



NBRRI

Newsletter

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NBRRI

**(VISION, MISSION & CORE VALUES)
BUILDING CAPACITY & SETTING THE
PACE IN INDIGENOUS CONSTRUCTION
TECHNOLOGY DEVELOPMENT**

VISION

To evolve and use a comprehensive and integrated approach in capacity building and investment promotion so as to foster the application of environment-friendly and energy-efficient innovation construction materials, manufacturing technologies and cost-effective building and road construction practices.

Which will enhance job-creation, wealth generation and poverty reduction as well as nurture the emergence of vibrant, knowledge-based and highly competitive indigenous construction companies capable of meeting global standards.

MISSION

Integrated R&B, Capacity building and robust extension services in which technology innovation and knowledge-based practices in the fields of building road and engineering materials will be used to provide adequate and affordable housing and road infrastructure as well as increased economic empowerment.

CORE VALUE

- ◆ Professionalism
- ◆ Resourcefulness
- ◆ Commitment and Integrity
- ◆ Innovativeness

EDITORIAL

As the year 2017 comes to an end, you will agree with me that it has been a very productive year especially for us in the Institute. This year the Institute witnessed the launch of the first ever Subgrade Soil Atlas of Nigeria, commissioning of the first ever Pozzolana cement Plant in Nigeria, Opening of the NBRRI Training Academy, launch of the 10 Curricula and Learning Guides for Artisans and Craftsmen in the Construction Trades as well as organizing another highly successful International Conference. What a year it has been for NBRRI. On behalf of the entire Newsletter crew, I wish you all a glorious end of year celebrations.

This edition of the NBRRI Newsletter brings your way a thought-provoking interview with the Chairperson, House of Representatives Committee on Science and Technology, Hon. Barr. Beni Lar. She succinctly evaluates the importance of Science and Technology for developmental strides and internal acceptability in, "Science and Technology can't be developed by importing equipment from other countries"

The second part of our featured interview focused on the virtues of service to fatherland. Mr. Okon Edet Effiong, who has been with NBRRI since 1983, shares his experiences, observations and way forward for a vibrant and efficient public service as he prepares to bow out meritoriously.

Expository research papers on Health and Safety, Road Network Map, Modification of existing NBRRI System Designs, Assessment of Fire Safety, Effective Public Relations and lots more are also captured in this edition for your educational upliftment and archival references.

The Institute is also being recognized from all works of life as organizations, groups continue to visit the Institute to award, partner and synergize with NBRRI. One of such visits as reported in this edition is the coronation of our amiable DG/CEO, Professor D. S. Matawal, as the "Garkuwan Matasan Arewa".

These and many more stories including the regular Social Dairy are well packaged in this colorful final NBRRI Newsletter edition for 2017.

As we commence the year 2018, here's wishing you all our esteemed and valued readers a fulfilling, rewarding and economically vibrant year. Do have an educative, informative and meaningful time.

SCIENCE AND TECHNOLOGY CANNOT BE DEVELOPED BY IMPORTING EQUIPMENT FROM OTHER COUNTRIES

...Hon. Beni Lar (Chairperson, House Committee on Sci & Tech)

The NBRRRI Newsletter crew veered into the world of the very intellectual Barrister and Chairperson of the House of Representatives Committee on Science and Technology, Hon. Beni Lar. Trained and tutored by one of Nigeria's most respected, renowned and passionate leaders, the first civilian governor of Plateau state, Late Chief Solomon Daushep Lar. You cannot but adore her sense of responsibility and passion for a humanistic community where there is decorum, respect and dignity for the human race and especially for women and the under-aged.

The crew in this heart-warming and homely interview with the elegant, ardent and highly knowledgeable ranking Lawmaker also explored her thoughts, political aspirations as well as the way forward in the Nigerian scientific circle. Excerpts:



NBRRRI NEWSLETTER: Ma, you are a lawyer, Politician and Federal lawmaker, can you share more on your biography.

HON. BENI LAR: Thank you very much for coming to my office and seeing me being worthy of this interview. I am a lawyer per profession and was in the practice for a while before moving to America where I also practiced. It was in America that I shifted base to politics, social and environmental activities. Also, having a Law

background, I have been a human right activist to date.

After spending years working in America, I decided to join the train of those with the ideology of making my country better; so, I decided to return to Nigeria to add my quota to that of other good people who are working for the betterment of Nigeria.

My political battle in Nigeria started when I contested for the House of Representatives in 2003, which I lost. This was as a result of my lack of knowledge on the Nigerian political terrain. I fully hoped on my Daddy's connection as the then immediate past PDP National Chairman. To my greatest surprise, my Daddy did nothing to lift me to victory because his policies remain 'work hard for you to attain victory'. After that lose, I learnt the hard but right way and till date, I have contested and won three elections in Plateau State.

As a three time member of the parliament, I am privileged to chair various committees like Human Right and now Science and Technology. There is this joy in you when you are young and have the acceptance of your people which will enable you to work for the growth of your country.

NBRRRI NEWSLETTER: You are a ranking member of the House of Representatives based on the years you have spent there, how important

is this arm of government and what has been your experience in the green chamber.

HON. BENI LAR: The Legislative is like the engine of the government; without the Legislative in democracy, the government cannot function because we are the Lawmakers who make the laws and everybody are bound to these laws and no one is above the laws no matter how highly placed or wealthy you are in the country. We act as the check and balance in government to make sure that government and its agencies functions properly that is why the constitution empowers us to oversight government especially in terms of spending and revenue. To this, a report on appropriation is submitted to the legislature to check and make sure that these monies are spent appropriately as stipulated in the budget. Also, the legislature makes sure that the fundamental human right of citizens are not violated but protected and respected.

NBRI NEWSLETTER: As the Chairperson, House Committee on Science and Technology, what are the responsibilities of the Committee?

HON. BENI LAR: Our responsibilities from day one are in our Standing Order. The Standing Order is a book containing the rules guiding the House and every committee. In my committee on Science and Technology, we have the jurisdiction to ensure that Federal Government, the Federal Ministry of Science and Technology and all the agencies under it are appropriately and judiciously funded and they utilize these funds effectively. We also perform oversight on them to make sure that they stick to their mandates and adopts the policies which they are been formed. The mandate of every agency is also listed in

contracts are given to those who truly qualified; and budget are completed in accordance to the physical responsibility act.

Our mandate in the committee is also to make sure that Science and Technology is promoted in the country. We go round the world to see new innovations and technologies. How much of it is actually going on in Nigeria. To this, we review a lot of our laws and introduce new laws that will promote Science and Technology in the country. For instance, the Science and Innovation Trust Fund Bill that we are introducing now is meant to handle issues on Research and Manufacturing of products. In this, we have a provision which all Multinational Companies operating in Nigeria have their research units here because a lot of their researches happen outside. We want home grown indigenous Technology which will boost our economy and upgrade our market value globally mostly when such product is massively produced and approved for the public. Also, this trust fund bill will help to promote research in the private sector too. We do a lot of interventions to urge government to carry out what will help promote the sector.

NBRI NEWSLETTER: What is your working relationship with the Federal Ministry of Science & Technology as well as Agencies under your supervision so far?

HON. BENI LAR: Our working relationship with the Ministry is quite good. The Ministry is a supervising agency and not an implementing agency. That is one of the committee's functions to see to it that the Ministry did not derail from its functions. The Ministry supervises all agencies under it to make sure that they abide by the policies of Science and technology to meet its

mandate and make sure it's a holistic picture of the government.

So far, the Ministry is doing great in its functions. I think we need to do more not just in the Ministry but in other sectors

The Legislative is like the engine of the government; without the Legislative in democracy, the government cannot function because we are the Lawmakers who make the laws

the Standing Order. We are to ensure that they act in line with their mandate and due process is followed and every citizen has the right to participate in the public procurement process and due process is followed and awards of

to have a holistic plan across the nation because some states in Nigeria even in the educational curriculum, they don't have people studying in the physical sciences, engineering and sciences. We need more educated minds.

NBRRI NEWS LETTER: Your committee was recently in Ota to carry out its oversight functions on NBRRI, based on your observations, what have you to say about the progress made in the Institute?

HON. BENI LAR: Well, our observations in Ota actually left the committee with a lot of hope because we were quite pleased with the fact that we saw a lot of efforts being made to improve the construction and building sector. We saw the Pozzolana Cement factory in Ota and we also saw how the Skill Centre was made with locally made bricks. It gives us a lot of hope and promise. What we are hoping for now is to see more of that replicated throughout the nation, not just in Ota alone. Our greatest joy is the passion of the DG to revive what he met on ground which so far, he has actually improved tremendously on what he met.



NBRRI NEWSLETTER: If you are to rate NBRRI in the area of R&D, local content production and the economic drive, what will be your score?

HON. BENI LAR: To give a score on this is not necessary, what I want to see is that NBRRI should do more because when you are doing well; the people will want you to do more for your good work. I think the National Assembly has done a lot to improve the budget of NBRRI and there is a lot of activities going on in NBRRI now around the country. With what we saw in Ota, I believe if we go round other NBRRI projects and offices on oversight we will see more satisfactory results. Presently, with the pictures and reports from most of my colleagues on the projects been handled by NBRRI in their constituency on roads and buildings, I think NBRRI has done well. I think the local content is what makes NBRRI very outstanding and appealing which is encouraging for the country.

NBRRI NEWSLETTER: How will you describe the Science, Technology and Innovation sector in Nigeria and what can Government do to improve it?

HON. BENI LAR: The only way to get there is through R & D. I was in China and Taiwan, and they told us that the secret in developing Research and Technology is through having your own Research and Development and build it to the height of appreciation globally. Science and Technology cannot be developed through buying and importing of equipment from other countries. If for instance the machine has fault, you need to import work force to repair and operate the machine which will increase your expenditure and reduce your productivity.

The best is to have a partnership with these foreign manufacturers where these machines will be manufactured locally and train citizens who will operate and repair them at any point in time. Such partnership was done recently with NASENI when we were in China together and signed memorandum of understanding to produce solar panels, transformers for our country. Thus China assured us that it is workable and they will facilitate eighty percent (80%) of the project.

The problem is that till date, government has not released a letter for the final approval of the MOU for reasons that nobody understands. The attitude of government officials sometimes is not really helping these developments. But we are on the right track and we need to fast track it.

NBRRI NEWSLETTER: We know that being a woman of great vision; you came to politics with great plans. How will you assess the level of women participation in Politics?

HON. BENI LAR: The fact is that the level of women participation in politics in Nigeria is very poor compared to other countries. The government has not done enough to encourage Nigerian women on politics and with the fact that we were unable to pass the Gender Appropriation Bill is worrisome.

In other countries like Egypt, even the Arab countries, thirty percent (30%) of their parliament are women and you hear them expressing full confidence on the women. In some interviews, you hear their men encouraging their male counterparts in Nigeria to give the women some chance that it will help the parliament a lot. Some countries like South Africa, Egypt, Rwanda have fifty percent (50%) participation of women in

The secret in developing Research and Technology is through having your own Research and Development and build it to the height of appreciation globally. Science and Technology cannot be developed through buying and importing of equipment from other countries

spirit that one day you will achieve your goals. That has helped me till date. That's why I still have that believe that this Gender Bill will see the good light of the day. Just like the Child Protection

their legislature and appointments. This is what Nigerian government should encourage and put into practice.

NBRI NEWSLETTER: You are also the daughter of a renowned Nigerian Statesman. How is growing up under the tutelage of a great figure like the Late Chief Solomon Lar and what are the main lessons that you learnt from him?

HON. BENI LAR: Thank you so much, I learnt a lot from my father mostly all the good virtues he taught us. One of the greatest things I learnt is relating with people positively. I grew up in a house that is always filled with people day and night both relatives and non-relatives. We all grew up as one big family. Till date, the house is still open to all even at the absence of my dad. I also learnt the virtue of patience and persistence for the right thing. When it comes to public service and something good for the general public, we were taught to keep fighting with good faith and

Enforcement Bill, I presented it twice at the National Assembly before it was able to scale through and now it is in the presidency for president's approval. This bill is fixed to enforce the provision of Child Right Act and to create an agency to protect the rights of children. The bottom line is we just need to learn how to be patience in life and keep on struggling for the best. These and many other things I learnt from my father.

NBRI NEWSLETTER: 2019 is approaching, will you be seeking reelection or you will want to move over to the Senate or vie for the Governorship seat in Plateau State?

HON. BENI LAR: This is a good but tactical question. I think it's coming rather too early because I am still in the process of consultation. I think I will wait till 2018 before I will make up my mind on it.





NATIONAL ASSOCIATION OF POLYTECHNIC STUDENTS VISIT NBRRI

...Honours DG and Institute

Executive members of the National Association of Polytechnic Students (NAPS) were at the premises of the Nigerian Building and Road Research Institute Administrative Headquarters, Jabi Abuja on a courtesy visit on 6th December 2017.

The Delegation came to honour the DG/CEO of the Institute Professor Danladi S. Matawal for his contributions

to the growth of Research in Nigeria.

On hand to receive the Students at the Conference Room was the DG and some management staff of NBRRI.

Speaking at a brief but elaborative session, the leader of the delegation, Comrade Adeyeye, said NBRRI under the leadership of Prof. Matawal has no doubt significantly impacted on the Engineering sector of Nigeria.

He further appreciated the efforts made by the Institute in the areas of innovation and improving tremendously since the coming of the current DG/CEO.

It was based on this that the Association deemed it apt and worthy to bestow the "Icon of Excellence" award on the DG/CEO. The Association also did not leave out the Institute as it conferred the National outstanding leadership

award to the Management and Staff of the institute as "Most Valuable Government Institute".

The Student group urged the DG/CEO not to relent but push further to make the Institute a world class agency that will make all Nigerians proud. They also encouraged Staff of the Institute to support the DG by being dedicated to the actualization of the Mandates, Mission and Vision of the Institute.

Comrade Adeyeye updated the DG/CEO of NBRRI and Management staff on some

of the Association's activities which will require the support of NBRRI.

Responding, Prof. Matawal thanked the delegation for the visit and also appreciated the association for the award given to him and also to the Management and staff of the Institute.

The DG/CEO expressed his delight that groups such as NAPS was closely monitoring agencies of Government and such a gesture will further spur NBRRI to achieve more.

He disclosed several

activities that the Institute have lined up and assured the gathering that NBRRI will play its part to ensure a viable construction sector of the Nigerian economy.

Matawal encouraged the students to study hard as they will be leaders of the country in future. He further admonished them to shun vices that can destroy them and their careers.

Highpoint of the visit were the presentations of the awards to the DG and the Institute by the Students' Exco.





MY EXPERIENCE AFTER 35 YEARS IN NBRRI

–Mr. Okon Effiong

NBRRI NEWSLETTER: Sir, we understand that you resumed work when the Institute was in its infant stage. Can you give an analysis of its structural and developmental rise from inception?

MR. EFFIONG: I joined the Institute on 11th May 1983 after the commencement of the Institute on 1st April 1978; that was five (5) years before I joined. I joined NBRRI when the only office was at number 15 Awolowo Road, Ikoyi, Lagos. Then we were occupying only the 1st, 2nd and 3rd floors of the building. But now, NBRRI occupies the whole building and the office is now the West Zonal Office. We have grown from a three floor office to an Institute with a very large land mass and Zonal Offices across the six geo-political zones with the zonal offices in Kano, Gombe, Jos, Lagos, Nnewi and Uyo; an administrative office in Abuja and a big laboratory complex in Ota, Ogun State. When I joined, we have less than 100 staff but today we have about 400 staff on our pay role which shows that we have grown. Some of us joined the Institute when we have Indian nationals who were sent from their Research Institute to come

and establish NBRRI. As for me, I worked for seven years in the laboratory before I went back to school for further studies and changed course to social sciences which made me an Accountant today. In as much as NBRRI has moved from one level to another in terms of structure, NBRRI still needs more professionals to handle the laboratory equipment. Training and retraining of staff is also very important and needed in NBRRI. At inception, NBRRI made tremendous impact but along the line NBRRI went into comatose.

The name was no more heard. Petitions after petitions, probe and facing panels upon panels affected the growth of NBRRI. At that point nobody knew NBRRI again. The success story began with the assumption of duty of the current DG/CEO Prof. Danladi S. Matawal. The introduction of good programmes such as the annual

International Conference brought NBRRI to the limelight and now all engineering groups mainly those in building and roads look forward to this annual conference; and also time to time come to NBRRI for professional advice and collaboration. With the current spade of development and what the Minister of Science and Technology Dr. Ogbonaya Onu is doing in repositioning the ministry for the better, I want to say that five (5) years from now, NBRRI will take its proper place as the biggest and best government agency in the Ministry of Science and Technology.

NBRRI NEWSLETTER: Generally, every government across the world and especially in developed nations, the remittance of tax by all eligible bodies serve as one of the income sources for government and hence development takes place. How can you assess the tax remittance situation in Nigeria and how best can the government channel this for mass benefit?

MR. EFFIONG: I won't use the word remittance, if I do; I am constraint to certain element of taxation when we talk about the

value added tax. I want you to know that tax is an obligation every adult in Nigeria that generates income should pay. In advanced societies tax is the most certain source of revenue, but in Nigeria it is not the case. In Nigeria, all we talk about is oil; this oil is the genesis of the corruption we have in this country. The good thing now is that this government is talking about diversification, but the problem is that they are not putting in place the structure and machinery of collecting tax. Presently, I doubt if government has a well-structured modality of collecting tax from those working in private sectors. My advice is that government should put more efforts and structure on private sector tax collection and also make judicious use of collected taxes for the betterment of the country.

NBRRI NEWSLETTER: NBRRI has over the years come up with abundant research innovations as you have witnessed. Speak to the general public on the benefits of these technologies and how Nigeria and indeed Africa can become self-reliant through the use of indigenous technologies.

MR. EFFIONG: These technologies are of tremendous benefits to the nation and continent in general. Part of the mission of NBRRI is to empower Nigerians with affordable housing. At the early stage of NBRRI in the soil laboratory, we were producing distilled water (water for making battery) from the waste of our testing chemicals. At that time, private individuals do come to NBRRI every morning to purchase the water for the use of their batteries. The publication of NBRRI research materials is also vital in the academic circle. The launching of the Digitized Subgrade Soil Map is a huge step in solving the issue of collapse building and bad roads in the country. This will help builders and engineers to have better knowledge of the soil texture and components of the area they are working on before start of work.

NBRRI NEWSLETTER: As one of the most experienced staff in NBRRI, can you briefly share with us some of your memories,

challenges and breakthroughs?

MR. EFFIONG: My first experience was in 1985, and then I was in the laboratory. We (NBRRI) attended a trade fair at the Tafawa Balewa Square, Lagos, on solar energy. Then, I was representing NBRRI at the institute's stand and attending to visitors at the stand which gave me the first opportunity to speak with the press and talked on solar energy. During the programme, the representative of the Head of State, Brig. Bako visited NBRRI stand and I was there alone. He asked some questions which I answered; two days later, the press published the short interview and I was called by the Institute (NBRRI) to give answers on why I granted the interview at my level.

My second experience was a query I received from management for rejecting the decision of management on some staff to forfeit their one month transport allowance. This happened when we were experiencing payment of half salary and for one of the months, salary was delayed for about two weeks and so some staff find it difficult to pay the bus fare then.

NBRRI NEWSLETTER: Let's vie briefly into the aspect of workplace unionism. As a man who presided over the Non Academic Staff Union in NBRRI, practically setting the foundation for its emergence, what would you say have been the achievements, goals and values in terms of repositioning the welfare of members and other union benefits?

MR. EFFIONG: I personally spearheaded unionism in NBRRI as a fall out between management and staff; since then, we were able to checkmate the government. Unionism is a tool to checkmate management and the government in general for the wellbeing of members and to promote government activities for the growth of the country. Unionism helps the management to archive its mandates and promote working cooperation in the institute or establishment. It serves as a watch dog to the government and institute.

NBRRI NEWSLETTER: What is your take on

constant strike by organizations and unions in Nigeria? What do you think should be done in place of strike?

MR. EFFIONG: Strike is not the best option to solving issues. To me, dialogue is and remains the best. But the issue of compromise by both parties is discouraging. Whenever strike occurs, it is the economy that suffers whether we like it or not. During strike, in every one hour, the economy suffers in terms of manpower and production is low which have grave effect on the generated finance of the country. This often leads to loss of lives in terms of medical practitioners going on strike.

NBRRRI NEWS LETTER: Briefly, in three points what can be done to motivate Civil Servants that will bring back the glory of the good old days of Civil Service?

MR. EFFIONG: One, there should be training and retraining of staff; Two, staff welfare should be taken more seriously; Three, the recruitment system and procedures should be based on merits.

NBRRRI NEWS LETTER: Kindly give some words of advice to the Institute's Management both now and in years to come.

MR. EFFIONG: My advice is for a way forward and progress, succession is very important. That is, the next DG should continue with the good work this present DG is doing. Also, if there is anything that must be done between now and the next few years, the present DG or the next DG should try as much as possible to create a conducive environment of less hatred and bitterness and management should do all it can to make staff happy. Also, there should be;

1. Good staff/management relationship;
2. Staff training should be done regularly to improve work output.

NBRRRI NEWSLETTER: At this point, the NBRRRI Newsletter wishes to appreciate your effortless service to NBRRRI as you retire from public service. However, what are your candid advice to the NBRRRI management



in respect to retiring members who have passionately and enthusiastically served out their tenures?

MR. EFFIONG: Thank you so much for that question. Everything that has a beginning has an end. I started with NBRRRI 11th of May 1983 and by May 11th 2018 I would have served the government for 35 years, am less than 60 years. I joined the institute as a technician and now I am a chief accountant, I give God the glory. First and foremost, when you engage a staff there must be an orientation and also when you want to disengage a staff, there should also be an orientation too so as to put such staff in a good state of embracing the new challenges ahead because he/she has lost touch with the private sector which he/she is going back to. You know that in the public sector, you are not allowed to engage in the private sector while serving in the public sector. This orientation will help remove fears and uncertainties. Management should do all it could in encouraging the staff in any form which will help to remove the fear of the unknown. I will like to say this to all staff that 35 years is a very short period. Most staff thinks it is long and never plans for retirement from their first day of appointment.

DG NBRRI BAGS “GARKUWAN MATASAN AREWA” TITLE

The Northern Youth Council of Nigeria (NYCN) has conferred on the DG/CEO of the Nigerian Building and Road Research Institute, Prof. D.S Matawal the title; “Garkuwan Matasan Arewa” meaning the Shield and Protector of the Northern Youth.

The conferment of the award was the highpoint of the courtesy visit which the executive of the group paid to the institute on 6th December 2017. The visit which took place at the Institute’s conference room also had the DG/CEO and some top management staff of the institute in attendance.

The leader of the delegation, Comrade Godiya T. Adams said the award of the DG is in recognition of his dedication to serving humanity. He therefore urged staff of NBRRI to continue to support the DG in order to excel and make the Nigerian construction sector among the best in the world.

Comrade Godiya went further to list some of the activities which the council is involved to include: entrepreneurial lectures, youth empowerment, Donations to IDP camps nationwide, advocacy on drugs, vandalism, etc, so as to empower the youth.

Responding, the NBRRI DG/CEO, Prof. Matawal, appreciated the council for visiting the institute and for honouring him with the title.

Prof. Matawal, stated that the institute is growing from strength to strength due to a vibrant set of professionals. He stated that management ensured that officers with high passion for innovation have been recruited to pursue a better future for the Institute.

The DG also appreciated his supportive management staff for their hard work noting that without their commitment, the Institute would not be where it is today.

He called on the Youths to continue to study hard so as to ensure a bright future and warned against indulging in vices that are detrimental to the society in general.



Matawal promised that the Institute will look into ways to assist the NYCN in achieving some of its laudable programmes.

EVALUATING HEALTH AND SAFETY PERFORMANCE OF THE NIGERIAN CONSTRUCTION SITE

By Professor Danladi S MATAWAL

ABSTRACT: Health and Safety topic is very important issue in construction as it helps to prevent people from being harmed by work or becoming ill by taking the right precautions and providing a satisfactory working environment. Managing health and safety is little different from managing any other aspect of a business. There is need to possess the general knowledge and skills required to undertake basic assessment to know the risks in the workplace, put sensible measures in place to control them, and make sure they stay controlled, especially in the construction site. The topic becomes even more important when an x-ray of the Nigerian construction industry is made and a catalogue of the accidents made to reveal that very little attention is paid to the plight of workers. As a consequence, Nigerian construction Sites can easily be classified as highly risky exposing workers and public to hazards to health and accidents. This paper presents the work of the Nigerian Building and Road Research Institute, NBRI, articulated in its curriculum and learning guide on H&S in construction launched on 18th May 2017 in Lagos. As a matter of fact, it is deemed that if adequate Health and Safety measures are put in place on construction Sites, the quantum of Building collapses in the country over the years, which is another dimension all together, would not have occurred.

1. INTRODUCTION

Government and Private Sector embark on massive construction at all times in the Building and Roads sector of the economy. In addition, a massive amount of investment is made by individuals for Housing where a large amount of Building materials are used possessing various and different characteristics, in terms of risk to human beings and the environment. Therefore, the construction client reserves the absolute right to insist to be put at the core of the construction process in terms of perfection of an accident free and safe working environment on Sites. Construction clients desire the maximum value for their project at the cheapest possible cost within the shortest possible time and safely too. Per se, the disposition of construction clients to the flow of resources has a lot to do with the quality and value of safety in any construction product development process, especially in a recessionary economy where desires are delimited by insufficient resources. However, the construction structure and the quality performance of materials and tools used for construction works are also very important. Obviously, achieving optimal safety performance of any construction project is a function of the vulnerability of constituent

materials. Recommended specifications and their standard descriptions are often prescribed in contract literatures (where applicable). However, apart from the fact that manufacturers' qualities are always at variant with recommended standards, in some cases, the performance of material 'standards' can be peculiar (thus restricted) to where they are recommended. To date, the Nigerian land construction industry (and indeed in most countries in Africa) has no coherent package of standard document to guide her material specification and standards as foreign standards are referred to at will. Apart from substandard materials as principal causes of construction failure and most clients' poor economic capability to afford best quality materials as well as established standard triangulation for reference, most materials in use also pose conspicuous health hazards. An understudy of confirmed effects of some of the major primary construction materials reveals that almost all primary construction materials like cement, water, glass, metals, timbers, paints, aggregate, asphalt, asbestos, etc, pose very severe health hazards during site applications than during manufacturing. For instance, silica, cement, timber, quarry and asbestos dusts are

known to cause lung function impairment, chronic obstructive lung disease, restrictive lung disease, pneumoconiosis, serious bacterial infections, skin cancer and carcinoma of the lungs, stomach and colon. Commonly, construction dusts have severe damaging effects when they enter system circulation, and after reaching all the organs of the body and different tissues, they pose more dangers to heart, liver, spleen, bone, muscles, hairs as their microstructure and physiological performance are being affected. Regrettably, construction workers are commonly exposed to various hazardous substances, physical agents, ergonomic factors and severe environmental hazards through hazardous conditions and materials like asbestos, lead, silica dust, organic solvents, sewer gases, welding fumes, radiation, noise and vibration. Many workers are also exposed to acute injury, chronic illness, permanent disability or even death through immediate effects of direct exposures.

On the other hand, fatigue, loss of concentration at work, poor health condition, site condition, constantly changing environment and distraction by other activities on site also increases the risk of accidents. In other words, apart from the fact that Nigerian construction workers seldom receiving modern technological training imperative to modern dynamic requirements of their job and the impact of the recessionary economy of the state of tools being used, workers psyche are constantly being demonstrated because of low payment, poor working conditions and social perceptions. In Nigeria, construction workers are mostly seen as indigent workers who are rarely respected for their skills in terms of remuneration. Thus, the discrepant flow of workforce in the industry is frightening. While many deaths are recorded through bad condition on sites, operational accidents, accumulated diseases etc, the industry's human capital also reduce tremendously through loss of interest of workers as many pick up other (better) jobs in vital industries of less risks and better appreciation. The labor attrition phenomenon in the Nigerian construction industry is both abhorrent and not regenerating. Thus, though there is incessant increase in construction cost principally propelled by rise in the costs of construction materials (material and their exotic applications are cocooned priorities to clients), not labor being considered in the balance of equations to

achieving cost performance and maximizing the true value for money. Therefore, this cultural misalignment in people issue explicates one of the basic fundamentals of disputes and feasibility obstacles in construction leading to the abandonment of the construction trades by well experienced and exposed personnel.

2. HEALTH, SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

Safety is everybody's business as it is the freedom from injury, danger or loss. Health is simply the general condition of the body or mind. In H&S terms, the term environment, which connotes the physical and biological factors along with their chemical interactions that affect an organism, is an important issue. Health, Safety and Environment are inter-connected as they each affect one another. The environment will inevitably affect the safety and health of the worker. Expressions like "health is wealth" and "safety first" are used to show the importance of being healthy and being safe. To maintain and increase work performance on a construction site, it is very important that personnel are healthy and are safe. Safety Management is important because it is applied to completely ameliorate hazards and dangers. However, certain hazards which cannot be completely ameliorated should be mitigated, that is its effects reduced to as low as reasonably practicable (often described by the acronym ALARP). Just as an illustration, the carpentry trade provides a valuable service to the construction industry. However, in order to sustain this valuable service, the workers need to look after themselves and the industry needs to look after them; it also requires workers to look after others including those new to the industry, such as apprentices.

In order to achieve these, a health and safety management system needs to be instituted which is, basically, a process put in place by an employer to minimize the risk of injury and illness. This is accomplished by identifying, assessing and controlling risks to workers in all workplace operations. The scope and complexity of a health and safety management system will vary according to the type of workplace and the nature of operations carried out. To be effective, there are vital components that should be in place, namely:

- Identification and analysis of health

and safety hazards at the work site that entails the evaluation of all equipment, machinery, work areas and work processes to recognize and analyze all potential sources of harm to workers.

- Control measures to eliminate or reduce the risks to workers from hazards like: engineering controls, administrative controls and personal protective equipment.
- Clearly demonstrated and management commitment, and written company policy from senior management is essential for the health and safety management system to be effective.
- Worker competency and training to impart requisite knowledge for them to do their jobs safely and without risk to their health when new and/or young workers need special attention.
- Inspection programs are an opportunity to identify any hazards that have not been recognized before, and to check that existing hazard controls are working.
- Emergency response planning that could include natural or manmade disasters as well as health emergencies or injuries are necessary. Effective plans need to be in place to address all potential emergencies.
- Incidence reporting and investigation when an incident occurs at any workplace it is important to investigate so that any inadequately controlled hazards are identified and controlled and processes can be put in place to prevent the recurrence of similar incidents.

The management system cycle therefore entails the actors to Plan, Do, Check and Act.

3. RISK ASSESSMENT IN THE CONSTRUCTION WORK PLACE

Risk is a function of the probability of occurrence of an undesired event together with a measure of its adverse consequences. Risk analysis seeks to answer questions such as how likely and how seriously things can go wrong; it also addresses matters related to the potential loss or damage. Thus the questions are what can go wrong, how likely and the anticipated impacts. There is an assessment of the likely outcome when workers are exposed to a hazard and the likelihood of it happening. A risk assessment can help determine

the severity of a risk, the effectiveness of any existing control measures, action required to control the risk, and how urgently the action needs to be taken. Risk assessment can be undertaken to varying degrees of details depending on the type of hazard and the information, data and resources available. It can be as simple as a discussion with the workers or may involve specific risk analysis tools and techniques recommended by safety professionals. Types of risks include potential loss of life, assets, production, insurance; and potential damage to health including injury and sickness, environment, asset reputation.

One of the most important aspects of risk assessment is accurately identifying the potential hazards in the workplace. It is the responsibility of the engineer to walk around the workplace brainstorming and searching for potential hazards associated with the activities, processes or substances to be used that could injure employees or harm their health. In order not to overlook some hazards, it is important to reflect back at accident and ill-health records, take account of non-routine operations (e.g. maintenance, cleaning operations or changes in production cycles), and think about long-term hazards to health (e.g. high levels of noise or exposure to harmful substances). There are hazards with clearly recognized risks of harm, like working at heights, or working with chemicals, machinery, and asbestos. In risk assessment, it is always important to predict how employees (or others who may be present, such as contractors or visitors) might be harmed, including asking questions to help fill in gaps. Some workers may have particular requirements, e.g. new and young workers, migrant workers, new or expectant mothers, people with disabilities, temporary workers, contractors, home workers and lone workers. People who might not be in the workplace all the time, such as visitors, contractors and maintenance workers, will need to be taken into consideration as well as taking members of the public into account if they could be harmed by work activities. If the workplace is shared with other trade workers, there will be need to consider how work will affect them and the vice versa.

3.1 Evaluating the Risks

Evaluating risks simply involves making records of significant findings – the hazards, how people

might be harmed by them and the structures in place to control the risks. Records produced should be simple and focused on controls; precautions must be reasonable and practicable; and remaining risks low: the greater the hazard the more robust and reliable the measures to control the risk of an injury. A risk assessment should be done when there is uncertainty about how a hazard may result in injury or illness; the work activity involves a number of different hazards and there is a lack of understanding about how the hazards may interact with each other to

produce new or greater risks; and when there are changes at the workplace that may impact on the effectiveness of control measures. Some hazards that have exposure standards, such as noise and airborne contaminants, may require scientific testing or measurement by a competent person to accurately assess the risk and to check that the relevant exposure standard is not being exceeded (for example, by using noise meters to measure noise levels and using gas detectors to analyze oxygen levels in confined spaces).

TABLE1: SOME SUGGESTED HEALTH AND SAFETY RISKS

Hazards	Effects
Noise	Staff and others may suffer temporary or permanent hearing damage from exposure to noise from woodworking machinery.
Vehicle accidents	Staff may suffer serious, possibly fatal, injuries if struck by a vehicle such as a lift truck or a delivery lorry. Being struck or run over by moving vehicles, falling from vehicles, or vehicles overturning are the most common causes. Vehicles operating in the workplace include cars and vans, lift trucks, heavy goods vehicles, dumpers, specialized vehicles or plant. Often there is significantly more danger from vehicles in the workplace than on the public highway since the operating conditions are different.
Slips, trips and falls	Staff could suffer injuries such as bruising or fractures if they trip over objects, or slip, e.g. on spillages, and fall.
Exposure to Electricity	Electricity can kill. Most deaths are caused by contact with overhead or underground power cables. Even nonfatal shocks can cause severe and permanent injury. Shocks from faulty equipment may lead to falls from ladders, scaffolds or other work platforms. Those using electricity may not be the only ones at risk. Poor electrical installations and faulty electrical appliances can lead to fires which can also result in death or injury to others.
Work at height	Falls from any height can cause bruising and fractures. One of the main causes is falls from ladders. To help prevent falls from height, make sure you consider the risks to all your workers, the work is planned, organized and carried out by competent people and you follow the hierarchy for managing risks. Make sure workers are properly trained and supervised, have the right equipment and know how to use it safely.
Fire	If trapped, staff could suffer fatal injuries from smoke inhalation/burns. Each year many people suffer burns caused by the flammable materials they work with. The wide variety of flammable substances found in the workplace ranges from the obvious, eg heating fuel, petrol, paint thinners and welding gases to the less obvious, eg packaging materials, dusts from wood, flour and sugar. For a fire to start, fuel, air and a source of ignition are needed. Controlling these can prevent fires.

3.2. Risk Control: How to Identify Hazard

Identifying hazards in the workplace involves finding things and situations that could potentially cause harm to people. Hazards generally arise from any situation or an interaction of situations, like: the physical work environment; equipment, materials and substances used; work tasks and how they are performed; and the work design and management. Some hazards are part of the work process, such as mechanical hazards, noise

or toxic properties of substances. Other hazards result from equipment or machine failures and misuse, chemical spills and structural failures. A piece of plant, substance or a work process may have many different hazards. Each of these hazards needs to be identified. For example, a production line may have dangerous moving parts, noise, hazards associated with manual tasks and psychological hazards due to the pace of work.

Table 2: EXAMPLES OF COMMON WORKPLACE HAZARDS

Hazard	Potential harm
Manual tasks	Overexertion or repetitive movement can cause muscular strain
Gravity	Falling objects, falls, slips and trips of people can cause fractures, bruises, lacerations, dislocations, concussion, permanent injuries or death
Electricity	Potential ignition source. Exposure to live electrical wires can cause shock, burns or death from electrocution
Machinery & equipment	Being hit by moving vehicles, or being caught by moving parts of machinery can cause fractures, bruises, lacerations, dislocations, permanent injuries or death
Hazardous chemicals	Chemicals (such as acids, hydrocarbons, heavy metals) and dusts (such as asbestos and silica) can cause respiratory illnesses, cancers or dermatitis
Extreme temperatures	Heat can cause burns, heat stroke or fatigue Cold can cause hypothermia or frost bite
Noise	Exposure to loud noise can cause permanent hearing damage
Radiation	Ultra violet, welding arc flashes, micro waves and lasers can cause burns, cancer or blindness
Biological	Micro-organisms can cause hepatitis, legionnaires' disease, Q fever, HIV/AIDS or allergies
Psychosocial hazards	Effects of work-related stress, bullying, violence

3.3 Risk Control: How to Find Hazards

i. Inspecting the Workplace to inspect and assess how people actually work, how plant and equipment are used including maintenance and suitability, what chemicals are around and what they are used for, what safe or unsafe work practices exist as well as the general state of housekeeping, the environmental risks to health and safety (for example, space for unobstructed

movement, adequate ventilation, lighting), and effect of changes in the workplace which may affect health and safety. Hazards are not always obvious as some hazards can affect health over a long period of time or may result in stress (such as bullying) or fatigue (such as shift work). Some hazards may be straight forward problems and action should be taken on these immediately, for example cleaning up a spill. Where there is

immediate or significant danger to people, they should be moved to a safer location first and the hazard attended to urgently. Make a list of all the hazards you can find, including the ones you know are already being dealt with, to ensure that nothing is missed. You may use a checklist designed to suit your workplace to help you find and make a note of hazards.

ii. Consulting colleagues Or workers directly or through worker surveys

iii. Reviewing Available Information and advice about hazards and risks relevant to particular industries and types of work is available from regulators, industry associations, unions, technical specialists and safety consultants. Manufacturers and suppliers can also provide information about hazards and safety precautions for specific substances (safety data sheets), plant or processes (instruction manuals). Analyzing records of health monitoring, workplace incidents, near misses, worker complaints, sick leave and the results of any inspections and investigations to identify hazards. If someone has been hurt doing a particular task, then a hazard exists that could hurt someone else. These incidents need to be investigated to find the hazard that caused the injury or illness.

3.4 Risk Control: How to Control Hazard

The most important step in managing risks involves eliminating, or if that is not possible, minimizing the risks so far as is reasonably practicable. In deciding how to control risks, consultation with workers and their representatives who will be directly affected by this decision is mandatory. Their experience will help you choose appropriate control measures and their involvement will increase the level of acceptance of any changes that may be needed to the way they do their job. Some problems can be fixed easily and should be done straight away, while others will need more effort and planning to resolve. Of those requiring more effort, we should prioritize areas for action, focusing first on those hazards with the highest level of risk.

4. THE HIERARCHY OF RISK CONTROL

The ways of controlling risks are ranked from the highest level of protection and reliability to the lowest, known as the hierarchy of risk control. We

must always aim to eliminate a hazard, which is the most effective control. If this is not reasonably practicable, then it should be minimized by working through the other alternatives in the hierarchy.

4.1 Level 1 Control Measures

The most effective control measure involves eliminating the hazard and associated risk, or removing the hazard completely. The best way to do this is by, firstly, not introducing the hazard into the workplace. For example, eliminate the risk of a fall from height by doing the work at ground level. Eliminating hazards is often cheaper and more practical to achieve at the design or planning stage of a product, process or place used for work. For example, a noisy machine could be designed and built to produce as little noise as possible, which is more effective than providing workers with personal hearing protectors. It may not be possible to eliminate a hazard if doing so means that one cannot make the end product or deliver the service.

4.2 Level 2 Control Measures

If it is not reasonably practicable to eliminate the hazards and associated risks, then minimize the risks using one or more of: *Substituting the hazard with something safer* (example, replacing solvent-based paints with water-based ones); *Isolating the hazard from people* (by the use of barriers like guard rails around exposed edges and holes in floors, use of remote control systems to operate machinery; and store chemicals in a fume cabinet); and the *Use of engineering controls* (control measure that is physical in nature, including a mechanical device or process. For instance, use mechanical devices such as trolleys or hoists to move heavy loads; place guards around moving parts of machinery; install residual current devices (electrical safety switches); set work rates on a production line to reduce fatigue).

4.3 Level 3 Control Measures

These control measures do not control the hazard at the source. They rely on human behavior and supervision, and used on their own, tend to be least effective in minimizing risks. Two approaches to reduce risk include: *Use administrative controls* (work methods or procedures that are designed

to minimize exposure to a hazard, like the use of signs to warn people of a hazard); and the *Use of personal protective equipment (PPE)* (ear muffs, respirators, face masks, hard hats/helmets, gloves, aprons and protective eyewear/goggles). PPE limits exposure to the harmful effects of a hazard but only if workers wear and use them correctly. Administrative controls and PPE should only be used when there are no other practical control measures available (as a last resort); as an interim measure until a more effective way of controlling the risk can be used; and to supplement higher level control measures (as a back-up).

5. SIGNIFICANCE OF FIRST AID IN THE CONSTRUCTION SITE

Providing immediate and effective first aid to workers or others who have been injured or become ill at the workplace may reduce the severity of the injury or illness and promote recovery. In some cases it could mean the difference between life and death. First Aid will be necessary in **high risk workplace** where

workers are exposed to hazards that could result in serious injury or illness and would require first aid and the equipment and facilities will have to be made available. Examples of workplaces that may be considered high risk are those in which workers:

- i. use hazardous machinery (for example, mobile plant, chainsaws, power presses and lathes)
- ii. use hazardous substances (for example, chemical manufacture, laboratories, horticulture, petrol stations and food manufacturing)
- iii. are at risk of falls that could result in serious injury (for example, construction and stevedoring)
- iv. carry out hazardous forms of work (for example, working in confined spaces, welding, demolition, electrical work and abrasive blasting)
- v. are exposed to the risk of physical violence (for example, working alone at night, cash handling or having customers who are frequently physically aggressive)
- vi. work in or around extreme heat or cold (for example, foundries and prolonged outdoor work in extreme temperatures).

TABLE 3: INJURIES ASSOCIATED WITH COMMON WORKPLACE HAZARDS THAT MAY REQUIRE FIRST AID

Hazard	Potential harm
Manual tasks	Overexertion can cause muscular strain.
Working at height	Slips, trips and falls can cause fractures, bruises, lacerations, dislocations, concussion.
Electricity	Potential ignition source could cause injuries from fire. Exposure to live electrical wires can cause shock, burns and cardiac arrest.
Machinery & equipment	Being hit by moving vehicles, or being caught by moving parts of machinery can cause fractures, amputation, bruises, lacerations, dislocations.
Hazardous chemicals	Toxic or corrosive chemicals may be inhaled, contact skin or eyes causing poisoning, chemical burns, irritation. Flammable chemicals could result in injuries from fire or explosion.
Extreme temperatures	Hot surfaces and materials can cause burns. Exposure to heat can cause heat stress and fatigue. Exposure to extreme cold can cause hypothermia and frost bite.
Radiation	Welding arc flashes, ionizing radiation and lasers can cause burns
Violence	Behaviours including intimidation and physical assault can cause nausea, shock and physical injuries
Biological	Infection, allergic reactions
Animals	Bites, stings, kicks, scratches

In Low risk workplace where workers are not exposed to hazards that could result in serious injury or illness such as offices, shops or libraries, potential work-related injuries and illnesses requiring first aid would be minor in nature.

The aims and objectives of First Aid are: to save or preserve life; to prevent the condition worsening by preventing further injuries and complications; and to promote recovery. The scopes of First Aid are simply Diagnoses, Treatment and Evacuation. Records of injuries, illnesses, 'near miss' incidents and other information that have already been obtained to assist in controlling risks at the workplace will be useful to make appropriate decisions about first aid.

6. PERSONAL PROTECTIVE EQUIPMENTS (PPE)

These are pieces of equipment and apparels used or worn by a worker to protect him against the hazards existing in his work situation. PPE's do not prevent the accident or remove the hazard, they can only minimize the effect of the hazard on the worker or reduce the severity of the injury resulting from the accident.

7. SAFE LADDERING TECHNIQUES

There are limits to the safe use of ladders and they should not be used for working at heights of 6 meters or more. Work done with ladders should be restricted to light duty work that is performed for short periods of time. For heights above 6 meters, ladders should only be used for access purposes.

7.1 Ladder Placement: Portable ladders must be supported at the base and positioned on a stable surface. Straight and extension ladders should be secured at both the top and bottom to prevent movement. Avoid using ladders in wet or windy conditions, unless control measures account for these conditions. For

soft, uneven or sloping surfaces use a support under the ladder feet for leveling and stability – e.g planks or a proprietary ladder-leveling device. Metal ladders must be fitted with rubber feet, or a similar non-slip material. Do not erect a ladder on a slippery surface as stability depends on friction at the base.

Ladders used near power lines should be non-conducting types, such as timber (without wire reinforcement or with the wire reinforcement recessed and insulated) or reinforced plastic (includes fiberglass), but not metal. Keep metal or wire-reinforced ladders at least three meters clear of power lines (or any electrical conductors). Beware of overhead power lines when putting a ladder into position. Place ladders away from areas where there are hazards such as sharp objects, machinery or chemicals. Other means of access, other than portable ladders, may be required above these hazardous areas. Place ladders away from edges such as balconies and other raised surfaces. When used near traffic areas, ensure that measures are taken to separate the public or other workers from the work activity – i.e. barriers, rerouting of pedestrian ways. Place ladders away from doors that could hit the ladder when opened, or lock or barricade the doors to avoid inadvertent opening.

7.2 Using portable ladders safely:

Portable ladders used for accessing or working within a scaffold should be made of Timber, Aluminum (unless to be used near power lines), or Fiberglass.

The following gives you a general idea for basic safe practices when you are using a ladder:

- make sure the ladder is on a stable base.
- do not move the ladder while standing on top of the ladder – a dangerous practice called 'walking' the ladder.
- slope the ladder from the base at an angle of

- one ladder per person – with at least three limbs on the ladder at all times—both hands and one leg or 1 hand and both legs. Do not climb above the third rung from the top of the ladder.

- use extension ladders that are compliant and following their rules.
- use stepladders only when it is fully opened and on a stable and level surface.
- follow safety requirements when using multipurpose ladders.

TABLE 4: A GUIDE FOR THE MAXIMUM LENGTH OF LADDERS (PREVENTS DETERIORATION OR DAMAGE).

Material	Single	Extension	Step	Trestle*
Metal	9.0m (industrial)	15.0m (industrial)	6.1m (industrial)	5.0m
Reinforced plastic (fiberglass)	5.0 (domestic)	7.0 (domestic)	2.4 (domestic)	5.0m
Timber	9.2m (runged) 4.9m (cleated)	15.3m	5.5m (industrial) 2.4m (domestic) 5.5m (platform)	5.1m

*A wooden or metal structure with 2-pairs of sloping legs - used in pairs to support a flat surface (example, the top of a table), Also, a supporting framework consisting of a horizontal beam held up by a pair of splayed legs at each end.

7.3 Ladder Use

Incidents involving portable ladders frequently occur because the limits on their use and design are exceeded. The base of a leaning (straight or extension) ladder should extend out one meter for every four meters of height – i.e a height to base ratio of 4:1. This minimizes the chance of the ladder falling backwards or the base sliding. It is the best slope for using a ladder. Secure it or tie it off from the stiles (not the rungs) – if it can't be secured, it should be 'footed' by someone holding the stiles or suitable stabilizers to prevent movement. Ensure that the structure the ladder is leaning against is stable and will not break or move away when a person is on the ladder.

8. CONSTRUCTION SAFETY SIGNS

The Health and Safety (Safety Signs and Signals) are required for the provision of

safety at work. This guidance is aimed at helping employers meet their responsibilities. Regulations require employers to use a safety sign where there is a significant risk to health and safety that has not been avoided or controlled by the methods required under other relevant law, provided use of a sign can help reduce the risk. Safety signs are not a substitute for those other methods of controlling risks such as engineering controls and safe systems of work.

Safety is a state of being protected from potential harm or something that has been designed to protect and prevent harm. A safety symbol indicates the presence of information or instructions about health or safety at work by means of a signboard, a colour, an illuminated sign or acoustic signal, a hand signal or a verbal communication. For effectiveness the symbol must communicate the same message as the text on the label or

sign. It should identify the hazard, and either show how the hazard can be avoided or show the consequences of not avoiding the hazard. The objective is to clearly communicate the safety message. This means the symbol should be as simple as possible (have only the essential information), and be easy to recognize and remember. There are basically four classes of safety symbols:

- i. **Prohibition Symbols** - these symbols identify activities that are prohibited. A symbol showing the activity is covered by a circle with a 45-degree slash, like No Flames/No Smoking, Stop, Injury Warning, No Firearms/No Photographs.
- ii. **Hazard Alerting Symbols** - these symbols identify and warn about specific hazards. The symbol is usually printed in black, although in some cases it may be printed in red, like Poisonous Substances, Electrical Safety, Slip/Trip/Fall, Pinch/Cut/Crushing, Hazardous Substances.
- iii. **Mandatory Action Symbols**- these symbols show an action that is mandatory, meaning the action is required. The most common actions shown by these symbols involve wearing PPE (Proper Protective equipment), like Hearing Protection and Dust Mask, Eye Protection, Information Symbols.
- iv. **Safety Information Symbols** - there are two categories of safety information symbols. One category are those symbols that provide fire safety information. These symbols identify the location of firefighting equipment, show pathways to fire exits, identify communication equipment, and provide other information needed by firefighters and paramedics. The second category is for general safety information. These symbols typically identify the location of safety equipment such as eye wash stations, emergency showers and first

aid kits. These include Fire Extinguisher, Fire Alarm, Emergency Equipment, Emergency Shower, Emergency Eye Wash, and First Aid Supplies.

To Whom Does Safety Signs Apply
Employees/ workers, Contractors, Non-employees, Visitors, Neighbors, Passer-by etc...

Using Safety Signs: It is the duty of employers to select, make effective use of, and maintain safety signs. The signs are to be used:

- When it is necessary to convey the relevant message or information.
- If the hearing or sight of any employee is impaired for any reason, for example, by wearing personal protective equipment, additional measures may need to be taken to ensure that employees can see or hear the warning sign or signal.
- In some cases more than one type of safety sign may be necessary, for example, an illuminated warning sign indicating a specific risk combined with an acoustic alarm meaning 'general danger' to alert people, or hand signals combined with verbal instructions.

Maintenance

- All safety signs need to be properly maintained so that they are capable of performing the function for which they are intended. This can range from the routine cleaning of signboards to regular checks of illuminated signs and acoustic signals to see that they work properly.
- A guaranteed supply of power or back-up in the event of failure may be necessary for safety signs and signals which require some form of power to enable them to operate (unless the hazard is itself eliminated by the power failure).

TABLE 5: SAFETY SIGN COLOURS (EXCLUDING FIRE SAFETY SIGNS)

Colour	Meaning or purpose	Instruction and information
Red	Prohibition sign, Danger alarm	Dangerous behaviour; stop; shutdown; emergency cut-out devices, evacuate
Yellow or Amber	Warning sign	Be careful; take precautions; examine
Blue	Mandatory sign	Specific behaviour or action, eg wear protective equipment
Green	Emergency escape First-aid sign	Doors; exits; escape routes; equipment and facilities

9. BUILDING COLLAPSE IN NIGERIA

There has been an increase in the number of building collapses in the country with so many cases recorded. In 2012 alone, Lagos recorded 33 cases of building collapses, while Abuja recorded total of 22 cases; other scattered cases were registered in Portharcourt, Benin, Awka, Enugu, Onitsha in the same year or the following two years. Because of the concern over the phenomenon, NBRRI organized a conference on Building Collapse in 2012 and a number of short-term, medium-term and long-term measures were designed. In 2013, Building collapse cases reduced to 17 in Lagos and NIL in Abuja while from 2014 to 2016, Building collapse cases reduced to single digits in the country, often as low as 5 cases. However in 2017, the figures of collapsed buildings are expected to rise to over ten(10) from the cases reported and still being compiled by the Institute, NBRRI. Of concern, have been a few cases like:

9.1 The Synagogue Building Collapse (12th September 2014): The worst building collapse in the country at that time occurred in a crowded six-storey guest house belonging to the Synagogue Church of All Nations trapping about 300 people. The death toll stood at 116 with over 100 others injured.

9.2 Lekki Building Collapse (8th March

2016): A 5-storey building under construction at Lekki Gardens Horizon 1, in the Lekki Phase 1 area of Lagos collapsed, killing no fewer than 34 persons and injuring several others. Most of those killed were workers

9.3 Jos School Building Collapse (September 2014): On a Sunday evening in September 2013, Abu Naima Primary and Secondary School in Bukuru, Jos South Local Government Area collapsed. Ten of about 30 pupils, who were said to be mostly below 10 years old, were killed when the two-storey school building collapsed. The building was originally a bungalow before it was converted to a two-storey building. It’s foundation could not support the weight in the end and poor concreting and no structural design.

9.4 Another Building Collapse in Ebute Meta (July 2013): A three-story building, which had been marked for demolition a year earlier, collapsed killing seven people.

9.5 Construction goes wrong in Umuahia (May 2013): A building under construction in the Agbama area of Umuahia, Abia State collapsed killing up to 7 people dead.

9.6 Reigners Bible Church along Uyo Village Road, Uyo (10th December, 2016): More than 27 persons died and over 37 wounded.

Building collapse discussion has always formed the topic of entire conference discussions but historically, it is an old problem that needs to be tackled until there is zero tolerance for building collapse. There have been major building collapses in Nigeria from as far back as the 1970s. For instance, 27 people had lost their lives in October 1974 when a multi-storey building under construction in Mokola, Ibadan, collapsed. 3 years later, in August 1977, 28 people were killed when a residential building in Barnawa Housing Estate, Kaduna, collapsed. In June 1990, between 50 and 55 people lost their lives when a 3-storey building collapsed in Port Harcourt. Probably when construction sites observe Health and safety Regulations on Site, we can begin to breath a sigh of relief that sanity is returning to the citizenry and to construction and even the human problems that give rise to collapse of structures would have been addressed.

10. CONCLUSION AND RECOMMENDATIONS

Overall, the experience of the Nigerian Building and Road Research Institute, NBRRI, on construction projects and through R&D activity reveals, through poor performance in the industry, that health and safety is **seldom** considered important in construction or in contractor selection process in **procurement** due to poor awareness level. There are tool problems, psychological factors, health problems, workmanship and material standard factors, contingencies and corporate code of health and safety management improprieties and short-comings causing occupational hazards in the construction work place. Furthermore, the awareness level of the industry is very poor leading to

a large percentage (up to 5%) of construction work force being lost annually due to death and permanent injuries suffered on site. Regrettably, this has led to declining interest in the industry and continuous scathing and embarrassing criticism of the technical quality of its practitioners. This has sadly led to tremendous lose of critical manpower leading to unacceptable Skills Gaps in the Artisan and Craftsman levels in Nigeria and accompanying lose of critical resources due to capital flight to the rest of the world and especially neighboring west African countries. It is thereby recommended that.

- i. Standards for Materials in the country should be enshrined in all current forms of materials and labour specifications to clearly spell out risks and hazards associated with their use and application, as peculiar to the industry – even when they are closely relate to those in other countries. NBRRI, SON, Professional bodies and construction multinationals should be required to research into this and create standard reference Literature/ Analysis.
- ii. There should be special focus on training for all categories of industry participants by all professional bodies and at industry levels. Training and re-training of Artisans and Craftsmen should be mandatory and accelerated.
- iii. Safety should be integrated into the procurement processes of contractor selection and other procurement laws. Contractors should not bid if adequate measures or commitment to Health and Safety of construction are not provided. Clients should be avoided if they are not committed too.
- iv. Workers’ motivation should be proactively looked incorporated into Site processes and decisions to correct the apparent ignorance that is beginning to take the nature of a cultural misalignment setting, making the country look like one of nonchalant people.

NBRRI HOLDS SECOND DACUM WORKSHOP



Sequel to the successful launching of the 10 Curricula and Learning Guides for Artisans/Craftsmen in construction trades by NBRRI in 2017 and the official commissioning of the NBRRI Artisans Training Academy in Ikoyi, Lagos state, the Institute has continued with the task of developing yet another set of learning guides with emphasis on road construction trades.

In line with this, the Institute organized the 2nd Occupational Analysis workshop for the development of Curricula for Nigerian

Artisans and Craftsmen in the Construction trades at the Top Rank Hotel, Abuja from the 7th to the 9th of November, 2017.

Speaking at the opening, the Director General and Chief Executive Officer of the Institute, Prof. Danladi Matawal said there is a proposed strategic plan by the Federal Ministry of Education which has been forwarded to the Federal Government and the Federal Ministry of Science and Technology to identify the problems of the construction sector. One of these is the shortage of

Artisans in the construction industry which has led to phenomenal loss of resources and capital flight. The workshop is therefore a measure by the Federal Ministry of Science and Technology through NBRRI to curb this menace. He added that the initial curricula was for 10No Trades principally in Building disciplines and there was the need to embark on another 10No Trades covering rolling and Compaction and Asphaltic works in road construction as well as Laboratory processes, thus the need for the current stage.

The Institute according to him has taken various steps in order to commence this application and ready to achieve these training skills. He revealed that the first step was the training of 127 artisans in alternative construction techniques in Lagos.

Matawal said, there is a budgetary provision in the year 2018/19 for centres across the country to take off on these trainings, and it is expected to be self-sustaining by generating its cost and requirements. The aim of this project according to the DG is to ascertain and monitor how NBRRI can successfully replicate these training all over the country as a measure to address the incompetencies by artisans.

Professor Matawal therefore enjoined participants to work assiduously and professionally towards achieving a technically vibrant programme. He noted that the tread gap in roads is in a highly distressed situation as compared to building. Matawal assured that the workshop and its outcome is not just a theoretical exercise, as there is the need to give relevance by the training of artisans.

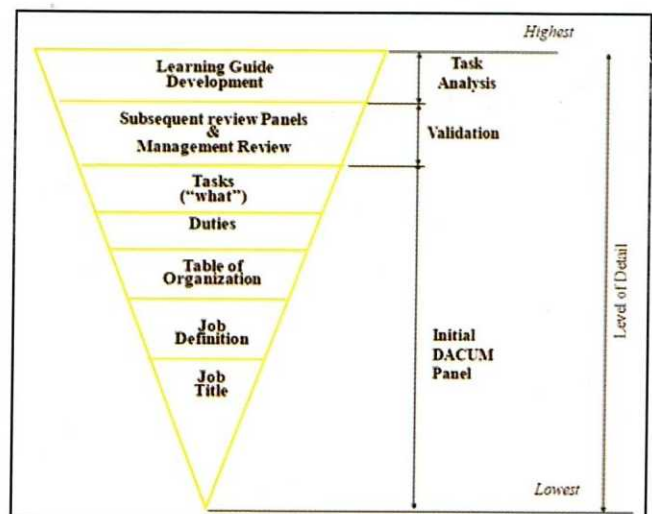
Preparatory to the second phase, a meeting with the National Association of Engineering Craftsmen was convened to give a brief on plans by the Institute to develop curriculum

and learning guides for a new set of trades, with emphasis on road construction.

Thereafter, there was an in-house refresher course which was organised in conjunction with the Develop A Curriculum (DACUM) consultant, Engr. J. O. Falade where old and new Staff of the Institute's Research department were trained on the DACUM Process facilitation as facilitators as well as the essentials of curriculum and learning guide development.

References were made from experience gained from the first set of curriculum and learning guides developed. Thereafter, the preparatory activity for the second phase, an occupational analysis workshop was organised.

At the workshop, small groups of experts were placed together with trained facilitators to elicit the duties and tasks required to deliver jobs in the trade, tools, behaviour expected of artisans and the future trends and concerns. The DACUM process is succinctly captured in the occupational analysis inverted pyramid shown below:



At the end of the workshop, the DACUM research charts for each of the trades were developed. There were no significant variations in the nomenclature of the job title as shown in the table below

S/No	PROPOSED JOB TITLE	DACUM JOB TITLE
1	Construction plant operators	Construction Plant Operators
2	Bitumen and asphalt works	Bitumen and Asphaltic Works
3	Laboratory assistant in soil, concrete and asphalt	Laboratory Assistant in Soil, Concrete and Asphalt
4	Concrete works	Concrete Works
5	Sheet metal works	Sheet Metal Works
6	Structural steel and Iron mongering	Structural Steel and Iron Mongering
7	ICT in Construction	ICT in Construction
8	Technical Measurement	Technical Measurement
9	Road maintenance	Road Maintenance
10	Waste water disposal system and maintenance	Waste Water Disposal System and Maintenance

According to the DACUM process, the next stage is the verification process with the 10 developed DACUM research charts. This process requires that the Institute send out the DACUM research charts developed, for verification by other professionals preferably those that have performed the tasks or supervised them before.

It would be recalled that Trades for which curriculum learning guides were earlier developed includes: Plumbing, Painting and Decoration, Electrical services installation and maintenance, Tiling and paving stone works, Masonry, Concreting, Iron bending, Carpentry, Draughting and detailing and Construction Safety.





Plate 1 Slum Study Team and Staff of Ministry of Lands, Survey and Town Planning Plateau State

APPRAISING URBAN RENEWAL PROJECTS IN NIGERIA: CASE STUDIES OF SELECTED METROPOLISES IN NIGERIA'S GEOPOLITICAL ZONES.

Surajo, L.A, Arc. Maton, D.J., Kigun, P. A., Buba, A.Y., Danjuma, A.G., Longtau, P., Makwin, G., Dr. Sule, J., Nyadar, B. and Amos-Audu, J.

There are claims by some state governments that they have executed various types of slum upgrade/Urban renewal projects in their respective states. However, a lot of questions are raised as to how sustainable are the programmes/initiatives; are the beneficiaries of such projects involved in selecting and implementation of the projects; what are the challenges encountered in the course of executing these programmes?

Therefore the study intends to identify slum settlements and appraise slum upgrade/Renewal programmes/initiatives adopted by various authorities in the selected case studies with a view to identifying sustainable approaches to urban renewal and slum upgrade programmes/initiatives in Nigeria.

The research is adopting case study approach. It is also premised on the cultural influences on settlements development. This implies that communities that have homogenous norms and values tend to accept programmes/initiatives adopted by their neighbouring societies, whereas they reject programmes/initiatives that are

imported from other places which they view as foreign. Hence the research team selects a prominent metropolis (city) in each of the six geopolitical zones of the country to serve as a case study so that the outcomes from the selected metropolises (Cities) can be easily adopted by the rest parts of the zones.

The expected outcomes, ultimately, will be a collection of slum upgrade programmes/initiatives that are sustainable and which can be replicated in relation to peculiarities of challenges to be found in each case study area.

This research work began with a reconnaissance study on Jos the Plateau State capital (North Central Nigeria) being first among the selected metropolises that the study intends to cover.

The main purpose of this preliminary study was to establish contacts with relevant authorities identify location of slum upgrade/urban renewal areas and have audience with a section of key stakeholders with a view to generating the appropriate instruments and tools for the study proper.

CHARACTERIZATION OF RICE HUSK ASH FROM SELECTED STATES IN NIGERIA

Makwin, H.L., Abdulmumin, M. M., Ojo, E. B., Yola, A.M. and Machibi, J.T.

The development and sustainability of affordable housing in Nigeria necessitated the optimization of emerging low cost construction materials, these materials are basically obtained from polycondensation of various waste materials with the potential of improving the durability and high performance of a system. Therefore, the conversion of waste to wealth could not only play a very significant role in the development of low cost construction materials but also address environmental issues, the environmental concern arising from the disposal of Rice husk (RH) is the main interest revolving around research community. Research findings have shown that calcination of RH gives rise to Rice Husk Ash (RHA), the RHA has high amount of Silicon Oxide (SiO₂) which could be

nano-sized and used for wide range of applications in the built environment. RHA was characterized to determine the SiO₂ variation.

The RH were sourced from selected states in Nigeria; (Fursa, Kano; Bida, Niger; Makudi, Benue; Kebbi and Miva Ash in Makudi). Rice husk calcined at 400, 650 and 850 oC for 120 minutes was tested for X-ray refraction (XRF), and X-ray diffraction (XRD) analysis. From the XRF and XRD analysis results, high SiO₂ were present in all the samples collected but varies with calcinations temperature. At 400 oC Fursa, Kano recorded the highest SiO₂ content of 96.4 %, the XRD analysis confirmed 400oC as the optimum calcinations parameters for obtaining high reactive RHA.

ASSESSING THE POTENTIAL OF SELECTED KAOLIN FOR THE SYNTHESIS OF METAKAOLIN BASED GEOPOLYMER

Yola, A.M., Abdulmumin, M.M., Ojo, E.B, Makwin, H.L. and Waziri, F.

This study is aimed at assessing the potential of selected kaolin within Nigeria for the synthesis of metakaolin based geopolymer. Four different kaolin samples were sourced from three locations; (Bokkos, Barikin Ladi and Bauchi) and characterized to determine their physical properties, elemental composition and mineralogy. Geopolymer paste was produced by activating the metakaolin with alkaline solution comprising of Sodium hydroxide (NaOH) and Sodium silicate (Na₂So₃) at varying alkaline ratios; 0.20, 0.25, 0.30 and 0.35 at a constant Molarity (8M) of NaOH solution. Bokkos white metakaoline was prepared and cast using mould size 10cm x10cm x 0.15cm and cured in an oven for

60oC at varying duration; 1, 2 and 3 days. The results show that the kaolin samples possess the requisite alumina and silica composition for geopolymer reaction. At optimum reaction condition of 8M and alkaline ratio of 0.25, Bokkos white metakaolin resulted in a stable geopolymer. However, it was observed that extended curing of samples resulted in an average percentage reduction in compressive strength by 2.84%.

It was concluded that the development of metakaoline based geopolymer has demonstrates the potential of utilization of locally sourced materials in the development of novel construction materials.

ROAD NETWORK MAP OF NIGERIA USING GIS APPROACH,

A CASE STUDY OF ABUJA

Amos-Audu, J., Longtau, P., Kigun, P. A., Buba, A.Y., Majidadi, S.T., Makwin, G. and Nyadar, B.,

The updating of road network databases is crucial to many Geographic Information System (GIS) applications such as navigation, urban planning. Abuja is a town where daily one form of road construction or diversion is taking place and new street names assigned to those roads.

This proposal seeks to presents a comprehensive framework for image-based updating of the database for road network in Abuja, in which the following three tasks are to be performed sequentially: road extraction from imagery, road change detection and

updating, a map conflation step is then used to create an updated road network map in which the attributes will be transferred from the existing map to the new map based on the conjugate features resulting from the feature matching step which will be applied to determine the changed and unchanged portions of the road network. Finally GIS approach will be employed by using ArcGIS 10.4 to produce an updated map showing road network changes and a comprehensive database of Abuja. This will help for further planning, decision making and development of Abuja.

MODIFICATION OF EXISTING NBRRI SYSTEM DESIGN TO REDUCE MATERIAL WASTE AND HEAT LOSS: A CASE STUDY OF SOLAR COLLECTORS

Abu, A.S.P., Cinfwat, K.Z., Abdulmumin, M.M., Nden, T., and Siyanbola, I.

This study aims to develop a sustainable means of generating thermal energy for domestic application. In order to reduce energy consumption and enhance energy efficiency in building, this study improves the previous system schematics through the design, fabrication and performance evaluation of solar flat plate collector. Challenges observed in the previous study include heat loss through the backside, material waste during fabrication and inefficient measuring mechanism during testing phase; these

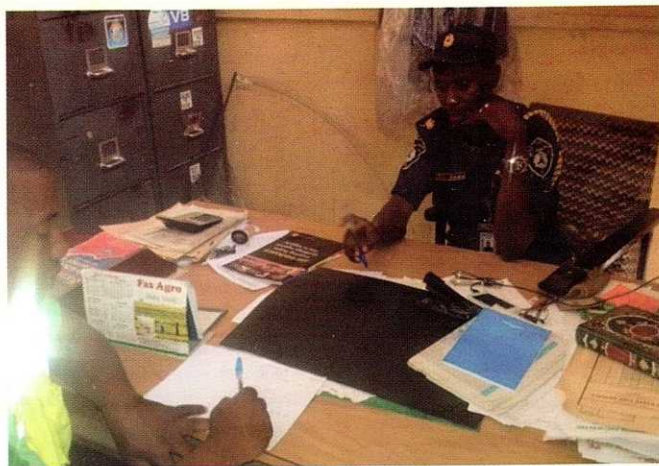
challenges will be mitigated through optimized system design integrated with microcontroller for monitoring & recording data and improved material selection to eliminate material waste in line with local content. The unique feature of the expected system is its' ability to work both as an active and passive system while eliminating the trial and error method typically employed in the fabrication of solar technology thus reducing cost associated with errors in improving higher energy gain.

AN ASSESSMENT OF FIRE SAFETY MANAGEMENT (FSM) IN NIGERIAN MARKETS.

Longtau, P., Arc. Maton, D.J., Majidadi, T.S., Abu, A.S.P., Emeson, S., Moses-Audu, J. and Nden, T.

Fire outbreak in different parts of Nigeria has indeed assumed an alarming rate, schools, public/government, petrol stations, shops, market buildings etc., have been ravaged by fire. Pertinent to note is the increasing number of lives lost in the outbreak. Over 60 markets have been visited by fire in Nigeria between 2010 and 2016. The National Association of Nigerian Traders (NANTS) has decried the incessant market fire across the country which it says has led to the loss of over ₦5.3 Trillion between May 1999 and March 2016. While traders lament that activities of relevant fire-fighting institutions fall below par in their mandate of fire safety management, fire-fighting institutions are of the opinion that traders and market managers have failed to comply with fire safety measures. It is against this backdrop that this study

seeks to assess fire safety management in Nigerian market: challenges faced by both traders and market management, and also evaluating the roles of relevant stakeholders in matters concerning fire safety and its management. A survey will be taken to markets in one states each of the six (6) geopolitical zones to, appraise the designs adopted in the planning of markets, assess the types of materials used in the construction of these markets, determine the level of fire safety knowledge of the traders in the markets, determine the level of compliance with fire safety measures by both the traders and management of the markets as stipulated in the Nigeria Fire Safety Code, evaluate the roles played by the relevant institutions in the management of market fires in Nigeria and examine problems which militate against effective management of market fires in Nigeria.



EFFECTIVE PUBLIC RELATIONS

Public Relations (PR) can be defined as “the methods and activities employed to establish and promote a favorable relationship with the public.” One can also say that Public Relations deals with bridging the communication gap, marketing and presenting the image of an establishment to the public.

It is necessary to note that Public relations represent the most daunting communication tool in a company’s marketing arsenal. PR is never just limited to publicity. Its process and benefits is complex and, when used correctly, the results are compelling.

PR is about building relationships. It’s how an establishment interacts with staff, clients and the general public. PR defines how the establishment is perceived. PR is meant to put the organization in direct contact with its target audience through public appearances, publicity and community outreach.

Publicity, an important element of PR, is the art of building favourable interest in your product/service through the media.

All PR personnel need to put in mind that an organization’s most valuable asset is its reputation. This makes public relations (PR), the marketing discipline which looks after it.

The weapons in PR armoury include persuasive copy writing, results-driven media relations, engaging social media, successful award bid writing and proven experience in the research and development of effective internal communications strategies. Understanding is the foundation of effective PR. Campaigns are built on insight, research and detailed planning. Knowing what is newsworthy, having an eye for a good story, being able to write succinct, compelling copy, picking the right image and understanding how to pitch ideas to journalists are the PR skills needed to draw upon to deliver effective media relations campaigns. By understanding what you want to say to whom and why helps the PR Officer find the right newspapers, magazines, programmes, websites and blogs to deliver his/her message.

When things go wrong, reputations can be damaged if the situation is handled badly yet, in contrast, if things are handled well, good reputations can be preserved and even enhanced. Effective planning is the key to success in crisis PR management which includes anticipating problems, being prepared and having clear lines of communication.

PRINCIPLES OF EFFECTIVE PUBLIC RELATIONS

Here are 10 public relations principles every PR practitioner should consider as they go through the process of assembling an effective plan.

1. Know Your Audience: Establish a foundation that’s grounded in insights. Do your research and ensure that whatever products or services you support, actually fulfill a customer need. Will your customers be satisfied with what they’re being offered? If not, voice those concerns internally. Many times PR practitioners can provide an ear closest to the customer, given their access to what press and analysts are hearing from end users. Use that knowledge to support the development of offerings that will truly delight the marketplace. The Better You Know Your Customer, the Better You Can Position Your Brand.

2. Be a Patient Storyteller: Many times brands and businesses get anxious and want to tell their story “right now.” Whether it’s the perception of momentum competitors may have or the need to “be a part of the discussion,” you can do more harm than good if you go out with a plan that’s half-baked. Take your time and don’t succumb to the pressure of “doing something.” Tell the right story, at the right time, to the right people.

3. Focus on Outcomes over Activities: What are the headlines, perceptions, and actions you want to see delivered through your plan? What do you want readers to see/hear/feel/do? Try and align to a long term plan and work towards creating a set of desired outcomes and key moments in time that create waves over ripples. The alternative, doing a bunch of activities that are not aligned to a broader strategy, isn’t the best use of your resources.

4. Know the Difference between Stories and News: There is a difference between stories and news. Stories have a cascading effect and maintain the necessary elements for driving reader engagement. Great stories are shared. News announcements are fleeting, and at their worst, inconsistent over time. Press do their homework and it’s very easy for them to dismiss “another press release” as noise, versus something of substance that they need to take an interest in, following and sharing with their readers.

5. Go beyond the Echo Chamber: Focus your attention outside of the walls of your business. If you spend too much of your time “drinking the Kool-Aid,” you’re going to miss an opportunity to understand broader market sentiment. Don’t dismiss what competitors do. Take an interest in learning and reading about others. What do they do well? Where can you differentiate? By knowing as much as you can about the broader environment,

the more well-rounded and precise your plan will be.

6. Be Humble: Focus on your products, partners and customers. Worry about what you are doing that makes you great. Be proud, but don't be boastful. Utilize partners and customers to tell your story. In fact, all of the messaging you create should be supported by a third party advocate who is willing to engage proactively with press on your behalf.

7. Under Promise and Over Deliver: It's okay to talk about vision and how you see the world, but be very clear on what you intend to deliver and when. If you stick to this commitment the more likely you never bend to say something that isn't accurate.

8. Have a Call to Action: Think about the actions you want people to take so you can maintain a relationship. This can come in the form of a pointer that brings the reader back to you. Once you have someone's attention, how will you keep them engaged? This is crucial.

9. Public Relations is not an Island: PR is far more than a vehicle that creates awareness at the end of a product cycle. Great PR teams are woven into the fabric of the business from day one. The team should be integrated into the long-term plans of the organization to ensure product and PR plans stay aligned. Spend a good amount of time with others (e.g. engineering and design). Some of the best stories will come from those closest to the product.

10. Require the Requirements: Every plan must meet a set of requirements (data, partners, launch dates etc.). If the requirements aren't met, that becomes your ultimate "go/no go" filter. PR practitioners often find themselves in a position where they are the ones to decide how, when and where a news announcement takes place. Your requirements become your rules of engagement, giving you the confidence you need to know your plan is sound.

COMMON PR TOOLS AND TECHNIQUES

In order to build a relationship with the target audience and maintain it on a high level, PR specialists use a variety of tools and techniques. Some of the most common ones include:

- Attendance at public events. In order to attract public attention and keep it engaged with a particular organization or an individual, PR specialists take an advantage of every public event and the opportunity to speak publicly. This enables them to directly reach the public attending the event and indirectly, a much larger audience.
- Press releases. Information that is communicated as a part of the regular TV or/and radio programme, newspapers, magazines and other types of mainstream media achieves a much bigger impact than advertisements. This is due to the fact that most people consider such information more trustworthy and meaningful

than adverts. Press release is therefore one of the oldest and most effective PR tools.

Newsletters. Sending newsletters – relevant information about the organization or/and its products/services - directly to the target audience is also a common method to create and maintain a strong relationship with the public. Newsletters offering promotional products are also a common marketing strategy but PR specialists use it to share news and general information that may be of interest to the target audience rather than merely promoting products/services.

Blogging. To reach the online audience, PR specialists use the digital forms of press releases and newsletters but they also use a variety of other tools such as blogging and recently, microblogging. It allows them to create and maintain a relationship with the target audience as well as establish a two-way communication.

Social media marketing. Like its name suggests, it is used primarily by the marketing industry. Social media networks, however, are also utilized by a growing number of PR specialists to establish a direct communication with the public, consumers, investors and other target groups

As an industry that's consistently evolving, public relations have become a staple for creating and maintaining a successful brand. Basic tools like press releases and pitching are no longer the only PR tools that assist in getting your brand recognized and talked about. With PR trends growing to include digital marketing techniques like social media and online video, incorporating a suite of these key public relations tactics is what will keep your news and your brand fresh and relevant.

Finally, for effective PR, the PR practitioner should note the following: 1. Tell your story with more than just words by using both pictures, videos where necessary.

Develop connections with influencers with the use of influencer marketing, users with a large social following have the power to motivate the thoughts of their audience with a simple Tweet, Facebook post or Instagram post mentioning and endorsing your product.

3. Contribute to outside sources similar to influencer marketing, contributor marketing puts you in the center of a publication or website with the use of original contributed content, most commonly articles. When you contribute to a website or news outlet, you get your name out to the public by discussing industry-related topics.

4. Keep the creative content flowing such as articles, videos or even info-graphics grab viewers' attention more than standard text.

Compiled by:

Oneshi Umoche (Senior Information Officer)

Makava Richard (Information Officer II)

SOCIAL DIARY

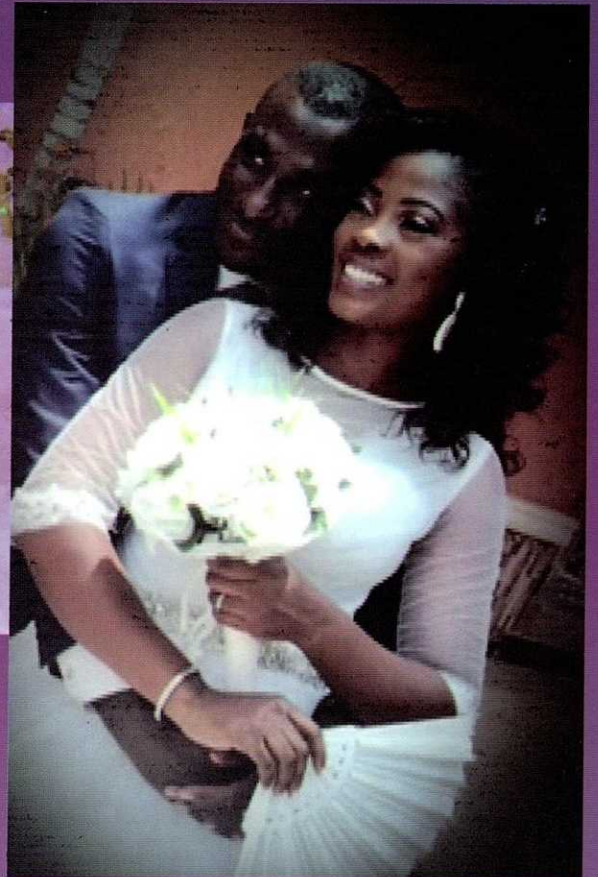
BIRTHDAYS

NAME	DEPT.	DATE OF BIRTH
Okon Daniel M.	RRD	1st October
Davies I.	A/F	3rd October
Aqbo Sunday	A/F	5th October
Ogala O. Mike	BRD	6th October
Olotu Garba Mohammed	DGs Office	7th October
Mlanga Victor	RRD	9th October
Tejumade Olufemi O.	A/P	9th October
Gidado M Tukur	CES	10th October
Gwiwanyi Sunday G	RRD	10th October
Obande Peter Obande	P/M	10th October
Adeyemi O.A	BRD	10th October
Subair Olakunle W	EMRD	10th October
Alabi Folasade Felicia	A/P	11th October
Ayitogo A Abdulkadir	PIT	11th October
Bakoji Adamu		11th October
Makwin Gillian Unapas	BRD Abuja	11th October
Adeyemi Aliu D.	BRD	12th October
AbubakarTahir		15th October
Ajayi Olumide	A/P	16th October
Ndibe Miracle	A/F	17th October
Mozea M.N	BRD	18th October
Obiora Frank I.	RRD	21st October
Ikani Adah	BRD	21st October
George Gondo	RRD	25th October
Danladi S. Matawal	DGs OFFICE	30th October
Aikpehae Itua I.	A/F	31st October
Afolabi Ajibola	A/F	1st November
Felix Onwa E.	PPM	1st November
Olotu Mohammed	PIT	2nd November
Fowobaje F.M	A/F	4th November
Akor Ojochide Innocent	A/F	7th November
Peter Mashem	PIT	11th November
Yahaya Sheshi Mohammed		12th November
Jaiyeola Sunday K.	CES	13th November
Nuhu Suleman	PITD	15th November
Inyang Enin Ata	BRD	15th November
Chukwuma Chigo	A/F	15th November
Aderokku G. Akinpelu	A/F	16th November
Egbunike Grace E.	A/F	16th November
Ojeka Gladys	BRD	18th November
Joe -Abaya Justina A.	RRD	19th November
Umoche Thomas	CES	19th November
Alabi Vincent Oio	A/F	20th November
Ameh Ikoyi Gloria	Proc	20th November
Nwafor Christiana O.	SLT	21st November
Olatoye Temitope .T	A/F	22nd November
Francis I.K	EMRD	25th November
Aisha SamailaYakubu	DGs Office	26th November
Sule Amos Dow	A/P	28th November
Ahmed B. Sanni	BRD	28th November
Afaha Philip Loveth	CES	29th November
Abe Taiwo	CES	30th November
Nden Timnan	BRD	1st December
Ezirim Sunny Okwuchi	CES	2nd December
Bldr. Nwaigwe Daniel N.	BRD	3rd December
Akims Ufoh. A	A/F	6th December
Engr. R.B Lawal	EMRD	6th December
Danyiwo .O.F	A/F	9th December
Sanda Abdullahi Usara	BRD	10th December
Asala Joseph	PIT	12th December
Danyiwo Muraino Adekunle	A/P	12th December
Egila James Monday		13th December
Apeh Enebi Solomon	EMRD	14th December
Ekandem E.S	BRD	16th December
Asuquo E. Asuquo	SLT	18th December
Ojo Soji Olaleye	A/F	19th December
Akanya Cinwonsoko	BRD	19th December
Dika Sunday Musa	A/F	20th December
Duru Chuks C.	BRD	22nd December
Nataala M. Usman	BRD	22nd December
Ajayi A.A	RRD	22nd December
Hassan Yusuf	CES	24th December
Obidiozor Anthony	PIT	27th December
Osei Regina Ime	A/F	28th December
Sule Emmanuel	RRD	30th December
Enebi Stephen	EMRD	30th December
Domi Ali	A/F	30th December
Stephen Joseph	A/P	30th December
Monday Eyojo	A/F	31st December
Sulaiman Oladimeji	PITD	31st December

WEDDINGS



Mr. Birmah Nyadar of Building Research Dept married former Miss Adama Bulama S. on April 22nd, 2017 in Abuja



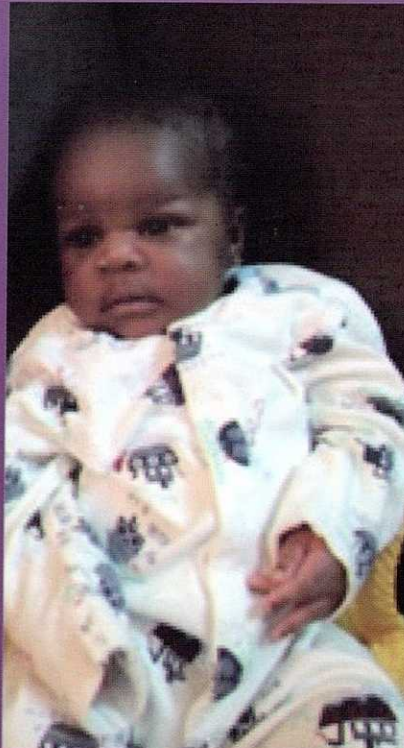
Mr. Agwu Abu of Building Research Dept married former Miss Yetunde Ojo on April 1st, 2017 in Abuja

BIRTHS

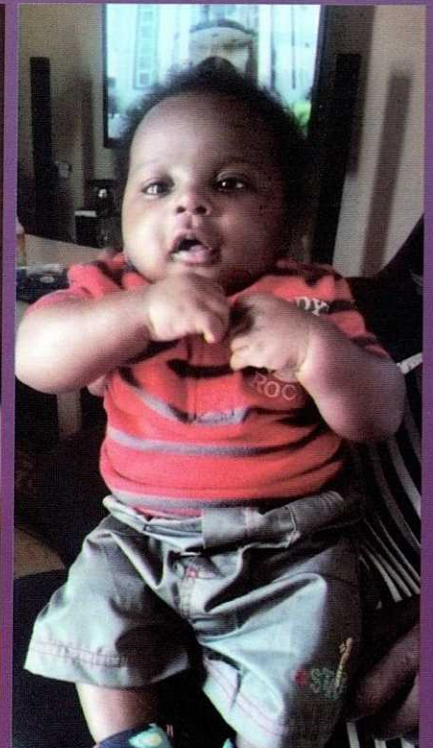


Joshua Enechojo Ajodo born on 20/10/17 to the family of Ajodo Godspower of Admin. Dept

Master Joshua Enechojo born on 20/10/17 to the family of Mr. Godspower Ajodo of Admin Dept, Abuja.



Oshione Emmanuella Kamsiyochukwu Makava, born on 21/12/17 to the family of Mr. Richard Makava of PIT Dept Abuja



Bwehdat Bright Makwin was born on 12th December, 2017 to the family of Heiman Makwin of Research Unit, Abuja



NBRRI

NIGERIAN BUILDING & ROAD RESEARCH INSTITUTE, NBRRI
(Federal Ministry of Science and Technology, FMST)

2018 NBRRI INTERNATIONAL CONFERENCE SERIES

THEME: **SUSTAINABLE DEVELOPMENT GOALS (SDGs) AND THE NIGERIAN CONSTRUCTION INDUSTRY - CHALLENGES AND THE WAY FORWARD**

CALL FOR PAPER ABSTRACTS

Date: 12-14 JUNE 2018

The Nigerian construction industry is greatly influenced by hydra-headed issues which include the extraction, processing & utilization of material resources; labour and finance issues; policy-related factors; greenhouse emissions; R&D; quality assurance: safety, etc. Sustainability of these construction activities and quality infrastructure delivery are very key not only to having a vibrant construction environment but also to complement quality delivery of Sustainable Development Goals (SDGs) that are related to construction, shelter, roads, transportation and quality life of citizens. There is therefore a need for the industry to begin to rethink and adopt a more sustainable approach to the design, planning, construction, building use, maintenance, renovation and demolition of structures.

In line with this, the 2018 International Conference with focus on achieving the Sustainable Development Goals using the Nigerian Construction Industry as a Tool is timely and apt to address critical issues and challenges in the Industry. Impactful plenary sessions and panel discussions will review issues related to the impact of the current construction materials/methods on the environment and proffer actionable framework for the Nigerian construction industry and implementation of SDGs in the Construction industry.

SUB-THEMES

1 ENVIRONMENTAL SUSTAINABILITY AND THE BUILT ENVIRONMENT:

- Impact of construction and transportation practices on the environment
- Development of resilient designs and remedies
- Innovative construction for enhanced sustainability
- Urban infrastructure challenges and remedies
- Impact of Nigeria's Construction terrain on Sustainable Development Goals programme

2 POLICY, ETHICS AND STANDARDS

- Quality assurance and control in construction
- Ethics, codes and standards of quality practice
- Inclusive sustainable construction-related policy thrust for Nigeria.

3 R&D INCLUDING GREEN CONSTRUCTION SOLUTIONS

- Application of emerging and innovative materials and methodologies
- Engineering properties and standardization of renewable materials and technologies
- Development and application of quality road, building and transport-related techniques

4 COMMUNITY DRIVEN AND HEAVY CONSTRUCTION TECHNOLOGIES

- Community-driven building construction technology
- Construction Technologies for labour-based access/feeder roads
- Advances in State-of-the-art heavy construction technology

5 DISASTER RESILIENT CONSTRUCTION METHODS

- Development of resilient cities through robust construction materials
- Novel technologies in disaster (flood, fire, etc.) prone areas

6 ARCHITECTURE AND MODULAR CONSTRUCTION TECHNOLOGIES FOR ACCELERATED HOUSING DELIVERY

- Modular construction materials and technologies for provision of temporary and permanent housing and road infrastructure
- Application of Modular construction technology for provision of shelter for internally displaced persons (IDPs)

Guidelines for the Submission of Abstracts and Papers

Papers on any of the Conference thematic areas are hereby invited. Each paper, which will be reviewed, should not be more than 12 pages, 1.5 lines spacing in MS Word, Times New Roman 12 font size with APA referencing style. It should include Abstracts of not more than 300 words with paper title (16pt font size), name(s) of the author(s), affiliations and contact details. Submissions should be based on a study, research or documented experience relating to the topic of the Conference

ACTIVITIES

- Submission of Papers
- Notification of Paper Acceptance

DEADLINES

- 14th April, 2018
- 28th April, 2018

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