management Science Enugu State University of Science and Technology, Enugu State, Nigeria

²Department of Public Administration, School of Business Studies, Institute of Management and Technology (IMT), Enugu

Email: nnaemeka.anikeze@esut.edu.ng; gloria.ugwunwangwu@esut.edu.ng

ABSTRACT

This study investigated the impact of road infrastructure on socio-economic development in Nigeria from 2016 to 2021, the specific objectives of the study include; to determine the extent road infrastructure as impacted on agricultural production in Enugu state, to know the extent road infrastructure as contributed to employment creation in Enugu state, to ascertain the extent of road infrastructure as impacted on small medium enterprises (SMEs) in Enugu state, to examine the extent road infrastructure as impacted on education in Enugu state. The study was carried out in three communities in Enugu North, which include; Onuato, Umunevo and Ihenwuzi. The research design adopted for the study is descriptive survey research design. 750 resident in the three communities served as the population for the study while 261 respondents were sampled using Taro Yamane sampling techniques. A structured questionnaire developed by the researcher served as the instrument for data collection while the data collected from the respondents were presented in frequency table and analyzed using simple percentage while the chi-square was used for testing of the hypotheses at 0.05 level of significance and two degree of freedom. The findings of the study revealed; road infrastructure has significant positive impact on agricultural production in the study areas, road infrastructure has positive significant impact on employment creation in the study areas, road infrastructure has significant positive impact on small medium enterprises in the study area and that road infrastructures has significant positive impact on education in the study areas. Based on the findings; the following recommendations were made; both federal, state government and private sector should take road infrastructure serious especially link from rural to the urban areas for easy access in the agricultural sector of the country, road infrastructure should be maintain from time to time in order to elongate the life cycle of road infrastructure and its impact on socio economic development.

Keywords: Road Infrastructure, agricultural production employment creation, small medium enterprises (SMEs), education

INTRODUCTION

Infrastructure is a key element of poverty alleviation. It often acts as a catalyst to development and enhances the impact of interventions to improve the poor's access to other assets, e.g., human, social, financial, and natural assets. Its impact is felt both on the economic and social sectors [1-4]. Without roads, the poor are not able to sell their output on the market. In India, it has been shown that roads alone account for seven percent of the growth in aggregate output of the rural areas. Without electricity, the industrialization process, which provides the poor an important source of employment, is unlikely to take off. In Costa Rica, a retrospective review of the rural electrification experience through electrification cooperatives indicates that for one of these cooperatives the number of major businesses jumped from 15 to 86 after electrification [5-7]. Without potable water and sanitation health is at risk. The social and economic impacts often go hand in hand [8-11]. Roads are arteries of economic activity; indeed, roads link economic agents, markets, access to health, producers with consumers, workers with employers, students with schools and therefore play an essential role in any development agenda. Thus, expansion



of road infrastructure in the form of highways promises to increase wealth and create new opportunities for local businesses and households. Ultimately, it is to generate spillover effects through relocation of businesses, higher incomes of households, and increases in tax revenues for governments, as well as boosting overall economic activity in the affected localities [12-14]. The general objective of the study is to examine the impact of road infrastructure on socio-economic development in Enugu State while its specific objectives are: to determine the extent road infrastructure as impacted on agricultural production in Enugu state, to know the extent road infrastructure as impacted on small medium enterprises (SMEs) in Enugu state, to examine the extent road infrastructure as impacted on education in Enugu state [15-17].

Statement of Problem

Road infrastructure plays a crucial role by providing mobility for the efficient movements of people and goods, as well as providing accessibility to a wide variety of commercial and social activities. However, to achieve a sustainable economic development in the country, there are some problems the road infrastructure and socioeconomic development face in Nigeria, and all cannot be mentioned but this study deal with the major once every average Nigerian face. There are challenges Socio-economic development like Agricultural production, Employment creation, Small medium enterprises (SMEs), Education through the impact of Road infrastructure negatively. This is why the researcher has decided to use this research topic "the impact of road infrastructure on socio-economic development in Enugu State to provide solution to the above problem.

RELATED LITERATURE REVIEW

Road

A road is a linear way for the conveyance of traffic that mostly has an improved surface for use by vehicles (motorized and non-motorized) and pedestrians. Unlike streets, the main function of roads is transportation. There are many types of roads, including parkways, avenues, controlled access highways (freeways, motorways, and expressways), toll ways, interstates, highways, thoroughfares, and local roads. The primary Road construction requires the creation of an engineered continuous right-of-way or roadbed, overcoming geographic obstacles and having grades low enough to permit vehicle or foot travel, and may be required to meet standards set by law or official guidelines. The process is often begun with the removal of earth and rock by digging or blasting, construction of embankments, bridges and tunnels, and removal of vegetation (this may involve deforestation) and followed by the laying of pavement material. A variety of road building equipment is employed in road building. After design, approval, planning, legal, and environmental considerations have been addressed alignment of the road is set out by a surveyor. The radii and gradient are designed and staked out to best suit the natural ground levels and minimize the amount of cut and fill. Great care is taken to preserve reference Benchmarks Roads are designed and built for primary use by vehicular and pedestrian traffic. Storm drainage and environmental considerations are a major concern.

Infrastructure

Infrastructure is the set of facilities and systems that serve a country, city, or other area, and encompasses the services and facilities necessary for its economy, households and firms to function. Infrastructure is composed of public and private physical structures such as roads, railways, bridges, tunnels, watersupply, sewers, electricalgrids, and telecommunications (including Intern et connectivity and broadband access). In general, infrastructure has been defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions" and maintain the surrounding environment [18-20].

Road Infrastructure

Mobility should also be viewed as being related to long-term decisions such as shelter and employment types of locations, vehicle ownership and its usage for accessing the city. Mobility or accessing the city is crucial for everyone in the city. It is more crucial for poor people as it is linked with the possibilities of escaping poverty and deprivation. Geographers consider a wide range of modes that may be grouped into three broad categories based on the medium they exploit: land, water and air. Each mode has its own requirements and features, and is adapted to serve the specific demands of freight and passenger traffic. This study focused on road transport mode [8].

Social Development

Social development is a process which results in the transformation of social institutions in a manner which improves the capacity of the society to fulfill its aspirations. It implies a qualitative change in the way the society shapes itself and carries out its activities, such as through more progressive attitudes and behavior by the population, the adoption of more effective processes or more advanced technology. As you see in the illustration below, there is a close relation among environments, ways of living and technology.

Economic Development

Economic development is the development of economic wealth of countries or regions for the well-being of their inhabitants. Economic growth is often assumed to indicate the level of economic development. The term "economic growth" refers to the increase (or growth) of a specific measures such as real national income, gross domestic product, or per capita income. The term economic development on the other hand, implies much more. It is the process by which a nation improves the economic, political, and social wellbeing of its people.

Gross Domestic Product (GDP): The gross domestic product or gross domestic income (GDI) is one of the measures of national income and output for a given country's economy. It is the total value of all final goods and services produced in a particular economy within a country's borders in a given year.

National Income: The income earned by a country's people, including labour and capital investment. It is the total value of all income in a nation (wages and profits, interests, rents and pension payments) during a given period, (usually one year).

Per Capita Income: The total national income divided by the number of people in the nation. This is what each citizen is to receive if the yearly national income is divided equally among all.

Socio-Economic Development

Socio-economic development is the process of social and economic development in a society. Socio-economic development is measured with indicators, such as GDP, life expectancy, literacy and levels of employment. Socio-economic development, thus, is a process of improvement in a variety of ways. It has to influence all aspects of human life in a country. But do you think the concept of socio-economic development takes care of all aspects of development? Its major indicator, the GDP is a specific measure of economic welfare that does not take into account important aspects such as leisure time, environmental quality, freedom, social justice, or gender equality.

Theoretical Review

Neoclassical growth theory

Neoclassical theory, rooted in neoclassical equilibrium economics, explains growth in terms of the availability and the use of productive factor inputs. The theory was initially developed by Solow (1956) and it argues that development proceeds as firms and households make increasingly more efficient use of their labour, capital and natural resources. Neoclassical theory assumes diminishing returns to investment. It argues that provided there are no major barriers to the operation of market forces, in an integrated national space economy there are strong pressures leading to the general convergence of incomes over time. Disparities are unlikely to be persistent, since such inequalities will set in motion self-correcting movements in prices, wages, capital, and labour, which impart a strong tendency toward convergence.

Endogenous growth theory

There is a progressive dissatisfaction with neoclassical growth theory, this give rise to endogenous growth theory. Instead of assuming factors, in particular technological change and human capital, as exogenous by neoclassical growth theory, endogenous growth theory treats them as endogenous to the growth process [5].

Empirical Review

[4] carried out a research on the Socio-Economic Impacts of Road Infrastructure Development During- and Post-Construction in a Fast-Growing City in Nigeria. Road infrastructure is vital to the development of any human settlement and thus it remains an integral part of the municipalities' annual budget. Despite the numerous benefits road infrastructure development (RID) offers, its development imposes negative impacts. While literature is replete with studies on socio-economic impacts of RID at post-construction stage, attention has not been paid to impacts during construction. Consequently, this study aims at analyzing the socio-economic impacts of RID during- and post-construction in Abeokuta city in Nigeria. Multistage sampling technique was utilised in sample selection for the study. Both descriptive and inferential statistics were adopted for data analysis with the aid of Statistical Package for Social Sciences (SPSS). Findings from the descriptive analysis indicated that residents were adversely impacted during construction in areas such as business activities, travel rate, property value, vehicle condition and community health. Regression analysis revealed road development statistically impact on socioeconomic activities during construction with three out of nine predictors: transport fare (p=0.009), business activities (p=0.015), and community health (0.031) exerting the major influence. Also, at post-construction stage, regression analysis revealed road Development statistically impacts the socio-economic activities with four of the nine predictors: transport fare (p=0.042), business activities (p=0.009), community health (p=0.035), and property value (p=0.003) exerting the most significant influence. Student t-test results showed that statistical difference existed between 'during constructions' and 'post-construction' impacts regarding property value, business activities, community health and transport fare. Finally, the study suggested ways to mitigate problems associated with RID, particularly during construction. Nurmukhammad, (2020) researched on the measuring impact of road infrastructure on household well-being: evidence from Azerbaijan. Infrastructure is often seen as a critical factor in economic development. However, impact assessment for infrastructure projects is a challenge due to a number of methodological issues. Both developing economies and countries in transition could benefit from such studies to

better inform their future policies. In this paper, we assess the impact of road construction on some aspects of household financial wealth in the target communities in Azerbaijan. To that end, we construct a two-wave data set with regional data and household characteristics, spanning the course of eight years, and estimate the differentials created by regional-level access to national roads. The results show that road treatment increased monthly rent by AZN83-AZN110 per month, which is 50%-60% of the mean monthly rent in the baseline year. Also, the selfassessed wealth increased by 0.9 to 3.1 units as a result of road construction, which is economically significant. Our study finds that gaining access to roads does indeed have a positive effect on financial wealth in some contexts. This may have implications for the selection of target communities or spatial sequencing in the infrastructure improvement efforts of policy makers. [7], examined the Small and Medium-Sized Enterprises (SMEs): The Engine of Economic Growth through Investments and Innovation. Small and medium-sized enterprises (SMEs) are crucial for local economic development, playing a noteworthy role in job creation, poverty alleviation and economic growth, but they encounter many funding barriers. The purpose of the current paper is to investigate the impact of investments and innovation on territorial economic growth, as measured by turnover, for Romanian active enterprises, especially SMEs, over the period 2009-2017. By estimating several log-log linear regressions, the quantitative outcomes provide support for a positive influence of investments on turnover. The association was confirmed both for all active enterprises at the national level, as well as for micro, small, middlesized and big companies. As regards expenditures on innovation, a positive impact on turnover was acknowledged for all enterprises and particularly for big companies, but there was an absence of any statistically significant relation in the case of SMEs. The impact of firm size on turnover was positive for all active enterprises at the national level, along with active micro-units. Also, the estimation results show a positive impact of the number of active micro-units on territorial economic growth. The empirical findings are relevant to managers and policymakers in order to stimulate, encourage and offer support to SMEs' development through their strategies.

METHODOLOGY

The study was carried out in three communities in Enugu North, which include; Onuato, Umunevo and Ihenwuzi. The research design adopted for the study is descriptive survey research design. 750 resident in the three communities served as the population for the study while 261 respondents were sampled using Taro Yamane sampling techniques. A structured questionnaire developed by the researcher served as the instrument for data collection while the data collected from the respondents were presented in frequency table and analyzed using simple percentage while the chi-square was used for testing of the hypotheses at 0.05 level of significance and two degree of freedom.

DATA PRESENTATION AND ANALYSIS

In this chapter, data generated were presented, analyzed and interpreted. However, it commenced with the distribution and return of the instrument of data collected.

Presentation of Data	
Distribution and Return of Questionnaire	
Table 1: Questionnaire Distribution and Response R	late

Options	Number of Questionnaire Distributed	Number of Questionnaire Returned	% of Returned Questionnaire	Number of Valid Questionnaire	% valid Questionnaire
Passer-by	87	81	31.0	78	29.9
Household	87	86	33.0	80	30.7
Market sellers	87	73	28.0	71	27.2
Total	261	240	92.0	229	87.8

Source: Field Survey, 2023

Table 1 shows the 261 copies of questionnaires distributed, 240 copies representing 92% were returned while 229 representing 87.8% are valid copies. The valid copies are used for rest of the analysis of this work.

Data Relating to Research Questions

Table 2: Distribution of Responses	, to what	: Extent Roa	d Infrastructure	as	Impacted	on	Agricultural
Production in Enugu State							

Options	Great Extent	%	None	%	Little Extent	%	Total
Passer-by	30	13.1	-	-	15	6.6	45
Household	100	43.7	10	4.4	19	8.3	129
Market sellers	40	17.5	10	4.4	5	2.2	55
Total	170	74.3	20	8.8	39	17.1	229

Source: Field Survey, 2023

From table 2, 30 respondents represents 13.1% for great extent, no responds for none, 39 respondents represents 17.0% for little extent are all for passer-by. 25 respondents represent 10.9% for great extent, 10 respondent represents 4.4% for none and 35 respondents' represents 15.3% for little extent, all of this is for household respondents. And 20 respondents represent 8.7% for great extent, 10 respondents represent 4.4% for none, while 60 respondents represent 26.2% for little extent, are all for market sellers responde.

Table 3: Distribution of Responses on what is the Contribution of Road Infrastructure Employment Creation in Enugu State

Options	Great Extent	%	None	%	Little Extent	%	Total
Passer-by	139	60.7	2	0.9	18	7.9	159
Household	22	5.2	1	0.4	7	3.1	30
Market sellers	30	13.1	3	1.3	7	3.1	40
Total	191	79	6	2.6	32	14.1	229

Source: Field Survey, 2023

From table 3, 55 respondents represents 24.0% for great extent, 2 respondents represent 0.9% for none, 18 respondents represents 7.9% for little extent are all for passer-by. 60 respondents represent 26.2% for great extent, 1 respond represents 0.4% for none and 7 respondents' represents 3.1% for little extent, all of this is for household respondents. And 76 respondents represent 33.2% for great extent, 3 respondents represent 1.3% for none, while 7 respondents represent 3.1% for little extent, are all for market sellers responds.

Testing of Hypotheses and Interpretation

Test of Hypotheses

The hypotheses were tested using the chi-square statistical tool, which is given as;

$$x^2 = \sum \frac{(o-e)^2}{e}$$

Where: $x^2 = chi - square$

o = observed frequency

- e = expected frequency
- Σ = summation sign

Operational Assumptions

Level of significance 5% = 0.05

Degree of freedom (df) = (r - 1)(c - 1)

Where: r = Number of rows

c = Number of columns

$$df = (2 - 1)(3 - 1)$$

$$1 \times 2 = 2$$

Critical value or table value = 5.991

Hypothesis I

 H_0 1: Road infrastructure does not impact on agricultural production in Enugu state.

Table 4 was used for testing hypothesis I							
Options	Great Extent	%	None	%	Little Extent	%	Total
Passer-by	30	13.1	-	-	15	6.6	45
Household	100	43.7	10	4.4	19	8.3	129
Market sellers	40	17.5	10	4.4	5	2.2	55
Total	170	74.3	20	8.8	39	17.1	229

Chi-Square Table

0	E	(o - e)	$(\boldsymbol{o}-\boldsymbol{e})^2$	$\frac{(o-e)^2}{e}$
45	76.3	-31.3	979.69	12.84
129	76.3	55.4	3069.16	40.22
55	76.3	21.3	453.69	1.98
229				55.04

Table value = 5.991; Calculated value = 55.04

Decision: Since the calculated value (55.04) is greater than the table value (5.991), the H_0 (null hypothesis) is rejected, while the H_1 (alternative hypothesis) is accepted. This implies that road infrastructure impacted on agricultural production in Enugu state

Hypothesis II

 H_02 : Road infrastructure will not contribute employment creation in Enugu state.

				0 1			
Options	Great Extent	%	None	%	Little Extent	%	Total
Passer-by	139	60.7	2	0.9	18	7.9	159
Household	22	5.2	1	0.4	7	3.1	30
Market sellers	30	13.1	3	1.3	7	3.1	40
Total	191	79	6	2.6	32	14.1	229

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Table 5 was used for testing hypothesis II

Chi-Square Table							
0	Ε	(o - e)	$(o-e)^2$	$\frac{(o-e)^2}{e}$			
159	76.3	82.7	6839.29	89.64			
30	76.3	-46.3	2143.69	9.36			
40	76.3	-36.3	1317.69	5.75			
229				104.75			

Table value = 5.991; Calculated value = 104.75

Decision: Since the calculated value (104.75) is greater than the table value (5.991), the H_0 (null hypothesis) is rejected and the H_1 (alternative hypothesis) is accepted. This implies that road infrastructure have contribute employment creation in Enugu state

Discussion of Findings

From the study above, there are two major variables that determine the whole study, which are:

Road Infrastructure and Socio-Economic Development, these two variables are used to formulate the specific objectives, before extracting the research questions and the hypotheses in line with the objectives. So far, data have been analyzed based on the hypotheses and the discussions of findings are:

First research question, "To what extent road infrastructure as impacted on agricultural production in Enugu state?" it was found that, road infrastructure in Nigeria is very important especially to the agricultural sector in Nigeria given road network from the rural areas to the urban areas. According to [8] which research on infrastructure to agricultural production, which is in line with analysis above that road infrastructure have impacted on agricultural production in Enugu state

Research question two "What is the contribution of road infrastructure employment creation in Enugu state?" this was found from the calculation above, that road infrastructure have contributed to employment creation in Enugu state. There are many studies showing how road infrastructure have been one instrument of employment creation [1,5].

Summary of Findings

From the above analyses, the following findings were made:

- 1. This implies that road infrastructure impacted on agricultural production in Enugu state, since the calculated value (55.04) is greater than the table value (5.991), the H_0 (null hypothesis) is rejected, while the H_1 (alternative hypothesis) is accepted.
- 2. From the calculated value (104.75) which is greater than the table value (5.991), the H_0 (null hypothesis) is rejected and the H_1 (alternative hypothesis) is accepted. This implies that road infrastructure have contribute employment creation in Enugu state

Recommendations

Sequel to the findings, the study recommends as follow:

- 1. Both federal, state government and private sector should take road infrastructure serious especially link from rural to the urban areas for easy access in the agricultural sector of the country
- 2. Road infrastructure should be maintain from time to time in order to elongate the life cycle of road infrastructure and its impact on socio economic development.

CONCLUSION

The study as explored in every lurk and corner of the topic "the impact of road infrastructure on socioeconomic development", with the analysis and findings of the study, it was proved that road infrastructure has impacted immensely on socio-economic development in Enugu state and as well as the Nigeria in general by using road infrastructure to impact on Agricultural production, employment creation, small medium enterprises (SMEs) and education.

Contribution to Knowledge

This study is a major contribution to knowledge-base on this subject (The Impact of Road Infrastructure on Socioeconomic Development). It provides researchers and other knowledge-seeking individuals' data and literature on the subject matter.

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