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Causes and Effects of Road Construction Project Failures in Nigeria: A Practical Perspective

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Abstract
This study examined the causes and effects of road construction project failures in Nigeria with a view to proffering possible solutions to the problem. The study was conducted using qualitative research based participatory observatory method and textual analysis of secondary data gathered from books, journals, archival documents, newspapers, magazines, and government reports related to the topic of the study. Findings from the study revealed eight major causative factors for road construction project failure such as the problems of geological investigation and lack of laboratory, poor design, poor supervision, the use of low quality work force and materials, poor maintenance culture, inadequate hydraulic structure, low standard practice, and inadequate enforcement of sanction to defaulting contractors. The study concluded by recommending workable solutions to drastically reduce the problem of road construction failures in the country.
Keywords: Construction, Project, Project failure, Road

Introduction

At present, the menace of road construction project failure has prompted the study to investigate the underlying causal factors leading to incessant road failures in Nigeria. The specific focus of the study is on road construction project failure around Kwara state axis especially between 2017 and 2024. Although, there are numerous studies on road construction projects in Nigeria, however, there are paucity of researches on the causes and effects of road construction project failure in Kwara state axis in the recent time. Therefore, the objective of the study was to determine the causes, effects and consequences of road project construction failures in Nigeria, particularly concerning some major arterial roads such as Ogbomosho-Ilorin-Jebba- Mokwa federal highway, Ilorin- Omu-Aran- Egbe-Kabba highway, and Ilorin-Igbeti federal highway that passes through Kwara state, north-central Nigeria.

The problems of road construction project failures affected the three levels of government in Nigeria because of the classification of roads in to federal, state and local, otherwise called trunk A, trunk B and trunk C roads across the country. Therefore, the three tiers of governments that are responsible for road construction and maintenance across the nation have not really planned, implemented, and executed road projects with due diligence in accordance with international best practices (Igwe and Ude, 2018). At present, there are widespread institutional mediocrity in road project execution, and

insufficient budgetary allocations, which ultimately results in high road project financing costs and corruption, and at the end, results to road project failures.

Because of incessant road construction project failures, the economy and environment are seriously affected. Okereke (2017) also identified other effects such as the waste of time, money, and human effort put into carrying the road project out, and the denial of other projects the chance to enter the stream, as well as the psychological effects of road project failure syndrome on the participants and stakeholder's mental health as some of the other effects of road construction project failure in Nigeria. Based on these adverse effects, David (2003) is of the opinion that it is preferable to forgo starting a project implementation than to start, get stuck, and then give up.

The threat of incessant road construction project failure has therefore prompted the study to investigate the underlying causes and effects of these problems in Nigeria. A survey of roads across Kwara state such as Ogbomosho-Ilorin-Jebba- Mokwa federal highway, Ilorin- Omu-Aran- Egbe-Kabba highway, and Ilorin-Igbeti- Kishi federal highway reveals the adverse effects of poorly planned, incomplete, abandoned, spoiled and aborted road projects, which required urgent solution. This study therefore examines the factors that are responsible for several road construction project failures that littered the nation's landscape and proffers solutions to this menace in view of its adverse consequences on the economy and the citizenry.

Methodology

The study employed a qualitative research design, whereby data were collected from reports of participant observatory works and inspection reports to project sites, archival documents and official publications, journals, textbooks, newspapers, conference papers and proceedings and other related documents to the study. The data were further analyzed using content analysis methods, which allows the use of the works of other scholars and documents of government.

Conceptual Analysis

The study engaged in conceptual analysis of the concepts of project and project implementation failures in the following order.

Conceptualizing Project: According to Imaga, Igwe, and Nwoji (2005), a project is a work plan that has undergone scientific evolution and is designed to accomplish a specific goal within a predetermined time frame. A project is a complicated, irregular, one-time endeavor with time, money, resources, and performance requirements that is created to satisfy the needs of the client (Imaga, Igwe, and Nwoji, 2005). A project is a brief endeavor started to produce a special good or service. In the work of Meredith and Mantel (2000), projects is broadly classified according to their purpose, life cycle, uniqueness, interdependencies, and conflicts. Programs, activities, and tasks that are used to deploy resources and interact with the environment make up the implementation of a project. In this study, project is viewed as a related group of tasks, planned, carried out, and coordinated to accomplish a particular goal or output at a specific location within a constrained budget and time frame.

Conceptualizing Project Implementation Failures: According to Banjoko (2009), project implementation is a well-considered and thought-out plan of action required to

deploy resources considered appropriate and adequate to achieve the desired objectives and quality specifications in an environment. It required planning, which encompasses all managerial activities required in structuring a course of action. Without a competent project manager in charge, project planning and implementation will fail. A project manager that is in charge is to make sure a project runs smoothly in terms of time, money, and technical performance (Ewurum, Eboh & Igwe, 2009). A project manager provides the management and leadership required to unite the individuals and teams working on a project from various departments and businesses into a single managerial organization and team (Igwe & Ude, 2018). Therefore, if any of the project's constraints, time, cost, or quality are not met, it constitutes failure. When considered, the effects of project failure is viewed as negative. Failure is not only defined in terms of project abandonment; other factors, such as the project's goals and qualities, are taken into account.

According to the studies by Mirza, Pourzolfaghar & Shahnazari(2013), when a project doesn't succeed in its objectives, it has failed. Also, in the opinion of Abbasi and Al-Mahra,(2000); Patanakul, (2014); & Damoah and Kumi(2018), Governments and organizations around the world have experienced project failures in recent years and the noted that the government usually lose enormous sums of money as a result of this failure. Nweze(2016) attributed the causes of failed projects in Nigeria to a number of different factors such as inadequate financial resources, inaccurate cost estimates, corruption, incompetence and poor planning and monitoring, and political instability.

Theoretical Framework

The Public Choice theory is adopted to analyze the topic of the study. According to Mueller (2004), the theory was developed by Anthony Downs in 1957 and further received widespread attention by William Rikey (1962), Kenneth Arrow (1963), Mancur Olson (1965), and William Niskanen (1971).First, the theory was used to ascertain peoples' participation in market-based collective decision-making. According to the theory, some people in markets are driven by self-interest and some based their decisions on the interests of others. In some situations, self-interest and satisfaction, rather than consideration for others, predominate in people's behavior, whether they are service providers, contractors, employers, employees in the public or private sector, or end users in marketplaces (Mueller. 2004).

Public choice theory is an economic tool used in examining the behavior of self-interested actors like contractors, voters, politicians, and bureaucrats as well as how they interact. It has always been in the public's best interest to look to public infrastructures like the transportation and road system, social services, healthcare, and education for satisfaction. The proponents of public choice theory stated that people acting in the political marketplace, particularly in towns and cities, frequently have other interests, but their primary motive is self-interest, whether they are acting as contractors, voters, politicians, lobbyists, bureaucrats, or customers of public service providers (Shaw, 2002). The theory, like the economic model of rational behavior on which it is based, makes the assumption that people are primarily motivated by their own selfish interests, which must be optimally maximized in order to meet human needs. Public choice theorists also highlighted the role that government failure plays, specifically that there are times when government interventions do not result in the desired outcomes or effects that the citizens

require (Shughart, 2019). This is true of Nigeria's project's markets, particularly the development of the road construction projects, where all interventions were aimed at enhancing good road transportation system but the nation's road system is still in dire state. Nigerian citizens still experience bad road and poor transportation system which has an impact on the economy and undermines the citizen's welfare. Since any responsible government and its agencies must guarantee the effective and efficient delivery of public services, the government and its agencies must give priority to finishing government projects, particularly those intended to benefit the general public. Any responsible government and service providers should place a high priority on providing quality public services and have a zero tolerance policy for project implementation failure.

In this study, the public choice theory's ability to encourage effective public service delivery in Nigeria is its main strength. The effort made by this theory to ensure the effectiveness and efficiency of public service delivery which is the duty of a responsible government makes it relevant. The delivery of public services such as roads and bridges is crucial to the socio-economic development and political growth of any country. The daily rise in citizen expectations of the government necessitates the provision of quality public services in order to reconcile the needs of both the people and the government. The theory becomes the most appropriate for this study because its applicability depends on its attempt to bring together the aspirations of the people and the government

Review of Related Literature

The literature review conducted exposed issues of serious concerns which hamper the successful completion of road construction projects in Nigeria. These issues need to be addressed if Nigeria's road infrastructure stock is to be expanded because there is ample empirical evidence linking a nation's road infrastructure outlay with its growth potentials (PMI, 2006). It is for this reason that this literature review centered on the examination of the causes and effects of project failure especially road construction projects failure in Nigeria.

Road construction projects are said to have failed when they fail to meet their budgeted cost, time, scope or quality. However, Ika (2012) insists that road projects may be completed within their estimated time and cost, and to the specified scope and quality but still be regarded as having failed essentially because the definition of project failure is influenced by how failure is defined among the project stakeholders, the nature of the project in question and the stage under review in the life cycle of the project. It is therefore crucial to look beyond the existing criteria of time, cost, scope and quality when seeking to determine whether a project has failed or not. Factors such as the aspiration and satisfaction of stakeholders, benefits to the community or project sponsor should be considered when determining the status of a project in terms of success or failure.

Project failure therefore exceeds the inability of a project to meet its stipulated targets. It includes the failure to satisfy the goals of stakeholders in terms of functionality and post-completion performance. Nelson (2005) support this view by arguing that project usefulness, value to society and learning potential should be of utmost concern when evaluating the status of a project. The functionality goals, ecstatic values and stakeholder satisfaction often envisaged at the commencement of infrastructure projects in Nigeria

have not been realized in majority of public projects scattered across Nigeria because of incessant project failures (Ayodele and Alabi, 2011). Over thirty-five years ago, Osemenan (1987) posited that Nigeria has become the world's junk-yard of failed projects estimated at billions of naira while six years later, Kotangora (1993) further buttressed the fact by stating that there are about 400 failed projects costing in excess of three hundred billion naira located across Nigeria. Since 1993, this number has since escalated ten times.

Review of existing literature on project failure further reveals that corruption, absence of project management expertise, inexperienced personnel and absence of relevant skills are some of the reasons for the failure of most projects in Nigeria. Igbokwe-Ibeto (2012) studied factors affecting local government infrastructure projects in Nigeria and concluded that corruption, delays in budget releases, delays in payment of performance certificates, community eruption, labour unrest, inaccurate assessment of the project environment and contractor incompetence are the fundamental causes of project failure in Nigeria. Another study conducted by Olalusi and Otunola (2012) revealed that incorrect estimation, insufficient planning, lack of risk management know-how, dearth of skilled personnel, poor knowledge of the work requirement as well as corruption are some of the key reasons for the failure of public projects in Nigeria.

Furthermore, Ubani (2010) conducted a research to determine variation factors of project plans and the role of such factors in the failure of projects in Nigeria. The study identified design errors, management challenges and resource allocation difficulties as the prominent variation factors which significantly contribute to infrastructure project failure in Nigeria. Similarly, many scholars have also cited inconsistency in government policies as one of the major causes of infrastructure project failure in Nigeria. Policy inconsistency in this regard mainly refers to frequent changes in leadership which brings about discontinuation of existing projects and programmes (Efenudu, 2010).

Considering the emphasis being laid on inadequate budgetary provision and insufficient resource allocation, it is pertinent to highlight the provisions of Section 4 (2) (b) of the Nigerian Public Procurement Act 2007 which stipulates that *''all procurement shall be based only on procurement plans supported by prior budgetary appropriations; and no procurement proceedings shall be formalized until the procuring entity has ensured that funds are available to meet the procurement obligations''* . This means therefore that contracts should only be awarded if funds are available at the procurement stage, implying that inadequate budgetary provision should not be a reason for project failure in Nigeria. However, Ewa (2013) insisted that numerous government infrastructure projects have failed due to paucity of funds and that variation of costs often render all initial funding arrangements put together for a project useless as an increase in costs ultimately makes available funds inadequate for the completion of the project.

Another cause of project failure in Nigeria aside from variation occasioned by inadequate scope description and documentation is the reluctance, usually midway into the project, of financial institutions involved in providing funding to contractors to make such funds available due to the fear and possibility that the project might not be implemented as envisaged, thereby stalling the project. Also, Akindoyeni (1989) observes that there is the penchant for some project designers to make adjustments during design in order to please the client without taking into consideration the effect of those

adjustments on the project cost and schedule. He further categorized changes as either project development changes or scope growth changes. Project development changes are changes which are required to implement the scope as presently defined, while scope growth changes are changes that completely modify the projects original scope which is the scope that was approved prior to the commencement of the design phase. These changes, though unavoidable sometimes, usually add cost and time to the previous design which eventually pose serious threats to the success of the project.

Analysis and Findings on the Causes of Road Construction Project Failures in Nigeria

Based on the author's practical experience as Permanent Secretary in Kwara State Ministry of Works and Transport and coupled with the various reports of participant observatory works and inspection to project sites gathered and analyzed in the course of the research, the followings are the casual factors for road construction project failures in Nigeria:

(i) Poor Design Good road designs will cater for drainage needs and present and future traffic flows. A practical example of the problem of poor design or design errors was witnessed in 2023 at the re-constructed Adeta-Pakata intra-city road in Ilorin, Kwara State capital. The road was awarded by Kwara State Government in 2021 and completed in 2023 with a covered drainage on both-side as walk ways. Since the completion of the road, the covered drainage had resulted in to environmental problem of silted sewage and its attendant flooding whenever rainfall in the area, causing havoc to homes along the road. Afield trip to the site indicated that the problem of the road is essentially the drainage design error, which is defective and not suitable for a build-up area like Gaa-Aremu and Pakata where the road passes. When the flooding persists, the Kwara State Government had to re-award the re-construction of the road in 2024 at the expense of public scarce resources. The field-trip to the site revealed a massive destruction of the covered drainage and walk-way, with a view to convert them to an open drainage as it was originally designed in 1977 when the road was first constructed by the administration of late General George Innih (Adeta-Pakata Field Report,2024). From this example, it is evident that road failures is essentially caused by improper designs, inadequate provision of hydraulic structures i.e. drainage and culverts, and heavy traffic as well as overloading, because most of the roads were not designed to carry heavy duty axle trucks that now ply on them.

(ii) Inadequate Hydraulic Structure: Hydraulic structure is important in any road construction because it determines the ability of road pavement to withstand traffic and environment effects. Poor hydraulic conditions ordinarily result to road pavement failures. Properly maintained hydraulic structures such as drainage system, culvert, bridges, etc. increase the lifespan of road pavement and poorly maintained hydraulic structures shorten the lifespan of road pavement. Silted or block drainage, inadequate drainage and blocked culverts is a typical feature on Nigerian roads which has made road surface pavement saturated, which usually percolate into the lower binder layer, and may not be able to drain through the road shoulders and sides, thus crack and later create potholes, gulley and erodes the pavement. As at the time of this study in March 2024, there are several spots of failed hydraulic structures along Oyo- Ogbomosho federal highway

(iii) The use of low quality workforce and materials during construction by Contractors: In order to maximize profits, most road construction companies usually engage the service of non-qualify engineers and surveyors during road construction. In some cases, some construction firms deliberately used the COREN's license and certificate of qualified Engineers to bid, tenders and secured road construction contracts, but after the award of the contract and during the execution of road works, construction firms usually dump such qualified and licensed Engineers to avoid high personnel emolument. Rather, most construction firms usually engage unlicensed engineers or even non-engineers to execute road works to maximize profit. Engagement of unlicensed engineers is therefore the consequence of inadequate supervision, poor quality control, poor execution of road works in form of poor laterite filling, poor use of sub-base and base materials and inadequate thickness of asphalt pavement layers,that frequently occurred in all federal and state road construction project sites across the country.

(iv) Inadequate geological investigation on road soil and lack of laboratory at project sites: In any road construction, in-situ tests must be carried out on soil. In Nigeria, the necessary soil tests and other in-situ tests required to be carried out on soil during earthwork's sub-grade and grade levels and soil tests are not always done. This is either because of lack of design or poor design and the use of assumed technical data. Adequate testing of soil during sub-grade level, which is the foundation of road construction is compulsory. However, some construction firms, in connivance with resident supervising civil engineers, usually skipped this important test, either due to lack of laboratory facilities at the site or due to lack of trained laboratory staff to carry out the test (Abdulmumini, 2017). Many of Nigerian roads failure are attributable to lack of laboratory at construction sites and inadequate in-situ test of soil during earth work's sub-grade level.

(v) Poor Supervision: Good supervision by project consultant and resident engineers will ensure that road construction is executed in line with design, specification and standards, and with right quality materials. Good supervision will also ensure quality control, carrying-out of in-situ soil test on laterite filling, sub-base, base soil materials and maintenance of pavement layer-thickness. However, practical experience during inspection to some road project sites has shown that road construction in Nigeria suffers from bad supervision from the project designers, project consultant and resident supervising engineers. Due to bad supervision of road construction, quality control is compromised in many ways. Such compromise ranges from lack of laboratory on site to inadequate in-situ soil tests on materials, inadequate asphalt pavement thickness to allowing unqualified skilled and semi-skilled workers to work on site.

Similarly, it is common practice in road construction site now that project consultant and resident engineers have turned themselves into sub-contractors at site, collecting laterite and granite suppliers and even construction firms' usually sub-let drainage and culvert components of the contract to project supervisors, in return for sub-standard, compromised and shoddy works. A critical observation of Oyo-Ibadan express way reveals that there is wide variation in the thickness of the stone base layer, binder and wearing course surface thickness of the carriage way constructed in 2007 by P.W. Construction Company, compared with the appropriate thickness of binder and wearing course pavement surface of Ilorin-Ogbomosho express way that was constructed at the

same period by Reynold Construction Company (RCC). The low thickness of asphalt pavement accounted for the high rate of spot failure along the Ibadan-Oyo express way. The thickness of binder and wearing course of Ibadan-Oyo highway is very low compared to the Ilorin-Ogbomosho highways, whose stone-base -layer, binder and wearing course thickness is relatively high (Report of Fieldwork along Ilorin-Ogbomosho-Oyo-Ibadan road,2018).

(vi) Poor Maintenance Culture: Nigerian roads suffer from maintenance and in few roads where maintenance is attempted by either the Federal Road Maintenance Agency or State Road Maintenance Agency, it is haphazardly executed and carried out. Due to poor or delayed maintenance, Nigerian roads deteriorate faster as failed portion spreads to other areas bounding the damaged portion rapidly, due to the ingress of moisture in the failed spot to the underlying layers of the entire defected road. It is regrettable to note that road maintenance has become a political issue as it is mostly carried out during electioneering campaigns and immediately after the election, road maintenance is usually suspended by governments at all levels for no cogent reasons.

(vii) Lack of Standard Practice: Improper use is a common feature on Nigerian roads because of lack of weight bridges. Absence of weight bridges on Nigerian roads had resulted to excessive load on the roads by overloaded axle trucks, petroleum tankers, illegal parking on asphaltic surface by petroleum tankers, especially at Ogere-Shagamu axis of Ibadan-Lagos express way, Olooru-Kanbi village and Oko-Olowo junction along Ilorin-Jebba highway and host of other illegal spots on the Nigerian highways. Most Nigerian roads receive heavy duty trucks traffic loads they were not designed to carry. Therefore, overloading is one of the major factors for asphalt pavement deterioration into alligator cracks, potholes, and gulley, which consequently results to the damaged paved road fast turning into earth road status. A typical example is PEKE area (near Eiyekorin Inter-change) along Ilorin- Jebba federal highway, which is notorious for annual deterioration during every rainy season (Report of Fieldwork along Ilorin-Jebba road,2018).

(viii) Inadequate Enforcement of Sanction: There are several enforcement agencies on Nigerian roads such as Federal Road Safety Commission, Nigerian Police Force, Nigerian Customs, Nigerian Immigration Service, Vehicle Inspection Officers (VIO), Traffic Management Agency, Federal Road Maintenance Agency, and State Road Maintenance Agency, and so forth. Despite several failures on Nigerian roads, no transporter or institution or road contractor has ever been held responsible or liable for these road failures. Equally, no sanction has ever been melted on poorly performed project consultant or resident engineer that carried out shoddy supervision during road construction. Also, there is are no records that the contractor that constructed bad roads was penalized for shoddy construction works. The traffic and vehicle inspection agencies that supposed to regulate overloading on Nigerian roads do not always enforce sanctions on offending vehicles for failing to abide by appropriate load weight. Indeed, many overloaded trucks and vehicles ply the road freely without penalties. In the same manner, road users are not sanctioned by the Vehicle Inspection Officers (VIO) for damages caused to roads. With this, both the institutions of government supervising road construction, road users, and contractors, supervising consultants and engineers and even the Council

for Regulation of Engineering in Nigeria (COREN) have all contributed negatively and are liable of road failures in Nigeria in one way or the other, through their ineptitude occasioned by non-enforcement of sanctions. The road traffic census conducted on 3rd Febuary,2024 in the course of this study at Rano Petrol Station Junction of Oko-Olowo area along the busy Ilorin-Jebba Federal Highway, revealed an average of two hundred overloaded trailers at every hour, plying Ilorin-Oko-Olowo-Bode-Saadu-Jebba federal highway, thus resulting to development of alligator cracks and fast deterioration of the road.

Findings on the Consequential Effects of Road Construction Project Failure in Nigeria

Evidently, an observatory field works along the 400kilometres stretch of Ibadan-Ilorin-Jebba –Mokwa Federal road on 3rd February, 2024 revealed the followings as the resultant effects of road construction project failures on Nigerian roads:

(a) Alligator cracks such as the type along Eiyenkorin-Okolowo axis on Ilorin-Jebba Federal Highway; (b) Potholes such as the type along Ogbomosho-Oyo Federal highways;

(c) Eroded edges and shoulders such as the type along Mokwa-Bokani Federal highway;

(d) Failed hydraulic structures – drainages, culverts, bridges such as the Moro and Ohan bridges in Kwara State (which collapsed since 1981) along Ilorin – Igbeti Federal highway. New bridges are yet to be constructed on Moro and Ohan rivers for fifty years after the collapse of the colonial bridges;

(e) Asphalt surface failure such as the type along Oyo- Ogbomosho highway;

(f) Depression on pavement surface; (g) Gulley due to erosion, which are common features along Oyo- Ogbomosho Highway;

(h) damages to road furniture and wiping of road marking which are common features along Oyo- Ogbomosho Highway; and

(i) Non-functional traffic signals which are common features along Oyo- Ogbomosho Highway; and non-functional traffic lights i.e. such as those dead street lights on Ibadan-Oyo Express Way at the outskirt of Ibadan, and Ilorin-Gari-Alimi-Eiyeorin axis and Outer Ogbomosho- Ilorin Highway.

Additionally, the major consequential effects of road construction project failure on Nigerian citizens include:

(a) *Heavy Damages to Vehicles*: Nigerian roads failure contributes significantly to major damages on vehicles, especially cars, buses and trucks making many Nigerian vehicles wear down faster compared with what is obtainable in developed countries where their roads are smoother and of standard.

(b) *Traffic Congestion:* Traffic congestion which is a common feature on the Nigerian highway is as a result of Nigerian roads failure. It is a daily occurrence to see hundreds of heavy axle trucks blocking major highways such as Ogbomosho-Oyo federal highway due to the dilapidated nature of the road. The Ogbomosho-Oyo federal highway is one of the worse roads in the country and most vehicles are forced to traffic congestion on the road due to the terrible nature of the road.

(c) Waste of Time: Bad roads waste the precious time of commuters and travelers plying the roads. Due to the bad nature of the roads, drivers waste much time avoiding

potholes, gulley, and other defected portions of the roads, thereby slowing down the speed of movement of vehicles.

(d) Fac*ilitate Crime:* Bad roads aid crimes such as armed robbery and kidnapping along the highway. The robbers usually hide in the bush side at bad spots where there are potholes, gulley or pavement wash away that usually force the drivers to make a temporary stop or do speed reduction to save vehicles from damage. Robbers and kidnappers usually waylay motorists at damaged spots of the roads to perpetrate their criminal activities.

(e) *Increase Accident Rate* Bad roads accounted for the increasing rate of accidents in the country. For instance, driving along Ogbomosho-Oyo federal highway has become increasingly dangerous due to the dilapidated nature of the road. In fact, the commuters now ply the on-going and yet to be completed Ogbomosho-Oyo dual carriage way, by illegally joining the road through bush-path at Odo-Oba township to save their lives, due to the increasing daily petrol tanker accidents on the old narrow carriage Ogbomosho-Oyo federal highway. According to Bashir (2012), the statistics of the Federal Road Safety Commission revealed that Nigeria had the World's third-highest number of road accident deaths, behind China and India between 2009 and 2011 as evident in table 1:

Table 1: ACCIDENT DATA ON NIGERIAN ROAD (2009 – 2011)

Year	Number of Road Accidents	Nos. Of Deaths	Number Injured
2009	8,875	5,654	25,056
2010	5,330	4,065	17,690
2011	4,765	4,372	16,855

Source: Weekly Trust of 10th March, 2012

(f) Flood: Blocked drainage and absence of adequate hydraulic structure on Nigerian roads usually result to flooding and erosion in the affected portion of the road. Due to inadequate hydraulic structures on road sides, many roads asphaltic pavement have been washed away thereby, making the road impassable to motorists, until the damaged portion is reconstructed.

(g) *Obstruct Commercial Activities:* The increasing deterioration of Nigerian roads is impacting negatively on the economic activities, especially the transportation system and commercial activities in the country. Bad roads usually lead to breakdown of vehicles which in turn slow down the movement of goods and people and consequently, affect adversely commercial activities in the Country.

Conclusion and Recommendations

Based on the foregoing, the study concluded that the problems of geological investigation and lack of laboratory, poor design, poor supervision, the use of low quality work force and materials, poor maintenance culture, inadequate hydraulic structure, low standard practice, and inadequate enforcement of sanction to defaulting contractors are the major factors responsible for road construction project failures in Nigeria. In the light of the foregoing, study is recommending the following seven measures to overcome road construction project failures in Nigeria:

Use of Appropriate Design: Road construction starts with survey, design and drawings. Government ministries and agencies in charge of road construction such as Ministry of the Works and Federal Road Maintenance Agency must take design seriously by employing and utilizing qualify surveyors, architects, town planners or consultants that will proactively handle road design and survey, which will provide technical pathway and guidance to civil engineers during road construction.

Adequate Maintenance of roads: The Ministry of Works and Federal Road Maintenance Agency should provide regular maintenance of carriage way, road shoulders, edges, hydraulic structures such as drainage, culverts and bridges. They should undertake constant checks of faults, defects and damages on the roads and rectify them appropriately. The maintenance work on the road should also cover desilting of blocked drainages, desilting of blocked culverts, integrity test on bridges, regular replacement of expansion joints of the bridges, patching of potholes, sectional overlay of damaged pavement, reinstatement of wash away road shoulders and edges, refilling of depressed pavement surface and clearing of refuse along the road side including deforestation of road side for easy accessibility. Adequate and regular road maintenance will ensure sustainability and increase the life span of roads. In order to facilitate regular maintenance of roads, it is also recommended that the governments at all levels should procure earth moving equipment such as pavers, graders, bulldozer, rollers and tippers for the Ministry of Works and Road Maintenance Agencies to enable these institutions respond swiftly to maintenance matters on Nigerian road. Without adequate provision of these equipment for these institutions, regular maintenance would continue to be a luxury on Nigeria's roads. Direct labour execution of road maintenance is cost-effective for government than the use of contract basis execution which is costly and may not enable the regular maintenance required. It is through the provision of equipment to government's maintenance institutions that these institutions can carry out regular maintenance through direct labour basis at cheap cost to the government. If the obstacles on the roads such as cracks, potholes, depression, and so on are quickly fixed as they occur by these institutions, Nigerian roads will be smoother, congestion will ease, travel time and accidents will reduce to the barest minimum.

Soil Test Soil tests are mandatory in road construction as it will help maintain standard and quality road. The soils to be used for sub-grade level, sub-base and base levels must be tested and must be found suitable before usage. Failure to carry out necessary soil tests should attract sanctions on construction firm and supervision engineers from the Ministry of Works and Council for Regulation of Engineering in Nigeria (COREN) should ensure strict compliance.

Quality Materials: Materials that are of standard quality are required for road construction. Materials for binders, wearing courses and pavement must be tested and must be found to meet the required standard and specifications before they are accepted by supervising engineers for road construction works. It is the use of quality materials that will ensure that the road constructed is durable, with longer life span and good quality.

Provision of Road Furniture and Facilities: In order to safeguard Nigerian roads, adequate furniture and facilities must be provided. Road furniture will ensure proper

functionality of Nigerian roads. Government institutions managing Nigerian roads should endeavour to provide road furniture and facilities such as drainages, adequate shoulder's surface dressing, road signs and marking, drainage desilting, etc for proper functionality of the roads.

Use of Licensed Engineers: Effective use of COREN's licensed engineers for road construction works by construction firms and Institutions managing road works will go a long way to address the problems of faulty designs, inadequate provision of hydraulic structures – drainages and culverts, failure to do appropriate tests on soils and materials and poor supervision, as these problems could easily be solved by licensed COREN's engineers than semi- skilled technicians or artisans and unqualified engineers, which most of the construction firms usually engaged for road construction works and

Application of Penalties: Appropriate penalties and sanctions need to be meted on construction firms, project consultants and resident engineers for road failures. If sanctions are meted, it will serve as deterrence to future occurrence of shoddy construction works and those in charge of road construction works will brace up to their responsibilities. Sanctions and penalties of construction firms should take the form of withdrawal of annual practicing license by COREN and refund of government expenses on poorly constructed roads by the construction firm, as well as fines for executing substandard works. Equally, the practicing License of resident engineers and project consultants that supervise poorly constructed roads should be withdrawn and the affected engineers is made to face the disciplinary committee of COREN for additional stiffer sanctions to serve as deterrence to would be negligent engineers in the future.

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