“Sustainability Concept in Architecture via Traditional Dwelling Fabric”

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Abstract: Sustainability is a concept which provides to make decisions directed at the future by considering the environment and investigates the harmony and balance between the conservation and usage of resources. The basic support of the sustainability concept in planning is creating settlement areas in harmony with the nature or maintain the continuance of settlement areas by making them become in harmony with the nature. In this context, historical fabrics and traditional environments are evaluated within “sustainability” concept. The traditional dwelling fabrics which are characterized as traditional architectural products are produced by starting from this concept. The general characteristics of traditional dwelling fabrics handled in the scope of sustainable architecture are their unique dynamics and components and their designs compatible with the nature, environment and the context they are placed in. Traditional dwelling fabrics provide adaptation with the natural conditions, topography, climate and context of the region, use traditional techniques and forms with the building materials obtained from their environment and form healthy and comfortable living environments through the natural insulation of the building materials. Therefore they are characterized as an important input from the point of sustainable architecture.

The routers in the traditional dwelling design compatible with sustainability principles form the basis of this study. These can be diversified such as the compatibility of the traditional dwelling fabrics to existing topography, climatic data, geographical values, walkability, accessibility, building in human scale, use of green area, building materials special to the region, building form, building shell and spatial configuration in dwellings. In this context, it is aimed to evaluate the regional architectural approaches of traditional dwelling fabrics in Anatolia geography according to sustainability criteria.

Keywords: Sustainability, sustainable architecture, traditional dwelling fabrics, regional architecture

1. Introduction

Traditional architecture—with broad definition— is the work of architecture without an architect reflecting the tradition based on knowledge, experience and building culture. This broad concept includes many areas like subsidiarity, territoriality and ethnic architecture. Traditional settlements, has contemporary, permanent and continuous characteristics from the point of reflecting the life style of the society to the space, rational interpretation of material and structure, the integrity of building and environment relations. In traditional architecture – when it is consciously analyzed— it is seen that it is designed with the understanding of sustainable architecture and can reach solutions balanced with climate.

Sustainability is a concept which provides to make decisions directed at the future by considering the environment and investigates the harmony and balance between the conservation and usage of resources. The basic support of the sustainability concept in planning is creating settlement areas in harmony with the nature or maintain the continuance of settlement areas by making them become in harmony with the nature. The router criteria in sustainable design principles is defined as site data including site selection, topography, direction, green fabric decisions and climate data. Sustainable design criteria on the other hand can arranged such as building form, spatial organization, building shell, material selection, use of boundless energy resources,
plumbing and circulation systems. In traditional settlements, it is possible to concretely read the decisions which are valuable for sustainable router and design criteria. In this study, the router and design criterion in sustainable design principles are exemplified via traditional settlements selected from Anatolia.

2. Sustainability Concept in Architecture

Sustainability can be defined as “the development fulfilling the requirements of today without conceding the abilities of next generations to fulfil their own requirements” [1]. Sustainability is a dynamic process [2].

The sustainability in architecture is a system questioning the economical use of the sources, reuse actions and the relationships between the built environment and the human being. The thing we define as cultural sustainability in architecture is the duty and the responsibility of each generation to transfer the cultural values and signs gained from the previous period to the next generations by interacting with the other cultures and adding new ones to them [3].

3. Evaluation of Traditional Dwelling Fabrics in the Context of Sustainability

When the sustainable architecture is defined in the light of being related to the natural environment fact, it can be described as an architectural approach which shows compatibility to the nature, climatic conditions, society and culture in its surrounding, provides historical continuity, consumes minimum energy in production and usage, can offer a loop in the ecosystem and uses materials those are obtained locally and can be recycled [4]. Traditional principles have evolved over a long period of time in virtually all countries of the world. People have developed building techniques excellently adapted to the building materials available and local conditions such as the climate. Traditional building is a similar principle used by “simple people” (without a specific education in building) adapting their houses to the immediate natural environment and employing locally available materials in an economically sound and resource-efficient manner [5]. When the traditional buildings are handled in this context, it is seen that they are built with the criterion of climate data and site data including site selection, topography, direction and green fabric decisions. Addition to this, traditional settlements can be qualified as contemporary and permanent solutions from the point of reflecting the life style of the society to the space, rational interpretation of material and structure, the integrity of building and environment relations. When the traditional architecture is analyzed, it is seen that a building approach which is sensitive to environment is adopted and solutions balanced with climate can be reached.

<table>
<thead>
<tr>
<th>Settlement Characteristics</th>
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<tbody>
<tr>
<td>• The least intervention to topography</td>
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<tr>
<td>• Opening to view</td>
</tr>
<tr>
<td>• Using natural landscape</td>
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<tr>
<td>• Organic roads</td>
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<tr>
<td>• Using the natural environment in its surrounding in the best way</td>
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</tbody>
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- Aksaray Güzelyurt Traditional Settlement (Using the natural environment it is located in)
- Mardin Traditional Settlement (The least intervention to the topography)

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There are important effects of different climate regions, topography, building material resources and social life on the formation of traditional dwelling fabrics in Anatolia. Therefore, traditional fabrics are defined as buildings which are shaped by geographical location, climate, tradition-manners, and production-consumption types and built with experience [6].

The architectural characteristics and settlement properties of traditional dwelling fabrics are formed depending on the traditions, culture and regional data. In this formation the effect of human life and social structure is seen. Different regional circumstances with their unique life styles form a “Regional Architectural Language” [7]. The spaces formed by reflecting the life style on the space provide opportunity for action diversity and dense usage.
**Formal characteristics**

- Intermediary space (sofa, courtyard) formation providing thermal control
- Multifunctional room order opening to intermediary space
- Number of rooms which can be increased according to the requirements – ability to grow
- Oriel reaching towards view (oriel at only one point on the façade prevents heat loss)
- Square or rectangular geometry
- Plan scheme formed by the repetition of the rooms
- Aesthetical and qualified forms because of the outer façade character and the surface characteristics of the used materials

Fig. 3. Formal characteristics

Main three materials used in traditional settlements with the effect on the regional and climatic data are stone, adobe and wood. In non-precipitation regions stone- if it exists- or if not earth (adobe) is used as building material [8]. Especially in settlements around Aksaray, Kayseri, Nevşehir some parts of the dwellings are formed by carving into the rock they sit on. Service rooms such as cool pantry rooms, şırahane, barn, storage and etc. are carved in the rock. All of these diversities exposed because of the obligation of being compatible to the climate type and local construction techniques.

**Energy saving**

- Local material usage
- Thick wall usage
- Considering heat loss in window dimensions
- Using ground floors as barns as the upper floors are warmer
- Spatial organization
- Components like courtyard, eyvan and etc.

Fig. 4. Energy saving

In traditional dwelling architecture by the use of local materials, construction methods and workmanship developed and the thermal insulation characteristics of local materials like adobe were discovered. With the use of natural materials, beyond the compatibility with the nature and aesthetical values, positive effect of the solar energy is provided [9]. All of these characteristics happen to be the indicators of the sustainability thought lying on the basis of traditional settlement formation.

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4. Conclusion

When the traditional dwelling fabrics in Anatolia are investigated;

- It is seen that they are designed in the most compatible way to the nature and environmental conditions. Traditional dwelling fabrics are located in such a way compatible with their geography, not interrupting each other’s day light and providing both privacy and neighborhood relationships. The width of the streets in hot regions narrows down as shaded spaces are required. Generally, orientation towards south or sunrise, organization of the spaces according to the dominant wind, location of the open, semi-open and closed spaces to make use of all climatic opportunities and sun and shaded spaces, the location of the sofa in plan schemes, building materials, location and dimension of windows aim to be protected from hot or cold.

- Traditional dwelling fabrics are characterized as rational solutions in the intersection of existing possibilities and user requirements [10,11]. It is seen that there can be diversities in the building materials and techniques according to the potentiality of the environment.

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6. References


