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Climatic effect in the formation of vernacular houses in the Eastern Black Sea region

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Abstract

Climate is one of the many factors such as socio-cultural structure, economy, materials, and technology that influence architectural forms. The resolutions that exist as a result of the effect of climate on architecture differ according to regions, cultures, time and technology. The climate in the Eastern Black Sea region, which lies in the north of Turkey, plays an active role in the formation and diversity of the vernacular houses in the region. Climatic factors such as rain, wind, humidity and sunlight in the region, which has a warm-humid climate and which gets excessive rain, have different effects on the spaces, elements and annexes of the vernacular houses. This study explains climatic approaches that are evident in the architecture of the vernacular houses in the Eastern Black Sea region. The aim of this study is to give information about the vernacular architecture in the Eastern Black Sea region and to investigate the relationship between the architectural products and the climate that plays a very important role in the formation of this architecture. Thus, the effects of climatic factors, such as rain, wind, humidity and sunlight, on vernacular houses are explained in the topics as plan, external walls, roof and exterior of buildings.
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1. Introduction

The most important reason for the existence of vernacular architectures that are peculiar to different regions in the world is that they are formed according to the climatic properties of the region in which they exist. In our age, an architectural understanding that ignores vernacular conditions and features prevails. This understanding, which gets its strength from technology and materials, presents formations all over the world, which are similar, which do not reflect the vernacular characteristics, and which solve atmospheric and geographical conditions with technology and materials instead of natural forms [1]. In the past, when technology and materials were more limited, climate was the main factor shaping architecture. Buildings that have the most economic, most useful and most effective solutions that are compatible to the climatic conditions of the region in which they exist and that accomplish these by using minimum subsidiary energy are best examples of vernacular architecture.

Vernacular buildings are the architectural products that emerged as a response to the requirements of societies before the industrial period and to the insurmountable limits created by the region and climate, and as a result of the unique interaction between human mind and experience gathered by observing natural phenomena. Vernacular buildings, either individually or a whole settlement, are the best examples of the harmony among human behaviour, building and the natural environment. While, on the one hand, people prepare their houses and settlements to be used according to the "location", they challenge the permanent conditions of "climate" with a mixture of foxiness, courage and modesty on the other. The products that emerge and the solutions that are developed as a result of the reflection of the different climatic effects on vernacular buildings reflect at the same time on the architectural characteristics of that region [2].

The climate in the Eastern Black Sea region plays an active role on the formation and diversity of the vernacular

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houses as well. Climatic parameters such as rain, wind, humidity and sunlight in the region, which has a warm-humid climate and gets heavy rain, are seen to have different effects on the spaces and elements and annexations of vernacular houses.

2. Eastern Black Sea region

The Eastern Black Sea region is one of the three sub-regions (Western Black Sea region, Middle Black Sea region and Eastern Black Sea region) that constitute the Black Sea region, which lies in the north of Turkey. The Eastern Black Sea region can be considered in terms of climatic, economic and administrative borders. In this study, the region was considered in terms of its climatic borders. For this reason, the borders of the Eastern Black Sea region have been determined as Georgia in the east, Giresun and Ordu border in the west, Kalkanli in the south, and the arch drawn by the summits of Soğanli and the Kaçkar Mountains in the south. The above-mentioned borders incorporate the cities of Giresun, Trabzon, Rize and Artvin (Fig. 1) [3].

3. Vernacular architecture in the Eastern Black Sea region

3.1. Site plan

When the vernacular architecture in the Eastern Black Sea region is in question, the first thing to be observed is the scattered settlement. The settlements in the mountainous Black Sea topography are on the upper parts of the mountains, on the mountain slope, at the feet of the mountains or in the valleys, and in some places combinations of two or three of them may be seen. The scattered settlement in the Eastern Black Sea region is the result of the unsuitable topography for collective settlement. The vernacular houses, which display the characteristics of slope houses, are dispersed in the topography as single houses or groups of few houses. Sometimes the distances between houses may be as long as 1000 m. This forces the local people to build houses that meet all their needs and that are self-sufficient (Figs. 2 and 3) [4].

3.2. Structure and construction

The most commonly used structure and construction type in the region is the wooden-framed structure. In addition, timber construction and stone masonry systems may also be seen (Figs. 4–6) [3].

3.3. Building materials

The main building material in the region is wood and stone, and it is possible to see the applications of these two materials in different construction techniques. The common characteristics of the wood types used are they are hard, resistant to moisture and heat changes, and long lasting. Stone is an indispensable building material in the Eastern Black Sea region. A house that is two-storey on the rear and three- or sometimes four-storey on the front side

Fig. 1. Eastern Black Sea region.

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