



Nigerian Institution of Highway & Transportation Engineers (NIHTE)

(A Division of the Nigerian Society of Engineers)

A Four-Monthly Journal of NIHTE

May - August, 2024

Vol. 7

8th Edition

Think, Transform & Transcend

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APTNG (ICTA) BEST AWARDS TO ENGR. HASSAN SAIDU, FNSE & ENGR. DR. AGBASI EMEKA, FNSE



ENGR. HASSAN SAIDU, FNSE, FNIHTE
NATIONAL CHAIRMAN, NIHTE



ENGR. DR. AGBASI EMEKA, FNSE, FNIHTE
FERMA MD/CEO

The African Professional Transportation Networking Group, in partnership with Morgan State University, USA, has honoured and commemorated exceptional accomplishments to the Managing Director of the Federal Road Maintenance Agency (FERMA), Engr. Dr. *cont'd. in pg. 7*

NSE PRESIDENT STATES COMMITMENT TO FOOD SECURITY IN NIGERIA

The President of the Nigerian Society of Engineers, Engr. Margaret Aina Oguntala, FNSE, emphasized NSE's commitment to supporting food security initiatives and the importance of collaboration with key companies and institutions during the maiden Annual Ademola Olorunfemi Public Discourse and Dinner, organized by the NSE Manchester UK Branch. In her remarks, NSE President introduced the NSE strategic agenda aimed at enhancing the agricultural *cont'd. in pg. 8*



The No. 1 Highway & Transportation Engineering Development Journal



OUR VISION

- To transform the nation's highway & transport sector that is centered on road safety, compliance, intervention, monitoring, assets management, reform, financing and capacity building for the nation's highway and transportation professionals.

OUR MISSION

- To think, transform and transcend the nation's highway & transport practice to that of global best practices.
To provide forum for members and partners of the highway & transport industry that foster education, innovation, research, fellowship, promoting a safe, sustainable and efficient highway & transport system.
To bring radical changes into the highway & transport practice in design, construction, maintenance, sustainability and management of highway & transport infrastructures.
To engage highway and transportation stakeholders.
To hold research, conference, seminar, technical publication, workshops, lectures in line with global best practices.
To provide professional leadership while developing and sharing knowledge, capacity building and technology acquisition.
To develop the nation's highway design and construction standards.
To net-work and engage with highway industry leaders from different countries of the world.
To have unparalleled professional and business development opportunities around the globe.

Core Values

Education and Innovation.
Diversity, Inclusiveness and Ethics.
Quality life
Fellowship.

Goals

Increase visibility.
Maintain membership and extend market diversity.
Promote education.
Educating highway & transport decision makers.

Aims & Scope

As an academic journal, the *Journal of the Nigerian Institution of Highway and Transportation Engineers (NIHTE)*, provides a platform for the exchange and discussion of novel and creative ideas, on theoretical and experimental research in the field of Highway and Transportation. This journal publishes high-quality peer-reviewed papers on engineering, planning, management, and information technology for highway transportation. The journal is committed to rapid peer review and publication.

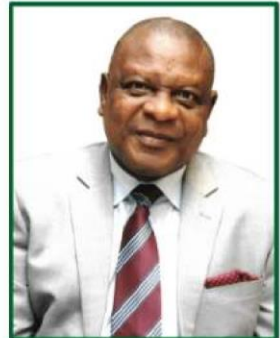
The scope of the *Journal of the Nigerian Institution of Highway and Transportation Engineers*, includes: -

- Road engineering, railway engineering, environmental engineering, ITS and traffic engineering and bridge and tunnel engineering
- Automotive engineering, design, manufacture, and operation of vehicles
- Air transportation, maritime transportation, road transportation, and railway transportation
- Analysis, operation, optimization, and planning of highway and transportation systems and networks
- Travel behaviour, information technology, traffic control, and traffic flow theory
- Economics, health, safety, security, environmental and management of highway and transportation
- Multi-modal highway, transportation and logistics research
- Intelligent highway and transport systems
- Materials science,

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A NOTE FROM THE LEAD EDITOR'S PEN

You are welcome to the Maiden Edition of NIHTE Journal. We are delighted to start this publication, which we understand will take forward our understanding and causes of things, to better humanity.

Where is LIFE, We Lost in Living?

Where is WISDOM, We Lost in Knowledge?

Where is Knowledge, We Lost in Information?

Wisdom is timeless. All that happens today and in future may or not seem right, but wisdom is always right. It is indisputable. It is the duty of all of us to share what we have learnt. An experience is worth million books, and sharing will only make the world a better place to live.

For some years, we had seen a celebrity-hood of wisdom imparting individuals. Back then, assimilating knowledge was precious. To attain it was expensive and still is a prerogative of those with resources. But the street is laden with golden words only that we must suitably excavate and present it to the world.

Not many schools in the world do help their pupil to extract wisdom. At best, we produce arguments, good and bad, mostly adjusting to the current times. Many parts of the world are still deprived of a sound education system, and where there is, it is turning out to be expensive.

NIHTE Journal is an endeavour to bring expertise to all. Like many and believes in the guiding principle of knowledge as power.

Further, we want to treat learning as a fundamental human right.

While all of us are filled with expertise, from every field of human involvement, holding it within, does little good around us. It must come out to be freely shared and equally honoured.

Billions have gathered wisdom, and each has a unique one. Generations have lived on this planet, and it has remained in those heads and had gone. It is the most significant waste of human resources ever to be realized. Hence, the hour's call is to start a consorted effort. In this digital age of interconnectedness, it is easy to put together wisdom. All, now and in future, will enjoy the benefit of this effort.

It is also essential to understand that social media is a 21st-Century creation. It has changed how humans consume data, where information may not be clean as it should be. Wisdom is seldom as grain in hay here. So, we must be careful in our endeavour.

Ours is a century run by-generation NIHTE, which moves faster than the speed of thought. The digital and lifestyle changes are supersonic. The culture of absorbing and processing information is moving at NIHTE times the rate of realization. So, not only do we need experts to catch up with current times, to behold deeper meaning, but to prevent it from slipping like wet sand in our palm.



Jones Nwadike
Lead Editor

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SUPPORT & DONATIONS BY NIHTE OF

SOLAR STREET LIGHTS TO RIVERS STATE UNIVERSITY (RSU), NKPOLU, OBIO-AKPOR L.G.A, PORT HARCOURT, RIVERS STATE.



TECHNICAL/INDUSTRIAL VISIT TO BOSKEL LIMITED, PORT HARCOURT BY NIHTE ON 28TH MAY, 2024.



NTA WEEKEND FILE

FOCUS:

UPDATE ON CRITICAL ROAD INFRASTRUCTURE



Engr. Babu Hassan
National Chairman, Nigerian Institution of Highway and Transportation Engineers



Engr. Felix Atuma, mni, PhD.
Former Registrar of COREN.

DATE: Sat. 04TH May, 2024

TIME : 9:00PM

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About NIHTE

NIHTE – the Nigerian Institution of Highway and Transportation Engineers – is a non-profit, non-partisan institution representing highway and transportation in the Nigerian Society of Engineers (NSE), in Nigeria. It represents all highway and transportation modes, including air, highways, public transportation, active transportation, rail, and water. Its primary goal is to foster the development, operation, and maintenance of an integrated national highway and transportation systems.

NIHTE works to educate the public and key decision-makers about the critical role that highway and transportation play in securing a good quality of life and sound economy for our nation. NIHTE supposed to serves as a liaison between national, state and local government departments of highway and transportation and the Federal government and is supposed to be an international leader in setting technical standards for all phases of highway and transportation systems development. Standards are supposed to be issued for design, construction of highways and bridges, materials, and many other technical areas.

Construction workers are often at risk of exposure to many infectious diseases, such as coccidioidomycosis, histoplasmosis, hypersensitivity pneumonitis, disseminated histoplasmosis, dengue, asbestos-related illnesses, silicosis, legionellosis, tuberculosis, blood-borne pathogens, and COVID-19. Due to severe working conditions and possible accidents, construction fields are high-risk zones by nature. It is very important to recognize and control the preventable health and safety hazards within these environments. The need for identification and prevention of these diseases is urgent, according to NIHTE. We can be nimble and quick in illustrating to those who are exposed to theses hazards, how to spot them and, hopefully, eradicate them, with help from health workers.

cont'd. from pg. 1

Chukwuemeka Agbasi, FNSE, and the National Chairman of the Nigeria Highway Institution and Transportation Engineers (NIHTE), Engr. Hassan Saidu, FNSE, with Global Recognition Awards in their significant impact on a range of Highway and Transportation Sectors and domains. The awards are special because of their unique selection procedure, in which subjects matter experts decide on the short-lists and global public votes to choose the winners.

The awards acknowledge their selfless contributions and support to the engineering community, particularly their involvement in the International Conference on Sustainable Transportation and Smart Innovation in Africa (ICTA).

The awards ceremony took place during the 9th ICTA conference in Arusha, Tanzania, which brought together global participants to discuss, share knowledge, and address challenges in improving Africa's road infrastructure.

Upon receiving the award, Engr. Agbasi expressed his gratitude, stating: "I am humbled to receive this recognition, which serves as a testament to FERMA's commitment to sustainable road maintenance and

development. I dedicate this award to our team, whose tireless efforts have contributed to our success."

Engr. Saidu also accepted the award with appreciation, saying: "This recognition is a reflection of NIHTE's dedication to advancing the transportation engineering profession in Nigeria and Africa. I thank our members and partners for their unwavering support, and I look forward to continued collaboration in driving innovation and progress in our field."

Engr. Mudasiru Bola, National Secretary General of NIHTE, who was present at the conference and award presentation, felicitated with the recipients, saying: "I am delighted to see our leaders receive this well-deserved recognition. Engr. Agbasi and Engr. Saidu are true champions of our profession, and their contributions have significantly impacted the transportation sector. I congratulate them on this achievement."

The awards ceremony was attended by esteemed professionals and stakeholders in the transportation sector, who gathered to celebrate the achievements of Engr. Dr. Agbasi and Engr. Saidu.



NSE PRESIDENT LAYING FOUNDATION STONE FOR UGHELLI BRANCH COMPLEX

You are officially invited

BOOK LAUNCH

STEPS, STRIDES & GLIDES

Reviews: Engr. Ebele Okeke, C.Eng, FNSE, CFR, OON
Ms Makosi Musambasi

Chairman: Air Marshal HB Abubakar, DfS, GSS, psc, fdc
Chief of the Air Staff

On Friday, September 13th, 2024
By 10am | @ NAF Conference Centre & Suites
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Nigeria Institution of Highways and Transportation Engineers (NIHTE)

In collaboration with:

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Present:

**An International Training Workshop on:
EFFECTIVE CONSTRUCTION & MAINTENANCE SUPERVISION FOR ROADS AND BRIDGES**

REGISTRATION FEES
N250,000

Course Presenters:
Mr Danny Gordon & Scott Bloxsom

NSE Auditorium, National Engineering Centre, Abuja, Nigeria

October 21-25 2024

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Sponsored by:

Contd. from page 1

sector's productivity through entrepreneurship and advanced engineering. She underscored the need for accessibility, affordability, and improved food quality for a healthy life, highlighting the role of engineering in revolutionizing agricultural businesses and establishing innovation hubs to attract funding partners and scale agricultural enterprises.

Earlier in his welcome address, NSE Manchester UK Branch Chairman, Engr. Patrick Obidoyin, FNSE, introduced the discourse on achieving food security in Nigeria through diaspora engagement and emphasized the importance of collaborative efforts in addressing Nigeria's food security challenges.

The event's keynote speaker, Farmer Kolawole Adeniji, CEO/MD of Niji Group of Companies, delivered an inspiring speech emphasizing the importance of local solutions for agricultural challenges in Nigeria. He emphasized the need for a holistic approach to agricultural transformation, focusing on technology, training, and market access.

A highlight of the event was the recognition of Engr. Ademola Isaac Olorunfemi, FNSE, the honouree, Past President of NSE and Patron of the NSE Manchester UK Branch, for his outstanding contributions to the engineering profession and the NSE.

The event underscored the critical role of engineering in addressing food security challenges in Nigeria and the importance of collaboration between the diaspora and local stakeholders to drive sustainable agricultural development.



ENHANCED CONTRACT MANAGEMENT WORKSHOP, MODULE 1 IN PICTURE



NSE PRESIDENT PRESENTS LAGOS STATE INFRASTRUCTURE SCORECARD TO GOV. SANWO-OLU; EXPANDS COLLABORATION FOR ENGINEER CAPACITY BUILDING



The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, presented the Lagos State Infrastructure Scorecard to Governor Babajide Sanwo-Olu on Wednesday, July 31, 2024. This presentation took place during a courtesy call at the Governor's office in Lagos. The Lagos State Infrastructure Scorecard offers a detailed analysis of the state's infrastructure projects, highlighting significant achievements, ongoing initiatives, and areas needing improvement. The NSE President emphasized that the "Lagos State Engineering Index & Infrastructure Scorecard 2022/2023" is a strategic tool designed to support the administration's future planning and budgetary decisions, providing insights to enhance project success and sustainability. During the meeting, The President praised Governor Sanwo-Olu for his proactive measures to combat building collapse in the state, particularly through the establishment of the Lagos State Building Control Agency (LASBCA) and the engagement of independent professionals from the construction industry. She noted that these efforts are critical in improving building safety and bolstering public confidence in the sector. The NSE President also requested further

collaboration to enhance the capabilities of engineers employed by the state. She urged the Governor to continue appointing qualified engineers to lead engineering-related ministries, departments, and agencies (MDAs), citing the unique problem-solving skills and technical expertise engineers bring to project implementation. Additionally, she proposed employing more engineers at Grade Level 10 within the civil service to ensure parity with other professionals and strengthen the state's workforce.

In his response, Governor Sanwo-Olu expressed gratitude for the development of the infrastructure scorecard and acknowledged the crucial role of engineers in overseeing and executing infrastructure projects. He highlighted the need for continuous capacity building for engineers to ensure the efficiency and effectiveness of state projects. The Governor also requested NSE's assistance in organizing training programs to enhance project management skills among Lagos State engineers.

This meeting has paved the way for deeper cooperation between NSE and Lagos State, focusing on elevating engineering standards and project management capabilities to support the state's development goals.



FEMALE ENGINEERS SEEK INNOVATIVE SOLUTION TO STEM INFRASTRUCTURAL DEFICIT

Female engineers seek innovative solutions to stem infrastructural deficit.

The Association of Professional Women Engineers of Nigeria Lagos chapter (APWEN Lagos) has called for increased investment in transformative and innovative infrastructure solutions as a means to achieve the United Nations Sustainable Development Goals (SDG six and seven) target.

The Association of Professional Women Engineers of Nigeria (APWEN) has called for increased investment in transformative and innovative infrastructure solutions as a means to achieve the United Nations Sustainable Development Goals (SDG six and seven) target.

The Managing Director, Association of Consulting Engineers in Nigeria (ACEN), Mrs Olufunmilayo Kadri, who led the call at a virtual forum themed: "Empowering Women Engineers: Transforming Infrastructure to Achieve Sustainable Development Goals," organised by APWEN, Lagos Chapter, noted that the problems with SDG six, which centred on clean water and sanitation, are inadequate access to clean water, poor sanitation facilities and inefficient water management, while goal seven is about affordable and clean energy.

She, therefore, challenged authorities and women engineers to lead the campaign aimed at improving investments in transformative and innovative solutions that would improve access to clean water, enhance sanitation, and efficient water management, increase access to reliable electricity, reduce reliance on fossil fuels, and improve energy efficiency.

Kadri said: "Engineering and engineers are crucial in the efforts to achieve SDGs six and seven. Investments in engineering solutions such as solar-powered water purification, rainwater harvesting, biogas sanitation systems, solar micro-grid, energy efficiency upgrades and innovative financing models and micro-financing options are required."

Chairman, APWEN Lagos Chapter, Mrs Atinuke Owolabi, said empowering women engineers is not only about breaking barriers but also about building bridges, to connect ideas, innovations, and aspirations for a better tomorrow.

Owolabi said the forum highlights the pivotal role

women play in shaping infrastructure and advancing global sustainability, adding that the discussion is timely and crucial to building inclusive and resilient infrastructure that meets community needs.

She urged Governor Babajide Sanwo-Olu to prioritise the maintenance of infrastructural development. "Let us empower our indigenous engineers, source spare parts locally, and implement regular maintenance checks to sustain our infrastructure investments, especially the rail mass transit system recently commissioned," Owolabi said.

APWEN President, Dr Adebisi Osim, said the theme was a reminder of the immense contributions that women have made, and continue to make, in the field of engineering from designing groundbreaking infrastructure to developing innovative solutions to global challenges.

She noted that women engineers have proven over time that their talents and expertise are essential to the progress and prosperity of society.

"We reflect on the pivotal role of infrastructure in achieving SDGs. Infrastructure forms the backbone of economies, societies, and environments, providing essential services and enabling growth.

However, its development and management present multifaceted challenges that demand innovative solutions and diverse perspectives," Osim said.

She said: "Through our expertise, creativity, and dedication, women engineers are not only designing and constructing resilient infrastructure but also integrating sustainable practices that mitigate environmental impact and enhance societal well-being.

"We are steadfast in empowering women engineers through mentorship, professional development, and advocacy. We believe in nurturing talent, breaking down barriers, and creating pathways for women to thrive in traditionally male-dominated fields. Our initiatives aim to equip women engineers with the skills, networks, and opportunities they need to succeed and lead impactful projects that shape our communities for the better."

\$16 BILLION WASTED: TOP 10 ABANDONED PROJECTS IN NIGERIA

Nigerian Government has spent \$16 billion and failed to deliver these 10 projects...Top 10 abandoned Government Projects in Nigeria.

Number 1. Ajaokuta Steel Mills. Amount Spent: \$8 Billion.

The Ajaokuta Steel Mill, located in Kogi State, Nigeria was designed to reduce dependency on oil by fostering a robust steel industry. However, the mill, which covers over 24,000 hectares, has never been fully operational. A myriad of challenges, including political instability, mismanagement, and funding issues, stalled its completion. The Nigerian government continues to express commitment to revitalizing the Ajaokuta Steel Mill, seeking foreign investment and partnerships to finally bring the project to fruition. As of today, over \$8 billion has been spent, and the project remains moribund.

Number 2: Mambilla Hydro Power Plant. Amount Spent: \$5.8 Billion.

First conceived in the early 1980s, the project has faced numerous delays and setbacks. Despite multiple feasibility studies and design changes, it wasn't until 2005 that the Nigerian government signed an agreement to move the project forward. However, bureaucratic hurdles, funding challenges, and legal disputes have continually stalled progress till date.

Number 3. Brass LNG. Amount Spent: \$1.2 Billion

Brass LNG, an ambitious liquefied natural gas project Located on Brass Island, Bayelsa State, the facility was designed to produce up to 10 million tons of LNG per year, positioning Nigeria as a key player in the global energy market.

Despite significant investment, the project has remained in a state of limbo. Disputes over the actual amount spent have arisen, with the Nigerian National Petroleum Corporation (NNPC) estimating the expenditure at \$1.2 billion. Regardless of the exact figures, Brass LNG's failure to progress has left a considerable gap in Nigeria's economic potential.

Number 4. Abuja CCTV Project Amount Spent: \$460 Million.

The Abuja CCTV Project, approved during President Goodluck Jonathan's administration, aimed to install over 2,000 surveillance cameras in strategic parts of the Federal Capital to improve security. However, the project has faced significant setbacks. An investigation by the Seventh House of Representatives revealed that the project was far from completion, with many installed cameras non-functional and essential infrastructure, such as the command-and-control center, remaining incomplete. The lack of a coherent strategy for maintenance and operation further hindered the project's success.

Number 5. Rivers State Monorail.

Amount Spent: \$400 Million.

The Rivers State Monorail project, launched in 2009 under Governor Rotimi Amaechi was envisioned as a state-of-the-art, elevated transit system covering a distance of 12 kilometers. However, numerous challenges, including funding issues, political controversies, and technical difficulties, have stalled the project. By the time Governor Amaechi left office in 2015, the project was far from finished.

Number 6: Dredging of River Niger

Amount Spent: 34 billion naira.

The Lower River Niger Dredging Project, approved in 2011 during the Jonathan administration, aimed to improve navigability from Warri, Delta State, to Baro, Niger State. The project was allocated 47 billion naira, with 34 billion naira released to contractors. However, by 2016, the Nigerian Indigenous Ship-Owners Association (NISA) lamented the poor handling of the project, claiming no substantial dredging work had been done despite the significant funds allocated.

Number 7: Katsina Windmills.

Amount Spent: 4.4 billion naira.

The Katsina Windmill project, initiated in 2005 by former President Umaru Yar'Adua when he was governor of Katsina State, aimed to boost renewable energy and complement power projects across Nigeria. Despite over 4 billion naira spent, the project remains incomplete.

Number 8: Tinapa Resort.

Amount Spent: \$350 Million.

The Tinapa Resort in Cross River State, designed to be a shopping and trading paradise, has fallen short of its potential. Initiated in 2005, the project was meant to transform 80,000 square meters of retail space into a bustling economic hub. However, despite \$340 million spent, the resort remains largely unoccupied, a stark contrast to the vibrant center it was intended to be. This project, a legacy of former Governor Donald Duke, now lies in waste.

Number 9. Abuja Millennium Tower.

Amount Spent: 34 billion naira.

The Millennium Tower and Cultural Centre project in Abuja began construction in 2006. At 170 meters, it is the tallest structure in Abuja. Despite being topped out in 2014, the project remains incomplete. The FCT Minister once promised to finish the project, but costs have ballooned from 50 billion naira to over 200 billion naira, with 34 billion naira already spent.

Number 10. Bayelsa Tower Hotel.

Amount Spent: 6 billion Naira.

The 18-storey five-star Tower Hotel project in Bayelsa State aimed to attract tourists and provide high-end accommodations. The project cost initially put at 8 billion naira had to be put on hold after the contractor demanded an upward review. This is after 6 billion naira had been released.

MICROSTRUCTURAL AND STRENGTH CHARACTERISTICS OF WEAK SUBGRADE SOIL STABILIZED WITH MODIFIED CALCINED CLAY

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ABSTRACT

Pozzolanic and lime based materials have been used to improve engineering properties of weak subgrade soil due to formation of cementitious compounds. Information on stabilization of weak subgrade soil with Calcium Carbide Waste (CCW) and Calcined Clay (CC) is scarce, hence this paper presents research study on modification of weak subgrade (S) with different percentages of CCW (4, 8, 12, 16 and 20%) to assess optimum subgrade lime blend (OSLB) which was subsequently stabilized with CC (3, 6, 9, 12, 15 and 18%) by weight respectively. Analysis of the strength characteristics of OSLB and OSLB-CC modified subgrade over curing periods of 0, 3, 7, 28, 56 and 90 days through Scanning electron microscopy (SEM) and X-ray diffraction (XRD) tests were carried out. The blends were subjected to compaction, soaked California bearing ratio (CBR) and unconfined compressive strength (UCS) tests. The blend of S + 8% CCW was found to be the optimum subgrade lime blend. The results showed that stabilization of subgrade with variations of CC reduced compaction characteristics. It increased soaked CBR (0 – 418.2%) and UCS (201.59 – 5660.84 kPa) for all curing days. According to SEM test, the blends of OSLB- OSLB-CC confirmed improvement of bearing capacity and strength as a result of reduction of voids by hydration reaction byproducts.

Keywords: Weak subgrade soil, calcium carbide waste, Calcined Clay, Micrograph, Strength

INTRODUCTION

Pozzolanic and lime based materials (fly ash, rice husk ash, steel slag, palm kernel shell ash, bagasse ash, millet husk ash, cement kiln dust (CKD), calcium carbide waste) had been used to improve engineering properties of weak subgrade soils and were found to be effective owing to formation of cementitious compounds (calcium silicate hydrate and calcium aluminate hydrate) from hydration and pozzolanic reactions (Horpibulsuk *et al.*, 2013; Kampala & Horpibulsuk, 2013; Eberemu *et al.*, 2013; Salahudeen *et al.*, 2014; Abiola *et al.*, 2016; Akinwumi, 2012; Zhang *et al.*, 2016; Quadri *et al.*, 2019; Quadri *et al.*,

2021). When cementitious additives are blended with expansive soils with loose grains, the intergranular spaces or voids would be filled or covered with hydration reaction products, that is, calcium silicate hydrate (CSH) and calcium aluminate hydrate (CAH) (Liu *et al.*, 2019; Mohammadinia *et al.*, 2014 Horpibulsuk, 2012; Mosa *et al.*, 2017; Solanki and Zaman, 2012, Quadri *et al.*, 2021).

Calcined clays from deposits with low to moderate kaolinite contents have been identified as supplementary cementitious materials and viable options to decrease the environment impact associated with production of cement (Msinjili *et al.*, 2019; Scrivener *et al.*, 2018). The reactivity of Calcined clays in cementitious system is governed by the removal of hydroxyl groups from its clay minerals during heat treatment thus leading to their partial amorphisation thus making them pozzolanic (Msinjili *et al.*, 2019).

Horpibulsuk *et al.* (2013) researched on strength development in silty clay stabilized with calcium carbide residue (CCR) and fly ash (FA). It was observed that the soaked and unsoaked specimen strength depended mainly on the CCR and FA contents. They added that most of the ratios of soaked strength to unsoaked strength specimen varied between 0.45 and 0.65 which proved that a mixture of CCR and FA could be used for soil stabilization instead of ordinary Portland cement. Vichan and Rachan (2013) stabilized soft Bangkok clay using the blend of CCR and biomass ash (BA) with binders' contents ranging from 5 to 30%. They concluded that strength development ratio of stabilized clay with CCR and BA mixture exceeded those of cemented clay and FA and BA blended cement admixture clay after 28 days of curing due to the progress of the pozzolanic reaction.

Solanki and Zaman (2012) evaluated the microstructural and mineralogical characterization of clay stabilized using calcium based stabilizers and reported that, there were significant changes in the microstructure of raw soil when mixed with CKD cured for 28 days. The flat clay structure surfaces were covered with cementitious reaction products (CSH and CAH). The micrographs at

different curing days showed rose-shaped, web-shaped, flower-like, rod-like, poorly defined shaped and needle-like shaped ettringite crystals. The improved modulus of elasticity exhibited by CKD-stabilized soil specimens after curing was attributed to the aforementioned reaction products. The micrograph of the raw soil showed a discontinuous structure, where voids were more visible because of the absence of hydration products. The microstructure of CKD-stabilized clay was clearly denser and compact when compared with raw soil. Quadri *et al.* (2021) also evaluated the strength and microstructural characteristics of weak subgrade soil stabilized with Calcined Clay (CC) and Iron Slag Dust (ISD). They concluded that the modification of weak subgrade soil with CC and ISD increased its strength and bearing capacity. The micrographs of the stabilized subgrade materials showed a reticulated matrix within the soil material and gradually transformed natural subgrade soil structure from open (loose) into dense states owing to cementitious products (CSH and CAH) formed as a result of hydration / pozzolanic reaction which coated particle surfaces and formed a fabric that filled the voids between the loose aggregates which enhanced the inter cluster bonding leading to improved strength parameters.

Previous researchers had studied the time-dependent increase in strength of treated soils and their physical-chemical processes, that is, cation exchange, pozzolanic reactions etc. as a result of treatment between chemical stabilizers and soil (Choobbasti and Kutanaei, 2017; Zhao *et al.*, 2016; Metelkova *et al.*, 2012; Pomakhina *et al.*, 2017). Some other studies focused on the effect on the microstructure of lime-treated clays in the long curing period as well as on the correlation between microstructural modifications and the improved geotechnical properties (Cuisinier *et al.*, 2011; Lemaire *et al.*, 2013; Al-Mukhtar *et al.*, 2012; Vitale *et al.*, 2017; Boriana, 2016; Horpibulsuk, 2012; Wijeyesekera *et al.*, 2016).

Many research studies on the geotechnical characteristics and stabilization of clay with Calcium Carbide Waste (CCW) and steel slag had been reported in the literature however; information on stabilization of weak subgrade materials with CCW and Calcined Clay (CC) is scarce. So it is necessary to investigate the geotechnical properties of weak subgrade and CCW-CC through a series of laboratory tests. The present study, therefore, aims to: (1) modify weak subgrade with CCW to determine the optimum reduction in plasticity index (2) analyze the strength behavior of untreated weak subgrade, CCW modified subgrade, and CCW-CC modified subgrade over a curing periods of 0, 3, 7,

28, 56 and 90 days (3) Examine the strength development of untreated and treated weak subgrade through Scanning electron microscopy (SEM) and X-ray diffraction (XRD).

MATERIALS AND METHODS

Weak subgrade material (S) was sourced from a section along Ota-Idiroko road at a coordinate of Latitude 6° 40' 53.082 N and Longitude 3° 9' 11.172 E while Calcium carbide waste and raw clay were sourced from automobile workshops and Owode-Ketu in Ogun State, Nigeria respectively. They were air dried, ground to fineness and sieved through 425 µm sieve after the raw clay had been calcined in a Kiln for 2 hours at a temperature of 700°C. These materials were subjected to specific gravity, particle size distribution and X-ray fluorescence tests to determine their properties.

The subgrade was modified with CCW by weight in these percentage replacements (0, 4, 8, 12, 16 and 20%) to determine the optimum plasticity index reduction which was tagged optimum subgrade lime blend (OSLB) and the results summarized in Figure 1. Consequently, the blend of S + 8% CCW exhibited the optimum plasticity index reduction (14.8 to 8.7%).

The OSLB (S + 8% CCW) was thereafter blended by weight with CC percentage replacements (3, 6, 9, 12, 15 and 18%) respectively in order to activate the pozzolanic potentials of CC for strength enhancement. The blends were subjected to Compaction, California bearing ratio (CBR) (soaked) and Unconfined compressive strength (UCS) tests according to BS 1377 (1990). Three specimens of each category of samples were tested, and the average of the three results were reported. However, the specimens for strength test were moist cured until testing at 0, 3, 7, 28, 56 and 90 days respectively.

The microstructural characteristics of blends which exhibited 7 days optimum soaked CBR and UCS values were determined using scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) tests to examine the surface morphology of the specimens and to detect the presence and composition of different elements in them.

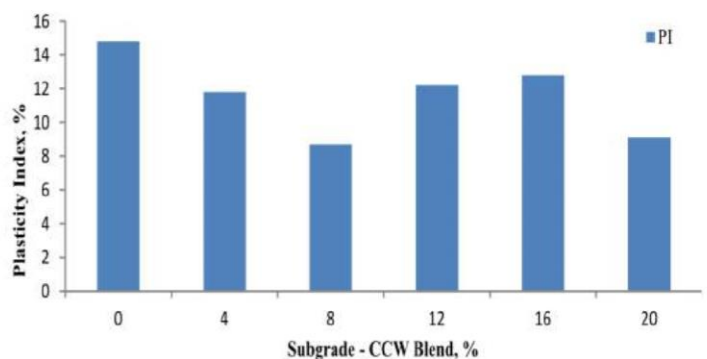


Figure 1. Relationship between plasticity index and blends of subgrade with CCW

RESULTS AND DISCUSSION

Physical and Index properties of Materials

The Subgrade material as captured in Table 1 was classified as A-7-5 and ML or OL according to AASHTO classification and Unified soil classification system respectively. The least dense material is calcium carbide waste (CCW) (1.81) with subgrade and calcined clay (CC) having equal weight (2.5) following their specific gravity results. Subgrade was found to be acidic with a pH value of 5.8 and CCW and CC were found to be alkaline with pH values of 13.5 and 8.9 respectively.

Table 1: Physical and Index Properties of Materials

Property	Subgrade	CCW	CC
Plastic limit (%)	31.2	-	-
Liquid limit (%)	46	-	-
Plasticity Index (%)	14.8	-	-
Clay content (<0.002 mm) (%)	53.3	2.975	1.7225
Silt content (0.002-0.06 mm) (%)	7.91	2.975	1.7225
Sand content (0.06 – 2.0 mm) (%)	35.54	96.75	98.003
Percentage passing sieve No. 200 (%)	61.21	-	-
AASHTO Classification	A-7-5	-	-
USCS classification	ML or OL	-	-
pH	5.8	13.5	8.9
Specific gravity	2.5	1.81	2.5
Colour	Reddish brown	White	Darkish brown

Oxide Composition of Materials

The sum of Al_2O_3 and SiO_2 for oven dried subgrade soil as observed in Table 2 is 78.43%. This is attributed to a very high content of clay minerals present in the subgrade soil (Mousavi and Karamvand, 2017). Calcined clay (CC) was found to be pozzolanic in nature and belongs to Class F according to ASTM: C618-08 standard owing to the aggregation of the three main oxides ($SiO_2 + Al_2O_3 + Fe_2O_3$) which was found to be 85.2%. Inspecting Table 2, CCW contains 93.74% mass fraction of clincker or quick lime (CaO) which makes it a potent binding material/binder with tendency to undergoing hydration reaction when mixed with water just as in the case of cement. The subgrade material was classified as a laterite and not a lateritic or non-lateritic material owing to its silica sesquioxide ratio of 1.11 as revealed by XRF results (Table 2). According to Martin and Doyne (1927, 1930) and Winterkorn and Chandrasekharan (1951) material with a silica sesquioxide ratio of less than 1.33 is laterite, between 1.33 and 2 is lateritic material and above 2 is non-lateritic material.

$$\text{Silica Sesquioxide ratio } \left(\frac{SiO_2}{Al_2O_3+Fe_2O_3}\right) \text{ of subgrade} = \frac{49.57}{28.86+15.58} = 1.11 < 1.33$$

Table 2: Oxide Composition of Subgrade, CCW and CC

Oxides	Percentage Oxide Contents		
	CCW	CC	Subgrade
SiO_2	0.83	58.86	49.57
Al_2O_3	0.71	16.23	28.86
Fe_2O_3	0.20	10.11	15.58
CaO	93.74	3.25	0.53
MgO	0	0	-
SO_3	0.7	7.81	-
Na_2O	0	0	-
K_2O	0	0.35	-
LOI	1.04	2.20	3.10

Compaction Characteristics of the Modified Subgrade Soil

The results of maximum dry density (MDD) and optimum moisture content (OMC) for blends of CC to blend of 8%CCW-subgrade (OSLB) are presented in Table 3. The blends CC-OSLB reduced MDD of subgrade from 1.82 to 1.54 Mg/m³. The reduction in MDD could be adduced to the fact that when a lime or pozzolant is added or mixed with a highly plastic soil in the presence of water, hydration reaction takes place leading to flocculation and agglomeration of particles where the number of free clay and silt present in the soil would be reduced leading to formation of coarser particles which occupy less place, hence the reduction in density. (Eberemu *et al.*, 2013; Ahmed, 1995; Abdullah, 2009; Al-Homidy, 2013; Al-Homidy and Abd El Aal, 2017, Quadri *et al.*, 2019; Quadri *et al.*, 2021).

The addition of CC to OSLB decreased OMC of subgrade soil from 23.7 to 17.2%. This reduction in OMC can be attributed to insufficiency of water in the mixtures thus resulting in self-desiccation and consequently lower hydration (Osinubi, 1998; Al-Homidy *et al.*, 2017, Quadri *et al.*, 2019; Quadri *et al.*, 2021)

Table 3: Compaction Characteristics of Blends of Weak Subgrade

Material	MDD (Mg/m ³)	OMC (%)
Subgrade (0%)	1.82	23.7
S + 8% CCW (OSLB)	1.60	17.2
OSLB + 3% CC	1.66	20.3
OSLB + 6% CC	1.59	21.9
OSLB + 9% CC	1.59	19.4
OSLB + 12% CC	1.59	18.1
OSLB + 15% CC	1.59	19.1
OSLB + 18% CC	1.54	17.9

California Bearing Ratio of Modified Weak Subgrade

Figure 2 shows the soaked CBR of subgrade, OSLB and OSLB-CC blends for 0, 3, 7, 28, 56, and 90 days curing periods. The results of Subgrade, OSLB and OSLB-CC ranged between 0, 53.2-456.6, 17.2-418.2% respectively for 0 and 90 days of curing. The first 7 days of curing showed that the blends had a slower rate of strength development compared to that of 7 and 90 days which increase substantially. Moreover, non-linear trend of increasing CBR can be observed after 7 days. The CBR value increased with increase in OSLB-CC blends and curing periods thus leading to formation of cementitious compounds (CSH and CAH) from continuous growth of hydration reactions with age (Gupta and Kumar, 2017; Horpibulsuk, 2012; Solanki and Zaman, 2012; Boriana, 2016; Wijeyesekera *et al.*, 2016; Quadri *et al.*, 2021).

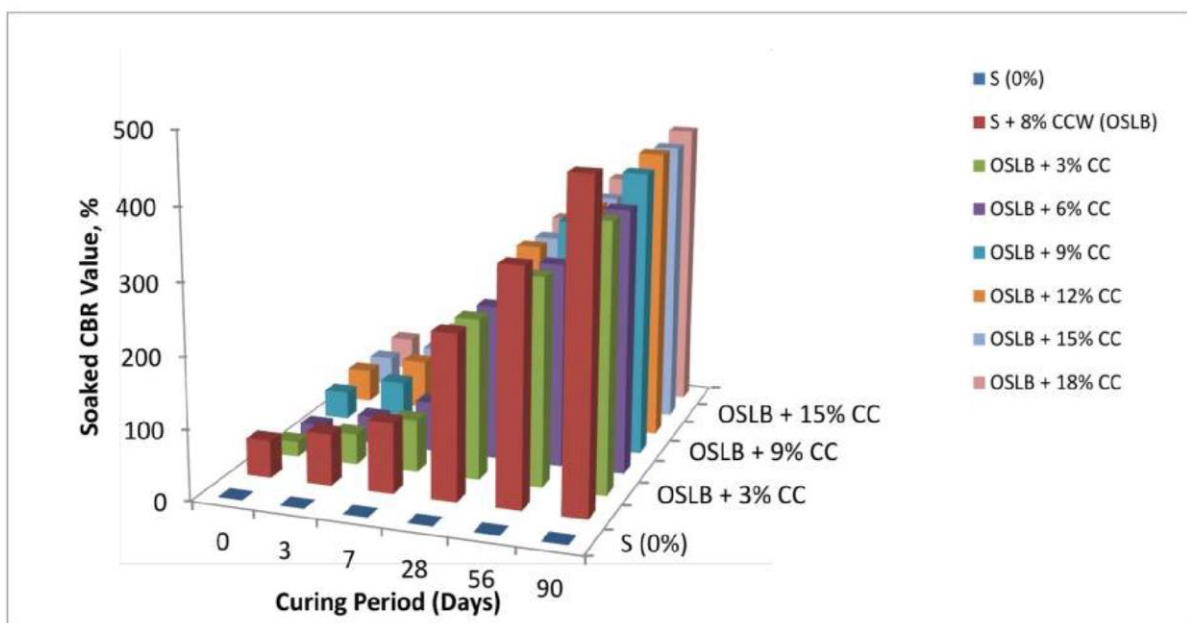


Figure 2: Soaked CBR of OSLB - CC Blends and curing days.

Results of Unconfined Compressive Strength of Modified Subgrade Soil

Figure 3 shows the variations of OSLB and OSLB-CC blends on UCS development after 0, 3, 7, 28, 56 and 90 days of curing. UCS increases with increase in CCW and CC percentage, the optimum OSLB and OSLB-CC providing the highest UCS are found at 8% CCW and 15% CC respectively. The strength of OSLB and OSLB-CC reaches its peak values, 3525.89 kPa (56 days), and 5660.84 kPa (90 days) respectively.

To analyze the effect of modifying CCW on UCS and curing time, Figure 4 shows the variation of UCS under stabilizing time. After, the addition of 8% CCW, the strength of the specimens increases significantly in 0, 7, 28 and 56 days by 630.5, 118.8, 204.3 and 279.8% respectively. There was great increase in UCS at 0 day which decrease at 7 days with increase in subsequent days. The early strength of CCW modified subgrade soil has reached a high value already showing CCW has significant effect on the early strength.

In analyzing the effect of CC on OSLB at 0, 7, 28 and 56 days, Figure 4 presents the effect of curing on UCS of the specimens showing that the strength increased with the curing periods. The strength of OSLB-CC increases with increasing curing periods, this shows that CCW produces more Ca^{2+} , which promotes the ion exchange of the system and pozzolanic reaction, and produces more cementing materials which enhances the strength.

Microstructural Characteristics of the Optimum Strength of Modified Subgrade Soil

Figures 5-7 present the micrographs and EDS of compacted weak subgrade soil, OSLB+18% CC and OSLB+6%CC after 7days of curing. The SEM micrograph and EDS pattern of compacted weak subgrade soil sample (Figure 5) shows a discontinuous structure where the voids are more visible (in the form of loose grain crystals or sands) due to the absence of cementitious binder (C-S-H and C-A-H) as reported by Solanki and Zaman (2012). The existence of the open voids points towards microstructural instability and this could be adduced to its low bearing capacity (0.0%) and low strength (1934 kPa) and high plasticity (14.8 %) when compared with the treated or stabilized subgrade materials (Wijeyesekera *et al.* 2016). The EDS results revealed presence of silicon (Si), oxygen (O), and Aluminum (Al) minerals and trace amounts of potassium (K), iron (Fe), calcium (Ca) and carbon (C).

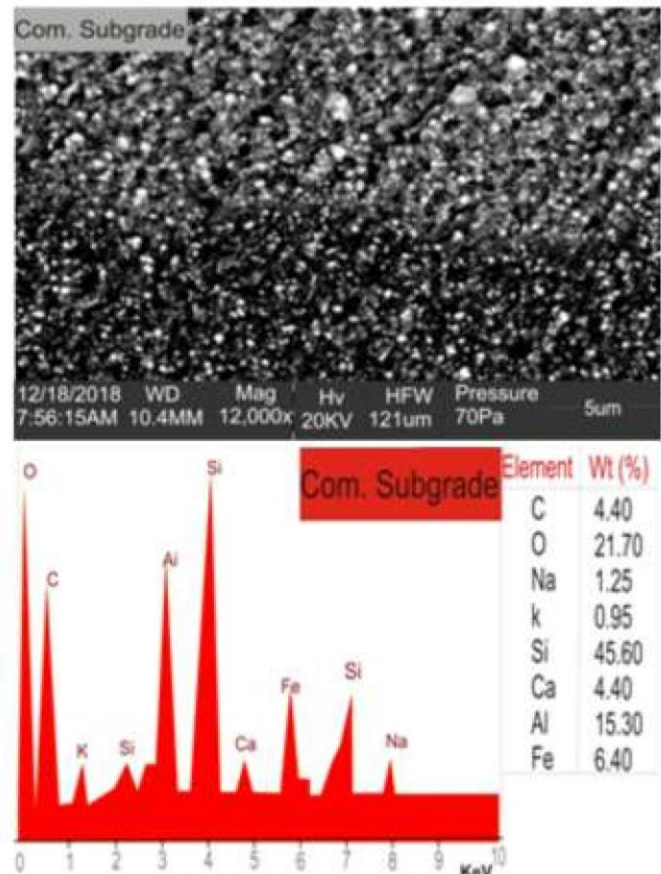


Figure 5: SEM/EDS Results of Compacted Subgrade (S)

Figures 6-7 show the SEM/EDS images of OSLB+18% CC and OSLB+6% CC after 7 days of curing. The micrographs showed a compact structure characterized by dense aggregates due to closing of smaller pores clearly denser and compact. The presence of flower-like crystals was noted in OSLB+18% CC while OSLB+6% CC blend showed the presence of poorly defined irregular shaped crystals. Due to the pozzolanic reactions,

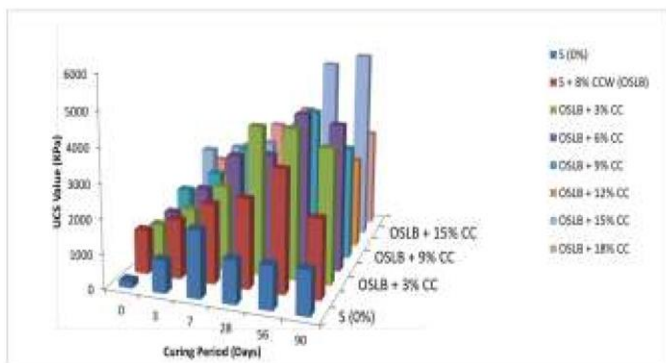


Figure 3: UCS of OSLB - CC Blends and Curing days.

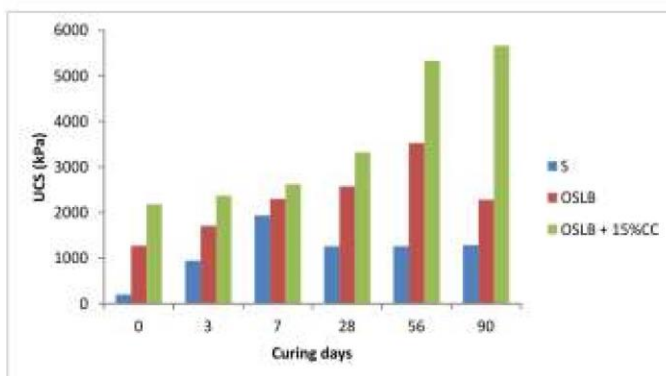


Figure 4: UCS of optimum blends of OSLB and CC against Curing days

cementation and the creation of CSH, CAH and CASH, the treated weak subgrade soils lead to increase in UCS values from 1934 to 2953 kPa as reported by researchers (Yi *et al.*, 2015; Singh *et al.*, 2016; Jahandari *et al.*, 2017).

To identify the hydration products, EDX was conducted on the samples. Figures 6 – 7 showed the major elements presence to include Ca, Si, Al, Fe, C, O, K and Na which are compatible with the chemical composition of CC. The specimen OSLB+18% CC when compared with weak subgrade (0%), silicon (Si) and Aluminium (Al) reduces from 45.6 to 45.10% and 15.30 to 15.10% respectively and Calcium (Ca) increases from 4.40 to 7.15 % as result of hydration that took place.

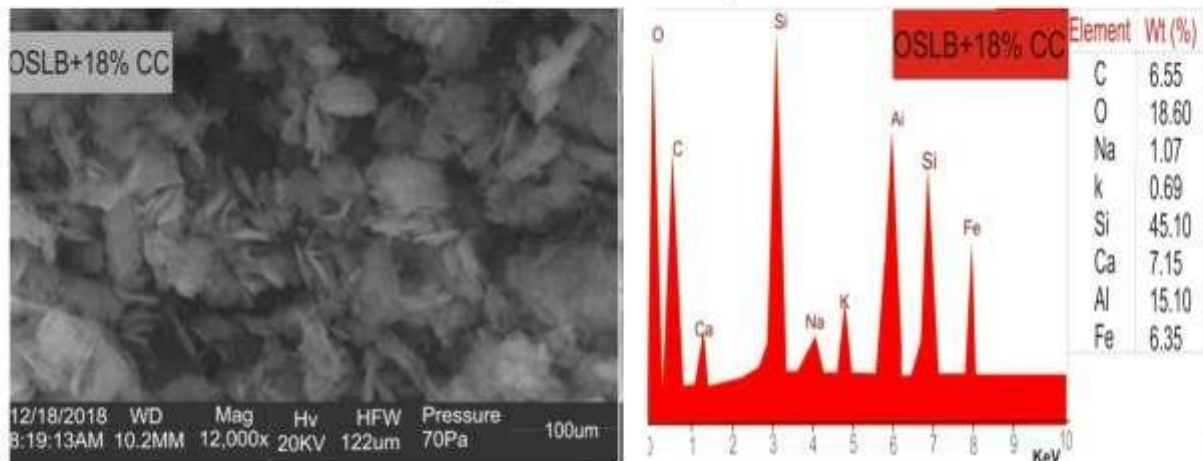


Figure 6: SEM/EDS Results of OSLB (S + 8% CCW) + 18% CC (OSLCCB according to CBR)

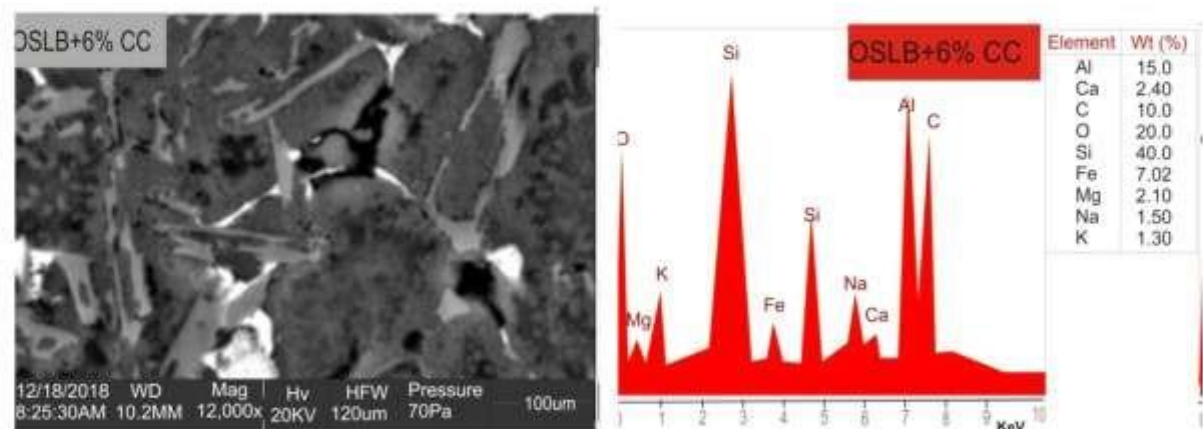


Figure 7: SEM/EDS Results of OSLB (S + 8% CCW) + 6% CC (OSLCCB according to UCS)

All the blends of CCW and CC confirmed improvement of bearing capacity and strength of the modified weak subgrade soil. Generally, the micrographs of all stabilized weak subgrade blends indicated the presence of a reticulated matrix within the soil material and the structure of the soil gradually transformed from open (loose) into dense states. It could be observed that the cementitious products, that is, calcium silicate hydrates (CSH) and calcium aluminate hydrates (CAH) formed as a result of pozzolanic reaction between 8% CCW and 18% CC, 8% CCW and 6% CC were attached to the soil particles, coated particle surfaces and formed a fabric that filled the voids between the loose aggregates which enhanced the inter cluster bonding leading to improved engineering.

CONCLUSIONS

The following conclusions could be drawn from this research work:

- The blend of S + 8% CCW was found to be the optimum subgrade lime blend (OSLB) exhibiting the optimum plasticity index reduction (14.8 to 8.7%).
- Modification of OSLB with CC increased soaked CBR for all curing periods (0 – 418.2%) owing to formation of cementitious compounds.
- Modification of OSLB with CC increased UCS for all curing periods (201.59 – 5660.84 kPa).
- The strength of OSLB-CC increases with increasing curing periods, this shows that CCW produces more Ca^{2+} , which promotes the ion exchange of the system and pozzolanic reaction, and produces more cementing materials which enhances the strength.
- The microstructural/EDS graphs of all the blends of OSLB-CC confirmed improvement of bearing capacity and strength.

- It was observed that the cementitious products, that is, calcium silicate hydrates (CSH) and calcium aluminate hydrates (CAH) formed as a result of pozzolanic reaction between 8% CCW and 18% CC, 8% CCW and 6% CC were attached to the soil particles, coated particle surfaces and formed a fabric that filled the voids between the loose aggregates which enhanced the inter cluster bonding leading to improved engineering.

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The Nigerian Institution of Highway & Transportation Engineers (NIHTE)



NOTICE OF 2024 FELLOWSHIP CONFERMENT

Distinguished Members.

The Nigerian Institution of Highway and Transportation Engineers (NIHTE) announces the opening of application for 2024 Fellowship Conferment.

The submission of the applications will close on Friday, 1st November, 2024

Interested members are expected to meet the following requirements.

1. Applicants must have a degree or its equivalent in Civil/Highway/ Transportation Engineering
2. Applicants must have at least 15 years of cognate experience in Highways/Transportation Engineering (inclusive of lecturing).
3. Applicants must have NSE and COREN certification.
4. Applicants must submit copies of the detailed CV of engineering practice.

5. Applicants by direct entry must submit reports and all documents used for NSE Fellowship with bias in Highway and Transportation Engineering and are required to pay the sum of 300, 000 naira only.

6. Applicants by invitation must submit a detailed resume of their Civil/Highway/Transportation engineering practice and evidence of NSE Fellowship and must pay the sum of 500,000 naira only.

For further inquiries on submission of applications and necessary documents, kindly contact: 08033575200, 08107825001, 08065668058.

Sincerely yours,

**Engr. Dr. Mudasiru Bola J., FNSE, FNIHTE
National Secretary General, NIHTE**

NSE PRESIDENT EULOGIZES LATE ENGR. IBRAHIM KHALEEL INUWA AT 6TH ANNUAL MEMORIAL LECTURE

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has lauded the late Engr. Ibrahim Khaleel Inuwa, FNSE, for his outstanding legacies and contributions to the engineering profession. These remarks were made during her speech as the Chairman of the



Occasion at the 6th Annual Lecture held in memory of the late Engr. Ibrahim Khaleel Inuwa.

In her address, the NSE President praised the NSE Kabuga Branch for instituting the annual lecture in honor of Engr. Inuwa. She assured that the NSE Headquarters would continue to support this initiative and uphold the good legacies left by the deceased.

Represented by the Deputy President of NSE, Engr. Ali Rabi'u, FNSE, MFR, she emphasized that honoring Engr. Inuwa for his contributions would undoubtedly inspire the younger generation to emulate his dedication and excellence. "Students and other younger generations need to give out their utmost best in coming up with new

innovations and proper solutions to many challenges as professionals so that one day they will be remembered," she stated.

Speaking earlier in his paper presentation titled "Nigerian Electricity Market: Challenges and Opportunities," Executive Director of Niger Delta Power Holding Company (NDPHC),

Engr. Abdullahi Kassim, advised other stakeholders in the electricity market to take necessary actions to provide sustainable energy in Nigeria.

The event, attended by professionals from various regions, served as a platform to celebrate the life and achievements of Engr. Ibrahim Khaleel Inuwa, reinforcing the importance of commitment and innovation in the engineering field. Late Engr. Ibrahim Khaleel Inuwa was the 16th President of the Nigerian Society of Engineers and former Kano State Commissioner for Rural and Community Development.

FG REJECTS JULIUS BERGER'S N279BN COST FOR SECOND NIGER BRIDGE BYPASS

The Minister of Works, Senator David Umahi, has rejected Julius Berger Plc's proposed cost of N279 billion for the Second Niger Bridge Bypass, describing it as excessively high.

In a statement on Thursday, Umahi expressed his disappointment with Julius Berger's pricing, saying, "One of the bypasses, which is 17.27 kilometres by two on asphalt, was awarded to Julius Berger. We changed the pavement elements to concrete, and the cost we calculated was N133 billion. Berger presented a figure almost twice our estimate, at N279 billion."

He further stated, "We disagreed with this cost during the negotiation in September 2023. We've decided to refer the project back to the Bureau of Public Procurement (BPP) and invite more contractors to bid because this involves public funds."

The Federal Ministry of Works has reviewed Julius Berger Plc's performance on all ongoing projects awarded to the company, with Umahi raising concerns over the unacceptable condition of some projects, including the Lagos-Ibadan Expressway phase 2.

Construction cost for Second Niger Bridge bypass too high —FG

He explained that the Ministry would seek selective tendering to complete the project, stating, "We changed the pavement elements from asphalt to concrete, and the total cost we calculated based on prevailing rates is N153 billion. However, they are proposing N258 billion. Since we've been negotiating since September 2023, we have no choice but to terminate this contract."

"We will then request a 'No Objection' from BPP for selective tendering, submitting our estimate of N153 billion and their proposal of N258 billion to BPP, while inviting other contractors to bid. This process will be concluded within the next month to ensure the project is completed promptly."



FG UNVEILS NEW POLICY GUIDELINES FOR ROAD CONSTRUCTION

The Federal Ministry of Works has introduced new policies aimed at transforming the road construction in Nigeria. The policies, unveiled by the Minister of Works, Senator David Umahi, are designed to address the poor pace of work and improve the service life of federal roads. According to the policy document shared with journalists by the Special Adviser to the Minister on Media Uchenna Orji on Friday, the new policies include the introduction of rigid pavements, reduction of claims for variation of price by contractors, removal of consumer price index from contracts, and introduction of uniform pricing in each zone. Other policies introduced by the Ministry include enhanced supervision of ongoing projects, introduction of whistle-blowing on bad jobs, prioritisation of projects within economic corridors, and completion of one carriageway before commencing the second carriageway for dualized projects.

The Ministry has also engaged with the Ministry of Steel Development for the revitalisation of the Ajaokuta Steel Company, established the Renewed Hope Infrastructure Development Fund, and commenced the Second Phase of the Highway Development Management Initiative.

These policies, according to the Ministry, are designed to ensure value for money spent on projects, improve the quality of roads, and enhance economic growth. The Minister stated that the policies are part of the Renewed Hope Road Infrastructure Revolution Agenda, aimed at making a difference in the road sector under the administration of President Bola Tinubu.

The Ministry urged stakeholders to read the policies and view the video on the systematic and strategic actions that have made a difference in the road sector.

"The Ministry has come up with new policies to mitigate the poor pace of work and improve the service life of Federal Roads," the document read partly.

Details of the new policies as contained in the document read as follows:

- Introduction of construction of Rigid Pavements (Continuously Reinforced Concrete Pavement) as against the Flexible Pavement (Bituminous), where appropriate, especially where there are high water levels and poor soil structure;
- Reduction of the claims for Variation of Price (VOP) by Contractors, which has, consequently, saved government money and reduced the incessant request for augmentation of project contracts;
- Removal of the Consumer Price Index (CPI) from all contracts, thereby giving the government value for money spent on the projects;
- Introduction of Uniform Pricing in each zone to ensure fair rates are utilized for procurement of projects;
- Enhance supervision of all ongoing projects, which requires all field staff to be on-site;
- Introduction of Whistle Blowing on bad jobs by engaging stakeholders such as communities where the projects traverse, road users etc to monitor works executed and report where poor quality works are being executed.

BEST PRACTICE IN MANAGING INFRASTRUCTURE PROCUREMENT TO ENHANCE SOCIO-ECO DEVELOPMENT GOALS IN NIGER DELTA REGION

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Abstract

This paper reports the findings of a study in the factors in infrastructure procurement development goals that are currently inhibiting the achievement of socio-eco development objectives in Niger Delta.

The paper explores the impact / performance of the asset and the service it delivers (the product) and the opportunities during the asset development and operation (the process) that leads to having a long-term, adequate, reliable and sustainable infrastructure procurement development goals in the Niger Delta.

Niger Delta has not lacked infrastructure development goals and programs, but the weakness in the implementation and execution are the problems. The infrastructure procurement development goals which successive administrations developed were often weak, segmented and isolated from various sectors of the economy.

In spite of the efforts of Federal, States and Local Governments, Niger Delta Development Commission (NDDC), etc. to enhance peace and well-being of people in the Niger Delta, wide disparities in development outcomes persist and the region compares poorly with the progress in other oil-producing countries in the world. In many cases, the conditions of rural communities are deplorable, with severe environmental degradation and no access to basic infrastructures like safe drinking water, electricity, transportation, good health, security & law, good education, oil & gas, housing, tourism, emergency response, etc. Among the people living there, the results have been disillusionment, frustration about their increasing deprivation and deep-rooted mistrust.

The report concludes and recommends a new development paradigm to address these concerns. In

a several point development agenda, it proposes using the region's vast oil wealth to create an environment that allows people to flourish, live valued and dignified lives, overcome poverty, enjoy a peaceful atmosphere and sustain their environment. The agenda is a people-centered and sustainable framework requiring the involvement of all stakeholders, including Local, State and Federal governments, NDDC, the oil companies and the entire private sector, civil society organizations, the people of the region and development partners.

Keywords: *Infrastructure procurement, Niger Delta, assessment, Niger Delta Development Commission (NDDC), Oil producing region, development partners.*

INTRODUCTION

Over the past six decades, the issues confronting the Niger Delta region have caused increasing local, national and international concern. The region produces immense oil wealth and has become the engine of Nigeria's economy. But it also presents a paradox, because these vast revenues have barely touched the delta's own pervasive local poverty. Today, there are formidable challenges to sustainable human development in the region, including the conflicts over resources among communities and between communities and oil companies.

Delta's infrastructure procurement development dilemma raises the question of why abundant human and natural resources have had so little impact on poverty. Exploring this conundrum is the purpose of this socio-eco development paper, the first for the Niger Delta. It is a component of an integrated infrastructure procurement development programme for the delta region. Its overall objective

is to promote sustainable poverty reduction by strengthening local governance and participatory planning, ensuring sustainable use of renewable natural resources and constructing social infrastructure. It analyses the various dimensions of the socio-eco development challenges in the region and proposes an infrastructure procurement development agenda grounded in the region's natural, human and social capital (www.bebor.org/.../UNDP-Niger-Delta-Human-Development-Report.pdf).

The imperative for a new infrastructure procurement development agenda arises from the fact that past infrastructure procurement development planning efforts have failed to adequately address the region's needs. In spite of the efforts of Federal, State and Local governments, Niger Delta Development Commission (NDDC) and oil companies to enhance the well-being of people in the Delta, wide disparities in infrastructure procurement development outcomes persist and the region compares poorly with the progress in other oil-producing countries in the world. In many cases, the conditions of rural communities are deplorable, with severe environmental degradation and no access to *basic infrastructures like safe drinking water, electricity, transportation, good health, security & law, good education, oil & gas, housing, tourism, emergency response, etc.* Among the people living there, the results have been disillusionment, frustration about their increasing deprivation and deep-rooted mistrust. This report recommends a new infrastructure procurement development paradigm to address these concerns. In an infrastructure procurement development agenda, it proposes using the region's vast oil wealth to create an environment that allows people to flourish, live valued and dignified lives, overcome poverty, enjoy a peaceful atmosphere and sustain their environment. The highlights include the following: -

- **Promote peace as the foundation for development.** There cannot be any meaningful infrastructure procurement development without peace. A peace agenda must include education, easier access to justice and a more equitable distribution of resources.

- **Make local governance effective and responsive to the needs of the people.** Governance is very central to achieving meaningful infrastructure procurement development outcomes. The effectiveness of governance, especially at the local

government level, is an issue of serious concern. At the core of promoting effective governance is the urgent need to institutionalize the practices of accountability, transparency and integrity to guide the flow of development resources at all levels.

- **Improve and diversify the economy.** The Niger Delta region, with its stock of natural and human resources, offers immense opportunities for developing a diversified and growing economy. A diversified economy would reduce dependence on oil and gas, jump start new industries and provide sustainable livelihoods. A growth pole strategy would forge closer links between industries and the production of agricultural and mineral products and galvanize local economies.

- **Promote social inclusion and improved access to social services.** A major concern is the region's long-standing exclusion from the mainstream of Nigeria's socio-eco and political activities. The majority of the people in the delta live on the margins. Reducing exclusion and achieving more even-handed development will depend on the empowerment of socially marginalized groups and individuals, stronger social institutions and infrastructure and the development of the capacity of existing local groups.

- **Promote environmental sustainability to preserve the means of people's sustainable livelihoods.** The mainstreaming of environmental sustainability into all infrastructure procurement development activities must be complemented by proactive steps to conserve natural resources; to reduce pollution, especially from oil spills and gas flares; and to set and achieve adequate targets for clean air and water and soil fertility. These should be backed by rigorous enforcement of environmental laws and standards.

- **Build sustainable partnerships for the advancement of human development.** Many stakeholders must work together to achieve meaningful change. All levels of government, NDDC, the oil companies, the organized private sector, civil society organizations and development agencies should form partnerships around plans for sustainable development and the attainment of the Niger Delta Development Goals (NDDGs).

WHY THIS PAPER?

- The ability to deliver infrastructures has been seriously eroded and that delivery of future growth opportunities will present major challenges.
- Bridge ideology, tribe, ethnicity, language & share hearts & minds ATTITUDE.
- Case for TECHNOLOGICAL breakthrough.

No changes to processes & procedures (need to be) proposed, but relentless implementation of detailed recommendations is needed.

Prior to the independence, Niger Delta did not have strategic infrastructure procurement development planning or Economic Blueprints over the last six decades. Niger Delta has been wobbling and fumbling over the years in its infrastructure procurement developmental drive due to lack of strategic infrastructure procurement planning and discipline to implement policies.

Sadly, principles of transparency, fair play, accountability and open competition were replaced with a broken down competition system that entrenched opaqueness, inefficiency, influence peddling and inflated costs with the attendant incidences of corruption.

Over the past six decades estimates suggest a considerable portion of region treasury was lost due to the poor contracting system. The infrastructure procurement system in Niger Delta had degenerated and the importance of reform to deliver its Economic Empowerment and Development Strategy. Procurement reform has focused on improving governance objectives through a certifying mechanism called '**Due Processes**'.

STATEMENT OF THE PROBLEMS

The following are *some socio-eco factors identified and assessed as possible* current infrastructure procurement development bottle-necks or inhibitors bedeviling institutional arrangements regarding infrastructure procurement to enhance socio-eco development goals:-

- Bad government policies, - Weak and unsuitable institutions, Lack of qualified manufacturing engineers, - Insufficient capital, - High degree of foreign dependence, - Lack of heavy-duty machinery manufacturing labour, - Low purchasing power of the populace, - Inadequate power supply, - Competition with foreign goods, - Shortage of raw materials production and plant location, - Shortage of entrepreneurs, - Poor management, - Political instability, - Inadequate transportation and communication facilities, - Lack of market for heavy-duty machinery manufacturing goods - Inadequate skilled man-power, etc.

AIMS AND OBJECTIVES OF THE STUDY

The author's aims and objectives in this work are not merely to discuss infrastructure procurement development in Niger Delta as previous writers on infrastructure procurement have been accustomed to do. Rather the author's aims and objectives are to

actually engage in real infrastructure procurement to enhance socio-eco development in the Niger Delta region. Others are:-

- To promote sustainable poverty reduction by strengthening local governance and participatory planning, ensuring sustainable use of renewable natural resources and constructing social infrastructure.
- To identify the problems confronting infrastructure procurement development.
- To proffer solutions to the problems of infrastructure procurement development.
- To highlight the impact / contribution of infrastructure procurement development on region building.
- To ensure that the region is self-reliant.
- To ensure that the means of infrastructure procurement and distribution are controlled by Deltans.
- To ensure that deltans will have control over their resources.

SIGNIFICANCE / JUSTIFICATION OF THE STUDY

The study aims at evaluating the immense contribution of infrastructure procurement towards stimulating productivity and other socio-eco activities in Niger Delta. The imperative for a new infrastructure procurement development agenda arises from the fact that past infrastructure procurement development planning efforts have failed to adequately address the region's needs. In spite of the efforts of federal, state and local governments, the Niger Delta Development Commission (NDDC) and oil companies to enhance the well-being of people in the delta, wide disparities in development outcomes persist, and the region compares poorly with the progress in other oil-producing countries in the world.

Moreso, it is a statement of fact that without an effective and efficient infrastructure procurement development in the Niger Delta all other socio-eco activities would come to a halt. The development of the Niger Delta is the key to the development of the whole Nigeria. More so, going by the present Federal Government programme and Indigenization Policy cum Nigerian Content Act in meeting the Vision 20:2020 and Niger Delta Development Goals, the role of infrastructure development in the provision of job opportunities, technological cum infrastructural development, funding of education and research, training cum skilled manpower development and invariably improve the standard of living and general well-being of the people of Niger Delta cannot be over *emphasized*.

SCOPE AND LIMITATION OF THE STUDY

The scope of the study is limited to infrastructure procurement development and also to the major nerves of the Niger Delta.

Over the past six decades, the issues confronting the Niger Delta region have caused increasing national and international concern. The region produces immense oil wealth and has become the engine of Nigeria's economy. But it also presents a paradox, because these vast revenues have barely touched the delta's own pervasive local poverty.

RESEARCH METHODOLOGY AND ORGANIZATION OF THE STUDY

The empirical method of research was used covering field work and specific method of articulation. Preliminary work done among Niger Delta people, a section of Ondo, Edo, Delta, Bayelsa, Imo, Rivers, Abia, Akwa Ibom and Cross River people.

The study adopts exploratory method of research to examine and discuss relevant issues of interest in the history of Nigeria heavy-duty machinery manufacturing development as an economically viable option for socio-eco development objectives. Because of the nature of the study (macro), the writer relies on published documents in the area of infrastructure procurement using commissioned studies, non-commissioned studies and published works from various sources. Some of these secondary sources are narrow in view, perspective and scope but they serve as useful materials for researchers wanting to embark on a macro-study.

Others include library books, previous works by the author, detailed investigations done on infrastructure procurement by the author, internet and articles from learned journals. During the study there was no case where anybody or scholar delved into discussing developing infrastructure procurement development as socio-eco viable option for socio-eco development objectives in Niger Delta.

The study is organized in seven (7) parts apart from the introduction, justification and methods of study. These are: literature review, what is to be done and how it will be done, what may not work and why?, lessons, recommendations, conclusions and references.

HYPOTHESIS

The hypothesis aims at determining the impact of heavy-duty machinery manufacturing development as a strategic catalyst for domestic socio-eco-growth and sustainability of the country.

H0: there is no positive relationship between the number of established infrastructure procurement and gross domestic product (GDP) of the Niger Delta.

H1: there is positive relationship between the number of established infrastructure procurement and gross domestic product (GDP) of the Niger Delta.

LITERATURE REVIEW

The **Niger Delta** is the delta of the Niger River at the Gulf of Guinea on the Atlantic Ocean in Nigeria. It is a very densely populated region sometimes called the **Oil Rivers** because it was once a major producer of palm oil. The area was the British Oil Rivers Protectorate from 1885 until 1893, when it was expanded and became the Niger Coast Protectorate. The delta is an oil-rich region, and has been the centre of international controversy over devastating pollution and ecocide, kleptocracy and human rights violations in which Royal Dutch Shell has been implicated.



Map of Nigeria numerically showing states typically considered part of the Niger Delta region: -

1. Abia, 2. Akwa Ibom, 3. Bayelsa, 4. Cross River, 5. Delta, 6. Edo, 7. Imo, 8. Ondo, 9. Rivers

Geography

For practical purposes, the Niger Delta region is defined as comprising the area covered by the natural delta of the Niger River and the areas to the east and west, which also produce oil. The natural limits of the Niger River Delta can be defined by its geology and hydrology. Its approximate northern boundaries are located close to the bifurcation of the Niger River at Aboh, while the western and eastern boundaries are around the Benin River and the Imo River, respectively. The area covers approximately 25,900 square kilometres (ERML 1997). The broader Niger Delta region, which includes all oil producing areas and others considered relevant for reasons of administrative convenience, political expedience and development objectives, extends the land area to

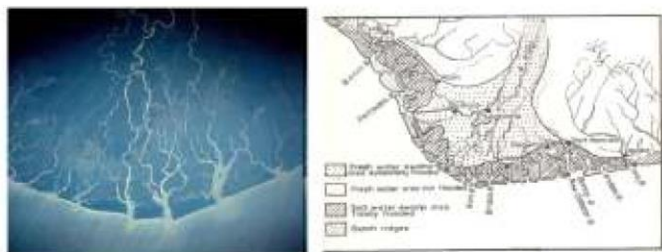
75,000 square kilometres. It is this definition that is used by the NDDC and in this report. Defined in this way, the Niger Delta consists of nine states (Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers) and 185 local governments.



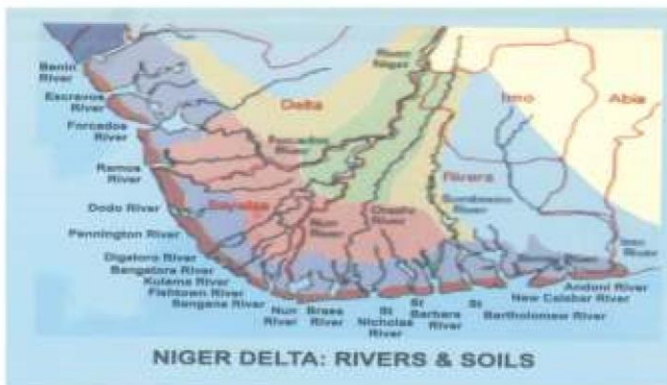
Map showing states typically considered part of the Niger Delta region:- Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, & Rivers

Geology, Relief, Drainage and Ecological Zones

The Niger Delta, as now defined officially by the Nigerian government, extends over about 70,000 km² (27,000 sq mi) and makes up 7.5% of Nigeria's land mass. Historically and cartographically, it consists of present-day Bayelsa, Delta, and Rivers States. In 2000, however, Obasanjo's regime included Abia, Akwa-Ibom, Cross River State, Edo, Imo and Ondo States in the region. Some 31 million people^[2] of more than 40 ethnic groups including the Bini, Efik, Esan, Ibibio, Igbo, Annang, Oron, Ijaw, Itsekiri, Yoruba, Isoko, Urhobo, Ukwuani, Kalabari and Ogoni, are among the inhabitants in the Niger Delta, speaking about 250 different dialects. The Niger Delta separates the Bight of Benin from the Bight of Bonny within the larger Gulf of Guinea.



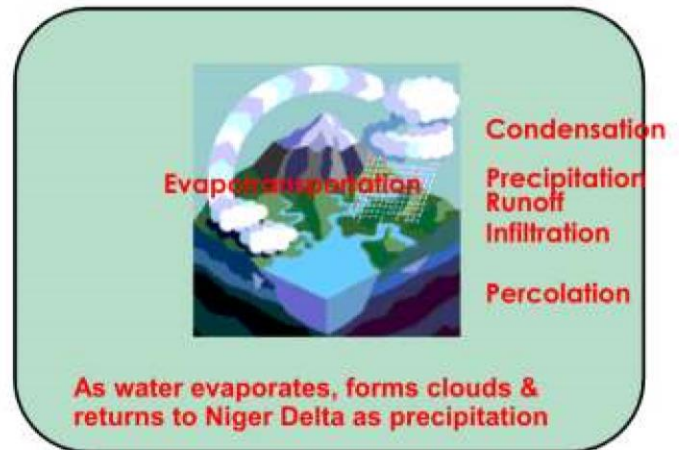
VIEW OF NIGER DELTA FROM SPACE LAND FORMS OF NIGER DELTA FROM SPACE



ECOLOGICAL ZONES OF THE NIGER DELTA REGION

Climate

The Niger Delta has a semi-hot, humid equatorial climate with wide variations from one part of the region to another. This is a place of uniformly high temperatures throughout the year, high relative humidity and intense rainfall, which occurs almost year round in the core delta, but becomes markedly seasonal further inland with increasing distance from the ocean. Copious rainfall coupled with the low relief and high water table produce frequent flooding.



HYDROLOGIC CYCLE OF THE NIGER DELTA REGION

The People

The Niger Delta region is extremely heterogeneous with respect to culture and ethnicity. The five major linguistic and cultural groups—the Ijoid, Edoid, Delta Cross, Yoruboid and Igboid—are each composed of numerous sub-groups.

The Ijoid, who are said to have the longest settlement history in the Niger Delta, are the most complex linguistically. Each of the numerous clans of this group has some linguistic and cultural distinctiveness. In certain cases, villages in the same clan have linguistic differences. This group, which occupies virtually the whole of Bayelsa State, is also found in Rivers, Akwa Ibom, Delta, Edo and Ondo states.

The Edoid group is made up mainly of the Isoko and Urhobo of Delta State, the Edo of Edo State, the Engenni and Apie-Atissa of Bayelsa State, and the Degema of Rivers State. Even within these groups, several sub-groups exist; many claim to have their own individual identity. The groups within the Urhobo are good examples. Typical cases are the Okpe and Uvbie. Among the Edoid groups, the Urhobo is the largest. Although the Edo is a larger group overall, most of them are found outside the Niger Delta region. The Edoid groups in Bayelsa and

Rivers states are considered largely within the Ijoid group because of the cultural impact the latter has had on the former.

The Delta Cross comprises mainly the Ogoni, Ogba, Abua, Odual and Obolo / Andoni in Rivers State and the Ibibio, Oron and Ibeno of Akwa Ibom State. The Ibibio is the largest of these groups. The most well known, especially internationally, is the Ogoni because of its agitation for resource control and autonomy. The ethno-cultural complexity of the Niger Delta region is vividly illustrated by the fact that even a small ethnic group like the Ogoni (about 500,000 people) is made up of at least four cultural groups: the Khana, Gokama, Tai and Eleme. In spite of the fact that the Yoruba and the Igbos are two of the largest ethnic groups in Nigeria, the related groups in the Niger Delta are some of the smallest there.

The main Yoruboid groups are the Itsekiri of Delta State, and the Ilaje and Ikale in the borderlands of Ondo State.

The main Igboid groups are the Ikwerre, Ndoni, Egbema, Ogba and Ekpeye in Rivers State and the Ukuwani in Delta State.

Settlement Patterns

Settlement patterns in the delta are influenced by topography and drainage. In the coastal beach ridge zone, dry land is readily available, though in narrow strips. Settlements in this area typically stretch along the coast with little breadth. Various wide estuaries separate settled areas. A number of sizeable settlements, such as Bonny, Akassa and New Forcados, are located here. Given the fact that the mangrove swamp zone is a massive swamp with scattered islands, population is sparsely distributed. The swamp is virtually uninhabited except for fishing camps; some settlements exist on dry islands. Settlement size is dependent on the size of a given island. Large settlements include Buguma, Nembe and Burutu.

Population and Demographic Characteristics

Population size and density

In the 1991 census, the total population of all nine states of the Niger Delta was 20.5 million (see table 1.2). This was made up of 10.133 million males and 10.329 million females. The projected total population for 2005 is 28.9 million, rising to 39.2 million by 2015 and 45.7 million by 2020. The states with the highest population sizes are Rivers, Delta, Akwa Ibom and Imo. With the possible exception of Bayelsa and Cross River states, there

are probably no significant differences in population sizes among the states.

Differences do show up in population densities. The overall population density for the Niger Delta region based on the 1991 population is 182 persons per square kilometre. But some states have densities far above this e.g. Abia State (478 per square kilometre), Akwa Ibom (354 per square kilometre), Imo (481 per square kilometre) and Rivers (307 per square kilometre). Population distribution within each state is uneven, particularly in the states in the core Niger Delta, where the fragmented, swampy landscape constrains human settlements.

Fertility, life expectancy and mortality

Available household survey data for 2004 put the average crude birth rate for the Niger Delta region at 45.8 per 1,000 people. The corresponding average natural growth rate of 3.1 per cent per annum across the region is, thus, higher than the rate of 2.5 per cent often used by the Government for estimating the growth rate of rural population in the country. There is little empirical data on life expectancy in the delta. But the best national estimates, citing figures from 2000, indicate that average life expectancy is 46.8 years.

Economy

Fishing and agriculture are the two major traditional occupations of the Niger Delta peoples. During the colonial era, forestry was introduced as the third major economic activity in the region. Today, agriculture, fishing and forestry still account for about 44 per cent of employment. All three economic activities have declined since the ascendancy of the oil industry, however.

Rubber plantations that once covered thousands of hectares of land in Edo and Delta states were cleared as the oil boom took hold. Many palm oil and cocoa plantations were abandoned and allowed to revert to bush. Fortunately, since the 1990s, there have been renewed efforts to resuscitate the agricultural sector. New rubber plantations are being established; cocoa and oil palm farms are being rehabilitated. Also, there is increased activity in arable crop cultivation, particularly of cassava for commercial purposes.

International Oil Company Activities

The Niger Delta Region has been particularly attractive to major international oil companies, including Shell, Chevron, Mobil, Elf, Agip and Texaco, among others, which have been involved in joint ventures with the Federal Government in connection with oil exploration, exploitation and

production. Links between their operations and human deprivation in some areas of the delta has local raised expectations that the oil companies should contribute to physical and human development in affected communities. Other expectations include the monitoring and promotion of respect for human rights, compliance with environmental standards for exploration and exploitation, and, where necessary, restitution for damages. For their part, oil companies expect the provision of security for the oil facilities, the prevention of damage to their facilities and environment and the protection of their personnel.

Oil company operations have included some externalities. For example, oil production has often damaged the environment in the region. It is also true that oil production and oil-based industrial expansion by the multinational oil companies have transformed the local economy of the region. Some communities have greatly benefited from oil production, through attractive wages for full-time employment or specialized contractual services, although underemployment and unemployment are also rife. Development spending by the oil companies has brought appreciable social services, utilities and other infrastructure to pockets of the region, in the absence of what the government could have provided.

Infrastructure and Social Services

In general, the available social development indicators in the Niger Delta region point to inadequate, unavailable and poor quality infrastructure and social services, from water to telecommunications. The historical neglect of the region's development poses a steep barrier to attaining socio-economic transformation and poverty alleviation.

Water supply

A vivid account of the water supply situation was provided in the focus group discussions held to prepare this report: -

Data from the Federal Office of Statistics, now the National Bureau of Statistics, reveal that water in the majority of Niger Delta states comes from unsafe supply facilities, including rivers, lakes or ponds, unprotected wells and boreholes. The Bureau classifies available sources of potable water for household consumption as: pipe borne, untreated pipe, borehole, protected well, unprotected well, river/lake/pond, vendor trucks and other categories.

In five of the nine states in the region—Akwa Ibom, Bayelsa, Cross River, Ondo and Imo—water problems are very acute and result in supplies of

unsafe water in more than 50 per cent of the cases. Most settlements depend on untreated surface water and wells, which leads to health problems from waterborne diseases. It was estimated that only 20 per cent to 24 per cent of rural communities and 45 per cent to 50 per cent of urban communities have access to safe drinking water.

Poor access to adequate drinking water has had serious implications for the general health, environment, economic activity and sustainable livelihoods in the Niger Delta region. The lack of potable water in rural areas, as well as severe shortages of pipe-borne water in urban centres, necessitates new policies that favour community involvement and participation in devising and managing water supply systems in a sustainable fashion.

Transport

Field research for this report revealed that the delta's roads are mostly bad. Focus group participants described them as being impassable during the rainy season. Efforts by local government authorities to repair the roads have worsened them and left the local people with more hardship. Although urban road transportation development has recently been accorded some priority attention, less regard has been shown for rural transportation, especially water transport, which the majority of the rural populace depend on. Transport and communication in the area is a source of misery, requiring people to trek long and excruciating distances due to the high cost of motorcycle transport, a popular means of transport. Some roads have so many death traps that motorists avoid them. Most roads linking communities to the local government headquarters are in deplorable state of disrepair.

Telecommunication

The dearth of telecommunication infrastructure in the Niger Delta region stifles the advancement of information technology and the development as well as technical empowerment of the populace. Most rural communities are largely unconnected and completely unable to take advantage of modern trends in telecommunications and technology as tools for accelerated rural development. Available data show that the number of telephone lines in the Niger Delta works out at about 38 per 1,000 people. Growth in the number of land lines has stalled in the last few years due to the introduction of the global system of mobile

Power and fuel

Across the region, on average, only 34 per cent of

people use electrical lighting; 61 per cent use kerosene or a lantern. Less popular sources of lighting are gas (1.2 per cent on average), a generator (1.5 per cent), batteries (0.2 per cent), candles (0.6 per cent), firewood (1.8 per cent) and others (1.2 per cent). The general sources of household fuel are firewood, charcoal, kerosene, gas, electricity, crop residues, animal waste and others. The modal fuel or primary energy source in the region is firewood (a mean of 73 per cent), followed by kerosene (24.8 per cent) and gas (1.2 per cent).

Housing

Housing in the Niger Delta region is predominantly of poor quality, especially in the swamps and creeks where dwellings are made up largely of mud walls and stilt or strip foundations. A survey of 40 locations that included Warri, Port Harcourt and Sapele revealed that 30.4 per cent of houses had mud walls, 53.8 per cent had corrugated-iron sheet roofing, and 46.6 per cent had a strip foundation. Flooring materials vary widely, but are predominantly concrete followed by mud. (*Source: UNDP 2006*).

Waste management

The Niger Delta region is laden with problems related to waste management. These are the combined effects of environmental pollution from oil, gas and industrial activities, as well as the implicit population / settlement issues in the semi-urban and urban areas. Drawing from the UNDP report of 2006, the most widespread methods of waste or refuse disposal are disposal within household compounds (an average of 56.9 per cent) and disposal in authorized heaps (34 per cent). Other methods are through collection by government (3.3 per cent), collection by private service providers (2.7 per cent), the use of government disposal bins (1.4 per cent) and others (2.7 per cent).

Recent ecological studies have shown that the adverse consequences of waste generation and improper disposal have been severe on both people and the environment. These effects have also influenced the stagnation of human livelihoods and the region's economy. In increasing the misery and impoverishment of the populace, they have exacerbated political tension, acrimony, outright conflicts and violence.

Education

Statistical estimates have put the proportion of children attending primary school at 80 per cent (which compares favourably with the estimated national average of 54 per cent). But across the region, nearly all school facilities are in a state of extreme disrepair, requiring major rehabilitation.

The secondary school system has been seriously afflicted by shortages of quality teachers, a regional pattern that is becoming increasingly acute due in large part to discordance between investments in infrastructure outside a well-coordinated planning process.

Revealing the immense challenge to development and provision of social amenities for sustainable livelihood, an UNDP report (2006) noted that in the Niger Delta states, covering some 30,000 square kilometres and with over 3,800 settlements and an estimated eight million people, there were only 2,169 primary schools and 545 secondary schools. For primary schools, this implied one school per 3,700 people serving an area of 14 square kilometres and one school for every two settlements. For secondary schools, the ratio is one school per 14,679 people serving an area of 55 square kilometres and one school for every seven settlements. (*Source: UNDP Survey 2006*).

Health and health service delivery

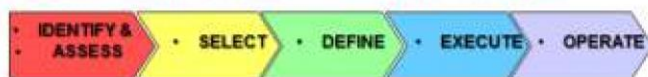
Dismal health and health care service delivery manifests in poor hygiene; little or no health information and education; a grossly inadequate capacity for service delivery; inadequate provision of hospitals, clinics and primary health centres; and a lack of effective operational plans for holistic health management. The majority of Niger Delta communities living in isolated areas lack the most basic modern medical care, including first aid, given the absence of formal health services in much of the hinterland (for the various dimensions of infrastructure and social services in the region, see the NDDC Regional Master Plan, 2003 / 2004, chapter one, pp. 1-19). The UNDP report provided corroborative evidence on the status of health in the region, affirming that modern health care facilities are largely absent. The few existing public health care centers are all in critical need of repair. Villagers described them as moribund and offering little or no assistance. The centers lack doctors, nurses, and critical supplies such as drugs, syringes and sterilizers. There were a few privately run clinics, but focus group members said services there cost exorbitant amounts. Community members resort to local and traditional remedies to deal with their health conditions.

Lack of infrastructure in Niger Delta represents one of the most significance limitations to economic growth and achievement of Niger Delta socio-economic development Goals (NDDGs). Infrastructure investments and maintenance can be very expensive. It has being argued that infrastructure investments contributed to more than half of nation's improved growth performance between 1990 and 2005 and increased investment is necessary to maintain growth and tackle poverty (Engineers against poverty, 2014). In order to reach the 7% annual growth calculated to

be required to meet the MDGs would require infrastructure investments of about 15% of GDP or around US\$93 Billion a year.

The need for Niger Delta to have a long-term and sustainable infrastructural development plan was unambiguously demonstrated recently, following the consideration and approval of the National Integrated Infrastructural Master Plan (NIIMP) by the National Economic Council and Federal Executive Council in Abuja. Although procurement reform has been principally aimed at improving governance objectives, the impact of private sector participation in the delivery of MDG infrastructure targets is leading to a change in the type of procurement strategies in use.

The Infrastructure Realization Process (IRP)...



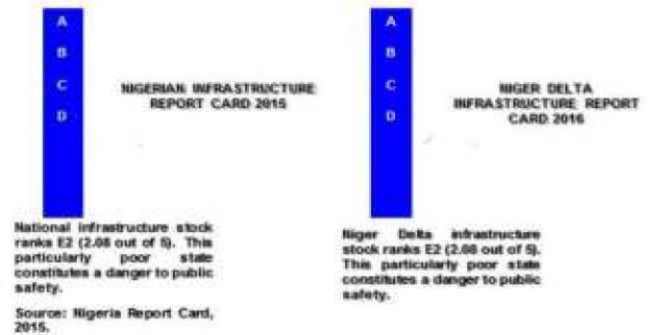
... and the best practice guide

WHAT IS INFRASTRUCTURE?

- Noun (plural/ infrastructures)
- The basic facilities, services & installations needed for the functioning of a community or society.

Key Infrastructure	Areas and Sub-Classes
1 Electric Power	. Power Generation . Power Transmission . Power Distribution
2 Transportation	. Roads & Bridges . Rail . Airports . Seaports
3 Water & Sanitation	. Public Water Supply . Waste Management . Dams . Irrigation
4 Health	. Primary Health Care Facilities . General Hospitals . Teaching Hospitals
5 Education	. Primary Schools . Secondary Schools Vocational Institutions . Tertiary Institutions (Polytechnics & Universities)
6 Oil & Gas	. Refineries . Pipelines
7 Housing	. Social Mass Housing
8 Tourism	. Important Tourism Attractions . Sports Stadia . Public Recreational Parks
9 Emergency Response	. Fire Station . Emergency Control Operation Centers
10 Security & Law	. Police Stations . Courts of Law . Prisons . CCTV Installations

CRITICAL INFRASTRUCTURES AND SUB-SECTORS



Source: Nigeria Report Card, 2015.

INFRASTRUCTURE REPORT CARD

A (5.00 - 4.35)	World Class
B (4.34 - 3.37)	Fit for the Future
C (3.36 - 3.01)	Satisfactory for now
D (3.00 - 2.35)	At risk
E (2.34 - 1.68)	Poor State
F (1.67 - 1)	Unfit for purpose

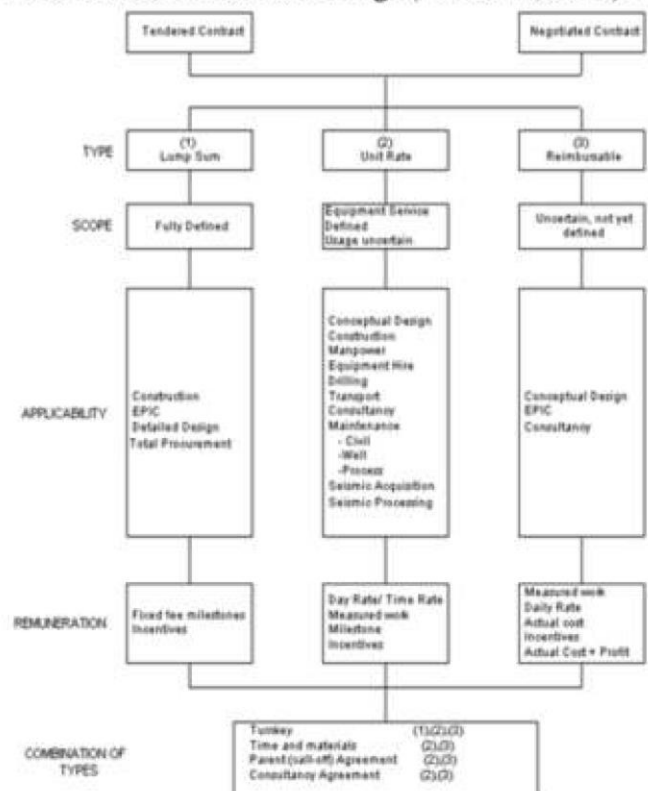
Please note: A, B, C, D, E ; 1, 2, 3 is sometimes used to indicate a grade which lines at the extremes or middle of the range. E.g., for grade E; E (1.89 - 1.680, E2 (2.11 - 1.90, E3 (2.34 - 2.12).

Source: Nigeria Report Card, 2015.

CUMMULATIVE GRADING & INTERPRETATION FOR INFRASTRUCTURE

WHAT IS PROCUREMENT?

- Noun (plural/ procurements)
 - (countable) The act of procuring or obtaining; obtainment; attainment.
 - (uncountable) The purchasing department of a company or institution.
- Due Process & Case for Change (Nwadike, 2015).



Selection of Appropriate Procurement Process in given Circumstances

TRADITIONAL INFRASTRUCTURE PROCUREMENT DEVELOPMENT PLANNING

Development planning in Nigeria, in the modern sense, dates back to the formative 10-year national development plan for 1946-1955 prepared by the colonial administration. After political independence in 1960, successive post-colonial governments initially prepared mostly medium-term development plans, namely 1962-1968, 1970-1974, 1975-1980 and 1981-1985. A series of two-year rolling plans followed between 1990 and 1998.

These efforts were often associated with the income-centred development paradigm. Short term and based on official convictions, they lacked essential civil society and grass-roots inputs or participation. They failed to be sufficiently far-reaching, longitudinal or symmetrical enough in scope and coverage to pursue the inclusive goals of human development. In most cases, traditional planning efforts amounted to ends in themselves. They ended up either not being implemented or, at best, being largely unimplemented.

Since the colonial era, some policies and programmes within national development plans have been formulated to address the minority status, agitations and perceived marginalization of the people of the delta. But the recurring feeling in the region is that it is often pushed aside within the Nigerian Federation. This is particularly true for minority ethnic groups. The first major attempt to address these grievances was in 1957, when the colonial administration set up the Willink's Commission of Inquiry to investigate the fears of minorities and how to allay them. The Commission reported in 1958 that "the needs of those who live in the creeks and swamps of the Niger Delta are very different from those of the interior."

The Commission also noted that "it is not easy for a government or legislature operating from the inland to concern itself or even fully understand the problems of a territory where communications are so difficult, building so expensive and education so scanty in a country which is unlikely ever to be developed." Perhaps more importantly, the Commission concluded that "a feeling of neglect and a lack of understanding was widespread...a case has been made out for special treatment of this area. This is a matter that requires special effort because (the area) is poor, backward and neglected." That conclusion is as true in the Niger Delta today as it was in 1957. Be that as it may, the immediate post-independence Government eventually responded to the Willink's Report by

setting up the Niger Delta Development Board (NDDDB) in 1961. The NDDDB could not solve the problems of the Niger Delta enunciated in the Willink's Report. Subsequent bodies included the Niger Delta Basin Development Authority (NDBDA) set up in 1976, and the Oil Mineral Producing Areas Development Commission (OMPADEC) set up in 1992. But they also failed woefully. In the case of the NDBDA, organizational problems bedeviled it from inception. None of the board members appointed by the Federal Government to run the Authority came from the Niger Delta.

Early eighties, eleven (11) River Basin development authorities were created; five (5) now have jurisdiction in the Niger Delta, including the Niger River Basin Development Authority, the Anambra-Imo River Basin Development Authority, the Benin-Owena River Basin Development Authority, the Niger Delta Basin Development Authority and the Cross River Basin Development Authority. But these authorities also have had very little impact. For one thing, their boards often comprise politicians who have regarded their tenures as opportunities to reap the 'dividends of democracy'. They have often been viewed as drains on the nation's finances.

OMPADEC was established in July 1992 and given the statutory responsibility to receive and administer, in accordance with the confirmed ratio of oil production in each state, the monthly allocation of the Federation Account. This is set aside for the rehabilitation and development of the mineral producing areas and for tackling ecological problems that have arisen from the exploration of oil minerals. At first, OMPADEC was allocated three per cent of the Federation Account, but this was raised to 6 per cent in 1995. The Commission did not make any meaningful impact on the lives and environment of the Niger Delta people. It was noted for its profligacy and extravagance. Contracts were awarded in anticipation of funds, with the result that contracts worth billions of naira were awarded that were not eventually backed with cash. At the time it folded, the Commission owed its contractors billions of naira and left the Niger Delta with numerous abandoned projects. The Chief Executive of OMPADEC had identified three pressing problems at the Commission. There were no available data for planning purposes, such as the crude oil production quota by state. The Commission had no means to cope with the volume of demands given decades of physical neglect and deprivation. And funding was inadequate. While the decree establishing OMPADEC stipulated that it should receive three per cent of the Federation Account, the Commission claimed that what it actually got was three per cent of

net revenues from the Federation Account.

In 1999, the federal government constituted a new body, the Niger Delta Development Commission (NDDC) to take over from OMPADEC. At the inauguration of its pioneer board, in December 2000, the President of the Federal Republic of Nigeria noted that the NDDC has the potential to offer a lasting solution to the socio-economic difficulties of the Niger Delta, which successive governments have grappled with even before independence. To achieve its mandate, the NDDC board identified areas of focus including: -

- development of social and physical infrastructures
- technology
- economic/environmental remediation and stability
- human development
- pursuit of a peaceful environment that allows tourism to thrive and supports a
- buoyant culture

As a development agency, the NDDC quickly identified the need for a master plan as part of its overall strategy, which has now been completed. In the interim, the NDDC board elaborated a plan involving the construction of roads, shoreline protection, rural and urban water supply schemes, and the rehabilitation of schools and health centres. This is in addition to human capacity development in new centres that help people acquire skills and build sustainable livelihoods. In spite of the provisions of the NDDC Act on financing, the NDDC is facing some of the same problems with funding that plagued OMPADEC. It is probably premature to assess the achievements of either the NDDC or similar state initiatives.

With the production of a Regional Master Plan for the Niger Delta, however, the NDDC is at least poised for positive action on its founding objectives. Earlier bodies had never managed or bothered to produce a plan, whether at regional or sectoral levels. But the NDDC does not seem to have made any positive impression on the peoples of the Niger Delta. People still see the NDDC as an imposition from the Federal Government and a top-down approach to development planning and implementation. The local people had no say in determining its composition; it primarily comprises appointees of the Federal Government. As far as ordinary people are concerned, the loyalty of the NDDC is not to the Niger Delta but to the Federal Government and the oil companies that provide the bulk of its budget.

PROCUREMENT POLICY

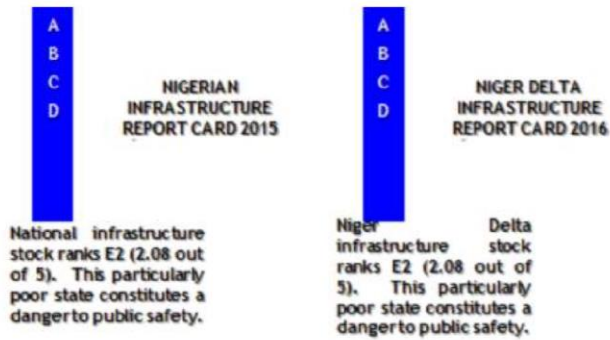
Following a highly critical World Bank Country Procurement Assessment Report in 2000, the

Nigerian Government issued a circular that set out 'New Policy Guidelines for Procurement and Award of Contracts in Government Ministries / Parastatals. The guidelines aimed to improve the efficiency, quality and governance of the tendering process through open competitive tendering, clearly defined bid criteria and a committee of professionals to evaluate bids. The establishment of the Budget Monitoring and Price Intelligent Unit (BMPIU) and a transitional 'Due Process Regime' has taken these guidelines and reform process further. This regime oversees the contract award, review and certification process but does not initiate the contract award process nor does it award contracts. With mandatory certification for public funding, only those projects that have passed the test for proper project implementation packaging leading to improved value for money are allowed to go forward. In its first two years, the Federal Government claimed that due process had led to reasonable progress in bringing competition into procurement, leading to cost savings of around \$800m for the Federal Government. It claimed that these cost savings were due to preventing overpriced contracts and securing a reduction in contract sums in a number of contracts (John Hawkins et al, 2006).

There are six core requirements with which all procuring entities of the Federal Government have to comply: -

1. Compulsory advertising requirements for passing the due process compliance rule for openness and provision of a level playing field are specified.
2. The criteria and scoring system to evaluate bidders for prequalification are to be specified with 65% of the total score based on the experience and technical qualifications/skills of the bidder.
3. Invitation to tender / bid process is in two parts: a technical bid and a commercial (financial) bid.
4. Opening of tender should take place immediately after the tender period has closed and must be witnessed by the bidders.
5. Evaluation of tender to be carried out by a five member committee including at least three individuals experienced in procurement. Financial bids are only to be submitted by those successful in the technical bids.
6. The winner is the bidder submitting the lowest evaluated tender cost. At the conclusion of the tendering procedure, the procuring entity is required to submit a report of its handling of the procurement process to the Budget Monitoring and Price Intelligent Unit (BMPIU).

INFRASTRUCTURE REPORT CARD



CUMMULATIVE GRADING & INTERPRETATION FOR INFRASTRUCTURE

A (5.00 - 4.35)	World Class
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WHAT IS TO BE DONE AND HOW IT WILL BE DONE

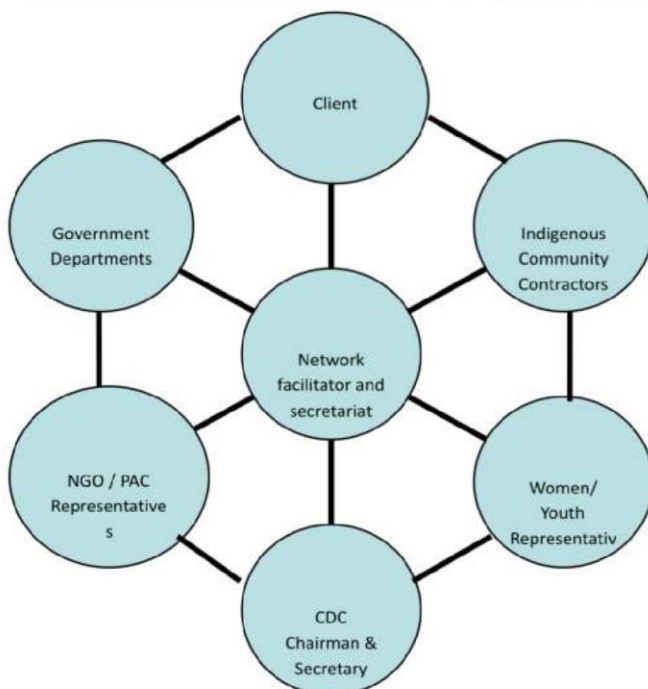


Fig. 1: Showing Network of Round Table Meetings / Discussions with Stakeholders

WHAT MAY NOT WORK AND WHY?

Series of meetings / discussions, implementing and following-up revealed a large number of factors in indigenous infrastructures procurement implementation procedures that are seen to be inhibiting or bottlenecking the achievement of

indigenous community infrastructures procurement and socio-eco objectives (Nwadike Jones, 2007). The main inhibitors or bottlenecks are: -

- Community crisis / disturbances, threat and insecurity.
- Lack of community consultation, community plans or other clear criteria for indigenous infrastructures procurement identification.
- Failure to incorporate social objectives in indigenous infrastructures procurement appraisal, design and budget.
- Failure to plan and budget for operation and maintenance.
- Inflexible indigenous infrastructures procurement management strategies and adversarial contract forms.
- Intense competition and selection based on lowest price.
- Vague and conflicting messages regarding social obligations in contracts.
- Failure to address corruption, which is a major inhibitor at every stage of the project cycle.
- Few clear standards for social objectives and failure to monitor and enforce the standards that exist.
- Confusion over the roles of the client, consortium and community representatives can lead to a lack of leadership and poor planning and implementation.
- Community representatives focus on financial auditing with minimal monitoring of infrastructures procurement outcomes.

RECOMMENDATIONS /WAY FORWARD

A number of key messages emerge from the work. These need to be kept in mind when proposing changes to indigenous community contractor management in order to enhance the delivery of social development objectives.

The recommendations / way forward that emerged from the work are highlighted below: -

Indigenous project identification, planning and design

- Project identification should be in line with indigenous community, local or sector plans and /or based on public / community consultation.
- The whole life cycle of asset (infrastructure) should be considered during planning and design and operation and maintenance strategy developed for each new infrastructure.
- Social objectives should be clearly identified at the planning stage and incorporated into the design.

Finance and procurement strategy

- i) Funds are set-aside in the budget for the realization of the social objectives.
- ii) Consider alternative infrastructures procurement strategy to ensure the appropriate or best approach to deliver the specified social objectives.

Tender and Selection

- i) The social objective must be clearly defined in the tender documents and explained at pre-tender and pre-award meetings.
- ii) Attention should be paid to the bidder's social performance and capacity to deliver social obligations.

Contract Agreement

- i) The project team must agree best approach in contractual mechanisms to deliver social objectives.

Monitoring, enforcement and evaluation

- i) Pre-award, kick-off and pre-mobilization meetings / discussions should be done before the client takes indigenous community contractor to site to commence work.
- ii) Contract obligations must be monitored and enforced through incentives and / or sanctions.
- iii) Social performance, toolbox-talk and hazard management audits should be conducted with the same rigour as financial audits.

LESSONS

A number of key messages emerge from the work: -

- Corruption is a major inhibiting factor and must be tackled at all stages of the indigenous infrastructures procurement management cycle.

- Promote peace as the foundation for development.

There cannot be any meaningful human development without peace. A peace agenda must include education, easier access to justice and a more equitable distribution of resources.

- Make local governance effective and responsive to the needs of the people.

Governance is very central to achieving meaningful development outcomes. The effectiveness of governance, especially at the local government level, is an issue of serious concern. At the core of promoting effective governance is the urgent need to institutionalize the practices of accountability, transparency and integrity to guide the flow of development resources at all levels.

- Improve and diversify the economy. The Niger Delta region, with its stock of natural and human resources, offers immense opportunities for developing a diversified and growing economy. A diversified economy would reduce dependence on oil and gas, jump start new industries and provide sustainable livelihoods. A growth pole strategy would forge closer links between industries and the production of agricultural and mineral products and galvanize local economies.

- Promote social inclusion and improved access to social services. A major concern is the region's long-standing exclusion from the mainstream of Nigeria's socio-eco and political activities. The majority of the people in the delta live on the margins. Reducing exclusion and achieving more even-handed development will depend on the empowerment of socially marginalized groups and individuals, stronger social institutions and infrastructure and the development of the capacity of existing local groups.

- Promote environmental sustainability to preserve the means of people's sustainable livelihoods. The mainstreaming of environmental sustainability into all development activities must be complemented by proactive steps to conserve natural resources; to reduce pollution, especially from oil spills and gas flares; and to set and achieve adequate targets for clean air and water and soil fertility. These should be backed by rigorous enforcement of environmental laws and standards.

- Build sustainable partnerships for the advancement of human development. Many stakeholders must work together to achieve meaningful change. All levels of government, NDDC, the oil companies, the organized private sector, civil society organizations and development agencies should form partnerships around plans for sustainable development and the attainment of the Niger Delta Development Goals (NDDGs).

- The decisions taken in the early stages of indigenous community infrastructures procurement have the greatest impact (negative or positive) cost and on the achievement of indigenous community infrastructure objectives. The biggest potential social impact probably lies in the choice of the indigenous community infrastructure.

- The participation of user groups and civil society at every stage of the management process from indigenous infrastructure identification right through to completion, operation and maintenance,

can increase the social benefit derived.

- There is little point in including obligations in contract documents that require action on the part of the contractor unless the actions have been considered at the design and planning stage, budget drawn up accordingly and some method agreed for monitoring and enforcing compliance.
- A more flexible and best approach by clients and community representatives to the choice of indigenous infrastructures procurement strategy could improve the delivery of the community infrastructure and the achievement of social development objectives.
- Consideration of operation and maintenance at the design stage of a community infrastructure can stimulate enhanced 'local content' (of materials, labour and business).

CONCLUSION

The research has shown that there are a large number of factors in procurement procedures that seem to be inhibiting the achievement of social development objectives. The main inhibitors are: -

- weak institutions.
- lack of public consultation, national plans and other clear criteria for project identification.
- failure to incorporate social objectives in project appraisal, design and budget.
- failure to plan and budget for operations and maintenance.
- inflexible infrastructures procurement strategies and adversarial contract forms intense competition and selection based on lowest price.
- vague and conflicting messages regarding consideration of social objectives in contract documentation.
- few clear standards for social, environmental objectives and failure to monitor and enforce the standards that exist.
- failure to address corruption which is a major inhibitor at every stage of the procurement cycle. it is worth noting that corruption (a major inhibiting factor) is pervasive and must be tackled at all stages of the procurement cycle. Tackling corruption at the tender and selection stage alone (which is the stage that currently received the most attention) is unlikely to be effective as the problem will simply move to a different stage of the process. The first step in tackling corruption is to increase transparency. It is therefore essential that processes at each stage of the infrastructures procurement cycle are as transparent as possible
- success is often measured by the quantity of funds disbursed rather than the quality of outcomes.
- confusion over the roles of the client and donor can

lead to a lack of leadership and poor implementation tied-aid raises cost and limits effectiveness donors focus on financial auditing with minimum monitoring of social outcomes.

- private financiers focus on social risk and neglect social opportunities.
- government fails to maintain robust registers of qualified consultants and contractors.
- government fails to enforce regulations.
- Collaboration can also minimize the weaknesses often associated with unilateralism.
- Advocacy is urgently needed to encourage social partnerships to form. Not all the development issues in this report are peculiar to the delta region. They cut across the entire Nigerian nation, with many areas afflicted by poor governance, conflicts, corruption, environmental degradation and social exclusion, albeit to varying degrees. Achieving some of the goals in this agenda for the Niger Delta would show the way forward on such issues of generic national interest as leadership and governance, corruption, environmental management and others. The human development agenda for the Niger Delta, therefore, carries hope for meaningful change for people both in the region and Nigeria as a whole.

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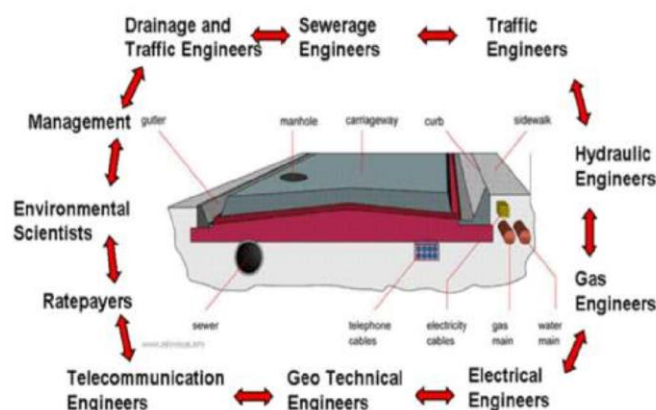
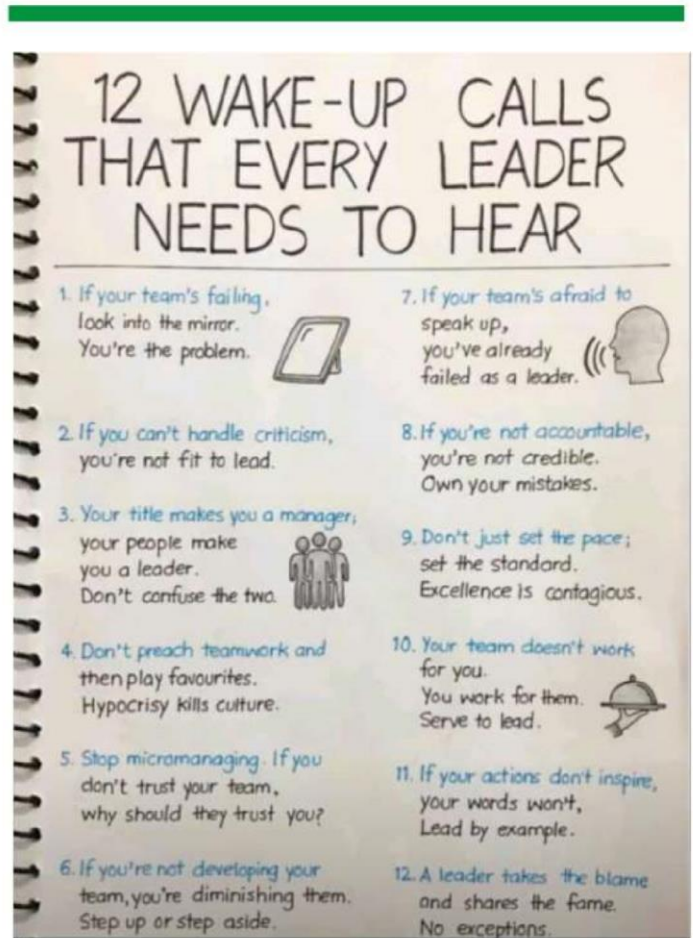
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1st Session of the Fellowship Conferment, at NEC Auditorium, NSE Headquarters, Off Labour House Road, Central Business District, Abuja, on July 25th, 2024



2nd Session of the Fellowship Conferment, at NEC Auditorium, NSE Headquarters, Off Labour House Road, Central Business District, Abuja, on July 25th, 2024

Obituary Notice



BONI MADUBUNYI, MFR
(1933-2024)



ENGR. MAXWELL OZELE, MNIEE



ENGR. DR. FREDERICK NOSAKHARE
OGBEIDE, FNSE, FNIHTE



ENGR. SIR ONYEKWELU
NWADIUTO, FNSE, FNICE

NIHTE BENIN CHAPTER PAID A ONE DAY INDUSTRIAL VISIT TO MINISTRY OF ROADS & BRIDGES CIVIL LAB

The Nigerian Institution of Highway & Transportation Engineers, (NIHTE) Benin Chapter, paid a courtesy visit to the newly equipped and functioning **Civil Material Testing Laboratory of the Ministry of Roads & Bridges** of Edo State Government today, Friday 5th July, 2024 and it was a huge success. The visit was led by the Branch Chairman of NIHTE, Engr. Wilson O. Asemota, FNSE, FNIHTE accompanied by Exco Members, Fellows and Corporate members of the institution. The NIHTE team brainstormed with the laboratory coordinator, Engr. Nosa Uwaila and staff of the establishment on areas of corporation and the need for upholding high standards for materials used in road construction. Staff of the lab were encouraged to be active members of the **Nigerian society of engineers NSE, COREN and NIHTE** which will give strong professional backing to the Laboratory deliverables. The NIHTE Chairman, Engr. Wilson O. Asemota, FNSE, FNIHTE emphasized and harps on the need to harness the Lab results to ensure stability and reduce failures of our Roads. The chairman appreciated all members of NIHTE that make the visit a reality as well as the management of the materials Testing laboratory in the Edo State Ministry of Roads and Bridges. The visit culminated with a photo session.





THE NIGERIAN INSTITUTION OF HIGHWAY AND TRANSPORTATION ENGINEERS (NIHTE)
IBADAN CHAPTER
A Division of The Nigerian Society of Engineers

join us at the



IBADAN CONFERENCE
2024 ANNUAL GENERAL MEETING (AGM)
& INAUGURATION CEREMONY OF
ENGR. ISMAIL OLASUNKANMI OLATINWO
MNSE, MNHTE, MNICE, MASCE
AS THE 3RD CHAIRMAN NIHTE IBADAN CHAPTER



Chairman of the Session
Engr. Sadiq Hassan, FCE, FNSSE
NIHTE National Chairman



Inauguration Chairman, 2024 Ibadan Chapter
Engr. Ismail Olasunkanmi Olatinwo, FCE, MNSE



Guest Speaker
Engr. Dr. Mustafu Bala J., PhD, FNSSE, FCE, FNSSE, FNSSE, FNSSE, FNSSE, FNSSE



Chief Guest
Engr. Lasini Adenuga Rafiq, MCE, MNSE
Chairman, NIHTE, Ibadan Chapter

Topic: RESILIENT TRANSPORTATION INFRASTRUCTURE: BEST PRACTICES FOR URBAN & RURAL MOBILITY

Sat 28th September, 2024 11:00am prompt
Function Hall, Jogor Centre, Off Liberty Road, Ibadan.

SOME OF THE 19TH ANNUAL LECTURE & AWARDS CEREMONY OF NSE, PH BRANCH PICTURES

 ENGR. MRS. MARGARET ANA OGUNFELA, FNSSE President, Nigerian Society of Engineers CHAIRMAN OF THE OCCASION	 CHIEF SAMUEL OGBURNU, PhD MD/CEO, NDDC SPECIAL GUEST OF HONOUR	 DR. TAWNY WENEKE DANAGOGO, PhD, BSc Secretary to Rivers State Government ESTEEMED GUEST OF HONOUR
 ALABO DUMO LULU-BRIGGS The Indefatigable (N) of Katsina Kingdom ROYAL FATHER OF THE DAY	 ENGR. DR. INNOCENT AKPAVIE, FNSSE, FNSSE MD/CEO, GDSI Int'l. (Nig.) Ltd. DISTINGUISHED GUEST OF HONOUR	 ENGR. BASOEMI J. BENIBO, FNSSE Hon. Commissioner of Housing, Rivers State GUEST OF HONOUR
 ENGR. DR. NANDO THEOPHILUS JOHNSON, FNSSE EMINENT LECTURER	 PROF. NELSON S. DIEGOUE, FNSSE, FNSSE Vice Chancellor, Rivers State University, RSU CHIEF HOST	 ENGR. ONWESHARI HARRIET AKALA, FNSSE NSE PH BRANCH CHAIRMAN HOST

PROMOTING PPP'S FOR RAPID TRANSPORT INFRASTRUCTURE DEVELOPMENT

THE ROADS JOURNAL

By Olorundare Enimola

The impact of a well-developed transportation system to the economic development of a country cannot be over emphasised, because development of societies, are directly proportional to transportation development. There are five mode of transportation services commonly used to move passengers, goods and services to places; by air, road, rail, water and pipelines.

Salaries and compensation for Nigerian workers can now be paid in US Dollars, you acquire premium domains for as low as \$1500 and PROFIT \$22,000 (₦34 million).

The more developed the intermodal system is in a country, the more visible its impact will be in terms of crystalising rapid development. Looking at the state of Nigeria's transportation system today, reveals the need for improvement and adoption of modern trends that are apt in promoting economic growths through seamless movement of goods, services and manpower from place to place within the right time frames.

In many of the developed countries, transportation plays a significant role in the ease of doing business.

A number of developed nations however, have boosted their economies through investments in world-class transport systems.

While in Nigeria, we have increasing urbanization and growing traffic demand, adding pressure on its largely inadequate transport systems, yet there seems to be no concrete evidence of steps taken to change the status quo in the country. This is despite the enormous resources available in the Nigerian transportation sector which is mostly untapped and unexplored.

Akinwunmi Alade, an investment expert said, "governments of most developed countries do not leave the transport sector wholly in the hands of private practitioners, but are strongly involved to effect the necessary regulations and control for optimal performance in providing the required leverage for economic development at the right pricing."

Noting that public transportation which includes buses, taxis, water ferries, trains, trams, and the metros, are regulated adequately by the government and it is not completely private-sector driven, making it so efficient and reliable. He stressed that where private companies are involved in the operations, it is usually on an agreed model such as the Public-Private-Partnership, PPP.

In Nigeria however, the unreliability of the transport system has continued to limit access to services, business, trade facilitations, attraction of foreign direct investments and also in the revenue drive of the government.

Akinwunmi, cited Lagos State, the economic centre of Nigeria, where transport operation is largely run informally by private individuals. This makes the services undesirable because of the inefficiencies that exist due to under-regulation.

However, the Lagos State Government through LAMATA, has taken up the challenge of massive investments in

Rail, Road and water Transportation to ease the commuting of its large number of residents.

Amuda Ajikobi, Senior Partner with Macro Investors Handling Company Limited, said, "In the UK, particularly in London, because of government regulation to enhance standards, a mobile application offers most of the information about its public transport system, and regulations in the city, including fares, routes, and time of arrivals and departures.

That means if you must operate, government has to know; this procedure reduces informality. In both UK and UAE, the logistics and business supply chains are effective because they rely on the transportation infrastructures and strict regulations available that helps to reduce the cost of business operations. For most public transportation, closed-circuit television, CCTV is installed for safety and security businesses.

"Transport cards are also used on most of these public transports for ease of payment; this offers a hassle-free environment for the populace, visitors and tourists. Strict regulations also avail government the opportunity to monitor many of these services, ensure accountability on the part of the operators, and for government to monitor service trends.

This is an indication that individuals move with ease and travel on public transportation because they are timely, affordable, and adequately available," Ajikobi said.

A well-developed transportation infrastructural system is required for a country like Nigeria, if it is in place, businesses can make projections and enjoy a reliable supply chain, while fulfilling the logic that an effective transportation system would serve as a catalyst for rapid economic growth will be true for the country.

In an article written by Olajimi Ogun of the Firma advisory, he said, "Given constraints such as bureaucratic bottlenecks, population explosions, and a lack of industry and technical expertise within government bodies, can limit a country's capacity to provide sufficient transportation infrastructure to meet the ever-expanding needs of their citizens, leading to the introduction of Infrastructure financing models such as Public Private Partnerships that aims to meet the identified needs."

PUBLIC-PRIVATE PARTNERSHIPS (PPPS)

Public-private partnerships involve collaboration between a government agency and a private-sector company that can be used to finance, build, and operate projects such as public transportation networks, parks, and convention centres.

Because of their ability to leverage private sector resources, expertise, and efficiency, public-private partnerships (PPPs) have emerged as a preferred infrastructure finance model in Nigeria. PPPs involve the collaboration of the public and private sectors to design, finance, build, and operate infrastructure

projects. This model promotes risk-sharing and innovation while reducing the burden on government finances. Let us consider the common types of PPPs available for infrastructure development in Nigeria:

BUILD-OPERATE-TRANSFER (BOT):

A private entity designs, finances, builds, and operates the infrastructure project for a specified period. Ownership is eventually reverted to the government.

BUILD-OWN-OPERATE (BOO):

In a BOO model, the private entity not only constructs and operates the infrastructure but also owns it for the duration of the project.

BUILD-TRANSFER-OPERATE (BTO):

Similar to BOT, the private entity builds the infrastructure and then transfers ownership to the government. However, the private entity is responsible for running the project for a set period before handing over control to the government.

A private company is hired to repair an existing infrastructure asset, operate it for a set period, and then return it to the public sector at the end of the concession period.

BENEFITS OF PPPS

ENHANCED EFFICIENCY:

Private sector involvement brings efficiency to project management, construction, and operation, ensuring timely completion and improved quality.

ACCESS TO CAPITAL:

PPPs attract private sector investments, allowing the government to leverage additional funds without straining public finances.

RISK SHARING:

The private sector shares financial and operational risks, alleviating the burden on the government and taxpayers.

CHALLENGES OF PPPS

Complex Legal Framework: Establishing a robust legal and regulatory framework for PPPs requires expertise and time. Revenue Generation: Sustaining revenue streams to repay private partners and ensure project viability can be challenging, especially for projects in remote areas.

Political and Regulatory Risks: Changes in government policies, regulations, or political instability may impact project continuity and profitability. Early this year the Nigerian Institute of Transport Technology NITT also disclosed its readiness to partner with young and innovative Nigerians from across the six geopolitical zones in the development of electric cars. seeking submissions from inventors in the area of Hybrid cars, Solar Vehicles and Driverless Vehicles. Other areas of partnership are in Vehicle Safety Technology, Activity Key Access and Battery Vehicle Technology.

BELOW ARE SOME EXISTING JOINT VENTURES & INVESTMENT OPPORTUNITIES

AVIATION SUB-SECTOR

Maintaining Hangars. Existing hangar owned by the airlines needs refurbishment and modern equipment; Aircraft Engine Workshop – A workshop that can effect A, B, C, & D checks on various grades of aircrafts used in the Country and in the West African sub-region; Development and management of a five-star hotel in Lagos.

Provision of catering equipment and infrastructure to meet the needs of the airline industry; Establishment

of a modern aircraft training facility; and Development/ construction of airport terminals.

MARITIME SUB-SECTOR

Liner Services – Foreign Shipping Companies can engage in the provision of Liner Services through joint sailing agreement with Nigerian shipping companies; Cabotage – Government encourages joint ventures in the ownership and operation of light vessels between ports, which must be fully registered in Nigeria; Ship Acquisition and Ship Building Fund/Lifting of Crude Oil and Gas; Pollution Control in the Oil Producing Coastal Regions.

Proposed Nigerian Maritime Consultancy Centre – this will cover the following: Marine engineering spare parts supplies; Ships and Port management; Ships, Ports and boat supplies; Seaports, oil terminals and ship communication equipment; Seaports and ships educational material; Combined maritime publications.

RAILWAY

There is need for modernization of the Nigerian Railway System which is still based on the prevailing technology at its inception early in the century, which is the 3" – 6" (1067mm) gauge. These include: Conversion of wagon bearings to roller bearings; Conversion of train braking system from vacuum to air; Conversion of AB coupler to more effective system; Modernization of track maintenance; Improvement of ticketing system; Manpower development and training.

ROAD TRANSPORT

Modern buses equipped with communication system; Trams to facilitate passenger movement in both rural and urban areas; Suitable haulage trucks for goods and services; Service facilities at the terminals on both the highways and destinations; Collection of tolls for the use of the service facilities provided to help sustain the system; Computerization of services to enhance efficiency and control of operations; Commercialization of terminal facilities; Central terminals in various urban and rural locations in the country with service facilities.

NATIONAL INLAND WATERWAYS

Dredging of the River Niger; Rehabilitation of Warri and Lokoja Dockyards, operational vessels, pollution control; Study and Development of River Benue System for all year round navigation; Dredging of Oguta Lake for effective navigation with larger vessels.



Another type of transportation

NIHTE OFFICIAL VISIT TO THE HON. MINISTER OF WORKS, ENGR. DAVID UMAHI, FNSE



THE NATIONAL CHAIRMAN OF THE NIGERIAN INSTITUTION OF HIGHWAY AND TRANSPORTATION ENGINEERS (NIHTE), ENGR. SAIDU HASSAN, FNSE, FNIHTE, EXECUTIVE MEMBERS AND ELDERS OF NIHTE PAID A COURTESY VISIT TO THE HONOURABLE MINISTER OF WORKS, ENGR. DAVID UMAHI, FNSE, LAST WEEK THURSDAY

NIHTE OFFICIAL VISIT TO THE CEO FERMA, ENGR. DR. EMEKA AGBASI, FNSE



2024 EXECUTIVE COMMITTEE MEMBERS



Engr. Margaret Aina Oguntala, FNSE
PRESIDENT/CHAIRMAN-IN-COUNCIL



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VICE PRESIDENT



Engr. Joseph Sunday Adebayo, FNSE
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Engr. Ibrahim Aliyu, FNSE
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Engr. Prof. Olumide Moses Ogundipe, FNSE
EXCO MEMBER



Engr. Rachel Ugye, FNSE
EXCO MEMBER



Engr. Tasiu Sa'ad Gidari-wudii, FNSE
IMMEDIATE PAST PRESIDENT



Engr. Joshua Egube, FNSE
Executive Secretary

NIHTE BUS, IBADAN CHAPTER



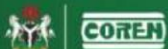
INTERNATIONAL HIGHWAY AND TRANSPORTATION ENGINEERS CONFERENCE & AGM

NEC, ABUJA, 2024

FRIDAY, 22ND NOVEMBER, 2024

*The Future of Roadways:
Green. Equitable. Intelligent & Integrated*

- Young Engineers/Students Activities
- Spouses Program
- Technical Sessions
- Annual Chairman's Cocktail
- Annual Dinner
- Industrial Visits
- Cultural Displays
- Election of Executive Officers
- Celebration of Achievers
- Exhibitions
- Fellowship Award and Fellows Night



Council for the Regulation of Engineering in Nigeria

Announces the



ENGINEERING ASSEMBLY

Theme:

REGULATING ENGINEERING PROFESSION FOR SHARED PROSPERITY IN NIGERIA

Venue: Thisday Dome, CBD, Abuja, FCT.

Date: Monday 2nd - Wednesday 4th September, 2024

Time: 10.00am daily

REGISTRATION

Engineers & Technologists:

N60,000.00 Early Bird
N70,000.00 Late Bird

Technicians & Craftsmen:

N40,000.00

Non-Engineering Practitioners:

N75,000.00 Early Bird
N85,000.00 Late Bird

Virtual Registration:

N40,000.00

RSVP

Engr. Olu Ogunduyile, FNSE
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Engr. Dayyabu Tijjani, FNSE
Secretary, Main Organizing Committee
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Engr. Prof. Adisa, Ademola Bello FNSE, FAEng
Registrar of COREN
registrar@coren.gov.ng
0803 573 3944

Participants and Exhibitors Registration is STRICTLY online

Visit: www.coren.gov.ng or www.corenassembly.coren.gov.ng to register.



The Nigerian Institution of Highway & Transportation Engineers (NIHTE)

(A Division of the Nigerian Society of Engineers)

CALL FOR PAPERS

SUBMISSION DEADLINE: 31ST DECEMBER, 2024

For publication in NIHTE 2024 Journal
Authors are requested to submit their draft manuscripts, via online @:

nihe.nse2013@gmail.com, japavisca@yahoo.com or 08032630023



GLOBAL ENGINEERING CONFERENCE ON SUSTAINABLE DEVELOPMENT & WFE0 EXECUTIVE COUNCIL MEETINGS

15th - 18th October 2024, Kigali, Rwanda

**Theme:
Engineering Innovations for
A Sustainable Future**



NIHTE SUB-COMITTEES

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4. Engr. Esther Oluwakemi Oladeji, MNSE, MNIHTE - Member 07031221452
5. Engr. Mrs. Mbak Akakwam, MNSE, MNIHTE - Member 08035701459
6. Engr. JudeMary Nwoti, MNSE, MNIHTE - Member 08033368662

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3. Engr. Friday Elaigwu, MNSE, MNIHTE - Member 08061602772
4. Engr. Imo Ukpong, MNSE, MNIHTE - Member 08035146679
5. Engr. Prof. Olumide Ogundipe, FNSE, FNIHTE - Member 08107825001
6. Engr. Dr. Mudasiru Bola J., FNSE, FNIHTE - Member 08065668058
7. Engr. Usman Mohammed, MNSE, MNIHTE - Member 08065395369
8. Engr. Lasisi Adekunle Rafiu, MNSE, MNIHTE - Member 08060761830

C. FELLOWSHIP COMMITTEE

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2. Engr. Oludayo Oluyemi, FNSE, FNIHTE - Alt. Chair. 08034017782
3. Engr. Prof. Olumide Ogundipe, FNSE, FNIHTE - V. Chairman 08107825001
4. Engr. Ayotunde Ogunnoiki, FNSE, FNIHTE - Member 08034081890
5. Lagos Chapter Rep. - Member***

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5. Engr. Onah Ezekwesili, FNSE, MNIHTE - Member 08063963769
6. Engr. Hassan Abubakar, MNSE, MNIHTE - Member 08059698604
7. Engr. Usman Mohammed, MNSE, MNIHTE - Member 08065395369

E. CONFERENCE & AGM PLANNING COMMITTEE

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3. Engr. Esther Oluwakemi, MNSE, MNIHTE - Member 07031221452
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5. Engr. Osarenogowu A. Wilson MNSE, MNIHTE - Member 08038805096
6. Engr. Iwanger Ortese, MNSE, MNIHTE - Member 07068943700
7. Engr. Chigozie Achi, MNSE, MNIHTE - Member 08034104170

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1. Engr. Jones Nwadike, FNSE, FNIHTE - Chairman 08032630023
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4. Engr. Friday Elaigwu, MNSE, MNIHTE - Member 08061602772
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NIHTE SUB-COMITTEES CONT'D.

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3. Engr. Ogiamien Cewuo MNSE, MNIHTE - Member 08036789325
4. Engr. JudeMary Nwoti, MNSE, MNIHTE - Member 08033368662

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3. Engr. Esther Oluwakemi Oladeji, MNSE, MNIHTE- Member 07031221452
4. Engr. Dr. Adekunle Olaoye, MNSE, FNIHTE - Member 08034011894

I. INTERNATIONAL CONFERENCE AND INTERNATIONAL AFFAIRS COMMITTEE

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The Nigerian Society of Engineers

REQUEST FOR CLASSIFIED ADVERTS FOR THE NIGERIA ENGINEER MAGAZINE


In our bid to fulfil one of the terms of reference of the Editorial Board which is to generate funds and make The Nigeria Engineer magazine self-financing, we seek the dissemination of e-mail to all corporate members to notify them of the committee's request for classified Adverts for the next edition of the Magazine. The size of the advert should be 4.123 by 3.924 inches and will cost Fifty Thousand (50,000.00) only per advert.

Evidence of payment and advert should be forwarded to editorialcommittee@nse.org.ng

All adverts should reach the committee latest 10th September-December, 2022, this is to enable the committee complete the production of the magazine by the 15th of September-December..

Thank you and regards

Engr. Dr. Felicia Agubata, FNSE
Chairman, Editorial Board Committee



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Nigerian Institution of Highway & Transportation Engineers (NIHTE)

(A Division of the Nigerian Society of Engineers)

A Four-Monthly Journal of NIHTE

May - June, 2024

Vol. 67

8th Edition

Think, Transform & Transcend

NSE PRESIDENT CALLS FOR STRENGTHENING LOCAL CONTENT LAWS IN OIL AND GAS SECTOR



Speaking at the National Assembly Stakeholders Engagement organized by the National Association of Petroleum Explorationists (NAPE), NSE President emphasized the need for increased participation of Nigerian engineers, technologists, and contractors in the industry which would build local capacity, create jobs, stimulate economic growth, and reduce the country's dependency on foreign expertise, thereby retaining more value within the economy.

At the event titled "Deepening Collaborations between the Oil and Gas Industry and the National Assembly," NSE President commended NAPE and the National Assembly for their efforts in strengthening local content laws governing the oil and gas industry.

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has called for renewed efforts to strengthen local content policies in the oil and gas industry.

She urged the government to take further steps to secure oil and gas-producing areas to combat the activities of vandals and hoodlums disrupting oil exploitation activities.

SOME OF THE 19TH ANNUAL LECTURE & AWARDS CEREMONY OF NSE, PH BRANCH PICTURES

