

THE ROLE OF RESEARCH IN STANDARDIZATION OF THE BUILDING CONSTRUCTION INDUSTRY

By

OPOKO, A.P. & ALI, J. A.

ABSTRACT

The paper identifies the vital role of the Construction Industry to the national economy and how such role can be enhanced.

The paper briefly examines the Nigerian Construction Industry. It identifies the importance of standardization of activities in the sector and the vital role research and development have to play in this regard. Finally it makes recommendations to enhance effective R&D in the sector.

INTRODUCTION:

The Construction Industry plays a vital role in the economic development of any country. The state of the Industry gives a fair indication of a nation's economy. Between 1971 and 1975, the Construction Industry in Nigeria emerged as a dominant feature of the nation's economic development as a result of high activity level in the sector occasioned by the after civil war reconstruction and oil boom which stimulated execution of various private and public projects ranging from new starts to rehabilitation of damaged and dilapidated buildings and other infrastructures. The Industry however, witnessed decline from 1976 as a result of economic recession, a trend

which has persisted to the present.

Despite this lull, the industry has continued to expand due to rapid urbanization and population growth which have increased demand for housing and other infrastructural facilities. Similarly, the expansion of the structure of governance and the need to bring governance to the grass-root level have also contributed to the demand for the various products of the Construction Industry which include buildings and roads. Design and construction of these products are guided by certain criteria, guidelines or standards. These are usually formulated based on wide representation and articulation of diverse needs and viewpoints observed over a considerable length of time. They are thus expected to guarantee user expectations that products and services are safe, reliable and suited for the purposes claimed by their manufacturers or providers.

Unfortunately, the Nigerian Construction Industry has been characterized by lack of adequate standards to guide activities in the industry. Although the Standards Organization of Nigeria has over 500 Nigerian Industrial Standards (NIS), only 67 of these are in the Building Construction sector, (Okoro, 2003). Unfortunately, little

emphasis has been placed on compliance with even the few elaborated standards. The effects of the fore-going are evident in the unethical, haphazard and non-streamlined management of various processes in the Industry; infiltration of unqualified persons and quacks into the Industry; non-regulation of participation of foreigners; proliferation of local and imported substandard materials; lack of sound practice and documentation processes, wastages; low efficiency and development of the Industry. The recent spate of building collapse in the country with its attendant colossal loss of lives and investments has also been linked to lack of standards and non-compliance where standards exist.

Aside from the issue of building collapse which has eroded public confidence in the Industry, the increasing demand for products of the Industry and growing insistence of clients on value for money, buttress the need for re-engineering the Industry. The above challenge can be effectively handled via formulation and enforcement of appropriate standards to guide operations in the Industry an area which research and development have very vital roles to play.

STANDARDISATION

Okoro (2003) defines 'standard' as "a published document which sets out specifications and procedures designed to ensure that a material, product, method or service is fit for its purpose and consistently performs the way it was intended to". The main purpose of standards is to guarantee user safety and satisfaction without unfair demands on producers/providers. Generally, standardization harmonizes criteria for the measurement of quality, performance, productivity, safety and authenticity amongst others. It stipulates acceptable levels of conformation, basis for comparison as well as quality control measures. It governs the conditions under which a product is produced, refined, packaged and used. Standards are however influenced by location or the environment in which they are expected to operate. An environment is conditioned by climate, culture, socio-economic peculiarities and the technological development level within the environment. This explains why what may be suitable in one country may not work in another country.

Standards are consensus documents drawn from the needs and expectations of consumers. To serve their purpose, they must be carefully and painstakingly formulated. The usual practice is for a series of the same test to be conducted within similar conditions and applying the same methodology. Although, the

tests may be done in one laboratory, to ensure authenticity and universality of results, it is advisable for the series of tests to be undertaken independently in different laboratories, and results thereafter collated and analyzed. If the trends or results are similar, then they can be adopted for use in the area. Standards may be in form of models, drawings, formulae, written mathematical or symbolic description, code of practice, test methods or in any other acceptable form. They must however be clear, and unambiguous.

Standardization in the Building Construction Industry.

The Building and Construction Industry is a major sector of the Nigerian economy, both in terms of magnitude of its products and the number of people it employs. However, lack of proper coordination of activities and products of the industry has resulted in several problems. These include use of substandard materials, infiltration of the industry by quacks and the recent spate of building collapse in the country. In order to avoid the above problems, coupled with increasing complexity of building and construction activities and clients becoming more demanding in their requirements, the need to streamline construction activities and make the project delivery process more effective and efficient becomes even more urgent. Standardization allows for clear communication between the industry, and its suppliers and clients. It also

helps to reduce conflicts and the need for litigation. It encourages modular coordination of components, which promotes mass production and prefabrication. Apart from production cost reduction, modular coordination facilitates interchangeability of components from different manufacturers. Prefabrication, which is encouraged by standardization, increases the possibility of manufacturing construction components at locations where raw materials and labour are cheap and products transported to where they are needed. This is very profitable especially where transportation cost is low. Standardization also simplifies construction processes, which significantly enhance productivity by savings in time, labour and costs. In recent times, standardization has facilitated computerization in the industry with positive results. Standardization ultimately raises quality of construction and safeguards the interests of all stakeholders in the construction industry, thereby positioning the industry to play its vital role in the nation's economic development.

In summary, standardization of building and road construction will evolve products and procedures, which will; guide quality control in production and utilization; ensure safety of products and users; ensure competitiveness in cost of products, and generally promote market acceptability of

products.

Research and Development (R&D)

There are different definitions of Research. The Oxford Advanced Learners' Dictionary defines research as "careful study or investigation, especially in order to discover new facts or information". It further defines Research and Development (R&D) as "the Scientific search for new and improved products and manufacturing processes". For the construction industry, this will also include various activities and components which make up the construction delivery process.

Although there is no clear-cut line between research and development, research is the initial stage of "asking and answering questions", which often involves trial and error. It needs to be focused and sustained in order to yield results. Research is divided into two types namely: basic (pure) and (applied) research. While basic research aims at exploring new frontiers of knowledge, applied research carries results of basic research to levels where specific needs can be met for the benefit of the end users. Development thereafter modifies and refines workable ideas, processes and innovations to full-scale production, making them available for market introduction and public acceptance.

In developed countries R&D has become a universal watchword. Although, it is not

easy to establish how much of a country's economic growth is attributable to R&D, a correlation has been established between countries and industries with strong R&D base and those, which show productivity growth and other evidence of progress, (Campbell, undated).

Role of R&D in Standardization of Building and Construction Processes.

R&D plays a key role in standardization of building and road construction processes. Standards evolve from knowledge based on experience and experimentation over a period of time. In reality, R&D should precede standardization. Through R&D, the needs of the Industry as well as areas in need of harmonization for the smooth operations within the industry are identified before acceptable criteria are set.

R&D will not only introduce new ideas and innovations in terms of construction materials and technologies but will go further to streamline such innovations to ensure their smooth market introduction. Take, for instance, new alternative building materials and technologies, which have been developed in response to the high cost of conventional building materials. Although few individuals/companies are producing these materials, they do not conform to any set standards of quality and quality control measures thus discouraging their widespread use by clients and professionals alike. Further R&D required to work out acceptable levels of

dimensional, physical, chemical and structural properties, which will solve this problem.

R&D will also be needed to establish the optimum climatic, environmental, socio-cultural, and functional parameters for determining acceptable levels of quality and performance of products. For instance, what should be the life span of a particular material? Under what climatic and environmental conditions will this be achieved? For what uses has the material been developed? These questions will be answered by R&D.

R&D is also required in the choice of terminology for use in the industry. For instance, what constitutes a brick? What differentiates a brick from a block? Similarly, what constitutes a roofing tile? What makes a roofing tile different from a roofing sheet? Research is urgently needed in this area in order to ameliorate conflicts and disputes arising from non-streamlined terminologies.

Products and processes arising from new ideas and innovations need to be tested prior to introduction into the market. Research organizations are in a privileged position to undertake such testing since they are expected to have the required equipment and expertise which individuals may not have. Besides, streamlining such services minimizes duplication of efforts and waste of resources in the industry.

Another vital role R&D has to

play in standardization of the Building Construction Industry is development of appropriate technologies, which will facilitate construction activities. Standards for building and construction materials can hardly be separated from technologies for production and use of the respective materials. In fact most of the problems arising out of lack of standards can be resolved by adopting effective technologies, which can only evolve via R&D. For example, use of appropriate brick presses; tools for serving soils and for batching ingredients; equipment for effective mixing of the soil with the required additives; practically guarantees the production of good quality stabilized bricks. These are parameters that are defined through R&D.

R&D outfits are also relevant in the investigation of consumer complaints as well as product certification programmes; via independent laboratory testing and quality evaluation of products. Investigation of consumer complaints will further highlight areas where R&D is needed.

R&D effort will also guide/control entry of building materials or components into the Nigerian construction market by ascertaining properties/qualities conform to stipulated standards. This will curb the prevalent proliferation of substandard building construction materials in the Nigerian market.

Benefits accruing from

standardization will be lost if the labour force is not repositioned to meet the challenges it will pose. Through formulation of training manuals and guidelines, R&D can facilitate training of various cadres of manpower in the building construction industry to ensure adequate supply of trained manpower in the industry. R&D will also determine appropriate work procedure and expected output and productivity rates, which will also guide activities in the industry.

Problems Hampering Effective R&D in Building Construction Industry

Unfortunately, R&D has not been able to effectively meet the above roles in the Nigerian Construction Industry due to certain limiting factors. Presently, the Industry is heavily dominated by foreigners in terms of resources (especially materials, technology and expertise) as well as the volume of work and earnings from the industry. There has not been any serious policy aimed at developing and protecting indigenous expertise and innovations in the Nigerian Building Construction Industry. Research will only flourish in this area when there are concerted policies, which compel stakeholders to look inwards for viable alternatives to conventional processes and products. This will not only result in development of indigenous capacity in various areas of the industry, but also save scarce foreign exchange, and ensure national security.

There is need for a conducive research environment. A conducive research environment is an environment in which "researchers are able to produce and communicate research results, and in which the populace, government and private sector have the will, capability, and appreciation to make optimum use of those results" (Campbell, undated). In terms of infrastructure, many R&D organizations in Nigeria lack the pre-requisite infrastructure like office accommodation, well equipped laboratories and field equipment required for meaningful R&D. Even where R&D results are available, they are not embraced and used by those they are intended for, thereby dampening enthusiasm of R&D personnel.

Researchers in the industry work in isolation. There is little collaboration between the research organizations and other stakeholders in the industry. This lack of collaboration means that inputs from stakeholders as to the needs of the industry are not articulated, agreed upon and integrated into the formulation of R&D proposals/projects. As such, research organizations may well be wasting valuable resources in pursuing R&D programmes, which are not relevant to the needs of the industry and society at large. There is also lack of networking between R&D organizations. Networking will provide researchers access to R&D activities in other organizations, as well as outlets for their own

work and opportunities to exchange ideas with their colleagues thereby facilitating R&D activities and minimizing duplication of efforts. Poor networking affects the quality of research personnel as well as their effectiveness. As regards formulation of standards relevant to the Building Construction Industry, there is need for intensive collaboration between the Standards Organization of Nigeria and Research establishments like the Nigerian Building and Road Research Institute.

Oftentimes, insufficient time is given to R&D, as positive results are expected almost immediately without room for failure. Meaningful R&D takes time. Depending on the scale of the project, a gestation period of 5-15 years may be considered reasonable for the generation of a research idea through development to the market introduction of the research results, where the end-users benefit.

Perhaps the major problem militating against R&D in the country is lack of adequate funding. Most R&D activities are dependent on funds. Fund is required to create a conducive research environment; attract and maintain the right caliber of staff; undertake the various stages of R&D; and effectively communicate results to the public. Unfortunately, level of funding for R&D establishments like NBRI has been low, thus necessitating the need to explore alternative sources of funding.

RECOMMENDATIONS AND CONCLUSIONS

Application of R&D in formulation of standards in the Nigerian Building Construction Industry will no doubt facilitate the drive for economy, safety and self-sufficiency of the Nigerian Construction Industry. Increased level of activity in the industry which the above will generate, will also contribute to improved standard of living of the people through provision of needed houses and infrastructure, job and income generation opportunities, for which the industry has great potentials.

Above all, R&D in standardization of building and construction activities will eliminate use of quack and substandard materials, which have been a major cause of building collapse in the country. To ensure that the industry enjoys the above benefits, however the following are recommended:

The need for networks and collaborations of all stakeholders including the Standards Organization of Nigeria cannot be overemphasized. This will streamline the needs of the industry, eliminate duplication and enhance quality of R&D interventions. As the primary R&D organization for the construction industry in the country, NBRI should be properly equipped to be a focal reference point for all stakeholders in the Industry. Of paramount importance is the establishment of a data bank to provide all information/data required by the industry; well equipped libraries and

laboratories which will serve the information, testing and analysis needs of the industry.

Government funding of R&D especially at NBRI needs to be improved. In addition, other sources of funding are needed to augment government subvention. These will include contributions from construction and manufacturing companies; National Housing Fund as well as proceeds from importation of building materials and technologies. Professional bodies and well-spirited individuals should support R&D through endowment, and donations in the form of cash, equipment, infrastructure and manpower development.

Government policies should encourage the need to look inwards in the Nigerian Building Construction Industry in order to stimulate R&D activities in the sector.

The need for effective monitoring cannot be overemphasized. When standards are not monitored to ensure compliance, the end users suffer as they lose out on the benefits which should accrue to them. Implementing and monitoring agencies should thus be strengthened to undertake this vital role.

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BUILDING AS AN ESSENTIAL PART OF HUMAN EXISTENCE

BEING AN OTUNBA F.I. OSIKOYA ESSAY COMPETITION WRITE-UP

By

ABDULLAHI MOHAMMED

MAT. NO 2000/11194VB 300LEVEL

DEPARTMENT OF BUILDING

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGER STATE, NIGERIA

INTRODUCTION

The international labour organization (I.L.O 1975:26) affirms that adequate residential accommodation and related facilities constitutes one of the essentials of good life and is a major requirement of an efficient and satisfied labour force and foundation of a satisfactory community life.

In satisfying the basic needs of mankind, housing ranks second only to food in the family's living expenses world wide and for the home owner it is by far the largest single purchase decision he/she can make in his/her life time.

The federal government of Nigeria has also felt the housing needs of its populace, this is evident in its various

housing policies in the past and the present National housing policy of president Obasanjo's administration which is committed to build forty thousand (40,000) housing units per annum Nationwide.

The primary function of housing is the provision of shelter, space safety/security protection of health and