NEWSLETTER DRAFT

EDITORIAL

Shelter is one of the critical and basic needs of human beings. The quest for decent homes coupled with the dearth for funds, inadequate housing stock, high population and peculiar culture of Nigerians, etc. have led to huge, though estimated, housing deficit of about 17million units. In spite of several interventions in the past by Governments and Stakeholders, the housing availability and affordability challenge has remained a hydra-headed headache for all shades of stakeholders in the Built Environment. This scenario informed the Nigerian Building and Road Research Institute (NBRRI) to beam its focus of the 2014 edition of its Annual Conference on housing-related issues. Consequently, the Conference tagged *INTERNATIONAL HOUSING SUMMIT 2014* was held between the 2nd and 4th of June 2014 at the Yaradua Centre in Abuja. *NBRRI Newsletter* was on hand and followed up on the events of the well-attended and highly technical Conference. The highlights of the events and in particular the summary of technical Papers presented as well as the Communiqué issued at the Conference are featured in this edition.

NBRRI has had a standing collaboration with its counterpart in Ghana, the Building and Road Research Institute (CSIR-BRRI) located in Kumasi Ghana. One of the joint collaborative efforts yielded dividend with the publication of the maiden technical *West African Journal of Building and Road Research (WAJBBR)* designed to service the Built environment in the West African sub-region in particular and African in general. The maiden edition of the Journal was launched during the Opening Ceremony of the Housing Summit. The highlights of this launch are presented in this edition of *NBRRI Newsletter*.

Included in this well-packaged edition are excerpts of an Interview with Professor Danladi Matawal, the erstwhile Director-General of NBRRI. As a critical stakeholder in the Built environment, the DG-NBRRI in this no-holds-bar interview, gave his take and candid views on the lingering and trending debate on cement quality in Nigeria, with respect to the 32.5 and 42.5 grades. This interview, which also addressed what the Institute has been doing towards ensuring that cement factories meet specifications and global best practices, is an interesting read.

In another interview, the President of the Council for the Regulation of Engineering in Nigeria (COREN), Engr. Ali gave an overview of some of the recent activities of and actions taken by COREN in regulating the engineering practice in the Nigerian Built environment. The Interview is as interesting as it s informative.

In keeping with its tradition, *NBRRI Newsletter* has packaged a series of important events and activities, laced with spices and presented in a manner that makes this edition an interesting read. You are invited to take a trip with us through this edition of *NBRRI Newsletter*……

Editor-in-Chief

Published by Nigerian Building and Road Research Institute (NBRRI)

HOUSING SUMMIT EDITION

NBRRI ORGANISES INTERNATIONAL HOUSING SUMMIT

A view of the rostrum during the 2014 International Housing Summit organised by NBRRI

As part of its resolve since 2011 to host yearly Conference on topical issues in the Built Environment, the Nigerian Building and Road Research Institute (NBRRI), in collaboration with key stakeholders in the construction industry, held a 3-day International Conference tagged **HOUSING SUMMIT 2014.** The theme for this year's well-attended Conference, which was held between 2nd and 4th June, 2014 at the Shehu Musa Yaradua Centre in Abuja Nigeria, was "**Achieving Affordable Housing in Nigeria".** Apart from the Lead paper presented by the Prof. D S Matawal, the DG/CEO of NBRRI, twenty-three highly technical and relevant papers were presented under the following five sub-themes:

- Sub-Theme: Housing Finance and Mortgage
- Sub-Theme 2: Housing Availability and Affordability
- Sub-Theme 3: Housing Delivery Models and Framework
- Sub-Theme 4: Building Materials and Technology
- Sub-Theme 5: Technical Capacity, Research and Development

The primary objectives of the Housing Summit, amongst others, were to

a. Provide a credible platform for professionals and relevant stakeholders in the Built environment to discuss and fashion out way forward for the provision of quality, functional and affordable Housing Delivery in Nigeria.
b. Harmonize existing requisite data to enable the right computation of housing shortages in Nigeria and proffer appropriate and affordable solutions to effectively cancel the deficit within reasonable time frame.
c. Review Research and Development innovations/products and alternative technologies to enhance cost-effective and affordable Housing delivery in Nigeria

The event had as Special Guest of Honour, the Honourable Minister, Federal Ministry of Lands, Housing and Urban Development (FMLHUD), Mrs Akon Eyakenyi represented by the Permanent Secretary, Dr. Ezekiel Oyebola Oyemomi. The Chairman, NBRRI Governing Board, Chief Dele Okeya gave the Welcome Address. Goodwill Remarks were given by the Permanent Secretaries of the Federal Ministry of Science and Technology (FMST) and FMLHUD. Other eminent dignitaries present included, Mr. Banini Richard, Representing Ghanaian High Commission to Nigeria; Hon. Gunju Ojo and Mallam Mai Adamu, members of NBRRI Governing Board; Dr. Gimba Ya'u Kumo, MD Federal Mortgage Bank of Nigeria (FMBN); Dr. (Mrs) Adhiambo Odaga, MD Dangote Foundation; Dr. Eugene Atiemo, Director/CEO, CSIR-BRRI Kumasi Ghana; Dr. A.A. Talabi, Director, Technology Acqusition and Assessment (TAA) FMST; Mr. Shaba Musa, Director Human Resources Management (HRM), FMST; Prof. (Mrs) Natalie Anigbogu, University of Jos; Presidents and/or Registrars of COREN, CORBON, NIOB, NSE, NIA, etc.

The highly successful Conference had over 300 delegates that cuts across professionals, professional and regulatory Bodies, technocrats, researchers, the academia, consultants, estate developers, NGOs contractors, etc. in the Built environment. Other participants included delegates from Federal and State Ministries of Housing, and Science and Technology, Development Control Departments, the private, among others. Useful and interactive sessions were held after which an all embracing Communiqué was issued.

A cross-section of participants at the International Housing Summit organized by NBRRI

HOUSING IS A PRESSING NEED FOR MAN AND NIGERIA

…....CHIEF DELE OKEYA, CHAIRMAN NBRRI GOVERNING BOARD

In his welcome address to participants and guests at the Housing Summit, the Chairman of the NBRRI Governing Board, Chief Dele Okeya noted that Housing is a pressing need for every Man and for socio-economic development of the nation; and that the hydra-headed challenges of the Housing sector to the Nigerian people and Nation needed to be effectively addressed. He acknowledged the contributions and collaboration of critical stakeholders in the Built environment with NBRRI particularly in Nigeria's quest to provide affordable housing to its teeming population. He emphasised that the Housing Summit offered another opportunity to address the Housing challenge in Nigeria and congratulated NBRRI on the successful organisation of the international conference. While welcoming the distinguished guests and participants to the Conference, he enjoined them to engage in useful deliberations that will inject useful and intelligent ideas to transform the housing sector.

The Board chairman pointed out that since 2011, the Institute had engaged in annual national and international conferences which deliberated on topical issues of national significance in the Built environment. He recalled that in 2011, NBRRI organised a *Stakeholders' Forum*; in 2012, the focus of the Conference shifted to *Challenges of Building Collapse* while the in 2013, the Conference focus was on *Road Pavement Failure*. These Conferences according to the Board Chairman have yielded results that have been of immense benefit to the nation which contributed to national economic transformation and progress. Chief Okeya noted that the intervention of NBRRI on Building Collapse contributed to the observed reduction in the cases of Building Collapse in Nigeria. He further noted that one of the outcomes of the Conference on Road Pavement Failure is subsequent NBRRI-organised studies on Traffic-related Speed Trends in Abuja which have resulted in significant reduction speed related Traffic accidents.

He said that the focus of the 2014 Conference was on *Achieving Affordable Housing in Nigeria* which is a pressing need of every man and Nigeria as a whole. Chief Okeya pointed out that the Government had intervened severally on this matter in the past but noted that rural-urban migration is still on the increase leading to slum development in many cities, nationwide. He stressed the need to improve the quality of life in the rural areas in an affordable manner while also addressing issue of affordable housing in urban towns and cities through appropriate, conducive and affordable housing environment.

The NBRRI Board Chairman stated that NBRRI has been providing local content interventions in the Built environment and enjoined Stakeholders to take advantage of the myriads of tested innovations at the Institute for use in housing delivery. He reiterated that some of the available technologies included those for roofing, walling, flooring, etc. He urged Government to intervene and support NBRRI's innovation drive by evolving strategic enterprise mechanisms

which will lead to high local content in fabrication and manufacturing outfits in Nigeria, thereby reducing dependence on imported machineries for its construction materials production while encouraging job creation.

He also urged Government to support the good initiatives of the Director-General of NBRRI and emphasized the need to provide a permanent site for the Institute as well as increased funding for its R & D programmes.

Chairman of NBRRI Governing Board, Chief Dele Okeya delivering his Welcome Address at the International Housing Summit

NBRRI HOUSING SUMMIT IS A CLARION CALL TO THE REALITIES OF NIGERIA'S HOUSING NEEDS

……..MRS WINIFRED OYO-ITA, PERM. SEC. FMST

In her remarks, the Permanent Secretary of the Federal Ministry of Science and Technology (FMST), Mrs Winifred Oyo-Ita who was represented by her Director, Technology Acquisition and Assessment, Dr. A. A. Talabi, said the Conference organised by NBRRI was a clarion call to the realities of Nigeria's housing needs as the projections by United Nation inferred that global urbanization rate is higher than global population growth.

She pointed out that according to a UN study conducted in 2008, the population of the world is expected to increase by 2.5 billion passing from 6.7 billion to 9.2 billion between 2007 and 2050, while its urban population is expected to increase from 3.3 billion in 2007 to 6.4 billion in 2050. According to another report (NHCS 1998) quoted by the PS, the search for better opportunities has left the rural poor who do not get a means in the urban centre classified as the urban poor, thereby increasing squatter settlements which is now occupied by 70% of the urban population in mega cities like Lagos and Kano.

Mrs Oyo-Ita noted that a common feature with urban centres is the influx of rural dwellers to urban centres for greener pastures; as such, achieving affordable housing in Nigeria will require enormous efforts by the citizens, stakeholders and government. She therefore advocated the need to formulate long and short-term solutions by creating appropriate financial provisions for the provision of mass housing schemes.

The Permanent Secretary commended NBRRI for it achievements especially in its R & D outputs such as the NBRRI cement stabilized laterite block technology and pilot Pozzolana Plant. She stressed that the pilot Pozzolana Plant was a giant stride and if harnessed appropriately by the nation and entrepreneurs, would effectively address Nigeria's high housing deficit. She praised the efforts of the DG/CEO of NBRRI and anticipated a rewarding session that will surpass previous conferences organised by NBRRI; and come up with practical and workable Communiqué to address the Housing challenge in Nigeria

The Permanent Secretary of the Federal Ministry of Science and Technology (FMST), Mrs. Winifred Oyo-Ita delivering her speech at the Housing Summit

The Permanent Secretary of the Federal Ministry of Science and Technology (FMST), Mrs. Winifred Oyo-Ita delivering her speech at the Housing Summit

THE QUEST FOR GREENER PASTURES ESCALATED DEFICITS IN THE HOUSING SECTOR

…… DR (MRS) OMOBOLA JOHNSON, HONOURABLE SUPERVISING MINISTER, FMST

The Honourable Supervising Minister, FMST, Dr. Mrs. Omobola Johnson, who was represented by the Permanent Secretary, FMST, Mrs. Winifred Ekanem Oyo-Ita, expressed her happiness at the Conference which provided a forum for erudite professionals, policy makers and stakeholders in the Built environment to discuss Nigeria's Housing Challenge which is a front issue of national importance to Government and Nigerians.

She noted that the Theme for the Conference was apt and timely since housing the Nigerian population has been a major challenge in recent times. She emphasized the need for equitable and affordable housing and observed that the primary constraints towards meeting housing need of Nigerians range from economic, social and cultural factors. She added that Mortgage options available in the system were not accessible by Nigerians because of their low income level; thus sourcing and deployment of materials for building was a herculean task to achieve. She further noted that in instances where finance is available, land acquisition remains a challenge.

The quest for greener pastures, she added, had escalated deficits in the housing sector; the primary reasons being that urban centres are the focal point of every city dweller where major socio-economic activities take place. She pointed out that studies have shown that 10% of visitors to Abuja always want to stay back. This influx has given rise to a heightened urban growth which is 5.8% in Nigeria and the highest globally, thereby overstretching Urban centres.

Equally noted was the population of Nigeria presently put at 170 million which she averred requires at least 820,000 housing units per annum based on an estimate of 9 dwelling units per 1000 No of population yearly. According to the Honourable Minister, World Bank estimates that over N59.5 trillion will be required to bridge the gap of 17 million deficit of housing. She opined and hoped that the Conference will address the issue of the authentic figures of housing deficit in Nigeria.

She commended the efforts of NBRRI for the great successes recorded in recent times. NBRRI, she added, is a Parastatal under FMST whose R&D mandates have direct relevance in providing affordable housing and infrastructure to Nigerians. She noted that one of NBRRI's innovations is the Interlocking cement-stabilized earth blocks (CSEBs) which has the capacity to provide alternative building blocks that are durable and environmentally friendly; and observed that the technology is gradually receiving acceptance in the society and is still undergoing improvement to meet global standards.

Another major success under the present NBRRI leadership as observed by the Honourable Minister is NBRRI Pozzolana cement technology and the Pilot Plant which is at an advanced stage of completion at NBRRI NLC, Ota, Ogun State. She noted that Pozzolana serves as partial replacement for conventional cement to aid in housing cost reduction; and has the potential to play prominent role in the provision of affordable housing delivery in Nigeria.

She acknowledged the presence of all Stakeholders and staff of NBRRI and hoped that the Conference will yield life enhancing results to transform our great nation in the Housing sector; which has been the desire of the Dr. Goodluck Ebele Jonathan, the President of the Federal Republic of Nigeria as enshrined in Nigerian Transformation Agenda. She wished all participants fruitful deliberations and hoped that the Conference theme be properly tackled leaving no stone untouched in achieving affordable housing provision in Nigeria.

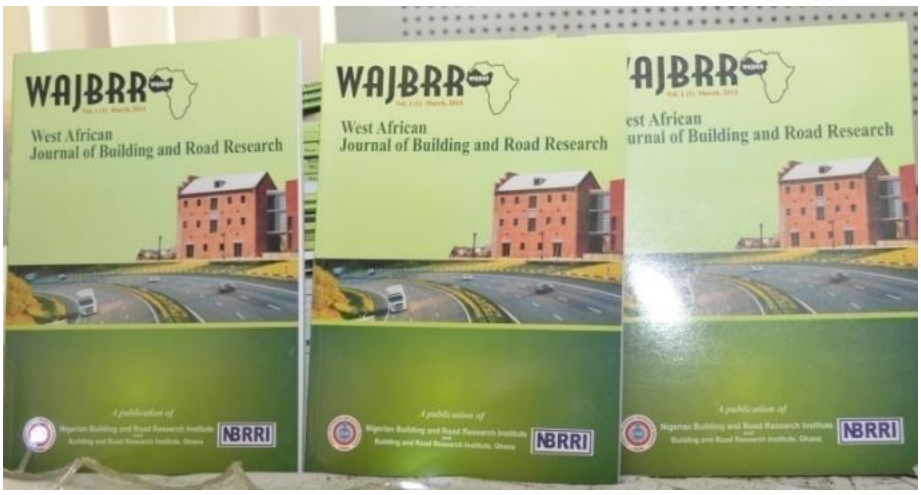

The Honourable Supervising Minister of the Federal Ministry of Science and Technology, Dr. (Mrs.) Omobola Johnson

WEST AFRICAN JOURNAL OF BUILDING AND ROAD RESEARCH (WAJBRR) LAUNCHED

The maiden edition of the West African Journal of Building and Road Research (WAJBRR) was presented and launched on the 2nd of June 2014 at the Yaradua Centre Abuja, during the opening ceremony of the *International Housing Summit*. In his presenting the Journal, the Director-General/CEO of the Nigerian Building and Road Research Institute (NBRRI) pointed out that the Journal was a product of the collaboration between NBRRI and the Building and Road Research Institute (CSIR-BRRI) Kumasi, Ghana. He highlighted other areas of collaboration to include:

- Exchange of scientific ideas and expertise on innovations between both Research Institutes. In an existing Memorandum of Understanding (MoU), NBRRI was to exchange technical information and expertise on Engineering Subgrade Soils Maps production; Interlocking Block making Technology and Machine production. CSIR-BRRI Ghana on the other hand is to provide and exchange expertise on Traffic Studies and Database; and production and commercialization of pozollana cement.
- Staff exchange programme between the two organisations based on the technical exchange programmes
- Sensitization of other West African countries on the need to set up Building and Road Research Institutes

The Journal was launched by the Honourable Minister of Science and Technology, Dr. (Mrs.) Omobola Johnson represented by the Permanent Secretary of the Ministry of Science and Technology, Mrs Winifred Oyo-Ita. In her remarks, she lauded the collaboration between both Institutes and prayed it would be a stepping stone for other West African countries to collaborate and exchange ideas for the growth of the Built environment in the sub-region.



Copies of the West African Journal of Building and Road Research (WAJBRR)

On the left is the Permanent Secretary of the Federal Ministry of Science & Technology (FMST), Mrs. Winifred Ita-Oyo representing the Honourable Minister of Science and Technology, assisted by the Director/CEO of CSIR-BRRI Ghana, Engr. Dr. Eugene Atiemo (on the far Right) unveiling the WAJBRR at the Book launch. On the 2nd from Right is Mr. Banini Richard, Representing Ghanaian High Commission to Nigeria followed by Chief Dele Okeya, the Chairman of NBRRI Governing Board

FMLHUD TO CHECK DEARTH OF LOCAL SKILLED ARTISANS AND CRAFTSMEN IN THE CONSTRUCTION INDUSTRY

…… MRS AKON EYAKENYI, HONOURABLE MINISTER OF LANDS HOUSING AND URBAN DEVELOPMENT (FMLHUD).

In view of the present dearth of housing and Housing Delivery challenges in Nigeria, the Housing Summit Conference is timely and is expected to proffer appropriate solutions. This assertion was made by the Hon. Minister of Lands, Housing and Urban Development (FMLHUD), Mrs. Akon Eyakenyi during her keynote address at the Conference. The Minister, who was ably represented by the Permanent Secretary of FMLHUD, Dr. Ezekiel Oyebola Oyemomi, noted that the constitution of the Federal Republic of Nigeria has placed high premium on housing for citizens but rapid rate of population growth has contributed significantly to Nigeria's housing deficit presently put at about 17 million units.

She added that Government has identified a number of challenges affecting the development of housing and urban development sector over the years. In recognition of these challenges, the administration of President Dr. Goodluck Ebele Jonathan (GCFR) had its vision of a repositioned and vibrant housing and urban development sector as provided in the Transformation Agenda and Nigeria's vision 20:2020 strategic document. This, according to the Hon. Minister, was underscored in Mr. President's address at the Presidential Retreat on Housing and Urban Development in which the President stated that "the current administration had taken cognizance of the housing and urban development sector as an important area requiring priority attention for re-invigorating and revitalization". This vision is energized by the FMLHUD in close collaboration with key stakeholders in the building industry, and efforts have been made in developing and implementing programmes to address the situation.

The Hon. Minister added that the housing and human settlement sector requires a quick turnaround which should not be left to Government alone. The private sector should contribute its quota. The renewed vigorous policy orientation of this administration, she continued, has put in place a National Housing Policy and a National Urban Development Policy as well as appropriate strategies to address housing and urban development in a more robust manner; while the process for the formulation of a National Lands Policy has commenced and is in progress. She reiterated that the National Housing and Slum Summit and the establishment of a National Habitat Committee have further provided platforms for key stakeholders in the housing sector to propose innovative and adaptable strategies as preparations are made for the post-2015 Development period.

She avers that another worrisome issue is the dearth of local skilled artisans and craftsmen in the building and construction industry resulting in extra labour cost, sub standards labour output, influx of foreign expertise/craftsmen but revealed that FMLHUD is partnering with the "Home

Builders Association and the Home Builders Institute" in the USA to jumpstart a scheme of construction skills and train the trainer programme to be flagged off before the end of 2014. She stressed that the training will bridge gaps in the standards of housing delivery and added that the Federal Government is actively engaged with organized sectors such as Shelter Afrique, UN HABITAT, African Urban Age with the aim of facilitating housing delivery in the area of finance and technical facilities bearing in mind that by 2025, more than 60% of Nigerians will live in cities.

Mrs Eyakenyi, who is the special guest of honour at the international Housing Summit, also commended NBRRI for hosting the series of annual Conferences, in the last three years, to address topical national issues in the Built environment. She stated that the theme for this year's Summit tagged *Achieving Affordable Housing in Nigeria* is relevant to the mandate and affairs of FMLHUD, adding that her Ministry is desirous to work with committed stakeholders in the industry such as NBRRI.

She stated that though the challenges faced in the sector are real and obvious, she is convinced that with the renewed commitment of the President Goodluck Jonathan's administration in collaboration with other relevant Stakeholders in the industry, the desired revolution in the housing sector will be achieved in the near future. She thereafter declared the International Conference opened and wished all delegates fruitful deliberations.

Hon. Minister of Lands, Housing and Urban Development, Mrs. Akon Eyakenyi

GOODWILL MESSAGES

FROM.....DANGOTE FOUNDATION

The goodwill message from the Dangote group was delivered by the Managing Director, Dangote Foundation, Dr Adhiambo Odaga, who pointed out that Nigeria is at a position where its housing sector is in a vibrant stage due to the high demand for housing and hence a huge avenue for job creation. She commended NBRRI for organizing this knowledge- and evidence-based forum to deliberate and strategise on achieving affordable housing in the country. She postulated that concrete homes would be a solution to the housing needs of the country.

Managing Director, Dangote Foundation, Dr Adhiambo Odaga

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FROM.....COUNCIL FOR THE REGULATION OF ENGINEERING IN NIGERIA (COREN)

The goodwill message from COREN was presented by the Registrar, Engr. Wopa Kamil Maliki. He noted the aptness of the theme of the conference and expressed his gratitude to NBRRI for organizing the conference and launching a knowledge-based international Journal. He highlighted the major role of COREN which was to ensure efficient engineering practice in the country. In concluding, he commended the organizers of the Conference on their initiative and hoped that the outcome of the deliberations at the Conference would assist in promoting engineering practices in the country.

Engr. Wopa Kamil Maliki ,
Registrar of the Council for the Regulation of Engineering in Nigeria (COREN)

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*FROM.....*COUNCIL OF REGISTERED BUILDERS OF NIGERIA (CORBON)

A goodwill message was presented by the President of CORBON represented by Bldr. Tunde Lasabi, President of the Nigerian Institute of Building (NIOB). In his message, he commended NBRRI for organizing a Conference with such an apt theme. He pointed out that Builders are the managers of the building process and CORBON is the regulatory body for all building construction in the country. This was the reason why the body has identified with the laudable ideals of the Conference. He hoped that at the end of the Conference, practical recommendations would be made that would foster the desired development in the country.

Bldr. Tunde Lasabi, President of the Nigerian Institute of Building (NIOB), representative of President of CORBON

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FROM..... BUILDING AND ROAD RESEARCH INSTITUTE, (CSIR-BRRI) KUMASI, GHANA

Goodwill message was presented by Dr. Eugene Atiemo, the Director/CEO of CSIR-BRRI, Ghana. He delivered felicitations from the parent body; the Council for Scientific and Industrial Research (CSIR) and his Institute, the Building and Road Research Institute in Ghana. He stated that he was delighted at the achievements of NBRRI and further pledged his collaboration. He pointed out that affordable housing was a serious issue in Africa and the housing deficits in the various parts of the continent had environmental and social consequences. He hoped the deliberations from the Conference would recommend strategies and actions plans to solve the housing problems facing our countries.

Dr. Eugene Atiemo, the Director/CEO of CSIR-BRRI, Ghana

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FROM.....FEDERAL MORTGAGE BANK OF NIGERIA (FMBN)

The Managing Director/CEO, Federal Mortgage Bank of Nigeria (FMBN), Malam Gimba Ya'u Kumo delivered a goodwill message. He congratulated the DG/CEO of NBRRI for organizing the programme as the country was at the verge of developing a roadmap to facilitate housing delivery in the country. Hence, the timing of the Conference was apt. He stated that he was delighted that the Conference was being organized by a knowledge-based Institute like NBRRI. He pointed out that Nigeria required 56 trillion naira to meet its housing deficit and considering the recent annual budgets, it would take 11 years to meet this deficit. He therefore called on other parastatals and agencies to emulate the laudable steps of NBRRI.

Malam Gimba Ya'u Kumo, Managing Director/CEO
Federal Mortgage Bank of Nigeria (FMBN)

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FROM.....GHANAIAN HIGH COMMISSION

The goodwill message from the Ghanaian High Commission was delivered by Banini Richard, the representative of the High Commissioner. He stated that the Ghanaian High Commission was delighted to receive the invitation to attend the Conference and more delighted to learn about the collaboration between NBRRI and BRRI Ghana. He further stated that the subject matter of the Conference was of high interest to Ghana since they were also experiencing similar high level of housing deficit. He concluded his message by stating that the Commission was ready to render any assistance required to facilitate the collaboration between NBRRI and CSIR-BRRI.

Mr. Banini Richard, the Representative of Ghana High Commission

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NBRRI ANNUAL CONFERENCE: HOUSING SUMMIT 2014

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LEAD PAPER

QUALITY OF HOUSING IN NIGERIA: THE STRENGTH OF CONSTRUCTION MATERIALS

Prof. D.S Matawal
Director-General//CEO
Nigerian Building and Road Research Institute (NBRRI)

The paper dwelt on materials used in delivering affordable housing with emphasis on the strengths and durability questions. The paper pointed out that housing quality assessment is related to materials and can be measured as tensile/flexural, compression or shear resistance of the materials used. Considering global trends, the paper noted that through human history, there had been a progressive substitution of naturally occurring building materials like bio-degradables, snow and ice, mud and clay with more composite materials like cement, fabric, metal, gypcrete, glass, plastics, etc., as building materials.

The strength of materials in failed construction sites was discussed. The studies conducted on failed buildings in Nigeria showed that the compressive strengths of key load bearing elements (columns, beams and slabs) are poor; and poor concreting was also observed at failed building sites. Also observed is poor bonding between the concrete and the steel reinforcements. On the quality management of sandcrete blocks in Nigeria, it was pointed out that since most bungalow structures are not framed, the walls made from sandcrete blocks become load bearing. Based on several studies, the quality of sandcrete blocks have been found to be progressively below the standards given in the Nigerian Building Code, with few registering above 1.00 N/mm^2. It was however observed that Abuja still produced some exceptional quality sandcrete blocks with stone dust aggregates mainly used, though sand is also utilized.

On studies on strength of Nigerian cement, the paper stated that there has been a marked increase in the production of cement in Nigeria. The paper also stated that NBRRI will continuously subject Nigerian cements to testing to ensure minimum requirements are met. It was stated that any cement class can be used to achieve any concrete grade and it stated that there was no direct link between building collapse and cement grade; therefore there was no need to banning any cement class. Discussing the potentials and structural properties of Nigerian timber species, it was reported that certain minor species were tested and found to be suitable for construction; with high strength, good aesthetics and acceptable workability with simple tools.

The strength of NBRRI technologies was finally discussed with the patented NBRRI interlocking blocks produced from locally made machines like Manual and Electro hydraulic Machines and Semi-Automated Machines. The successful application of these for the construction of a large Skills Acquisition Centre project was presented and discussed. A recent pilot plant project on Pozzolana production from clay by NBRRI, which is located in NBRRI NLC, Ota Ogun State and currently undergoing test running was presented. The extension of this programme to the establishment of another Pozzolana pilot plant using volcanic ash as raw materials, currently under construction and located in Bokkos, Plateau State was also discussed. These technologies when successfully completed and embraced by entrepreneurs and the Built environment industry will go a long way to complement the use of Ordinary Portland Cement for affordable housing delivery. Several other technologies like Paving Stone making Machines and Fibre Concrete Roofing (FCR) Tile making Machines developed by NBRRI were presented in addition to technologies related to the road sector.

In conclusion, it was stated that despite the availability of alternative composites, the citizenry still depend on bio-degradable materials for rural housing.

PLENARY SESSION 1: HOUSING FINANCE AND AFFORDABILITY

PAPER 1

NIGERIAN MORTGAGE INDUSTRY: ISSUES, CHALLENGES AND ROLE OF FMBN

Mal. Gimba Ya'u Kumo, Managing Director
Federal Mortgage Bank of Nigeria (FMBN)

The paper pointed out that the Federal Mortgage Bank of Nigeria (FMBN) evolved from the defunct Nigerian Building Society (NBS) that was founded in 1956 through several policy changes to become the apex Nigerian mortgage institution. The paper highlighted the two broad categories of Mortgage markets namely the Bundled or Unbundled systems as one category and Depository-based or Capital-Market based systems as the other. It stated that Nigeria operates a bundled system where a single institution carries out all functions and also a depository based system where the funds are based on deposits instead of funds issued from the capital market.

The stakeholders of the mortgage industry were also itemized to include: Regulators, Secondary Mortgage Operators, Primary Mortgage Operators, Developers, Facilitators and the end users. It also highlighted some of the recent developments in the FMBN which included, in line with its mandate, the automation of contributions and delivery of electronic cards (NHF e-Cards); the Informal Sector Cooperative Housing Scheme; the Ministerial Housing Scheme; Partnerships with certain trade unions, the Goodluck Jonathan Legacy Model Housing Estate; the Nigerians in Diaspora Housing Loan Scheme; the Offshore Investments in the Nigerian Housing Sector; etc.

The Paper went on to describe various key issues and challenges of the Nigerian housing sector and the prevailing Mortgage system. These included the high rates of population growth and urbanization; low disposable income which raises affordability issues coupled with high building and transaction costs; the dearth of long term financing for housing; mortgage and infrastructural financing; the low capital base of FMBN and inadequate stock of decent and affordable housing.

Other challenges raised and discussed included the high cost of building materials, access to land titles and high cost of house rent. It averred that about 80% of the Nigerian population is only capable of accessing social or low income housing. At the very conservative average price of N3.5 million per unit, Nigeria requires N56 trillion to bridge the current housing deficit placed at over 17 million units.

On the legal and regulatory framework issues in the housing mortgage sector, the paper pointed out that the Land Use Act (LUA) only recognizes holders of rights/certificates of occupancy; and as such, the LUA expressly excludes mortgages or lenders from its definition of a 'holder' of Right of Occupancy. Other related challenges include the requirement for Governor's consent and challenges in foreclosure/recovery laws and procedures. All these have hindered the growth of a robust mortgage system to adequately meet up with challenges of the housing sector in Nigeria.

The paper concluded by recommending solutions for the Nigerian housing sector. It proposed that the FMBN be recapitalized from the current N2.5 billion to N250 billion. Secondly, there is need to carry out an extensive review of legal and regulatory framework and review land registry practices to achieve timeliness and effectiveness. It also recommended the deployment of Geographic Information System (GIS) in the States and integrate same to a national database; and that strategies should be evolved to ensure compliance by Banks, State Governments and related agencies to the contributory provisions as enshrined in the National Housing Fund; as well as the provision of conducive, economic and monetary policies to effectively drive the sector.

PAPER 2

AFFORDABLE HOUSING IN NIGERIA: CONCEPTUAL CLARIFICATION AND NEEDS ASSESSMENT

Tpl Abimbola Onibokun

The Paper noted that Housing proffers security, safety, privacy and indeed a status symbol; and that all countries provide some form of the policies to house her citizens. The paper ighlighted the challenges in the housing sector and noted that attempts at solving the housing challenge predated independence; and that though several housing policies had been developed to address them, significant housing deficit still exists.

On the affordability concept, the paper pointed out that the most common measure for housing affordability is the house price/income ratio expressed in the number of years of income needed to purchase a dwelling. This is usually specified as 25 to 30% of an individual's net income to be spent on housing. The paper further pointed out that up to 65% of many Nigerian cities are described as slums. The only comprehensive study of the housing sector in Nigeria was conducted with the census exercise of 2006, the result of which was released by the National Population Commission in February 2009 with the priority tables released in March 2010.

The Paper also listed the construction index as another form of determining housing availability. This indicates new additions to building constructions within a defined period; and a recommendation from the UN Habitat states that between 8 to10 housing units/1000 population is the appropriate annual input to adequately respond to any nations housing needs. Equally important, as pointed out in the Paper, is that the affordability of any housing arrangement must consider serviceability, sustainability considerations and construction materials selection.

According to the paper, housing construction in Nigeria is mainly carried out through individual efforts and such constructions employ traditional construction methods although, it is generally agreed that the use of off-site manufacturing increases quality and reduction in time and costs in the long term. This has become a key challenge in housing delivery in Nigeria. In conclusion, the

paper stated that effective housing delivery can only be achieved with a good mix in policy, strategy and resources. It summarized the criteria required in achieving affordable housing in Nigeria as the 8Rs of affordable housing i.e. **R**educe LABOUR costs: **R**educe MATERIALS cost: **R**educe reliance on SERVICES: **R**educe reliance on TRANSPORT: **R**educe or eliminate FEES for services: **R**educe OCCUPANCY COSTS, **R**educe the cost per person housed and **R**emove all encumbrances to accessing land.

PLENARY SESSION 2: HOUSING AVAILABILITY AND AFFORDABILITY

PAPER 3

ACCURATE PREDICTION AND REDUCTION OF THE NIGERIAN HOUSING DEFICIT

Prof Kabir Bala

The paper identified housing as a very important phenomenon in any society and considered it to be the second greatest need of humans. It also raises the Human Development Index (HDI) and noted that current policies are designed to improve the contributions of housing ownership and construction to the economy. It highlighted the challenges of Nigeria's housing sector as high rent, high rural-urban migration, refugee situations, etc.

It described affordable housing as housing priced to cost not more than 30 percent of the income at each level. However, it stated that other researchers consider rent, household income, type of household and household eligibility for housing benefits; as relevant variables.

It highlighted the issue of population growth, particularly the growth in the number of households that result in growth in demand, migration, other human movements like divorce and separation. It also highlighted additions and subtraction in population (births and deaths) to be issues that influence housing demand.

To predict the total households within a given area, the Paper listed rate of households' formation, total number of existing housing units, rate of housing construction, and number of houses that are inhabitable; as data that need to be collected. It pointed out that there was no universally accepted formula for estimating the housing needs as some models are more suited to certain situations.

For housing projections and forecasts, the key consideration was listed as 'Natural change' which is the relationship between births and deaths; as well as changes affecting existing

households such as breakdown in relationships; in and out migration and the relationship between them. It noted other frameworks developed to predict housing demand such as the Headroom framework, each with its strengths and weaknesses. The task of projecting accurately the housing deficit in Nigeria and elsewhere are known to be quite complex. The paper emphasized the need to develop a database irrespective of the framework used and also the development and actual utilization of roadmaps. It concluded by recommending the development and application of several technological alternatives as well as consideration of other financing and subscription options through cooperatives, the capital market and pension funds.

PAPER 4

DEVELOPING AND MANAGING AFFORDABLE QUALITY RURAL & URBAN HOUSING MODELS FOR NIGERIANS

Prof. (Mrs) Natalie Anigbogu

The paper provided the history of housing development in the nation. It pointed out the significance of housing and noted that the issue of housing has been studied especially with regards to Housing Affordability which had moved from the 20 percent rule to the 25 percent rule up to the recent 30 percent rule over time; and all are based on the cash income of the household. The Paper noted that other issues not often considered in Housing Affordability are household types and size; household expenditures and consumption patterns; fluctuations in income; and prices.

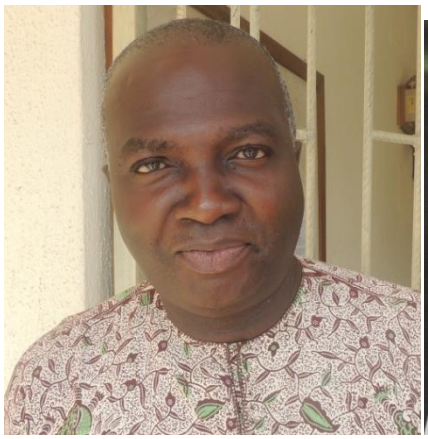
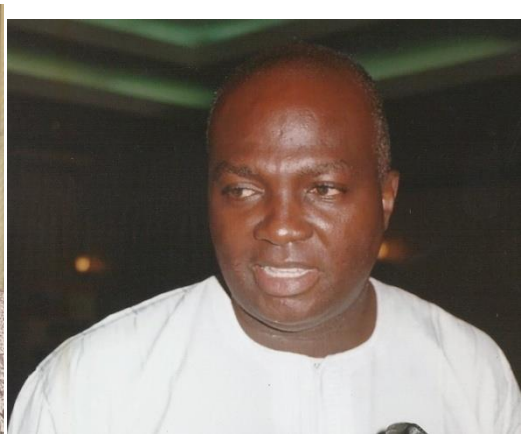
According to the Paper, affordable housing can only have meaning and utility if certain essential questions are answered. These questions include: Affordable to whom? On what standard of affordability? For how long? Meeting what physical standard? The Nigerian urban areas are supposed to be local government headquarters and/or any location with more than 20,000 persons. It however noted that in terms of population density and built up area, Nigeria is primarily rural with informal housing predominating.

The paper highlighted some models of housing affordability to include the Bertoud model and others developed as part of the Global Shelter Strategy Programme; and also discussed their strengths and weaknesses. For Nigeria, several policy reviews have led to the 2012 National housing Policy document. The paper suggested the Nigerian housing model should have affordability calculations without the restriction to rent-to-income ratio. Model designs with affordability and quality, sustainability and life cycle costing should be included. Models that allow for instant calculation of eligibility and mortgage and models for rural and urban housing should also be considered. Other ideas worth studying and experimenting in the context of Nigerian National Housing Policy were listed to include the following: inclusionary zoning policy, private sector finance, partnerships, shared equity, rent to buy, etc.

The paper concluded by recommending that the role of the Government as enshrined in the recent National Housing Policy should be that of supporters and not suppliers of housing and that the intervention should include physical and social infrastructure.

PAPER 5

CHALLENGES AND PROSPECTS OF ESTATE DEVELOPMENT IN NIGERIAN CITIES

Bldr Anthony Okwa

The Paper noted that Nigeria has a large population of about 160 million with a total area of 910,771 sq km and an estimated housing deficit of 17 million units. The Paper noted that there has been a large rural-urban migration; and though there are no agreed specifications defining cities, Nigeria has only a few cities with a population of over 1 million people (from largest to smallest: Lagos, Kano, Ibadan, Kaduna, Port Harcourt, and Benin City). It noted that Lagos is the largest city in sub-Saharan Africa, with a population of over 8 million in its urban area alone.

The Paper emphasized that there has been a challenge in obtaining land for the development of residences in Nigeria. This is mainly related to the Land Use Act (LUA) which has its custodians as the Governors who must sign the titles. It recognized that certain difficulties exist in the processing land titles, and in Nigeria the land is usually procured first by individuals who now act as middle men to the real individual, who really have the interest to develop the land.

It also noted the challenge of infrastructure and technological deficiencies impeding the delivery and adoption of high rise apartments which included the absence of electric energy to power lifts and manage reticulation for such high rises. Other infrastructural deficiencies also slow down development and affect cost of delivery.

Financing was observed to be a key challenge to Estate development as funding is left sided. Typically, civil servants become eligible with less than a decade to leave service. The FMBN is the only Bank that can offer loans to developers for mortgages at 10 percent and to individuals at

6%. There was also the challenge of time to complete businesses, related to housing and property with a one-stop-shop approach heavily reliant on Information Technology (IT).

The Paper noted the difficulties in getting construction permits or approvals in Nigeria which involve 16 procedures that take an average of 465 days to accomplish. Other important challenges include tax issues at various levels of housing development with taxes reaching 35% of final costs; difficulties in enforcing contracts with the absence of foreclosure laws in Nigeria; etc. The Paper however observed recent prospects at addressing these challenges with the promise of land provision by some State Governments; artisan training; land allocation through the land swap scheme in Abuja; the proposed unveiling of the under 1 million Naira house called a 'Kobo house', etc.

The Paper recommended that Government should review policies related to the built environment and allow for infrastructure growth to facilitate the development of estates ranging from recapitalization to reducing the time for conducting construction businesses and obtaining permits.

PAPER 6

UPGRADING URBAN SLUM IN NIGERIA: ISSUES, STRATEGIES AND SOLUTIONS


Prof Mustapha Zubairu

The paper defined a slum as a run-down area of a city characterized by substandard housing, squalor and lacking in tenure security. It noted that before the 21st century the majority of people lived in rural settings but now more than half the world's population are said to lives in cities.

The paper emphasized that slums are said to occur in Africa due to several reason which include urbanization and the higher share of wealth compared to population of cities; which lead to rural-urban migration. It noted that the challenges of slums include public health failures, refuse collection failures leading to dysfunction in supplied services like blocked drains, public area defecation, etc.

As a case study, the city of Minna was presented illustrating how the (9) nine distinct slum areas in 1933 grew to over 21 (Twenty-one) slums in 2013 with encroachment into initially planned areas. These slums have been found to be self-reliant due to the absence of government to provide solutions. The Paper noted that the Federal Government on its part has developed several strategies for slum upgrading and prevention; and cited successful cases of slum upgrading strategies in Sao Paulo and India.

The Paper underscored the need to empower the Local Government Areas to provide affordable housing. It noted the need to develop an institutional framework for implementing effective slum upgrade; and observed that the failure to effectively implement past National Housing and Urban Development Policies has been responsible for the proliferation of slums in most Nigerian cities.

The Paper concluded by reiterating the need to harness potentials within the slum settlements; improve the health and environmental conditions of the cities especially the slums within them; provide adequate and sustainable water supply and environmental sanitation; among other key issues.

PLENARY SESSION 3: HOUSING DELIVERY MODELS AND FRAMEWORK

PAPER 7

SELECTING APPROPRIATE HOUSING MODELS/SCHEMES (SOCIAL, CLUSTER, CORE, CONDOMINIUM, COOPERATIVE HOUSING) FOR NIGERIAN CITIES

Arc (Mrs) Bamidele Falako

In the paper, it was pointed out that access to decent affordable housing has become a formidable developmental challenge for emerging economies like Nigeria because housing affects the mental and physical health of humans, both positively and negatively depending on the quality of its provision.

In Nigeria there are several large cities namely; Lagos (10.203 million); Kano (3.304 million); Ibadan (2.762 million); ABUJA (1.857 million); Kaduna (1.519 million) as at the year 2009. Some critical issues related to rapid population growth in cities included enhanced socio-economic development, natural increase by births, rural-urban migration, and policy of Governments like the movement of the Nigerian Capital from Lagos to Abuja.

The past efforts of housing in Nigeria were chronologically presented from the Nigerian Building society to the present day. Some international case studies were also presented, mainly the Netherlands, Singapore and Ethiopia where the movement from urban sprawls to multi-level constructions of condominiums are the current practices in the later two. In Netherlands, an effective social housing scheme is in place with 60% private ownership, 40% rental stock.

In selecting an appropriate model, the presenter highlighted the various options in use globally namely social housing; cluster housing (Estates) which could be commercial or social; and core

housing, a unit that grows with time through expansion from the core unit. Other models are the condominiums and cooperative housing.

The presenter finally proposed a 3-stage housing model for Nigeria. The model provides access to affordable decent housing on a sustainable basis through; firstly, provision of affordable mass rental housing at 50% of housing stock at 1 and 2 bedroom block of flats for 15 - 20 years; secondly, a rent to own status from 20-35 years at 30% of the housing stock in 2 and 3 bedroom block of flats; and thirdly, the home owner status as units of bungalows and terrace duplexes at 20% of the housing stock.

PAPER 8

ISSUES OF REGULATION ENFORCEMENT AND CONTROL IN NIGERIAN HOUSING DELIVERY

Tpl Yusuf A. Yahaya

The Paper indicated that the Nigerian housing delivery challenge is a result of rapid urbanization of Nigeria. Other related challenges include crime, overcrowding, pollution and unemployment. Given the cardinal role housing plays in human development, it has been recommended that 8-10 houses are delivered for every 1000 persons annually in any given country but some researcher has suggested that in Nigeria only 2 houses per 1000 persons are delivered annually.

The Paper showed that several figures of housing deficit had been provided since the 1990s with the figure placed at 8-10 million units in 2007. The failure to bridge the gap was attributed to corruption, politicization, insufficiency of technical staff at building sites, and lack of infrastructure.

On housing development frameworks in Nigeria, the Paper noted that two policy frameworks have been instrumental to the progress, though little, that has been made with housing delivery in Nigeria. These are the National Urban Development Policy and the numerous Housing Policies enacted over time.

Discussing the role of development control in sustainable housing development, it was shown that sustainable development was the basis for development control and this control is achieved through the implementation of National Building Code/Development Control Manual and specifications for every proposed development. The Paper went on to show that the legal provisions and scope for development control practice in Nigeria stem from the Nigerian Urban and Regional Planning Act 1992 that allows for all tiers of Government to exercise development control. Other sources of control and enforcement include bye-laws, regulations, guidelines, official gazettes, circulars and the National Building Code.

The Paper noted that other urban regional planning tools included urban master plan, environmental impact statement and for an approval in most States Urban development agencies. The basic requirements for issuance of permits other than compliance to the land use plan are: Availability of genuine land title document; complete set of designs to include site plan, architectural, structural, mechanical and electrical engineering designs, which must be stamped and sealed by relevant professionals; submission of site analysis report and/or EIA;, soil test report depending on the scale and magnitude of the proposed development.

The Paper highlighted the difficulties experienced in enforcing development control guidelines for sustainable housing development in Nigeria. These included delays in approval processes, development without genuine land titles, professional negligence and mediocrity, recalcitrance on the part of the developers, the use of court injunction to prevent enforcement; improved economic base; slow pace of resettlement activities; work hazards; and a general abuse of mass housing objectives.

In concluding, the Paper proffered several suggestions used to mitigate the difficulties enumerated above. These included the provision of security operatives to development control staff during site visits, improvement of urban resilience, among others..

PAPER 9

ACCESSING LAND FOR HOUSING IN NIGERIA: ISSUES, CHALLENGES AND WAY FORWARD

Please obtain photo

Tpl R. Shola Salami

The Paper noted that based on observed population growth rates in Nigeria over a period of 100 years from 1921, the population of Nigeria would have grown several times approaching 170 million. The graphs presented showed that urbanization has tracked the population closely over the projected period.

The Paper further pointed out that Africa currently has a slum population of about 199.5 million people, representing 61.7% of its urban population. In Nigeria, several issues related to accessing land for housing were highlighted to include the Land Use Act (LUA), high interest rates on low income housing and other finance related challenges.

The Paper presented some Nigerian Government strategic programs and services that included site and services programme which offer the prospect of easy access to land to the low income group. A second program discussed was affordable mass housing scheme deemed affordable to the low or median household income groups. The most recent scheme called the Land Swap Program of the Federal Capital Territory (FCT) was discussed; and this involved the provision of infrastructural facilities through government/private partnership to expedite delivery of housing through fast-tracked infrastructure delivery.

Also presented in the Paper were the challenges of accessing land for housing. These included development control regulation, cultural and religious factors; a poor targeting strategy with low income housing affordable to medium and high income earners, etc.

On the way forward on accessing land for housing, the Paper highlighted several points which included controlling the use of urban and rural lands through effective physical planning; Facilitation of the availability of serviced lands; ensuring security of tenure to land; strengthening and coordination of Land Registries at all tiers of Government to adopt a robust, dynamic, compatible and geo-referenced land information system for efficient land administration and housing delivery; etc. It was further emphasised that keeping proper records of land transactions; establishment of Land Registries in States where they do not exist; coordination of the Registries on at the national level; and production of Cadastral and Township Maps were considered important. It was further recommended that a title insurance system and the establishment of a National Land Commission should be done and maintained.

The Paper finally called for the review of the LUA and management of urban sprawl with the development of more people-oriented inner city high/medium housing schemes. The role of the Development Control was again highlighted. One way to address this issue was suggested namely, a community-driven Land Tenure System where it will be possible to purchase a house without the land, with the land held as a community land under a trust mechanism that allows such an arrangement. The land trust mechanism is currently deployed in 160 areas in Nigeria.

(No Picture yet)

PAPER 10

AFFORDABLE HOUSING: THE GHANAIAN EXPERIENCE .... E. ATIEMO and I. DECARDI-NELSON

Dr. Eugene Atiemo
Director/CEO
Building and Road Research Institute, CSIR-BRRI, Ghana

This Paper provided an overview of Affordable Housing situation in Ghana, where according to the paper, only about 5% of the population can own a house through their own resources while 60% would need some form of financial assistance with the remaining 35% being classified as those who can never own a house and would require some form of social housing.

The Paper further noted that only 30% of the annual housing requirements of Ghana are met. The situation is worsened by a growth rate of 2.5%; the high cost of building materials which are mainly imported; and deteriorating old swish/mud houses. Other factors include the high cost of land; increased urbanization; the unstoppable rural-urban migration; and the low-density, low-rise housing development. The Paper provided an overview of historical perspective of housing development in Ghana starting from the time of Nkrumah regime through the period of Military régimes till the return to democracy. It highlighted the several housing programmes and what became of them. It was noted that laudable as most of the several projects at the different times are, they became abandoned either at policy making stages or at some stage of development and left uncompleted till the present day. The lack of continuity in the implementation of the various housing programmes by successive regimes was a major hindrance.

On the Ghanaian Housing Policy, it was noted that there were several changes in policy thrust through the years; and that the provision of affordable housing was done through two main channels. The first was through the encouragement of research into the production and use of local building materials such as bricks and tiles, sandcrete blocks, adobe bricks, compressed earth bricks, pozzolana cement, bamboo, and secondary timber species. The second and most popular channel was the construction of affordable or low cost houses by Government and other private-sector led agencies. In 2010, the Government came out with a policy of utilization of 60% of local building materials in government projects with emphasis on burnt bricks, pozzolana cement, compressed earth blocks (CEB), bamboo, etc. by 2015. Furthermore, it was noted that the provision of adequate resources to institutions involved in research and development of local

building materials; massive training programs of both skilled and unskilled artisans; expansion and setting up of production of local building materials are areas of development in Ghana for the delivery of affordable housing.

In conclusion, the Paper presented strategies to improve the delivery of housing. These included a call for the promulgation of an all embracing Ghana National Housing Policy; development and implementation of spatial planning schemes for all Districts; promotion of the utilization of durable local building materials; provision of affordable housing schemes for the low to middle income groups in partnership with the private sector.

PAPER 11

QUALITY, APPLICATION AND COST BENEFITS OF NBRRI INTERLOCKING BLOCKS AS SOLUTION TO NIGERIAN AFFORDABLE HOUSING ASPIRATIONS.....

...Edom A., G.A Danjuma, D.J Maton and J.M Didel


Dafang J. Maton
Research Officer, NBRRI

The paper centred its focus on the quest for an enduring solution to housing needs in Nigeria. It was emphasised that Housing was and continues to be an issue of concern to successive Nigerian Governments as well as professionals in the built environment. The Paper emphasized that with an estimated population of 150 million in Nigeria, at least an additional 720,000 housing units per annum (based on an estimate of 9 dwelling units a year per 1,000 of population) would be required; not only to replenish decaying housing stock, but to meet rising demand and avert a further housing crisis by 2020.

It noted that the provision of durable and affordable housing to Nigerians had been discussed at different fora with several interventions made by the different key players in the built environment. In spite of the efforts, the challenge has persisted. The Paper further noted that housing deficit has continued to rise over the past years and is presently put at 17 million units; while emphasizing that the cost of building materials constitutes 60% of the construction cost of a building. Consequently, the Paper opined that one of the critical strategies to proffer solutions is to develop cheaper but durable alternative building materials from local sources to augment conventional building materials that are in common use**.**

From the above discuss, the Paper provided an overview of the quality, performance and cost advantage of the NBRRI Cement-Stabilized Earth Blocks (*CSEB)* as a walling material over conventional Sandcrete Blocks. The cost advantage assessment was done through a comparative cost benefit analysis of construction of three different building designs. The analysis was based on the assumption of a mortgage loan facility with repayment plan spanning over a 30-year period at 6% annual interest rate. The Paper further presented a comparative assessment of

engineering properties namely the Strength, Durability Density, Thermal Value, Shrinkage, Water Absorption and Moisture Content of NBRRI Interlocking Blocks and conventional Sandcrete Blocks; and concluded from the studies that NBRRI CSEBs possess good strength, insulation and thermal properties, less carbon emission and embodied energy in the production phase; and cause no direct environmental pollution during the whole life cycle.

From the outcome of the study, the Paper concluded that NBRRI CSEBs is a suitable and preferable alternative walling material compared to conventional sandcrete blocks. The study also presented the following advantages that stand the CSEB out as a walling material of choice:

- It possesses better performance advantage with regards to compressive strength, durability, thermal comfort, when compared to sandcrete blocks.
- It offers a cost advantage (savings) of up to 20%, 21% and 22% for 3 building designs over conventional sandcrete Blocks.
- If mortgage loan is obtained for the building from the FMBN at an interest rate of 6% per annum for a 30-year period, there will be savings in monthly loan repayments of 13.8%, 11.69% and 11.32% for 1, 2 and 3-bedroom bungalows respectively.

The Paper finally emphasized that construction with NBRRI CSEBs presents a 20% construction cost advantage and 12.27% Mortgage repayment advantage over conventional sandcrete blocks.

PAPER 12

ECO-FRIENDLY SOLUTIONS, GREEN CONSTRUCTION AND SUSTAINABLE ENERGY IN NIGERIA'S HOUSING DELIVERY.

Louis Gyoh

The paper explored the linkages between the housing sector and global warming. According to the Paper, housing sector plays a major role in the current global environmental crisis and it is also the most important sector that can, without extra costs, address the issue of climate change. It is noted that 40% of all energy consumption and greenhouse gas emissions in the world are created by building construction and housing sectors. The Paper emphasized that scaling up efforts of making housing in Nigeria more sustainable can significantly impact on the climate change mitigation and adaptation as well as improve the quality of life in Nigeria. It noted that sustainable housing in this context means housing that takes care of the long-term environmental, social, cultural and economic balance of the housing stock and its occupants.

The Paper presented a case study of Chevron Office Complex in Warri which recently implemented an eco-friendly and energy efficient house. This was achieved by employing a number of design strategies and construction techniques namely Bioclimatic architecture- shape and orientation of the building, solar protections, passive solar systems; High performance building envelope through insulation, high performing glazing and windows, air sealed construction and avoidance of excesses thermal transfers; High performance controlled ventilation; and mechanical insulation.

According to the Paper, the study revealed that most building approaches that are environmentally sustainable are not adopted at scale. Ideally, these should be scaled-up to meet the massive housing demand in Nigeria where buildings should be designed to minimise energy loads. The designed low energy requirement should then be met with the use of green and alternative non-fossil fuel sources as a follow up strategy. This would ensure an eco-friendly, energy efficient and sustainable housing delivery in Nigeria.

(No Picture yet)

PAPER 13

ASSESSING THE POTENTIAL IMPACTS OF NBRRI POZZOLANA PROJECT IN AFFORDABLE HOUSING DELIVERY ON NIGERIA

.....G.N Omange, D.S Matawal and R.B Lawal

Engr. R.B. Lawal
Nigerian Building and Road Research Institute

The Paper described the development of a pilot Pozzolana Plant, the first of its kind in Nigeria. In doing this, the Paper provided an exposite on the importance, availability, uses, advantages, etc. of Ordinary Portland Cement (OPC) in Nigeria. It emphasised that cement is the most commonly used building material and binder in all construction works in Nigeria; and that in spite of increased cement production level which currently is in excess of demand in Nigeria, the cost of Cement has remained high and has contributed to the high cost of housing delivery. This high cost was attributed to several factors which include, among others, high production cost arising from high energy requirements during manufacture process, artificial scarcity, sharp practices at the downstream sector which has impacted on the high cost of housing delivery.

The Paper averred that Pozzolana cement, which has remained unexplored and undeveloped in Nigeria, is a cheaper binder to OPC; and has applications in construction works where early strength is not required and in the construction of bungalows and single/two-storey buildings. This is because Pozzolana, though derived from waste products such as flyash, clay, volcanic ash, etc., constitutes cheaper and durable substitute binder for affordable housing delivery. The Paper noted that various mix ratios of between 25% and 60% replacement of Cement with Pozzolans and lime mixes have produced low to medium strength concretes, blocks and mortar as well as high strength concrete for structural applications. In addition to the above, the Paper described some of the critical properties of Pozzolans which included the slow development of strength which appreciate to the optimum with time; the better green house effect; the prevention of sulphate attack in concretes; the high workability; among others. This makes them favourably disposed for use in concretes, mortar and blocks

Taking a further step from the results of its R&D works on pozzolans, the Nigerian Building and Road Research Institute (NBRRI) embarked on the development of prototype pilot Plant for the

production of Pozzolana from calcined, pulverised clay. According to the Paper, this involved the development/fabrication and installation of a series of Machines, including a Hammer Mill, Noduliser, Palm Kernel Shell (PKS), Grinding Mill, Vertical Shaft Kiln (VSK), Ball Mill and a Bagging/Metering Facility, for the prototype "NBRRI Pilot Pozzolana Cement Plant". Some of the justifications for the pilot project, the test running of the plant and challenges encountered were highlighted in the Paper.

The Paper however noted that the major challenge to the massive use of Pozzolana Cement in Nigeria was the acquisition of expertise, skills and confidence in their use in construction. This could be overcome not only from its cost benefits but primarily from creating interest and awareness amongst Stakeholders, on alternative binders in appropriate building for sustainable development.

The Paper provided a strategic framework for promoting the efficient use of pozzolana cement in Nigeria as a complementary binder substitute. This would involve conducting advocacy, training, re-training and train-the-trainer programmes that would allow producers and users to gain the skills and confidence in their use. Consequently, the use of Pozzolana cement will provide a cheaper and durable "Binder Alternative" that will have significant impact in cost reduction on Affordable Housing delivery in Nigeria**.**

PAPER 14

DEVELOPING A CURRICULUM FOR THE CERTIFICATION OF ARTISANS FOR ENHANCED PERFORMANCE IN THE CONSTRUCTION INDUSTRY.....J. Falade, E. B. Ojo and F. I. Gai

Engr. J. Falade

The paper noted that buildings and infrastructural development by Governments contribute to an unprecedented boom in the construction and property sectors. It emphasised that the construction sector has critical challenges amongst which are the dwindling levels of technical capacity in the construction workforce of the country; shortage of skilled manual manpower, among others. This, according to the Paper, has to a large extent resulted in recurrent building collapse cases in the country; importation of skilled labour from neighbouring West African countries causing a capital flight estimated at over 960 billion naira annually, etc. Consequently, the Paper proposed cooperative education and training model as a tool for the development of skilled manpower needed in the construction sector of the economy through the development of a competency-based curriculum.

As pointed out in the Paper, Cooperative Education is an educational system which combines classroom-based education with practical work experience. It comprises of an agreement between the industry and the institutions, the trainees and the community to meet the competencies, knowledge, skills, understanding equipment and attitudes required in the world of work. The training model would be established based on the following criteria and standards:

- Development of a robust, practical, relevant and competency-based curriculum for the training of artisans
- Dual learning venues
- Recognition of prior achievement and qualification
- Acting as a bridge between the vocational education sector and the construction industry
- Collaboration with all cognate professional regulatory bodies

The Paper proposed that NBRRI should function as a Vocational Education (VE) hub connected to a network of occupational training centres to be spread across the country. Programs to be run would be tailored to match the commercial needs of communities, thereby empowering the whole community. The Paper noted that when fully operational, the programme would ensure quality assurance of construction activities, curb incessant cases of building collapse, check the practice of importing artisans from neighbouring West African countries and avoid the resultant capital flight from the nation's scarce resources.

PARALLEL SESSION 1: RESEARCH AND DEVELOPMENT INTO ALTERNATIVE CONSTRUCTION MATERIALS

PAPER 16

POTENTIAL UTILIZATION OF IRON ORE TAILING FOR MANUFACTURE OF BUILDING BRICKS …

Yisa G.L., Akanbi D.O. and Mlanga V.

Yisa G. L.
Research Officer,
Nigerian Building and Road Research Institute

The paper identified the increasing high demand for and the high cost of building materials as the primary justification for exploring alternatives through the conduct of research into development and use of alterative building materials from local sources. One typical source is the mining and mineral wastes such as iron ore tailing (IOT) which abound in iron mining sites in Nigeria and which have created disposal challenges. If the tailings are not disposed of, the environment would be polluted and useful land resource cannot be fully utilized. The paper presented the results of investigation carried on iron ore tailing. The objective of the study, as described in the Paper, was to evaluate the prospects of utilizing iron ore tailing (IOT) in the production of bricks, paving blocks and other value-added building products as a result of their pozzolanic potentials and prospects. The results of the investigation revealed that the maximum compressive strength of 42N/mm^2 was obtained from mix containing 750g of (IOT), followed 500g and 250g of IOT respectively. This indicates that that the compressive strength of laterite bricks containing IOT mixes increase with increase in IOT content, as compared with that made by laterite only. The Paper concluded by stating that the utilization of IOT as an admixture in brick production leads to bricks of high strength.

PAPER 17

EVALUATION OF THE STRENGTH PROPERTIES OF REINFORCING BARS IN NIGERIA: CASE STUDY OF BAUCHI METROPOLIS

…..Maleka A.M., Garba A. and Aliyu I.

NAME (Ask Emeso)/Better picture

The Paper evaluated the imperfection in the characteristic strength of reinforcing bars which constitute a great threat to the safety of lives and property as building are liable to collapse or fail if constructed using sub-standard reinforcements. It was noted that the tensile strength and ductility of reinforcement bars affect not only the stability but also the serviceability requirement of buildings and other civil engineering structures.

According to the paper, reported cases of premature structural failures have become frequent especially for buildings; and the reason for this is the non-conformance of structural properties of materials used in the actual construction to the properties of materials specified for it. The Paper presented the results of a study by the authors which evaluated the tensile strengths and ductility of reinforcing bars used in Bauchi metropolis. The steel grades used for reinforcing bars for reinforced concrete structures were characterized using the yield strength and mechanical properties after yielding. The Paper noted that the presence of variation in the strengths of bars was as a result of such factors of variation in the chemical composition, heat treatment, sampling and testing. The results from the investigation presented in the Paper showed that the 6mm and 10mm diameter mild steel used in Bauchi satisfied the recommended yield of 250N/mm^2; the 10mm diameter high yield steel was found to be inadequate; the 12mm and 16mm diameter high yield (deformed) bars used in Bauchi satisfied the characteristic strength 410N/mm^2 with minimum elongation of 14% as specified in British Standard 5950 - 1:2000.

The paper concluded by pointing out that 10mm diameter high yield steel used in Bauchi which has a yield stress less than the 410N/mm^2 recommended in British standard 5950, be subjected to further research to be able to conclude beyond any reasonable doubt that the 10mm diameter high yield steel used in Bauchi metropolis is adequate.

PAPER 18

COST COMPARATIVE ANALYSIS OF COMPRESSED STABILIZED BLOCKS AND SANDCRETE BLOCKS IN AFFORDABLE HOUSING PROVISION IN NIGERIA

…..Didel M.J., Matawal D.S. and Ojo E.M.

Didel M.J
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The paper identified the cost of conventional building materials as one of the factors hampering affordable housing delivery in Nigeria. It projected that by 2050, Nigeria's population would be third largest in the world after China and India respectively. Given the above, and in order to meet the housing needs of the growing population, the paper pointed out the need to promote the use of alternative building materials which are locally available, affordable and cost effective. This, the Paper asserted could be achieved through the use of NBRRI Compressed Stabilized Blocks (CSB) made from local materials (Laterite) compared to the high cost of sandcrete block. The paper also stated that CBS are durable, strong and cost-effective especially in building houses to meet the needs of its fast growing population in an affordable especially for lower income and vulnerable groups. The CBS do not require plastering or painting.

The Paper presented results from a study by the authors which revealed that with CSB, cost reduction of 22%, 20% and 21% for the 1, 2, and 3 bedroom bungalow compared to sandcrete blocks. In the light of its findings, the Paper concluded by recommending alternative building materials to achieve affordable mass housing delivery programme in Nigeria and this could be promoted through effective public enlightenment programme targeted at all the stakeholders.

PARALLEL SESSION 2: HOUSING DELIVERY MODELS AND FRAMEWORK

PAPER 20

INNOVATION IN HOUSING COOPERATIVE FRAMEWORK MODEL: A SIGNIFICANT TOOL IN ACHIEVING SUSTAINABLE MASS HOUSING IN NIGERIA

Habeeb Shuaeeb

The Paper noted that most developed and developing countries have continuous strategic approaches towards providing and improving housing infrastructure for residents; and that the various approaches adopted in the 21st century are PPP as well as Housing cooperatives. It however opined that that in developing countries, PPP have less impact on low income earners, thereby creating the need to evolve innovative cooperative housing model as a tool towards developing sustainable mass housing. The Paper further observed that majority of the Nigerian Housing Cooperative Initiatives have been slowed down by financial flux and existing socio-cultural settings. It provided a history of mass housing in Nigeria and noted Government efforts at establishing organization such as National Building Society (NBS), FMBN, etc.

In view of the above, the Paper presented a an innovative cooperative model with the ultimate aim of evolving strategies aimed at promoting socio-economic growth through the Collaborative Cooperative Housing Model (CCHM) that will address critical challenges of housing delivery implementation in Nigeria. It noted that although successful housing deliveries over the years were achieved based on principles involving critical decisions, adequate financial management, transparent delivery system and phase to phase project monitoring, the integration of structural and tested framework models into housing cooperatives will provide the requisite support towards achieving the desired objectives. In Nigeria, there are various housing initiatives for mass housing delivery, e.g. National Housing Trust Fund, etc.

As stated in the paper, the model is focused on housing cooperatives, identified as an informal sector with wide coverage of membership in Nigeria. The CCHM is an integration of key stakeholders merging both financial and intellectual resources together in resolving housing

deficit particularly for low-income earners in Nigeria. The model is structured in consideration to the hierarchy of operations amongst the participating stakeholders. Despite the stakeholders interactive chain linked based on positions in the model, their primary focus is on the Special Purpose Vehicle (SPV) floated to achieve the desired needs of non-profit housing cooperative. As proposed in the Paper, the SPV will be managed by an independent administrative firm, which will successfully inter-link the cooperative housing societies with the identified stakeholders of the model.

The paper underscored the significance of financial disbursement of members of the cooperative, noting that Housing Cooperatives have a form of legislation that guides its operations. He added that Federal, State and Local Government have roles to play in these housing corporations. The Paper observed that at every point, the government has limits in financial cooperation; and concluded by recommending that Government should consider and recognize the significance of CCHM and consider its adoption; and show commitment by giving financial support at low interest rates.

PAPER 21

SOME ENGINEERING PROPERTIES OF SANDCRETE BLOCKS CONTAINING FLY ASH……. **Duna S., Matawal D. S. and Ejeh S.P.**

Dr. Samson Duna, ATBU, Bauchi

The Paper provided an overview of the investigation carried out on the engineering properties of sandcreet blocks containing fly ash. In doing this, it started by highlighting the problems facing the Nigerian population among which is a dearthe of shelter. It pointed out that the high and continuously increasing cost of cement and its scarcity in Nigeria have made it necessary to search for cement alternatives that can be used for the construction of common residential buildings which are bungalows.

It noted that external and internal walls of buildings are primarily made up of sandcrete blocks, which were defined as hollow blocks, typically pre-cast units, and made from cement-sand mixes. It also observed that there have been attempts to substitute or supplement cement in the mixes used for concrete or mortar production.

The test methods, the actual tests and the results using Fly Ash as pozzolanic materials in the production of sandcrete blocks were presented. The Fly ash was sourced from Ashaka Cement Company where coal is used to burn its raw materials. Other materials like sand were obtained from Bauchi Metropolis. After producing sandcrete blocks under conditions that closely simulated field situation, with different percentages replacement of cement with fly ash, the blocks were cured and tested at several days of curing. The following tests were carried out on the samples produced; density test, shrinkage test, water absorption test, compressive strength test, particle size distribution of fly ash and Ashaka brand of Ordinary Portland Cement.

With the detailed and comprehensive analyses of the test results presented, the Paper concluded that the addition of fly ash to cement paste increases the water requirement, soundness and setting times. All the values obtained for the soundness, initial and final setting time were all within the range specified for Ordinary Portland Cement and Portland Pozolana cement. It was further shown that the density of the sandcrete blocks decreases with an increase in fly ash content which again decreases with length of curing period. The results presented indicated that sandcrete blocks of mix ratio 1:6 (cement/sand ratio) and maximum percentage of up to 30% cement can be replaced with fly ash; and that for a 1:8 mix ratio, a maximum 20% can be

replaced with fly ash. The results obtained from the tests satisfy the Federal Ministry of Works strength requirements in Nigeria.

PAPER 22

COMPARATIVE ANALYSIS OF THE COMPRESSIVE STRENGTH OF MACHINE MOULDED AND HAND MOULDED SANDCRETE BLOCKS

…Osadebe C.C., Obiora F.I., Egbuna I.C and Sani R.O.

Dr. C.C. Osadebe
Deputy Director, NBRRI

The Paper presented the results of a comparative analysis of the compressive strength of Machine-moulded and Hand-moulded Sandcrete Blocks. According to the paper, the workability of sandcrete blocks depends highly on the strength, method of production and mix ratios. The two widely used methods of production of sandcrete blocks in Nigeria are machine-moulded blocks and hand-moulded blocks. The comparative analysis was on the compressive strengths of machine-moulded and hand-mould blocks at different mix ratios of 1:3, 1:4, 1:5, 1:6, cured under alternate wetting and drying conditions for 7, 14, 21 and 28-day curing age. The compressive strengths of both sandcrete blocks were taken for each curing day age. It was noted that irrespective of the production method, and mix ratios used; sandcrete blocks developed 60-70% of their 28-day strength on the 7^{th} day. Their strengths increased with increase in number of days i.e. strength is directly proportional to age. For all mix ratios, the sandcrete blocks moulded with diesel machine attained higher compressive strengths compared to hand-moulded sandcrete blocks for all curing ages. The various mix ratios of sandcrete blocks, irrespective of the production methods, attained the minimum requirement of 1.75N/mm^2 of the Nigerian National Building Code (2006) for individual block and 2.0N/mm^2 by the British Standard for non-load bearing walls. However, ratio 1:6 for hand-moulded blocks just met the 2.5N/mm^2 minimum requirement of Nigerian Industrial Standard (NIS 87: 2000) at the 28-day curing age for load-bearing walls but failed to satisfy the British Standard minimum strength requirement (1976) of 2.75N/mm^2 for sandcrete blocks used in the construction of 2-storey buildings.

NIGERIAN BUILDING AND ROAD RESEARCH INSTITUTE
(Federal Ministry of Science and Technology)

2014 INTERNATIONAL CONFERENCE WITH THE THEME "ACHIEVING AFFORDABLE HOUSING IN NIGERIA"

COMMUNIQUE ISSUED AT THE 'INTENATIONAL HOUSING SUMMIT 2014' ORGANIZED BY THE NIGERIAN BUILDING AND ROAD RESEARCH INSTITUTE (NBRRI) AND HELD FROM 2ND TO 4TH JUNE, 2014 AT ABUJA-NIGERIA

A. INTRODUCTION

1.1 The Nigerian Building and Road Research Institute (NBRRI), in collaboration with key Stakeholders in the construction industry namely FMHLUD, FMBN, COREN, CORBON, ARCON, TOPREC, NSE, NIOB, NIA, REDAN, NITP, SON held an International Conference tagged '**HOUSING SUMMIT 2014'** with the Theme "**Achieving Affordable Housing in Nigeria",** on the 2nd to 4th June, 2014 at the Shehu Musa Yar'Adua Centre in Abuja, Nigeria.

1.2 Participants at the Conference included a broad cross-section of professionals, researchers, professional regulatory bodies and associations, the academia, practitioners, NGOs, key players and captains of the industry in the Built environment. Others included are the Federal and State Ministries of responsible for Housing and Science & Technology, Estate Developers, construction companies, consultants, contractors, the Media; as well as the Building and Road Research Institute (CSIR-BRRI) Ghana. The event attracted more than 300 participants.

1.3 The opening ceremony was chaired by the Supervising Minister of the Federal Ministry of Science and Technology, Dr. Mrs. Omobola Johnson, ably represented by the Permanent Secretary Mrs. Winifred Ekanem Oyo-Ita. The Welcome Address was delivered by the Chairman of NBRRI Governing Board, Chief Dele Okeya, while the Opening remarks were made by the Permanent Secretary FMST, represented by the Director Technology Acquisition and Assessment FMST, Dr. A. A. Talabi. Goodwill messages were given by eminent personalities from the Built environment including the Dangote Foundation; Dr. Eugene Atiemo, Director/CEO of CSIR-BRRI Ghana; COREN; CORBON; FMBN; and Banini Richards, Minister representing the Ghanaian High Commission.

1.4 The Conference was declared open by the Special Guest of Honour, Mrs. Akon Eyakenyi, the Honourable Minster of Lands, Housing and Urban Development, (FMLHUD), ably represented by the Permanent Secretary, Dr. Ezekiel Oyebola Oyemomi, after delivering the Keynote address tagged **"Nigerian Housing Delivery Challenges and Solutions".** A high point of the Opening session was the presentation of the maiden edition of **an International Journal titled "West African Journal of Building and Road Research (WAJBRR)** which is a

veritable platform for researchers in Africa to share knowledge; and is a result of collaboration between NBBRI-Nigeria and its Ghanaian counterparts, CSIR-BRRI, Ghana.

B. CONFERENCE OBJECTIVES

The **objectives** of the Housing Summit, amongst others, were to

d. Provide a credible platform for relevant professionals and stakeholders in the Built environment to review, discuss and fashion out way forward for the provision of quality, functional and affordable Housing Delivery in Nigeria.

e. Harmonize existing requisite data to enable the right computation of housing shortages in Nigeria and proffer appropriate and affordable solutions to effectively cancel the deficit within reasonable time frame.

f. Review Research and Development innovations/products and alternative technologies to enhance cost-effective and affordable Housing delivery in Nigeria

Apart from the Lead paper titled "**Quality of Housing in Nigeria: The Strength of Building Materials**" which was delivered by the Director-General of NBRRI, Prof.Danladi Slim Matawal, twenty-three technical Papers were presented at five Plenary and two Parallel sessions under the following sub-Themes: ***Housing Finance & Affordability; Housing Availability & Affordability; Housing Delivery Models & Framework; Building Materials & Technology; Technical Capacity, Research & Development.***

C. DELIBERATIONS AND OBSERVATIONS

After extensive deliberations on all presentations and on critical issues affecting the Built environment, the following general observations were made:

3.1 Housing Availability and Affordability

a) Though Nigeria has an elaborate National Housing Policy and Urban and Regional Planning Policy, among others, affordable housing for Nigerian citizens in both urban and rural areas remains a considerable challenge.

b) Urbanization rate is high with rapid urban expansion without commensurate provision of infrastructure and services, leading to growth of slums.

c) Many Nigerians are still living in sub-standard houses with little or no infrastructure and services

d) Nigeria has laudable policies, resources and technical capacity to provide affordable housing but the lack of political will is a major impediment.

e) Affordable housing needs to be treated with utmost urgency as the population of Nigeria has been projected to reach 440 million by 2050, which will make it the 3rd most populous country in the world just behind India and China.The available data and information on housing needs and housing requirement in Nigeria are presently varied and not reliable. The figure of housing shortage/deficit for Nigeria from different sources varies between 17-21 million; which calls for a more reliable and more realistic estimate to guide in effective planning.

f) There is a dearth of adequate data required, such as update on housing census in Nigeria, for the accurate computation and prediction of the housing deficit in the country

g) The failure to achieve effective synergy among the tripod stand of *Policy, Strategy and Resources* in Nigeria has been the bane of successful housing provision for the people.

h) There is lack of synergy among the critical players in the Built environment. Indeed, the lack of or limited collaboration and synergy between NBBRI and many key stakeholders such as the FMLHUD,

the Mortgage Institutions and Real Estate Developers and other stakeholders in collectively tackling the challenge of affordable Housing delivery for Nigerians was noted.

i) Some sections of the Nigerian Land Use Act have been found to constitute hindrances to the provision of affordable housing, housing finance and effective property transaction.

3.2 Building Materials and Technology (Research and Development)

a) There are several innovative technologies by NBRRI and other institutions for providing affordable housing in Nigeria that are yet to be adopted by both public and private sectors

b) Nigeria possesses various waste materials and natural deposits (e.g. Sawdust, Volcanic Ash, Bagasse, Rice Husk, iron ore tailings, etc.) which can be harnessed for conversion into Pozzolana and used for various construction works.

c) There is a general reluctance by professionals and developers in the built environment to specify and use proven local, alternative building technologies in affordable housing delivery; at the expense of imported conventional materials and this has significantly contributed to high cost of conventional building materials that has remained a major challenge in the provision of affordable housing

d) The Housing sector has the greatest potential for Eco-Friendly and Energy-Efficient applications, compared to other sectors, which can be harnessed for affordable housing delivery.

e) Some of the more important deleterious effects on building strength and durability are poor concreting & construction techniques as well as inadequate production management, which underscore the need for quality control in cement production and its use in construction.

3.3 Housing Finance and Affordability

a) The cost of housing development in Nigeria is very high, mainly due to high cost of funds; high cost of land and building materials; high cost of obtaining Title deeds; and unnecessary delays in obtaining title deeds and approvals; which in turn make housing affordability a major challenge, especially to low income earners.

b) Inadequate Government intervention in the provision of subsidy and development of social housing is a challenge for the vulnerable groups (i.e. the no-income, low and middle income earners).

c) Sourcing mortgage facilities for housing development and delivery at low interest rates from mortgage institutions is the primary avenue of housing fund pursued by developers. There are however other sustainable frameworks for housing funds such as the Cooperative Housing Schemes which Nigerians have not effectively taken advantage of.

d) The high interest on housing funds which is rarely at single-digit rate, the reluctance of commercial Banks to grant long-term loans for housing development, the limitations in the financial base of the Federal Mortgage Bank of Nigeria were identified as some of the challenges of sourcing housing funds for massive housing delivery by Developers.

e) There are no existing instruments such as insurance schemes and similar platforms which can underwrite risks of lenders in the event of foreclosures. Even the primary target of the recently established Nigerian Mortgage Refinancing Company (NMRC) appears not to adequately address risk taking in the provision of social and affordable housing for the no-income, low and middle income groups.

f) Since the promulgation of the National Housing Fund (NHF) Act in 1992, its provisions especially with respect to investment of loan portfolio in housing development has been minimally complied with. Indeed, some financial institutions (insurance companies and banks) and States have not complied with National Housing Fund (NHF) Act.

g) The Federal Mortgage Bank of Nigeria, as currently capitalised, cannot respond to the housing finance needs; efforts by the organisation to undertake capital raising from offshore sources are barely visible.

3.4 Technical Capacity

There is inadequate competency level of Artisans in the use of conventional and a general lack of competence in the use of alternative building materials, to ensure the provision of affordable quality houses

3.5 Housing Delivery Models and Framework

a) There is inadequate and/or lack of appropriate mechanism and framework for implementing effective urban renewal and slum upgrading schemes.
b) Most towns lack proper land use planning schemes to accommodate the surge in population, leading to excess population settling on marginal suburban lands which results in the development of slums and derelict settlements.
c) The National Building Code, needed to foster robust affordable housing delivery has remained largely unimplemented because the enabling Act for its implementation is yet to be passed by the National Assembly

4 RECOMMENDATIONS

After exhaustive deliberations and considerations of the observations noted above, it was resolved as follows: that

4.1 Housing Availability and Affordability

i) Nigeria's elaborate National Housing Policy should be implemented by the relevant Agencies to achieve affordable housing for Nigerian citizens in both urban and rural areas.
ii) A National Committee should be set up to conduct an assessment of all relevant data and information to provide an accurate and reliable estimate of housing deficits in the country.
iii) A comprehensive study/inventory should be undertaken by FMLHUD in active collaboration with NBBRI and relevant stakeholders, to obtain adequate data and information on housing needs in Nigeria.
iv) An update of the housing census should be conducted in order to have the appropriate data that will assist government in addressing the issue of housing shortage in Nigeria.
v) In keeping pace with the high rate of urbanization in Nigeria and to curb the growth of slums and upgrade existing city slums, all tiers of Government should through the relevant Agencies, implement and intensify enforcement of extant rules and regulations while providing/upgrading infrastructure and services on a continuous basis.
vi) Government should intensify its current political will and commitment to affordable housing delivery and demonstrate this by the effective implementation of existing Policies in the Built environment; passage of laws on outstanding bills in respect of the built environment that are in the National Assembly; provision of adequate resources and enabling environment; and ensuring effective mobilization of the Private sector in affordable housing delivery.
vii) To entrench effective synergy amongst key players in the Built environment industry for better output and performance in collectively tackling the challenge of affordable Housing delivery for Nigerians; as well as avoiding duplication of efforts, NBRRI should establish and/or strengthen collaboration and interactions with other key stakeholders such as FMLHUD; Ministries of Housing in each State of the Federation; FMBN and the Mortgage Institutions; REDAN, etc
viii) To make the existing Nigerian Land Use Act effective and relevant to the Built environment, Government should not only facilitate its removal from the Nigerian Constitution but should subject it to comprehensive review in order to remove hindrances to the provision of affordable housing, housing finance and effective property transaction.

4.2 Building Materials and Technology (Research and Development)

a) The Government and people of Nigeria would need to develop the strong 'WILL' to adopt and leverage on the massive use of innovative, durable and cost-effective technologies (including NBRRI innovations), in order to surmount the challenge of housing shortages
b) Synergy between NBRRI and the Built environment Professional Bodies, relevant associations e.g. CORBON, COREN, REDAN, ARCON, TOPREC, etc. should be sustained to work out modality for the use of alternative building materials in construction
c) The Government should put in place mechanisms to protect innovations, and provide enough funding for the setting up of fabrication outfits in the country for the production of Machines that will produce affordable building materials; while also making them available to communities in the country.
d) Government should evolve and support policies that will encourage the use of NBRRI Pozzolana cement in Nigeria for affordable housing delivery in complementation of Ordinary Portland Cement
e) Incentives should be provided for manufacturers of indigenous construction materials to promote their widespread use

4.3 Housing Finance and Affordability

a) In order to encourage robust long-term housing loans from commercial and mortgage institutions in Nigeria, Government should initiate and implement Policies that would empower the National Insurance Corporation of Nigeria (NMRC) to set up instruments that will underwrite risks on housing loans in the event of foreclosures.
b) Furthermore, the newly established NMRC should diversify and extend its operations to favour re-financing housing loans for social housing and mass housing which affects a larger percentage (85%) of Nigerian home seekers
c) Government should develop strategies to address bottlenecks associated with land processing and acquisition (i.e. cost of land; cost of Title deeds; Delays in Obtaining Approvals, etc.)
d) Nigerians should be encouraged to take advantage of other sources of Housing Finance such as the Cooperative Housing scheme, etc. in acquiring homes.
e) An effective mechanism for risk sharing should be developed which would encourage banks and other financial institutions to extend mortgage loans to people at the lower income level, with insurance companies as key players; which would allow underwriting of such loans in the event of foreclosures.
f) The provisions of the National Housing Fund (NHF) Act of 1992, especially those in respect to investment of loan portfolio in housing development should be complied with. Also, Government should compel Banks, Insurance companies & defaulting State Governments to comply with the Fund contributory provisions in the National Housing Fund (NHF) Act.
g) FMBN should be adequately recapitalised to equip it to respond to its mandate. To achieve this, streams of funds should be provided and institutional investors encouraged to buy into the bank.

4.4 Housing Delivery Models and Framework

a) Government intervention through subsidy and development of social housing is highly recommended; as this would open a window of opportunity for low and middle income earners.
b) The Social Rental Housing Delivery Model should be adopted as the most appropriate for Nigerian cities because it provides for **Sustainable access** to decent **Affordable** and **Acceptable** (qualitative) housing to the low and medium income groups.
c) Nigerian cities should be planned to accommodate the low, Medium and high income groups in the appropriate proportion to create the required balance.
d) There should be a Review of the Legal & Regulatory Framework for housing in Nigeria; especially the Land Use Act: while integrating respective registries into a nationally-accessible network

e) A proper institutional framework for implementing effective urban renewal and slum upgrading programs should be established.

4.5 Technical Capacity

a) Structured Training, Retraining and Train-the-Trainers programmes should be organised for Artisans in the use of conventional and alternative Building materials for effective output.
b) Structured and robust Curriculum for artisan training in different Trades in the Built environment such as Masonry, Iron Bending, Carpentry, etc. should be developed by NBRRI in collaboration with NIOB to improve the technical capacity and competences of construction workforce.
c) Competence in R&D into affordable building technologies should be developed. Also, training of artisans in the use of local building materials is recommended to promote its widespread use.
d) In order to bridge the technical skills gap in the construction sector, NBRRI should in collaboration with relevant stakeholders such as NIOB, be empowered to establish training centres in the six geo-political zones for the training of artisans in the construction industry.
e) Government should adequately fund NBRRI and other Research Institutes to facilitate bespoke Research and Development into critical areas in the housing sector that would facilitate the attainment of affordable housing in Nigeria
f) NBRRI should develop and sustain a National Data Bank on Housing to service all key players in the Built environment and the construction industry.

5 CONCLUSION

The cooperation, efforts, contributions and the commitment of all key stakeholders to the success of the HOUSING SUMMIT is highly appreciated by NBRRI. It is hoped that all Stakeholders including Government and indeed all Nigerians will show similar synergy in the implementation of this Communiqué.

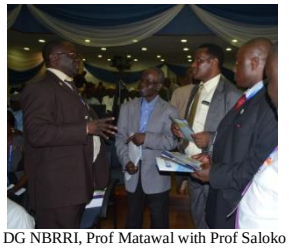
CONFERENCE PHOTO SPLASH- CENTRE SPREAD

Cross section of participants at the summit.

Top dignitaries pose for a photo at the summit

DG NBRRI Prof. Matawal addressing the summit

Housing Summit Registration stands



DG NBRRI, Prof Matawal with Prof Saloko (Unilag) and other participants

Members of the high table at the summit

A cross section of participants at the parallel session

NBRRI board member, Engr. Oyefeso, D(CES) Bldr. H. I Wali, NBRRI Board Chairman, Chief D.Okeya and DG NBRRI, Prof Matawal

Tea break time at the summit

The NBRRI exhibition stands at summit

Plateau State Commissioner of Housing, Engr. S. Maren contributing at the summit

INTERVIEW

WE ARE AVAILABLE FOR CERTIFICATION PURPOSES ..... Prof. Matawal, DG/CEO NBRRI

Recently, there have been debates over the quality of cement being sold in Nigeria. The debates generated a lot of concern by the Coalition of Civil Society and Professional Bodies in the construction industry, Regulatory Bodies, the Standards Organisation of Nigeria (SON), Cement Manufactures, Cement Users in the construction Industry and the General Public with claims and counter claims. The debate centred on the accusation that the quality of the 32.5 grade of cement which has been in the open market was not adequate and has been responsible for the spate of building collapse in the country. While some school of thought was of the opinion that the accusation was wrong and ill conceived, others believed that the accusation was right and advocated that the minimum grade of cement in the country should be pegged at the 42.5 grade. As the foremost Research Institute in Nigeria with mandate on the construction industry, the Nigerian Building and Road Research Institute (NBRRI) lent its voice to the debate. In a recent interview, the Director-General/CEO of NBRRI, Professor Danladi Matawal spoke on what the Institute has been doing towards ensuring that cement factories meet specifications and global best practices. Below are excerpts from the Interview.



NBRRI Newsletter: What is the Institute doing in the aspect of cement meeting up to specification and standard?

Prof. D. S. Matawal: I believe that the Nigerian public is entitled to asking questions about the quality of construction materials that are being used. I believe also that there are many questions that need to be answered by both cement manufacturers and those in charge of regulations and specifications and that includes NBRRI (for providing testing infrastructure) as well as primarily the Standards Organization of Nigeria (SON). It should be noted that the activities and mandate of SON covers a wide array of specializations, disciplines and materials. They will have to depend on the goodwill of research and development (R&D) from specialized research institutions, like ours, and possibly our laboratories and those of the tertiary education sector, to provide and give them data in areas where it is their responsibility to set standards and undertake regulation. This is because, SON could be lacking well-equipped laboratories and facilities for quality assurance tests and specifications in the several but varied areas of disciplines covered by their mandate, which is wide.

Specifically on the issue of Cement quality in Nigeria, we have spoken in public fora organized by the Cement Manufacturers Association of Nigeria (CMAN). We have also made similar initiatives in public fora of the Standards Organization of Nigeria relating to the quality of construction materials; where we have given our views on quality of Nigerian cement and other construction materials, like sandcrete blocks and concrete. Cement generally, as example, is in classes and fundamentally, there are five classes of cement all over the world. There is Cement Class 1, Cement Class 2, Cement Class 3, Cement Class 4 and Cement Class 5.

Cement Class 1 is the most popular of the Ordinary Portland Cements (OPCs) that are very ubiquitously applied in the Nigerian construction industry. Cement Class 2 is also Portland Cement but modified so that it has a lower heat of hydration. The Class 1 Cement type releases high heat during the process of transforming from liquid to plastic paste and the hardening phase known as hydration. In many circumstances, high heat of hydration is not to the advantage of concrete and the structure because, though it results in higher early strength but leads to cracking, lower ultimate strength and the processes for its production are not energy efficient; as a result of which this second type of cement was brought into contention. Comparing and contrasting the other three types: Class 3 is for high early strength designed for specialized rapid strength requirements. Unfortunately, as is typical with higher early strength, it leads to low final strength and high heat of hydration. Class 4 is cements that have partial replacement up to 55% Pozzolana, a material that NBRRI is now promoting and championing in Nigeria. It has its own advantages when you want to improve on the degree of imperviousness of structures. It also gives higher workability and has pronounced appeal as it relates to affordability (because of lower costs). Type Class 5 are composite cements which are primarily developed to provide resistance to leaching in saline environments associated with sea water; and they are known as sulfate resisting cements for special purpose conditions.

Since Cement Classes 3 and 5 are for special conditions, they are not commonly available for everyday and common applications, while Class 4 cements are just being championed by the Nigerian Building and Road Research Institute for extensive use in Nigeria. Therefore, it is both Classes 1 and 2 that the Cement manufacturers claim are being produced for the Nigerian construction industry. Their application depends on the circumstances whether it is Class 1 or 2; each is also further re-categorized theoretically and practically according to the strength class. Therefore, Classes 1 and 2 Cements, depending on chemical proportioning of the four primary compounds constituting cement and smaller additives, each has strength Classes 32.5 and 42.5 in Nigeria, and also Class 52.5 available internationally. The problem in Nigeria is vividly that the cement companies do not explicitly state the cement specifications on their bags, if they know it at all, or they are making errors of harpharzard production, or they are making the matter some sort of trade secret, in order to maximize profits and evade enforcement.

I recommend that the cement bag should be appropriately labeled to contain details of whether the cement content is Class 1 or Class 2 in addition to the strength Class (whether 32.5 or 42.5 MPa). Where special cements are to be produced, the additional details should be provided. These are the issues that Nigerians are complaining about without even being

technical personnel. Once the cement quality and specifications are clearly stated, then the argument of who should be giving the instructions and monitoring field use in terms of appropriate mixing and application of different types of cements to achieve the optimal results dictated by design, can be looked into. In a nut shell, there are definite questions of quality that Nigerians need clarifications on from the Cement Manufacturers, from regulators (like SON), from certification agencies (like NBRRI) and from R&D groups (like NBRRI and tertiary education institutions).

NBRRI Newsletter: You talked about strength of cement?
Prof. D. S. Matawal: Definitely, strength is a quality matter and there is the need for quality control at the production source. Quality control is not an issue of arbitrariness. When cement companies are working towards a set of specifications, they need to be guided about the chemical composition of the cement, the calcining conditions, including incinerating temperatures, milling, etc. For example, the relative proportions of the four primary compounds constituting cement is the primary determinant of the various classes of cement. In another dimension, there is a broadband of specifications about the specific sizes of the cement constituent particles themselves that determines their strengths, limited by the percentage passing micron sizes of aperture openings, like 5 and 45 micrometer sizes. These need to be carefully observed, monitored, and regulated, not by the consumer public, but by experts in and outside the cement companies and government regulators. In any case, there are tests available on Nigerian cements that reveal that even if they do not fail very general criteria, but vary very widely and wildly in terms of minimum criteria and specifications such as the initial and final setting times, fineness (which I earlier pointed out as a primary determinant of strength), etc. These are issues of regulation because there is no reason why materials, in this case cement and in one country, governed by uniform rules would vary in results from one source to another. The Institute did present the results of tests on 14 Nigerian Ordinary Portland cements, from a sponsored research, to prove the above deductions. The results were presented in a forum of Cement manufacturers; and to ascertain that the deductions are being used for compliance, more frequent tests need to be conducted for certification and/or regulatory purposes.

NBRRI Newsletter: What factors could lead to deterioration of cement?
Prof. D. S. Matawal: One of the most important factors, related to deterioration, is the level and period of exposure of the cement. Basically, the shelf life of cement should not be more than 3 months, given proper compliance with storage processes so that they are not unduly exposed to humidity and very high pressure from over-stacking. I don't know if anybody is observing these at all because the cements we buy from the open market do not even carry manufacture date; and quite many of the cement would have started caking, losing some of their potent cementitious properties while still in the warehouses. If cement is exposed to damp weather, it is likely to deteriorate much faster; if it is stacked more than 10 bags, which exist all over the place anyway, the undue pressure will have its deteriorating effect. These are rule-of-thumb laws made for a purpose, not arbitrarily, to protect even the most ordinary user.

NBRRI Newsletter: Is there any area of partnership with other regulatory bodies to ensure that cement is produced to standard?
Prof. D. S. Matawal: We partner and synergize in most of our activities with Universities, SON, cognate Professional bodies, and many other government agencies. We are available for certification purposes and I recall vividly in one of our public outings, the DG/CEO of SON made a proposal to visit our laboratories with a view to utilizing them for their monitoring activities; and we have given the go-ahead. Therefore, NBRRI is very open to collaboration and complementation for the benefit of Nigerians. NBRRI is also well placed to guide in the evolution of Standards, Codes of Practice and Specifications for Nigeria. The study of Nigerian Cements I sighted earlier was presented last year at a forum organized by CMAN in Abuja and was also presented in other fora. The objectives of such NBRRI presentations are to build capacity, emphasize the need for regulation and to be firm on specifications. From the NBRRI viewpoint, the Institute has done what it is supposed to do on this matter.

NBRRI Newsletter: Are you saying there is a specification for cement in Nigeria?
Prof. D. S. Matawal: Yes there are sets of specifications: what is generally referred to as the Nigeria Industrial Standards, NIS, related to Cement. There are couples of documents on the shelf and without any ambiguity you can trace them to SON. These specify many of these limits that have or may not have already been mentioned in our discussions; such as Setting times, fineness modulus, loss on ignition and strengths at varying curing ages. These specifications are there and some of NBRRI's presentations have comprehensively analyzed them; and compared and contrasted with other countries' specifications, like S/Africa, India, US, UK, based on which opinions were made. It is also important to note that some of these specifications are between 40-50 years old and are long overdue for review, which can only succeed through collaborations and research.

I think some form of visitation program on a regular basis must be instituted to bring sanity to the industry. This is a fundamental issue that has to do with application not theoretical. There should be commissioned laboratories that back up any claims with tests, because this is an issue of confirmatory and baseline tests completely. It does not matter where the tests are done as long as they are authentic. This is called Certification which NBRRI can easily provide. One of the fundamental tests for cement, as an example, is the chemical composition determinations; and I am aware that a number of laboratories in African countries, in fact most African countries were commissioned to do research on cement between 2012 and 2013 and the results were presented. But it was discovered that most African laboratories are deficient in chemical laboratories. This is one fundamental area that we need to pay attention to, and NBRRI will equip itself for all tests. It turns out that this test is also an item that appears to approximately define the borderline between developed and developing countries. So many laboratories in developed countries conduct chemical tests and conversely, very few or no laboratories in developing countries conduct chemical tests. NBRRI does specialize primarily in physical tests but has already installed capacity for the important chemicals too because they are important. Every cement company should also have its own laboratory. A number of the tests that NBRRI has done were domiciled in the laboratories of a Cement Company but we now have the facilities to do that by ourselves.

NBRRI Newsletter: What are your challenges in discharging your responsibilities?
Prof. D. S. Matawal: The country is very big and we find it difficult to cover the entire regions, states and zones. That is why we decided to established zonal offices. The philosophy behind the zonal offices is that they will be promotional offices and we shall install Display Stands and Areas where our literature (research work and technology) will be made available to the people within every zone. In this regard, we have revived our zonal offices in Kano, Lagos and Nnewi, and we have opened new zonal offices in Uyo, Jos and Gombe so that all the six geo-political zones in the country are covered. We will welcome all intervention and support to make sure that these offices grow in order to serve the purposes of reaching the very large population of Nigerians and meeting the high demand of the construction industry.

We also offer spotlight attentions in parts of the country where Construction activity is high. Such spots include Abuja, Lagos, Kano, Kaduna, Onitsha-Awka-Enugu-Portharcout axis, and Benin. All these need funding, which is only scantily available and continually dwindling. Our research Officers are also in dire need of continuous further training in Nigeria and abroad.

NBRRI Newsletter: Any international collaboration?
Prof. D. S. Matawal: We have international collaborations with our sister institute in Ghana, with an outfit, *Totally Concrete* in South Africa, with Fengkai Jiayuan Group in China, ELE Group and TRL both in UK, a Belgian Group and many others. We welcome any International organization, Foundation and other corporate bodies to support the operations of the institute on specific research activities.

NBRRI Newsletter: What advice do you have for Nigerians who intend to buy cement in the market?
Prof. D. S. Matawal: When you want to buy cement, there are certain simple tips about the set of questions to set out to answer. How explicit are the specifications and how long has it been on the shelf? Is it always exposed to the environment, i.e. not in an enclosed environment or it is given good protection. Is it a heap so high that maybe it begins to deteriorate in quality under pressure and what are the weather conditions, especially humidity? I would definitely truly love to see inscriptions on bags of Nigerian cements that says: "Manufacture Date; Cement Class I, II, etc; Strength Class 32.5, 42.5; etc".

Finally, there should be consultations in application because not every Nigerian is so conversant with cement use. Therefore Users should be able to make minimal consultations with some professionals or experts who can provide some guides about how it should be applied.

“I believe that the Nigerian public is entitled to asking questions about the quality of construction materials that are being used. I believe also that there are many

questions that need to be answered by both cement manufacturers and those in charge of regulations and specifications….”

“Cement generally, as example, is in classes and fundamentally, there are five classes of cement all over the world. There is Cement Class 1, Cement Class 2, Cement Class 3, Cement Class 4 and Cement Class 5.”

“Cement Class 1 is the most popular of the Ordinary Portland Cements (OPCs) that are very ubiquitously applied in the Nigerian construction industry. Cement Class 2 is also Portland Cement but modified (and)…. has a lower heat of hydration. ….. Class 3 is for high early strength designed for specialized rapid strength requirements…….. Class 4 is cements that have partial replacement up to 55% Pozzolana, a material that NBRRI is now promoting and championing in Nigeria. ……. Type Class 5 are composite cements which are primarily developed to provide resistance to leaching in saline environments associated with sea water and they

are known as sulfate resisting cements for special purpose conditions."

"Cement Classes 3 and 5 are for special conditions …. are not commonly available for everyday and common applications, while Class 4 cements are just being championed by the Nigerian Building and Road Research Institute for extensive use in Nigeria. Therefore, it is both Classes 1 and 2 that are produced for the Nigerian construction industry."

"I recommend that the cement bag should be appropriately labeled to contain details of whether the cement content is Class 1 or Class 2 in addition to the strength Class (whether 32.5 or 42.5 MPa). Where special cements are to be produced, the additional details should be provided."

"…. there are sets of specifications: what is generally referred to as the Nigeria Industrial Standards, NIS, related to Cement. (However), It is also important to note that some of these specifications are between 40-50 years old and are long overdue for review…."

“NBRRI is very open to collaboration and complementation for the benefit of Nigerians. NBRRI is also well placed to guide in the evolution of Standards, Codes of Practice and Specifications for Nigeria.”

“There should be commissioned laboratories that back up any claims with tests, because this is an issue of confirmatory and baseline tests. It does not matter where the tests are done as long as they are authentic. This is called Certification which NBRRI can easily provide.”

“I would definitely truly love to see inscriptions on bags of Nigerian cements that says: ‘Manufacture Date; Cement Class I, II, etc; Strength Class 32.5, 42.5; etc’”

The problem in Nigeria is vividly that the cement companies do not explicitly state the cement specifications on their bags

INTERVIEW

NBRRI IS RESPONSIVE TO HER RESPONSIBILITIES

…… Engr. Kashim Ali, President, COREN



*At the sidelines of the NBRRI Annual Conference tagged **Housing Summit 20** which took place in June 2014, the President of the Council for the Regulation of Engineering in Nigeria (COREN), Engineer Kashim Abdul Ali, FNSE shared his views to the editorial crew of **NBRRI Newsletter** on the Summit and other trending issues in the Built and Construction industry in the country.*

NBRRI NEWSLETTER: By way of introduction, can you please tell us your name sir?
Engr Ali: My name is Engineer Kashim Ali, President Council for the Regulation of Engineering in Nigeria (COREN).

NBRRI NEWSLETTER: Sir as a COREN President, what is your assessment so far on this Summit?
Engr Ali: What I see by my assessment is that NBRRI is being responsive to the responsibilities of its mandate, to keep the rest of us educated and informed about what NBRRI is doing in terms of R&D that could be useful for the Professionals and the general public. When I say us, I mean the Stakeholders in the construction industry.

NBRRI NEWSLETTER: Sir, a lot has been said about housing problems, how do you think Nigeria can solve these issues?
Engr Ali: it is quite unfortunate that as a nation, we have refused to use all the materials available to us. There is what is called history for decision making; we have very rich history that we can rely upon to do a lot as regards construction varieties in this country. In the olden days, things were not as bad in spite of little or no resources in the nation, when people have low education, when individuals were providing shelter for themselves and so on. But with Government intervention, things have not been moving as would have been expected. I dare say

that one of key reasons for this is our refusal to look inwards. For instance, in the olden days when cement was not available, mud was used to build houses; and they were well built. People were more conscious because the mud has the capacity of absorbing water and moisture, so they use all manner of lubricant to ensure they could create a kind of thinner surface to avoid ingress of water; and these houses have stood the test of time for many years. But what we have nowadays is not as durable. There are many intervention measures and certain investment requirements that we could taken to construct cheaper houses than they are now, but the primary challenge is that there is no sufficient will by Government and the Nigerians to ensure we achieve that.

NBRRI NEWSLETTER: Sir you just chaired a session, can you tell us about the papers that were presented?
Engr Ali: We had three (3) papers and each of them is unique in their own way. The first paper for instance was on the use of Iron Ore Tailing (IOT) in the production of bricks for the construction of roads and buildings. If we project it appropriately, it can be used as a key construction material. Now NBRRI had done a beautiful research earlier on IOT and they know the result could also be added to NBRRI bricks in bringing down the cost and also making it stronger. That was all about the first paper. The second paper looked at the quality of reinforcing bars in our markets; Bauchi construction market was used as a case study. The paper made it clear that there may be abundance of some fake reinforcing bars in the market because some of them failed integrity tests. The purpose for this information is to be able us isolate those materials that are not suitable and take them out of the market. The third paper was on NBRRI bricks and the presenter did an effective cost benefit analysis on the use of sandcrete blocks; and we saw that there is positive and significant cost differential in the use of bricks to the tune of 20-22%. The implication is that if you decide to use NBRRI bricks for massive housing project, you could reduce the cost by 22% and this translates to huge savings on the part of the Government and Estate Developers. Now if IOT stabilization is incorporated into the Bricks, the cost differentials might rise to the tune of 30%which is substantial. For me, it was well organised and I was quiet pleased to have the opportunity to chair that session; and I would like to thank NBRRI to find me worthy of the honour.

NBRRI NEWSLETTER: For the benefit of our readers, what is IOT?
Engr Ali: IOT simply means the waste from Iron Ore Processing. It is technically called Iron Ore Tailing. But to the ordinary man, it is industrial waste from Iron Ore constituting a nuisance and some of them have been dumped on so many acres of land around Okene; but if converted and used as pozzolana in construction, they would be very useful.

NBRRI NEWSLETTER: What do you hope would be achieved at the end of the Summit.
Engr Ali: At the end of the Summit, I see a situation where abundant information become available to practitioners and stakeholders in the Built environment in the private and the public sectors; information about the prospect of affordable housing in Nigeria, cost reduction strategies in housing delivery, cost reduction in the provision of public Infrastructure, etc. than we already have.

NBRRI NEWSLETTER: As a regulatory body, what is COREN doing to address the challenges in the construction industry generally?

Engr Ali: What we are doing at COREN is to improve in our standard of regulation. There are certain things that are a bit discretional but we are now trying to make them non-discretional. I will give you an instance. Part of our function includes accrediting Universities, Polytechnics and other Institutional programmes. Previously we could base our judgment, as experienced Engineers, on assessment of laboratory performance and on the least fundamental equipment that requires attention. This is discretional. But now, there are better assessment strategies and benchmarks are set in line with international best practices for the accreditation of Universities. This ensures that the accreditation exercise is well articulated and well organized; and makes scoring to be based on empirical evidence of available facilities. By this, the issue of subjectivity and discretion are removed. We are also looking taking steps to address the issue of quacks that practice in this profession. These quacks are very influential in the society and they have the propensity and tendency to buy their way out each time challenges crop up such as in cases of building collapse. But we are spreading our tentacles to accost them irrespective of their status in the society. In fact we have collaborated with ICPC and signed an MOU under which we can report such quacks for necessary actions. Beyond that, we are also trying to regulate our own practice to conform with international best practices and in line with Institutions we mutually collaborate with across the world. These are some of our thrust areas of operation for now.

NBRRI NEWSLETTER: Yesterday (2nd of June 2014), there was a report of a building collapse and about 50 people died while some were trapped inside the collapsed structure. As a professional, what would you say about the incident?

Engr Ali: As I talk with you now, our engineering research team are on site for on-the-spot assessment; take samples from the site; interact with key construction crew at the site on the possible causes; identify and interact with the engineer(s) for the structure, if any. From there, we will do detailed analyses and desk work and conduct technical interrogation of the site Engineer(s) to explain what really happened. But if there is no registered or licensed engineer on site, the person(s) in charge of the building will have to face the music, because if you are going to build a multi-storey building, it has to be handled by an expert. But if that was not the case, the person in charge will have to be held responsible and accountable for any damage; and the law will have to take its course. The culprit will have to treated as a criminal. We pray to get all the support from Government in order to discharge our duty.

NBRRI NEWSLETTER: What advice would you give NBRRI in respect of this Summit and what other areas would you like NBRRI to venture into in the subsequent conferences.

Engr Ali: Well I have been very positive about NBRRI because I was at one of your functions last year and was very captivated because of the openness in data and information sharing. At that time, a paper was presented on Pavement Failure of the Enugu/ Port Harcourt highway and I was impressed with the role of NBRRI in the investigation. Well, I am a fan of NBRRI because I very much believe in their potential, activities and performance. So I really don't know what to advice. Probably I will continue to challenge the Institute so that they continue to strive for greater heights. Honestly, from the information available, I am very happy with NBRRI. Moreover, with respect to NBRRI bricks, I know it this NBRRI technology has been in existence for so long and Nigerians are not interested in them. But for the consistency in information, more people have come to know of it; as we all know, good things don't come out easily. I would however advise that NBRRI should not stop no matter who the Director-General is. NBRRI is an Institution that will exist in its perpetuity and peculiar mandate. I will just add that NBRRI

should please keep flag flying and information on the front burner. I know that someday in the future, somebody is coming back to ask about their inventions or R&D results in order to carry out some projects.

NBRRI NEWSLETTER: Sir, there are plans by NBRRI management to bring in some regulatory bodies as part of the Management team. What is your take on this?
Engr Ali: It is quiet thoughtful of the Management if such plan is in the offing, because an adage says ”He who wears the shoe knows where it pinches”. If you don’t have an attachment to something in a particular way, you may not appreciate it. So there is need for professional bodies to be brought in to enhance the advocacy of the NBRRI because you have done a lot and there is the need for input of professionals for NBRRI’s voice to be heard in the industry. Bringing in these professional bodies in the Built environment will encourage effective technical input that would be beneficial and lead to greater performance of NBRRI in the construction sector. To me it will be a credit to NBRRI.

There are many intervention measures and certain investment requirements that we could taken to construct cheaper houses than they are now, but the primary challenge is that there is no sufficient will by Government and the Nigerians to ensure we achieve that

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SOCIAL DAIRY

BIRTHDAYS

	NAME	DEPT	DATE OF BIRTH
1.	Igwilo Sophia C	PIT	1st April
2.	Fakeye A.M	RRD	1st April
3.	Obidozie Ndidi V	CES	4th April
4.	Okolo Idah Grace	A/F	4th April
5.	Okoliko Sylvester	A/F	5th April
6.	Essien Bassey Udoh	A/F	5th April
7.	Adebola Abiodun	A/F	9th April
8.	Osuagwu P.N	RRD	10th April
9.	Effiong Okon Edet	A/F	10th April
10.	Makwin Paul Luka	A/F	12th April
11.	Birnin kudu Rakiya	M/P	12th April
12	Falayi C.	A/F	12th April
13	Avre Kazzi Gaius	BRD	14th April
14	Taiwo Ayandapo	A/F	14th April
15	Mudi Bello	A/F	15th April
16.	Ojo Emerso Beckley	RRD buja	15th April
17	Ibrahim Mohammed	A/F	15th April
18	Diji Nduka	A/F	16th April
19	Bulus Oliver Stephen	A/F	18th April
20	Etuk E.A	RRD	18th April
21	Bobzom B.G	RRD	19th April
22.	Gai Friday Iliya	DG's Office	20th April
23.	Majidadi T. Solomon	RRD	21st April
24.	Sunday Egbe	A/F	21st April
25.	Okpebho Enobakhele	A/F	24th April
26.	Edom Atomen	BRD	24th April
27	J.S Ameh	EMRD	25th April
28	Olorunfemi A.C	PITD	26th April
29	Sosanolu Omoniyi	RRD	26th April
30	Abu paul Agwu	PIT	1st May
31	Chimezie Onyema	A/F	2nd May
32	Ebenezer Asala	A/F	2nd May
33	Umar Saidu M.	A/F	2nd May
34	Ogwu Ekele	EMRD	3rd May
35	Aka Endurance	RRD	5th May
36	Sanni Jeremiah D.	BRD	6th May
37	Akanbi Oluwatoyin	RRD	7th May
38	Longtau Pirmak	??????	8th May

39	Durojayi A.M	PIT	8th May
40	Ojachiere Rukeuwe	BRD	9th May
41	Ojo F.A	RRD	10th May
42	Elisha Gelkur	M/P	11th May
43	Ibe Kingsley	BRD	11th May
44	Effiong Effiong Okon	A/F	12th May
45	Taofiq Bello	BRD	12th May
46	Friday I. Apeh	EMRD	13th May
47	Lamidi R. Bukola	RRD	14th May
48	Dada Kazeem	RRD	14th May
49	Iliya Yusuf	A/F	15th May
50	Onwusiri Ignatius	A/F	18th May
51	Cecilia Agida Omari	CES	19th May
52	Ali O.J	A/F	19th May
53	Abdulsalam Yatasu	????????	22nd May
54	Babatunde A.O	A/F	22nd May
55	Makwin M. Danladi	M/P	25th May
56	Ademosu B.	PIT	25th May
57	Paul Isebor	A/F	26th May
58	Igbiele Sylvester N. E	A/F	27th May
59	Bassey Jack Edet	DG's Office	27th May
60	Achema Felix	EMRD	28th May
61	Chukwura Chris N.	PIT	30th May
62	Emoh Nya	BRD	1st June
63	Okoro Leonard .O.	BRD	4th June
64	Tenimu Ahmed	DG's Office	7th June
65	Oladipo Oluwatosin	RRD	8th June
66	Bala Uba Jidere	RRD	9th June
67	Atiku Sabitu Dabai	BRD	10th June
68	Umar Enejo Yusuf	EMRD	13th June
69	Magdalene Usen	A/F	15th June
70	Yashi Jennifer	RRD	16th June
71	Enenche Agbo U.	A/F	16th June
72	Fiyebo Samson A.B	EMRD	17th June
73	Anyim Okoro E.J	BRD	18th June
74	Fabiyi Mustapha O.	EMRD	18th June
75	Ibhadode Osagie	BRD	19th June
76	Salami Samshudeen	BRD	20th June
77	Akande Cecilia N	A/F	20th June
78	Larry Marcel Oforji	BRD	21st June
79	Yunusa Saliu	A/F	25th June
80	Menegbe Ralph	A/F	27th June
81	Chukwuma G. Obiora	RRD	27th June
82	Thomson A.E	A/F	28th June
83	Idowu Rasheedat	A/F	29th June

WEDDINGS

Former Miss Margret Ebeagu of the Planning and Information Technology Department walked down the aisle and was joined in holy wedlock with her heartthrob, Emmanuel Chukwudi Odinwanpka on 21st April, 2014 in Enugu state.

PIX

Miss Juliana Maichibi of the Research Unit, Abuja got wedded to Mr. Nanfwang Tyoden on 12th April, 2014 in Abuja.

PIX

Mr. Golesh Danjuma of the Research Unit Abuja, got wedded to former Miss Esther ????

PIX

Former Miss Ojachiere Rukeuwe of Building Research Department was joined in holy matrimony to Benson Imonikusaye on 10th May, 2014 in Delta state.

PIX

CHILD BIRTH

Mrs. Aka Edurance of Road Research Department was blessed with a baby boy, Bryan Divinewill Okonofua on 21st March, 2014.

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Mrs. Basirat Atim, (Corps member) with the Administration and Finance Department was blessed with a baby boy, Paul Ekpang Atim on 16th January, 2014.

PIX

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A baby boy, James Obande was born to the family of Mr. Obande Peter of the Maintenance and Procurement Department, Abuja.

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Mr. Andaowei Felix of the Planning and Information Technology Department was blessed with a baby girl, Marvelous Ebikpo on 28th April, 2014.

PIX

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Mr. Abubakar Yola of the Research Unit, Abuja was blessed with a baby girl, Aisha on 1st June, 2014.

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Mr. Sule Emmanuel of Road Research Department Ota, had a set of twins, LISA Palang and Lilian Yesmirin on 14th June 2014.

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Mr. and Mrs. Adeyinka O. Adeyemi of Road Research Department and Planning and Information Department respectively had a baby boy, Master Allen Adebukunmi Oluwatobi Adeyemi on 5th June, 2014.

Mr. Terver Tyosar of Jos Zonal Office had a Baby boy, kator Tyosar on 19th May 2014.

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AWARD

The Deputy Director, Administration, Mrs. Ifeoma Jude-Iloma was given a merit award as Communication Woman of the Year by the Christ the King Church (CKC) Kubwa, Abuja at the 48th World Communications Day on 1st June, 2014.