Effect Of Samaru - Dange Road Maintenance On Adjacent Environment In North-western Part Of Nigeria

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Abstract: This study examined the role of Samaru - Dange road maintenance on adjacent environment in north-western part of Nigeria. . Primary and secondary sources were used to elicit for information from respondents. The instrument used for this study was questionnaire. Purposive sampling method was used to administer three copies of questionnaires were administered to house hold heads at home and heads of business at their places of operations. Descriptive and inferential statistics were used to analyse results. The descriptive statistics include; percentages, cross tabulation and pie chart. While the inferential statistics include the use of T- test statistic to test the state hypothesis in the study. Values were tested at 0.05 level of significance. The findings revealed that 82% of the people living in present settlements along the Samaru - Dange highway have migrated from old settlements. It also showed that most of these people are from western, southern and eastern parts of Nigeria and that they constituted a significant percentage of those living in Samaru, Giwa, Funtua, Sheme, Tsafe, Talata Mafara and Dange. It also revealed that 83% of the settlements grew as a result of maintenance of the 400km Samaru-Dange highway around point where facilities and activities like markets, road junction, trading and commercial points were located. It revealed that there was an increase in settlements. The main reasons for expansion of these settlements along the highway included natural population increase, migration, increasing social activities and commerce. The finding revelled that 66% of respondents have improved in housing type. Periodic markets, commerce and petty trading constituted significant portion of the land use along the corridor of Samaru-Dange highway. It was revealed that existing large periodic markets, population size, availability of minerals resources, marketing structure and organisation and taste are major factors which enhance movements of people and growth of businesses. The P –value is less than 0.05, which implies that there is significant differences on the role of road maintenance on commercial activities and growth of settlement in North western part of Nigeria. It was recommended that social welfare facilities and more security should be provided to enhance quality of live and protect properties of people along this highway.

Key words: Change, Commercial activities, Maintenance, Growth and Settlements.

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1. Introduction

Road maintenance is vital in order to prolong the lifespan of roads. A well maintained road reduces cost of operating vehicles by providing good moving surface. Proper maintenance keeps the roads open and ensures greater regularity, punctuality and safety of transport services. Effective highway maintenance is the most important prerequisite for safeguarding the investment and ensuring that the highways serve their purpose over the anticipated lifetime. It must be noted that highway should not be constructed if rehabilitation cannot be afforded and managed [5]1 Road development is a requirement of every nation, regardless of its industrial capacity, population size, or technological development. Movement of both people and goods enhances strong economic and political ties within and between regions [2].

Highway construction and rehabilitation are highly capital intensive projects that can deplete the financial resources of government. The federal government of Nigeria has over time invested huge amount of money on the construction of highways. Investment on highways have usually been thought of as a quick way of

strengthening the economy as well as increasing political and administrative control of a region. [64, 65].

However, in recent times, the state of highway in the country had deterioted with most roads left to decay. Much of this could be traced to the fact that Nigerian highways, are heavily motorized with goods that ought to have passed through the railways and waterways. Further the poor usage of this road by heavy duty trucks and trailers is frequently responsible for some of the fatal accidents. Indeed, trucks and trailers are known for overloading in contemptuous disregard for traffic laws. The excess weight of these trailers and trucks on the asphalt surfaced road is often responsible for the ubiquitous potholes. Because of the acute shortage in weighbridge provision, road weight capacity enforcement is flouted with impunity by the truck and trailer drivers in Nigeria. The federal road network carries 70% of freight in the country, [1].

Nigeria as a developing country has embarked on a number of development programmes which are housed in different ministries, out of which the transport sector receives commendable attention. [6]2 reported that settlements grew as a result of development of the80km Katsina - Maradi trans-border road around point where facilities and activities like markets, road junction, trading and commercial points were located. The main reasons for expansion of these settlements along the road included natural population increase, migration, increasing social activities spots and commerce. It was also revealed that 62.8% of the people living in present settlements along the Katsina - Maradi trans-border road have migrated from old settlements.

The need to ensure environmentally sustainable development in recent years has led to increase in the formation of environmental non-government organisation (ENGOs). This has also generate a lot of literature, new concepts and ideals on non-government interaction. For instance, environmentalism is one of the ideals expressed by the new wave of environmental movements. It has a close with ecologism. Ecologism refers to radical forms of green politics while environmentalism is a reformist approach to sustainability [2]1. Environmentalism seeks to address how resource depletion and misuse of environment by man have both positive and negative consequence on the environment.

Several studies have shown that road development has positive but also some contain effects on people and their activities. [4, 61, 62]. But it is generally agreed that areas which are not connected remain isolated and poorly developed, while those connected to road are well developed. The economic development of Nigeria has reflected the development of her transport systems. This is particularly true of the road transport system, which is by far the most widely used mode of transport in the country. [5]2 note that the vast majority of transportation in Nigeria is by road. Today, road transport accounts for more than 90% of the country's goods and passengers movements. This was further reaffirmed by [5]3, that of all commodity movements to and from the sea-ports, at least two-thirds were handled by road transport, while up to 90% of all other internal movements of goods and persons took place by roads.

The focus of sustainable development is to integrate economic and ecological consideration in decision making. According to [6]3 sustainable development could mean the end goal of the Nigerian rural environment. He therefore advocate for three environmental management techniques. These are Primary Environmental Care (PEC), Participatory Development (PD) and Participatory Rural Appraisal (PRA). It must be noted that sustainable wellbeing must emphasize the need for highest level of community participation, meet local people's needs and promote local quality of life in ways that protect the natural environment.

The maintenance of Samaru-Dange road in transfer of goods, agricultural commodities and movements of people from the northern region to the south and eastern region of Nigeria includes changes in human activities in adjacent settlements, changes in pattern and structure of settlements, improvements in trading and commercial activities, employment generation, migration and infrastructural development. The central issue addressed by this study therefore is the examination of the role of Samaru – Dange road maintenance on commercial activities and growth of settlement along it course.

2. Methodology

Data used in this study were obtained through primary and secondary sources. Twelve settlements were identified along Samaru-Dange road, Table. 1. These settlements were used as sampling points for this study. This selection was based on population size, location and the fact that some settlements are big enough to encompass the characteristics of smaller ones.

Table 1 Sampled Settlements along the road

S / No.	Settlement	State
1.	Samaru	Kaduna
2.	Mil Goma	Kaduna
3.	Shika	Kaduna
4.	Giwa	Kaduna
5.	Funtua	Katsina
6.	Mairuwa	Katsina
7.	Sheme	Katsina
8.	Tsafe	Katsina
9.	Kwatarkwashe	Zamfara
10.	Maru	Zamfara
11.	TalataMafara	Zamfara
12.	Dange	Sokoto

Source, Field Survey, 2017

The researchers administered 300 designed copies of questionnaire to respondents; purposive sampling methods was used to administer25 copies questionnaire in each of the settlements and household heads who were meet in their houses and to owners of businesses at places of work were the target. Equal numbers of questionnaires were administered purposively in each of the settlements, because the population figure were not available The questions asked included, names and locations settlements, reasons for migrating to settlements along the road, type of occupations in both settlements.

The secondary Information gotten from these sources were used to develop, improve, support literature reviewed and field data for this study.The non-inferential statistical tools such as tables and percentages were used to summarise information obtained from the field and inferential statistics of T – Test was used to test the stated hypothesis. Data on the role of Samaru – Dange road maintenance on commercial activities and growth of settlement before and after in North Western part of Nigeria were subjected to T – Test at P – value 0.05. This was to determine whether there was significant difference between road maintenance before and after. Analysis were carried out under Micro Soft Word, Micro Soft Excel Office 2013, Statistics Package for Social Science version 22 environment and descriptive method was used in explaining the results.

3. The Study Area

Samaru-Dange road is located between latitude 110.0'0"N and 130 0100N and between longitude 5030100Eand7030'00E. The prominent ethnic groups in these settlements are Hausa, Fulanies, Gbagis, Yorubas and Igbos, Table 2 and Figure 1. Samaru-Dange road is 400km long. It is a trunk-A single carriage highway road which passes through Kaduna, Kastina, Zamfara and Sokoto States respectively.

Table 2. Point locations of sampled Settlements along the study area

Road	Nature of road	S /No.	Settlement	Latitude	Longitude
Samaru toDange	Single Carriage highway	1.	Samaru	11.2213	7.8733
		2.	Mil Goma	11.1794	7.6033
		3.	Shika	11.2047	7.7747
		4.	Giwa	11.3400	7.6197
		5.	Funtua	11.6925	7.4225
		6.	Mairuwa	11.7978	7.3100
		7.	Sheme	11.8586	7.2333
		8.	Tsafe	12.2764	7.2286
		9.	Kwatarkwashe	12.1858	7.1750
		10.	Maru	12.4431	6.5397
		11.	Talata Mafara	12.7572	6.0933
		12.	Dange	13.1442	5.4183

Source; Field Survey, 2017

The point locations of sampled settlements were used to produce nap of study area, Figure 1.

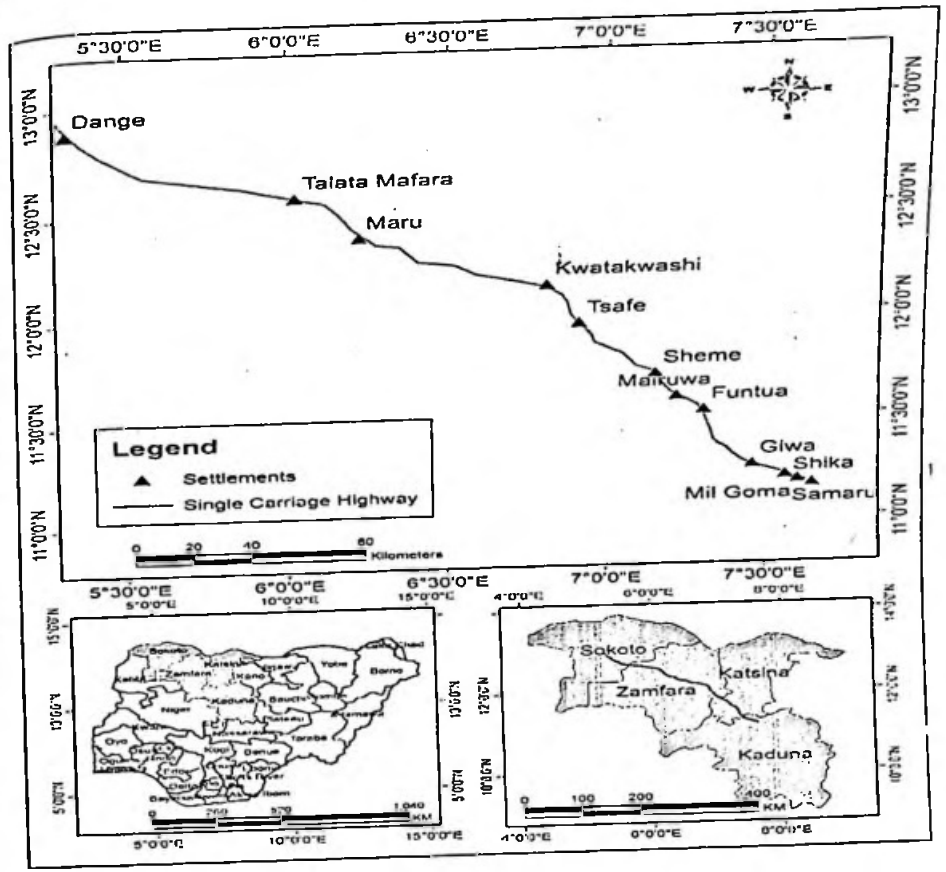


Fig. 1 Study Area

Source, Modified from map of Nigeria, Ministry of Survey, 2017

4. Results And Discussion

The Settlements assessed along Samaru-Dange highway grow around point located facilities, which could be a market, a social gathering place or road junction point. Table 3 highlights commodities, goods and items used for commerce and trading activities in the settlements. These settlements exhibit a linear pattern and continue to expand along the road, with cull -de- sac street patterns which converge at the market centre.

Table 3. Commodities, Goods and Items of Trade in settlements along Samaru-Dange highway

S / No.	Commodities, Goods and Items
1	Maize
2	Millet
3	Beans
4	Rice (local)
5	Rice (Imported)
6	Irish/sweet Potatoes
7	Sugar/milk
8	Cosmetics / Drugs
9	Soap
10	Detergents
11	Ceramics
12	Communication Products
13	Ply-wood
14	Furniture
15	Fuel-wood
15	Cement
16	Vehicular Spare parts
17	Sheep
18	Goat
19	Cattle

Source; Field Survey, 2017

The commodities and goods identified in Table 3 such as grains and cattle are transported almost on daily basis to Eastern and Southern part of Nigeria for consumption and trade. Continuous movement of people increase the commercial activities and patronage of people with towns along the road. The type of commercial products or trade posts carried out along the study area at market places, leventies stores, super stores, road side plazas, bus stops, under or by the side of overhead bridges and by T-Junction to major towns. Whereas Table 4 present locations of commercial areas along the study area.

Table 4. Location of Commercial areas along the study area

S/no.	Locations
1.	Kwangila
2.	Samaru
3.	Giwa
4.	Funtua
5.	Mairuwa
6.	Sheme
7.	Tsafe
8.	Talata Mafara

Movement of people, goods transported by heavy duty vehicles along this road on daily basis had made the emergence of commercial areas, Table 4. Some of these areas such as, Samaru, Funtua and Tsafe have serve as 'rest point' for travelers. As a result of this, food canteens, restaurants, guest houses and hotels are available at the rest points increasing commercial activities and more settlements are built to accommodate the growing population of the area.

Migration is the major process that has led to increased population and growth along the highway under study. A summary of the nature of movement to the road is presented in Table 5.

Table 5. Migration of respondents to the new areas

	Frequency of Responses			
Settlement	Alone	%	With Family	%
Samaru	23	92	02	08
Mil Goma	17	68	08	32
Shika	24	96	01	04
Giwa	22	88	03	12
Funtua	25	100	00	00
Mairuwa	17	68	08	32
Sheme	21	84	04	26
Tsafe	19	79	06	21
Kwatarkwashe	25	100	00	00
Maru	14	56	11	44
Talata Mafara	23	92	02	08
Dange	16	64	09	36
Total	246		54	
%	82		18	

From Table 5, it can be observed that 82% of respondents indicated that they were migrants who came alone to the study area, while the remaining 18% respondents were migrants who came along with their family to the study area. During interviews with the respondents, many explained the reasons for the changes as follows: when they first settled, it was either they came as singles or that their stay was temporary, waiting to see what the future might bring in terms of economic ability. A few respondents explained that when they first arrived, they did not have enough resources to build the kind of houses they would have loved to live in. After the road construction, the economy later improved, as a result of good accessibility, increased agricultural yields, as well as trades and commerce all of which generated the need for better accommodation which was later addressed. People also migrated from their isolated hamlets to the highway side to form the new settlements that emerge along the road.

The views on settlements growth were obtained and Figure 2 presents responses obtained from respondents. It was found that the settlements, for example, Samaru, Mil-Goma, Shika, Funtua, Sheme, Tsafe, and Talata-Mafara had increased in size.

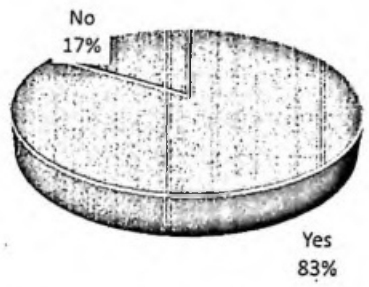


Fig. 2. Growth of Settlement
Source; Field Survey, 2017

Fig 2 present the result that the settlements in the study area have grown in size for substantial proportion of 83% respondents answered yes while the rest 17% answered no. The reasons for growth included natural population increase, migration and booming social, commercial and trading activities along the road. There are evidences of big commercial stores, shops and markets which provide revenue to their local governments. There are also mixtures of formal and informal building materials used in building their houses, which suggest modernization and urbanization. There is also evidence that the settlements are now receiving attention of town planning authorities, who are coming up with layout and planned streets, markets and social or recreation places.

Before the rehabilitation of the road, some semblance of nucleated, scanty and disperse settlements did exist. However, it must be pointed out that most of these settlements were unplanned, featuring narrow paths and a mixture of radial and cut- de-sacs pattern, mostly converging at the market square or the chief's palace. Following the maintenance of the Samaru-Dange road, the settlements have become linear as repair was done on the road and new residents prefer their houses to be directly accessible from the road. This preference has produced a linear pattern of settlement in the study area. The linear pattern did not arise from a deliberate government plan, but from the spontaneous response of individuals to the accessibility offered by the road under study.

Shelter is one of the basic needs of man. The type of residential houses people live in is a reflection of the socio-economic characteristics of the occupiers: a wealthy individual will prefer to live in a reserved area while an average individual will rent rooms in a compound house according to his income. Before the dualisation of the highway, houses in the study area were largely mud houses, usually round in shape and roofed with grasses. The houses were isolated farmsteads or clusters of compound surrounded by family farmlands with either or open closed entrance. The pit toilet was in vogue or people made use of the bush behind the house as toilet. The kitchen and essential facilities, were usually open and located at the corner of the compound.

After the dualisation of the highway, houses changed from mud with thatched roofs to cement blocks or bricks wall with corrugated and galvanised iron sheet roofs. The shape of the houses changed from round to rectangular. Some settlers have built their houses in the form of bungalows or duplexes with kitchens, toilets and garages. Table 6 presents the information on the nature and types of houses in the study area.

Table 6: Distribution of the respondents by type of residential houses

Residential housing type of frequency of responses				
Settlement	Cement wall with Aluminium roof	%	Cement wall with Aluminium roof	%
Samaru	05	20	20	80
Mil Goma	10	40	15	60
Shika	07	28	18	72
Giwa	10	40	15	60
Funtua	09	36	16	64
Mairuwa	08	32	17	68
Sheme	11	44	14	56
Tsafe	12	49	13	51
Kwatarkwashe	10	40	15	60
Maru	03	12	22	88
Talata Mafara	05	20	20	80
Dange	02	08	23	92
Total	102		198	
%	34		66	

[redacted] Field [redacted] vey, 2[redacted]

Table 6 revealed that after maintenance of the road, there was increase in residential housing types with 66% respondents while the remaining 34% respondents housing types before dualisation of the road. The interview with respondents on the increase in housing types, they indicated that improvement in income, improved accessibility, and migrations in to the settlements were responsible for the increase.

Table 7. T – Test Statistics testing the differences on type of residential houses

Variable	X^2	T	DF	Sig. (2-Tailed)	Remark
Cement wall with aluminium roof before – Cement wall with aluminium roof after dualisation	-9.6667	-5.141	11	.000	Signifi - Cant

Source; Field Survey, 2017

The P – value is less than 0.05. The null Hypothesis is therefore rejected. This implies that there is significant difference in increase housing type after maintenance of the road in the study area

The study found that periodic markets 48%, commercial activities22% and petty trading 30% are major activities which constituted significant features of settlements along the corridor of the Samaru-Dange road. Field observations revealed that major markets in Giwa, Sheme, Tsafe and Talata Mafara are located by the road side and bear names of the settlements in which they are located. Also the market days are staggered to allow for sufficient build-up of effective demand. Some of these settlements rose to prominence by virtue of the fact that the function as social and major periodic market towns and are patronise by people from different places.

Markets, petty trading spots, commercial and social activities places in settlements along Samaru-Dange road. Plates 1. The basis for spatial interaction theory of complimentarily, intervening opportunity and transferability. The concept of complimentarily states that interaction between two places is a function of specific interdependence between them.

It was also found out that large quantities of grains, as well as large number of sheep, goats and cattle are transported daily to south eastern and south western regions of Nigeria. These daily routing activities create employment for the settlers and patronage for market people, transporters and channel loaders. Also a number of "stop-over" places that emerged have improved the settlement with social and commercial activities along the 400km Samaru – Dange road.



Plate 1. Market day (Thursday) at Giwa

Source: Field Survey, 2017

5. Findings

Road maintenance has brought many advantages, some tangible and others intangible, to both the people and settlements along the road corridor. The plan to maintain Samaru-Dange road has been fruitful, because it has brought many advantages. The interest of this study is to explain the impact of road development on commercial activities and growth of settlement along the road corridor.

The study found that there is high inter relationship between the settlements mentioned, others manifested in commerce and trading of industrial goods and agricultural commodities between the northern and southern regions of Nigeria. The trade is determined by nature of the goods or commodities to be transferred, differences in marketing structure and organisation, difference in pricing, homogeneity of population and common language are among the factors responsible for growth of settlements, commerce and trading along Samaru-Dange road. The study also revealed that a significant percentage of the people living in settlements along the road corridor have migrated from neighbouring settlements and from other parts of Nigeria. Therefore the sizes of some settlements along the road are increasing rapidly due to natural increase, migration, commerce, trading, social and other informal activities

6. Conclusion

The maintenance of Samaru-Dange road attracted people from old to new settlement by road side. Other nucleus of growth and expansion included the existence of markets, commercial and social activities. Those who migrate from old to new settlements include people from other regions in Nigeria. The importance of this road in transfer of manufactured goods, agricultural commodities and movements of people is much discerned. It plays other roles in settlement change, employment generation and infrastructural development. It was recommended that

more life enhancing welfare facilities and security should be provided

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