



Rammed earth farmhouse, Piedmont. (photo: Isidoro Parodi)

Earthen architecture in Italy

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A culture of earthen buildings has existed in Italy since ancient times, with influences from the Middle East, North Africa, and later from the Transalpine area, the Balkans and Spain.

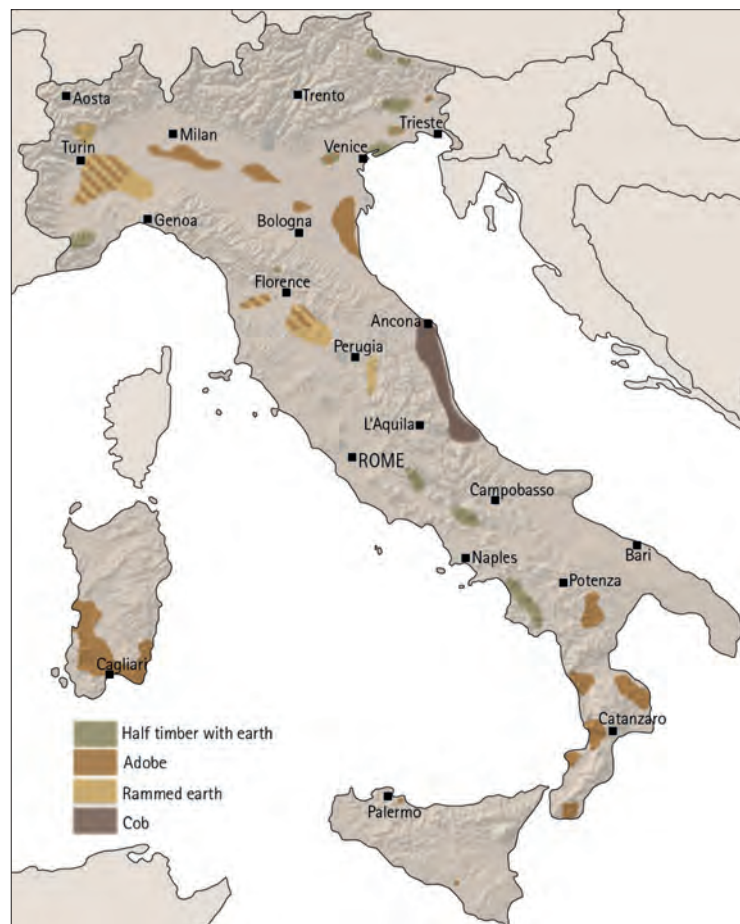
The earliest records of earthen buildings, belonging to the Etruscan civilization, may be dated between the 7th and 6th century BC. The use of earth developed significantly during the time of Greater Greece, when adobe was used for the construction of public buildings and fortified walls. Two examples of earthen fortification are admirable: the fortified city wall of Gela in Sicily, 3 m thick and 8 m high, composed of a stone foundation enclosing a compacted mixture of earth and rubble, and walls made with adobe squares (40 cm x 40 cm), and the rampart of Reghion (Reggio Calabria), built in the same manner, with rammed earth in the middle of two rows of bricks on the higher part. Earth as building material was used in Italy up until the mid-20th century, when sustained economic growth and changing living needs lead to the phasing-out of the constructive techniques and to the disuse of existing earthen buildings, considered as poor constructions inherited from the past. The geographer Osvaldo Baldacci, describes the distribution of earthen buildings in the 1950s, which embraces the whole country, with a predominantly rural use and some examples of urban settlements, as in Sardinia, Calabria and Piedmont.

Building techniques and materials

Adobe

In Italy, the presence of adobe constructions is most widespread in the southwest of Sardinia and in the region of Calabria. Some adobe constructions have been identified in rural areas of Lombardy, in the Piedmont, Emilia-Romagna, Tuscany, Lazio and Basilicata regions.

In the Sardinia region, adobe (*ladiri* o *làdri*) constructions are historically and currently present in the Campidano plains, a vast area of alluvial origin, dating from the Spanish occupation of the 15th century up to the middle of the 20th century. The typical building is called *domu* and consists of single-floor



Cascinali Pagella, Piedmont. (photo: M. Chiara Robboni)





Adobe wall, IV century B.C., Gela, Sicily. (photo: Letizia Dipasquale)

Adobe wall in Pimentel, Sardinia. (photo: Silvia Onnis)

Adobe wall in Lamezia, Calabria. (photo: Letizia Dipasquale)

Adobe wall section with "Civatura" rendering, Lamezia, Calabria. (photo: Ettore Pelaia)

constructions, arranged around one or more courts for agricultural activities. In Calabria traditional adobe is known as *vriesti*, *bresti* or *mattunazzu*. Earth mixed with straw or chaff is used in the Crati valley, coarse-grained earth rich in sand and gravel mixed with lime around Reggio, fine-grained earth in the Lamezia area. In Lamezia aristocratic buildings with internal courtyards and terraced houses were built with a foundation of masonry stone and adobe masonry on the uppermost floors, as well as for the interior walls. It is common to find even modest structures and large noble palaces covered with a rendering, known as *civata* or *civatura*, made with tiles and stone fragments bound by lime.

Rammed earth

Rammed earth is consistently present in Piedmont, around Turin and especially in the province of Alessandria. Here countryside farmhouses and both private and public buildings- such as schools and churches- still coexist (Bollini, 2009). Dry earth, with humidity up to 10-15%, is beaten in thin layers

inside wooden formworks. The wall is built following a spiral course, in order to have a firmer construction. Also adobe is used, mostly in foundations, corners, arches, vaults, and in the inner part of the wall, difficult to achieve with formwork.

In Tuscany (in the area of Val di Chiana, Val d'Elsa, Val d'Arno, San Miniato and in other inland parts of Pisa) we find rural and rustic dwellings in rammed earth, mostly dating back to the 13th century. Earthen architecture here is not valorized yet, in fact in the urban context the presence of rammed earth is often unknown and rural buildings are frequently abandoned or used for service spaces.

Half timber with earth

The wattle and daub technique was used by the Etruscans to build elliptical or oval huts and by the Romans, who constructed buildings *a graticcio*. The buildings were composed of a structure in wood, filled in with an earthen plaster with straw.

Today, a few examples of wattle and daub rural buildings, with a straw roof, can be found in the north of Italy (the Alpine zone, Veneto, Friuli Venezia Giulia) and in Lazio, where the *fraticci* consists of vertical posts and horizontal poles tied together with wickers, on a stone foundation, filled with chestnut, oak or elm branches and interlaced canes (Beranger, 1995).

In Calabria, after the earthquake of 1783, "case baraccate" were built with a wooden frame, with vertical, horizontal and oblique chestnut or oak beams placed at a distance of roughly 1.20m to create a cross structure. A weave of wickers and reeds is yoked to the main structure with thin chestnut laths and is covered with an earth mortar. In some cases adobe fills in the structure. For the interior walls the "incanniciato" technique is frequently used, a mesh of interwoven canes or branches covered by a clay plaster.

In Veneto, the traditional rural buildings, called "casoni", are composed of a wooden structure with adobe filling and a high spire roof, covered by straw and ditch reed (Bertagnin 1999). Today only three examples of these buildings, transformed into museums, survive.

Cob

In Italy there is a consistent presence of cob in Abruzzo, probably introduced by Christian immigrants from the Balkan territories (Galdieri 1982) and in the southern Marche region.

The Cob technique, locally denominated *massone*, consists in the mixing of the earth and straw until lumps are formed, which are then piled up and pressed together to build the walls. The earthen rural houses are called

pinciare in Abruzzo and *atterrati* in the Marche region; buildings have on the ground floor spaces for agricultural products and cattle, while the upper floor is given over to dwelling and accommodation. An over-lapping roof is often used to better protect the top of the cob walls.

In the town of Macerata, a rare example of urban settlement, *Borgo Ficana*, from about the middle of the XIX century, survives. It now consists of about sixty terraced houses, recently partially restored and employed for cultural use.

Present situation

As in other countries, in Italy a new interest in earthen constructions spread from the 1980s, thanks to the impulse from the academic world and international institutions for the safeguarding of heritage and to the initiative of local authorities. A great number of universities, most of which grouped together in the UNIVERSITERRA foundation as from 2001, a research and information network of 7 Italian universities, have developed in the last 20 years research and awareness programs for their students on building culture, structural behavior of the earthen construction and innovation in the use of the material.

Among the institutions most active today in the field of valorization of earthen architecture we may mention: in Abruzzo the *Centro di Documentazione Permanente sulle case di terra* of Casalinocontrada (Chieti) founded in 1993, which has an important role in the dissemination of information, and hosts every year the *Festa della Terra* forum; in Sardinia the *Centro Studi e Ricerche sull'Architettura Regionale in Terra Cruda*, working at the Architecture Department of Cagliari University since 1997 and the *Rete dei Comuni della Terra Cruda*, a network initiated in 2000, that links those towns characterised by an earthen architectural heritage. An important result reached in Sardinia, through the collaboration between the University and the Region, is the "Manual of Rehabilitation of the historic centers of Sardinia" (2008), an in-depth analysis of building culture which provides guidelines and specific intervention on earthen heritage.

Unfortunately, this increasing attention collides with a low economic interest and legislative framework that discount earth as a building material. Very few professionals are dedicated to new architectures with earth as a material, which is used mostly as plaster, or as fill in wooden or concrete frames. Awareness towards earthen heritage is sustained by some regional laws for the valorization and rehabilitation of earthen buildings (in Abruzzo R.L. n.17/87 and 5/2001, in Piedmont R.L 16/2006) that promote the knowledge of



Sa domu 'e Nannai, Museum of Popular Traditions, Samassi, Sardinia. (photo: Silvia Onnis)

existent heritage and give incentives for census, investigation into techniques and intervention of restoration. In 2002 a national bill ("Normative to support raw-earth buildings and raw earth as a building material") was introduced to the Chamber of Deputies of the Parliament but is still being evaluated. We trust in the increasing process of preservation and valorization of earthen architecture in Italy, and at the same time the prompt development of a specific normative to add earth as a building material to new buildings and certify its safe use.



Isolated adobe house near Lamezia, Calabria. (photo: Ettore Pelaia)
Massone at Morro d'alba, Ancona, Abruzzo. (photo: Eliana Baglioni)

