Appropriate Building Technologies

The Option for Affordable Housing in Kenya

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Introduction

For a long time now, the provision of housing in Kenya has been increasing but in a skewed propotion in favour of high cost housing. House delivery to the low incomed has become a nightmare as a result of the increased cost of the conventional building materials. In addition, the quarry sites are closing for being exhausted and soon we may not even have the conventional materials.The low incomed are therefore , as a result of the prohitive cost of housing, forced to live in very sorry states. To correct this situation a number of interventions need to be put in place. One of these that can ensure housing facilitation to the low incomed is to offer alternative affordable mateials and technologies. It is from these realizations that i take a burden through this paper to seek posibilities to offer the alternative which i believe will reduce remarkably the house cost so as to cover the larger low incomed population.

1 Situation analysis

1.1 Basic General Data

The republic of Kenya became a sovereign state in 1963 when it gained its independence. It is situated in the eastern side of the African continent and occupies an area of 588,648 km². Kenya is divided into 8 provincial administrative boundaries namely: Nairobi province, which is the capital city of

Kenya, Central province, Rift Valley province that is the breadbasket of Kenya, Eastern province, Nyanza province and Coast province. It has an estimated population of 37.2 million people and official languages are Swahili and English. The official currency is the Kenya shilling.

1.2 Shelter Related Fact and Figures

The Kenyan housing sector is characterized by inadequate affordable and decent housing, low-level of urban home ownership (16 per cent) and extensive and inappropriate dwelling units including slums and squatter settlements. It is estimated that out of a total 150,000 housing units required annually in urban areas, only an estimated 35,000 are produced. The shortage of housing for low-income households is particularly acute in urban areas, with only an estimated 6,000 units, or 20 per cent of all houses produced catering for this group. This is attributed to under-investment in low and middle-cost housing by both the public and private sectors. Other constraints include; poor governance; an outdated legal and regulatory framework; and the high cost of finance for housing both to long term developers and the end users (buyers). The housing shortage is for both owner-occupier and rental housing. (1)

With the demand for new housing units in urban areas currently standing at 150,000 units annually and only 23 per cent of this demand being met, the national gap is big and requires an urgent solution. The shortfall is more acute among low-income households whose present demand is about 48 per cent of total new houses required in Kenya.

Currently, more than 80 per cent of new houses constructed are for high and upper middle-income earners. Considering that more than 60 per cent of the Kenyan population is younger than 25 years, it is clear that the demand for adequate housing will rise steadily as those aged 20 and below reach adulthood and start family life. (2)

Stock and Quality: The distribution of housing stock in Kenya is skewed in favour of the rural areas. For instance from the 1999 Population and Housing Census statistics, 82 per cent of Kenya's housing stock is in the rural areas leaving only 18 per cent in urban areas. The quality of housing is however dictated by

cultural and environmental factors. The following tables on roofing and wall materials demonstrate this:

Table 1: Distribution by roofing material in rural and urban areas

	Corrugated iron sheets	Tiles	Concrete	Asbestos sheet	Grass	Makuti	Tin	Others
Kenya	73.6	2.4	3.4	0.6	14.8	3.2	0.3	1.7
Rural	74.0	0.5	0.2	0.1	19.5	3.3	0.3	2.2
Urban	72.0	8.1	13.3	2.1	0.8	2.8	0.4	0.2

Source: Kenya Integrated Household Budget Survey (2006)

Table 2: Distribution by walling material in rural and urban areas

	Stone	Brick/ Block	Mud/ Wood	Wood only	Corrugated iron sheet	Grass	Tin	Others
Kenya	*14.3*	*16.7*	*45.4*	*10.2*	*3.5*	*2.9*	*0.3*	***1.6***
Rural	*6.5*	*14.5*	*54.0*	*12.1*	*2.3*	*3.7*	*0.2*	***2.0***
Urban	***37.9***	***23.3***	***19.4***	***4.7***	***7.0***	***0.4***	***0.4***	***0.2***

Source: Kenya Integrated Household Budget Survey (2006)

Demand versus Supply: Although it is currently projected that the demand for housing may not be uniform every year. However based on household sizes, it is projected that to adequately provide shelter for the projected population of 60 million by 2030, and assuming the household size of 5 members per household, the projected housing demand for the country would be more than 12 million quality dwelling units by the year 2030.(3)

Housing in the National Vision for Development

Given the current demographic trends, Kenya will be a predominantly urban country by 2030. The country therefore, plans for high quality urban livelihoods for most of her people by that date. The 2030 vision for population, housing and urbanisation is "an adequately and decently-housed nation in a sustainable environment." This will be attained through: (i) better development of and access to affordable and adequate housing; (ii) enhanced access to adequate finance for developers and buyers; (iii) pursuit of targeted key reforms to unlock the potential of the housing sector; (iv) initiation of a nationwide urban planning and development campaign, starting with Kenya's major cities and towns.

The Ministry of Housing is strategic in ensuring that the vision of “an adequately and decently-housed nation in a sustainable environment” is met. This will contribute to the realization of the social pillar of the Kenya Vision 2030.

Flagship projects on housing identified for implementation include:

1 Installation of physical and social infrastructure in slums in 20 urban areas to formalize slums, permit construction of permanent houses and attract private investment;

2 Facilitation of production of 200,000 housing units annually by 2012 through a mixture of initiatives in order to fill the huge housing gap in the country (e.g. build/enhance capacity in local authorities to provide serviced land; and/or to produce low-cost housing);

3 Establishment of housing technology centres in each constituency to increase access to decent housing by promoting location-specific building materials and low-cost housing;

4 Establishment of a secondary mortgage finance corporation to increase access to housing finance.

The government has also implemented specific strategies such as to increase the participation of women in all economic, social and political decision making, improve access to disadvantaged groups to basic necessities (e.g. housing), minimizing vulnerabilities through prohibitions of retrogressive practices (e.g. female genital mutilation and child labour) and by up scaling training for people with disabilities and special needs.

2 Organisation

2.1 Background

Housing is one of the principal sectors that can revitalize economic growth in Kenya with shelter being recognized as one of the tools of development. Investment in housing and related infrastructure and services have affects on the national income that go far beyond the direct investment itself by triggering forward and backward linkage through additional investments in building materials production, transportation and marketing.

2.2 Current Mandate

The mandate of the ministry as spelt out in the presidential circular No. 1/2008 of May 2008 includes:

- Housing policy
- Shelter and slum upgrading
- Development and promoting of Low Cost Rental Housing
- Building and construction technologies
- National secretariat for human settlements
- Housing for civil servant and Disinclined forces
- Civil servant housing scheme
- Management of government housing
- Leasing of public office accommodation
- Rent restriction tribunal
- National housing corporation (NHC)
- Housing finance Company of Kenya Ltd .(5)
- As from the mandate above, I am placed in the functional Housing department that carries out the first five functions, at the Provincial level.

2.3 Core Functions

Arising from the mandate, the ministry core functions are:

- Formulation, implementation, review and monitoring of national housing policy as well as legal framework,
- Coordination of stakeholder in local, national, regional and international forums.
- Evaluation and advice to National Environmental Authority (NEMA) on environmental impact assessment of housing development projects.
- Determination and control of rent for residential dwelling units for low-income earners in order to protect the vulnerable groups in society while ensuring fair economic returns to the landlords.
- Formulation and implementation of policies and legislation to guide estate management

- Coordination of initiatives to upgrade slum and informal settlements,
- Coordination of provision of housing infrastructure,
- Development and implementation of guidelines for public private partnerships (PPPs) in housing,
- Empowering civil servant to own houses
- Promotion of appropriate building materials and technologies (ABT).

2.4 Functional units

The ministry operates seven functional departments. These are:

1 General administration and planning department –Human Resource Management (HRM), Account, Central Planning and Monitoring Unit (CP & MU), procurement, Finance, administration support, procurement, Information Communication Technology (ICT) and Internal audit.

2 Housing Department (HD)

3 Estate Department (ED)

4 Rent tribunal department (RTD)

5 Slum upgrading department (SUD)

6 Civil servant housing Department (CSHD) and

7 Housing infrastructure department (HID). (6)

3 Shelter Problem

The Kenya housing sector is characterised by inadequate affordable and decent housing, low level of urban home ownership (16 per cent) and extensive and inappropriate dwelling units including slums and squatter settlements. It is estimated that out of the total 150,000 housing units required annually in urban areas, only an estimated 35,000 are produced. In the rural areas, it is estimated that there is no need to improve the quality of over 30,000 housing units every year. The shortage of housing for low-income household is particularly acute in urban areas with only an estimated 6,000 units, or 20 per cent of all houses produced catering for this group. This is attributed to under-investment in low and middle-cost housing by both the public and private sectors. Other constraints include; poor governance ;an outdated legal and regulatory framework; and the

high cost of finance for housing both to long term developers and the end users (buyers). The housing shortage is both for owner-occupier and for rental housing. (7)

3.1 Building Material and Research

As will be explained in the document the building materials, which form the major inputs in shelter delivery dictate the costs of houses and impact on effective demand and to some extend on supply. I am therefore going to deal with the building material and what the government has done and is in the process of doing to realize adequate, excellent, quality and affordable housing in a sustainable human settlement

Issues

1 The building materials and construction industry constitutes one of the most important sectors in Kenya's economy. Some of the materials, which are produced in some large-scale industries, end up being costly due to high costs of production arising from high electricity cost. It is also costly to transport the materials to construction sites for incorporation into the housing structure. The materials can be produced on site using labour intensive techniques thereby reducing overall costs.

2 Kenya is endowed with abundant natural resources that can meet the demand for basic materials using available surplus labour in peri-urban and rural areas. There are extensive deposits of limestone, gypsum, clay, coral, forest and agricultural fibre and wastes that can increase the supply of building materials and substitute current imports. A well-developed local building materials industry can provide such benefits as improved skills, greater income generation and stimulation of other sectors.

3 The existence of inappropriate standards and by-laws has greatly reduced the range of approved materials and building technologies. There has not been extensive research on alternative locally available building materials by our research institutions. Though some research findings have been achieved through the efforts of research institutions including Housing and Building Research Institute (HABRI) of the University of Nairobi and other

organizations, dissemination and use has been minimal due to inadequate funding for research and dissemination. (8)

Though not ongoing now, it must be noted that the resultant research findings have led to the successful Housing Policy delivery; whose element include the acceptance of the ABTs. I can also say the exercise inspired the idea of Building Technology Centres. Because of its significant contribution to advancement of the Housing Agenda, the Housing Department keen on reintroducing the fund for the research. There are great prospects since the exchequer funding was increased three years now.

Policy Statements

In order to increase the production of housing units through utilisation of research findings as well as the use of innovative but cheaper conventional building materials and technology the Government will:

a) Increase allocation to research institutions to facilitate research on building materials and technologies, and also consider imposing a research levy on the building construction industry;
b) Review from time to time the taxation levels on building materials so as to reduce the housing construction cost arising from the building materials component;
c) Establish a National Research Coordination Secretariat within the Ministry in charge of housing to coordinate and disseminate research findings;
d) Require all research actors to harness and document existing locally available building materials and technologies as well as disseminate this information to the users as appropriate;
e) Promote and encourage small-scale enterprises to engage in production and application of researched materials;
f) Promote the production of innovative building designs and traditional architecture that are cost effective and compatible with the use of locally available and affordable.
g) Stimulate the production and availability of conventional building materials like cement, steel and stones as part of the industrial policy;

h) Promote wider adoption and application of the revised Building By-Law's and Planning Regulations;

i) Encourage the public, private and voluntary sectors to utilize the research materials in their housing and other development programmes;

j) Promote intensified training in requisite skills and construction technologies through Youth Polytechnics, Women and Youth Groups, Community-Based Organizations and Appropriate Technology Building Centres.

k) Encourage production and use of fire resistant building materials; [(9)]

4 Proposal for Change and Improvement

The Government through the Ministry of Housing is establishing housing Technology Centers in all the 210 Constituencies to increase access to decent housing by promoting location-specific building materials and low cost housing. Their operation will ensure quality housing for both urban and rural areas.

So far, the Ministry has taken initiative to establish the Appropriate Building Technology Centers plus one National Appropriate Building Technology Centre located in Nairobi, the city. The ministry is corroborating with the Local Authorities to create land banks for this exercise which was started in 2006 and to date 15 ABT centers have been established. They include one each in Eldoret, Malava, Webuye, Sagana, Mombasa, Malindi, Sotik, Embu and Nakuru. There is ongoing progress and by the end of this year, ten more will have been set up. The construction of the National/Regional Appropriate Building Technology Center in Nairobi, which is under my area of duty, is also under way and 30% of the work has now been done. We hope it will commence operations in February 2010. In these ABT Centers, the following functions are carried out:

- Promotion of research, documentation and dissemination of appropriate building technologies
- Materials and technologies assembling
- Training of communities on the locally available building materials
- Promoting utilization of low cost technology equipments
- Identification, documentation and dissemination of best practices in housing settlements.

I propose to continue playing a major role in what the Government is doing to see that her subjects are well housed. I will mainly focus on searching into the locally available materials and technologies.

Research on appropriate and low cost building technologies was done through HABRI university of Nairobi and by 1992; the results partly indicated that stabilised soil blocks were much cheaper than the natural stone and concrete.

When comparing the total roofing costs for conventional concrete tiles, Galvanized Corrugated Iron Sheets (GCI g30) and Ferro Cement Roofing (FCR) tiles (6 mm plain), cost of FCR tiles roofing was somewhere in between the two types of galvanized iron sheets and conventional concrete tiles. So far, the few locally available materials used include the interlocking stabilized soil blocks for walling and the concrete roofing tiles. When established The National Appropriate Building Technology Centre will be equipped with the necessary facilities for Training and research. Training and enhancement of the use of ABTs already existing will also be ongoing.

The Training of Ministry Housing Staff on ISSB Production at Nakuru ABT centre

The National /Regional Appropriate Building Technology Center Nairobi

The Center is now under construction where most of the basic structures are near to completion. Phase one of it includes;-

- Fencing
- Gate erection
- Workshops

- Lecture and conference halls
- Ablution block
- Sewer services
- Access road
- Internal roads network
- Equipment stores and
- Office and Administration blocks.

The perimeter wall and part of the gate house under construction

The ABT centre seen from the road.

Some of the Equipment has also been procured such as Hydraform Machine, manual block press for SSBs production. There is also a vehicle for it.

It is expected that in March of year 2010 the above structures will have been finished and Centre will be operational

Sometimes the materials introduced do not meet the desired performance standards. For these I wish to establish how the materials will be appropriate as compared to the conventional materials in the following aspects:

- the material to be used
- whether the material is widely locally available
- whether the material is appropriate
- what other components are used with it for production of blocks
- how the material will lower the cost of house production
- the life span of the material
- to what extend the material can be used
- the appropriate system of replication

I will also be gathering other technologies that will serve to reduce housing costs in Kenya. This I will do by subjecting proposed building materials through a sequence of research and analysis program. Other actors in shelter provision including private, institutions, professional bodies and government organs will actively be involved. The Appropriate Building Technology Centers will be used in conducting the exercise. In this way, I hope the proposal target will be met.

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