



Evaluation of the Material-Protection Sustainability Relationship on the Identity of Traditional Settlements

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Abstract

Settlements are important units that contain different features in their structure. In addition to elements such as topography, climate, vegetation, and socio-cultural structure, the character and identity of these settlements are shaped by structural characteristics, spatial fiction and building materials within the settlement.

Particularly in the traditional settlement textures, material as stone, wood or adobe is an important parameter that influences the characteristics and identity of these areas. In this context, material is undoubtedly one of the most defining features of the identity of the settlement which is with structures built using adobe.

Adobe is effective on many different issues in traditional settlements. In this context, adobe, a local material, is a decisive factor in the character and identity of traditional settlements, especially as it reflects traditional construction practices and is unique.

The aim of this study is to examine the role of adobe in the formation of the characteristic of the settlements and to develop suggestions for the sustainability of this characteristic. In the scope of the study, as first, the definitions of protection and sustainability concepts and their place in the literature will be covered. Then the concepts will be considered as material-oriented. Following these reviews, material-focused conservation and sustainability will be detailed in the sample settlement. In this context, adobe settlements in Malatya / Turkey region will be discussed. It is believed that the study will contribute to the protection of these settlements by examining the qualifications of material, which is an important characteristic of traditional settlements.

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Keywords

Material; Identity; Traditional settlement; Adobe; Protection; Sustainability

1. Introduction

Protection and sustainability in the field of architecture are important concepts that have been discussed for a long time and different approaches are being developed. First of all, these concepts, which are evaluated in such a way as to include all kinds of social and cultural etymologies of the structures that are formed later, have become a multi-faceted field of investigation that includes the disciplines of today.

The concept of conservation is related to the sustainability approach that discussed in almost every area. In this context, many different parameters related to both concepts are considered in order to make protection sustainable.

These parameters can be regarded as attributes related to the structure, such as the form of positioning and spatial fiction, as well as all the qualities that are influenced by materials and materials used in construction.

When traditional structures and settlements formed by these structures are examined, it is seen that some materials have come forward with regard to the natural and cultural conditions in the settlement area. One of these materials is adobe. The use of adobe, which is one of the most frequently encountered materials in traditional settlement, is an important parameter in the context of conservation and sustainability. In this context, the aim of the study is addressing conservation and sustainability in adobe material specifics; to contribute to these approaches with suggestions.

Within the scope of the study, the meaning of conservation and sustainability in architectural discipline was examined; moving from this, the relation between these two concepts with materials that used in construction has been examined. As a result of the conceptual studies made, the use of materials in traditional settlement textures was discussed in the context of conservation and sustainability and discussed through case of Malatya / Turkey. In this sense, first of all, conceptual studies and evaluations were made on the information related to the subject in the literature; the evaluations made were reviewed and suggestions have been developed on the selected sample area.

2. The Relationship Between Protection-Sustainability and Material

Conservation and sustainability are two closely related concepts discussed by many different disciplines. These two concepts, which have an important place in the field of architecture, also come to the forefront in the context of the evaluation of building and settlement textures. In this sense, one of the important factors to be taken into consideration in achieving protection and its sustainability is material. For this reason, conservation, sustainability and materials are issues that need to be considered in relation to each other in the field of architecture.

2.1. Architectural Protection

Conservation is expressed in dictionary terms as "assuring an entity against danger and external influences". Protection in an architectural sense can be considered as ensuring that structures bearing historical or artistic values or settlement textures can keep their lives alive (Aladağ, 2010). The said structures and settlement textures are the concept of protection in order to preserve the past as a historical document, as resources to be used by humanity, as a work of art, to protect the social life in order to protect the environment in which they are surrounded from undesirable changes and to transfer cultural concepts, traditions and thoughts to future generations (Aysu, 1984).

When the developments in conservation around the world are examined, it is seen that the Venice Charter is one of the important developments in this area. According to the Venice Charter, the aim of preserving the monuments is to be able to transfer them not only as a work of art but also as historical documents to future generations (ICOMOS, 1964). In addition, International documents such as Declaration of Amsterdam 1975, The Conservation of Historic Towns and Urban Areas 1987, Charter on the Built Vernacular Heritage 1999, Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage 2003, The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas 2011 and some local documents such as Charter for the Preservation of Quebec's Heritage 1982, Appleton Charter For The Protection And Enhancement Of The Built Environment 1983, First Brazilian Seminar About The Preservation And Revitalization Of Historic Centers 1987 and ICOMOS Turkey Architectural Heritage Conservation Charter have provided a more detailed and versatile discussion of the concept of protection. In this context, the purpose of conservation is to maintain a certain life-style, cultural accumulation and physical characteristics; to be transmitted to future generations both in the time of their protection and in the coming ages (Resuloğlu, 2005).

It is not possible to protect structural cultural assets and settlement textures with all their characteristics forever. In this context, the purpose of conservation is to identify and control the factors that cause the destruction of structures and settlements. In this way, continuous maintenance and supervision with ensuring that the values are adopted by

the society; will ensure that the protection work being carried out is continuous (Kapubağlı, 2004). In this sense, it carries importance that conservation efforts provide sustainable results.

2.2. Architectural Sustainability

Sustainability is a multi-faceted concept that is addressed in the context of architecture and conservation as well as in different disciplines, and is in this sense the focus of today's important debates. Different institutions and organizations in the world have assessed sustainability and determined various principles. These principles, which define sustainability in general, protection of human resources and biodiversity, develop holistic planning and strategy, balance between natural resources and economic growth, achieve long-term productivity and transfer to future generations, and stabilize inter-country opportunities (Duran, 2009). Following these criteria, various parameters were developed at the Rio Earth Summit in 1992 and sustainability became a concept considered in all aspects of life. In this context, it is emphasized the importance of sustainability in with developments almost every field (Kahraman&Türkay, 2006).

Sustainability is an important concept in all areas that focus on the future of mankind and aim to protect the resources of the area in which it is included (Beyhan&Ünügör, 2005). However, sustainability is a multi-faceted phenomenon that expresses the re-establishment of the balance between economic, environmental and social objectives in the long run, as a concept arising from the effects of human activities on environmental resources (Coccosis, 1996). In this context, architectural discipline is one of the areas where sustainability is most discussed and considered.

Nowadays architectural production, giving the least amount of damage to the environment by the prominent in the field; together with that the ability to accurately convey a culture, thought or social practice to future generations. Environmentalist approaches in this context constitute important criterias of sustainability in architecture (Ciravoğlu, 2006). These approaches are discussed on the basis of contemporary design and futuristic design approaches as well as traditional design conception. In this respect, the relation of traditional structure and settlement to the environment, the protection of this relationship and the transfer of it to future generations is one of the most discussed approaches related to sustainability.

2.3. The Relationship Between Material-Focused Protection and Sustainability

Constructions and settlements that come together form their own characters and identities with the unique features they possess. In the formation of this identity, the topography, climate and vegetation of the area in which the settlement is located are important factors that shape settlement as physical elements. Besides, the socio-cultural structure, livelihoods and the way of living depending on all the parameters of the users can be considered as intangible factors that affecting the settlement and its identity (Fig. 1). In this context, settlement identity is a unique concept influenced by many different elements

The physical elements affecting the identity of the settlement also reflect the characteristics of the structures. In this sense, the structural characteristics within the settlement texture; the spatial fiction that influences this characteristic, and the building materials that both shape and limit all these are some of the important elements that influence identity.

When traditional settlements are examined, it can be seen that the spatial composition that makes up the building characteristic is related to the socio-cultural structure, livelihoods and also the physical elements such as topography, climate and plant cover and the materials in connection with them. The fact that the material is also affected by similar factors and is therefore selected from the surrounding sources in the settlement; it can be seen that the places and settlement textures are formed by traditional, conventional construction techniques when the examples of settlement in question are examined. In this context, stone, brick and adobe obtained from earth are the most frequently preferred materials in traditional settlements.



Figure 1. A settlement shaped by the influence of different elements and having an identity, Mardin/Turkey (Kılıç, 2010).

When we examine the relation between conservation and sustainability of materials used in construction, it can be seen that these concepts can not be considered separately from each other. It is possible to say that traditional structural materials have great importance in the context of sustainability when it is considered that sustainability is the approach that has the least harm to the environment and conservation of resources with today's approach. In this context, the basis of sustainability is in the past; in conjunction with which conventional material is in use (Slessor, 2002). User comfort, thermal, visual and acoustic comfort, outdoor visual communication, clean air and user-specific measures to ensure sustainability in building design have been achieved through the use of traditional materials. When traditional settlements and the materials that make up these settlements are considered in the context of conservation, it can be considered as an approach which makes it possible that use the specific building materials with specific techniques, to protect the structures and to transfer them to future generations. However, in order to ensure full protection, it has a big importance that maintain the buildings constructed with such materials and to use them in a way that is not contrary to the nature of these materials. In this sense, material is one of the main factors of sustainability.

The concepts of material, conservation and sustainability are related to each other in the sense of examining the traditional structures and the identity of the settlements formed by these structures. In this context, adobe which is one of the unique traditional building materials and forms the identity of the settlements is an important material that can be considered in terms of conservation and sustainability.

3. Adobe Material and Traditional Settlements

The adobe is a widespread and important building material that has been used in many different settlements, dating back to the very early ages. It is known that it was used together with stone in ancient Egyptian architecture or sometimes used as a single material and sometimes with stone in some settlements in Mesopotamia. In Egypt, stone is often used in religious and military structures; whereas the people and the lower income group were found to have lived in wooden and adobe structures. On the other hand, adobe in Mesopotamia and its continuation in Anatolian architecture, has been used intensively in the construction of the upper floor and the roof as the main building material (Ünsal, 1960).

The settlements located in Anatolia are the textures that have common examples of original adobe structures under the influence of environmental conditions, climate and vegetation cover. Today, the existence of the traditional settlement textures created by the structures built with adobe in Anatolia continues.

Descriptions and terms related to the adobe differ according to the area they are produced, but they also contain some common points. In this context, adobe can be defined as the bricks obtained by mixing the soil, which is generally sliced with water, with straw and pouring wooden molds and drying them with the sun (Arseven, 1956)

(Fig. 2). As it is understood from the definition, there are various processes to make adobe which include making it a mixture, drying it and using it as building material. From here, factors that cause the use of adobe material can be listed as economical, climatic, functional, traditional and technological factors (Çelebi, 2012).



Figure 2. Adobemix in the wooden mold, Konya/Turkey (Duran, 2016).

The adobe has become a useful building material in many places in traditional settlements. In this context;

- Its raw material can be supplied easily, almost everywhere,
- Do not need to carry a long time with expensive vehicle because it can be found in the construction site,
- No need special tools, systems and specialist labor are required to be converted it into building materials,
- Especially no need mastery to built wall; when needed mastery, it is able to meet to this need from nearby because it is a unique material,
- For all of the above reasons, both economic convenience and the ability to produce unique structures are some of the outstanding benefits of using adobe materials (Naumann, 2007; Çelebi, 2012).

It is possible to find many examples of the traditional settlement which is built with adobe material and these buildings, in most of the rural settlements in Anatolia today in Turkey. In this sense, Anatolian cities which are most common in traditional rural adobe settlements can be listed as Kırşehir, Van, Elazığ and Malatya in general (Çelebi, 2012) (Fig. 3).



Figure 3. The Anatolian cities where the rural adobe settlements are most prevalent in Turkey.

Malatya, which is one of Turkey's Anatolian cities that have in traditional rural settlements, is a residential area to the east of the country, a well-established historical site that has been home to different civilizations. It has been one

of the most important cities preferred for settlement throughout the history, due to its location in a locality where topographical features are favorable and many vital resources are available (Fig. 4). In the historical process, the settlement area of the city, which has been plundered and burned down many times, has been moved; today, the old settlement areas of the city are far from the central settlement area.



Figure 4. City of Malatya (GoogleMap, 2017)

Today, while the city center of Malatya shows a more modern development, it is seen that the traditional buildings continue to be used in the towns and villages that make up the city. In this context, it is possible to see that when traditional structures and the textures formed by these structures are examined in general, material usage and space design are developed depending on Anatolian culture (Fig. 5). Materials used in this sense have been chosen as stone and earth that can be produced as building material, which is the most common and easily accessible material in settlements and surroundings. However, the poplar wood around the settlement is frequently encountered, and the wood obtained from this tree is hard and durable, allowing it to be used in structures.

When the traditional rural settlements in Malatya are examined, it is seen that the adobe material is especially prominent in the civil architecture examples together with the structures having different functions. In this context, the bases of traditional buildings constructed with stone and continuing as stones up to 1-1.5 meters high from the ground are completed with adobe walls. In some cases, it was seen that the wall was brought up with the adobe filling technique, but in general the piling technique was used (Durgun, 2006) (Figs 6, 7). Apart from this, in some examples, there are about 80 cm thick adobe on the outer parts of the walls, while on the inner part small adobe walls called "kuzu" are used; in order to connect these walls, sashes called "hatıl" were created and filled with adobe and pieces of stone and wood (Özyılmaz & Aluçlu, 2009).

When the spatial arrangement of traditional buildings is examined, internal courtyard is seen with a place called "hayat" which is used as a balcony and rooms arranged around a "sofa"; usually separated from the street by a garden, depending on user requirements and social structure. There are places such as kitchens and cellars on the ground floor (Durgun, 2006) (Figs 8, 9).

When traditional settlements are examined in socio-cultural sense in Malatya;

- The existence of large families, usually parents, children and grandchildren,
- The fact that the privacy sense is the front panel and the structures are structured accordingly,
- Removing the need of food with the provisions stored in the house,
- Especially the livestock and agriculture-based livelihoods to come to the forefront (Fig. 10), are the features that



Figure 5. A partially preserved traditional rural settlement, Malatya/Turkey.



Figure 6. Adobe house that was built by the pilling technique, Malatya/Turkey.



Figure 7. Anadobe house that was built with adobewalls on stone walls, Malatya/Turkey.



Figure 8. Anadobe house with its with its spatial arrangement, Malatya/Turkey.

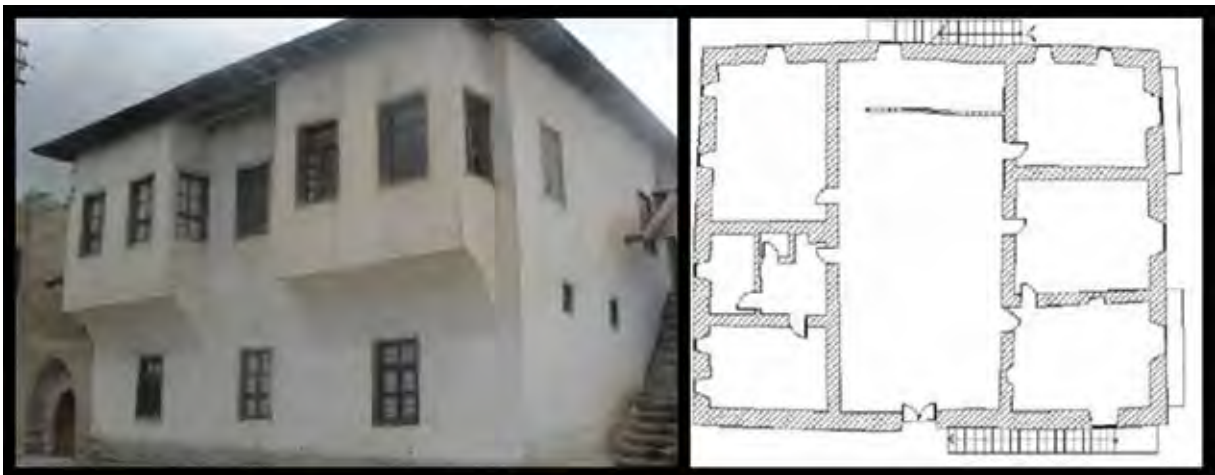


Figure 9. An adobe house with its with its ground floor plan, Malatya/Turkey.

most common (Özyılmaz & Aluçlu, 2009). All these features directly affect protection and sustainability in the traditional rural adobe settlements



Figure 10. Some of agricultural livelihoods and their relationship with houses and streets, Malatya/Turkey

Today, the users of the traditional rural adobe settlements in Malatya have changed in a great way and continue to change. Among the reasons for this are;

- The decline of large families and the formation of core families due to the widespread use of modern life forms,
- The change in the sense of privacy and therefore the beginning of an outward-looking life,
- Change of expectations from the living area with the increase in the level of education,
- Especially educated individuals do not prefer livelihood-related living.

The change of traditional settlements in socio-cultural sense has also caused changes in the use of buildings. According to this;

- With the formation of core families, new and smaller houses have been constructed to meet the needs of these families,
- Traditional adobe houses have only been used by the eldest households of the house, due to the abandonment of the majority of users (Fig. 11),
- With the spread of education, especially young population has gone to urban centers and many users have taken their families away from traditional settlements; adopted a modern lifestyle.

Depending on all these changes and reasons, the structures in the traditional rural adobe settlements remained neglected, and most of these constructions were closed. The fact that elderly individuals who use these structures need only one or two rooms and that they can not overcome the damages that necessitate simple repairs in the construction have led to bigger problems and negative situations in the sense of protection. However, because of users who leave the settlements come there at certain times; especially for use in the summer months and their adoption of modern living; it has not been effective in providing protection that destroying traditional houses and building completely different houses with modern materials.

The economic situation as well as the changes in socio-cultural conditions are also effective factors in preserving traditional rural adobe settlements. In this context, it can be said that when the settlements in question are examined, the generally low-income elderly users and families continue to live in adobe houses, while the rising income users tend to break up adobe houses and build modern houses. Nevertheless, it has been observed that adobe homes, with a small number of them, was repaired by the high economic level of users and continued to be used as summer residence. There are also examples of monumental structures such as mosques built with adobe material, which



Figure 11. Adobe house which is used by only an old user, Malatya/Turkey

are located in some of these settlements, have been restored and continued to be used. However, in general, it is understood that it is increasingly difficult to protect traditional rural adobe settlements with the influence of socio-cultural and economic reasons.

When we look at the benefits of using adobe in the light of the samples, it is possible to say that it is a sustainable material because of many reasons such as availability, natural air conditioning and not harming nature. However, ensuring sustainability is not only about the properties of building materials; it also depends on the use of the structure built with the material. In this context, adobe is a sustainable material, but needs care and used in structures that can not meet modern expectations in traditional settlements; for this reason, a situation has emerged that is sustainable in terms of material, but unsustainable in terms of use.

4. Conclusions

Material, conservation and sustainability are multi-faceted concepts discussed in the field of architecture both in relation to traditional buildings and in the context of new building production. These concepts, which can not be

considered separately from each other, are expected to be examined in detail both in terms of production, use and identity of architectural products all over the world.

Conservation is an important discipline within the field of architecture; integrating past architectural accumulation with new trends of the future architecture and aiming to transfer them from generation to generation. In this context, it is also in a relation with sustainability. Traditional settlement textures are areas where conservation and sustainability are associated with structural material.

The preservation of traditional buildings and settlements by unique materials and construction techniques largely coincides with today's sense of sustainability. At the same time, the handling of materials, conservation and sustainability also have great importance in the sense of protecting the identity of buildings and settlements. In this study, traditional rural adobe settlements in the Malatya / Turkey case, which is also present in the mentioned settlement examples, is an important field to examine the effect of material on identity, conservation approach and sustainability.

As a result of the study, to protect the settlements that made of traditional materials in a sustainable way;

- Natural materials have an important place in the identity of traditional settlements,
- As a traditional material, adobe has shaped the vital and spatial fiction in the settlements,
- The maintenance of the mud brick settlements is vital to its preservation and sustainability.
- In the conservation and sustainability of traditional rural adobe settlements it is seen that the material must be examined in detail, in the context of tangible and intangible data. These deductions will contribute to the field of architectural identity and conservation by emphasizing the relationship between material-conservation and sustainability.

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