

# **International Institute of Traditional Knowledge at the The Gualchiere di Remole, medieval architectural complex in Florence**

Architect Beatrice Gentili

Politecnica Ingegneria ed Architettura, Florence, Italy

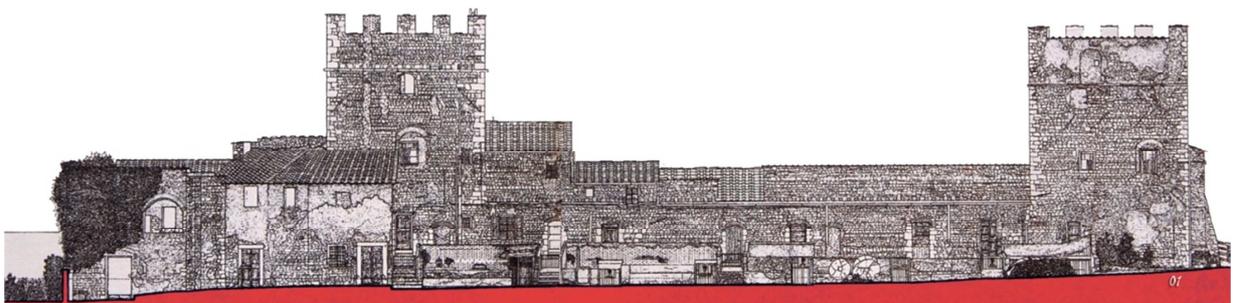
e-mail: bgentili@politecnica.it

## **ABSTRACT**

After a long journey that has involved the public administrations of Tuscany, the Ministry of Italian Environment, The Organizations of United Nations, Private Foundations, the ONG's (Nobrega Foundation, Foundation Romualdo del Bianco, IPOGEA), international experts and scholars gathered at numerous conferences and engaged in pilot projects and experiences, we have arrived at the decision to found the International Institute of Traditional Knowledge.

The Institute has the task of creating a database of traditional techniques and sustainable technologies, already started at the prototype stage, which will become the preferred portal and certification system for solutions, good practice, and quality of companies committed to the preservation of landscapes, ecosystems and cultural heritage. Traditional solutions and innovative proposals will have as a channel of diffusion, the network of more than 800 UNESCO sites in the world and an international network of foundations, centres, experts and practitioners. The final seat of the Institute will be the Gualchiere di Remole.

The guarantee of maintaining public awareness of this complex, of the restoration, musealization, visitability of the monuments, and of the recovery of the entire area with procedures guided by the utmost respect, the sustainability, and eco-compatibility is a primary objective of the Institute.



**Figure 1. Drawing of the historical complex Le Gualchiere di Remole**

## **A RESTAURATION WITH HIGH SYMBOLIC VALUE IN TERMS OF FACING THE GLOBAL CRISIS ( ENERGY, WATER, ECOSYSTEMS )**

The Gualchiere di Remole is a medieval architectural complex located in a unique landscape on the banks of the Arno, forming a veritable fortified village. The monumental piece overlooking the Arno is crowned by two towers and crossed by bridges carrying streams of water which supplied water power to the large wheels and mills. This part is faced by another 1000 square feet of workshops and medieval houses. The structures construct part of a vast green area of pertinent use. The restoration project is based on these principles.



**Figure 2. View of the site**

Le Gualchiere is a symbol of the appropriate use of energy as well as a unique artifact in the history of science and industrial archeology. Their recovery is a message addressing the preservation of those fundamental structures which protect the landscape and ecosystems and which are able to provide essential goods such as water and sustainable energy.

The restoration of the mills and water wheels for museum purposes will contribute to the decentralization of tourism in Florence, still strongly polarized in the

city center, and will shift it towards the hills and the landscape of the Arno. Some parts, which constitute the old town of the Gualchiera, will form the headquarters and training facilities of the Institute and the Bank of Traditional Knowledge and Innovation, together with workshops and exhibition rooms for fabrics made accordingly to historical experience and quality.

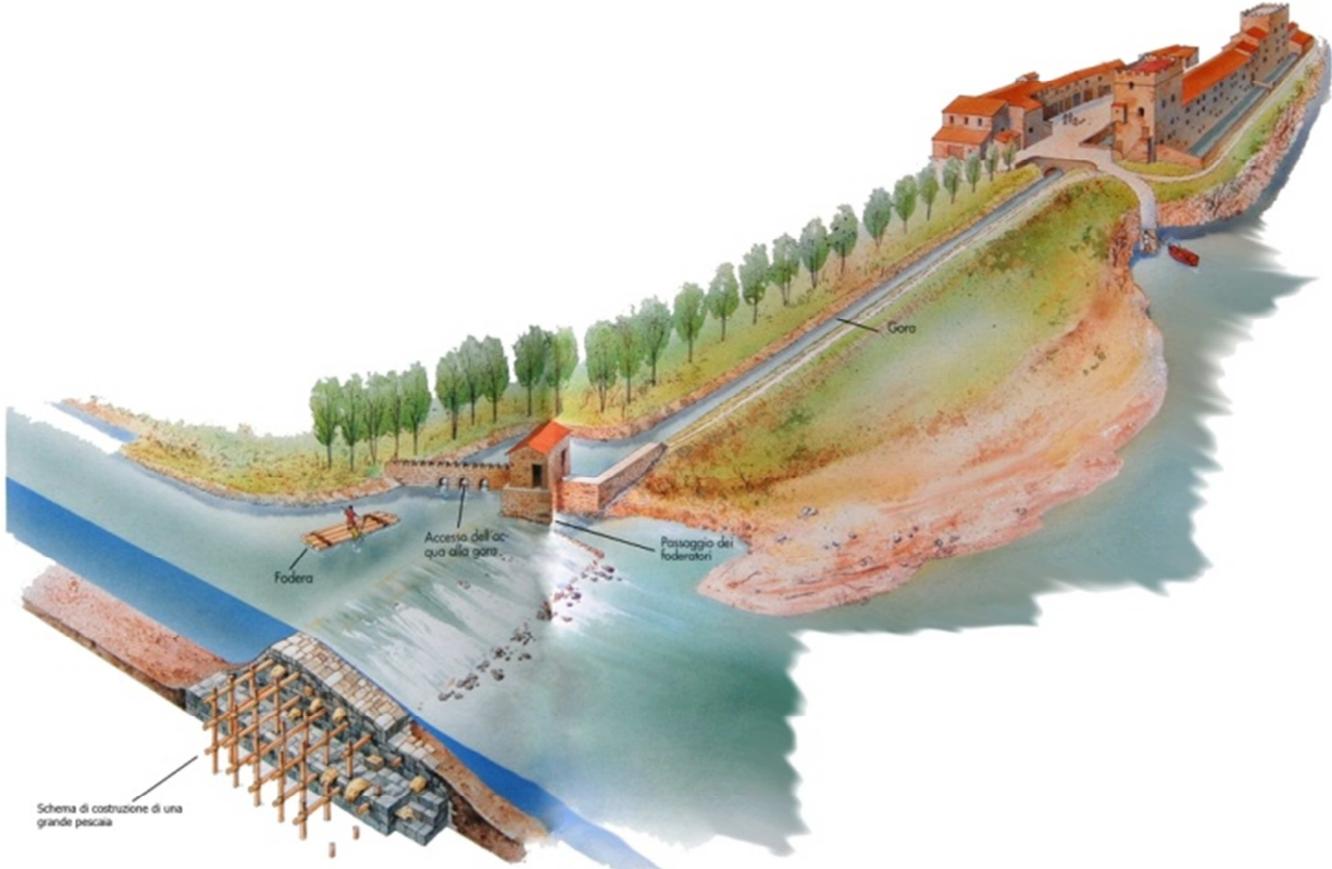


Figure 3. Scheme of the use of traditional hydraulic techniques

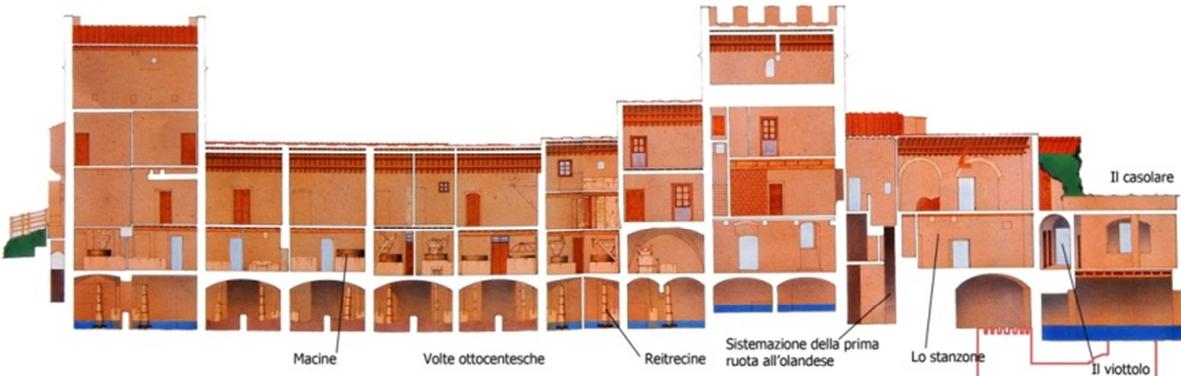


Figure 4. Section of the main building

The Gualchiere di Remole are the sole survivors of the numerous buildings scattered from the Middle Ages onwards along the banks of the Arno. Active for more than five centuries and remarkably preserved in the architecture and the plumbing attached, they form a single reference in the landscape of pre-industrial European archeology.

The Gualchiere di Remole have arisen, since the second half of the fourteenth century on the initiative of the families of Albizzi and Alessandri.

From the 13<sup>th</sup> century, the Florentine magnates devoted themselves to an increasing commitment to the refined production of wool fabric. One of the first steps of the operation cycle and the milling of cloth material consists of wetting and beating the pieces in a way that can be monitored so that the process remains the same.

This process used a high quality of wool that was tightly woven, soft, resistant and impermeable. In the Middle Ages one of the most important innovations adapted was use of a round wheel, which made water available by “follatura” or milling. This was done on special machines operated by strong hydraulic force; their use required the creation of specialized workshops, all realizing the same milling process and results, located adjacent to a major waterway. Initially the mills were positioned along the Arno and Mugnone rivers, near the city or its immediate vicinity. Then, after they exhausted all the possible locations, it was clear that the factories should be built outside the city where particular topographical and hydraulic conditions could guarantee the operation would work for a suitable number of months.

The restoration project realized:

- 1- The museum of water-wheels and traditional hydraulic techniques
- 2- The production of sustainable energy and the systems of transport along the Arno
- 3- Leonardo’s laboratory
- 4- Textile studio and “eco” fashion boutique
- 5- Database of historical information
- 6- A center for historical research

## THE MUSEUM OF WATER WHEELS AND TRADITIONAL HIDRAULIC TECHNIQUES

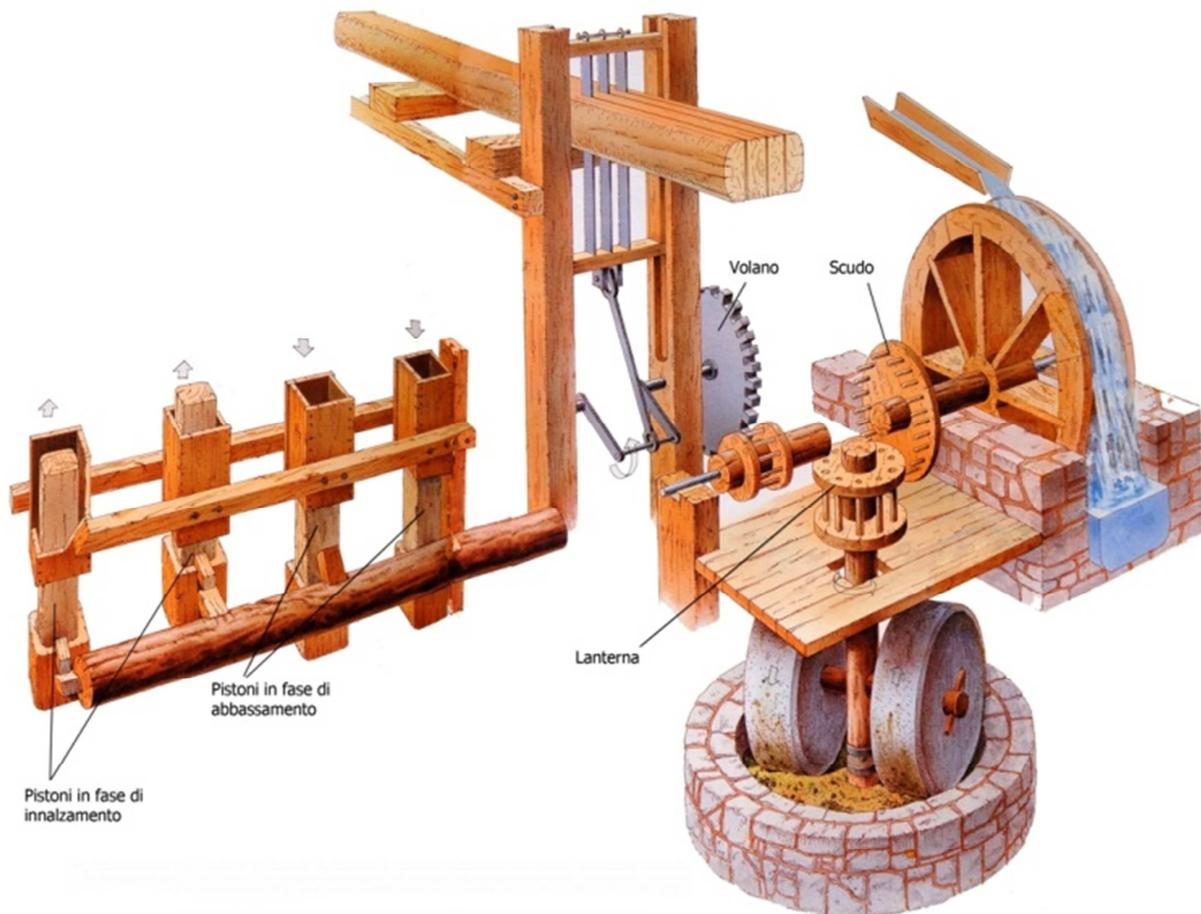


Figure 5. Scheme of the water wheels

The project of the International Institute of Traditional Knowledge aims to reconstruct the museum with a system of water wheels and mills and create permanent exhibitions of traditional techniques and the machines innovative uses.

There will be new advancements made in hydro-turbine electricity production. The turbines will supply energy for electric powered boats that will go through the Arno and can be used to connect passengers. From the Uffizi, Ponte Vecchio and the Science Museum it will be possible to travel 17 kilometers ending at the mills through a single route that will show the history of Florence's cultural and natural landscape along the Arno and in the Florentine hills. The mills will be a connecting point from Florence's historical centre to the hills through a system of natural links along the docks of the Arno River. For this reason, the project is strongly supported by the towns of Fiesole, Bagno a Ripoli and Pontassieve.

The mills have been a place to apply recent scientific knowledge from the Middle Ages to the Renaissance. Among Leonardo's drawings of the mills appear along with the techniques used in the water mills. The Leonardo Da Vinci Museum realized the importance of his complete scientific study. Under the support of the

museum, in a tower of the mill they intend to recreate Leonardo's laboratory with his machines and research.



Figure 6. Leonardo Da Vinci's laboratory

The mills represent the advanced level of Florentine skill for the art of textiles. This quality is still a source of pride felt in Tuscan towns. In the areas around the museum and park the mills will re-establish areas for high quality workshops and stores. The new buildings and whole restoration constitute a manifesto of ecological architecture and a certificate of sustainability from UNESCO that will affect the whole world.

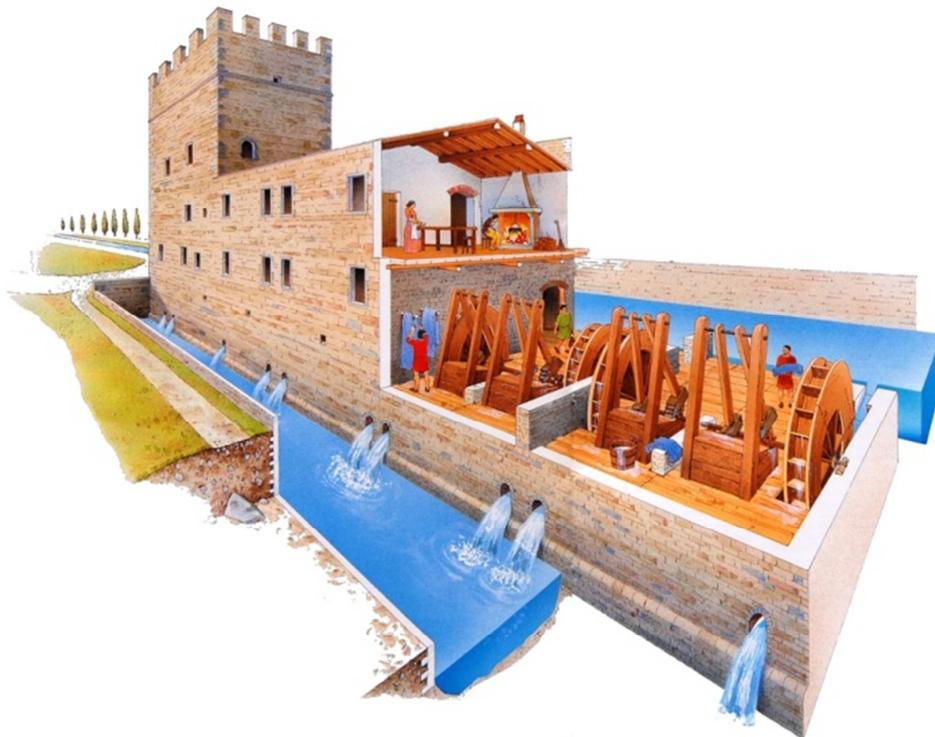


Figure 7. Water wheels and the traditional textiles production

## **THE RESEARCH CENTER OF TRADITIONAL KNOWLEDGE**

Traditional knowledge represents the knowledge that has allowed us to build buildings and landscapes of universal value now protected from the UNESCO in the category of cultural landscapes and safeguarded by the Convention on intangible heritage. They have allowed people to make living and harmony in the most difficult conditions and are still at the base of the possibility of existence of most of humanity. Appropriate use of natural resources such as water, soil and energy is possible using traditional knowledge that establishes the harmony between architecture and the environment, the symbiosis between technical organization of space and the tradition, customs social, spiritual values and the merger of the practical and aesthetic. Traditional knowledge is now in danger and its disappearance may result in loss of ability of peoples to preserve and pass on the natural and artistic heritage. It represents a tremendous source of local knowledge and cultural diversity from which they can derive innovative and appropriate solutions.

Traditional knowledge and innovative usage is the basis for sustainable technology, and is essential for the development of a new model of human progress.

The Tuscany Region, UNESCO, UNCCD and the Italian Ministry of Environment have promoted the creation of an international center in Florence. This center will be based on traditional knowledge in order to create an inventory, as well as protect and disseminate traditional knowledge, all while using innovative thinking. In preparation for this center, a meeting was held from July 11<sup>th</sup> to July 12<sup>th</sup> 2009. The "International Meeting on Traditional Knowledge and Living Heritage" allowed 60 experts, from 30 different countries around the world, to meet in Florence to discuss how to tackle the global crisis due to the collapse of ecosystems, global warming and waste of natural resources.