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Valuation of Traditional Turkish Wooden Building Culture in Terms of Ecological and Socio-cultural Sustainability, Case Study Cumalikizik/ Bursa

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Abstract: The aim of this paper is to evaluate the traditional wooden culture in Turkey in sustainability context. The concept of sustainability is envisioned as closely bounded up with heritage conservation in social, cultural, economic and environmental terms where, it can be investigated most fruitfully in traditional home environments. In this context, the physical and spatial features of traditional wooden buildings are evaluated in terms of ecological and socio-cultural sustainability, through an empirical study. Preserving its historical texture and traditional lifestyle up to this date, Cumalıkızık- an authentic Ottoman village in Bursa- is selected as a case study area. Evaluation of the traditional wooden building culture of Cumalıkızık in sustainability context could be the initial step to set out the principles of preservation for such a village including many valuable traditional wooden buildings. It is thought that, this evaluation study could light the way for sustaining historical and architectural heritage of such traditional settlements.

Key words: Wooden building culture · Wooden material · Heritage conservation · Historic settlements · Sustainability · Cumalıkızık

INTRODUCTION

For centuries the wood continued its existence in nature by its usage in buildings as the most robust material. Its unique properties as reproduction regeneration, resistance and sustainability, has succeeded in keeping its special place so far from the existence of man. Wood is preferred instead of the most of the developed materials and systems because of its appropriate properties for sustainability when used at the right place, in the right way and in the ecological sense. In all studies with various perspectives like climate, geography, culture, ethnic groups or history, wood has been used in different ways, from the basement up to roof covering, not only as a conveyer but also as a plating substance or an aesthetic supplement.

The wood is the best material reflecting the traditional way of life. The basic factors that improved the wooden structure culture can be listed as; local characteristics of the environment, topography, climate, building culture, local culture, functional relations and organization concepts. It can be said that wood is the best loved of the building materials. We treasure its natural, organic qualities and take pleasure in its genuineness. Even as it ages, bleached by the sun, eroded by rain, worn by the passage of feet and the rubbing of hands, we find beauty in its transformation of colour and texture.

On the other hand, the wood is strong and stiff, yet by far the least dense of the materials used for the beams and columns of buildings. It is worked and fastened easily with small, simple, relatively inexpensive tools. It is readily recycled from demolished buildings to be used in new ones and, when finally discarded, it biodegrades rapidly to become natural soil. It is our only renewable building material, that will be available for us as long as we manage our forests with an eye to the perpetual production of wood [1]. Unfortunately there are so few materials having the similar features as wooden. Thus, many different materials of which production processes seriously threaten the nature, have been started to be produced. Due to these technological developments threatening the natural balance of the world, the concept of "sustainability" came in the world agenda. In the 20th UIA Congress, sustainability was defined with a holistic approach as; "*a local, informed, participatory, balance-seeking process, operating within an equitable ecological region, exporting no problems beyond its territory or into the future.*" This definition has profound implications to the future of the design professions.

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It is indicated that, to form an equitable way of living on this planet, within the limits of nature is a design problem including urban and architectural design and urban management [2]. Hence, protection of natural resources, re-use of materials and the other environmental issues have been started to be discussed in today's construction industry. What's more, the multi-dimensional concept "sustainability" puts stress on the protection of historical values and transmission of these values to the future generations. Sustainable development of the historical environments could only be achieved by ensuring their liveability in today's conditions. [3]. However, the identity and uniqueness of these settlements are under a growing pressure for change - as the case of Cumalıkızık-Bursa, because of the changing society and life style and growing in numbers.

In the light of these, the principle aim of this paper is to evaluate the traditional wooden culture in Turkey in the context of ecological and socio-cultural sustainability. Preserving its historical texture and traditional lifestyle up to this date, Cumalıkızık- an authentic Ottoman village in Bursa- is selected as a case study area. In the following section, after giving brief information about traditional wooden building culture in Turkey, the unique examples representing this construction system in Cumalıkızık are determined with the explanation of their special characteristics and relations with the settlement. In the other section, the traditional wooden building culture in Cumalıkızık is evaluated in terms of ecological and socio-cultural sustainability. Finally, some recommendations for the sustainability of this traditional village together with its physical, spatial and socio-cultural features are discussed as a conclusion.

Traditional Wooden Building Culture in Turkey and in Cumalikizik: Wood material is frequently and differently used all over Turkey, especially in coastal areas, because of ease of supply, opportunity of timber supplement in different forms and lengths, alternatives for carriage, flexible usage, ease of repairing and montage. Turkey has unique weather conditions caused by its geographical structure as; being surrounded with seas, the relation of the mountains with the sea and the variety in ground shapes. Moreover Turkey is highly substantial on its forestalling areas especially in coastal regions. The wooden houses which are the best examples of civil architectural heritage in Turkey are located especially near shore and forest sides, densely in the Marmara, the Black sea and the Aegean regions [4].(Fig.1.)

In traditional Turkish architecture, wooden has been used so much structurally by its handling strength, isolation properties, suitability for different dimensions, adaptability for variety of forms and assembling properties. What's more, one of the most important characteristics of timber is its being a renewable resource. Why wooden had been chosen as a building equipment for centuries? The answer is simple; for economical and technological reasons. In traditional Turkish houses, the wooden material is mainly used for the constructive elements which form the buildings affecting their aesthetic texture and integrate with the traditional differences. Chestnut, pine tree, willow and poplar trees are used alternatively according to the regional climatic conditions.

On the other hand, the spatial organization, form and facades of traditional houses reflect the traditional life style of Turkish family that is composed of grandparents, parents and children. With the advantages of wooden material, generations can live in more changeable, era adaptable, continuous, flexible residences made up of timber than that of other materials. Some modifications, adapting to new life styles and needs, some adds and removes can be made easily with wooden [5]. The technological, socio-cultural and socio-economic developments caused new requirements and consequently changes in traditional settlements and houses. Thus, the traces of cultural and historical heritage are to be erased because of inadequate protection and maintenance.Turkish houses are invaluable historical treasures, unfortunately many of them are either seriously damaged or have been lost by disasters and dilapidation

Cumalıkızık is one of the most valuable and conserved villages in Turkey hosting many examples of traditional Turkish wooden building culture. As an example of Ottoman rural architecture, in 1999 the village celebrated its 700th anniversary with its very valuable heritage and undisturbed historical structure and natural landscape which consists of splendid houses, an ornament mosque, a Turkish bath and water fountains, still perpetuates these specialities [6].

In the past, there were 270 houses in Cumalıkızık. However, at present, there are 180 houses out of which only 150 are inhabited. Combination of timber produced from chestnut tree and natural stone as constructional elements in the structural system of these houses is a very specific characteristic of them (Fig 2).

The ground floors of these houses have rough stone walls which are supported by horizontal beams and they are closed to the street for defensive reasons and for the provision of privacy required by Islamic religion [6].

Hajji Ibrahimoglu House,Rize
www.ahsap.com

Traditional house,Safranbolu
www. Tenkafesi.com

Fig. 1: Examples of Traditional Wooden Buildings in Turkey

Fig. 2: Cumalikizik settlings area (adapted from Google Earth) and traditional houses. (Photography by Ozturk,R.,2009)

Fig. 3: Stone walls, wooden windows and latticework (Photography by Ozturk,R.,2009)

Fig. 4: Courtyard,stairs and handrail (Photography by Ozturk,R.,2009)

Fig. 5: Recent damages on houses (Photography by Ozturk,R.,2009)

Thus, functions such as stables and straw storages, which can be completely closed or require small windows are located on the ground floors of Cumalıkızık houses. The upper floors, constructed with adobe between chestnut frames, project to the street by means of cantilevers supported with stanchions. These cantilevers enable visual integration with the street through windows covered with wooden latticework to provide privacy and sun control (Fig3).

The, double winged wooden main entrance doors of the houses are usually made of walnut trees. On these wings the wrought iron belts attached with hobnails. The door handles and the knob is made of wrought iron. The floors of the houses, are formed with the crossbeams and the wooden coverage's o them. The other parts of the traditional Cumalıkızık house made up of wooden without any coloured paint over, are the its stairs, windows together with their lattice cages in front of them, doors of the rooms and its roof. Other than timber, in the walls between laths, the brick and mud plaster can be seen. [7]. The monumental buildings in Cumalıkızık are also unique. The mosque with wooden bearing system, wooden ceiling and roof is three hundred years old and has been constructed in place of the first mosque of the village. The wooden conveyor system, seen in here, with the wooden ceiling, belts and engraves are mostly perfect [6]. (Fig.4)

Cumalıkızık was announced to be a cultural heritage site by Turkish government and also was included into the "Urban and Natural Protected" area in 1981. These legislative actions have contributed the conservation of the village. The mosque, hammam, the cemetery, two monumental trees and 57 civil architecture samples were taken into preservation plan in 1990 by "The Higher Commission of Non-moveable Structures and Monuments", an additional 65 houses were registered in 1993 according to the proposals of the planners [6], [8]. In order to improve the infrastructure of Cumalikizik, an infrastructure project was prepared together with local water distribution, electricity and telecommunication companies and Bursa Metropolitan Municipality. Also, a fire safety plan including features of fire prevention and protection, which is inevitable for such a village was developed by academicians [9]. Since 2007, there has been another Project going on entitled, "The Living Ottoman Village in the Third Millennium-Cumalıkızık Collaboration Project". This project, launched by the state, is carried out by the local authority, the Chamber of Architects and all those who participate in its implementation in the field-professionals such as architects, planners, civil engineers, art historians, along with inhabitants of the village. The principle aim of the collaboration project is to provide standards for the integrated conservation of cultural and natural heritage, together with the sustainable development of Cumalıkızık in ecological, socio-cultural and economic terms. To achieve this goal, all possible means are employed to provide financial resources and enable residents to live in a village that offers a better quality of life [10, 11]. Although there have been many studies having the common aim of preserving Cumalıkızık, there is still a great need to establish the priorities for the village and to set out the principles of preservation in the context of sustainable development.

In order to achieve sustainable development of Cumalıkızık as a heritage site, one of the most important priorities is to put stress on the researches about continuity of wooden building culture and indicate the ways of protecting and maintenance of the traditional wooden buildings in the village. Evaluation of the traditional wooden building culture of Cumalıkızık in sustainability context should be the initial step to set out the principles of preservation for such a village including many valuable traditional wooden buildings. In the light of these, the evaluation study undertaken for the traditional wooden building culture of Cumalıkızık is presented in the following section. It is thought that, this evaluation study could light the way for sustaining historical and architectural heritage of such traditional settlements.

Evaluation of Traditional Wooden Building Culture in Cumalikizik: This paper envisions sustainability as closely bounded up with heritage conservation in social, cultural, economic and environmental terms where, it can be investigated most fruitfully in traditional home environments. In this context, the purpose of the study is to evaluate the physical and spatial features of traditional wooden buildings in terms of ecological and socio-cultural sustainability, through an empirical study.

Evaluation in the Context of Ecological Sustainability: When the stress is put on the ecological dimension of sustainable development, as Paehlke [12] states, it is useful to consider it with its three distinct dimensions. Each of them is associated with one of the three central value clusters of environmentalism: ecology, habitat, biodiversity and wilderness; air and water quality (pollution); and the conservation, preservation and management of renewable and non-renewable resources. In Cumalıkızık, all of these components can be investigated by means of the physical, spatial and ecological characteristics of the village.

Focused on the traditional wooden building culture, it is obvious that, the wooden structural material of the houses is variously damaged over time. The reasons of these damages on the houses which were mostly built by wooden structural elements produced from chestnut trees can be summarized in four groups as; physical, chemical, biological and humanistic. Physical reasons have three subgroups as; water-moisture effect caused by ground water, condensation, sanitary installation problems, domestic water; mechanical abrasion causing change in texture, change in strength; the impact of climate actions causing change in colour and cracks. Chemical reasons have two subgroups as; corrosion effect and heat-fire effect. Biological reasons have three subgroups as; bacteria effect causing increase in water permeability, decrease in fungi defence; bug and beetle effects causing appearance of holes and decrease in cross section; fungi effect. Human effect as wrong material selection, errors in maintenance, wrong usage, conveyance and neglect [13].

Although the strong properties of their building materials let these houses to stand against all kinds of corruptions, unfortunately chestnut trees have started to be desiccated by ink disease in recent years (Fig. 5).

One of the main reasons for the continuity of the natural environment in Cumalıkızık is the use of wood as the structural material together with stone in buildings. Thus, ecology, habitat and biodiversity have been conserved till today, together with the conservation of good quality of air and water. On the other hand, the conservation, preservation and management of renewable and non-renewable resources were possible with the wooden building culture. However, today because of the ink disease affecting the trees seriously, it is not possible to use this material for the building of houses anymore.

Evaluation in the Context of Socio-cultural Sustainability: Jenks [14], points out that there should be a variety of forms for settlements and a number of pathways to achieve sustainable development. However, in traditional settlements conservation of cultural, architectural and historical heritage is another matter of concern. The socio-cultural dimension of sustainability gains more importance for integrated conservation of cultural and architectural heritage that lays emphasis on the necessity for contemporary life styles and planning projects to take historic heritage into account [15].

The cultural, architectural and historical heritages of Cumalıkızık are reflected mostly by its traditional houses in which the traditional life style is still going on both inside and outside. The unique spatial organization of the houses and their near environments composed of "hayat", garden and street hierarchy; the traditional materials used in the construction of the houses and the special mass composition of them with the cantilevers, windows, doors and roofs are very suitable for the sustainability of this social and cultural life.

In the last decades, economical and social changes caused by the urbanization process lead to different requirements for changing life styles, consequently, spatial layout of Cumalıkızık houses also began to change. On the other hand, the population of the village has been decreasing year after year because of the shifting work power towards Bursa. Thus, the conservation and maintenance of the houses mostly belonging to the old villagers become impossible. Consequently, together with the ecological sustainability, the social and cultural sustainability for the village are being jeopardized.

CONCLUDING REMARKS

So as to conclude, it must be pointed out that, whereas socio-cultural sustainability is the precondition of ecological and environmental sustainability, economic sustainability is a vital requirement for socio-cultural and ecological sustainability. Ecological sustainability is summarized by Castells[14] as; to fight against the rapid changes affecting the environment and quality of life. On the other hand, socio-cultural sustainability can be defined as; the achievement of the development that meets the basic needs of people and is proper for the social life and structure of different cultures, with working of the society as a whole [17].

As a result of the evaluation study that takes into consideration of these definitions of sustainability, it is justified that the traditional wooden building culture has a great importance for achieving ecological and socio-cultural sustainability in historical heritage sites. The empirical study made in Cumalıkızık as a case has shown that the ink disease caused the usage of chestnut trees to be impossible; however, pinus nigra can be used as a structural material both for the restoration studies of the traditional houses and new constructions instead of chestnut. Besides the usage of pinus nigra , impregnated wood technologies that provide much more life to wooden material, are recommended to provide the continuity of the wooden building culture of the village .

On the other hand, in order to get success from the preservation studies of the village, the conservation and maintenance of these traditional houses are not enough. Adaptive re-use of these houses should be ensured with a holistic approach. By this way, the historical and

cultural values could be carried on in today's conditions, which is one of the most important requirements of socio-cultural sustainability. Multidisciplinary studies that undertake all dimensions of sustainability managed with a participative bottom-up approach are inevitable to get success.

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