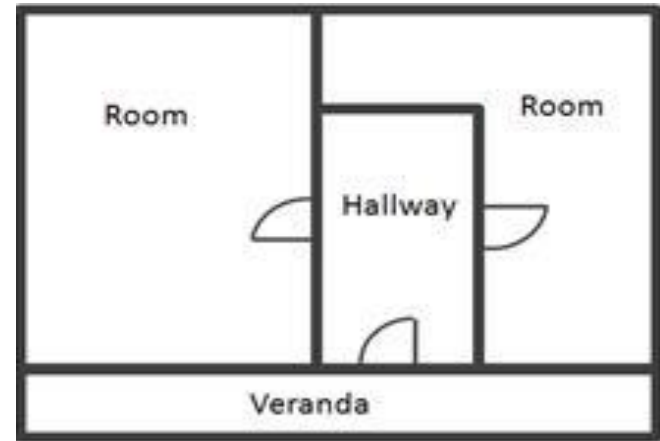


# **Design and durability of traditional wooden houses. A case study**

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**The wooden house in Bucovina developed over hundreds of years of permutations and assimilations, and in 19<sup>th</sup> century, became an original style which can be found in the entire region.**



## Materials

Foundation – river stones

Structure – wood beams

Insulation / plaster - lime or clay as binder in mixture with different natural materials (straw, hemp or goat hair - as reinforcements), and horse manure



# Thank you!

## Design and durability of traditional wooden houses. A case study

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Over the centuries, even from the beginning of civilization, wood played an important role in the human life, therefore, it has been used in many applications from the domestic tasks, furniture to different wooden structures - i.e. houses. Traditional houses from every country differ normally from one region to another, being influenced by different factors. Apart of the design, the materials are also different, therefore, usually for the construction, wood beams, stone or stone tiles are also used.

Comparative evaluation of natural materials used in construction

Material	Region	Physical properties	Chemical properties	Biological properties	Thermal properties	Acoustic properties
Wood	Europe	High strength, high stability, low weight	Low moisture content	High resistance to decay	High thermal insulation	Good acoustic insulation
Clay	Europe	High strength, high stability, low weight	Low moisture content	High resistance to decay	High thermal insulation	Good acoustic insulation
Stone	Europe	High strength, high stability, low weight	Low moisture content	High resistance to decay	High thermal insulation	Good acoustic insulation
Straw	Europe	Low strength, low stability, high weight	High moisture content	Low resistance to decay	Low thermal insulation	Poor acoustic insulation
Brick	Europe	High strength, high stability, low weight	Low moisture content	High resistance to decay	High thermal insulation	Good acoustic insulation
Plaster	Europe	Low strength, low stability, high weight	High moisture content	Low resistance to decay	Low thermal insulation	Poor acoustic insulation
Concrete	Europe	High strength, high stability, low weight	Low moisture content	High resistance to decay	High thermal insulation	Good acoustic insulation
Insulation	Europe	Low strength, low stability, high weight	High moisture content	Low resistance to decay	Low thermal insulation	Poor acoustic insulation
Roof tiles	Europe	High strength, high stability, low weight	Low moisture content	High resistance to decay	High thermal insulation	Good acoustic insulation
Windows	Europe	Low strength, low stability, high weight	High moisture content	Low resistance to decay	Low thermal insulation	Poor acoustic insulation
Doors	Europe	High strength, high stability, low weight	Low moisture content	High resistance to decay	High thermal insulation	Good acoustic insulation

The wooden houses in Quercy, developed over hundreds of years of population and assimilation, and in 19<sup>th</sup> century, houses an original style which can be found in the entire region.







House plan includes a hallway which have the entrance door, and the 2 side chambers. These houses have also side rooms formed by extending the roof, called "de" or "valley". Veranda is not found in the old houses, however, it appears in the second half of the nineteenth - early twentieth centuries. The roof was covered, usually with shingles and can take variable forms, depending on the presence or absence of space formed by extensions or verandas.

The houses in the second half of the nineteenth century and the first half of the last century were decorated on the outside only if they had veranda and pillars.

Later on, in the twentieth century, the old decoration is replaced by modernist style, so called "modern".

For the insulation, usually it is used the same way as timber in, mixture with different natural materials such as: stone, hemp or oak hair (as reinforcement), and horse manure. Recently fiberglass mesh can be used as reinforcement instead of natural fibers. In order to obtain a proper insulation, a correct composition is required, therefore, sometimes it is the surrounding, and prefabricated materials were used instead. Therefore, the insulation plaster obtained from traditional natural materials used to increase in popularity due to its high quality and durability.