CHAPTER FOURTEEN

Appraisal of Disaster Implications of the Ongoing Road Construction and Urban Renewal Projects in Minna, Niger State

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Introduction

One of the main components of the urban renewal initiative is building new roads. It raises the standard of living for locals, revitalises cities, and enhances transportation. It has long been understood that the construction of new roads affects a country's population and economy (Siyan et al., 2015). Investment in road infrastructure leads to job creation, job shifts, increased productivity, and a rise in the number of businesses along transport routes (Leopoldo & Daniel, 2019). In addition, the development of road infrastructure facilitates travel and connects additional destinations.

There are numerous negative effects of road development projects. Gilchrist & Allouche (2005) outlines four categories of adverse consequences that development initiatives in urban areas may encounter. These four areas include pollution, traffic, economic activity, and ecological, social, and health issues. The host community is additionally affected by vibration, noise pollution, and dust emissions during building activities (Segni, 2020; Jia et al., 2013; Umar, 2010).

Numerous studies have been carried out to illustrate the impact of road development initiatives. Most research focuses on the effects of the ongoing construction on the environment, communities, drivers, and roadside businesses (Afolabi et al., 2018; Imam & Ohida, 2024; Marzouk et al., 2017). Studies like Fan & Chan-Kang (2005), Gibbons et al. (2012), Banos et al. (2013), and Ogunseye et al. (2020) concentrate on the effects of post-construction projects on GDP growth, productivity growth, socioeconomic development, and economic expansion. Few research has examined the effects of road construction projects both during and after construction (Aka et al., 2022; Ogunseye et al. 2020). Nonetheless, favourable effects outweigh unfavourable ones (Ogunseye et al., 2020). In other words, the impact after construction usually outweighs the impact during construction.

Considering this, the present study is here to fill the dearth of literature by focusing on how the ongoing road construction projects impact motorists in Minna. The study utilises survey research to gather information from motorists on their perceptions of noise generation, excess dust emissions, increased fare prices, vehicle collisions, and increased traffic congestion in Minna. Minna was chosen for the study because of the ongoing urban renewal project across the Minna metropolis, which has generated excessive traffic and dust

clouds.

Literature Review

A road-building project is the process of constructing a paved or smooth surface that allows cars to travel between two locations by laying down asphalt, concrete, soil stabilisers, and other materials in a predefined path (Albert, 2023). A strong transport network that makes it easier for people to travel from one location to another is provided by good roads, which are essential for economic development (Imam & Ohida, 2024). The effects of building projects have been extensively studied in both industrialised and developing nations. For instance, in Pakistan, Awan and Anum (2014) investigated how the expansion of road infrastructure affected economic growth. The study's goal was to look at the connection between economic growth and infrastructure development using time series data spanning from 1971 to 2013. Their research reveals a favourable correlation between economic expansion and physical infrastructure. The study concluded that building infrastructure is essential to maintaining and boosting economic growth.

In a different study, Kanwal et al. (2020) used the social exchange theory to examine how transport and road infrastructure are developing, as well as community support for tourism. The purpose of the research was to ascertain whether there was a positive correlation between the perceived benefits of tourism, community satisfaction, and the environment, and the development of road and transportation infrastructure. The study's conclusions show a positive correlation between the perceived benefits of the transport infrastructure and the China-Pakistan economic corridor road. In this relationship, perceived tourism advantages and community satisfaction serve as moderators.

In Nigeria, Osun state precisely, Leo-Olagbaye & Odeyinka (2020) investigate the influence of risk on road projects using survey research. The goal of the study was to ascertain how risk affected the time and cost performance of a few road projects. The study included thirty-two criteria, including unanticipated unfavourable events, ground conditions, disregard for contract requirements, and contract cash flow, among others, that are thought to affect cost and time performance. The study's findings show that scope creep and design flaws are two of the biggest risk factors that arise on road projects, with political and economic variables having a greater degree of influence. The study's conclusion showed how risk impact on road project cost and schedule could be modelled utilising important risk variables.

Nicholas & Babajide (2010) investigated the risks impacting Nigerian road and highway development projects. The study sought to evaluate how risk assessment and management processes are used and understood, as well as the consequences of risk events, in Nigerian road and highway construction projects. According to the research, Nigerians are typically aware of risk occurrences, but no risk management plans have been developed for projects involving the construction of new roads and highways. The study's conclusion listed the top three risk events in order of likelihood of occurrence. These include defective material and material shortages, design changes and inaccurate design details, and contaminated soil and unstable soil conditions.

Using a qualitative research design, Aka et al. (2022) investigated the effects of urban renewal on the built environment in Nigeria. The study's goal was to employ an observatory survey, focus group interviews, and on-time interviews to investigate the positive and negative

effects of urban regeneration on the built environment. The study's findings show that urban renewal has both positive and negative repercussions for Nigeria's capital city. Some of the beneficial benefits include environmental improvements, economic stability, and increased value for land and infrastructure. The negative consequences include displacement, loss of property, exorbitant prices for land and infrastructure, and economic hardship. Their research showed that solutions such as community participation, adequate compensation, government policy, and execution were established to offset the detrimental impact of urban renewal on the built environment.

In a separate study, the environmental effect indicators in road construction projects in underdeveloped nations are examined by Marzouk et al. (2017). The goal of the project was to model building information methodology for the assessment of environmental impacts in road construction projects using environmental indicators such as smog, ozone depletion, human health particulate matter, eutrophication potential, acidification potential, and greenhouse gas footprint. The project considers the duration of the project. The analysis indicates that the model can be used to address large-scale road-building projects.

Ogunseye et al. (2020) investigated the socio-economic effects of road infrastructure development both during and after construction using the example of a rapidly growing metropolis in Nigeria. The study investigates the socioeconomic impact of road development in Abeokuta using both descriptive and inferential statistics. According to their research, the construction had a negative influence on locals' business ventures, travel frequency, home value, car condition, and general well-being. The study concluded that road development affects community health, business activity, and transportation fares. Following construction, there were substantial effects on property values, business operations, community health, and transportation costs.

Ezenekwe & Uzonwanne (2017) investigated the effects of abandoned highway development projects on the Nigerian economy using the case of the Enugu-Onitsha route. According to the report, many Nigerians, particularly those who utilise it daily, have suffered economically because of the abandoned Onitsha-Enugu highway road. The investigation also revealed that abandoned roads have caused numerous economic disruptions and accidents, including ongoing collisions, armed robbery, and fatalities.

To ascertain the effects of the road development on locals and business owners, Iman and Ohida (2024) use the case of Minna and a purposive sample technique to select two routes (the Gidan Kwano and Chanchaga-City Gate traffic corridors) that are undergoing construction. The results of the study indicate that some of the effects of road-building projects include social disturbances, increased traffic, interruptions of roadside businesses, and effects on environmental aesthetics. According to the study's findings, respondents had no opinion about the effects of dust and noise.

From the reviewed literature, it was observed that disasters caused by road development still require more studies. It is on this basis that the present study utilises survey research to gather information on the disaster implications of the ongoing road construction and urban renewal at the residence of Minna. Gas emissions, excess dust, engine noise and vibrations, congestion, and accidents are among the risks posed to road users in Minna, which the study has tried to explore.

Research Methodology

The study used a descriptive research design to describe the study populations. The study population as of the 2006 census was 293,000, with a growth rate of 2.81 (NPC, 2006). The study population was forecasted to be 482,508. The study uses the Dillman and Ulman 2007 sample size formula, which is shown in equation 1, to determine the number of questionnaires administered to motorists in Minna.

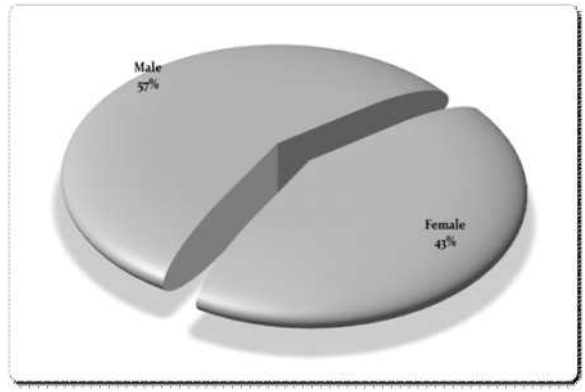

Figure 1: Gender of the motorist

Sources: Authors' survey (2024)

Figure 2 reveals the marital status of the motorist in Minna. From the analysis, it was discovered that a larger proportion of the respondents were married, about 121 respondents were still single, 57 of them were widows and only 19 respondents were divorced.

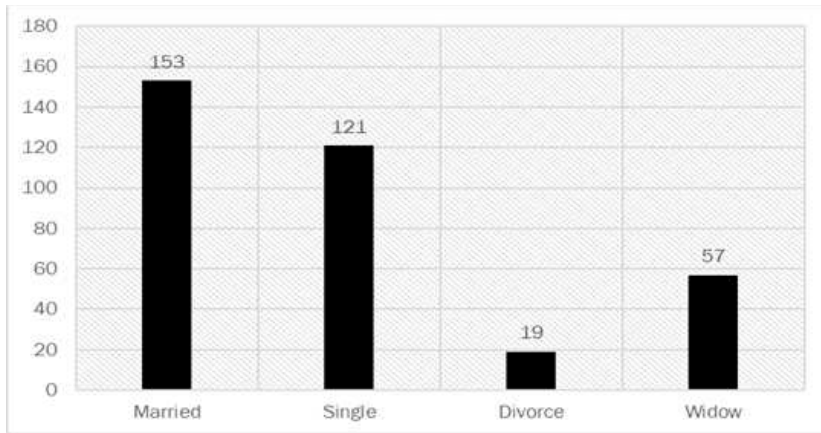

Figure 2: Marital status

Sources: Authors' survey (2024)

The analysis in Figure 3 reveals the monthly income earned by the respondents. Figure 3 recorded that 24% of the respondents earned between 30,000 and 90,000 per month, 22% of them earned less than 30,000, 17% earned around 152,000-212,000, 16% earned between

91,000 and 151,000 monthly, 13% earned between 213,000 and 273,000 monthly and only 8% of them earned over 274,000 monthly.

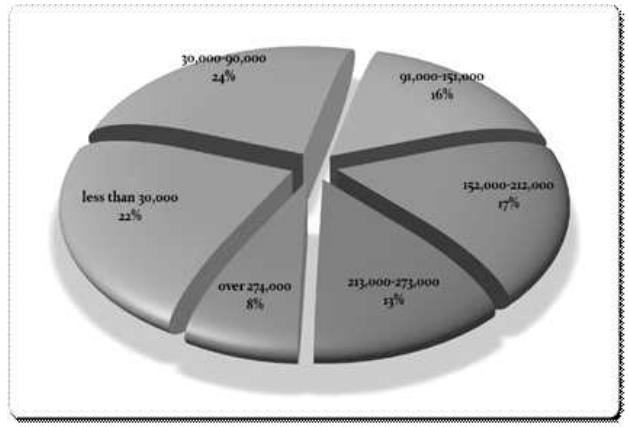

Figure3: Monthly income

Sources: Author's survey (2024)

The analysis in Figure 4 reveals the educational certificate possessed by the motorist in Minna. From the analysis, it was recorded that 32% of the motorists possess a higher national diploma or Bachelor of Science, 21% hold a postgraduate certificate, 20% of the motorists possess a National Diploma or National Certificate of Education, 15% have West Africa Examination Certificate (WAEC) or Senior School Certificate (SSCE) and only 12% of them possess school certificate. This analysis is a revelation that the motorists who participated in the research are highly educated and understand what the survey is all about since most of the motorists are HND or BSc holders

Figure 4: Educational certificate

Sources: Authors' survey (2024)

Figure 5 shows the analysis of the occupation of the motorist in Minna. 20% of the motorists are business owners, 19% are students, and only 17% of them are farmers. Also, the figure reveals that 15% of the motorists each work as a civil servant or private establishment, and 14% of them are motorists.

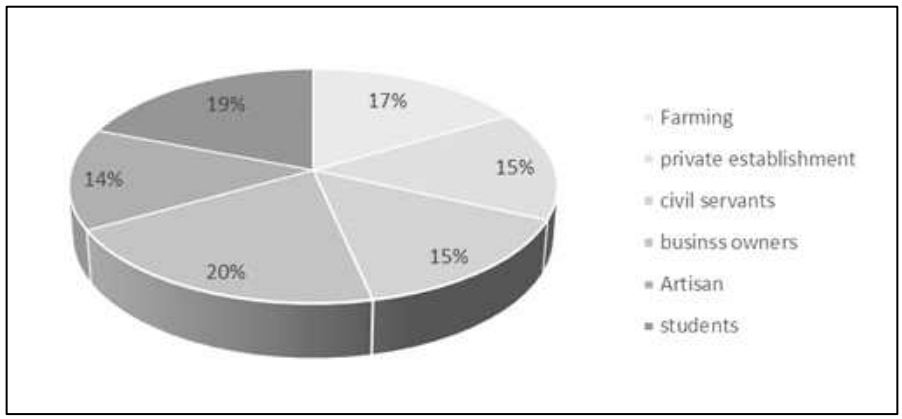

Figure 5: Occupation of the motorist
Sources: Authors' survey (2024)

The analysis in Figure 6 shows the age distribution of the motorist in Minna. The analysis, reveals that 103 respondents were between the ages of 29 and 39 years, 73 motorists who took part in the study are between the age of 18 and 28 years, and about 63 of them are less than 18 years. Moreover, Figure 6 indicates that 56 motorists are between the age of 40 and 49 years, 30 of them are between the age of 50 and 59 years and only 60 of them are over 60 years of age.

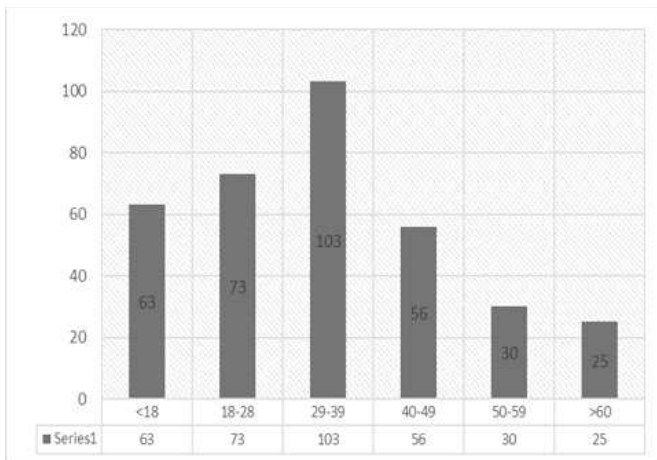

Figure 6: Age of the motorist
Sources: Author's survey (2024)

Analysis of the influence of the disasters on the motorist

This section describes the possible impact of the disaster caused because of road construction projects in Minna. The ongoing road construction and urban renewal project impact motorists in Minna in several ways. According to Table 1, 40.3% of the respondents agreed that the ongoing road project and urban renewal impact motorists and residents' health; 28.6% were neutral in their opinion; 116.3% disagreed; about 16.3% strongly agreed; 11.2% disagreed; and only 3.6% strongly disagreed. This outcome indicates that the respondents agreed that the ongoing road construction project and urban renewal in Minna impact their health. According to Imam and Ohida (2024), studies reveal that the road construction project in Minna has a salient impact on the health of the residents and business owners. Excessive dust generated due to earthwork may cause serious health issues, such as nasal congestion.

Similarly, the analysis of the noise impact in Table 1 recorded that 63.1% of the respondents agreed that there is noise impact, 18.35% strongly agreed, 15.0% were neutral in their view about 2.8% disagreed on noise impact and only 0.8% of the respondents strongly disagreed on noise impact. However, noise is generated from truck movement and beacons during crushing and laying down of Asphalt.

Also, the analysis of the possibility of a high chance of a vehicle collision is shown in Table 1. From the analysis, 45.9% of the respondents agreed, 27.1% strongly agreed, 20.1% disagreed, about 5.7% were neutral in their view, and only 1.2% of them strongly disagreed whether there is a high chance of a vehicle collision due to the ongoing road construction project. Again, Table 1 recorded the respondent's response to increased traffic congestion. From the analysis, about 74.4% of the respondents agreed about 13.3% were neutral in their view, and only 12.2% of them disagreed that there is increased traffic congestion due to the ongoing road construction project. It is significant to note that road construction projects result in high traffic because the activities obstruct traffic flow, and when the traffic is intense, the possibility of a traffic accident is high (Imam & Ohida, 2024; Abubakar et al., 2023).

Additionally, the analysis of the impact on buildings due to vibration is shown in Table 1. From the analysis, 53.5% were neutral in their view, 23.4% agreed, 19.0% disagreed, and only 4.1% strongly agreed that the ongoing road construction projects and urban renewal projects in Minna impact buildings due to vibrations from vehicles. However, construction activities such as excavation, drilling, pile driving, and heavy truck traffic are known to generate ground-borne vibrations that can propagate through the soil and affect nearby structures (Ouis, 2024).

Moreover, Table 1 shows that 52.7% of the respondents agreed that they have frequent catarrh due to excess dust, 26.2% were neutral in their view, about 16.5% disagreed, and only 4.6% strongly agreed. During the construction process, dust clouds usually form due to the movement of trucks as well as passing vehicles. The excess dust finds its way into the nearby residents, causing catarrh and coughing in the people around the construction zones (Jose & Srimuruganandam, 2020).

Again, the analysis of whether road construction causes an increased fare rate in Minna in Table 1 reveals that 48.3% of the respondents agreed that there is an increased fare rate, 24.4% strongly agreed, and 17.8% were neutral in their view. In addition, about 6.1% of the respondents disagreed that the ongoing road product does not result in an increased fare rate, and only 3.4% of them strongly disagreed that the road project causes an increased fare rate.

Table 1: Influence of Road Construction and Urban Renewal Project on a Motorist in Minna

S/N	Criterion	SD	D	N	A	SA
			Percentages			
1	Impact on motorist and residents' health	3.6	11.2	28.6	40.3	16.3
2	Noise impact	0.8	2.8	15.0	63.1	18.3
3	High chance of vehicle collision	1.2	20.1	5.7	45.9	27.1
4	Increased traffic congestion	0.0	12.2	13.3	74.4	0.0
5	Impact on building due to vibrations	0.0	19.0	53.5	23.4	4.1
6	Frequent catarrh due to excess dust	0.0	16.5	26.2	52.7	4.6
7	Increased fare rate	3.4	6.1	17.8	48.3	24.4
8	Distortion of roadside business	0.0	0.0	21.5	55.8	22.7
9	Impact on vehicle and roadside structures	0.0	8.3	11.6	70.1	10.0
10	Delays cause by truck movement	0.0	0.0	9.8	73.4	16.8

Sources: Authors' survey (2024)

Associatively, Table 1 recorded that more than half of the respondents agreed that ongoing road projects cause distortion of roadside business, 22.7% of the respondents strongly agreed, and only 21.5% of them were moderate. This analysis enables the researchers to conclude that the ongoing road construction project and urban renewal cause distortions in roadside business.

Moreover, Table 1 shows the analysis of the impacts of the road construction project on vehicle and roadside structures. From the analysis, about 70.1% of the respondents agreed that the road construction project impacts vehicles and roadside structures; 11.6% were moderate in their view; about 10.0% strongly agreed; and only 8.3% disagreed that the ongoing project does not impact vehicles and roadside structures. Furthermore, the analysis of the delay caused by truck movement in Table 1 reveals that 73.4% agreed about 16.8% of the respondents strongly agreed, and only 9.8% were neutral in their view.

Conclusion and Recommendations

The present study assessed the disaster implications of the ongoing road construction and urban renewal projects in Minna. The purpose of the study was to identify the impact of the ongoing road construction on motorists and the residents of Minna. The study concluded that noise, a high chance of vehicle collisions, increased traffic congestion, an impact on buildings, and an increased fare rate are the impacts the ongoing road construction project has on motorists and residents of Minna. The study concluded that in any construction project or urban renewal project, the initial phase is always tedious and has and has an impact on the people in the community where the project is taking place. However, eventually, the project tends to improve the socioeconomic status of the community as the development begins to attract more development in society. The study therefore recommended that:

i. The construction company should continue to spray water on the construction route to prevent excessive dust generated when vehicles pass by.
ii. The project should have a timeline for completion. Time wasting should be eliminated

since prolonging projects has serious health implications in any area.

iii. Adequate road signals should be provided to aid motorists driving both at night and day to avoid sudden collisions.

iv. Roadside businesses should be compensated for any part of their business or properties damaged during the ongoing urban renewal project.

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