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TABLE OF CONTENTS

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NOTE TO CONTRIBUTORS

The Journal of Geomatics and Environmental Research (JOGER) is a bi-annual journal published by the Department of Surveying and Geoinformatics, Faculty of Environmental Sciences, University of Ilorin, Ilorin with a devotion to issues in the fields of geomatics, geospatial technology and environmental research.
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EDITORIAL

It is a great pleasure to welcome you to the "world" of Journal of Geomatics and Environmental Research (JOGER) a publication of the department of Surveying and Geoinformatics, University of Ilorin, Ilorin, Kwara State, Nigeria. This is the third edition of the journal, precisely the Volume 3 Number 1. In this issue, you will find researches and contributions that would be of great benefit.

This issue presents articles in the areas of Urban management and planning, Land Use/land cover change detection, Remote Sensing and Geographic Information System (GIS).

The studies captured are Examining The Impact Of Informal Activities On Urban Road Infrastructure In Minna, Nigeria, A Multi-Spectral Assessment Of Sub-Saharan Cover Change In Geidam Local Government Area (LGA.), Yobe State, Nigeria, Geospatial Modelling Of Soil Erosion In Zaria Local Government Area, Kaduna State – Nigeria, The Impact Of Improper Solid Waste Disposal In Some Selected Areas Of Lokoja, Kogi State, Nigeria, UAV-Based 3d Model Of Part Of University Of Lagos Main Campus, Food Security And Rural Entrepreneurship In Birnin-Kebbi Region Of Kebbi State, Development Of A Web Based Cadastral Information System For Land Use Charges Collection In Akure Metropolis, Anthropogenic Activities And Their Impacts On Biodiversity Survival In Ifelodun Local Government Area, Kwara State, Nigeria.

We look forward to receiving your articles in subsequent editions of the journal.

Thanks for publishing with *JOGER.*

Prof. Olaleye J.B.
Editor-In-Chief

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EXAMINING THE IMPACT OF INFORMAL ACTIVITIES ON URBAN ROAD INFRASTRUCTURE IN MINNA, NIGERIA

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ABSTRACT

Major concern of urban decision makers is allocation of space for an informal sector economy, this is because the effect of its activity on available infrastructure especially road network infrastructure. The uncoordinated spread of informal activity in Minna has continued unabated, due to high population of people trooping to Minna as a result of its closeness to the Federal Capital Territory (FCT). This paper examined the effect of the informal activities on neighbourhood road network in Minna, Niger State. Primary and secondary data were employed for the study, primary data were generated from residents of the areas and operators of informal activities within the neighbourhood selected, while the secondary data were sourced using the report from the Niger State Urban Development Board. Systematic random sampling technique was used in the selection of 175 respondents and descriptive statistical method of analysis was employed. The Google-Earth map of the area was digitalised using GIS method to determine the extent of encroachment on road setbacks and right of way. The result shows that most of the structures along highway corridor have been converted to commercial for informal activities use and the open spaces and vacant plots converted also, for various informal activities, such as, viewing centres which occupies 9%, car wash centres 5%; automobile mechanic workshop 9%; motor-bicycle and tricycle mechanic workshop 7%; game houses 6%. The study concluded that, the present pattern of development, especially along the major road in selected areas have negated the basic principles of smart city on the integration and communication route network within the city without optimising the efficiency of city operation and infrastructure and other services. The study recommended the monitoring of informal activities so as to reduce the rate of nuisance and decay development caused by informal activities.

Keywords: *Informal Activities, Infrastructure, Neighborhood, Route Network, Smart City*

1.0 INTRODUCTION

Urbanization is largely a product of change in land use characteristics, Teck-Hong (2010). The high level of urban growth in the developing countries is associated with increasing levels of informal activity, which in most time changes the configuration of urban

landscape. The increase in the informal activities is due to the availability of urban space (United Nations World Urbanisation Prospect Report, 2005).

The capacity of the informal sector economy to absolve a teeming population of the unemployed into the labour force has posed a considerable challenge to urban land use planning and management, not only in Nigeria, but also, in some developing countries of the world. According to Okeke, (2000) the challenge is borne out of the capacity of the sector to generate land use problems such as sprawl problems, incongruous land uses, building alterations, the menace of temporary structures, alteration of land use functions, open space conversions and land degradation. According to Nigeria Ministry of Labour and Productivity, (2009) informal economic activities encompass a wide range of small-scale largely self-employment activities which could either be rendering services or be engaged in the production of a particular commodity, including economic endeavours of subsistence nature as retail trade, restaurants, repair services and household or other personal services. While traditional town planning tends to see the informal sector as being an environmental nuisance, its importance cannot be overemphasized as many urban households will be unable to meet their survival need without participating in this sector.

Tipple, (2003) & (2005) supported the notion that "the informal economy is the highest employer of urban poor and is believed to be very important particularly in developing countries where population and demand for jobs, goods and services are growing at a rate which the formal sector cannot cope with. It also contributes to economic growth as the United Nations Development Programme (2003), in its report outlined that "informal activities constitute 70% of the Gross Domestic Product (GDP) of Nigeria and Egypt, and 30% of the GDP of Costa Rica, Chile, Brazil, Colombia, Venezuela and Paraguay. From the above assertions, it can be deduced that the activities of the informal sector contributes quite significantly to the growth of the Nigerian economy in terms of output and employment. The International Labour Organisation (ILO) (2007) clarifies on the forms of such enterprises as comprising of some or all of the following: easy entry into and out of the business, reliance on indigenous resources, family ownership, small scale of operation, labour intensive and adopted technology, skills required outside the formal school system, unregulated and competitive market and lack of legal or government recognition. The International Labour Organization further estimated that the proportion of the urban workforce engage in informal sector activities is highest in Sub-Sahara Africa and account for more than 50% of urban employment in two thirds of countries surveyed in 2009. In Nigeria, the informal sector unfolded conspicuously after the introduction of Structural Adjustment Programme (SAP) which eventually led to mass retrenchment of formal sector workers.

Despite the advantages associated with these informal activities, the sector is not devoid of negative impact to the environment. According to Harth (2007), "the presence of unregulated activities is a major feature associated with developing countries particularly in

the urban centres". Besides the violation of the use of land by informal sector workers, their activities often constitute nuisance generating noise and other forms of pollution, unsanitary environment as a result of indiscriminate waste disposal and the obstruction of movement. It is also characterised by traffic congestion and unsightly appearance. Rate of unemployment contributes to the upsurge of the informal sector activities. According to the World Bank Report (2010), unemployment rate in Nigeria as at 2011 was 23.9%, more particularly, the effect is felt in the urban areas, of which its roads network infrastructure (highway corridors) are not left unaffected, a situation which is attributed apparently to the over response to the attraction of cities. More so, there had been no considerable provision for land space for these activities commensurate to the number of people involved in them. Hence, land uses have been tempered with and developments have become haphazard (Rogarson 2006, Linda 2010 & Simon 2017). In Minna, road network infrastructure (highway corridor) has been distorted with several informal activities competing for land spaces and altering the scenery to the detriment of the planned use of land earmarked for Minna highway corridor. The afore-stated are courses for action, and it is pertinent to check its proliferation particularly on highway corridors, hence, a study of this nature, to evaluate the influence of the informal sector activities on the road network infrastructure (highway corridor) in Minna.

This study examines the effect of informal activities on urban road network infrastructure (highway corridor) of Minna with a view to establishing its spatial attributes by identifying the nature and categories of informal activities on road highway corridor in Minna and by assessing the effect of these informal activities on road network infrastructure and examining the pattern of the regulatory measures in coordinating the activities in the study area.

2.0 THE STUDY AREA

Minna is geographically located on Latitude 9^0 28'N and Longitude 5^0 33'E in the North Central Nigeria, It is the capital of Niger State and according to National Population Commission (NPC), the 2006 population figure of Minna was estimated to be 895,874 out of the population of the entire Niger State that was calculated to be 3,515,535, but the population projection was estimated to be 1,287,346 in 2018. Minna has good road network infrastructure and other infrastructure facilities to boost its economy.

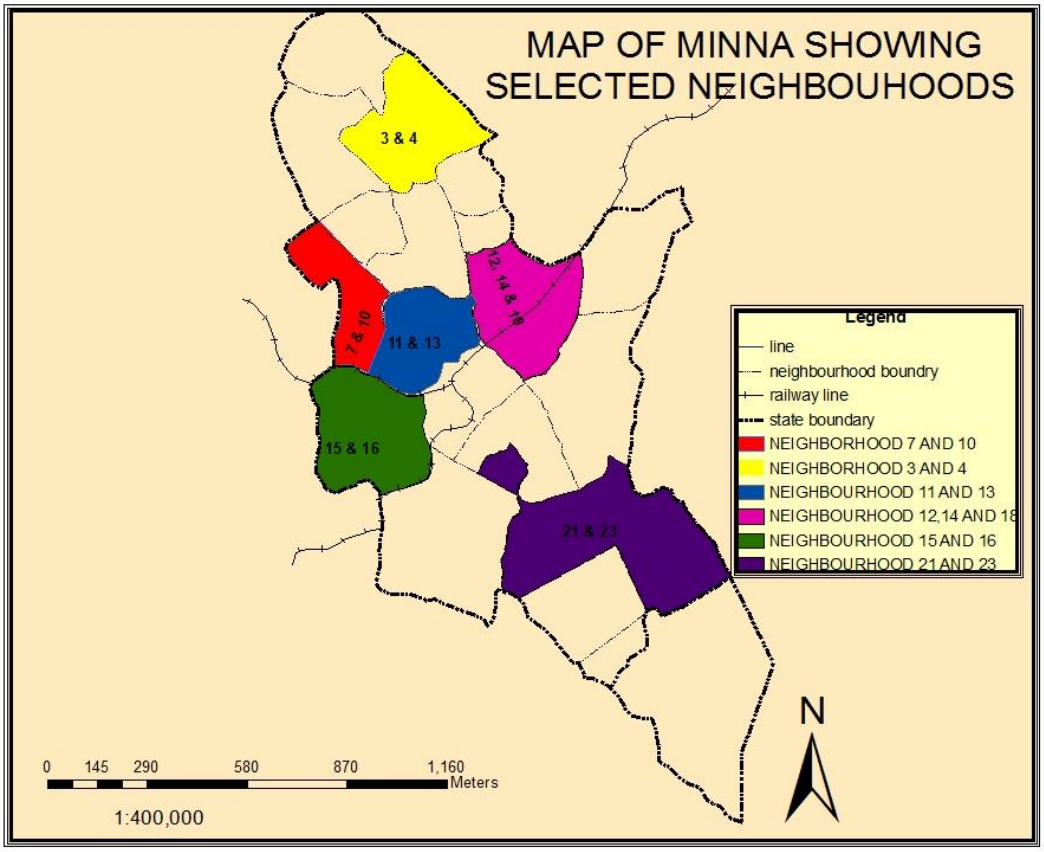

Figure 1: Map Showing Selected Neighbourhood with Informal Activities with Colour

3.0 STUDY PROCEDURE

The study area stretches for about 11km in length from City Gate at Shango on the South to City Gate at Tudun-Fulani in the North and the high way corridor was divided into two segments. (Segment 1 and Segment 2)

Segment 1 extending from City Gate (Shango) to Mobil area. Most of the plots of land immediately adjacent to the corridor are in the State or Federal ownership, with some private property holdings. In the western part of this segment, there is the State Secretariat, Hydro-electric power development commission office and Central Bank of Nigeria among others. The eastern part of this segment comprises of the State House of Assembly, National Youth Council of Nigeria, and Federal Road Safety Corps office among others. The majorities of the commercial services are located along this portion of the route network corridor and include: petrol stations, restaurants, eateries, banks and other offices alongside retail shops. The area is also interspersed with residential houses.

Segment 2 runs from Mobil roundabout down to Tudun-Fulani, traversing F-layout area where there are more residential buildings and schools such as Ahmadu Bahago secondary school, Marafa primary school, Government secondary school and Waziri nursery and primary school. This segment is also characterised by formal commercial activities such as banking and government owned institutions. Furthermore, the Federal University of Technology Minna Bosso campus is located on this segment of the corridor.

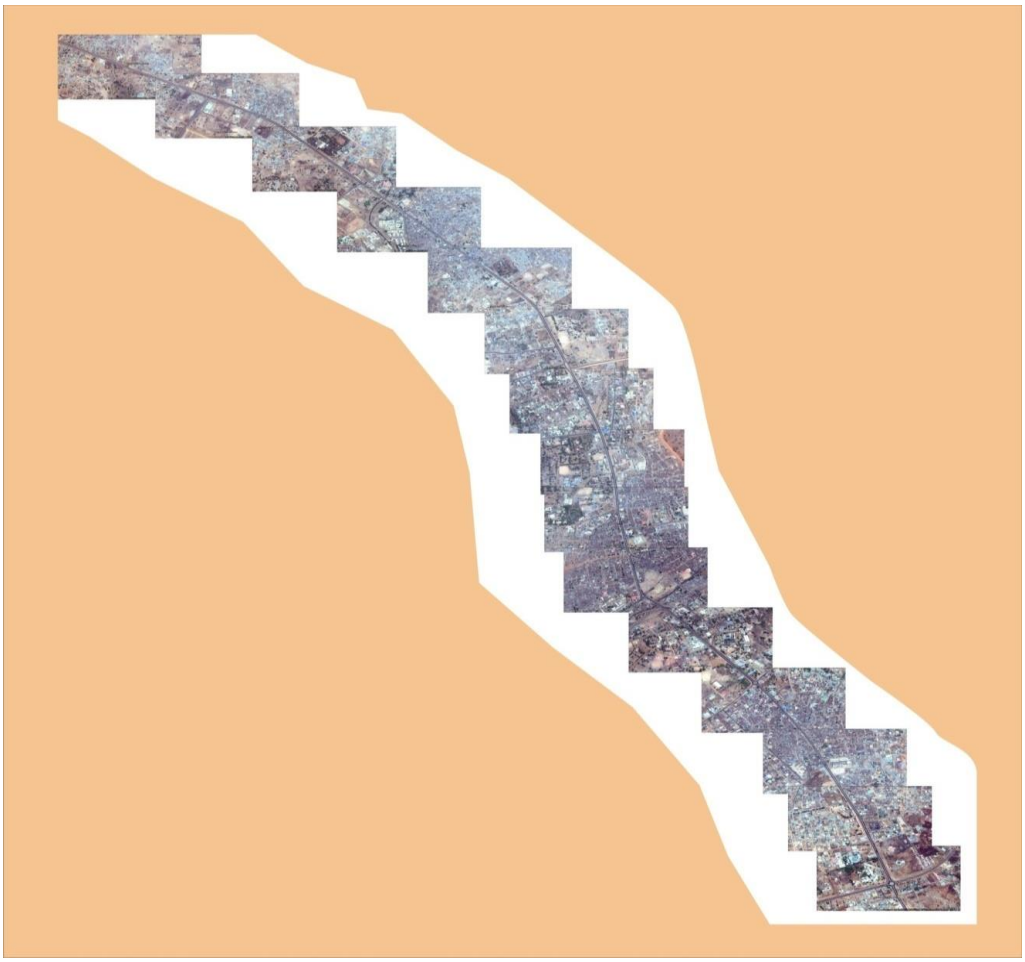

Figure 2: Showing Image of the Study Area

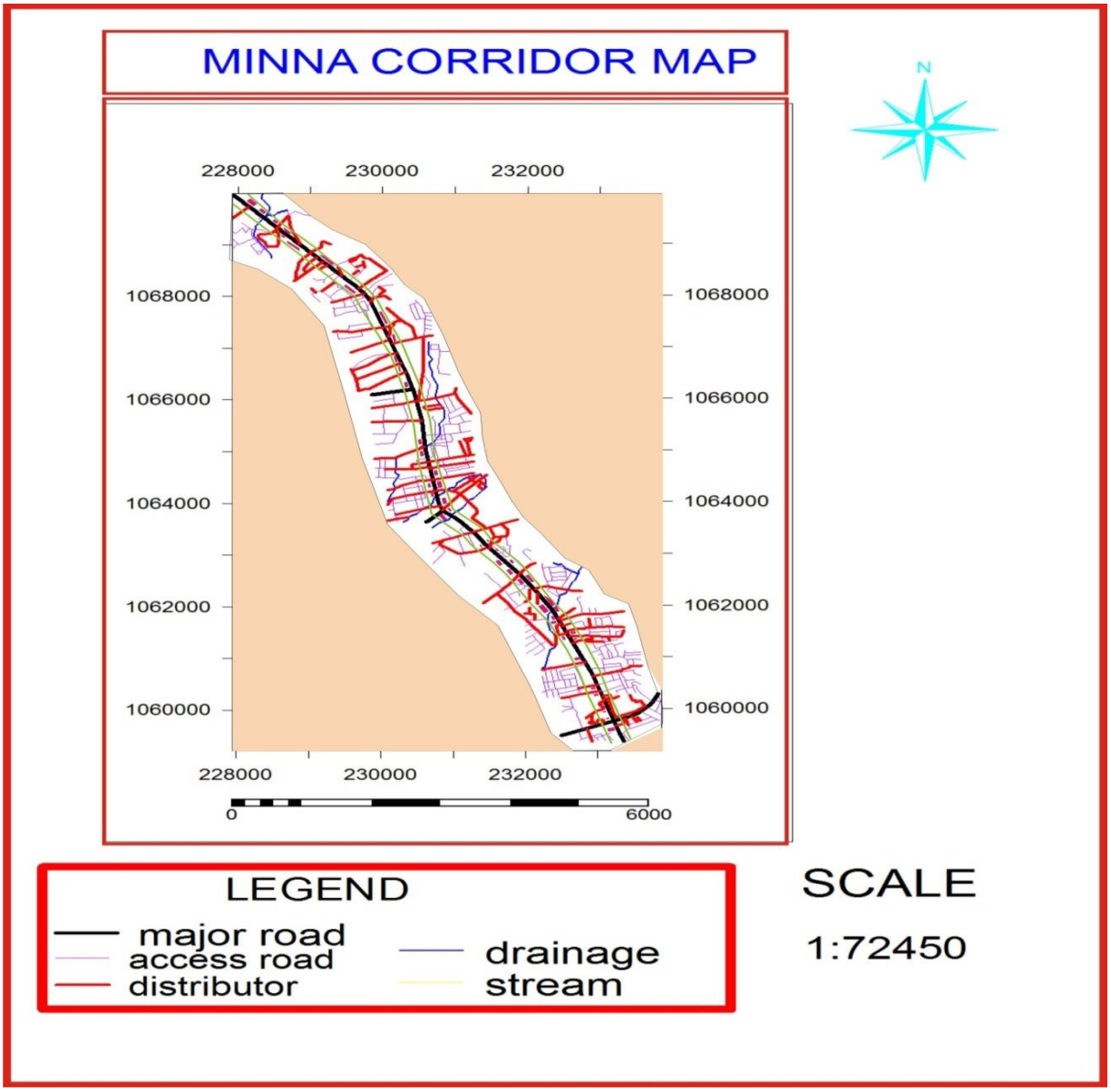

Figure 3: Showing Informal Activities along the Road Network Infrastructure in Minna

4.0 LITERATURE REVIEW

Oshinowo, (2007) opined that urbanisation and increase in population put additional strain on transportation system globally. This has invariably increased the rate of informal activities that take place on highway corridors of cities. According to Harth (2014),
informal sector is defined as employment beyond government services, factories and large scale commercial ventures. According to Oshinowo (2007), as cited by Farinmade & Anyankor (2012), the drive for profit maximization of people in informal sector inform their strategic location at road junctions, various bus stops and points of high pedestrian traffic. The urban informal sector covers all aspect of production, distribution and services. Its size allows adaptation to any space so desired. Onibokun *et al;* (1996) the informal sector plays an important and controversial role. It helps alleviate poverty as it provides jobs and reduces unemployment, but in many cases the jobs are low–paid and the job security is poor. It improves entrepreneurial activity but at the detriment of state regulations compliance, particularly regarding tax and labour regulations. The investigative concept of (Simon 2017) on the structure and relevance of small informal retailing revealed that, the size and role of informal sector business in the economy increases during economic downturns and period of economic adjustment and transition. It was concluded that, the size of the informal labour market varies from the estimated 4-6% in developed countries to over 50% in developing countries.

Lawanson, (2017) carried out a validation study on assessment of home-based economic enterprises in the Western Nigeria. It was found out that, operationalising the concept of the informality for the purpose of measurement is not easy both because the two categories of the informal sector overlap and because the border between the informal sector and formal sector is blurry. First, unofficial earning strategies are exercised by a low–profit, small enterprise with low quality working conditions, then workers of this enterprise and the enterprise itself can be classified as belonging to both informal market categories. These characteristics combined unofficial and survival activities. Second, some formal market enterprises were classified as informal, it was found that they have poor work protection, the life style and opportunities they portray are considered undesirable. Todaro and Harris, (2011) the upsurge in the number of participants in the informal economy has been attributed to various reasons. According to Okeke (2000), poverty has been highlighted as the major stimulator of these informal activities while others such rural–urban migration, increase in population growth rate, urbanisation and unemployment are also crucial contributing factors.

Urban Age, (2009) the study asserted that economic crises such as underemployment, lack of governmental resources for basic services, and ineffective and cumbersome government regulation have further increased the informal activities. Consequently, the study concluded that, those that are often employed full time in the informal sector are still forced to find additional means of income to survive while the unemployed take to miniature jobs just to

make ends meet. Manning (2009), commented that the progressive weakening of the formal economy as in the case of South Africa has exhibited an alarming decrease in its capacity to absorb new entrants to the labour market. This resulted to entrepreneurs functioning in the informal sector 'out of necessity rather than choice'. Manning concluded that, low labour absorption in the formal economy and the dire crises of survival are the primary factors responsible for the massive expansion of the informal economy that has taken more than a decade.

Recognising the activities of these informal sectors as one of the important underlying causes of road network infrastructure degradation calls for legal and institutional frameworks that are effective for the sound urban landscape management, if cities and towns are to remain both economically and environmentally sustainable (Juliette *et al;* 2008). Transportation has a strong influence on the spatial structure at the local, regional and global levels. A historical perspective on the evolution of transport systems underlines the impact of technological innovations and how improvements in transportation were interdependent with economic, social and spatial changes. The physical and visual relationship of the roadway to its surrounding is a key factor to the roadway (Sethuraman 2009).

5.0 RESEARCH METHODOLOGY

The study adopted experimental research design approach that revealed the effect of informal activities on route-network infrastructure. Both primary and secondary sources of data were employed A total of 175 structured questionnaires, "which represent 10% of the 1,758 population sample" were administered on operators of informal activities in the area under study. Secondary data were collected from development control department of the Niger State Urban Development Board to examine the efficiency of the measures for the regulation of informal activities on arterial roads. Simple random sampling method was used in the administration of questionnaire to collect data. The data collected was coded and decoded with the use of SPSS. The data were then analyzed using descriptive and inferential statistics. The use of ArcGIS for mapping the informal activities was also employed in the process of analysis.

6.0 RESULTS AND DISCUSSION

Data analysis revealed that 63.4% of the participants are females, while the males constitute 36.6%. This shows that females are more involved in the informal sector employment; this also conforms to an earlier finding in the south eastern part of Nigeria by (Okeke 2000) as cited by Samson *et al;* (2006) that women tend to maintain employment more, both in the formal and informal sector so as to make ends meet. The study also revealed that the age distribution of majority of the respondents is between 25-44years (60%). This indicates that majority of the operators are young men and women (youths), 10.9% of the respondents are

between ages 16-24, while 26.9% are over 45years of age. Further analysis revealed that the education level of the respondents varies, majority of the respondents which constitute 61.1% acquire education up to secondary school level, while 28% and 10.9% had primary and tertiary education respectively. This implies that educational qualification influence the level of involvement of individuals in the informal sector. Hence, it can be said that the informal sector attracts most people with lower education.

Furthermore, 5.7% of the respondents are employed in formal sector and also participate in the informal sector; this is in order to supplement income earned in the formal sector, while 94.3% depends on their informal business as sole source of income. The category of informal activities in the area is divided into three (3) which are manufacturing, services and marketing. Marketing clearly dominates the area with 64.6%, next is the service sector while manufacturing is the least with 15.4%. The spatial attributes comprises of the quality and features of these informal activities on space. The analysis revealed that most of the activities are located on building setback as the operators utilise it to display their products. Also, shops and structures used are located on road setbacks and on walkways leaving the pedestrian with no safe place to use. Also there is problem of on-road parking that reduces the width of the road and results to traffic congestion and causes environmental nuisance. The type of structures used by informal sector workers ranges from kiosks, shops, temporary structures and open spaces. Most of the shops are front attachment to the main building after construction has been completed.

Determining the reasons for informal activities locate within the area where they occur is very important so as to develop better way of managing the activities. Result revealed that majority of the informal sector workers at 84% chose their locations because of the positive influence on sales, 14.3% admitted that this based on the advantages that a business or group of businesses enjoy by being located in close proximity to each other.

Locational Status of Informal Activities

Table Showing Locational Status of Informal Activities in the Selected Neighbourhoods of the Study Area

	Bosso		Jikpa		Dutse kura gwari		Fadikpe		Kpakungu		Barki – Sale		Tunga		Shango		Minna Central		Limawa		Sabon - Gari		Nassarawa		Angwan daji	
	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P
Individual	12	80.0	5	83.3	3	75.0	2	100.0	8	80.0	9	90.0	8	88.9	3	100	9	90.0	1	100.0	2	66.7	7	70.0	2	100.0
Group	3	20.0	1	16.7	1	25.0	-	-	2	20.0	1	10.0	1	11.1	-	-	1	10.0	-	-	1	33.3	3	30.0	-	-
Total	15	100	6	100	4	100	2	100	10	100	10	100	9	100	3	100	10	100	1	100	3	100	10	300	2	100

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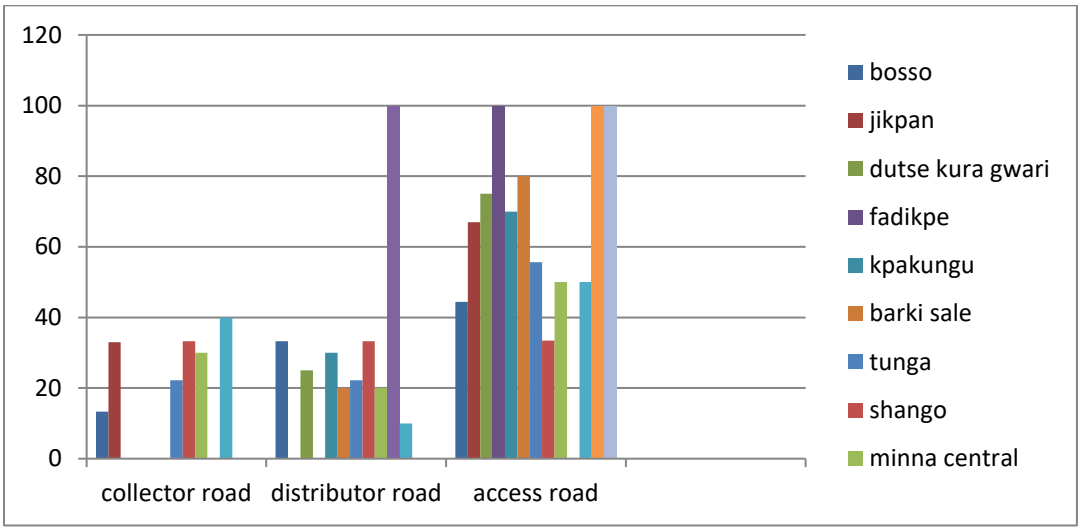
Operators' Reasons for Setting up Informal Economic Activities

	Bosso		Jikpa		Dutse kura gwari		Fadikpe		Kpakungu		Barki sale		Tunga		Shango		Minna central		Limawa		Sabon gari		Nassara wa		Angwan daji	
	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P
Population target	8	48.3	4	60.0	3	75	1	50	7	70	6	60	5	55.6	2	66.7	6	60	1	100	1	33.3	3	30	1	50
Space availability	4	26.7	-	-	1	25	1	50	1	10	2	20	3	53.3	1	33.3	1	10	-	-	2	66.7	2	20	1	50
Economic downturn	5	15	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cost of renting shop	3	10.0	2	33.0	-	-	-	-	3	20	2	20	1	11.3	-	-	3	30	-	-	-	-	5	50	-	-
Total	15	100	7	100	4	100	2	100	10	100	10	100	9	100	3	100	10	100	1	100	3	100	10	100	2	100

Type of Road Network Infrastructure Conditions of Informal Activities within the selected Neighborhoods

The chart below shows the type of road in the neighborhoods under the study.



Sources: Author Field Survey (2019)

Result from the analysis shows that 13% were collector roads, 33.3% are distributor roads while 44.4% are access roads in Bosso, 33% are collector road while 67% are access road in Jikpan, 25% are distributor road while 75% are access road in Dutse Kura Gwari, 100% are access road in Fadikpe, 30% are distribution road while 70% are access road in Kpakungu, 20% are distributor road, while 80% are access road in Barki Sale, 22.2% are collector road, 22.2% are distributor while 55.6% are access road in Tunga, 33.3% are collector road, 33.3% are distributor road while 33.3% are access road in shango, 30% are collector road, 20% are distributor road while 50% are access road in Minna Central, 100% are distributor road in limawa, 40% are collector road, 10% are distributor road while 50% are access road in Nassarawa neighbourhood, 100% are access road in Angwan Daji, 100% are access road in Sabo Gari.

7.0 SUMMARY OF FINDINGS

Larger part of the road network infrastructure has been taken over by informal activities that are not coordinated and charactrised by numbers of factors among which are unemployment, supplement income to mention but a few. It was also observed that, informal economic activities violate planning rules and regulations and every retailer with business orientation engaged in informal activities because of positive influence on sale and economic of scale. There had been operational problems and the regulatory agencies are developing new strategies to ameliorate the conditions

8.0 CONCLUSION AND RECOMMENDATIONS

The study examined the infiltration of urban informal sector activities in Minna highway corridor. Without any iota of doubt, informal economic activities have its merits and demerits both on private and public sectors. As a result, there is a need to checkmate the socio-economic, transportation and environmental implications of these activities on urban landscape, as it is expected that urban centres will continue to attract the surplus, poor and underemployed labour force from the rural areas which will lead to increase in the activities of the informal sector. It is therefore recommended that, the informal business activities should be integrated into land use planning as this will subside the distortion of the aesthetic of the highway corridor. Also, regulatory agencies relating to the use of land and development control department in the state should be more empowered and adequately funded to meet the challenges of informal sector activities and step up in their duties without fear or favour

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