Revalorization Of The Use Of Raw Earth In Construction Practices In Kinshasa (Democratic Republic of Congo)

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Development is impossible without the realization of basic infrastructure and the construction of a quality habitat. Therefore, this project aims to contribute to the valuation of the clay resources of the Kinshasa region in order to develop the production of local, sustainable and energy efficient construction materials. The chosen region is justified by the abundance of clay raw materials and by important needs. The Kinshasa region is facing strong spatial and demographic expansion with, as consequence, the development of a suburban area in which the habitat quality is a critical problem.

Since the early 1990 and the bankruptcy of the Kinshasa Brickyard, the abandonment of building in clay materials was systematic in Kinshasa. Nearly the whole population turned to a local material: the concrete brick. It is a brick made by manual or mechanical compression by mixing grinding fines of a sandstone rock (the Inkisi sandstone) locally called “dust”, alluvial sands (alluvial deposits of the Congo River or the Mbinza, Kalamu and Ndjili rivers) and cement. These concrete bricks of 10, 15 or 20 kilograms cost on average 1, 1.5 and 2 $ the brick. Despite this high cost for most households, the concrete brick architecture is almost the only present in Kinshasa. Earth bricks (even in terra-cotta) are considered poor materials and low resistance materials. People prefer big concrete bricks, which they consider to be more aesthetic and stronger. In addition, the lack of masons trained to build with other types of materials complicates the implementation of another construction method in the region. This is a challenge that seeks to overcome a brickyard which has just been created in the nearby province of the Central Congo. I have participated in providing solutions to that challenge. The brickyard tries to diversify its products by offering a compressed earth block (CEB) made on earth-sand and earth-sand-cement to suburban and disadvantaged populations. The idea is to put forward the ecological, economic and comfort benefits of earthen habitat.

To achieve this, compressed earth blocks (CEB) were produced locally in Kinshasa by a manual press. The dimensions of the manufactured CEB have been adapted to be closer to those of concrete bricks. After a period of drying, the bricks were brought to a laboratory in Belgium to undergo durability tests (accelerated erosion test and accelerated aging test) and uniaxial compression test on CEB submitted to different rates of relative humidity.

This work will show how we manage to generate interest among the local population about the use of earth brick based on scientific researches aiming to produce a quality building material.