

POLYTECHNIC OF TORINO
FACULTY OF ARCHITECTURE 2
Degree in Architecture
Honors theses

Low cost housing – A study case: the reality of Pawaga (Iringa – Tanzania)

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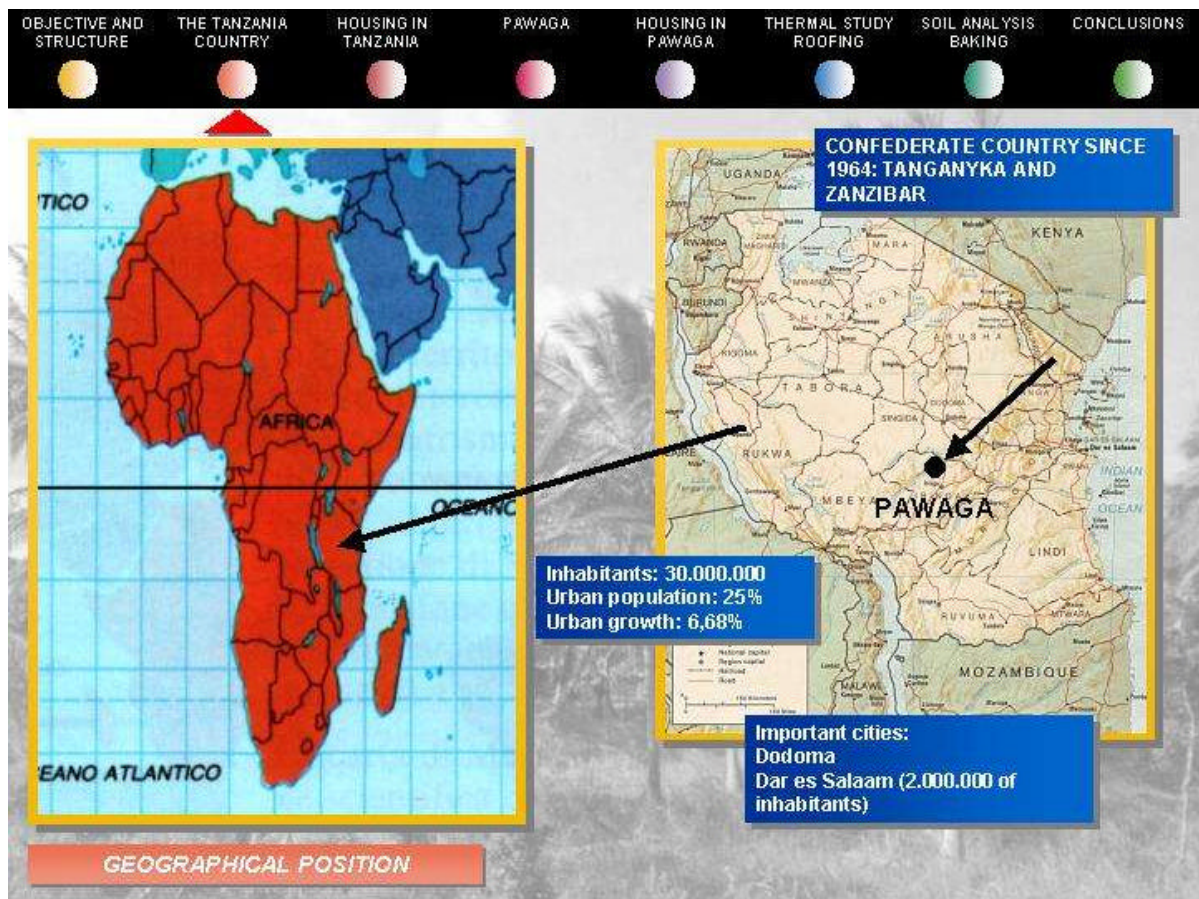
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This work comes from the idea of examining the theme of the design for Developing Countries, analysing a real situation to think of interventions that can be realized.

The main object in this study has been of thinking about this intervention examining all the aspects of the site: then not only those building and technological, but also cultural ones.

Pawaga villages are in the Iringa region in Tanzania, and are located on a table-land at 800 m above sea level. The zone is characterized by a hot-dry climate, and the main growing is the rice. The revenue of each person is of 60 U.S.\$.



Pawaga and Tanzania localization in the African continent

Pawaga, that we knew through the Missioni Consolata Institut, suffered many damages in 1998 for the El Niño cyclone. The buildings were almost completely destroyed: many doubts so rose from the local missionaries about the rebuilding, from which an article was written, that was read by us and chosen as starting point for the work.

Thanks to the availability of the missionaries of the villages and to the help given us by the University College for Lands and Architectural Studies of Dar es Salaam and by the Polytechnic of Torino, to organize a period of 50 days in Itununtu, in the sub-district of Pawaga, was possible.

During the stay in the village an analysis was made, considering all the aspects related to the zone of study either about the territory (climate, economy, territory structure...), or about social aspects

(history, customs...), or about architecture (traditional building techniques, use of house, employed materials, costs, building of houses...) through direct surveys in the site.

OBJECTIVE AND STRUCTURE	THE TANZANIA COUNTRY	HOUSING IN TANZANIA	PAWAGA	HOUSING IN PAWAGA	THERMAL STUDY ROOFING	SOIL ANALYSIS BAKING	CONCLUSIONS
<p>USE OF MUD</p> <p>FOUNDATIONS OF 30-40 cm WALLS REALIZED BY STREPS WITH WIDTH OF 25-30 cm AND HEIGHT OF 30-40 cm 3-4 MONTHS FOR REALIZATION USE OF LOCAL SOIL: BLACK COTTON SOIL</p> <p>WALLS AND FOUNDATIONS: THE BASIS HOUSE</p>							

The Wahehe traditional house: the technology of mud

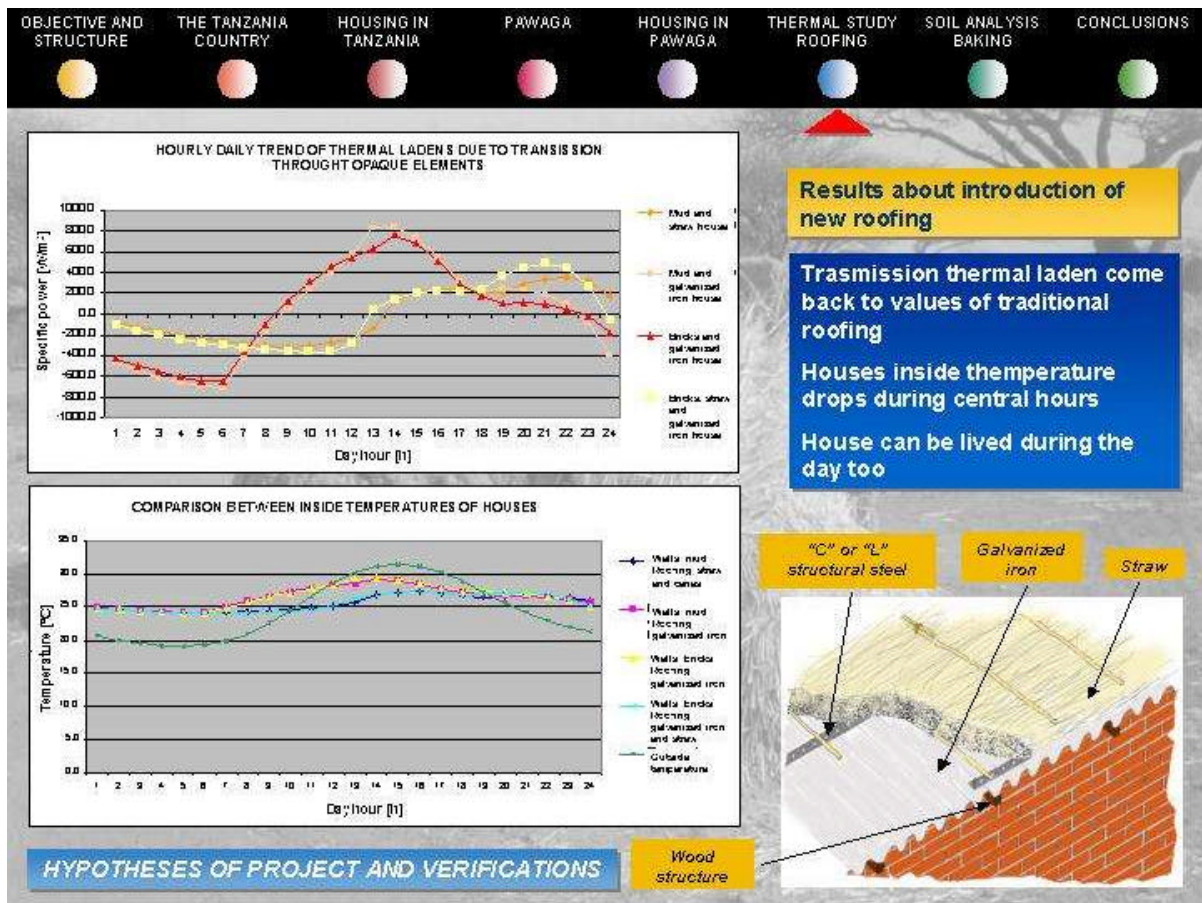
In the Pawaga territory many ethnics are present: the main is the Wahehe one, about which our work was concentrated. Their traditional house is still the most diffuse: it's built with mud walls and straw and canes reeds roof. Starting from 1998 bricks and corrugated iron were introduced, but the rectangular shape was maintained.

A second type of work was made at the University of Dar es Salaam, where many aspects related to housing conditions in Tanzania were discussed: this study was possible also thanks to the rich documentation given by Building Research Unit (B.R.U.) and by Housing Museum of Dar es Salaam.

After the analysis, it was considered how the El Niño cyclon phenomenon was exceptional. In fact important problems of houses are others: first of all the salubrity of the house that is not guaranteed with normally used materials, that can easy be attacked by insects; than there are problems of high temperatures that are created by the presence of corrugated iron, and the disafforestation, of which burning of bricks is an important cause.

About building of walls, proposals have been made to produce bricks using combustibles as rise chaff: this to reducing environmental costs and to improve brick performances.

From the thermal point of view, physical features for each shell element and thermal behaviour of each type of house were analyzed. Having found the main problem of overheating of houses in the presence of corrugated iron, a new covering system was designed made by the iron with, over, an air space and straw. In this way inside temperature values came back to ones of traditional roof, mantening hygienical advantages that iron guarantees.



Roofing design hypotheses and internal temperature trend for houses

When these design hypotheses were completed, some "open problems" were individualized, to carefully study in the idea to realize these interventions.

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