

Eastern Black Sea Region—A sample of modular design in the vernacular architecture

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Abstract

Rural settlements of Eastern Black Sea Region have an original architectural characteristics which are shaped by the climate and topographic conditions, local materials, and the social living style. But, this characteristic structure which is covering the vernacular houses, has been started to lose its specifications because of new buildings which are unconsidering the importance of local conditions and the architecture. The target of this study is to design model houses which are in accord with the vernacular architecture and climatic-topographic conditions, and will answer varying needs of the modern life. The realizations of these designs (with a prefabricated system which is easily carried, buildable on inclined topography, and simply installed) is important due to the regional conditions. Therefore, local texture will be saved, and a contemporary system will be adapted with the vernacular architecture.

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1. Introduction

The abandonment of vernacular building methods in the process of building production was first realized by using rather cheap and abundant concrete and reinforced concrete instead of stone and wood which were the vernacular structural materials [1].

Instead of using Turkey's potential of wooden material, the use of reinforced concrete is increasing rapidly. Reinforced concrete is not compatible with nature and environment, creating health problems especially in moist climates; and does not meet the needs of the society, and encourages high buildings [2]. This negative condition can also be seen in the Eastern Black Sea Region which lies in the northeast of Turkey (Fig. 1) and which keeps the characteristics of the vernacular architecture until recently.

The Eastern Black Sea Region presents interesting characteristics in terms of the diversity of the vernacular architecture. Because of the topography of the region—steep and perpendicular to the sea—road construction works could only start in the 1970s, which had reduced all kinds of cultural interaction to a minimum and debilitated the learning of new materials and building techniques. For

this reason, types and constructions of buildings which differed in terms of details in different parts of the region became concrete in the vernacular buildings and preserved their authenticity until very recently [3] (Fig. 2).

However, because of some reasons, the continuity of the vernacular architecture is under threat in recent years. Vernacular houses are disappearing rapidly, and the number of new buildings which do not conform to the characteristics of the region is increasing. Most important reasons dealing with these, are given below.

1. Living in modern buildings instead of buildings that conform to the texture of the architecture and the climatic conditions of the region has been considered by the local people as an indication of status [5]. High and large houses replaced the 'land' which was one of the status markers in the past. Such uses as large terraces and unused balconies, column-to-column windows, eye-catching façade colours (pink, blue, red, etc.) [6] and high buildings with different sizes and shapes among the vernacular houses created contrasting views with the present architecture (Fig. 3).
2. The poor comfort conditions of the vernacular houses led the people to construct buildings which were not

compatible with the present buildings and which deteriorated the architectural texture. The poor comfort conditions that the vernacular houses in the Eastern Black Sea Region have can be listed as follows:

- The toilets in the vernacular houses are not hygienic in terms of installation and end in open cesspits. In addition, the toilets are either semidetached to the houses or completely detached from the houses [5] (Fig. 4).
- As the height of the site increases the windows get smaller. Since the height increases, the temperature decreases, and therefore the number of windows become fewer of which the heat loss is high. The total area of windows is below the standards in terms of both the level of illumination of the inner spaces and heat preservation. In the major parts of the houses, the level of illumination in the daytime living spaces is very low. When considered as a whole, natural illumination in a house is also far below the acceptable level. There are more windows in bedroom sections than in other sections [5] (Fig. 5).
- The heating systems in the vernacular houses are far away from providing the family members with a minimum level of comfort conditions and they are usually used for cooking purposes [5]. The utilization of such a system as a heating system is only possible

in unhealthy conditions in the daytime spaces which have many openings in their constructions and where the ground level is earth. In bedrooms, there are no heating systems for the host users [5].

- Because of the climate, extended families, bulk of the daily chores, and the economic structure in the Eastern Black Sea Region, the number of the daily users of the houses is very high. For this reason, the ground of the daytime spaces are usually compressed earth. However, this is not preferred today because of comfort reasons [5].
- Some measures were taken to prevent the penetrations of the harmful gases and odour in the stables into the spaces in the living floor, but they are not enough. There are some ventilation problems in the stables [5].

In order to improve the negative conditions which caused the deterioration of the characteristics of the vernacular houses in the Eastern Black Sea Region, it is necessary to create new designs that are compatible with the vernacular architecture and climatic characteristics. It is very important to realize the designs which will be applied with a prefabricated system that is simple to fix and easy to transport in the inclined areas. Because of this, it has been decided that the prefabricated system to be set up in Eastern Black Sea Region and reflect the characteristics of the vernacular houses will be made up of structural insulated panels (SIPs).

2. Structural insulated panels (SIPs)

SIPs are prefabricated wooden-based panel systems that can be used in the load-bearing walls, floors and roofs of the buildings [7] (Fig. 6).

Because of their smooth facings, rapid fitting, perfect insulation characteristics, ability to create a stronger



Fig. 1. Eastern Black Sea Region.



Fig. 2. Vernacular architectural samples from Eastern Black Sea Region [4].

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