



NBRRI

NEWSLETTER

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NBRRI DEVELOPS VIBRATING TABLE FOR PRODUCTION OF INTERLOCKING PAVING STONES

■ *Using Plastic Moulds For The Production*

In order to ease the mechanical production of interlocking Paving Stones, NBRRI developed a Vibrating Table which uses plastic moulds for production. Paving Stones are produced from sharp sand which is common in riverine and coastal areas. They are generally used in road construction for light vehicular and pedestrian traffic. The machine (Vibrating Table) is an improvement over the semi-automated and automated versions earlier developed by NBRRI both of which use hydraulic fluid system.

The Machine (Vibrating Table) developed by NBRRI uses a vibrator, control button and timer for the production of quality paving stones. The production capacity per operation is 32 paving stone per operation. With this Machine, the operational requirement for paving stone production is reduced to the barest minimum. Different configurations of Plastic Moulds can be used to produce different types of paving stones, such as the Hammer Type, the Double Tee Type, etc. The Master Mould for the



*NBRRI VIBRATING TABLE (MACHINE)
Picture shows the Vibrating Table,
Plastic Moulds and Paving Stones produced*

Plastic moulds has been designed and fabricated.

The operation is simple and involves placing the moulds filled with the wet mix on the metal Table and vibrating to the required specification. The

EXTRA-ORDINARY MEETING OF NATIONAL COUNCIL ON SCIENCE AND TECHNOLOGY HELD IN LAGOS

THE Federal Ministry of Science and Technology (FMST) held an extra-ordinary meeting of the National Council on Science and Technology (NCST) on the 12th and 13th of May 2011 at the Woodridge Hotel Royal in Ajao Estate in Lagos. The NCST is the highest policy making organ in the Science and Technology sector composed of Commissioners of Science and Technology in all States of the Federation and chaired by the Honourable Minister of Science and Technology (HMST). The extra-ordinary meeting was convened to specifically consider and adopt the Draft Policy on Science, Technology and Innovation (STI).

As part of the efforts to reposition the FMST to effectively function as a catalyst for the actualization of Vision 20:2020 and make STI drive national development, actions were taken to review the existing Policies on Science and Technology of 1986, 1997, 2003 and 2007. The

evolving Draft Policy on STI was for a long time subjected to rigorous reviews and wide consultations to ensure that it is comprehensive and be in line with international best practices. For effectiveness and completeness, a participatory approach involving key stakeholders such as distinguished scientists, professors, experts, practitioners, etc. was adopted. This strategy came to a climax during the two-day meeting preceding the hosting of the extra-ordinary NCST meeting.

On the first day of the meeting, a technical session of Officials of the NCST was held during which the Draft Policy on STI was exhaustively deliberated upon and adopted. During the Council meeting proper of the NCST which had the Commissioners of Science and Technology in all States of the Federation in attendance and chaired by the HMST, the Draft Policy on STI was unanimously adopted. The Draft policy on STI was to be presented before the Federal Government.

The release of the 2011 first quarter edition of the resuscitated NBRI NEWSLETTER received a lot of accolades especially from Stakeholders in the construction industry. This was as a result of the renewed hope that NBRI activities and innovations will be better publicized and made available for the benefit of the industry and Nigerians at large.

One of the first steps taken by the Director-General/Chief Executive Officer of NBRI on assumption of office on 1st March 2011 was to strategise on revamping NBRI to execute its mandate more effectively and improving collaborations between NBRI and Stakeholders' in the construction industry. This led to the organization of a *NBRI Stakeholders' Forum* which took place on the 24th and 25th May 2011 at Sheraton Abuja Hotels. The highlights of the successful outing are presented in this edition which is aptly tagged *NBRI Stakeholders' Forum Edition*.

The issue of housing provision for the teeming Nigerian populace continues to be a subject of intense concern especially against the backdrop of several challenges. The housing deficit is on the rise above the 16million units mark of some years ago. The rising high cost of cement in the first half of 2011 received presidential attention with Mr. President giving an order for the downward review of cost of cement. The Nigerian Mortgage system is yet to become friendly to and satisfy the yearnings of Nigerians and the industry. All these and more were addressed in an Exclusive Interview which NBRI NEWSLETTER held with **Engr. Dipo Asafa**, a one-time Commissioner in Lagos State, a one-time Chief Executive of Lagos State Development and Property Corporation (LSDPC) and now a key player in Estate Development in Nigeria.

This Stakeholders' Forum Edition is no doubt a must-read. I invite you to come along and enjoy it.

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NBRRI ORGANIZES STAKEHOLDERS' FORUM

The Nigerian Building and Road Research Institute (NBRRI) organized a Stakeholders' Forum which took place on the 24th and 25th May 2011 at Ladi Kwali Hall, Sheraton Abuja Hotel. The aims were among others to

- Actualize the desire of the Management under the new Director-General to rebrand, re-engineer, re-invigorate NBRRI in line with its Vision, Mission and Mandate, and to enable NBRRI refocus its activities
- Bring together all stakeholders in the construction industry and create synergy for better working relationship for the growth of the industry.

The theme of the Forum was "VISIONING FOR THE FUTURE: Bridging the Gap between Building and Road Research and Stakeholders"

The occasion, which was declared open by the Honourable Minister of Science and Technology, Prof. Mohammed Ka'oje Abubakar, FAS, was well attended by a wide spectrum of Stakeholders' in the construction industry. These included technocrats, professionals and professional bodies in the Built environment, the academia; researchers; security and paramilitary agencies; Government establishments; private sector; banking and financial institutions; the media, the general public, among others. Some of the professionals present included Engineers, Builders, Town Planners, Land Surveyors, Quantity Surveyors, Estate Surveyors and Valuers, Architects, Bankers, among others. The professional bodies included NIOB, CORBON, NSE, NIQS, COREN, NIA, ARCON, NITP, TOPREC and REDAN. Other agencies present included but are not limited to the Bank of Industry (BOI), FHA, FMLHUD, FCT, NEPAD, FERMA, etc.

Five technical Papers from eminent scholars and professionals were presented. These elicited discussions and deliberations which gave rise to several suggestions and recommendations on how to move NBRRI forward through a co-ordinated and systemic synergy between NBRRI and all Stakeholders' in the industry. At the end of the programme, a Communiqué was adopted and issued.

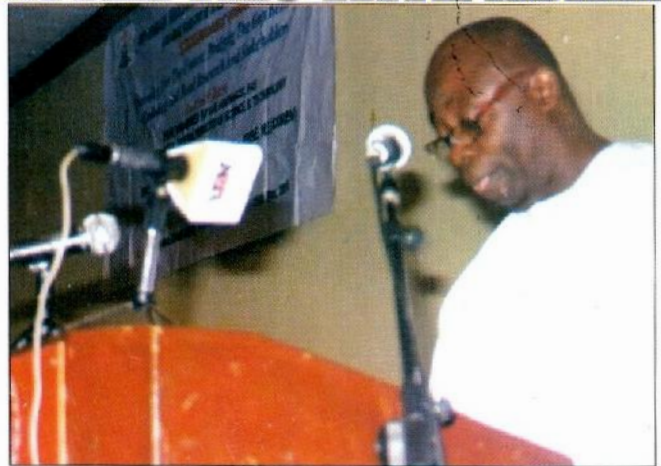
The papers delivered were on the following topics

- Achieving NBRRI Vision and Mission: Proposed Strategies and Challenges By Prof. Danladi Slim Matawal
- Promoting Effective Linkages Between NBRRI and Stakeholders in Construction Industry By Engr. Emeka Ezeh (Represented by Dr. J.A. Akanmu, DD, BPP)
- Options for Capacity Building and Funding Building and Road Research In Nigeria (Through Technology Transfer) By Engr. Umar B. Bindir (PhD), DG/CEO (NOTAP); Presented By Engr. Nwosa Lucky (Acting Director, Technology Acquisition Development)
- Framework for Efficient Development and Application of Pozzolana Cement in Nigerian Construction By Prof. (Mrs.) Natalie A. Anigbogu
- Building Collapse Phenomenon in Nigeria: The Role of NBRRI By Prof Stephen Pindah Ejeh

During the Forum, the Heads of Building Research Department, Engineering Materials Research Department and the Road Research Department of NBRRI presented overviews of the activities, achievements and challenges in the respective Departments. This also elicited useful deliberations and suggestions. At the end of the programme, a Communiqué was adopted and issued.

EKPENYONG CALLS FOR BETTER TIES WITH NBRRI

The Chairman of the Governing Board of the Nigerian Building and Road Research Institute (NBRRI), Engr. Dr. Obong Chris Ekpennyong gave the Welcome Address during NBRRI Stakeholders' Forum and called for better collaboration between NBRRI and Stakeholders in the construction industry. He noted that Science, Technology and Innovation (STI) is fundamental as a driving force for national development. He emphasized thus: "Nigerian dreams encapsulated in the 7-Point Agenda and Vision 20:2020 will only be a reality when science and technology is fully embraced". The Chairman acknowledged that research institutes in Nigeria, inclusive of NBRRI, have come up with a lot of technological innovations that are still lying on the shelves begging for nurturing. He, therefore, considered the hosting of the Stakeholders' Forum as timely and providing a critical window for stakeholders in the construction industry to get these research findings to the end users. He enjoined key players in the construction industry to look inwards and embrace the use of alternative building materials in their construction activities. This, he says, will not only give Nigerians a specific building identity but also



provide cost-effective and affordable houses for the Nigerian populace.

He implored and encouraged the private sector to partner with NBRRI and take advantage of the numerous technological innovations of the institute which he says are very useful in both the building and road sector of the economy.

HIGHLIGHTS OF KEYNOTE ADDRESS BY HMST

In his keynote address at the Stakeholders Forum, the Honourable Minister of Science and Technology (HMST), Professor Mohammed Ka'oje Abubakar noted that no nation can develop without giving premium to Science, Technology and Innovations. In order to lead the way for the nation, the Federal Ministry of Science and Technology (FMST) evolved a new Science, Technology and Innovations Policy in line with international best practices but with direct relevance to the Nigerian environment. The Policy was ratified recently by a broad spectrum of Stakeholders and adopted by the National Council on Science and Technology in May 2011.



Former Hon. Min. of Science and Technology,
Prof. Mohammed Ka'oje Abubakar At the NBRRI Stakeholders' Forum

The Minister added that the Government of President Dr. Goodluck Ebele Jonathan, taking cognizance of this, had taken steps to encourage the commercialization of R & D products. He emphasized the need to re-position NBRRI and other Research Institutes to better address their mandates for the country's goal of economic development. He made emphasis on the accreditation of Research Institutes which will be undertaken by the Academy of Science.

The Hon. Minister observed that the role of NBRRI has a great impact on the life of Nigerians. He further said that FMST is blessed with an array of research findings and structures that can change the face of the country. But these have to be translated to viable and commercialisable products to benefit Nigerians. He explained that for the past two years, the FMST had worked assiduously to achieve this. The commercialisable R&D innovations have been compiled, investment profiles prepared and consultations held with Stakeholders including the Banking industry and financial institutions to move to the next level. The Honourable Minister however noted that the innovations have to be patented and said that the

National Office for Technology Adaptation and Promotion (NOTAP) has the mandate for this. He called on all Nigerians to be proud of what they have which, oftentimes, are of better quality instead of relying on commodities imported from China and elsewhere.

The Hon. Minister commended Mr. President and the Chairman of NBRRI Governing Board for the choice of the current DG/CEO of NBRRI from an array of candidates.

OVERVIEW OF PAPERS PRESENTED

The highlights of the five Papers presented at the Stakeholders' Forum are provided. The full Papers can be obtained on request.

PAPER 1: ACHIEVING NBRRI VISION AND MISSION: PROPOSED STRATEGIES AND CHALLENGES

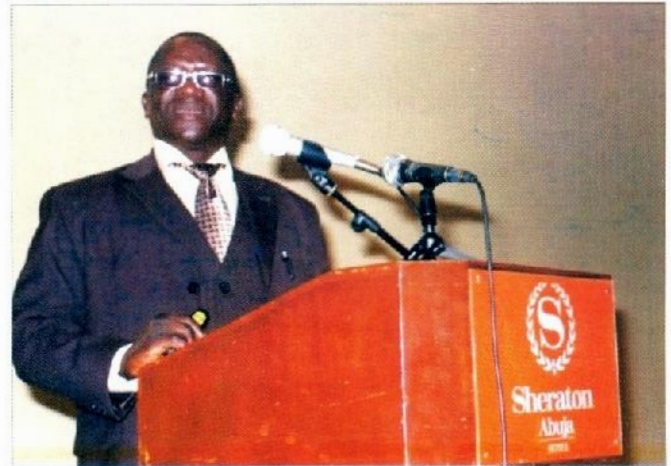
By Prof. Danladi Slim MATAWAL, DG/CEO, NBRRI

The Paper gave a brief history on and importance of the Nigerian Building and Road Research Institute (NBRRI). Information on the role of research establishments in building, roads/transport and construction materials sectors was provided. It also discussed extensively the global significance and practices of Research Institutes in Building, Road and Construction sectors while citing examples from Research Establishments worldwide. These included Building and Road Research Institute in Ghana, the Building Research Establishments and the Transport Research Laboratory both in the United Kingdom, the Central Building Research Institute and Central Road Research Institute both in India, Building Research Institute in Japan, European Network of Research Institutes as well as Research Institutes in Sweden, Israel, Australia, Singapore among others. It was emphasized that the practices in these research establishments are varied and some of the specific peculiarities include but are not limited to the following issues: Training and Accreditation, innovation Parks, Certification, Testing Building Systems and Materials, Consultancy, Fire Engineering, Disaster Mitigation, etc.

The paper further highlighted the importance of continuous discourse, dialogue and collaboration with 'STAKEHOLDERS' on the mandate, strategies for achievement and challenges of the NBRRI. The principal Stakeholders in Nigeria were identified as Federal, State and Local Governments, construction companies, professional bodies, professionals, etc. and they are expected to make necessary contributions for uplifting the performance of NBRRI and the Nigerian construction industry in general.

The paper proffered modifications to the current vision, mission and mandate of NBRRI with explanations which included the quest to improve and keep in tune with international best practices of Research Institutes the world over.

The paper discussed the various innovations of NBRRI. These innovations are contained in Technological Innovations Booklet and other publications of the Institute along with the



organizational profile, mission and direction. While NBRRI has made significant progress (which was extensively discussed) in Consultancy and Extension Services, Testing Building and Road Construction Materials, Building Technology Innovation for Brick and Tile production, Labour Based/Light-equipment supported Rural Feeder Roads and Community Skills Acquisition Centres, the Institute has no record in Certification and Licensing. Some on-going projects in the Institute were presented.

Some strategies for achieving the vision and mission of NBRRI were proffered and discussed. These included commercialization of NBRRI Technologies, BREM Technology, Certification, Training and Accreditation; Green Buildings, Green cement. The Paper concluded by recommending the following strategies:

- Effective dissemination of research outcomes
- Raising the profile of NBRRI
- Green Buildings/Materials Research
- Ensuring a more conducive working environment
- Consolidation of on-going research
- Promoting NBRRI in critical role as research outfit for publicizing and commercialization of research
- Supporting active development of curriculum and facilities for CPD, laboratory technologist/artisan training to build capacity of professionals
- Promoting active development of codes of practice and specifications in collaboration with professional bodies, tertiary institutions, SON, Governments and other cognate research organs.
- Linkages, collaboration with cognate agencies and organs on innovative R & D in Roads, Buildings and construction sector
- Identifications and development of state-of-the-art equipment and methods for Nigerian laboratories
- Improving quality of life through publication for the literate and extension services for rural people.

PAPER 2: PROMOTING EFFECTIVE LINKAGES BETWEEN NBRRI AND STAKEHOLDERS IN CONSTRUCTION INDUSTRY

By Engr. Emcka M. EZEH, DG/CEO (Bureau of Public Procurement, Abuja (Delivered by Dr. J.O. Akanmu, DD, BPP)



The Paper noted that the developed world is changing from an industrial economy based on steel, automobiles and roads to a new economy which he said is based on silicon, computers and networks. Nigeria is however blessed with numerous natural resources that needed to be tapped and processed for use in any form.

The Paper opined that the high cost of building and road construction materials has affected the nation's economy badly due to the limited or no attention paid to the use of local raw materials within the country; which can also generate employment and reduce cost of building and road construction materials. The Paper proffered that if Nigeria wants to get it right in the development of local raw materials for industrial output, we must adopt the principle of Total Quality Management approach in the use of locally produced raw materials for human use which the Japanese adopted after the Second World War

The Paper discussed the emergence of NBRRI and emphasized the need for it to re-double its efforts in carrying out its R&D responsibility in the area of building and road with emphasis on increasing local content and quality for the benefit of Stakeholders. These Stakeholders which spread across the entire institutions in Nigeria were identified. Furthermore, the need for effective linkages between NBRRI and the Stakeholders were exhaustively discussed. To create the needed linkages, the Paper suggested that NBRRI must act very fast in taking the following steps

- **Import duties:** Steps should be taken to ensure that the importation of construction materials that can be sourced locally are either banned or import duties increased; and the additional proceeds channeled to R&D in NBRRI
- **Raw Material Development:** NBRRI to promote construction materials production units in rural areas through SMEs and at cottage level. NBRRI should effectively Liaise with Building Materials Manufacturers Associations in the country
- **Human Capacity Building for the stakeholders:** NBRRI should initiate capacity building

programmes for all categories of stakeholders.

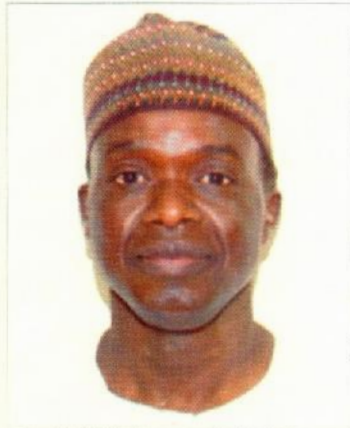
- **Formulation of Standards for Local Building Materials:** NBRRI should work with Standards Organisation of Nigeria in formulating standards for local building materials (sandcrete blocks, floor tiles, wash hand basin, electrical cables, steel bars, cement production and many more).
- **Knowledge-Based Stakeholders:** The Institute should focus on technical competence and professional integrity
- **Code of Ethics for the Stakeholders:** NBRRI should liaise with various professional bodies to uphold and implement the ethics on any stakeholder that acts at variance with the professional codes and ethics. This will sanitize the conduct of the stakeholders.
- **Create Road and Building Construction Materials Data Base for the country :** NBRRI should liaise with Standards Organisation of Nigeria, Federal and State Ministries of Works and Housing, Universities and Polytechnics to collate all data on road construction and building materials and develop a data base.

The Paper opined that effective linkages between NBRRI and Stakeholders' will lead to greater patronage of made-in-Nigeria goods, job creation, youth empowerment, accelerated socio-economic growth, enhanced self-reliance in building and road technology, etc. It was emphasized that Nigeria stands at a cross road faced with only one important decision to make; that is to implement the use of locally made materials or continue to enrich the economy of other nations by dwelling in continuous importation of building and roads materials that can be produced locally. For Nigeria's industrialization, research and development efforts must be geared up and given more focus in order to reduce high cost of building and road materials.

Finally, the Paper reiterated the need to ban the importation of cement, bitumen, steel bars, etc. To achieve this, existing moribund cement plants in the country, the Ajaokuta Steel Complex, the Steel Rolling Mills in Nigeria and other industries engaged in the production of building and road materials should be rehabilitated; and more efforts be placed on R&D in building and road construction. NBRRI was advised to champion the cause of completing the Ajaokuta Steel Complex for possible realization of availability of local products derived from local sources.

PAPER 3: OPTIONS FOR CAPACITY BUILDING AND FUNDING BUILDING AND ROAD RESEARCH IN NIGERIA (THROUGH TECHNOLOGY TRANSFER)

By Engr. Umar B. BINDIR (PhD), DG/CEO (NOTAP); Presented by:
Engr. Nwosa Lucky (Acting Director of Technology Acquisition Development)



The paper defined "capacity" as "the ability of individuals, institutions and societies to perform functions, solve problems and set and achieve objectives in a sustainable manner." In line with this

definition, "capacity building" or capacity development" was described as the task of establishing human and institutional capacity. This could be achieved through:

- Staff training and re-training
- Provision of state-of-the-art equipment
- Study tour of similar organizations in other countries
- Conferences, Workshops, seminars, etc
- Technology transfer

The paper focused on technology transfer which could be achieved through formal and informal means, noting that effective technology transfer would take into consideration, the following critical factors which were discussed. These are:

- Technoware, human ware, orgaware, infoware
- Cost of technology
- Terms of transfer
- Technological capability of recipient
- Political and cultural environment
- Technology transfer framework
- Market size

Technology transfer was defined as the flow of applicable knowledge, skill, capability, expertise, equipment or facility for manufacture, construction, management, processing or production of a device, product, system or services from one location, sector or activity to another within a specific time frame

and could be done through local or foreign avenues.

The local avenues include:

- University/Polytechnics Education
- Students Industrial Attachment
- Skills acquisition through apprenticeship, and
- On the job training of workers.

The foreign avenues on the other hand, include:

- Licensing
- Purchase of industrial property rights
- Acquisition of capital goods
- Technical assistance agreement.
- Turnkey contracts
- Joint venture
- Consultancy management

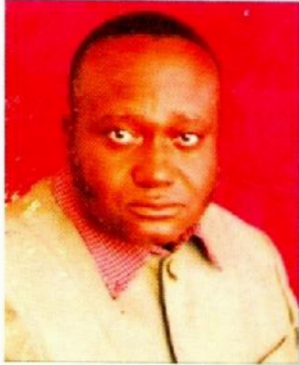
Various challenges confronting technology transfer at the input stage, the process stage and the output stage were pointed out and the important role that NOTAP could play in technology transfer were itemized in the Paper.

In conclusion, the Paper suggested the following actions as a way forward for NBRRI capacity Building and Funding through Technology Transfer:

- SWOT analysis of the operations of NBRRI including the quality of its entire workforce with a view to coming up with areas that require improvement.
- Identification of marketable Building and Road Technology and plan to acquire
- Planning to transfer any of its developed technologies to identified clients to raise funds
- Awareness creation on the activities of NBRRI
- Regular training and retraining of its workforce
- Public Private Partnership with relevant organizations
- A review of NBRRI's enabling Act to reflect current realities in the Building and Road sector in the country

PAPER 4: BUILDING COLLAPSE PHENOMENON IN NIGERIA: THE ROLE OF NBRRI

By Prof. Stephen Pindah EJEH, Dean of Engineering, A.B.U. Zaria



The Paper defined building as a structure with a roof and walls such as a house or a factory. The walls may include columns, beams to support floor slab, down to foundation which transfer the load from the superstructure to sub-structure or bedrock. For

a Layman, collapse can be defined as a suddenly fall down to give away or sudden failure/fail suddenly and completely. When collapse occurs, there is little or no repair to restore to normalcy or completely.

Thus building collapse phenomenon in Nigeria can be said to be sudden failure of residential, offices and factory structures or buildings leading to loss of materials as well as human lives without actually knowing the conditions or situations leading to such failure immediately. Research work on such buildings can lead to finding solutions/reasons as to the collapse.

The Paper gave an overview on the aims and objectives of structural design, which is to achieve a structure or building that fulfils the requirements of a client at a reasonable cost. The objective of the design is to achieve an acceptable probability that a structure will not become unserviceable in its life time. The Paper further explained that a structure is usually designed for ultimate limit state and checked for serviceability limit state. Usually, damage from collapse is much. Therefore the ultimate limit state designs are not acceptable like in others. It was noted that limit state designs are based on the application of the concept of probability and is based on the application of statistics to the variations that occur.

The paper asserted that in design, the designer must be a qualified registered Engineer with COREN and must have paid his practicing fees up to date. Every design must be stamped with COREN stamp.

The Paper emphasized that a good design with good detailing without a sound supervision by the

designer (consultant) is equally useless as this could lead to sudden collapse. Consequently, in construction, there should be qualified Engineers on site for supervision to ensure good mix and use of appropriate equipment and curing at the right temperature and correct placing of reinforcements among others. These are vital for good and durable structures.

Case histories of building collapse in Nigeria spread across the six geopolitical zones of Nigeria were presented. It was noted that only few buildings/structures in Nigeria actually involve registered engineers to supervise the projects. Furthermore, the use of substandard materials for construction was considered as a major reason accounting for building collapse in Nigeria. The Paper however noted that not all cases are reported in the media.

The paper mentioned that many people of various professionals give different reasons why buildings collapse in Nigeria. Mention was made of Orumu's studies in Port Harcourt, Daramola and Ayo Vaughan's studies on building collapse in Lagos as example. Lagos alone accounts for 60% of building collapse in Nigeria. Generally, Lagos and Port Harcourt topped the list of cities with building collapse and the months of June and July have more cases of building collapse.

From the various studies carried out, the Paper concluded that the reasons/causes for building collapse include: -

- Use of substandard materials
- Use of quacks and unapproved drawings, etc.

Studies between 2000 and 2010 indicate that over 300 deaths were confirmed and many socio-economic losses were incurred.

The Role of NBRRI: The paper emphasized the need for NBRRI to liaise with higher institutions as well as COREN to carry out detailed research on building collapse and come out with comprehensive results that could be used to modify codes and standards for application within Nigeria. NBRRI can also liaise with SON to test and check materials imported into the country for the

Contd. page 10

PAPER 5: FRAMEWORK FOR EFFICIENT DEVELOPMENT AND APPLICATION OF POZZOLANA CEMENT IN NIGERIAN CONSTRUCTION

BY Prof. (Mrs) Natalie A. ANIGBOGU, Dept of Building, University of Jos

The paper discussed the relevance of cement in construction and provided statistical details on world consumption of cement. It also enumerated the consumption and purchasing cost of cement in Nigeria. The major challenges affecting the production of cement in the country and the quality of cement in Nigeria were presented. The various brands of cement in Nigeria such as Ashaka cement, Elephant cement, Burham cement, Dangote cement were discussed with emphasis on their quality.

The environmental effects of cement production were extensively discussed. The Paper suggested that concerns on the environment effect can be addressed by the use of supplementary cement materials, also called mineral admixtures which include natural pozzolanas like fly ash, ground granulated blast furnace slag and silica fume. With Portland cement, they can be used as blended cement.

The paper also gave a brief history of pozzolans and their applications in construction. Pozzolana was described as a material which when combined with calcium hydroxide exhibits cementitious properties. Properties and applications of pozzolanas were discussed. The extent of the strength development depends upon the chemical composition of the pozzolan. There are growing numbers of developing countries now using pozzolans in conjunction with lime or ordinary Portland cement in construction. The paper also enumerated raw materials from which artificial pozzolans can be made. These include clay

Paper 4 Contd.

construction industry. Knowledge of the soil for the entire country will also help in curbing the incidence of building collapse. NBRII should also be centrally located in Abuja for easy coordination.

The Paper concluded with the following notes:

- Building collapses are more common in Lagos, Abuja and Port Harcourt
- That 60% of the building collapse occur in Lagos state alone
- That 70% of the reported collapsed buildings stemmed from the use of quacks instead of professionals
- That 70%, 23.3% and 6.7% of collapsed buildings belong to private, public and



products, rice husk ash, fly ash, slag, silica fume, mine wastes etc.

The effect of pozzolan on strength, colour and weatherability were discussed. All cement substitutes have the dual benefit of economy and replacement of energy intensive Portland cement. The substitutes should be added to the concrete along with Portland cement rather than added as raw materials. Methods for an increase in the degree of pozzolana activity were discussed in the paper.

On a final note, strategies for efficient development and applications of pozzolans in the Nigerian construction industry were proffered. These strategies could form a framework that will promote the development of a whole new industry that would not only support the progress, development and modernization of the Nigerian construction industry, but would also open new opportunities for affordable housing delivery and national industrial development.

corporate organizations respectively.

- Use of poor materials as well as poor workmanship by these quacks is also responsible for building collapse
- 70% of collapsed buildings do not have government approval prior to the building development
- 80% of contractors and 90% clients indicate that there is no supervision or quality control existing on building sites prior to collapse
- As an Institute with mandate for research work, NBRII should work with professionals in higher institutions to carry out research in liaison with COREN, Highway Division, FMWH, SON, Pavement Evaluation Units and FERMA, among others.

REACTIONS FROM STAKEHOLDERS

Most Stakeholders in the Nigerian construction industry including professionals, professional bodies, contractors, consultants, even technocrats in Government and the private sectors have been paying lip service to the use of alternative building materials particularly stabilised bricks and blocks which they preach about. We should practice what we preach, go by example and build our houses with alternative building materials; so that others will have enough confidence to patronize these materials.

..... Prof N. A. Anigbogu, Department of Building, University of Jos



NBRRI should double her efforts in publicizing her research findings. Also, the Federal Government should have a strong linkage with the Building Materials Manufacturers and NBRRI so that the Institute's research findings can be better employed in mass housing delivery. All hands should be on deck to bring NBRRI products to the public for adaption.

..... Engr. O.A. Ajibola, FNSE, President, Nigerian Society of Engineers (NSE)

NBRRI is faced with poor funding. The Honourable Minister and indeed the Federal Government should address this issue. Let Science, Technology and Innovations drive Nigerian economy. The absence of the major construction companies at the Stakeholders' Forum is surprising and regrettable. There is need to develop specifications on NBRRI innovations and products. We in ARCON offer our assistance in this regard.

..... Arc Umaru Aliyu, FNIA, President, Architect Registration Council of Nigeria (ARCON)



NBRRI has made significant achievements in the fabrication of interlocking block making machines. But Interlocking Blockmaking Machines are still being imported from South Africa. This is regrettable and something should be done about this. Furthermore, there should be increased collaboration between NBRRI and Stakeholders. Strategies should be put in place to enhance partnership between the Institute and relevant agencies and professional bodies.

There is need for all the professional Regulatory bodies (Engineers, Architects, Builders and Town planners, etc.) to collaborate and find solutions to the phenomenon of building collapse in Nigeria

..... Engr. Mustapha Bulama, FNSE, President of Council on Registered Engineers in Nigeria (COREN)

The research work in NBRRI is commendable. NBRRI needs to be challenged further. Much work has been done in the areas of walling materials. Further work should be done to improve on them most especially on the weight of laterite blocks. They should come up with hand tools which are critical in building construction to improve the performance and productivity of masons. The rural access road technology should be pursued more vigorously. NBRRI needs to be properly funded. That major contractors in the building industry are absent at the Stakeholders forum is lamentable. More emphasis should be placed on the Popularization and enlightenment of Stakeholders and the public on NBRRI activities.



A quack is anybody practicing what he/she is not trained on. In other words, if a builder does the work of an architect, he/she is a quack. A quack is a person who is not trained or without University or Polytechnic education on his area of practice.

..... Builder D.D. Jambol, FNIOB, President of the Nigerian Institute of Builders (NIOB)



NBRRI should be congratulated for organising the Stakeholders' Forum. NBRRI should identify and relate more with Stakeholders including the Real Estate Developers Associations of Nigeria (REDAN), Building Materials Producers Association of Nigeria (BUMPAN), Community Development Associations, Local Governments, Schools Management Boards, Tertiary institutions, Universal Basic Education Commission (UBEC), National Board for Technical Education (NBTE), etc. in order to promote the massive use of alternative building materials in the construction of houses, classrooms, etc.

..... Anthony Okwa, Executive Secretary, Real Estate Developers Association of Nigeria (REDAN)

There should be capacity building for the production of interlocking blockmaking machine and indeed other machines developed at NBRRI. The Institute should collaborate with Agencies like, NASENI, PRODA and NBTI in the Federal Ministry of Science and Technology for the production and commercialization of its machines.

..... Engr. Yahaya S. Mohammed, Director, Technology Acquisition and Adaptation, FMST; Representative of the Permanent Secretary, FMST





NBRI should be commended for its achievements so far. However, the Institute should pay serious attention to the following:

- R & D in the utilization of bamboo, waste plastics, rice husk ash, etc.
- Resuscitating R & D exchange with at least the first generation tertiary institutions in Nigeria, especially those that produce construction professionals
- Employment, training and re-training of qualified research officers and artisans
- Conducting R & D in areas that are of particular relevance to the Nigerian situation

..... *Dr. I. K. Zubairu, Ahmadu Bello University*

Professionals are often exonerated and blames of collapsed building are heaped on quacks and contractors. Professionals should work closely and stamp out quacks. Synergy of professional bodies on the matter is the key. As professionals, bill boards should be mounted at every project site to clearly identify the professionals that are involved in such projects.

..... *TPLA.G. Ndirimbula, FNITP, President Town Planners Registration Council*



NBRI should strengthen its collaboration with NEPAD Nigeria in the 2- clusters (i.e. Science and Technology and Infrastructure Development clusters). As a facilitator, NEPAD will be willing to collaborate with NBRI in form of international funding in line with the mandate of the Institute. NBRI should liaise with Rural Access and Mobility Project (RAMP) in the Federal Ministry of Agriculture for more assistance in rural and access road technology.

..... *Engr. A.G. Abubakar, NEPAD Nigeria*

For effective mass housing delivery geared towards the reduction of housing deficit in Nigeria, there is need for Local and State Governments to be involved in housing delivery using alternative technology which are durable and cost-effective. More research efforts are needed to reduce cement content in building construction. This is very important due to the high cost of cement in the country.

..... *Prof. M. E. Ibrahim, University of Technology, Yola*

NBRI should be commended for its pro-activeness in organising the Stakeholders' Forum. The earlier collaboration of FCT with NBRI did not work out as expected. It is hoped that the situation would improve with the new DG/CEO. Also there should be improved collaboration and enlarged commercialization in respect of NBRI products.

..... *Mr. O. Kolawole DD, FCT Agency for S&T*

There should be active research on alternative cement as a viable construction material. With respect to road materials, stabilization materials should be researched on to improve on the suitability of poor quality soil materials.

..... *Engr. Dr. N. L. Obasi, Department of Civil Engineering, ESUT*

NBRI should collaborate with other Tertiary Institutions in the development of soil engineering maps.

..... *Engr. Dr. Bassey from ESUT*

NBRI should apply for land for mass housing development to construct demonstration houses and roads in Abuja, Lagos and major cities in Nigeria. Research findings should be adequately publicized. NBRI should liaise and collaborate with Federal Ministry of Works (FMW) and Federal Ministry of Land, Housing and Urban Development (FMLHUD) on matters relating to the built environment. NBRI should establish schools for training of artisans in the construction industry and also collaborate with the Ministry of Education with a view to introducing *Introductory Building Technology* courses in secondary schools. NBRI should consider organising an annual conference which all Stakeholders in the construction industry will look up to. NBRI should also conduct R&D on plastics, polymer, wire gauze, downstream petrochemical products e.g. foam, etc. as alternative building materials.

..... *Arch. (Sir) Anthony Ibekwe, FMLHUD*

GOVERNMENT MUST INTERVENE TO REDUCE HOUSING DEFICITENGR DIPO ASAFA

Engr. Ashafa is a quiet and unassuming personality who knows his onions. A professional Civil Engineer, Engr. Ashafa has had a lot of experience in the public and private sector. He was once an Assistant Director in the Federal Ministry of Works and Housing; a Commissioner for two different portfolios in the Lagos State Government; Sole Administrator of LSDPC in Lagos State among others. He is currently in the private sector with focused interest in real estate development. As a Council member of the S. O Fadahunsi (Housing) Foundation, he is the Chairman of the **NBRRI Endowment Trust Fund on Building and Road Research**. In spite of his busy schedule, Engr. granted this interview just after holding one of the meetings of the Foundation at NBRRI, Abuja. It was a frank exposé where Engr. Ashafa gave his candid views on various aspects of the Nigerian construction industry. It is quite stimulating and revealing. Please read on:

Q. Can we meet you, briefly sir?

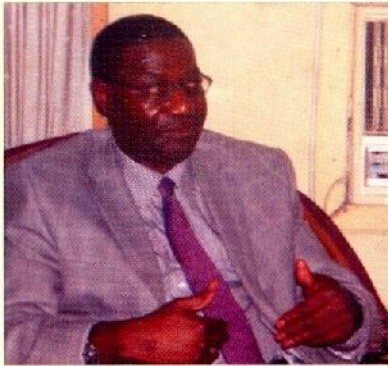
ANSWER: My names are Engr. Oladipo Asafa. I am a Civil Engineer by profession. I am currently into Engineering and Real Estate. I have experience in the Private Sector. I have experience in Government service during which I worked at the Federal Ministry of Works and Housing. I left that Ministry as an Assistant Director. Later on in my career, I became the Hon. Commissioner for Agric and Rural Development, and later the Hon. Commissioner for Environment and Physical Planning in Lagos State. Thereafter I became the Sole Administrator of Lagos State Development and Property Corporation (LSDPC) which is probably the largest builder and Manager of residential buildings in Nigeria. Right now, I am into the Private Sector. I am the Chairman of a company called *Solid Homes Limited*. This company builds houses for sale to the public. We have projects in Lagos and Abuja. I also have a Consultancy Engineering Services firm. I have a construction company in which I am Chairman and Managing Director. I am very much interested in development of houses for the masses. As a result of this, I became a Council member of a Non-Governmental Organisation, S.O. Fadahunsi (Housing) Foundation simply referred to as "SOFF". The Foundation is in partnership with NBRRI on a project *Endowment Trust Fund for*

Building and Road Research to assist in raising funds so that NBRRI can enhance its capacity to carry out meaningful research that can lead to more development, cheaper houses for the masses and better infrastructure for the country. That is why I am here (NBRRI office in Abuja). We just finish a meeting of the planning committee of the *Endowment Trust Fund for Building and Road Research* which is managed by SOFF and of which I am the Chairman.



Q. How can this Endowment Fund benefit Nigerians?

ANSWER: Very frankly, this is a country where sometimes we don't get our priorities right. We are often referred to as a developing country. We need a lot of research that can take us out of this developing status. Let me give you an example. If you go to any building materials market anywhere in Abuja or any part of Nigeria, you are probably going to find out that not less than 70% of the market items are imported; which is a serious foreign exchange loss to the nation. This is a serious issue. This even applies to some of the materials that are made in Nigeria, like paint, maybe roofing sheets and so on. You may find out that most of the raw materials for these made in Nigeria goods which are up to 90% are imported. Most of the aluminium for roofing and windows are sometimes from abroad. Also, most of the chemicals for paints production are imported. These are areas where a properly funded NBRRI can do a lot of research and come out with beneficial results. We are better endowed with resources than the European world that we get all these things from. Just look at the ground outside there; the ground can be dug for 12 months of the year while some places abroad are covered with ice for some months of the year. Yet they dig their ground and bring out raw materials used in making end products which we buy. This is because they have done research on their materials there and they have used what they have to make their own products. We need to make use of



what we have to make our own products. Today all the houses we build are built with sanderete blocks and concrete blocks, and the main component of these blocks are cement. But again

cement is a problem in Nigeria in spite of the abundant natural deposits of limestone in Nigeria. Some of the components in producing cement locally are imported. There are alternatives these products. We can build houses with the bricks. If you go to London, most of the residential houses (I believe about 90%) are built with bricks. This Institute (NBRRI) has done a lot of research but people have not been able to adapt these because sometimes you need a lot of money to fine tune the research. Also to publicise the research results, we need a lot of money. Maybe if the Government had more money and better interest, they would have taken the research innovations from the Institute and build say 3 or 4 brick manufacturing factories or facilitate the setting up of many SMEs in alternative building materials production all over the country. People will start using bricks and the cost of cement will go down.

“This Institute (NBRRI) has done a lot of research but people have not been able to adapt these because you need a lot of money to fine tune the research (and) publicise the research results”

Research Institutes like NBRRI which evolve technologies for utilising our local resources will help the country to develop faster. There will be decrease in the cost of building with concomitant decrease in the cost of Government spending; and the economy will be better for it.

Q. In other words, S. O. Fadahunsi (Housing) Foundation is advocating for the use of locally sourced construction materials?

ANSWER: Yes, S.O. Fadahunsi (Housing) Foundation is advocating for housing for

everybody. What is the greatest impediment for the provision of housing for everybody? Not all of us can afford to buy houses. Not all. The average Civil Servant who progressed in his career from GL 08 to the post of a Director (on GL: 17) cannot afford to buy a decent house by himself except he has something else doing. This is the reality and it is a bad situation for any country. It is a situation that can lead to corruption and many other vices.

The average Civil Servant who progressed in his career from GL 08 to the post of a Director (on GL 17) cannot afford to buy a decent house by himself except he has something else doing. This is the reality and it is a bad situation for any country.

So, to make everybody have access to houses, what do you do? One of the ways is to try to make the houses cheaper. With research done on alternative building materials, the cost of housing provision will be lower and more people will be able to afford it. There are other issues such as mortgage. One of the fundamental mandates of S. O. Fadahunsi (Housing) Foundation is to promote affordability and availability of houses to the average Nigerian. One way of achieving this is to collaborate with organisations like NBRRI that can provide practical remedies that can assist in bringing down the cost of building houses.

Q. Talking about the high cost of cement, recently Mr. President gave an ultimatum of one month for the prices to be reduced. What is your stake in this?

ANSWER: I pray to God that the intervention of Mr. President will help. But, it is not just an issue of giving ultimatum. Prior to this, you will recall that some cement manufacturers were crying that one of the reasons their prices have gone up is because Government taxes have gone up. Unless all the myriads of issues such as Government taxes, port charges for their raw materials, operational costs especially relating to availability of power, haulage costs relating to road condition in the country, etc., are adequately and properly addressed, the cost of cement will not significantly come down. So, there is a lot to do other than issuing orders. As somebody who builds houses, if you want to sell your product very fast, the best thing to do is to minimise your profit.

“Unless all the myriads of issues

(such as Government taxes, port charges, operational costs especially relating to availability of power, haulage costs relating to road condition in the country, etc., are adequately and properly addressed, the cost of cement will not significantly come down”

All of us involved in housing provision including cement manufacturers, etc. collect bank loans for our operations. If you raise your price very high to the extent that people don't buy fast, the profit you make may be eaten up completely by interest on the loans. I don't think the manufacturers of cement who increased their price did that unilaterally. Several issues have to be addressed.

QUESTION: Sir, it is no longer news that majority of Nigerians lack adequate shelter. In fact, mainstream opinion is that, the housing deficit in the country has risen from 16million to 18 million units in the last few years. What would be the immediate and effective remedy to this problem?

ANSWER: I thank you for talking about the deficit in housing and the increase in demand of houses. It should be increasing because our population is increasing at a rate faster than the increasing stock of houses. To be frank with you, we have to categorise houses into different types. Apart from the economic state of the low, medium and high income earners, I believe Government has to directly intervene to address the issue of housing deficit. By direct intervention, I mean Government must deliberately provide assistance to property developers such that they can provide cheaper houses. For example, there is a programme in the Federal Capital Territory (FCT) for which I commend the Ministry of Federal Capital. The Minister of FCT invites developers and gives them land for estate development. The land is actually free to the extent that there are some specifications that must be met. While the FCDA provides the primary infrastructures, the land must not be sold but must be used to provide houses of defined specification for the masses. That means, if they give you land in the bush, FCDA will construct the access roads, connect water, electricity, etc. All the developer does is provide the houses.

“I believe Government has to directly intervene to address the issue of housing deficit”

Such a programme can assist in lowering the prices of houses. If the developer has to provide the infrastructures in addition to providing the houses, this will lead to higher cost of each house. So, I commend such a programme. I think Lagos state has such a programme. I commend it too.

I also would like Government, if possible, to engage directly in building houses. I know a lot of people are not happy with this. But I think if Government engages in indirect building of houses, it will assist. I would be very glad to see Government building houses to sell at acceptable mortgage rates to public officers to start with. The private sectors should also take care of their own people. Some State Governments are doing this. I will like to see that happen everywhere.

“I also would like Government, if possible, to engage directly in building houses. I know a lot of people are not happy with this. But.... Government (can) build houses to sell at acceptable mortgage rates to public officers to start with.”

Let it be such that they can build houses, maybe a two-bedroom bungalow that won't cost more than N3 million; and they tell you to look for N300,000 that is 10% of 3 million. With this deposit, you acquire the house and pay the balance over 25-30 years. If during the process of paying the balance the person dies, the family of the deceased takes over the mortgage. The family is housed. All these can contribute to make houses cheaper and more affordable to the people. Of course, just like Mr. President said, the cost of cement is high. Cement in Lagos is now about N2,500 a bag. About six to seven years ago, it was about N800 a bag. This means there is a 300% inflation which makes things worst.

QUESTION: By the contribution of the private sector to the alleviation of housing problems in Nigeria, i.e. by the provision of rentable houses, do you think their efforts have aggravated or reduced the problem?

ANSWER: Let me state here emphatically that, without the private sector and individual developers, the housing problem in Nigeria will be so enormous that there'll be chaos in the country. Of the newly developed houses, about 90% are developed by the private sector or individual developers compared to Government. That should tell you that if there is no private sector or individual developer, increment in housing provision will be grossly insignificant. So the private sector is vital. Talking about rent and the private sector, most of them are not charity organisations. It is a free economy. Many of them also build to sell not just to rent. It is an investment. Just like somebody decides that he wants to make bread and sell, another person decides to build houses and rent or sell. While I agree that rental prices particularly in Abuja are getting prohibitive, but then the solution will be to provide more houses. With this the rental prices will reduce. But, the rent is high because there is dearth of houses and the population of Abuja is increasing. It is simple economics of demand and supply. When the demand is greater than the supply, the supplier may unreasonably put up his price high. So the solution is for Government to promote massive construction of houses, provide all kinds of assistance, subsidies in building materials, development of infrastructures, etc.

“...the rent (in Abuja) is high because there is dearth of houses and the population of Abuja is increasing. It is simple economics of demand and supply”

Government should also improve another vital sector which is the mortgage sector. As we speak here now, there is nobody in London or America that has money to pay for a house in cash. But here, we are forced to cough out money 100% because of the lack of revenue of our mortgage sector. There, they cough out 5%, 10%. They just look at your work. If you have a good work that can pay continuously the mortgage rate, they give you a mortgage and you move in. So, there's a lot to be done to improve the sector. The Government must do everything to make sure there is massive construction going on as far as houses are concerned.

QUESTION: Finally, from the colonial times till date, Nigeria's housing problems still remain intractable. How can Nigeria attain a sustainable housing development?

ANSWER: Well, most of the things that have been said contribute to sustainability. We talked about cheaper building materials, which lead to sustainability. Once you have cheaper and durable building materials, people will make sure their houses are built with better quality materials. When you have a house built with better building materials, the lifespan of the house will be longer.

“Government should also improve another vital sector which is the mortgage sector..... our mortgage sector is in two tiers, one provided by commercial banks at commercial rate, which is not mortgage per se. If you take any mortgage at 20% per annum interest, your next four generations will still be paying it. But there is another tier called the National Housing Fund Loans. The interest rate there is low, but the bureaucracy involved is killing.”

When you have a good mortgage system in place, it means there is no fear. I tell you very frankly, I was in Ghana. I observed that Ghana has developed a very strong mortgage system such that the average worker can easily have access to mortgage. If you have been working for 2-3 years and there is the prospect of your continuing work or the sustainable future is there, you can go to a housing estate developed by a private person. After making your choice, you go and complete a form with some mortgage provider. Oftentimes, in one week or so, you can get the house. That is not the case yet in Nigeria because our mortgage sector is in two tiers, one provided by commercial banks at commercial rate, which is not mortgage per se. If you take any mortgage at 20% per annum interest, your next four generations will still be paying it. But there is another tier called the National Housing Fund Loans. The interest rate there is low, but the bureaucracy involved is killing. The bureaucracy involved is such that you may apply today and not get it in 2 years time. So, all these things have to be streamlined to create a sustainable atmosphere. Make houses cheaper, make mortgage available, make supply of building materials cheap and available and use alternative building materials. That will make the prices go down, because Government has the many resources and machinery in bridging them. Once these things are created, you have a sustainable situation.

PRESENTATIONS BY HEADS OF RESEARCH DEPARTMENTS IN NBRRI

At short notice, the Heads of the Building Research Department, the Engineering Materials Research Department and the Road Research Department and of NBRRI made impromptu presentations at the Forum.

Building Research Department

The HOD gave an overview of the activities and achievements recorded in the Building Research Department in recent times. He suggested that with the housing deficit standing at 16m units, the current housing policy whereby real estate developers provide housing on a cash and carry basis should be looked into and discouraged. He further recommended that quality, price and short supply of cement in the country has to be looked. The need for a deliberate policy by Government to encourage the development and proliferation of mini cement plants and production of alternative cement was emphasised. He also stated that the collapse of buildings in Nigeria remains a great challenge and concern to Nigerians and NBRRI is currently rising to the challenge with the collation of information and study of this menace comprehensively. He made mention of the current study being carried out by NBRRI to study the Collapsed Building in Ikeja area of Lagos State
..... *Mr. Earnest Iheonu, HOD, Building Research Dept., NBRRI.*

Engineering Materials Department

The HOD reported that the Department was established in 1992 as a result of the expanded mandate of the Institute to include Engineering Materials. The Department is charged with the responsibility of producing alternative materials for NBRRI products. Giant strides have been made in the past few years with

the design and fabrication of high tech Machines for the production of quality alternative building materials.

The HOD further explained that one of the major challenges faced by the Department and the Institute at large includes the lack of Machine Shop in the Institute to guarantee precision-driven machine fabrication. Stakeholders were informed that the Department is presently involved in the fabrication of cube moulds which are at advanced stage of completion. When completed, there would not be the need for the importation of cube moulds for use in yje construction industry. (As at the time of going to press, the cube moulds have been fabricated). In addition to this, the Department has developed multi-purpose kiln for the production cost-effect lime, blended cement and firing of Roof Tiles. Recently, the semi-automated machine for the production of interlocking paving stones for road construction was developed and is undergoing field trials.

..... *Engr. Friday I. Apeh, HOD, Engineering Materials Research Dept., NBRRI./*

Road Research Department

The Director of Road Research Department itemized the various sections of the Department and their functions. He explained that there are about 200,000 Km of Federal, State and Local Government roads in Nigeria. Safety on these roads constitutes major challenge with about 50 deaths occurring on Nigerian roads on a daily basis. Furthermore, he stated that travel time is increasing due to the bad state of our roads.
..... *Dr. Soibi DeDe, Director, Road Research Dept., NBRRI.*

VIETNAMESE INVESTORS VISIT NBRRI

A Team of Vietnamese investors from *Viglacera Trading Joint Stock Company, Vietnam* paid a visit to NBRRI. The two-man team comprising of Messrs. **Nguyen Van Dien** and **Le Phuong Nam** informed the Institute that they were in Nigeria to undertake a research on the country's building materials' market and to study the Nigerian building construction industry. They further expressed their desire to fashion out a working relationship with the Institute and to create linkages between Nigeria and Vietnam.

In his welcome address and remarks, the DG/CEO of NBRRI, Professor Matawal intimated the team that since inception, NBRRI has through its concerted efforts developed a lot of technologies in the areas of local building and construction materials, architectural designs to suit the Nigerian environment, amongst

others. He expressed optimism that the visit by the team will no doubt be of immense benefit to the Institute, and in general the two countries, "We are going to look into the avenues of this partnership for the benefit of Nigeria, the Republic of Vietnam, for the benefit of NBRRI and the Viglacera Trading Company" Professor Matawal said. In order to ensure a proper and more effective partnership and support, the DG/CEO immediately assigned two contact persons from the Consultancy Extension Services Department and the Planning and Information Technology Department to attend to all enquiries and further transactions with the team on behalf of the Institute.



Left to Right: Mr. Nguyen Van Dien receiving NBRRI Technological innovations booklets from Prof. Daviladi S. Matawal, DG/CEO, NBRRI during the courtesy call on the Institute.

The visiting team was conducted round the Institute and introduced to some of NBRRI technologies and Machines within the office premises and at the Institute's display centre.

COMMUNIQUE OF NBRRI STAKEHOLDERS' FORUM

COMMUNIQUE OF THE NIGERIAN BUILDING AND ROAD RESEARCH INSTITUTE (NBRRI) STAKEHOLDERS' FORUM WHICH TOOK PLACE AT LADI-KWALI HALL, SHERATON HOTEL, ABUJA BETWEEN 24TH-25TH MAY, 2011

THEME: "VISIONING FOR THE FUTURE: BRIDGING THE GAP BETWEEN BUILDING AND ROAD RESEARCH AND STAKEHOLDERS"

A. INTRODUCTION

NBRRI Stakeholders Forum took place from the 24th to 25th May 2011 at Ladi Kwali Hall, Sheraton Abuja Hotel, and was graced by the Honourable Minister for Science and Technology, Prof. M. K. Abubakar, FAS. The Permanent Secretary was represented by the Director, TAA of the Ministry and the Chairman of NBRRI Governing Board Engr. Dr. Obong Chris Ekpeyong who gave the Welcome Address.

The Honourable Minister of Science and Technology in his keynote address emphasized that the nation cannot develop without Research, Development and Innovation in Science and Technology. The Government of President Goodluck Ebele Jonathan in taking cognizance of this has taken steps to encourage commercialization of R & D products to reposition NBRRI and other Research Institutes to better address their mandates for the country's goal of economic development. He also emphasized the accreditation of Research Institutes which will be undertaken by the Nigerian Academy of Sciences.

Stakeholders present included NIOB, CORBON, NSE, NIQS, FERMA, ARCON, NIA, COREN, NITP, TOPREC, the Bank of Industry, the FHA, the Academia, REDAN and the FCT among others. However, it was observed that major players in the construction industry such as Julius Berger, Dantata and Sawoe, Bullet, Setraco, CCECC were absent from this Forum.

Papers were delivered by eminent scholars, captains of industry and experts on the following topics:

- i) Achieving NBRRI Vision and Mission: Proposed Strategies and Challenges
- ii) Promoting Effective Linkages Between NBRRI and Stakeholders in Construction Industry
- iii) Options for Capacity Building and funding Building and Road Research In Nigeria (Through Technology Transfer)
- iv) Framework for Efficient Development and Application of Pozzolana Cement in Nigerian

Construction

- v) Building Collapse Phenomenon in Nigeria: The Role of NBRRI

DELIBERATIONS

The Forum recognized the efforts of both Governments and private individuals in housing delivery and road construction in Nigeria. It also noted the acute shortage of accommodation in both rural and urban centres and the deplorable conditions of our roads and observed that:

- i. There is the need for capacity building in the area of applications and production of NBRRI technological innovations
- ii. NBRRI research products need to be standardized in line with International requirement.
- iii. There is need for effective dissemination of research findings and collaboration with relevant stakeholders.
- iv. There is acute shortage of accommodation in both urban and rural areas of Nigeria, because housing has not been recognized as an essential social service.
- v. The cost of construction of buildings has gone beyond the reach of an average Nigerian due to high cost of imported building materials and construction technology. It was also observed that there are appropriate indigenous building technologies that can drastically reduce the cost of construction
- vi. Research and Development (R&D) in the construction and road sectors is inadequately funded.
- vii. Despite the poor funding of research activities, modest but significant achievements have been recorded by NBRRI in the development of appropriate building materials and road construction equipment using locally available materials as well as conducting researches valuable for housing and road development.
- viii. There is weak collaboration and partnership between NBRRI and stakeholders such as, Academia and Industry.

- ix. There is a dearth of qualified indigenous artisans and craftsmen in the construction industry. The Forum also recognized lack of adequate provision of laboratory equipment in Technical and Vocational schools to meet current and future manpower needs.
- x. NBRII should endeavor to patent her research findings and to disseminate information on them.
- xi. There is need to carry out further research in the use and application of substitute Cementing Materials.
- xii. NBRII should champion the training of skilled artisans and craftsmen for the construction industry including certification.
- xiii. There has been technological failure and inadequacies in building and road construction materials

B. RESOLUTIONS

In view of the above, the Forum resolved that:

- i. NBRII should liaise/collaborate with relevant Government agencies to establish Standards for their research products and to patent them with NOTAP.
- ii. NBRII should be empowered by law to certify the quality building and road construction materials in Nigeria
- iii. There should be deliberate government policy to promote the continuous development and utilization of existing technologies and materials. Governments at all levels should therefore lead the way in the use of alternative building materials and technologies for the construction of public facilities such as health centres, classrooms, barracks and markets, etc.
- iv. Government and industry should adequately fund R&D which should be market driven.
- v. A construction research fund, e.g. 1% of Custom and Excise Duties on all imported construction materials and equipment, as well as similar funds from the profit of construction companies should be set aside for R&D in NBRII.
- vi. The weak collaboration and partnership between NBRII and Stakeholders such as the Academia and the Industry should be strengthened for easy accessibility to research findings.
- vii. The lack of adequate provision of equipment in Technical and Vocational schools where available should be adequately equipped to

- meet current and future manpower needs. There is the need for NBRII to set up a school for the training of artisans
- viii. There should be strong public private partnership for full commercialization of research findings to reduce cost and create accessibility for usage in both rural and urban areas. NBRII needs to employ building marketers and a crop of fund raisers.
- ix. There is need for NBRII to create a platform for all professional bodies (COREN, NSE, CORBON, NIOB, NIQS, NIA, ARCON, NITP TOPREC, etc.) to collaborate and proffer solutions to building collapse in Nigeria and enforcement of the National Building Code
- x. NBRII should work closely with its Stakeholders for the promotion of Research, Development and Innovation (R, D & I). The Stakeholders include Engineers, Architects, Builders, Town Planners, Real Estate Dev. Assoc. of Nigeria, Building Materials Producers Assoc. of Nigeria, Community Dev. Associations, universal basic Education commission, National Board Technical Education, and National Universities Commission, FERMA, FCT, ETF, FHA, etc.
- xi. The Forum recognized the contribution of NEPAD in the utilization of our resources. NBRII is therefore encouraged to collaborate with NEPAD Nigeria to enhance its mandate.
- xii. There is need for NBRII to show interest in Ajaokuta Steel Complex because of the strategic importance of its end products to all constructions.
- xiii. The Forum recognized the need for NBRII to take the lead in the production and popularization of substitute pozzolana cement.
- xiv. There is need for NBRII to focus her research efforts on quality of buildings and road construction materials. This will assist in minimizing technological failure and inadequacies in building and road materials.
- xv. There is need for NBRII to reach out to Rural Access and Mobility Project (RAMP) in the Federal Ministry of Agriculture and Rural Development and similar donor funded projects.
- xvi. NBRII should endeavour to use ICT in her research activities.

C. CLOSING

Participants were grateful to NBRII, Press, Sheraton Abuja Hotel and all those who worked hard to make the event a success.

FMST REVIEWS NATIONAL POLICY ON SCIENCE, TECHNOLOGY AND INNOVATION (STI)

In its quest to produce a customized but comprehensive, development-focused and widely accepted Policy on National Science, Technology and Innovation (STI) that is in tandem with international best practices, the Federal Ministry of Science and Technology (FMST) held a two-day meeting on 10th and 11th May 2011 at Woodridge Hotel Royal, Ajao Estate, Lagos. The aim was to effect a broad-based participatory and consensus-building approach by experts in the varied sectors of national economy in coming up with a viable and workable STI Policy document. It was expected that this would generate the desired momentum for developmental agenda as articulated in the Vision 20-2020, 7-Point Agenda and the Millennium Development Goals (MDGs).

The meeting was attended by technocrats, eminent scholars, captains of industries, the academia, security and para-military agencies, Directors-General of Research Institutes, practitioners, professionals and experts in different sectors of national economy as well as international development partners. The first day was for the different sub-Committees to accommodate operational mandates and views of different sectors, conclude and submit their reports. The different sectors covered in the Policy review include the following: STI Promotion; Human Resources Development in STI; Research and Development; Water Resources; Biotechnology Research; Health Research and Innovation (Natural Products, Natural Medicine, Pharmaceutical Research, etc.), Energy; Environmental Science and Technology; Mines and Materials Development; Ferrous, Non-Ferrous and Chemical Technologies Research; Information

and Communication Technology; Space Research and Investments; Industrial Research and Development and Production. Other sectors are New and Emerging Technologies (Nanotechnologies and New Materials); Raw Materials and Materials Engineering; Defence and National Security; Transport System; Youth, Sports and Tourism Development; Works, Land, Housing and urban Development; Wood Resources; Science Laboratory Technology; Intellectual Property Management; Technology Transfer and Diffusion; Standardisation and Quality Assurance; STI Information Management System; Gender and STI; Funding STI Activities; STI Partnership and Collaborations; Governance of Science Technology and Innovation in Nigeria; Institutional and Legal Framework.



*Permanent Secretary, FMST,
Dr. (Mrs) Dere Awosika, MFR, mni*

The second day of the meeting chaired by the Honourable Minister of Science and Technology,

Prof. Mohammed Ka'oje Abubakar was an interactive session involving the FMST, the sub-Committees and Directors-General of cognate Agencies of FMST. Comments raised were noted and accommodated in the Draft Policy. This Policy was duly considered and adopted at the Extra-Ordinary Meeting of the National Council on Science and Technology which took place on the 12th and 13th May 2011 in Lagos. This gave rise to a Final Draft Policy document which has to be ratified by the Federal Government.

It may be remarked that the National STI Policy document is a monumental improvement on the existing policies of 1986, 1997 and 2003 which did not emphasise the Innovation component and other issues that were relevant for sustainable technological and national development.

NBRRI INTERACTS WITH BANK OF INDUSTRY

A Management Team from NBRRI led by Prof Danladi Matawal, Director-General/CEO had an interactive session with the Bank of Industry (BOI) on the 18th of May 2011. The meeting which was at the instance of NBRRI and the Permanent Secretary of the Federal Ministry of Science and Technology (FMST) was to explore opportunities for the funding of developmental projects derived from R&D innovations

Welcoming the NBRRI team, the Managing Director/CEO of BOI, Ms Evelyn N Oputu mentioned that as a development financial institution, the BOI was committed to supporting developmental projects especially those with high local content and job creation potential in order to stem the high rate of rural-urban migration, create wealth and restore the dignity of Nigerians. She emphasized that the model adopted was to support small scale businesses with high value chain that concentrates on high local content in terms of materials utilization, high job creation potential and high import substitution levels. BOI services have also been extended to cooperative societies and the performance level has been encouraging.

Responding, the DG/CEO of NBRRI, Professor Matawal gave an overview of the vision, mission, mandate and activities of NBRRI. He provided basic information on the array of NBRRI technological innovations that have the potential for turning around the Nigerian construction industry and promote the development of Small and Medium Enterprises in the construction sector. It was emphasized

that these achievements included the development of alternative construction technologies, processes and machines with high local content to address Nigeria's critical challenges in the construction sector and support the establishment of SMEs in the sector. One of the viable projects is the Establishment of Pilot plant for the production of Blended/alternative cement which prompted NBRRI's visit to BOI. The Blended cement when in production will serve as a suitable alternative to the now expensive Portland

Cement produced from our capital intensive industrial plants. The pilot plant will involve

- Securing steady source of agro-industrial wastes and other materials for the plant
- Provision of infrastructure and equipment for the Plant and carrying out activities such as incinerating, grinding, sieving, and packaging of the Blended Cement.



The MD/CEO of BOI expressed her excitement on the array of NBRRI technologies and the desire to partner with NBRRI to propagate the mass production of these machines and technologies to the benefit of Nigerians both for local consumption and export. As a result of the local content and the job creation potential, the innovations can be taken to the next level to involve multinational organizations and donor agencies. With respect to the Pilot Plant on the Blended Cement, Ms Oputu requested for the submission of full proposals and investment profile on the project. It was emphasized that for viability, this has to be driven by a commercial outfit with BOI on an equity sharing basis.

REDAN COLLABORATES WITH NBRRI

The members of the Executive Council of the Real Estate Developers Association of Nigeria (REDAN) paid a working visit to the administrative headquarters of the Nigerian Building and Road Research Institute (NBRRI) in Abuja. The REDAN team was led by its National Deputy President, Rev. (Surv), Ugo Chime who sat in for the National President. The meeting was to explore areas of collaboration between REDAN and NBRRI.

The Director-General of the Nigerian Building and Road Research Institute (NBRRI), Professor Matawal welcomed the delegation to NBRRI. He informed them that the Institute already has a plan to visit professional bodies in the construction industry in order to improve relations with them and create a platform for mutual collaboration among stakeholders. The 10-man delegation was informed of the forthcoming Stakeholders' Forum being organised by the Institute

In his response, Rev. (Surv) Ugo Chime said he believes that NBRRI and REDAN can play a leading role in the provision of affordable housing in the country. Thus, the mission of REDAN for the visit was to achieve many goals. It included the desire to explore the possibility of

- having a joint working relationship using NBRRI-tested alternative building technologies/materials for housing delivery to fast track the reduction of housing deficit in the country currently put at the 18million units
- collaborating with NBRRI on all issues of identifying local materials and technologies that are useful in the housing sector
- organising joint workshops and seminars to popularize these technologies.
- Uplifting, along with REDAN, the performance of the Building Materials Producers Association

of Nigeria (BUMPAN) so as to create employment for teaming Nigerian youths.

Professor Matawal seized the opportunity to inform the delegation of some tested-NBRRI technologies which can be readily deployed in mass housing delivery. He told the delegation of his recent experience at a project site where he discovered that the Institute's interlocking blockmaking machine performs better than a similar machine that was imported. Also, NBRRI has set up a Rapid Response team that would ensure prompt response to faulty machines and the demands of our clients.

He reiterated that with the successes recorded at NBRRI, the nation does not need to import interlocking blockmaking machines nor the materials required in this sector. He informed the delegation that the use of alternative building materials can lead to significant cost reduction of housing delivery. For example, the cost of a two-bedroom flat could be reduced from around N4.5m using conventional materials to less than N2.0m using alternative technologies. The resuscitation of BUMPAN which NBRRI helped create is

vital and should be pursued.

The delegation from REDAN was further informed that NBRRI is currently working on many products which include NBRRI Alternative cement to reduce dependence on Portland cement; locally produced concrete moulds; etc. The Institute is making significant progress in the development of digitised sub-grade soils Maps of Nigeria to assist in cost-effective road route location and preliminary design of roads. In all these areas as well as in training/capacity development, Prof. Matawal stated, REDAN and NBRRI can collaborate effectively. To give effect to the collaboration, a six-man joint REDAN/NBRRI team was established.



The National Deputy President of REDAN, Rev. (Surv), Ugo Chime and DG/CEO, NBRRI, Prof D.S. Matawal During the courtesy visit to NBRRI

DG-NBRRI VISITS LEADERSHIP NEWSPAPER

The Director-General/CEO of the Nigerian Building and Road Research Institute, Prof. D. Matawal led a team from NBRRI on a courtesy visit to and held an interactive session with the Management of Leadership Newspaper. On ground to receive the NBRRI team was the Chairman/Proprietor of Leadership Newspaper, Chief Sam Nda-Isaiah as well as the Editor-in-Chief and the Editorial Board.

Prof. Matawal told the Leadership Newspaper team that NBRRI was established in 1977 with the sole mandate for capacity building and to carry out integrated applied research in the areas of building, road and engineering materials sectors of the economy. He further stated that the Institute has its National Laboratory Complex situated in Ota, Ogun State with its

Administrative office in Abuja. He reiterated that his visit is a friendly gesture to thank the leadership of the Newspaper for the balanced reporting and coverage/patronage the Institute has received so far. He emphasized that it was in line with the desire of NBRRI under the new Management to reach out to all Stakeholders' and that the Leadership Newspaper was the first private Non-Governmental Organisation visited since his assumption as the DG of NBRRI on 1st of March, 2011.

The Leadership Newspaper Management was informed that NBRRI has over the years developed several technological innovations which are

relevant to the construction sector and that there is the urgent need for practitioners in the construction industry to key in into them so as deliver affordable housing to Nigerians. Furthermore, Prof. Matawal mentioned that one research area currently engaging the attention of the Institute is the development of alternative cement in commercial quantity in order to reduce dependence on Portland cement. These are pozzolanic materials derived from agro-industrial wastes and natural materials.

This he said requires funding and discussions are being held with some organizations for funding.

Another area of interest to the Institute is the issue of Building collapse which has become a source of concern to Governments and Nigerians in general because of the attendant loss of lives and huge socio-economic implication. On the last building structure that



Left to right: Prof D. S. Matawal, DG/CEO, NBRRI presenting some documents to the Chairman/Editor-in-Chief of Leadership Newspaper, Chief Sam Nda-Isaiah during a courtesy visit of NBRRI to the Newspaper house

collapsed at Ikeja, Prof. Matawal said, the Institute has constituted a committee of experts to investigate and come up with technical report for the purpose of building a case history, developing a databank and evolving effective mitigative actions. The DG opined that whenever there is an incidence of building collapse, the area should be quarantined and relevant bodies like NBRRI gain access to the venue to investigate the building collapse and build up a case history for the country. These activities are also being extended to road collapse/failures which are prevalent. Already linkages are being established with relevant Agencies such as the Federal Road Maintenance Agency (FERMA)

NBRRI AND NBTI SIGN MoU

The Director-General/CEO of the Nigerian Building and Road Research Institute (NBRRI), Prof. D. S. Matawal led a delegation from NBRRI to National Board for Technology Incubation (NBTI) to sign the Memorandum of Understanding (MoU) between the two organizations. The MoU was designed to set the pace for mass production of commercialisable NBRRI Machines which produce alternative building materials for use in the building construction industry. These Machines include the Electrohydraulic Brickmaking Machine, Interlocking Blockmaking Machine, Laterite Grinder, Laterite Mixer among others.



Directors of NBRRI and NBTI posed for a group photograph after signing the MoU. Fourth from the left is the DG/CEO, NBRRI, Prof Danladi Matawal. Sixth from the Left is DG/CEO, NBTI, Prof (Mrs.), Gambo Laraba Abdullahi

In his remarks, Prof. Matawal said that the signing of the MOU is the outcome of the inter-agency co-operation and synergy designed to take R & D results from the laboratory shelves to the construction. This, he says, signals the first bold step for the commercialization of NBRRI R&D results for the benefits of the Nigerians who are in dire need of these technologies. He further expressed the view that NBRRI is bringing in its array of technological innovations and robust extension services into this collaboration which has the prospect of revolutionising the building construction industry in Nigeria. His expectations, according to him, is that NBTI on the other hand would bring into the collaboration the capacity, expertise and competence that are based in NBTI-

Technology incubation centres to mass produce these NBRRI machines and also provide display space for the innovations in all NBTI centres nationwide.

Prof Matawal emphasized that NBRRI intends to resuscitate its zonal offices in Lagos, Kano and Nnewi in addition to setting up three additional zonal offices in the South-South, North Central and North-East geopolitical zones of the country. The zonal offices will provide additional services and outlets to back up the twenty-five Technology Incubation Centres in the NBTI network.

In her remarks, Prof. Gambo Laraba Abdullahi, the Director-General of NBTI congratulated the DG on his new appointment and for his tenacity and determination

to strategically partner with the Board in the use of the technology incubation system to promote NBRRI innovations. According to her, the objective of the MoU signing is to synergise efforts particularly in the fabrication of some NBRRI Machines in order to achieve a virile techno-based industrial sector in Nigeria through the translation of R&D findings and innovations into commercializable products with value addition. This has the potential of creating employment, growth and generating wealth as well as promoting indigenous potentials.

SOCIAL DIARY

WEDDINGS



Mr. Olumide Ajayi of the Admin Department and Folake Saka were joined in holy wedlock at the Apapa Local Government Area Secretariat Registry Lagos on Saturday 21st May, 2011

Mr. Ajibola Afolabi of the Admin Department was joined in holy wedlock to Princess Patience OmaOgiegor at the Oredo Local Government Marriage Registry, Benin City on Thursday 19th May, 2011. This was followed by the traditional marriage the Palace of Enogie of Egor Land, Benin City on Friday 20th May, 2011



BIRTHS



The family of Mr Ganiu M. Lawal of Audit Department in National Laboratory complex, NBRRI, Ota was blessed with a bouncing baby boy, *Ridwan Olanrewaju Olamide Lawal*, on 14th May, 2011.

The family of Uchebuakwu Enenche-Agbo of Admin and Finance in National Laboratory complex, NBRRI, Ota was blessed with a bouncing baby boy, Oche Christopher Enenche, on 30th May, 2011.



INDUCTION CEREMONY

Mr. Ganiu M. Lawal of the Audit Unit in NLC, Ota was inducted as Associate Chartered Accountant (ACA) into the Institute of Chartered Accountants of Nigeria (ICAN) on 11th May, 2011

BIRTHDAYS

	NAME	DEPT.	DATE OF BIRTH
1	Obidozie Ndidi Virginia	CES	April 4 th
2	Okolo Idah Grace	A/F	April 4 th
3	Essien Bassey Udoh	A/F	April 5 th
4	Effiong Okon Edet	A/F	April 10 th
5	Ibrahim Mohammed	A/F	April 25 th
6	Mudi Bello	A/F	April 15 th
7	Makwin Paul Luka	A/F	April 12 th
8	Gai Friday Iliya	DGO	April 20 th
9	Egbe Sunday Enyi	CES	April 22 nd
10	Osuagwu P.N	RRD	April 4 th
11	Bobson B.G	RRD	April 19 th
12	Fakeye A.M	RRD	April 1 st
13	Diji Nduka .J	A/F	April 16 th
14	Olorunfemi A.C	PIT	April 26 th
15	Sosanolu Omoniyi	RRD	April 26 th
16	Sanni Jeremiah	BRD	May 6 th
17	Ibe Kingsley E.	BRD	May 11 th
18	Ojachere R.	BRD	May 9 th
19	Bello Taofiq	BRD	May 12 th
20	Babatunde A. O.	A/F	May 22 nd
21	Paul Isebor	A/F	May 26 th
22	Ali O. J. (Mrs)	A/F	May 19 th
23	Ademosu Babatunde	PIT	May 25 th
24	Durojaiye A. M.	PIT	May 8 th

	NAME	DEPT.	DATE OF BIRTH
25	Chukwurah C. N.	PIT	May 30 th
26	Ozwo Ekele	EMRD	May 3 rd
27	Achema Felix	EMRD	May 28 th
28	Lamidi Rashidat B.	RRD	May 14 th
29	Dada Kazeem A.	RRD	May 14 th
30	Mrs. M. O. Igweonu	A/F	May 5 th
31	Umar S. Mohammed	A/F	May 2 nd
32	Asala Ebenizer	A/F	May 2 nd
33	Effiong Effiong Okon	A/F	May 12 th
34	Iliya Yusuf	A/F	May 15 th
35	Omange George Ngozi	PIT	May 17 th
36	Onwusiri Ignatius	A/F	May 18 th
37	Agida O. Cecilia	A/F	May 18 th
38	Igbiele Sylvester N.	A/F	May 27 th
39	Bassey Edet Jack	A/F	May 27 th
40	Isah Tenimu	A/F	June 7 th
41	Akombu C. Magdalene	A/F	June 15 th
42	Yunusa Saliu	A/F	June 25 th
43	Menegbe R. Atsumbe	A/F	June 27 th
44	S.X.Akpan	A/F	June 16 th
45	C.N Akande	A/F	June 20 th
46	E.M Eyojo	A/F	June 30 th
47	Enenche Agbo .U	A/F	June 16 th

FACELIFT FOR NATIONAL LABORATORY COMPLEX (NLC), OTA

At the National Laboratory Complex (NLC) of NBRRI in Ota, an elaborate landscaping and beautification programme was mapped. The implementation has commenced with the clearing of the Dumpsite and stopping the immediate community from dumping refuse along the frontal perimeter of the Complex. The landscaping exercise is in progress and there is planting of flowers around the Complex. The design of a befitting Gate House has been prepared and the construction of a new and befitting Gate House will commence shortly.

NBRRI PENSIONERS' ANGLE

The Management of NBRRI has always given paramount attention to the welfare of NBRRI Pensioners. In respect of this, a Management team led by the Director-General, Professor Matawal visited the IGI Pension Manager Ltd on the 4th of May 2011. The mission was to address some pending issues affecting the welfare of NBRRI Pensioners. These include but are not limited

- ▶ The non-payment of pension arrears as well as implementation of the increment approved by the Federal Government for Pensioners
- ▶ The low interest rate of 4% charged on investment funds which NBRRI BOT Pensions want increased to 6%
- ▶ The changing of interest rate without reference to NBRRI against the statutory provisions that this should be mutually negotiated every year
- ▶ The NBRRI BOT proposal/request for funds to defray operational costs of its Secretariat, which is not forthcoming from IGI Pension Mangers.
- ▶ The 5% Administrative Charge by IGI Pensions Manager which is a subject of disagreement since all charges are paid through the standard premiums to the Underwriter

These issues were presented by the DG/CEO of NBRRI to the Operations Team of IGI Pensions Fund Managers Ltd led by Mr. Rafiu Shontan at the meeting and these exhaustively discussed. After useful deliberations, most of the issues were resolved. Some of the decisions reached include the following.

The Pensions Fund Managers (the Underwriters, IGI) have strategies in place for prompt payment of pensions and will ensure early remittances of lodgements.

As a result of the current unstable and fluctuating money market, the Fund Managers considered the request for 6% interest rate on the high side. A suggestion to settle for 5% interest rate was considered by the Managers who promised to forward same for the consideration of their Management; but offered a definite 4.5% on the table.

The Pension Fund Managers were agreeable to the proposal to provide funds to defray operational costs of NBRRI BOT Pensions secretariat.

IGI will pay new rates based on Federal Government review with effect from January 2011 but the arrears would depend on when FGN remits them

The 5% Administrative charge was explained out to be a consequence of bank charges and other administrative costs of doing business. However, the Director-General/CEO of NBRRI who is the NBRRI BOT Chairman said this was contentious and unacceptable and should be reversed accordingly

It was suggested that the Management of IGI Pensions Fund Managers Ltd should consider holding consultative/interactive sessions with NBRRI BOT to discuss issues of mutual interest and to promote harmonious relationship. They should therefore send a powerful delegation to the next quarter BOT meeting in June 2011.



Left to Right Chairman of NBRRI Governing Board, Engr. (Dr.) Obong Chris Ekpenyong and Member of the Board, Alhaji Mohammed Yaro Hayatu.... during NBRRI Stakeholders' Forum

AFFORDABLE HOUSING IN NIGERIA AND THE ROLE OF NBRRI

.....By George Ngozi Omenge, Director, Planning and Information Technology



Apart from food, and clothing, there is a consensus that shelter is atop on the list of human needs. This explains why it is regarded as basic and crucial to human survival. Despite the importance of shelter, many Nigerians cannot boast of decent accommodation. Consequent on this, Governments at various

times have provided several intervention programmes to address the issue of providing shelter for the Nigerian populace.

As far back as 1973, the then military Government of General Yakubu Gowon engaged Romconsult (a construction firm) of Romania to carry out a comprehensive study of the country's housing situation and proffer solutions. On completion of its task, the firm recommended gradual construction of mass housing estates for a period of between 25 and 30 years. But this recommendation could not be sustained following the fall of that administration in 1975.

Another effort at tackling the problem was launched in the early 80's by the Shehu Shagari Administration with the construction of some low cost and high cost estates across the nation. This was abandoned as soon as the life of the administration was terminated in 1983. The Ibrahim Babangida Administration which held sway between 1985 and 1993 took steps towards alleviating the housing difficulties with the cliché "Housing for all by the year 2000". This, like others came and went with the housing deficit increasing to an all time high.

By 2004, when the Obasanjo administration created the Federal Ministry of Housing and Urban Development (FMHUD), the housing problem had become endemic with millions of Nigeria not having access to decent housing. It was little wonder therefore when sometimes in 2005, the then Minister of Housing and Urban Development (now Governor of Ondo State), Dr. Olusegun Mimiko told the nation that the housing deficit had reached a worrisome 16 million units. This scenario was even more worrisome as available record showed that a greater percentage of the nation's population spends between 36-40 percent of its gross income on rents. Given that the population growth is estimated at 2.9 percent a year, the deficit's annual increase would almost be at par with the growth rate.

It is instructive to note that though many new housing estates are being developed in recent times, they are hardly affordable for the average citizens. Experts believe that one effective way of tackling the nation's housing problem is by ensuring that the use of various local raw materials should become the cornerstone of all mass housing programmes in the country. This is where the Nigerian Building and Road Research Institute (NBRRI) readily comes in.

NBRRI was established in 1978 with the mandate to conduct integrated applied Research and Development (R&D) in the building and construction sectors of the economy. Indeed, over the years, NBRRI has recorded a number of significant breakthroughs in the development and use of local building materials, enhanced architectural designs and locally developed construction equipment to fast track housing delivery programmes. All these took cognizance of Laterites which occur abundantly in Nigeria. The technologies developed by NBRRI can be used for mass housing delivery programmes as well as for small construction jobs.

One area where NBRRI has made significant impact is in the development of Manual and Semi-automated Brick-making machines for the production of quality cement-stabilised bricks for walling. During the production and use, great economy is achieved because less cement is utilized than would normally be required if sandcrete blocks were used for walling. Where burnt bricks are desired, these machines produce unstabilized bricks which are then burnt in clamp kilns.

The Manual Brickmaking Machine has an average production capacity of 500 bricks per an eight hour working day. Two bricks, each with size 190x140x100 (mm), are produced in one operation. NBRRI also developed the semi-automated version i.e. the Electro-hydraulic Brick-making machine in order to mechanize the brick production process. This machine, which has a production capacity of 3000 bricks in an 8-hour working day, produces bricks of uniform size and consistent high quality. In using this machine, the drudgery of human effort exerted in the use of Manual Brickmaking machine during brick production is drastically reduced.

Another area NBRRI has made a mark is in the development of three versions of Interlocking Block-making machines for the production of interlocking blocks for walling without using mortar except at the first course, gable course and the ring beam. These machines come with Double mould compartments which can be interchanged with Single moulds. The Diesel engine-powered and the Electric motor-powered Interlocking Blockmaking Machines each has

production capacity of 3,000 interlocking blocks in an 8-hour working day; while the Manual Machine has a production capacity of 1000 interlocking blocks per day.

Other alternative technologies developed by NBRI for affordable housing delivery include the Laterite Grinding Machine and Laterite Mixing Machine. The Laterite Grinding Machine pulverizes laterite to the required consistency for use in the production of stabilized bricks/blocks and prevents waste of materials (Laterite) which can be up to 25%. The Laterite Mixing Machine eliminates the drudgery of manual mixing as it is used for mechanically mixing laterite, cement and water during brick and block production. These technologies complement the productivity of the brickmaking and interlocking blockmaking Machines; thereby reducing production costs.

For Pedestrian and Light trafficked roads especially in housing estates, NBRI developed the Manual and Hydraulic Paving Stone Machines. These machines are equipped with moulds for the production of Double-Tee and Hammer types of paving stones. While the manual version produces 1,200 paving stones in an hour work day, the Hydraulic version produces 2,000 paving stones that are of higher quality.



On roofing elements, NBRI has developed the Fibre Concrete Roofing (FCR) Tile (referred to as "Mador Tiles"), Semi sheet and Clay Roofing Tile Technology. The FCR Tile is a durable, water resistant and cost-effective Tile developed from coir fibre (from coconut), sand and cement. Rama and washed palm fibres (from palm tree) which are available in northern and eastern Nigeria respectively can also be used. For this, NBRI developed the Single Mould and Multi-Chamber FCR Tile making machines. The Single mould Vibrator produces 150-200 Tiles per 8-hr day while the Multi-Chamber machine produces 1000 FCR Tiles. The roofing elements are suitable alternatives to the now expensive conventional galvanized iron, asbestos and aluminum roofing sheets.

The Institute has also developed effective and innovative construction tools and gadgets such as End Frames, String Holders and Mortar Guide Boards to achieve better and cost-effective brick/block laying and plastering operations during construction. Increase of Productivity rates of 30% to 40% in building operations such as plastering, block laying, etc. have been recorded.

In rocky areas, Stonecrete Block technology was developed to make use of abundant stones for walling in

such areas.

It is noteworthy to mention that these technologies have been successfully used in the provision of houses over the years. Some of the successful projects included but are not limited to the following

- * Construction of 3-bedroom detached houses aptly called WAZOBIA HOUSES in Lagos, Asaba, Makurdi, Birnin Kebbi, Damaturu, Umuahia, Benin and Minna. These were demonstration houses built with cement-stabilized bricks in conjunction with State Governments
- * Construction of lock-up shops in Damaturu, Yobe State and Shendam in Plateau State.
- * Construction of NBRI zonal offices in Kano in Kano State and Nnewi in Anambra State
- * Construction of Medical Centre building in NBRI, Ota office
- * Construction of classroom blocks for Aflon Computers Ltd, Kuje, FCT.

These are a just a few of the projects in which NBRI was directly involved. Generally, for walling, a savings of 25-30% were achieved.

As a way of popularizing these technologies, NBRI developed several

enterprise models which prospective developers can key into. Generally, technical and back-up supports were often provided with the sale of every NBRI machine and technology in order to ensure customer satisfaction. Also, these technologies can readily support the setting up of Cottage and Small Scale Enterprises in alternative building materials production to service the construction industry.

Indeed, as a result of the durability, cost-effectiveness, user-friendliness, etc., and the need to popularize these viable alternative construction materials, efforts should be made by Government agencies such as Universal Basic Education (UBEC), National Directorate of Employment (NDE), Millennium Development Goals (MDG), etc. to utilize these technologies in their developmental projects e.g. in the construction of classroom blocks, market stalls, maternity centres, town halls, etc.

Furthermore, if estate developers in Nigeria can tap from the indigenous expertise of NBRI and commit themselves to using these alternative but cheaper technologies to deliver at least 5-10% of their housing stock in estate development, the housing deficit in Nigeria will be drastically reduced within a short time.