

Considering The Role of Local Building Craftsmen of Earthen Architecture for Sustainable Development



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ABSTRACT

UNESCO underlines that culture needs to be considered a significant issue in sustainable development. The UNESCO 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, UNESCO Recommendation on the Safeguarding of Traditional Culture and Folklore of 1989, and UNESCO Universal Declaration on Cultural Diversity of 2001 have underscored the importance of intangible cultural heritage as a mainspring of cultural diversity and a guarantee of sustainable development.

The knowledge, skills, and practices of local building craftsmen that have continued in local building tradition in the rural settlements of Anatolia constitute a significant part of intangible cultural heritage. The documentation and transmission of know-how, skills, techniques, and methods of the masters as the practitioners of the building tradition are compulsory for their conservation and the continuity of tradition. Considering 17 goals highlighted within the 2030 Agenda for Sustainable Development published by the United Nations General Assembly in 2015, the continuity of local building tradition is especially significant for providing sustainable development in historic environments throughout the rapid change process and the development of tourism.

In recent years, the traditional building ways, particularly, earthen architecture, have gained importance in the discussions on sustainability; and the number of studies on the use of local building materials in the design of new buildings has noticeably increased. In the publications issued by the World Heritage Center, the availability and economic quality of adobe material is regarded to contribute to sustainable development. Among the risks to earthen architecture, the absence of traditional conservation measures is particularly emphasized. As a result, it is emphasized that earthen constructions require special attention in terms of conservation. The sustainability of the earthen architecture throughout the restorations and new buildings is linked with the transmission of specific knowledge, and skills of master builders related to earthen architecture to the new generations. Therefore, it is necessary to find the living experienced building masters and documentation of their specific knowledge about **traditional construction techniques**. This study tries to put forward a specific methodology for documentation of the knowledge of local building masters experienced in earthen architecture from Konya. The study uses a mixed methodology composed of architectural and folklore documentation methods, specifically, in-depth interviews, and observation, to document both tangible and intangible aspects of traditional craftsmanship.

Keywords: Earthen architecture, local building craftsmen, **traditional construction techniques**, traditional craftsmanship, sustainable development, Konya

1 INTRODUCTION

Traditional architecture is a valuable source to discover the ecological and sustainable principles with regard to its inclusion of a variety of nature-friendly designs, the usage of local materials, and the creative building methods of local building masters (Karakul, 2016, 68). Traditional earthen architecture has been constructed in a process through which local building masters have used their specific techniques, know-how, and skills by considering cultural values that survived in local building tradition. The knowledge and practices of building masters and local people on construction, maintenance, renewal and repair, and ornamentation that have continued through the building tradition in historic earthen settlements in Anatolia constitute a significant part of intangible cultural heritage.

In terms of the preservation, repair, and sustainability of traditional buildings, it is critical to understand and develop traditional construction techniques and builders' technical knowledge. In order to carry out applications based on the accurate "technical knowledge" for the protection of cultural heritage, more research on masters who know traditional construction techniques is needed. Starting with this problem, this study tries to learn from traditional builders' technical knowledge, analyzes traditional building technology in a holistic way, and transforms it into information to be used in current conservation studies and restorations. It documents traditional earthen construction techniques and methods in this setting by contacting construction masters still living in Konya and its environs and documenting their knowledge, skills, and behaviors.

The documentation and transmission of know-how, skills, techniques, and methods of the masters as the practitioners of the building tradition are compulsory for their conservation and the continuity of tradition. The UNESCO 2003 Convention, has mainly focused on the measures of its conservation of intangible cultural heritage. While the conservation process of tangible heritage includes documentation, analysis, and preservation measures, the conservation of intangible cultural heritage is intimately linked with its practice and its transmission to new generations¹, besides their documentation. On UNESCO's official website, the decline in the number of practitioners of traditional craftsmanship is recognized as one of the biggest threats to the viability of intangible cultural heritage. In this regard, Article 2.3 of the UNESCO 2003 Convention places "transmission" among the safeguarding measures aiming at ensuring the viability of this heritage. Because the conservation of intangible cultural heritage necessitates the continuous practice and the transmission of the knowledge to future generations, living practitioners need to be identified, and the appropriate ways for practicing need to be provided.

In the United Nations' 42nd General Assembly in 1987, the term "sustainability" was defined as "filling today's requirements without jeopardizing future generations' ability to meet their own needs" (Karakul, 2016, 67). Steele (2005: 6-7) expands on this concept in his thorough research of ecological architecture by breaking it down into eight aspects as resource equity, traditional wisdom, institutional transformation, energy, global community, economics, renewability as well as technology. Traditional wisdom, which can be related to the value of learning from traditional and local architecture, which has arisen out of numerous trial-and-error attempts to cope with nature must be respected to achieve sustainability of traditional architecture.

Considering 17 goals highlighted within the 2030 Agenda for Sustainable Development published by the United Nations General Assembly in 2015, the continuity of local building tradition is especially significant for providing sustainable development in historic environments throughout

¹ On the UNESCO website, "safeguarding" of intangible cultural heritage is explained in four titles as "involvement of communities, inventorying intangible heritage, transmission, legislation". (See <http://www.unesco.org/culture/ich/index.php?pg=00012>).

the rapid change process (UNITED NATIONS, 2015). Considering these goals with the traditional craftsmanship, the continuity of local building tradition and craft production process is especially significant for providing sustainable development in historic environments throughout the rapid change process and the development of tourism (Karakul, 2019c).

In recent years, the traditional building ways, particularly, earthen architecture, have gained importance in the discussions on sustainability; and the number of studies on the use of local building materials in the design of new buildings has noticeably increased. UNESCO WHEAP (World Heritage Programme on Earthen Architecture)² strives to improve the protection and management of earthen architecture sites around the world. On the website of WHEAP, it is stated that the earth material's availability and economic quality suggest that it has a lot of potential to help with poverty reduction and sustainable development. Among the risks to earthen architecture, the absence of traditional conservation measures is particularly emphasized. As a result, it is emphasized that earthen constructions require special attention in terms of conservation. Earthen structures deserve special attention in terms of conservation and maintenance because they are increasingly threatened by natural and human impacts. The disappearance of traditional conservation practices is highly emphasized as a threat to adobe architecture.

The sustainability of the earthen architecture throughout the restorations and new buildings is intimately linked with the transmission of specific knowledge, know-how, and skills of master builders to the new generations. Therefore, it is necessary to find the living experienced building masters and documentation of their specific knowledge about traditional construction techniques. So, this study tries to document traditional construction and maintenance techniques of earthen architecture based on the information of the experienced building masters for the conservation and sustainability of earthen architecture. The knowledge of building masters is especially useful for both restorations of traditional buildings and the construction of new buildings made of local building materials to achieve the sustainable development of historical environments.

2 LOCAL BUILDING MASTERS OF EARTHEN ARCHITECTURE IN KONYA

Konya's earthen building culture is so specific as the embodiments of both the practices, knowledge and know-how of local building masters on adobe construction and maintenance techniques. The method used for the documentation of earthen construction techniques is based on literature research and field research. Within the scope of the field research, it is aimed to document the knowledge, skills, and behaviors of traditional building masters, their techniques and methods, tools and equipment, and their reflection on building elements in traditional architecture, architectural elements, decorative elements by using architectural documentation methods and folklore methods together.

Field surveys were carried out in Konya and its surrounding rural settlements, Sarayönü, Kadınhanı, and Hüyüklü districts and villages in July and August 2017³. Within the scope of field studies, traditional architecture and local construction techniques were examined, and photographic documentation was made. Interviews were carried out with the building masters and local people

² For detailed information, see the website of <https://whc.unesco.org/en/earthen-architecture/>.

³ Field surveys were carried out within the scope of the BAP Research Project called "Documenting Knowledge, Skill, and Manners of Traditional Building Masters" completed by the author in 2020 In Selçuk University.

living in the working areas, and audio recordings were taken to compile information about the technical knowledge and construction techniques they used.

İbrahim Can, Hakkı Dağlı, and Mustafa Küçüksarı, who were the building masters interviewed in the Kadınhanı, Sarayönü, and Hüyük districts, gave detailed information about the traditional building construction processes in their districts. Although the construction systems used in all three settlements are similar, the construction techniques, materials, and tools used vary depending on the region.

İbrahim Can was born in 1959 in Çavuş Village. He is a primary school graduate. He started to work as an apprentice at the age of 12-13 with his father, who was a builder. There are many buildings built by İbrahim Can, who is a farmer as well as a building master in Çavuş Village and nearby villages, and 29 buildings in the village of Sonsuz Şükran, built nearby.

Hakkı Dağlı was born in Ladik in 1952. He is a primary school graduate. He started to work as an apprentice at the age of 13 with his father, who was a builder. Hakkı Dağlı, whose grandfather, father and brother are also masters. Working with a team of 4 masters and 4 workers, including his brother and children, Hakkı Dağlı built approximately 50 traditional buildings, schools and mosques and 150-200 new brick structures in Ladik, Sarayönü, Konyadağ and the surrounding villages. Hakkı Dağlı tells that the builders in Ladik completed the construction from the foundation to the roof, and completed all the works except plastering. Hakkı Dağlı has trained 10-12 masters.

Mustafa Küçüksarı was born in 1958 in Kadınhanı. He is a primary school graduate. He started to work as a master at the age of 22, after completing his military service in 1980. He has worked as a farmer, service driver and shepherd in addition to mastery, and, now given up mastery. His elder brother and father are also masters. He has built many buildings in Kadınhanı and Osmancık.

3 KONYA'S EARTHEN ARCHITECTURE

Konya's earthen architecture is a significant resource to discuss sustainability and sustainable development with regard to its inclusion of a variety of nature-friendly designs, the usage of local materials, and the creative building methods of local building masters. According to the information obtained from master builders, the techniques and methods used during the construction and repair of earthen architecture can be investigated to be sustained in restoration and new building processes as specific technical knowledge. The rural settlements studied mostly consist of flat earthen roofs that cover wooden beams and were built using the stone masonry technique and the adobe masonry technique (Karakul, 2019a, 2019b) (Figure 1-3).

3.1 Construction Process of Earthen Architecture

Building masters begin the process of traditional building construction by excavating a pit for the foundation walls. Because mud-brick is not water-resistant, the stone is used in the construction of foundation walls, which must be water-resistant, and ground floor walls up to the subbasement level to protect adobe masonry walls from water. The foundation walls of rubble stone are begun to be constructed when the foundation pit is dug at least 60-150 cm below ground level to the point where the hard earth is located, and they are erected up to a height of at least 50 cm from the ground level.

The building masters of earthen architecture construct adobe masonry walls using mud-brick blocks as masonry materials and earth and mortar mixtures as binder materials after digging the foundation pit. Adobe is formed by mixing soil with an organic binder material, such as hay or

animal hair, to form blocks that are then dried in the sun. The process of making adobe blocks is divided into three stages: sludge preparation, molding-cutting-casting, and drying.

The external walls of traditional adobe buildings are usually constructed by stone masonry technique up to 50-60 cm height from the ground level. During building up the masonry of the mudbrick walls, the large blocks and small blocks are placed side by side and the gaps between them are filled with mud mixed with the fragments of mud bricks. The wall thicknesses are generally 60 cm with a main and two small adobe blocks and an air gap, and the inner walls are 40 cm with a main and a small adobe block. During the construction of the mudbrick walls, the main and small blocks are placed side by side and the gaps between them are filled with mud mixed with mud bricks.

In the rural environment of Konya, particularly in Hüyük district and its immediate surroundings, in two-story houses, local building masters place wooden pillars under wooden beams, inside an adobe wall to support the structural system of the earth buildings⁴. The timber frame system, which is connected to each other in such a way as to remain standing even when the adobe wall collapses, increases the earthquake resistance of the buildings. The timber frame system, built into the adobe masonry system, is a system in which the pillars made of juniper or poplar wood are placed inside the adobe walls from the floor to the roof and connected with wooden beams at the upper level.



Figure 1. A traditional adobe building in Hüyük

⁴ Interviewer: İbrahim Can



Figure 2. A traditional adobe building in Sarayönü



Figure 3. A traditional adobe building in Bulgurpinarı Village

According to local building masters, during the construction of the flat roofs in the villages inspected in Konya, wooden beams are first placed under the slab beams on the adobe walls

(Karakul: 2019a). Depending on the economic position of the host, round wooden beams are placed on them, the mat layer is procured from Beşer, Akşehir, or the surrounding area, and a reed layer is spread on the mat. The soil is put in varying thicknesses depending on the region over the reed layer, and after soaking, either salt or a soil type called *çorak* is applied to restrict water penetration by compressing the soil surface and becoming rugged. After laying salt, the earth layer is compacted by using a cylindrical stone, called *yuvak*.

3.2 Maintenance and Repair Process of Earthen Architecture

Regular maintenance is essential for the preservation of adobe buildings, as it is for all historical structures. At regular intervals, the renewal of the mud plaster applied to the wall surface, which is built from the earth and has a lower degree of water resistance than stone and wood, increases the building's life span. The maintenance methods in the traditional earth buildings in the rural environments of Konya, where the investigations were conducted, are a three-stage procedure consisting of the creation of earth plaster by building masters, the application of sludge called *yalabitma* by local people in Çavuş and Değirmenaltı Villages, and painting.

The first stage of maintenance applications is the application of mud plaster by the building masters as the last stage of the construction process of traditional mudbrick buildings. According to the statements of the building masters⁵ in Çavuş Village of Hüyük District, the soil brought from Söğütlüdere Region was mixed with straw and water and then kept on the first day, then mixed from time to time for three days, and then used as a plaster on the fourth day after reaching a normal consistency. It is taken into account that the soil used in the plaster preparation is cored, and the straw used in the mudbrick construction blocks is thinner. Following the completion and drying of the craftsmen's plaster, the peasant women use the sludge plastering technique, which entails soaking the soil in straw and water for three days, relaxing, and trampling⁶.

4 CONCLUSION

In recent years, the adobe construction technique and earthen architecture have gained importance within the discussions of ecological architecture and sustainability; as well as a growing number of research on the use of adobe materials and techniques in new construction. In this regard, traditional earthen architecture in Hüyük, Sarayönü, and Kadınhanı, which is accepted as a significant information resource for identifying rural architectural tradition in the nearby environment of Konya, has been investigated to identify the knowledge, know-how, techniques used by building masters to be used for providing the continuity of the historic environments throughout the restoration and new building activities.

The sustainable development of the historical environments of Konya necessitates the identification and documentation, conservation, and sustainability of traditional construction techniques through new building activities. The adobe building tradition has unique value both as an architectural ornament as well as the way it is implemented in terms of technique, materials, and tools, as intangible cultural heritage to be conserved. From this perspective, earthen building tradition and the related practices of building masters need to be documented and conserved holistically considering its tangible and intangible aspects. In this regard, local building masters' role as practitioners of this building heritage is especially important in achieving sustainable development of historical environments. This study can be performed in other Konya rural settlements to identify and convey master builders' knowledge and practices in the earthen building tradition to future generations and to provide the sustainability of the environment.

⁵ Interviewer: İbrahim Can

⁶ Interviewer: Kerime Çelik

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