STRATEGY FOR COPING WITH NIGERIA'S HOUSING NEEDS

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ABSTRACT

The paper blames Nigeria's complete reliance on the conventional methods of construction as the root of her inability to provide adequate number of housing units for her people. While recommending industrialisation of the building delivery system as the method most likely to enable the country overcome her housing shortfall, the paper warns against any attempt at full-scale importation of sophisticated factory-oriented, capital-intensive systems from the developed countries. It rather sees great merit in partial prefabrication tailored specifically to the nation's level of technology and infrastructural development, and which as skills, market, economy, infrastructure and know-how also develops until the standards of prefabrication enjoyed by the developed countries is achieved, the housing needs met and perhaps surpassed.

Key words: *Housing needs, strategies for coping in Nigeria.*

INTRODUCTION

Naturally, shelter, in form of building, is amongst the three basic needs of life, universally accepted and redesigned as essential for life sustenance and survival. This single reason has made the construction industry the oldest and fastest growing industries both in terms of demands and sophistication over the years. However, it is the desire of every human being to have comfort, security, physical and mental development without hints of possible mishap, collapse or failures associated with their place of abode. It is therefore a social responsibility of the government to ensure that the wish of the people is achieved within limited resources and constraints (Anderson 2012).

The magnitude of housing shortfall in Nigeria is of colossal proportion. As at the beginning of 1991 the Federal Government estimated that between that year and the year 2000, a total of eight million additional housing units were required to meet the nation's housing need. By 1998, seven years later and two years to 2000, not much was done to improve the situation. The country still needed about eight million additional housing units by year 2000. Of course, the accumulation of housing need started much earlier than 1991. Before the mid 1970's Nigeria's policy makers had viewed housing as a consumer good having only a social function. This erroneous view resulted in the gross neglect of the housing sector in the allocation of economic resources. Again, the promise of education for all and housing for all by the year 2020 by government also proved to be a complete failure. Even after two years this year 2022, the citizens are still suffering from inadequate housing needs and extravagant

house rents for the few houses available for rent. Government thus made no significant intervention there but left that sector principally in the hands of the private entrepreneurs.

Many factors may have contributed to the failure of the government and the construction industry to affect successful housing programme. The view, however, is that the root of Nigeria's failure to provide adequate number of housing units for her people can be found in her complete reliance on the conventional methods of building construction and that the problem of housing will persist until such a time that this country adopts modern and appropriate method(s) of building construction and management. The conventional methods suffer many drawbacks:

They employ slow processes which prolong the completion of a house by several months, generally eight or more months would have been enough for the completion of a two storey residential building, but this takes longer. This results in low productivity with need for outstripping production. Material wastage is high during construction. Moreover, higher factors of safety are assumed during design to allow for inefficient site measurements.

The rate of the countries' technological development is slow. A comparison with the manufacturing industry shows that whereas in manufacturing industry almost all needs of the fast growing population in consumer goods and durables are being met by mass production in factories utilizing modern machinery, equipment and technological know-how, the Nigerian building industry which leans heavily on the conventional method is not developing at a fast enough pace nor is it utilizing modern technological know-how. This is as a result of its fragmented structure which leads to a laissez-faire attitude on the part of several sub-agencies, contributing to each sub-agency concentrating on its little part and aiming at the maximum profit for itself. Consequently, the building industry in Nigeria is not meeting the requirements of the population. To catch up with the ever increasing need for housing in Nigeria, a revolution in our building construction method is inevitable. The objective of that revolution should be to select a technology or a combination of technologies which would ensure speedy and quality delivery of houses and optimum saving of resources.

WHICH CONSTRUCTION TECHNOLOGY?

There are five (6) types of construction technological systems to consider:

- Pure traditional method
- Evolved traditional method
- Modern insitu method
- Partial prefabrication
- Complete prefabrication
- Recycling

Pure traditional Method

Here design and construction are at their most basic levels. Materials of construction are employed at their untreated or near crude forms, can be easily destroyed by biological and environmental agents and thus required frequent replacement.

Evolved Traditional Method

This is the method in which the labour content of the operations that are carried out by traditional trades has been significantly reduced either by modified materials, and/or the application of non-traditional construction aids.

Modern In-Situ Method

This is the method of building in concrete (in all its forms) that is cast in-situ by means of multi-use shutters to form complete elements; operative type labour and mechanical aids are used.

Partial Prefabrication

This is a construction method in which prefabricated elements are used together with traditional, evolved traditional and/or modern in-situ methods.

Complete Prefabrication

In this method, the elements and components of the final product are serially produced in a factory on the basis of modern mass production procedures. The quality, precision and detail of the elements are such that assembly can take place with an absolute minimum of on-site skilled and unskilled labour. The pure traditional, evolved traditional, and the modern in-situ method are together classified as conventional methods while the partial and complete prefabrication methods are classified as industrialized methods. As has earlier been pointed out, the conventional construction method with their low-level technology and high cost have not been effective methods of housing provision in Nigeria. We must therefore look beyond them for the solution of our housing need. Let us therefore consider the industrialized methods and their advantages among which are:

Speed: Shorter construction time, which means not only a reduction of time used at building site with consequent savings on interest payment but also a more rapid turnover of invested capital. The Planning Group on Prefabrication and Industrialization of the National Committee on Science and Technology of India (1978) claims that through the use of industrialized building and prefabrication methods, it is possible to reduce construction time by 40% for single storey houses and by 25% to 40% for multi-storey flats.

Superior Quality Control: Superior quality control resulting from factory or site production using special labour and skilled supervision minimizes heavy recurring maintenance expenditure.

High Productivity: Improved productivity results from better organization and supervision and labour specialization. If the components are factory produced, there is the further advantage that inclement weather does not hold up operation.

Cost Reduction: At the start, industrialized building techniques and prefabrication may be marginally more expensive than traditional because of higher capital investment. But with time and assured demand, cost reduction to the tune of 10 to 15% is possible because of savings in materials, labour, and economies resulting from bulk purchase and scale of operation.

Disciplined Use of Scarce Materials: Industrialized housing and prefabrication will employ standardized components whose designs can be optimized, employing controlled methods so that the consumption of scarce material is reduced to a minimum. Definitely, the advantages of the industrialized building systems over the conventional methods recommend them to any country in a hurry to solve the housing problems of its people.

Recycling

Recycling of waste products into building materials has lately become the norm in the construction industry. The essence of this practice is to put waste into good use and reduce the amount of trash that goes to landfills. Interestingly, contractors are increasingly joining the green building bandwagon by advocating for the use of recycled waste products, to reduce the costs of construction and save the environment.

The major problem faced by many people is identifying waste products that can be turned into building materials. Therefore, outsourcing your waste management process to a professional company can be the only viable solution.

Below are 10 surprising building materials made entirely out of waste products:

1. **Wine Cork Panels**: Very few people know that wine corks are reusable. Recycled wine corks make great floor tiles, wall and ceiling panels. You can recycle your used wine corks to create stylish, mosaic flooring and wall panels instead of dumping them into your rubbish bin.
2. **Newspaper Wood**: Unbelievably, it is now possible to make wood from your old newspapers and cardboard. This innovative recycling process involves compressing newspapers and solvent-free glue to create log-like pieces that you can cut, mill or sand for various construction applications. What is more amazing is that the paper wood is non-combustible and waterproof.
3. **Bottle Bricks**: The recycling of plastic and glass bottles into different products is not anything new. However, very few people know that bottles can also be used as building materials. This can be achieved by stuffing them using sand or gravel until they become compact and sturdy enough for construction.

4. **Recycled Glass Tiles**: Old windows, broken glasses and damaged solar panels can be converted into useful building materials for glass tiling and countertops. A special machine is used to crush and compress the waste glass pieces into layers, which are ideal for making glass tiles and countertops.
5. **Nappy Roofing**: With advancements in recycling technology, used nappies no longer belong to the rubbish bin. Remarkably, you can now reprocess old nappies into roofing tiles. The recycling process involves turning old nappies into plastic by separating the polymers from organic waste. You may then use the resulting plastic to make roof tiles or plastic wood.
6. **Mushroom Walls**: Mushrooms are not only nutritious but also important building materials. Their roots can be moulded into wall insulators and packing materials using special technology. The most exciting part is that mushroom walls are arguably stronger than concrete, and they are entirely compostable.
7. **Plasphalt**: As the name implies, Plasphalt is made from a combination of waste plastic and asphalt, hence the name "Plasphalt." The plastic waste replaces the sand and gravel used to make asphalt. Plasphalt is considered more durable and less vulnerable to wear compared to traditional asphalt.
8. **Cow Dung Bricks**: Animal waste is also an ideal option for making building materials. You could use animal dung to make bricks or for flooring purposes. The best part is that cow dung bricks are much more resilient and, they do not produce bad odour once they are turned into bricks.
9. **Recycled Plastic Blocks**: Plastic bags are a nuisance to the environment, considering the fact that they are not biodegradable. However, they can be put into good use by turning them into decorative building blocks. The only downside is that these blocks are extremely light and they cannot be used to make load-bearing walls.
10. **Bark Siding**: Sawdust, tree barks and other waste from lumber can be used to make exceptional wood siding. The best part is that you do not have to cut down any tree for siding, as you only need to source for barks and sawdust from the construction site.

Industrialization Must Be Adjusted To Need: The folly of importing sophisticated factory oriented systems from the developed countries without first building a supporting Research and Development (R&D) has been highlighted by many writers. Loen Monk (2003) warns that prefabrication and democracy have to be adjusted to the needs and economy of a country because the poor countries of the developing world unlike their developed counterpart cannot

afford the expensive lifting and haulage equipment of large scale prefabricated components. The moral is that the level of product and processed technology must be tailored to local conditions.

Factory oriented European Systems are highly capital intensive. They can be viable only if capital investment made in setting up plant can be amortized over a period, assuming of course that the factory has an assured take off. Moreover, Nigeria does not have a good network of good and solid highways necessary for hauling heavy prefabricates from factory to site, given an example with what is going on, on the Enugu – Lagos express way, is a complete write-off now, and the Kaduna – Abuja Express way that has been taken over by bandits now. And this is a prerequisite for success of such systems. Furthermore, Nigeria just does not have the maintenance facilities to keep such plants going without frequent breakdown, nor does the country have enough facilities for this. At the present time therefore, Nigeria cannot afford nor does it have the infrastructure for full-scale industrialization and prefabrication. She needs therefore to start the process of industrialization via partial prefabrication. This principle is well suited for gradual industrialization of the building, which appears to be the method most likely to succeed in a developing country like Nigeria. In the initial stage, only a few and relatively simple component s will be manufactured by industrialized methods, and as skills, market, infrastructure and know-how develop, more and more products can be prefabricated until the standard enjoyed by some developed countries is achieved and perhaps even surpassed. In proposing partial prefabrication, the following additional factors have been taken into consideration;

- The existence of abundance of manpowerwhich is relatively unskilled.
- Machinery and equipment needed for partial prefabrication are simple and can easily be fabricated manned and maintained locally.
- The existence of prejudice against prefabrication and the need to show that it works better than the conventional systems of building construction.
- The relative scarcity of capital needed for long term capital finance mortgage due to lack (or underdeveloped nature) of the appropriate financial institution.

Essentials of the Proposed Partial Prefabrication System

- It should be a combination of standard timber components such as doors and windows, pre-cast structural components such as beams, lintels, floors produced on or off-site, and-in-situ constructed walls. The choice of factory or site prefabrication should largely depend on project requirements, consideration of the economics of the project(s), and the facilities for handling and transportation. On-site prefabrication is recommended where only limited number of houses is to be put up. It would appear

more practicable in Nigeria for now, until production factories and other infrastructure are reasonably developed.

- The components should not be unusually heavy as to require heavy transportation and hoisting equipment. They should be such as can be assembled and hoisted manually by a maximum of four workers, or with simple machinery such as pulleys or un-mechanized crane.
- The elements should either be craft-fabricated or fabricated with the help of simple machines, and should be such as can be manufactured by small factory units spread all over the country and owned and managed variously by government or private manufacturers, or contractors.
- Raw materials for it should be available.
- It is necessary to incorporate in the building regulations, the structural systems and sizes of elements and components that would be suitable for the industry in any given time. These regulations should be subjected to regular assessment and review as condition change.

CONCLUSSION

The study, therefore, clearly revealed that housing need in Nigeria is still on the rise as people do not have adequate shelter to carter for the housing needs. The study primarily blames the country for its complete reliance on only the conventional method of constructions as the main course of the problem of her inability to provide adequate number of housing units for her general populace. Based on the findings of the study, it was concluded that industrialization of the building delivery system as a method, will most likely enable the country to overcome her housing shortfalls. It also sees a great merit in partial prefabrication tailored towards the countries level of technology and infrastructural developments. It is alarming, that with an increase in the country's population, provision of adequate housing is still on the low. This calls for urgent policy intervention.

STRATEGIES AND RECOMMENDATIONS

1. The reasons for the limited success characterising most attempt to introduce prefabrication systems in some countries can generally be traced back to prerequisites for prefabrication not having been established beforehand. These prerequisites include:

   Long term planning as a basis for continued demand.

   - Modular co-ordination must be widely practised in order that prefabrication building components may be used in different types of buildings and structures.

- Building codes must not be restrictive or prescribe the use of certain materials or techniques, but should permit the use of prefabricated components. The building codes should preferably be performance oriented i.e. based on functional requirements.

2. National standard should be adopted for as many building components and materials as feasible. The establishment of these prerequisites will benefit the development of a well-functioning building industry. Rationalization of design to minimize consumption of scarce materials and the introduction of simple handling and hoisting devices and training of craftsmen are some of the steps to be taken to realize economy in cost and material and improved productivity.
3. The process of gradual industrialization of the building industry appears to be that the building industry appears to be the method most likely to succeed in a developing country like Nigeria. At the initial stage, only few and relatively simple components will be manufactured by industrialized methods, and as skills and market develop, more and more products can be pre-fabricated. Low rise and high-density, low-cost housing utilizing a sizable degree of prefabrication is not only more acceptable as a solution, but probably also the type of housing that is best suited to a process of gradual industrialization.
4. Deliberate efforts at industrialization need to be made by all concerned parties, that is; local, state and federal governments, professional organizations of architects, engineers, building contractors, and building material and component manufacturers. The government must ensure a long-term policy which will provide a base for the creation of industrialized building industry, and the professionals must use their creativity and inventiveness to take advantages of possibilities offered by industrialized process of building construction.
5. Building research institutes need to be established and should play an active role in the development of suitable components and methods as well as adaptation of techniques and systems developed in and for advanced countries.
6. In order that all nooks and crannies of the country benefit, the diffusion of the new techniques can be ensured by covering the country with a network demonstration cum training production centres located at all local government headquarters, polytechnic, technical colleges or trade centre, and civil engineering departments of universities. Each centre may serve a city section of a city, or a group of villages. The function of such

centres will be the production of standardized components, training of craftsmen in the new techniques, and arranging demonstration of the new processes.

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