POLITECNICO DI TORINO
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Master of Science in Architecture
Honors theses

Bamboo in India. A case study in Assam: a new housing prototype coming from tradition

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In terms of population and geographic area India is equal to 1.5 times the entire European Union: 35% of its 1 billion inhabitants lives with less than 1$/day and 80% with less than 2.
The demand of housing is official estimated at 72 millions units until 2012 and most of these regards the weaker sections of population.
There are basically two opportunities to change this situation:

- Working on the tragic emergency of *slums*, with very low-cost dwellings (*urban housing*);
- Solving this situation before, thinking to the 70% of population which is still living on rural areas (*rural housing*), improving their life condition and encouraging people to stay there, reducing the migratory pressure to urban areas.

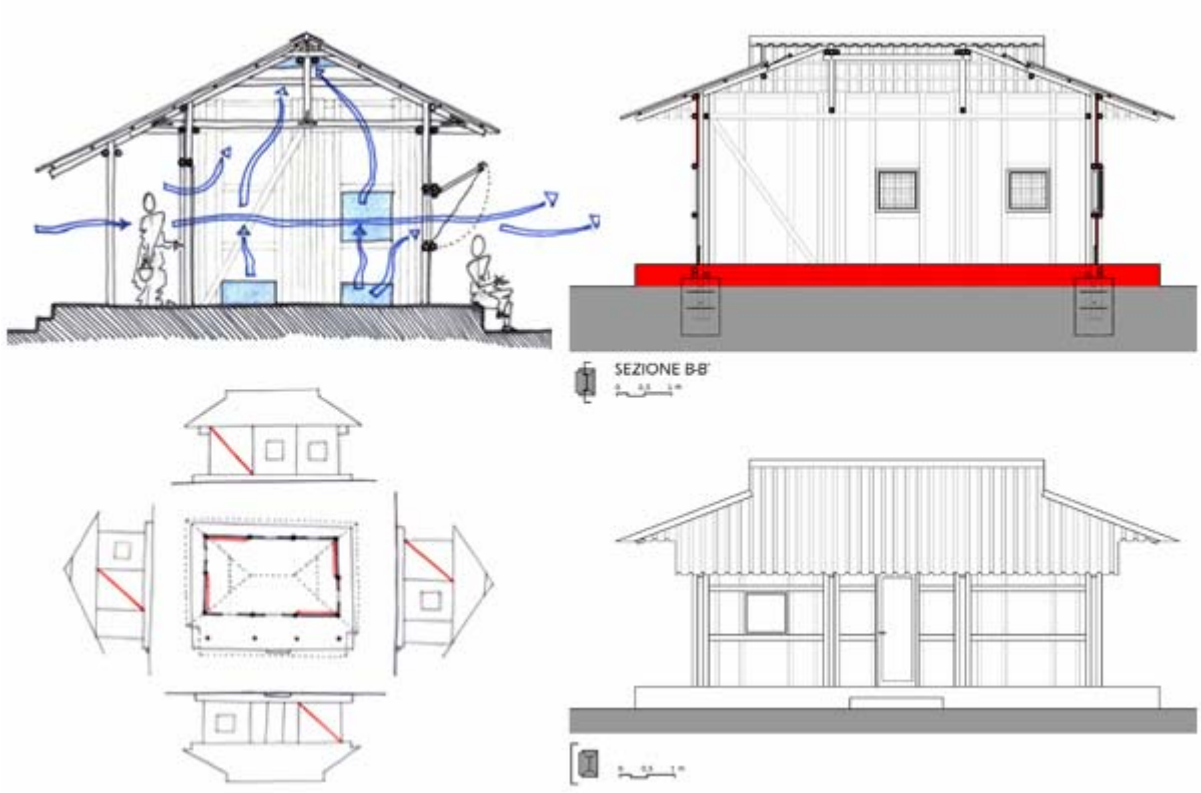
This project is going exactly in this second direction: growing and processing bamboo it is possible to generate new employment in little and middle firms; in this manner many families would invest in their own houses (also with bank loans based on job's guarantees), building it safe, comfortable and durable. Their house could be another guarantee for further founding, giving the chance to enlarge business and building, to buy livestock, to afford marriage… to make possible a true rural development.

Rural houses in the North-East of India

The investigation begins from bamboo as plant and building material, analyzing its infinite uses and which different organizations are working on it in India.
The State of Assam was my starting point for this project because of its long building tradition about bamboo, the important diffusion of this giant grass there, the deep poverty, the villagers' willingness to be involved in this process (verified through apposite interviews) and the possibility I had to visit directly different villages.
I have analyzed insediative layouts and peculiar elements of single dwellings built with different materials, underlining strength and weak points of everyone. The purpose is to introduce a project which would be well accepted from every households, also taking care about social aspects as well as climatic and economic ones.

The State of Assam and some traditional solutions which use bamboo properties

The result is a house of 26 m^2 with a cost of 930 €, which uses a large prefabrication for structural parts and self-building for finishes. This structure is made in bamboo culms and metallic joints, while walls are in plastered weaving (wattle-and-daub). Roof, doors and windows are made in *bamboo mat boards (BMB)* and in their corrugated form *(BMCS)*. *BMCS* is a particular type of industrial panel with excellent mechanical, thermal and acoustic properties and with interesting implication to generate employment.
In relation with natural calamities of this area there are some elements to prevent seismic and flooding damage. There is also a strong natural ventilation and the possibility of protection from winter climate. Big overhangs on the roof protect from monsoon's violence.



The final project

The building has the added value of flexibility in base of user's needs and it can be afterwards improved with some simple and cheap inventions, both as internal division and as customized solutions.
The hope is to give a contribute to change the widespread perception of bamboo like poor man's timber, leading out its revaluation through modern ideas and new technologies.

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