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Turkey at the Beginning of the 21st Century: New Perspectives

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Chapter 5

Research on Traditional Wooden Buildings in Postgraduate Education on Architecture: A case study in Turkey

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1. INTRODUCTION

In the 21st century, the issue to protect universal cultural heritage is the common responsibility of all world countries. Traditional wooden buildings in Turkey that include examples of civil architecture of Ottoman Period are also an important part of universal cultural heritage. The level of awareness of today's architects on the issue should be high to protect and carry into future such buildings; therefore Turkish postgraduate education on the field of architecture assumes an important role in this sense. On the other hand, traditional wooden buildings that have withstood for centuries create a specific investigation field, providing significant clues to today's architects for making quality buildings. In this context, it is very important to understand conditions that affected construction of these buildings, to identify elements that enabled them to withstand from past to present time as well as inventory and documentation works for these building to carry into future preserving their original features. Furthermore, addressing to traditional wooden buildings for issues on the agenda of 21st century's architectural environment and examining these buildings using current technologies and research methods are also very important to make a contribution to education on architecture as well as practice.

2. TRADITIONAL CUSTOMS FOR WOODEN BUILDING IN TURKEY

It is known that there existed a culture of housing that was maintained for ages and based on wood material on Anatolian territory, and Turkey's traditional customs for wooden buildings were mainly based on this culture of housing. This housing appears to be the type of building that was observed in the Central and Western Anatolia as well as in Istanbul and the Balkans and its size varied between the a small house and a court. This type of building was the original product of the culture of Ottoman Period after the 17th century. This original wooden house on Anatolian territory has maintained an identity peculiar to Ottoman culture although it was altered by western influences after the 19th century. The mentioned wooden building is a kind of synthesis of Anatolian Turkmen culture and Ottoman culture. The house is referred to as "Hayatlı Ev" which was influenced by past Anatolian customs for housing, building techniques and materials and used their data, but was differentiated over time and completed its development after the 16th century, constructed by complex construction techniques, and used a wood base. This house is usually a two-storey traditional building and mainly has a wood base and rural characteristics, and the most important feature of this house is that it represents a unique Turkish period and is a significant material cultural element reflecting social characteristics, construction customs and aesthetical choices of this period. Although different typologies of housing exist in various regions in Anatolia, traditional Anatolian house, referred to as "Hayatlı Ev", and its derivatives virtually serve as a mirror for Ottoman building culture (Çobancaoğlu, 1998; Kuban, 1995, 1998). In this context, this traditional wooden house creates an important research field for postgraduate education on the 21st century's architecture.

3. RESEARCH ON TRADITIONAL WOODEN BUILDINGS IN POSTGRADUATE EDUCATION ON 21ST CENTURY'S TURKISH ARCHITECTURE

This section of the study includes postgraduate dissertation research on traditional wooden buildings in Turkey since 2000 in a chronological order.

The study performed by Çakır in 2000 compared and interpreted traditional wooden systems and modern wooden systems in the Black Sea Region under topics such as structure, thermal insulation, fire and endurance (Çakır, 2000).

In 2002, Köysüren performed a comparative study and examined traditional and modern construction systems for wooden frame in order to determine whether it was possible to interpret and use traditional frames in modern systems. In this study, walls, flooring and roof framework systems, joggles and façade set-up, roof and floor cladding were separately discussed, and a comparative interpretation was provided for positive and negative aspects of traditional and modern frame systems (Köysüren, 2002).

The study performed by Çevik in 2003 was aimed to do a typological research on façade architecture of wooden buildings in Arnavutköy, Istanbul. In this study, façade design of examples selected from traditional wooden buildings in Arnavutköy that have the architectural features of the period when they were constructed, and a detailed evaluation on architectural aesthetics was made in line with the data obtained (Çevik, 2003).

The study conducted by Sarı Aksoy in 2003 placed an emphasis on the importance of earthquake-resistant structure design and investigated behavior of buildings with traditional wooden frame system against earthquake (Sarı Aksoy, 2003).

The study performed by Sevimli in 2003 investigated the use of wood as construction and structure material by combining the wood using different techniques with the aim of assisting selection of building materials during the design stage. In the same study, historical transformation of wood into wooden elements was discussed giving examples from Turkey and the world, and addressed to various production and processing methods for wooden materials as well as practices for wood preservation. Finally, recommendations were presented for selecting building materials based on the data obtained from the study (Sevimli, 2003).

The study conducted Dışkaya in 2004 initially emphasized that natural disasters such as earthquake were one of the major fears of human being as they pose a threat to life. This study expressed that the first houses were built with stone masonry and adobe bricks by people of agricultural society that adopted permanent settlement in Anatolia, and wood was used in the flooring and roof cover of these houses. It was also emphasized that frame systems made of wood, which is a lighter and more flexible material, because buildings with masonry carrier system were destructed by earthquakes. The same study suggested that wooden buildings, one of the most important witnesses of cultural history, have been able to withstand despite all wear and deterioration effects; and they were not fully destructed and somewhat maintained their firm stand even against a disaster such as earthquake. In this study, impacts of the earthquake on traditional buildings were discussed; the earthquake resistance of an example traditional wooden building was analyzed based on the 1998 earthquake specifications, and accordingly recommendations on necessary structural reinforcement were made for such buildings to exist under current conditions (Dışkaya, 2004).

The study performed by Er Akan in 2004 aimed to investigate the behavior of Turkish traditional wooden buildings under lateral loads. This study underlined that houses with wooden frame were a product of a cultural heritage from people living in Anatolia, and these houses displayed a good performance against earthquakes throughout the history. The study initially examined the general characteristics of wood, the earthquake was defined; impacts of earthquake on buildings were discussed; and current information on performance of traditional Turkish wooden buildings toward earthquakes was analyzed by means of computer-assisted models (Er Akan, 2004).

The study performed by Matsushita in 2004 aimed to conduct a comparative study on carrier systems of Turkish and Japanese traditional wooden houses (Matsushita, 2004).

The study by Perker in 2004 emphasized that wood material was deteriorated by physical, chemical, biological and human-related causes, which has been used from the past to the present day to meet the need of people for housing; traditional wooden buildings that are important cultural and architectural heritage have been worn down and demolished day by day due to causes mentioned above. In this context, the study was focused on presenting traditional wooden buildings by studying deterioration of building materials in traditional wooden buildings in an example site, and aimed to provide an insight to preservation process. In the same study, Cumalıkızık in Bursa was selected as the example site. With a history of 700 years, Cumalıkızık that has survived to the present day and has been preserved as much as possible has traditional wooden buildings with features of Ottoman Civil Architecture; therefore this particular site was selected for the study. In the study the introduction section was followed by a section titled "Theoretical Information" including wood as building material, causes of deterioration of wooden building elements, and traditional wooden buildings. The Materials and Methods section addressed to the systematic structure created in the light of theoretical information, and the state of deterioration of wooden building elements in houses of Cumalıkızık was investigated based on physical, chemical, biological and human-related causes. Furthermore, a questionnaire study was carried out for the same study to identify problems of people living in the site regarding the traditional wooden houses and the site. In the light of findings, recommendations were made on preserving wooden building elements in houses of Cumalıkızık and ensuring sustainability of Cumalıkızık Site (Perker, 2004).

The study performed by Elmas in 2005 expressed that Çamlıca and its surrounding, which was considered a summer resort in Istanbul Anatolian side from

the period of Murad IV to the last quarter of the 20th century, was the place where mansions owned by leading persons of the society were located. It was underlined that upon building Bosphorus Bridge in 1973, it was considered to use these historical mansions for commercial purposes, and this changed the appearance of that area. In this context, a preservation project for a wooden building in this area was created as part of the study to protect the urban texture against destruction (Elmas, 2005).

The study performed by Özhan in 2006 emphasized that as a result of contribution from a multivariate cultural accumulation, wood materials were involved in a very large part of the domestic architecture that started and developed with adaptation of agricultural system, and wood material was used almost any type of building production in Anatolia. In this sense, the study examined Anatolia's rich traditional wooden domestic architecture from the very start to present day. The same study also placed an emphasis on recognition of wooden houses in their association with regional characteristics as well as their general characteristics which enabled wooden houses to form and become widespread. The study was not limited to a single area, settlement or area of use, but aimed to address Anatolia as a whole and aimed to investigate houses whose main carrier material was wood. For this particular purpose, the literature was reviewed to describe the concept, formation and development of traditional wooden houses in Anatolia, and to identify factors that caused these houses to become popular as well as principles for change. In this review, Anatolia was addressed on the basis of Northern Anatolia, Central Anatolia, Western Anatolia, Southern Anatolia and Marmara Regions based on the generally used geographical regions, and wooden houses were examined which were shaped with general characteristics of these regions and influences of local characteristics. At the end of the study, a map was created regarding distribution of wooden houses in Anatolia by regions. The authors studied wooden house's general characteristics developed by regions and observed similarities over regions, except for minor differences, in line with the data obtained (Özhan, 2006).

The study performed by Yaman in 2007 focused on evaluating the performance of wood building materials and their condition in accordance with standards and regulations, and assisting preservation activities at the level of building elements and making a contribution for traditional buildings to hand down the next generations. In the same study, Turkish traditional wooden buildings were discussed in terms of wooden base and wood building elements, and general characteristics of wood materials and basic requirements that need to be met by building elements were investigated. Also, general information was provided on the influences of mechanical, biological, environmental and physical factors on the long-term performance and service life of wooden buildings and wood elements, the methods for status evaluation, and damage assessment activities. In this sense, context, an example house was selected, and examined by a systematic created, in Zeytinlik, Giresun in the Eastern Black Sea Region (Yaman, 2007).

The study conducted by Apak in 2009 reported that structural characteristics of wooden structural systems varied; therefore it was particularly laid an emphasis on selection of a feasible system that is literally compatible with the architectural project when designing a wooden building. Thus, it was emphasized that a feasible and compatible wooden structural system would only be selected by a decision-making

method. The objective of the study was to find an answer to question by which criteria this decision-making method would be developed and also how to develop this method. A selection model was created for wooden structural system and this created model was examined on traditional wooden houses of K1y1köy as part of the study (Apak, 2009).

The study conducted by Buz in 2010 discussed the transformation of wooden building tradition in Istanbul and Boğaziçi over time, and properties specific to wood materials, traditional methods to derive and produce wood materials, and traditional building stages were investigated. In the same study, carrier systems were analyzed in the region and examples of wooden civil architecture that provided data on the carrier system were documented with technical drawings in Beylerbeyi and Çengelköy, and based on the obtained data settlement stages of the region in time, locally applied wooden building techniques and standards of elements used for buildings were interpreted (Buz, 2010).

The study performed by Hayes in 2010 examined five mosques with wooden pillar that were built in Anatolia during the sovereignty of Mongols in the history. An emphasis was placed on the cultural parameters of that period and on character of sovereignty of Mongols, and conditions and cultural production form, which influenced building of Sahip Ata Mosque in Konya, Ulu Mosque in Afyon, Sivrihisar Ulu Mosque, Ahi Şerefettin Mosque in Ankara, and Eşrefoğlu Mosque in Beyşehir, were interpreted (Hayes, 2010).

The study performed by Kandemir in 2010 was aimed to improve ultrasonic speed measurements and infrared thermal imaging methods by using with visual analyses in order to assess endurance of historical wood elements. These methods were assessed by applying on Aslanhane Mosque in Ankara and traditional wooden houses in Ayaş and İstiklal Mahallesi (Kandemir, 2010).

The study by Aktaş in 2011 focused on the seismic resistance of buildings of Ottoman period which constitute a large part of traditional house architecture in Turkey. In this sense, sample buildings of various characteristics were selected and examined in Safranbolu, which was a town in Ottoman period (Aktaş, 2011).

The study performed by Dışkaya in 2011 underlined that traditional wooden buildings in Istanbul have been able to withstand major earthquakes and survive to the present day, and conditions that formed Istanbul's 19th century wooden buildings and seismic structure of the city were investigated. The impact of the earthquake on a wooden ribbon building of 110 years selected in Süleymaniye Region was assessed by modeling with finite element method, and findings obtained were interpreted (Dışkaya, 2011).

The study performed by Yağşi in 2012 architectural characteristics, construction techniques, façade characteristics and current condition of traditional wooden houses in Tuzla, one of the coastal district of Istanbul, were investigated. In the same study, alterations undergone by the examined area and its immediate vicinity over historical process and the influence of such alterations on the wooden architecture were interpreted (Yağşi, 2012).

The study conducted by Aykut in 2013 aimed to document current condition of traditional wooden houses of Istanbul and a wooden house located in popular Fatih district; to identify materials used for the building and deterioration; to investigate

historical development process; to identify its original status, and to determine interventions necessary for preserving the building (Aykut, 2013).

The study performed by Hacısalihoğlu in 2013 underlined those examples of wooden buildings, which comprise a substantial part of traditional house architecture, were reduced in time, and expressed that it was necessary to document buildings particularly located in Anatolian rural areas together with their characteristics. In this context, the study was aimed to address to traditional wooden construction systems, which play a particular role in Bursa's rural architecture, with respect to regions facing to northern and southern slopes of Uludağ. This study investigated the traditional texture and wooden construction systems for five different village settlements selected from Bursa rural with the aim of identifying the influence of wood materials on the local identity in rural regions (Hacısalihoğlu Yaşar, 2013).

The objective of the study performed by Şık in 2013 was to assess the condition of traditional wooden buildings in Tekirdağ, to make a status evaluation on traditional wooden buildings over selected sample building, to make a map on damage, and to make a contribution to holding down traditional buildings to next generations, creating a source for subsequent preservation works. For this purpose, a typical example was selected from traditional wooden houses of Tekirdağ; this selected example house was evaluated for location, architectural characteristics, construction system, use of materials, alteration, carrier system, deterioration of materials, and causes of deterioration; and recommendations were made to eliminate wood problems (Şık, 2013).

The study performed by Yağcı in 2013 discussed a group of houses located in Eyüp, Istanbul, which is rich in traditional wooden houses and the first settlement area outside the fortification wall in Ottoman period. In this study, unique characteristics of examples of wooden civil architecture were investigated; current conditions of buildings were examined in detail, materials and deterioration were identified. In the light of obtained data, recommendations were made for interventions required by the building (Yağcı, 2013).

The study conducted by Güneş in 2014 underlined that traditional wooden building systems, which were widely used in Anatolia for centuries, have been ignored with development of modern construction systems. The same study emphasized that traditional wooden buildings, which were completely built with local materials without receiving any engineering service or being subjected to any regulations, reflected the use of materials by master builders who built these houses, and their knowledge and experience on earthquake and ground characteristics. It was also underlined that expose of such legacy of craftsmanship, which is at risk of forgetting since there is no written document, would both cast light upon history of building and create an inspiration to modern construction systems. In the same study, the literature was reviewed to evaluate in detail properties of wood as a building material, traditional wooden construction setup, and damages to wooden buildings; and the carrier system of traditional wooden buildings in the selected area was examined using detection forms developed for wooden buildings, and finally obtained data was interpreted (Güneş, 2014).

The study performed by Saydamer in 2014 emphasized that wooden bases fell behind especially after reinforced concrete and steel construction techniques became widespread, and those who want to own a house mostly prefer buildings made of reinforced concrete. Reasons for choosing wood material for Anatolian domestic architecture and its advantages provided under current conditions were explained, and carrier systems used in wooden buildings were examined with examples of Bursa's traditional buildings (Saydamer, 2014).

4. CONCLUSIONS AND RECOMMENDATIONS

In the review performed as part of this research, it was observed that a large number of postgraduate research were conducted on Turkish traditional wooden buildings from 2000 to present day, and these researches were guiding, extensive and rich researches in terms of both applications and contribution to education. The relevant postgraduate researches have focused on the creating an inventory of wooden buildings for preserving urban texture; developing measures for preservation, investigating traditional wooden buildings by means of current technologies, comparing Anatolian traditional wooden buildings with traditional wooden buildings of different countries, presenting differences and wealth in the building culture, technically comparing traditional wooden buildings with modern wooden buildings, and investigating material problems of traditional wooden houses and their resistance to earthquake. The postgraduate dissertation studies on traditional wooden buildings performed as part of postgraduate education on architecture since 2000 comprised the half of postgraduate dissertation studies on wood performed again in the field of architecture. Although this is pleasing, the number of studies needs to be increased, considering the stock of Turkish traditional wooden buildings. We believe that increased number and diversity of studies would make substantial contribution both to practice and education.

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