

Research Paper

Evaluation of features of plex housing relating to vernacular housing of warm & dry climate, (case study: Kerman City)

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Abstract

Plex construction is a method in residential design which has been suggested with the aim of a sustainable, secure and consistent with environmental conditions. Plex housing has been selected as an optimal type of social housing for study and analysis due to positive specifications like consistency with the environment, climate and region, reduction of the building energy consumption during cooling and heating, saving in the use of urban land per capita, and in qualitative respect, promotion of social sustainability in this type of housing. In one hand, by attention to vernacular architecture, we may find out that this type of architecture benefits from unique features relating to climate, cultural and social considerations that regarding these patterns in contemporary architecture, could return the housing to the nature of the land in which it has been located. The aim of this study is to show the approaches of designing plex housing relating to vernacular housing of warm and dry climate for reviewing and reviving the rich patterns of past architecture in the contemporary architecture. Research method in this study is descriptive-analytical and comparative and the required information has been collected through field studies (observation and interview) and reviewing some documents. The results obtained from investigating the studied indicators show that in plex housing and vernacular housing, a great interaction is observed in respect of physical position. These two types of housing are in a very close interaction in respect of spatial structure and in climate view, vernacular housing has better responded the environment, but totally all design criteria in two types of housing are interacting with each other. Plex housing may be effective and useful as a new form of contemporary housing in creation of a linkage with the past architecture in responding the environment and creation of sustainable housing and follows revival of rich patterns of vernacular housing architecture in contemporary architecture.

Key words: vernacular housing, plex housing, hot and dry climate, housing typology, plex.

Extended abstract

Introduction:

Plex construction is a method in housing design which has been proposed with the aim of providing a sustainable, secure housing consistent with environmental conditions. Considering the wide range of the buildings constructed for residential application and appropriation of a high rate of energy consumption to them, placement of several buildings beside each other may reduce the rate of energy wastage (Ghialvand, 2007). Also, this is necessary regarding the shortage of urban land per

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capita, using the constructional techniques which reduce the per capita rate of using land. Plex construction is significant as a method which includes energy reduction and respecting the environment and less use of land (Goodarzi et.al, 2013, 67). On one hand, Iran vernacular architecture has unique specifications that besides attention to the environment respond the climatic needs of every region that this issue is abundantly observable in warm and dry climatic regions. By recognition and investigation of the vernacular architecture and the features consistent to the climate, they may be used in improvement of today buildings architecture. In this regard, the vernacular housing of Kerman city is evaluated with the aim of achieving the designing approaches of contemporary housing utilizing the rich patterns of past architecture in the physical and climatic dimensions. The research questions include: what features and criteria may provide adaptability of plex housing as a type of contemporary social housing with past models of vernacular housing in physical and climatic dimensions? And how much the past model of vernacular housing is consistent to warm and dry climate relating to plex housing? The proposed hypothesis is that the plex housing may lead to revival of past vernacular housing and systematic recognition by adaption to past architectural models which is responsive to the needs of contemporary housing relating to the climate and improvement of designing quality in architecture of contemporary architecture.

Methodology:

The present study is a combination of analytical- descriptive and comparative methods with applied objective. The required data has been used through field and documentary studies. The statistical population of the present study is Kerman city vernacular housing (in respect of features of warm and dry climate vernacular housing). At first, the principles and criteria of plex housing and vernacular housing are identified, then for evaluation of the design specifications, these criteria have been used in study samples of plex housing and vernacular housing and achieving the rate of utilizing each sample from assessed criteria of scoring systems. Since the rate of efficiency of each sample is different from the considered criteria, the scoring system has been used that based on viability world literature¹ and the rate of adaptability of these two types of housings are investigated.

Results:

For comparison of the designing criteria in the architecture of vernacular and plex housing, the searchable points in designing studied samples were extracted. The studied criteria have been categorized in the format of two physical and climatic indicators. Then, for making the assessment process more accurate, the considered indicators were classified in the format of component and criterion and the searchable criteria were assessed in the studied samples. So, the rate of distinction of each criterion is investigated in each sample and all study samples in vernacular and plex housing as scoring. For evaluation of the specifications of these two types of housing, comparative comparison of the obtained scores was performed and the rate of adaptability of the considered cases in both housing was obtained. The designing criteria are conformed to each other in climatic respect in plex and vernacular housing in using air flow and relation to the environment. In using native materials, construction of vernacular housing is completely matched with native materials but in plex housing, this trend is descending and almost in most constructions, new materials have been used. Saving in energy consumption in vernacular housing has been more considered. The building orientation in vernacular housing has been applied very carefully but in plex housing some descending trend is observed. In plex housing and vernacular housing, in respect of the structure commonalities have been in interaction with each other, using central yard as a collective space is seen in both housings. Collective spaces for creating more social interactions and building joint sections are seen in both housings. In respect of situation, adjacency exists in both types of housings but in vernacular housing, adjacency of the residential units has more consistency that this leads to more energy saving. In respect of space independence, both housing types are in interaction with each other. In respect of security, spatial and functional privacy, in vernacular housing is more observed due to the building introversion, but generally in both housing types, the element of security exists in the view of defined relations to joint parts and spaces

Conclusion:

The theoretical fundamentals show that in the past planning of vernacular and plex housing, each has been evaluated based on its features and the interaction of these two types of housings have been ignored by planners and designers whose consequence is environmental and urban problems relating to the contemporary architecture. The salient feature of vernacular residential housing is conformation of housing to the environment and climatic and regional conditions and responding the environmental needs affected by climatic conditions. So, revival of vernacular architectural values which include the experiences of past skillful architects in construction of climatic housing and its adaption to contemporary architecture may lead to qualitative housing promotion. For rereading and revival of these models, the present study evaluates the features of plex and vernacular housing. The results obtained from the study show that in plex housing and vernacular housing, much interaction is seen in view of physical position. In respect of the spatial structure, these two types of housings are in close interaction with each other and in climatic view, the vernacular housing better responded the environment, but totally, all designing criteria in two housing types are in interaction with each other. Plex housing as a new form of contemporary housing may be useful and effective in creating a link to past architecture in responding the environment and creating sustainable housing and follow revival of the rich models of vernacular housing architecture in contemporary architecture. The results of the study indicate adaption of features of designing plex housing in relation to vernacular housing.

