

# Challenges in highway construction | research proposal



## Dissertation Proposal

## Challenges in Highway Road Construction in Nigeria.

## Research Questions:

- Why is there a high number of highway roads in poor conditions especially in the eastern part of the country?
- Why is there abandoned highway roads across Nigeria despite huge investments in highway construction?
- Why is there a poor maintenance culture of roads across the country?

Hence, this proposed dissertation would aim to address this gap in knowledge by challenges facing the highway road construction, focusing more on the supervision of highway roads of indigenous construction companies.

## AIM

To review and identify the challenges facing the construction of highway roads in Nigeria and to provide relevant recommendations for minimising these problems.

The objectives of this research proposal are:

- To clearly identify the challenges facing highway construction in Nigeria through literature review.
- To conduct a questionnaire survey and interview of professional bodies and engineers and obtain their perceptions on highway construction

challenges in Nigeria (particularly professionals with 30 years and over of experience).

- Analysis of the survey data.
- To recommend possible changes in the supervision of highway construction in Nigeria.

### Background Introduction

Nigeria is the largest country in Africa in terms of size and population of 174 million with landmass of 923, 768 sq. km with diverse ethnic and cultures. It has 36 states with the Federal capital at Abuja with commercial states at Kano, Lagos, and Port Harcourt representing the northern, southern and eastern parts of the country.

The Construction industry contributes about 7% of the GDP (Gross Domestic Product) in Nigeria annually and the GDP per capital was about \$2, 800 in 2013 and is made up of small, medium and large scale companies. It is dominated by foreign companies controlling about 95% of the construction works across the country with top construction companies namely Julius Berger, Dantana & Sowoe, Borini Prono, China Civil Engineering Construction Corporation, etc.

### OVERVIEW OF HIGHWAY CONSTRUCTION IN NIGERIA

Nigeria has the largest road network in West Africa with a total of over 193, 000km length which is generally funded and managed by government.

Road transportation is the major means of movement in Nigeria and it accounts for about 90% of movement of goods and services (Akpogomeh,

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2002). In terms of scale and value, the transport infrastructure sector is dominated by the roads and bridges which make up about 17.2% of the total construction industry in 2014. However less than 20% of the road network is paved. With the government's commitment to development, large investments in highway roads has been awarded across the country and the sector is expected to grow.

The road network in the South and eastern part of the country are denser than the other parts owing to the high population densities in the areas (Ubogu et al, 2011). For example, the population in Lagos is about 6 million which was the former capital state and is the commercial and production part of the country and hence the volume of usage of the highway roads to and fro Lagos is quite high. The total highway roads are separately owned with the responsibility for construction, maintenance, and rehabilitation. The Federal roads are about 17%, State owned roads 16%, rural and Local Government Areas (LGAs) about 67%. The funding of the construction of the highway roads comes from the allocation of budget and also revenues from excess crude oil sales. Also, some states generate funds through private partnering which is used in Lagos States.

However, only about 27% of Federal roads are reported to be in good condition, of which a major cause is likely to be the instability of the country during the military regime, which later became civilian rule since 1999. Annual loss to the economy is estimated in the region of N175b (N75b due to reduction in asset value; N88b due to increased vehicle operating cost; N12b due to increased turn around and increased travel time). Due to the high cost of construction of highway roads especially in the southern part of the <https://assignbuster.com/challenges-in-highway-construction-research-proposal/>

country characterized with poor soils, high cost of labour, the Federal government relies heavily on international aid especially from China and the World Bank. With the World Bank, funding erosion projects across the country worth over \$500 million.

In October 2012, in the Northern part, Kaduna State approved \$176million for 31 rural and township roads, and the World Trade Organization (WTO) agreed a loan of \$170million for roads as part of the Nigeria Agriculture Transformation Agenda (NATA), which targets rural development. Also, a 128km road contract in Zamafara state worth \$43. 47million was awarded in 2013.

Over in western part of Nigeria November 2012, in one of the biggest road developments, Ogun state awarded four companies a share of \$568million for road contracts. Borini Prono, China Civil Engineering Construction Corporation (CCECC), Hi Tech and PW Construction will complete eight new roads by 2014, with a second phase of construction worth over \$250 million.

Also, the Lagos-Ibadan Expressway is one of the major road projects under development. The Infrastructure Bank Plc. is to raise NGN117bn for the reconstruction of the 127km road.

Over in the Middle part of Nigeria, Delta where the country gets its crude oil from, a road construction contract worth \$1. 07 billion has been awarded to China Railway Construction in Nigeria. The Ministry of Delta Affairs of Nigeria awarded the package of works for Section V of the A121 East-West highway to China Civil Engineering Construction, a division of China Railway

Construction with a 5 years duration to connect the main North-South  
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highways. ITS route runs from the A1 highway at Shagamu in Ogun State to the A2 highway at Benin City in Edo State.

More recently, in 2014, the governments of the Economic Community of West African States (ECOWAS) of which Nigeria is strong member approved a \$50million six dual lane road projects to link Lagos, Abidjan and Dakar together cutting across Benin, Togo and Ghana. Also, the African Development Bank is expected to provide \$16million for the construction and rehabilitation of roads across Africa linking the major cities.

In general, the present condition of the Nigerian roads require urgent attention, in terms of rehabilitation and had a negative effect on the cost of production, lengthy travel time and standard of living ((Ubogu et al, 2011). For example, travelling from Benin to Lagos normally should take 5hours, but due to the bad road, the journey takes 8hours.

Table 1. 0 showing highway construction projects, value in US dollars, capacity, contractors and status.

Project Name	Value( US\$)	Capacity /length	Companies	Status
Benin-Sagamu Highway	156	9. 93km	NA	Under construction from
Edepie-Tombia road Reconstruction	63	13km	Shell Petroleum Development	Under construction

			Company	
Niger Delta East-West Highway	2,175.69	338km	Setraco Limited	Under construction from
Akwa Ibom State roads reconstruction	726	266km	NA	Planning stage
Six lane Rig road in Niger Delta Port Harcourt	1,000	125km	Africa Finance Corporation, China Harbor Eng. Company	Contract awarded in 20
East-West Road Project	2,276.3	338km	Setraco Nigeria Ltd, Reynolds Construction Company Ltd, Gitto Costruzioni General Nigeria Ltd.	Under construction since 51% of work completed
Ibadan-Ilorin highway upgrade	292	52km	Shikin & Binui Housing and Construction	Under construction awarded in 2010 and includes new carriage with interchange bridges.
Lagos- Ibadan Expressway	1054	127.6km	Julius Berger, Reynolds Construction	Awarded 2013. Concession awarded to Bi-Courtney Highway Services Ltd and

					terminated and granted
				Company Ltd.	Messrs Julius Berger Plc
					Reynolds Construction
					Company.
Gbongan Akoda					
Omoluuabi Motorway widening	185.8	30km		RATON construction Nigeria	Awarded May 2013
Magami-Dangulbi					
Dankurmi, Sabon Birni, Bagega & Anka road	94.91	128km		Bonny Prono	Awarded Nov. 2012
Charanchi Ganuwa-Rawayau road	8.18	17km		Mothercat	Under construction from 2013
Kaduna roads	178.1	NA		NA	Project Finance Closure Approved)

NA-Not Available

Source- Nigeria Infrastructure Report 2014 (BMI key Projects Database)

## SUPERVISION IN HIGHWAY CONSTRUCTION IN NIGERIA

In Nigeria, supervision of highway construction is done by consultant engineers and middle level supervisors with few highway field experience, for example in the construction of say 10km rehabilitation in rural areas. A

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major factor affect supervision of highway projects is low knowledge of highway design and construction, understanding and interpretation of drawings, which is impossible to supervise what ones does not have knowledge of.

Some processes in highway construction requires proper supervising such as the road alignment, soil tests, laying of asphalts or macadam as the case maybe. Also, the supervision should involve checking of quality of the material used for construction such as sand, laterite in accordance with the specifications in the highway drawings.

In the awarding of highway roads contracts, the construction and supervision are awarded separately with competitive biddings. For example, Julius Berger, a foreign based company which specializes in highway construction which major works in Abuja city capital. The major issue is that for some construction works supervision contracts are awarded based on connection instead of actual knowledge of the supervision and hence there are no checks. But in general, most of the construction of highway roads by the foreign companies have stood the test of time. The case is not the same for home based construction companies who have limited resources and technical knowledge are awarded huge highway road contracts, with home based consultants supervising.

Another issue is that the bill of the consultants supervising the construction is often times added to the entire contract and hence responsibility rests in the hands of the contractors and hence the consultants are often times

forced to cut corners and save costs such as not putting a resident engineer to supervise daily and give reports.

#### LOW KNOWLEDGE BASE.

A major problem facing the highway construction is the lack of knowledge passage from the old and experienced engineers to the young, inexperienced engineers. Often times, due to the lack of availability of supervision works, most consulting firms do not employ and train engineers, engaging them in design and interpretation of drawings on site. Often times, when consulting firms get work, they employ contract based engineers to supervision leaving a huge gap of knowledge passage to the younger engineers and hence in Nigeria, most graduate Engineers have little or no construction experience.

Also there is a lack of modern method of road construction especially the home based construction companies and hence many highway projects, such as highways and bridges, do not meet cost and time performance requirements.

There is a poor maintenance culture of highway roads across the country and with the huge investments in highway construction, the average Nigerian lacks maintenance culture. In some cities across the country, some of the highways are constructed without the side drains and in some other cases only one side of the drains are constructed, which later causes failure of the roads. Also, litters can be seen in some of the highway roads especially in the eastern and western parts of the country which is a very serious issue which should be addressed. In the rural areas, most of the side

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drains are completely blocked especially in the eastern part which is prone to erosions.

Another major issue within the highway construction in Nigeria is the failure of the Federal Government in paying contractors. For example, in the reconstruction of the 125km Lagos-Ibadan Expressway which was re-awarded to Julius Berger and R. C. C in which the construction is due to start due lack of payment by the government which is one of the reasons for abandoned highway projects across the country.

Nigeria still uses the traditional contracting approach in which procurement is done through advertisement and bid processes has failed in performance in both the quality of construction and the management of the highways, in many developed countries adopting performance-based contract in road construction and maintenance.

The Federal Ministry of Works which has branches across the 36 states with head office in Abuja the capital is responsible for all the federal highways construction which involves planning, design, construction, and rehabilitation. It is responsible for awarding for major highway contracts across the country. It also supervises and monitors construction and maintenance of the federal roads.

In terms of quality, the choice of materials used, methodology and supervision are key in improving the quality and life span roads. In this regard, (Arumala 1987; and Akpododje 1986) investigated how the design standards, poor supervision and the failure of highways and found little or no evidence supporting it.

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Also, studies on road failure caused by use of sub-standard materials and knowledge on the geotechnical properties of the soils in which the roads are built (Ibrahim 1980; and Ola 1978). For example, the cost of road construction in the south and eastern part of the country is higher than that in the northern part mainly on the bad conditions of the soil, high cost of labour and availability of construction materials.

The British code of Highway practice (BS codes) are still used in Nigeria for both in highway construction and buildings as it was a former colony of the Britain and currently a member of the Common Wealth.

The Federal ministry also supervises the activities of the Federal Roads Maintenance Agency (FERMA) which is responsible for carryout maintenance works on the federal and state highways across the country.

### Research Method

My proposed research method would be a qualitative research (questionnaire and interview survey). Interview survey for consultant engineers who have over 30 years' experience in highway construction and questionnaire survey for contractors in highway construction in Nigeria. The reason being that the research requires an in depth perspective and in terms of numbers there are few engineers with over 30 years' experience I can meet.

The structure of the interview would be semi structured to allow for flexibility for 3 consultant engineers home based medium scale firms.

### Possible Problems & Potential Solutions

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Possible limitations to my proposed study is the firstly the time management and a timetable has been drafted as shown below. Also the responsiveness of the interview survey could be challenging finding professional engineers and consultants with over 30 years' experience. The research limited to home based construction companies and professionals.

## Conclusion

Hopefully, at the end of research work, solutions could be recommended in the highway construction industry in Nigeria especially in the supervision area which would help in future planning of projects.

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