

MFA/HRDU 1809

Serene Seminar
Commonwealth Seminar
on Building Materials

Local Building Materials

by

E. Acevi

Housing Research and Development Unit

University of Nairobi

Kenya

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1. Introduction

Kenya, like many developing countries, is facing acute shortage of low-cost housing. The present population is about 23 million and it is predicted that in the year 2000 it will reach to the border of 38 million.

The Government of Kenya has, since independence, been concerned with the problem of shortage of shelter and has taken serious measures to overcome it. In the Fifth Development plan (1984-88), among others, it is clearly stated that:

- Realistic building standards should be adopted;
- Research on local building materials should be intensified;

In the current Development Plan the government places emphasis on:

Technological developments, simplification of specifications adaptable to small enterprises, research, training, dissemination of technological innovations etc.. However, despite the declared stand by the Government, the efforts for the promotion of local innovative technologies for the production and application of building materials have not been very encouraging so far, i.e., lack of official standards for low cost materials has hampered the viable promotion of productivity of informal production units, or the revised by-laws have not been implemented effectively.

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Considering the above issues, and in order to overcome the problems, some attempts have been made so far. These include: training actors in production units, popularizing low-cost alternative materials, setting-up units in various parts of the country, etc. These efforts are being made possible by the assistance of the Government, NGOs, R and D agencies, bi and multilateral fundings, etc.

2. Clay bricks and tiles

Traditional brickmaking has been introduced in the country by missionaries at the turn of the century. A simple technology, at cottage level, is scattered across the country and the products are often of low quality.

At formal level, Kenya has three clay brick and tile industries, two in Mombasa and one in Nairobi. Due to the low quality of the clay in Nairobi, the products have 30-50% rejects, whereas those in Mombasa have less. Kilns are Hoffman type which utilize wastes from industries or agriculture e.g., sludge from oil refinery tanks, sawdusts, coffee husks etc.

The main research work that has been carried out has focused on assessment of raw materials for ceramic products in western Kenya. Further research has been carried out in the last 7-8 years jointly with China, England, Italy and Japan, the aim being to promote clay based building materials in the country. At present, apart from small scale and informal plants scattered across the country, there are five LBDA plants producing over 25,000 bricks/day. These bricks are very popular and have high quality. The machinery of these plants, except of one case, are mainly locally produced.

3. Stone, aggregate and sand.

The stone quarries are widely distributed in the country. Stone is used in low-cost housing as well as in high-income residential and non-residential buildings. Stone quarrying in Kenya is labour-intensive, it utilizes mainly local simple tools and imported explosives. Aggregates require sophisticated machinery and powerful explosives. There are quite a number of small-scale aggregate producers in the country.

Quarrying sand, vis a vis aggregates and stones is rather simple and is widespread. Transportation of sand has attracted both local and non-local entrepreneurs.

The quality of sand and aggregates is generally good in Kenya.

4. Lime and other low-cost binders.

Lime, which would have been a good replacement for cement as a binder, is not extensively used in construction, except for whitewashing and soil stabilization in road construction. Lime is not as widely distributed as cement. Most of lime produced in three existing plants is consumed in agriculture, the sugar industry, pulp and paper and other chemical industries.

There are adequate sources of raw materials in the country which are not fully utilized. Presently, wood is the source of energy which becomes scarce and costly. Experiments are underway to change kilns to oil firing.

Among other binders, except cement, volcanic pozzolana and lime are possible suitable substitutes to them. Kenya has large deposits of tuff and other volcanic reserves.

Presently, plans are underway to start research activities at HRDU on both mineral and agricultural based pozzolanas.

5. Timber

Commercial exploitation of forests in Kenya started soon after the construction of railways. The traditional role of forests in Kenya has been to provide firewood and wood for building construction and tools, however, industrial development has caused using forests extensively for production of panels, sawn timber, pulp and paper etc.

Currently, there are 350 licensed sawmills which produce approximately 200,000 cubic metres of timber per annum. The quality of wood in recent years has dropped and it is generally difficult to find good quality timber on the market.

In 1965, the Ministry of Natural Resources introduced a programme for mass timber houses. Late in 1970, 27 timber houses were built on an experimental basis at Kariobangi. The experience gained by HRDU from these 27 wood houses resulted in a successful commercialization of timber-based house construction by the Economic Housing Group (EHG) in Kenya. The collaboration between HRDU and EHG is an example of effective translation of research.