



Effective Mechanisms for a Faster, Cheaper and More Efficient Delivery of Affordable Homes

The delivery of low cost housing through conventional construction methods is costly, time consuming and inadequate to meet the increasing demand for housing in developed and emerging markets. This has led many governments to introduce legislation and encourage programs that promote the use of alternative building technologies (ABT) in large housing projects. In Sub-Saharan Africa, South Africa has been in the forefront of employing ABT in the development of low income housing. A recent survey conducted in that country by a housing finance firm showed that US\$1.2 billion has been invested in the country's affordable housing sector in the past 8 years from 2004¹ during which a number of building technologies have been tested and implemented.

Nigeria, on the other hand has not effectively embraced and invested in technical and financial concepts that provide an alternative means of solving today's shelter problems, and creating habitats for sustainable living. With a population growth rate of 2.5%,² urbanization at 3.8%,³ environmental degradation and escalating cost of conventional construction, it is imperative that the government and private sector collaborate to promote ABTs. At the very least ABTs encourage standardization, lower costs through mass production and ultimately achieve quicker housing delivery especially for low income households, where demand is greatest.

This edition of RE insight provides some examples of the use and benefits of ABTs in the South African and Ghanaian markets and suggests ways to implement same in Nigeria.

Alternative Building Technologies (ABT)

The demand for housing over the years has resulted in industry experts exploring new ideas with the aim of developing sustainable designs to reduce construction costs while being environmentally friendly, affordable and offer people greater control over the production process.

Prefabricated homes were first produced after the Second World War to fast track the construction of homes and replace neglected slum quarters. These were created in sections and transported to site for installation. Today, architects are increasingly incorporating modular prefabricated forms into creating bespoke architecture. Other benefits of ABT include development and dissemination of technological ingenuity, local skills development and promoting the economic strength of the people.⁴

Over the past 25 years, a large number of ABT's

have been developed and utilised for construction of low income homes. Popular technologies include: Structural Insulated Panels, Insulated Concrete Forms, Radiant Wall System, Timber Frame, Cob, Stabilized Mud Blocks, Straw-bale, Log, Adobe, Rammed Earth, Plastic Forms and Earth Ships.⁵

South Africa - Mass Housing Production at its Best

With the delivery of over 2.4 million subsidized housing units between 1994 to 2010, South Africa's housing deficit though significantly reduced, remains sizeable at between 2.2 - 2.5 million units. To contain the rise in demand for housing, the National Housing Department (NDH) in 2004 introduced sustainability to human settlement by establishing the Breaking New Grounds (BNG) initiative. Key objectives of BNG is to eradicate all informal settlements by 2014 and to deliver low income houses (80sqm and less) within the context of integrated sustainable human settlements with all social infrastructure and amenities.⁶

To reduce cost and achieve quicker delivery, the Department of Housing encouraged the use of ABT to complement conventional construction. Innovation centres were established and different ABTs were tested. Financial institutions went into partnerships with developers in ground breaking PPP arrangements providing bridging finance (US\$5 billion) for projects. Two pilot projects were launched using precast insulated concrete panels and part-polystyrene bricks.

South Africa's foray into the use of ABTs has been relatively extensive with varying degrees of success with a dozen housing projects serving as pilots for a variety of ABTs including compressed earth brick technology, Interlocking blocks, Shutters and Concrete. In spite of this, of the 2.5 million affordable housing units delivered from 1994 to 2010, less than 1% was delivered through the use of ABTs. SA government targets to close majority of its housing backlog (which stands at 300,000/year) utilising such technologies.⁷

Ghana - Reaping Early Gains of ABTs

A decade ago, it was almost impossible to find formal low income housing in Accra, Ghana, (housing deficit = 1.5 million units). Developers focused on mid/high income housing and delivered the most basic 3 bed unit (120 sqm) for US\$80,000, making housing out of the reach of majority. Government in the past 10 years focused on improving the supply of more affordable



Figure 1: Building Constructed Using Interlocking Blocks

Source: www.howwemadeitinafrica.com

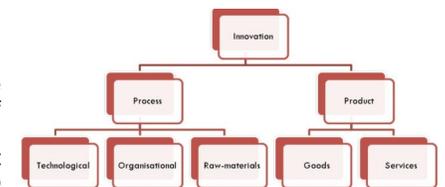


Figure 2: Categories of Innovation

Source: Human Settlement Review., Vol 1, Num 1,2010

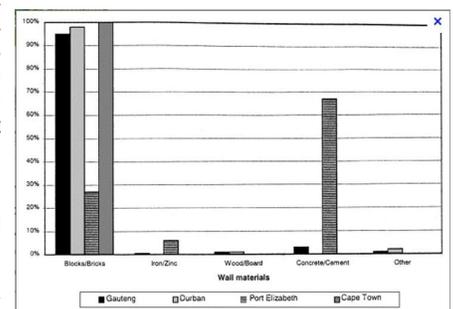


Figure 3: Materials used in Construction of Walls for Formal Low Income Housing in South Africa

Source: www.sciencedirect.com - Energy Policy

housing. Initiatives embarked on include: promoting research in the use of local materials, basic building technologies, the use of affordable, fast and sustainable alternatives to complement standard construction, reducing time and cost of delivery. A number of these technologies are now actively promoted through partnerships with private Developers.⁸ Pilot and full scale projects are currently on-going in Accra and Kumasi.

In addition to embarking on research and partnerships with Developers deploying ABTs, the Ministry of Environment, Science and Technology developed a building policy which makes it mandatory that 40% of the building materials used by contractors on all government projects is locally sourced. The country's Building and Road Research Institute (BRRI) confirms that there is increasing use of local building materials, and a stronger focus on research and development of both materials and hand-held construction equipment. The government of Ghana opines that the building policy will result in cost savings of up to US\$80 million per annum (30% of current spend).⁹

Alternative Building Technologies in Nigeria

The Nigerian Building and Road Research Institute (NBRI) which engages government on various policies that regulate and improve the quality of buildings in Nigeria signed a Memorandum of Understanding with its Ghanaian counterpart in 2009 with the intention to develop a cement stabilized building technology, an affordable alternative to the standard sandcrete block. In 2011, NBRI formed a partnership with Federal Mortgage Bank of Nigeria (FMBN) to deliver 1,000 low income housing units in every state of the federation using this technology.¹⁰ There are however no records of the Institute's achievement in this area.

Pilots schemes though slow and sporadic, have been driven by private sector Developers who are constrained by capacity, access to finance, the high cost of land transactions and low level of acceptance of ABTs. Developers who use ABTs often produce below capacity and are unable to realise the full potential of embarking on mass housing initiatives. Ultimately, the stock supplied is considered unaffordable for the majority of the target market.

Many governments across the emerging economies continue to review and develop new programs and strategies to promote the supply of affordable housing for low income households. There are many examples of such successful initiatives that may be adopted having created the right environment. Some initiatives to consider include:

Government/Private Developer Collaboration - Government commitment by way of promoting research and testing of ABTs and providing institutional support (the funding of pilots, land subsidies and off take capital) for successful technologies.

Tax Incentives - financial incentives such as tax discounts and breaks, reduced permit charges for developers as well as innovative acquisition subsidiary structures for low income households will be

required to further cap the final cost of these housing units. Planning laws and regulations guiding land use need to become more flexible to allow increased densities and percentage of built up areas, without compromising the quality of the environment especially for projects in locations, targeted at young professionals.

Encourage Professional Programs - working with professional bodies to develop best practices, standards and specifications for ABTs. The planning office will need to re-train staff on approval and monitoring of projects deployed using ABTs. This is to ensure that production and assembly are carried out according to codes, standards and specifications for mass housing construction thereby ensuring high quality outputs and value for money for the end users.

Industry Wide Training - Encourage the establishment of vocational centres for local training as well as stakeholder and community awareness programs on the use and benefits of ABTs. Project budget should also cater for continuous training and skills development of local artisans by ABT experts. Furthermore, government and private sector stakeholders in the housing and construction industry such as co-operatives, non-governmental organisations (NGOs), developers, professional bodies and government agencies, need to continually promote the use of ABTs in order to create awareness and acceptance.

Conclusion

The use of ABT for the supply of low income housing albeit limited is slowly gaining prominence across emerging countries in Africa. African governments have recognized that the use of ABTs as a supportive initiative to conventional building methods is crucial to combating the widening housing deficit. However, lessons learnt from SA reveal that: implementation of flexible housing policies regulation, adoption of multiple and dynamic strategies, improvement of capacity for developers and education of housing policy regulators and end users will lead to efficient delivery of low income housing.

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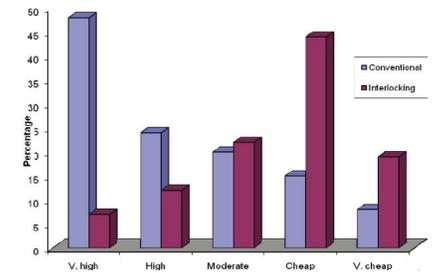


Figure 3: Material Pricing of Conventional Construction Vs Interlocking Blocks

Source: Standard and Poors, 2012



Figure 6 Moladi Plastic Formwork

Source: www.jovoto.com



Figure 6: Use of Alternative Building Materials by Habitat for Humanity

Source: www.taoshelter.tao-pilipinas.org