An Investigation of the Economic Implication of Road Traffic Congestion on the Economy of Kebbi State, Nigeria

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Abstract:- **It is a well known fact that road traffic congestion has been a menace with perceived negative impact to the economic activities of our nation. To this ends, this research work aimed at investigating the Economic Implication of Road Traffic Congestion on the Economy of Kebbi State. Five objectives were specifically drafted and five corresponding research questions were formulated to guide the study. Descriptive survey research design was considered suitable for this stud. The population of the study comprised of related agencies in Birnin Kebbi Metropolis including the staff of Kebbi State Transport Authority, Kebbi State Ministry of planning and Budget commission, Ministry of Works, Housing and Transport, the Road Traffic Unit of the Nigerian Police Force, Bindawa Shopping Complex Authority Birnin Kebbi, NARTO Motor Park Official and leadership of New Garage in Birnin Kebbi. The sample for the study was 350 drawn from population area using random sampling technique. The questionnaire titled "IEIRTCEKS" was employed as the instruments. The questionnaire was administered to the respondent with aid of trained research assistance and co-researchers. SPPSS 2.1 version was used for data analysis with Four Likert scale criterion used to determine respondents response be using tables and percentages to simplify the analysis. Result from the study indicate that road traffic congestion has un-measurable impact on the economy of Kebbi State by causing a reduction in economic productivity. It leads to high fuel consumption there by increasing the cost of goods and services. It is also found to cause increase in air pollution, cost of freight movement and travelers which often leads to wastage of fuel, wear and tear of vehicle as a result, frequent repair of vehicles eminent. I was however recommended that the state government should rehabilitate the bad road that causes the traffic congestion throughout the state and that strict condition should be put in place to reduce traffic congestion in areas which can easily be over crowded.**

Keywords:- Road, Road Traffic, Cogestion, Economy, Tranportation, Urban City.

I. INTRODUCTION

Transport is one of the key sectors of the economy. It plays a vital role in the daily activities of economic development. It serves as a catalyst in production, as it facilitates the movement of inputs to production points and evacuates products for storage or marketing. Its role is essential for all aspects of the social and economic life of society [1]. Transportation, especially road transport, is a basic necessity for people after food and shelter.

With an efficient, safe and affordable transport system that offers the option of different modes of transport, accessibility to basic needs can be improved; many costs can be saved; productivity can be increased; and thus human and economic development can be improved. In addition, the reduction of pollution, the reduction of necessary transport spaces and the improvement of road safety lead to an improvement in the quality of life [2][6].

[3] Argued that inefficient transport systems significantly limit economic development, social opportunities and social interactions. Access to affordable and good quality public transport is essential for the urban population, since its absence generates economic, social and physical isolation [4]. The problem seems to affect low-income communities in suburban areas with inadequate access to public transport and other basic urban infrastructure [5]. In general, transportation is essential for development because, without physical access to resources and markets, health, education and other social services; quality of life suffers, growth stagnates and poverty reduction cannot be maintained. Motorized transport, with its corresponding negative impacts, contributes greatly to creating an imbalance between the three aspects of sustainable development: economic growth, social progress and environmental protection [7].

Kebbi State is largely based around fishing and agriculture, mainly of sorghum, groundnuts, millet, onion, and rice crops. Other key industries are trading, especially in the city of Birnin Kebbi, and the livestock herding of camels, cattle, goats, and sheep with one of the largest commercial and public administrative centers in Nigeria; host many offices of many ministries and departments, private sectors and non-governmental organizations (NGOs). Kebbi has the lowest Human Development Index and sixth lowest GDP in the country. The Birnin Kebbi metropolis of Kebbi State is characterized by a high proportion of informal development and poverty, where almost 35% of its population lives in informal settlements [8][17] Most people cannot afford to buy a private car and around 57% of trips to the city are by public transport and on foot [18].

Population growth, urbanization and family income that create a greater propensity to travel; marked increase in car ownership; and the increase in commercial and industrial activity has in turn led to an increase in the demand for car transport [9]. However, this increase does not correspond to the expansion of the physical infrastructure of the city, which is one of the essential facilities for the establishment of an adequate and efficient transport system. If roads become impractical due to lack of facilities to allow vehicles to circulate efficiently, the most notable effects are traffic jams. The consequence of these bottlenecks is the inefficient use of material and human resources in particular.

Traffic congestion disturbs nearly everyone in the world due to the environmental damage and the transportation delay it causes [9][13]. In Nigeria, traffic congestion in the major cities has remained part of the operating transportation systems, attempts made by governments to ensure that congestion is managed through various traffic management techniques have not yielded the desired result [10][16]. Traffic congestion is a regular occurrence on road networks in especially in Birnin Kebbi metropolis which are recurrent and non-recurrent. Recurrent congestion which is recurring at specific times of the day seems to be dominant along the certain segments of the corridors. Efforts have been made by many researchers to investigate the causes of traffic congestion and ways to minimize it. Result from such studies indicate that traffic congestion is caused by inadequate road capacity, poor road pavement, poor traffic management, poor drainage system poor driving habit and many others. Effects of road congestion from such studies were waste of time, delay of movement, stress, accident, and inability to forecast travel time. However this research work in addition to investigating the causes and effect of traffic congestion on the populace of the study area it will also examine the economic impact of traffic congestion on the lives of people in Birnin Kebbi metropolis.

➢ *Statement of the Problem*

Road traffic congestion is a great menace in Birnin Kebbi, the Urban Center of Kebbi State of Nigeria and an enormous problem for public and private institutions; and the inhabitants of the city in general. Congestion in Birnin Kebbi metropolis is associated with an increase in vehicle queues and poor accessibility to work and homes, especially in the morning and evening hours. Serious traffic congestion is observable between 7:00 a.m. and 9:00 a.m. (the time that most workers go to their workplaces) and students go to school. The other hours are between 03:00 and 08:00 p. m. Based on these facts, it can be established that the majority of workers and people in general report very late in their work stations, such as offices, markets, schools and hospitals. This means that some may report on time, although very tired and stressed, and others may not. Others face the problem of a few hours of sleep due to early awakening and late sleep, wasted time in queues, overtime work and a few hours to rest at home after work.

The loss of time of road vehicles due to traffic congestion is determined based on more or less estimated queue lengths, congestion periods and average queue speed [15] It is clear that people in Nigeria spent more time in traffic queues than in other transactions. In general, transportation in Nigeria is chaotic, inefficient, unreliable and dangerous [14]. It negatively affects society, especially the urban poor, through loss of productivity, inhibiting human development and reducing the quality of life. It is said that all these complications and problems that most employees and people in the general public encounter in varying degrees and circumstances are directly associated with the congestion of existing road traffic. It is in light of the foregoing that this research will be embarked upon to investigate the Economic Implication of road traffic congestion on the Economy of Kebbi State, Nigeria.

➢ *Objectives of the Study*

This study is generally aimed at investigating the Economic Implication of road traffic congestion on the Economy of Kebbi State, Nigeria. Specifically, the study seeks to:

- To examine the impact of road traffic on the economy of Kebbi State.
- To evaluate value loss from the road traffic congestion.
- To examine the psychological implications caused by the traffic congestion that affect work performance.
- To identify supporting policies that may need to be put in place to reduce road traffic congestion.

➢ *Research Questions*

The following are the research questions were formulated to guide the study, they include:

- What are the physical impacts of road traffic on the economy of Kebbi State?
- What are the financial/economic impacts of road traffic on the economy of Kebbi State?
- What are the psychological impacts of road traffic on the economy of Kebbi State?
- What policy should be put in place to reduce road traffic congestion in Kebbi State?

II. METHODOLOGY

A. Research Design

Research design according to [12] is a plan that guides the researcher in structuring the collection, analysis and interpretation of data. This research work is non-experimental and therefore does not require variable manipulation. This makes descriptive survey research design suitable for this study as it would enable the researcher to obtain credible information on views, perceptions and opinion of the respondents. The researchers will solicit information from respondents in Birnin Kebbi Metropolis who are in the best position to provide information on the economic impact of traffic congestion in the state.

B. Area of Study

The study was conducted in Kebbi State which is in the North West Geo political zone of Nigeria. Kebbi is a state in north-western Nigeria with its capital at Birnin Kebbi. The state was created out from part of Sokoto State in 1991. Kebbi State is bordered by Sokoto State, Niger State, Zamfara State, Dosso Region in the Republic of Niger and the nation of Benin. It has a total area of 36,800 km^2 (14,200 sq mi). Kebbi State consists of 21 Local Government Areas (LGAs), four emirate councils (Gwandu, Argungu, Yauri and Zuru), and 35 districts. And it has a total population of 4,440,050 as at 2016 population census. The choice of Kebbi State for this study is because it houses a quite number of functional academic libraries.

C. Population of the Study

The population of the study will comprise of all the staff of Kebbi State Transport Authority, Kebbi State Ministry of planning and Budget commission, Ministry of Works, Housing and Transport, the Road Traffic Unit of the Nigerian Police Force, Bindawa Shopping Complex Authority Birnin Kebbi, NARTO Motor Park Official and leadership of New Guarage in Birnin Kebbi.

The distribution is shown in Table 1 below:

SN	Location	Total Sampled
	Table 1: Population Distribution of Respondents	
1.	Kebbi State Transport Authority	50
2.	Kebbi State Ministry of Planning and Budget Commission,	50
3.	Ministry of Works, Housing and Transport	50
4.	Road Traffic Unit of the Nigerian Police Force	50
5.	Bindawa Shopping Complex Authority Birnin Kebbi	50
6.	NARTO Motor Park Official Birnin Kebbi	50
7.	Leadership of New Guarage, Birnin Kebbi.	50
	Total	350

Source: Field survey (2022).

D. Sample and Sampling Technique

The sample for the study will comprise of 350 staff drawn from the population using random sampling technique.

The sample will be made up of both male and female staff in the selected government establishments.

E. Instrument for Study

The questionnaire titled "IEITCENS" will be employed as the instruments. It will contain 21 twenty one items used in answering the research questions.

F. Validation of Instrument

The questionnaire will be validated by two research experts in the department of social science, Kebbi State Polytechnic Dakingari. The input made by the research experts will be incorporated into the final copy of the questionnaire.

G. Method of Data Collection

Personal visits will be made to the organizations for the distribution of the questionnaire. Three hundred and fifty (350) copies of questionnaires will be distributed among the selected respondents and analyzed after collection. The questionnaires will be administered to randomly select sampled staff of the earlier mentioned organizations.

H. Method of Data Analysis

For easy analysis and interpretation of the information obtained from the administered questionnaires, the options to be selected by the respondents are: Strongly agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). They are coded 4, 3, 2 and 1 as postulated in likert scale respectively. The data will be analyzed using SPSS 2.1 version involving tables and percentages to simplify the analysis. The statement will be accepted if its mean ($\overline{X}$) is greater than or equal to 2.5 the cut off mean of the codes. The statement is rejected if otherwise.

III. RESULTS

Variable	Case	Frequency	Percentage
Table 2: Democratic Information of Respondents			
Gender	Male	327	93.4
	Female	23	6.6
Age Distribution	18 – 30	110	31.4
	31 – 40	170	48.6
	41 – 50	32	9.1
	51 – 60	23	6.6
	61 – Above	15	4.3
Marital Status	Single	117	33.4
	Married	213	60.9
	Divorce	20	5.7
Educational Qualification	NCE/ND	121	34.6
	BSc/HND	52	14.9
	MSc	24	6.9
	PhD	11	3.1
	Others	142	40.6
Employment Status	Civil Servant	82	23.4
	Self-Employed	252	72
	Unemployed	16	4.6

Field Survey: 2022

Table 2 above summarizes the demographic characteristics of the respondents. The study shows that most of the samples were male (93.4%) as compared to female (6.6%). The age distribution of the respondents' shows that age group category of 31–40 years accounted for 48.6% of the samples. This group was followed by the 18–30 age brackets (31.4%). About 34.6% of the populations have NCE/ND certificates (the lowest level of education). In terms of employment status, most of the respondents were self-employed (72.0%). Additional 23.4% were in government employment. Only 4.6% of the respondents were unemployed.

➤ *Research Question One: What is the physical impact of road traffic on the economy of Kebbi State*

Condition for Acceptance/rejection: when the mean of the distribution is greater than 2.5 we accept since it is approximately 3 and reject if less than 2.5 as it is approximately2.

Note: SD= strongly disagree (1) D=disagree (2) A=agree (3) SA= strongly agree (4)

Table 3: The physical impact of road traffic on the economy of Kebbi State

Physical impact of road traffic	Percentage of respondents				Mean = ($\bar{x}$)
	SD	D	A	SA	
Reduction in economic productivity	46 (13.1)	100 (28.6)	80 (22.9)	124 (35.4)	2.806
Road traffic leads to higher fuel consumption rate	65 (18.6)	20 (5.7)	84 (25.4)	176 (50.3)	3.074
Road traffic congestion increased cost of goods and services	169 (48.3)	110 (31.4)	50 (14.3)	20 (6.0)	1.774
Road traffic congestion increased air pollution	0 (0.0)	82 (23.4)	156 (44.6)	112 (32.0)	3.086
Road traffic increased the cost of freight movement and traveler.	30 (8.6)	50 (14.3)	170 (48.6)	100 (28.6)	2.971
Grand Mean ($\bar{x}$)					**2.718**

Source: Questionnaire Administered, 2022

From table 3 above, the response of the respondents on whether or not road traffic congestion causes reduction in economic productivity returns a mean value of 2.806, since this value is greater than the cut off mean of 2.5, the proposition that road traffic congestion causes reduction in economic productivity is therefore accepted. On a similar note, investigation whether or not road traffic congestion leads to higher fuel consumption returns a mean value of 3.0743, this invariably means that road traffic congestion leads to high fuel consumption. Response of the respondents on whether or not road traffic congestion increase cost of goods and services return a mean value of 1.774. This value is less than the cut off mean of 2.5, it can therefore, be safely inferred that road traffic congestion does not increase the cost of goods and services. Finally, based on the mean values of 3.086 and 2.971,

it can be concluded that road traffic congestion increase air pollution, cost of freight movement and travelers respectively.

To answer the first research question, the grand mean of the questions related to the research question is evaluated as shown below:

$$\overline{\overline{X}} = \sum \frac{\bar{x}}{n}$$

$$\overline{\overline{X}} = \sum \frac{2.81 + 3.07 + 1.77 + 3.07 + 2.97}{5}$$

$$\overline{\overline{X}} = \frac{13.59}{5}$$

$$\overline{\overline{X}} = 2.718$$

Since the grand mean is approximately 3, we conclude that road traffic has physical impact on the economy of Kebbi state.

➤ *Research Question 2: The financial/economic impacts of road traffic on the economy of Kebbi State.*

Table 4: The financial/economic impacts of road traffic on the economy of Kebbi State.

Financial/Economic Impacts Of Road Traffic	Percentage of respondents				Mean = ($\bar{x}$)
	SD	D	A	SA	
Road traffic lead to wastage of fuel	30 (8.6)	50 (14.3)	170 (48.6)	100 (28.6)	2.971
Road traffic leads to wear and tear of the vehicle	66 (18.9)	19 (5.4)	89 (25.4)	176 (50.3)	3.071
Road traffic congestion leads to frequent repairs of vehicle	30 (8.6)	55 (15.7)	100 (28.6)	165 (47.1)	3.143
Traffic congestion restrict economic growth	30 (8.6)	28 (8.0)	164 (46.9)	128 (36.0)	3.114
Traffic congestion leads to waste of time	25 (7.1)	55 (15.7)	100 (28.6)	170 (48.6)	3.186
Grand Mean ($\bar{x}$)					**3.098**

Source: Questionnaire Administered, 2022

From table 4 above, the response of the respondents on whether or not road traffic congestion leads to wastage of fuel returns a mean value of 2.971, this value greater than the cut off mean of 2.5, indicate that the assertion is valid. Determination of whether or not road traffic congestion leads to wear and tear of the vehicle, returns a mean value of 3.071, this result clearly show that wear and tear in vehicle can be attributed to the effect of road traffic congestion. Result from the study also show that road traffic congestion leads to

frequent repair of vehicles. This is arrived at from the 3.143 mean value rating from table 4. Finally, based on the mean values of 3.114 and 3.186, it can be concluded that road traffic congestion restrict economic growth by greatly contributing to time wastage.

To answer the second research question we look for the grand mean of the questions relating to the research question as presented above.

$$\overline{\overline{X}} = \sum \frac{\overline{x}}{n}$$

$$\overline{\overline{X}} = \sum \frac{2.97 + 3.07 + 3.14 + 3.12 + 3.19}{5}$$

$$\overline{\overline{X}} = \frac{15.49}{5}$$

$$\overline{\overline{X}} = 3.098$$

The grand mean of the obtained result, indicate that road traffic has financial/economic impact on the economy of Kebbi state.

➤ *Research Question 3: The psychological impacts of road traffic on the economy of Kebbi State.*

Table 5: The psychological impacts of road traffic on the economy of Kebbi State.					
Psychological impacts of road traffic	Percentage of respondents				Mean = (x)
	SD	D	A	SA	
Road traffic congestion lead to late arrival to work	25 (7.1)	55 (15.7)	100 (28.6)	170 (48.6)	3.186
Road traffic congestion lead to stress and anxiety	25 (8.0)	30 (8.6)	164 (46.9)	128 (36.6)	3.120
Road traffic congestion lead to missed deliveries	30 (8.6)	50 (14.3)	170 (48.9)	100 (28.6)	2.971
Road traffic congestion reduce productivity	65 (18.6)	20 (5.7)	89 (25.4)	176 (50.3)	3.073
Road traffic congestion lead to loss of output	20 (5.7)	50 (14.3)	110 (31.4)	170 (48.6)	3.229
Road traffic congestion leads to reduction in monthly earning due to late arrival to work	30 (8.6)	55 (15.7)	100 (28.6)	165 (47.1)	3.143
Grand Mean ($\overline{x}$)					3.12

Source: Questionnaire Administered, 2022

From table 5 above, the response of the respondents on whether or not road traffic congestion lead to late arrival to work returns an average value of 3.186, since this value is greater than the cut off mean of 2.5, the proposition that road traffic congestion lead to late arrival to work is therefore accepted. An enquiry on whether or not road traffic congestion leads to stress and anxiety returns a mean value of 3.120, since this value exceed the cut off mean, it is safe to conclude that road traffic congestion leads to stress and anxiety. Response of the respondents on whether or not road traffic congestion lead to missed deliveries return a mean value of 2.971 to validate the fact that road traffic congestion actually result to missed deliveries. The mean score values obtained from table 5, also indicate that road traffic congestion reduce productivity, loss of output and reduction in monthly earning as a result of late arrival to work.

To answer the third research question, the grand mean of the questions relating to the research question is computed as shown below:

$$\overline{\overline{X}} = \sum \frac{\overline{x}}{n}$$

$$\overline{\overline{X}} = \sum \frac{3.19 + 3.12 + 2.97 + 3.07 + 3.23 + 3.19}{6}$$

$$\overline{\overline{X}} = \frac{18.72}{6}$$

$$\overline{\overline{X}} = 3.12$$

The obtained grand mean is approximately 3, we therefore conclude that road traffic congestion has psychological impact on the economy of Kebbi state.

IV. DISCUSSION OF RESULTS

Result from the study indicate that road traffic congestion physically impact on the economy of Kebbi State by causing a reduction in economic productivity. It leads to high fuel consumption there by increasing the cost of goods and services. Further attempt to find out how traffic congestion in Kebbi State impact on the economy revealed that it causes increase in air pollution, cost of freight movement and travelers. In terms of financial considerations, road traffic congestion leads to wastage of fuel, wear and tear of vehicle which ultimately result in frequent repair of vehicles. Finally, it can be inferred from this study that road traffic congestion restrict economic growth by greatly contributing to time wastage. Psychologically, road traffic congestion immensely contribute to late arrival to work. It leads to stress and anxiety and often lead to missed/late deliveries. Road traffic congestion reduce productivity, loss of output and cause reduction in monthly earning as a result of late arrival to work.

V. SUMMARY OF FINDINGS

The summary of the finding in this study are outlined as follows:

- It was observed that road traffic as a negative impact on the economy of Kebbi State as it reduces productively, lead to high fuel consumption rate; increase air pollution, induce transport cost, lead to wear and tear of vehicles; wastage of productive time of users, loss of output etc.
- It was found out that road traffic lead to reduction in monthly income of respondents through cut in their pay due to late arrival at work and increase maintenance cost of vehicles due to often repair of the vehicle.
- The finding also revealed that road traffic affect the performance of staffs (users of the road) as they arrive late to work, stress on transit reduce their productive capacity at work.

VI. RECOMMENDATIONS

Having found out that road traffic congestion has a negative impact on the economy of Kebbi State, the following recommendations are proposed.

- The state government should rehabilitate the bad road that causes the traffic congestion throughout the state by filling the pot holes
- Private and public sector should construct new roads and rehabilitate the existing ones to reduce traffic congestion.
- Strict condition should be put in place to reduce traffic congestion in areas which can easily be over crowded.

VII. CONCLUSION

Having analyzed and discussed the data collected from the field through the use of a well-structured questionnaires, the researchers reach a conclusion that road traffic congestion impact negatively on the economy of Kebbi State. Therefore proper means to address this area by concerned stakeholders would greatly increase economic efficiency in the state.

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