

Stabilized Earth Housing Delivery through the Public-Private Partnership: Panacea to Inadequate Housing Provision for the Low-Income in Nigerian Cities

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Abstract—Housing is a very critical basic need of man and constitutes the third necessity of life after food and clothing. The high cost of conventional building materials in Nigeria is making the government and the private sector to look for alternative sources of building materials locally in order to meet the housing needs of particularly the low-income citizens. This study looks at the use of stabilized earth bricks by the public-private partnership (PPP) initiative in trying to solve the problem of inadequate housing for low-income urban dwellers in Nigeria. The paper highlights the practice of the public-private partnership in some developed and developing countries for the purpose of delivering a project or service such as housing provision for the populace, which was traditionally provided by the public sector. It was noted that the stabilized earth bricks can be used in the various part of a building depending on the percentage of cement or other additives added to the earth to stabilize the bricks. Recommendations were then made as to how the stabilized earth bricks can be used to meet the housing needs of majority of the low-income urban dwellers in Nigeria.

Index Terms—Housing, Low-income, Public-Private, Stabilized earth.

I. INTRODUCTION

Shortage of housing has been recorded in both rural and urban communities of Nigeria. Though, housing shortage is a worldwide phenomenon amongst developing and developed countries. For example, a United Nation study revealed that estimated normative housing requirements during the period 1970-1980 were 323 million dwelling units for the world – 90 million units for the developed region and 233 million units for developing regions [1]. It was against this background that the delegates at the 1976 United Nations Conference on Human Settlements (Habitat) in Vancouver, Canada, demanded a completely new and radical approach to housing policy. The policy was expected to have a strong political and financial commitment by governments especially in helping the poorest citizens of the world. To corroborate this fact, the magnitude of the housing problem in the urban areas of Nigeria as contained in the National Housing Policy (which was established in 1991) was such that 5 million new housing units were required to meet up to year 2000 A.D. Hence, the total housing needs of Nigeria by the year 2000 A.D. would be about 8 million units (i.e. between 1991 and 2000 A.D.). The total housing

requirements for the whole of Africa for the same period has been put at between 28 million and 32 million [2].

This paper looks at the use of stabilized earth bricks in housing provision by public-private partnership initiative. Reference [3] revealed that the use of stabilized laterite brick was being accepted for walling. It therefore becomes necessary to look critically at the use of the stabilized laterite bricks for building construction purposes particularly for the low-income in Nigeria. Reference [2] further stressed that modern building industry lays so much emphasis on sophisticated techniques and building materials particularly the use of cement and cement-based products which are cost and energy intensive. There is inadequate provision of housing for the low-income earners in Nigeria. The high cost of using imported building materials for provision of housing for the low and middle income earners is almost becoming impracticable in present day Nigeria. Reference [4] noted that with the increasing demand of the population on the national economy and the government's propensity for enlarging the multi-sectorial allocations in terms of finance, it is becoming more obvious that government alone can no longer provide adequate housing for all categories of her citizens. Therefore, alternative sources of building materials must be sought for in order to meet the ever increasing housing demand of the citizens particularly those of the low-income citizens.

The Public-Private Partnership (PPP) is the collaboration between the public and private sector for the purpose of delivering a project or service which was traditionally provided by the public sector. For a very long time, until recently the government has been saddled with the enormous responsibility of providing housing for its citizens. Recently, the private sector has been showing considerable interest in the provision of housing, not as a social service to the people but with the intension to make profits. Reference [4] noted that the expediency of the increased adoption of the Public-Private Partnership for housing delivery in the present socio-economic circumstances of shortage of housing in Nigeria is now even more glaring. With the increasing demand of the population on the national economy and the government's propensity for enlarging the multi-sectorial allocations in terms of finance, it is becoming more obvious that government alone can no longer provide adequate housing for all categories of her citizens. Thus, the public-private partnership will facilitate the provision of housing delivery.

II. PUBLIC PRIVATE PARTNERSHIP

Public-Private partnership (PPPs or P3) are arrangements

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between government and private sector entities for the purpose of providing infrastructure, community facilities and related services. Such partnerships are characterized by the sharing of investment, risk, responsibilities and reward between the partners. Generally, these partnerships involve the financings, design, construction, operation, maintenance of public infrastructure and services. Reference [5] asserts that the rationale for these partnerships is the need to harness the combined strengths of both the public and private sectors to establish complementary relationships, on the premises that both the public and private sectors have unique advantages in specific aspects of service of project delivery. The roles and responsibilities of the partners may vary from project to project and various forms are adopted. Reference [6] defines a PPP as a cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards. Furthermore, reference [7] defines public-private partnerships as forms of cooperation between public authorities and the world of business which aim to ensure that infrastructure projects can be carried out or that services of use to the public can be provided. Reference [8] on the other hand defines the public-private partnership as a variation of privatization in which elements of a service previously run solely by the public sector are provided through a partnership between the government and one or more private sector companies.

Reference [9] asserts that partnership today, particularly in the context of human settlement development is defined as a mechanism for ensuring that the comparative advantages of different actors in the development process are exploited in a mutually-supportive way, i.e. that the strengths and weaknesses of the public, commercial, private and non-governmental sectors are harmonized so that maximum use is made of the strengths, while minimizing the potential for the inefficiency caused by the weaknesses.

Reference [10] assert that after the second world war successive governments positively set out to stimulate reconstruction activities. As part of Ireland government's commitment to developing the public-private partnership approach as an important element in delivering infrastructure investment under the National Development Plan (2000 – 2006, (NDP) for Ireland, local authorities have been asked to consider the potential for using PPP arrangements in a range of housing areas, including social and affordable housing provision, the management of housing estates, the provision of rental accommodation and the carrying out of remedial works and regeneration schemes [11].

Another major problem confronting many Nigerian cities is the problem of housing for the poor, culminating in slums and squatter settlements. Three main categories of poor urban dwellers may be recognized in many African countries. First, are the homeless and the street urchins, poor dirty street boys. Second, there is a large group of people living in slums, but who frequently pay high rents especially those living within the urban fringes. Finally, the third group is the squatters and occupants of shanty towns. Slums and squatter settlements are basically environmentally – degraded areas in urban centers [12].

They adequately reflect excess of housing demand over supply indicating failure of the private and public sectors to provide adequate low-income housing. Nigeria is presently confronted with a relatively large deficit of housing requirements, a very high occupancy ratio in most cities, lack of basic provision of infrastructural facilities like pipe borne water, water closet, electricity etc., a large volume of solid waste generated especially in the cities, unsanitary conditions in which the solid wastes are collected, processed and disposed of, and so many more – all contributing towards environmental degradation.

III. WHY BUILD WITH STABILIZED EARTH?

Building houses from laterite or earth materials has a long illustrious past. Today, approximately half of the world's population of about 7 billion people still inhabits dwellings made with soils harvested from the earth's crust [13]. Mud or earth houses are appropriate for a variety of climates and are ideally suited for passive solar heating and cooling. Built largely from soil excavated on site, stabilized earth houses require substantially less fossil fuel-derived energy to build, than the conventional concrete buildings commonly found in many urban centers in Nigeria. Stabilized earth buildings help to ease pressure on the world's over-harvested forests. Materials used for its construction are collected locally: no huge mines are required to supply building materials, and the blemish produced when extracting laterite can generally be repaired quickly and easily with little environmental impact.

Construction of stabilized building techniques requires very little skill and is ideally suited to owner-building projects. You can learn what you need to know in a week-long workshop. Stabilized earth buildings can be quite economical, thereby further adding to their appeal. As a building material, earth continues to predominate in Africa, the Middle East and nearly the whole of Latin America. The adobe house is considered as a building that blends with nature. Its thick wall gives one a feeling of security. The houses are built with walls which are considered to be alive, as there is a growing awareness with people going against "artificial" building materials such as plastic and glass; indeed the manufactured world are gradually choosing to embrace their own "natural" house, growing out of the earth. This idea of the "naturalness" of earth could then be regarded as a passing phase or a response to the failure of conventional architecture to meet the requirements of inhabitants of houses.

IV. IMPACT OF STABILIZED EARTH BRICKS

The earth as building material is found in great abundance all over the six geo-political zones of Nigeria. Therefore, it then means that the stabilized earth bricks can be manufactured in almost anywhere in Nigeria. For the stabilized earth bricks to make any impact on the housing sector, it must be widely preferred to any basic building material. But preference of building material is a function of many factors – cost, availability, technology, and psychology and government promotion. Where the stabilized earth bricks have been accepted and used, it has

been observed that time taken for the construction of such buildings take relatively short time to complete. Interlocking stabilized earth bricks are fast gaining acceptance in terms of usage among urban dwellers in Nigeria. The stabilized earth bricks were used recently to construct the Electronic Testing Centre of the Federal University of Technology, Akure. Several buildings at the National Museum of Traditional Architecture in Jos Nigeria were constructed with the stabilized earth bricks.

V. CONCLUSION AND RECOMMENDATIONS

It is time that Nigerians re-appropriate the technical skills needed for their own building development technique. However simple a technique, if it has not been re-appropriated by the group which would have made it theirs, it will remain inadequate. And this is all the more apparent in the case of Western technologies grafted onto environments that are quite incapable of absorbing them, as is often the case in the developing countries, where all they achieve is the destruction of the structure and equilibrium of cultures often still seeking to establish their own identities. The construction industry has not been spared either. In fact, it is one of the most affected industries in Nigeria. The authors think the time has come to start thinking of how local building materials particularly consumption of stabilized laterite bricks and its products can be researched into, to be self-involving and be used to reduce the cost of building construction, thereby increasing housing stock in Nigeria.

This paper focuses on housing development efforts in Nigeria through the public-private partnership initiatives and recommends the use of Stabilized Laterite Brick that is cheap, durable and readily available as an appropriate technology for building construction works in Nigeria. In order to provide housing for the greater majority of Nigerians, stabilized earth bricks must be used. The public-private partnership initiative in housing delivery has been recommended in this study particularly for the low-income earners in Nigeria. Other advantages of the stabilized earth bricks are the benefit of not painting the walls over the years except where the walls are later plastered with cement. Some other advantages of the stabilized earth bricks are on the national economy, it is energy saving, in terms of conservation of heat within the buildings. In colder regions of Nigeria such the Jos Plateau and the Manbila Plateau several houses are built using the stabilized earth bricks.

REFERENCES

- [1] United Nations, *Compendium of Housing Statistics, 1972-74 – Recommendations*, 1974.
- [2] O. Arayela and A. O. Owolabi, "Towards a sustainable national housing development: Comparative cost analysis of common walling materials," *Advances in Environmental Sciences*, 2002, pp. 7-9.
- [3] O. Arayela, "Development without growth: strategies for sustainability in Africa in the next millennium," in *Proc. Conf. on Sustainable Architecture, Sustainable Practice*, organized by the

- New Zealand Institute of Architects and the Commonwealth Association of Architects at the International Conference Centre, Wellington, New Zealand, 5-8 April 2000, pp. 29-40.
- [4] F. Ikekpeazu, "New trends in low-cost housing delivery systems in Nigeria: An overview of the public-private partnership approach." *Housing Today*, vol. 1, no. 8, 2004, pp. 30 – 36.
- [5] H. Agenda, Paragraph 213 of Habitat II Conference held in Istanbul, 1996.
- [6] The Canadian Council for Public-Private Partnership "Definitions" [Online]. Available: <http://www.pppcouncil.ca/January>
- [7] EUROPA. Internal Market-Public-Procurement-Public-Private Partnership. [Online]. Available: http://europa.eu.int/comm/internal-market/public_procurement/ppp-en.htm
- [8] Wikipedia. The free Encyclopedia, Public-Private Partnership. [Online]. Available: http://en.wikipedia.org/wiki/public-private_Partnership
- [9] S. B. Agbola, "The housing of Nigerians: A review of policy development and implementation in housing sector," *Research Report 14*, Development Policy Centre, Ibadan Nigeria, 1998, pp. 79-86.
- [10] F. Witbraad and P. Jorna, "Public-Private Partnerships," in *URBAN REGENERATION: Property Investment and Development*, J. Berry, Ed. Stanley Mc Ereat & Bill Deddis, 1993, pp.230-231.
- [11] T. Day. Ireland's Public Private Partnership-Housing Sector. [Online]. Available: <http://www.ppp.gov.ie/>
- [12] F. W. Schwerdtfeger, "Traditional housing in African cities," John Wiley and Sons; Chichester, New York, Brisbane, Toronto, Singapore, 1982.
- [13] O. Arayela, "The politics of housing the masses in Nigeria - A retrospective introspection," *Journal of the Association of Architectural Educators in Nigeria*, vol. 1, no. 3, 1996, pp. 29-33.



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