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

Climate and local resources as factors which influence home-building in the developing countries: the case of Junin de Los Andes

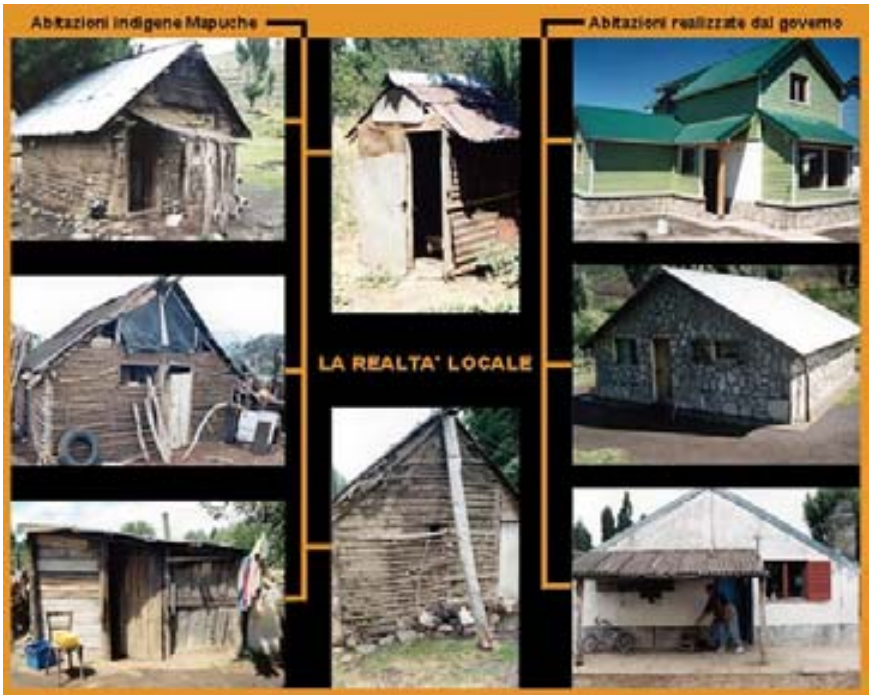
By: Alezio Rivotti
Tutor : Roberto Mattone
Co-tutor : Valentina Serra

Introduction

The conditions of the Mapuche native reservations' houses located in Junin de Los Andes' area and, sometimes, also in the town could be described as precarious and inadequate, without due cleanliness. The works done by the public administration in these years are inadequate to satisfy population's needs and, for the most cases, are too expensive for the consumers. These are the reasons why the building conditions in Junin de Los Andes are the object of this work, aimed at the research of a simple and cheap building systems, suitable for self-construction works, with those technological improvements that could increase their quality.

The work done is divided into two parts:

- a mission in Patagonia, aimed at the analysis of the local situation, at the requirement's valutation and at the available materials' research.
- the laboratory's tests and the thermochemical analyses, carried out in the Architecture Faculty II of the Polithecnic of Turin, within the Laboratory of Material's and Component's Tests and the Department of Energetics.



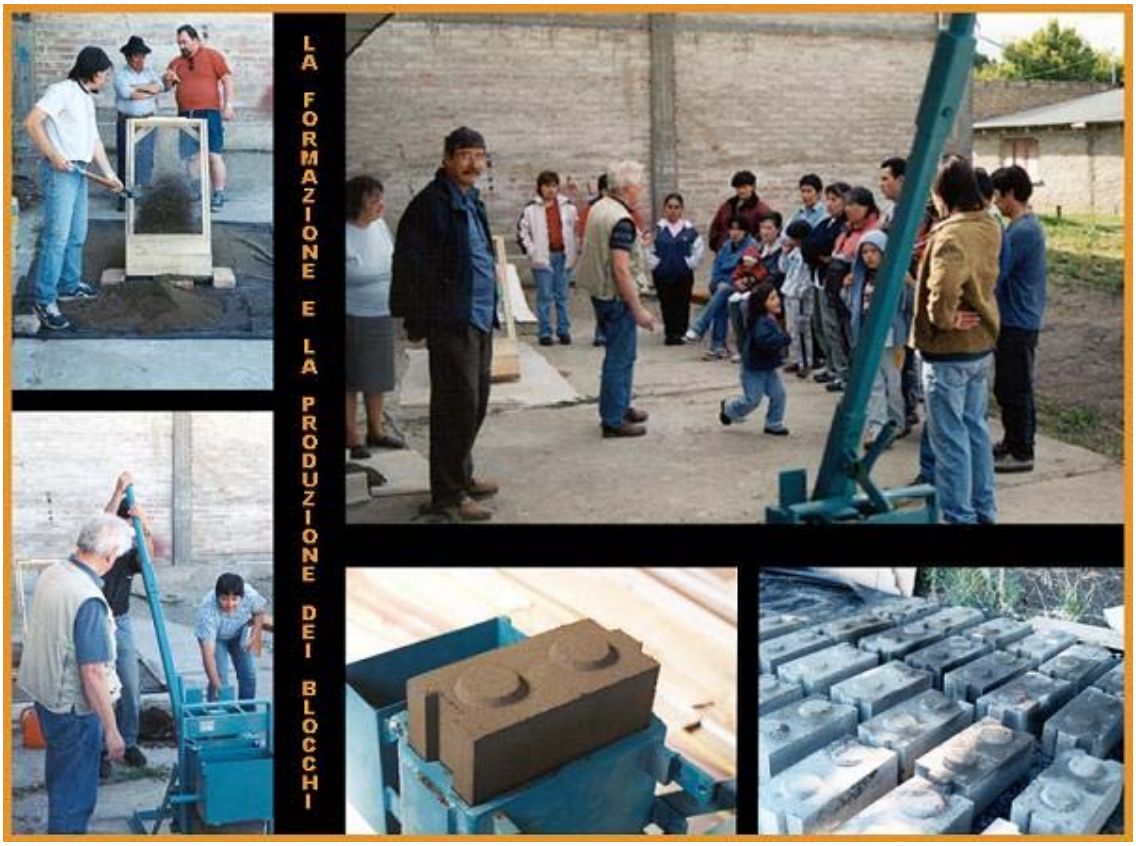
Picture 1: the local building within the native reservations

The mission in Patagonia

Among the materials available in the area, right for the carrying out of the masonry, there is the earth, that is the cheapest and easiest to find**.**

In this direction, were made a close inquires about the different earth's kinds and, with field testing, were chosen the earth suitable for making of pressed and stabilized blocks.

At the same time, a small training course were organized to teach the local population to manufacture the blocks of earth with a press Altech GEO 50 and to run a whole production cycle; than, was planned the prototype of a small single-family home, that now is in course of execution.



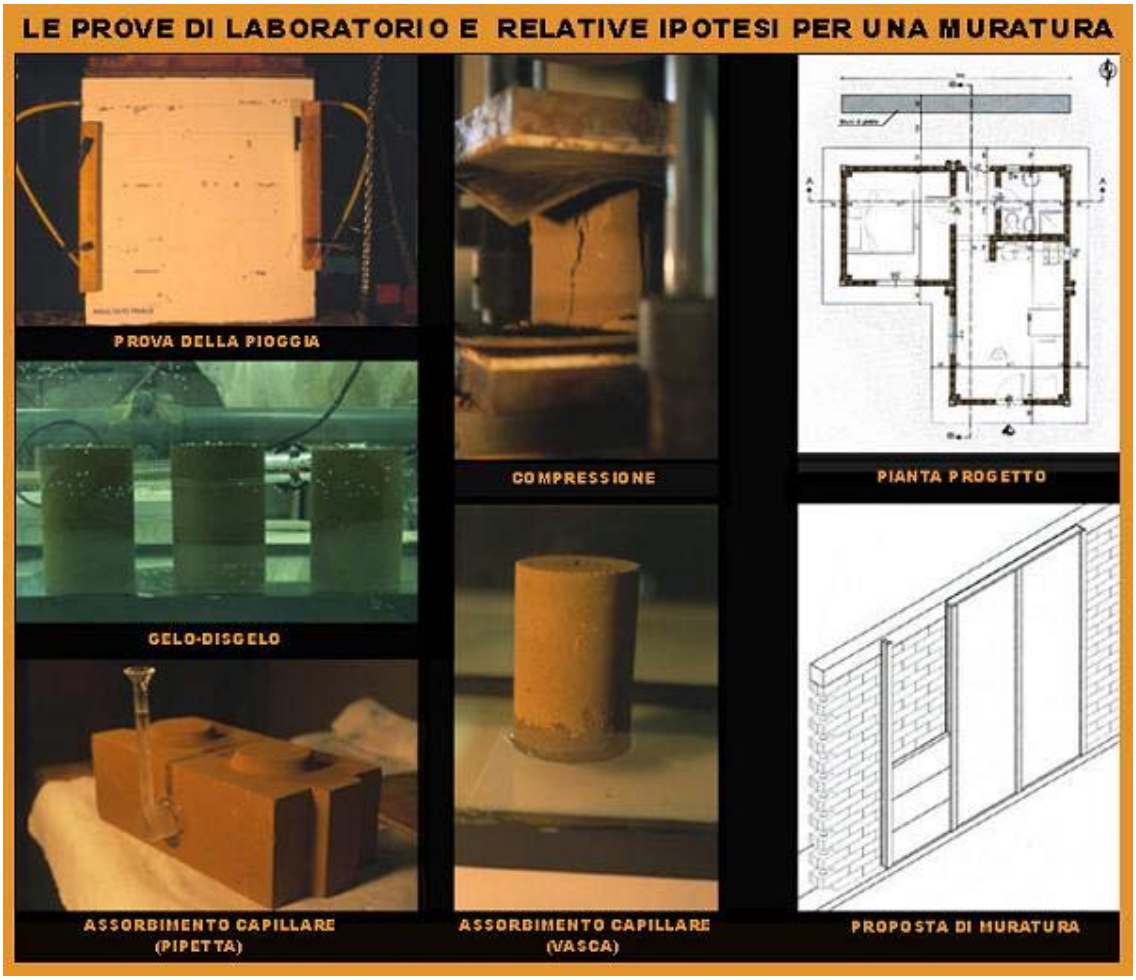
Picture2: the training course and the manufacturing of blocks of earth shaped like "bricks"

Lab. tests and thermophisical analyses

The testing beginning in Patagonia, was carried out in the Polithecnic of Turin, where some cylindrical test-pieces were set up with a small amount of earth coming from Junin. Then, some exams have been carried out on such test-pieces with the following objectives:

- inquire into the performance and issues that were came out during the stay.
- research for a surface treatment of the wall able to guarantee an effective protection against the atmospheric agents. This research has been carried out through water's behavior's tests, like absorption tests, imbibition's tests, frost erosion tests, rain tests.

The spotting of the climatic characteristics in this area had also allowed to make some remarks on the thermophysical behavior of the covering's components, and on the thermic comfort connected with the wall's stratification. In this stage, we tried to find a stratification of the wall which had to be cheap and able to make the inside environment more comfortable from a thermic and sanitary point of view.



Picture3: lab. tests, plan of a prototype and of a wall.

Conclusion

Some features might deserve a closer examination, like the costs of the covering. Indeed, from the analyses that were made so far, it came out that the use of the blocks of earth to build the walls lowers the overall building costs in a slight way, because of the high expenses for the construction of the covering.

For further information: Alezio Rivotti, e-mail: arivotti@yahoo.it