INVESTIGATING HOUSING DESIGN WITH SUSTAINABLE ARCHITECTURE-ORIENTED MODEL IN THE CITY OF ARAK

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ABSTRACT
From the beginning of human creation, housing as a shelter, after the man’s need to the food and clothing has been considered and emphasized as the man’s third skin and in order to human to grow and flourish has been considered as the first necessity. Human therefore has made every effort to provide housing shortages over time. Today, three major factors are being considered in the mass production: light building, speed and accuracy. Given the new available facilities, systems and new materials, we can make large lightweight projects in a very less time with high-quality, in which building units with the lowest cost by using modular system and industrialization in the form of similar shape cells and arrangement of these cells next to each other is made possible. To achieve this goal, industrial design is used. Of course, besides it, in order to optimize the energy consumption the sustainable architecture is also being used. Modular system is a system that has long been used in traditional architecture in our country, but today, it is rarely being studied and implemented. Due to the need of users whom are from the low-income class of society and given studies that have been done in the field of customs and climate of region, it was concluded that units should be designed small, independent and also in harmony with the climate and customs. With the proper and standard alignment of furniture and the number of people using housing, the appropriate size for each cell was determined.

Keywords: Housing; Low-income Class; Low-cost Housing; Industrialization

INTRODUCTION
Housing as a real phenomenon is one of the first human issues that human have been faced with and have been always trying to find the right sensible and thought answer for it. This phenomenon is of various socio-cultural, physical and economics dimensions. Housing constitutes one of the basic needs of human. Access to these needs, given its properties is difficult and complex and the ways of designing and getting it have been always discussed.

Given the technical developments of construction of housing and changing social conditions, the problems of housing and the need for it day by day takes new dimensions to itself. Iran is currently among the developing countries and one of the major factors driving the country forward is the need for housing.

Given the growing need for housing as well as the unprecedented growth of young population of the country, especially in the city of Arak, I was interested for meeting the need to the housing to do present research and investigate the subject. The main users of this study may be the poor and working people of the city. The essential point is that we emphasize on the industrial design of units with minimum cost as well as the creation of appropriate and optimum spaces according to the needs of the inhabitants, their customs, region’s climate and finally regarding architecture regulation.

The Concept of Residence in Architecture (Website of Zoran, Research institute of Art and Architecture, Spring 2004)
Christian Nordberg-Schulz, the Norwegian architect and scholar, citing the philosophy of Heidegger about the spatiality of human existence and based on environment phenomena identification, which considers issues relevant to the nature and the structure of places, gives the existence and quality to this concept. He considers loving the location and the land as part of the world and prefers it to the technical issues.

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In general, we can distinguish four ways of residence that occur in different levels of architecture. Four ways of residence and architectural levels associating to each of them are as follows:

Normal Residence in the Village

Settlement is the first place that in the study of residence styles can be considered.

Collective Dwelling in Urban Space

After settlement in the village, other ways of residency that are in relation with basic forms of human solidarity would be discussed. From the ancient times, the urban and village have been the scene on which people were visiting and meeting each other. Having a meeting does not necessarily represent compromise of both parties, but it means coming together regardless of all their differences. Therefore, the urban place is being considered a location providing various facilities. In the urban space, human feeling what gives the world a meaning chooses his residency.

Public Dwelling in Public Buildings

In addition to the agreement, a residence should provide the intention of getting to public meeting where the shared values are kept and manifested. Such a place is usually called a public entity or public building.

Private Dwelling in a Residential Building

In the concept of dwelling, there exist more private options and the nature of every individual follows a specific and unique stream. Therefore, dwelling also incorporates the isolation that is necessary of formation and development of individual identity. The latter case, with regard to the activities that must be kept from interfering with others, is called private dwelling. Given the four ways of dwelling, the concepts that can be inferred from the dwelling can be classified as follows:

- Meeting others for exchange of products, ideas and emotions, i.e. examining life as a scene of various features.
- Agreement with others, i.e. accepting a set of shared values.
- Finding entity by selecting a small world.

Mentioned concepts can be called collective, public and private dwellings, respectively.

Research Questions

In this study we encounter these issues:

Is there any model for construction of buildings, at least in terms of its architecture?

How should be the quality of these constructions?

Given the above questions, what is the best design with respect to the ground and what would be the likely future needs?

The Target Population, Sampling Method and Sample Size

To meet the environmental goals as well as the climate architecture and urban studies, the statistics provided by meteorological stations of the country, especially those in the region of interest, was used and to analyze and evaluate this data and using of them in plans, monthly methods were used. In order to develop a design appropriate to the current and future needs of plan, issues and topics published about the design of residential complexes. Were used and the relevant statistics and graphs were verified based upon statistics by the Statistical Center of Iran.

MATERIALS AND METHODS

Methods and Tools for Data Analysis

Classification of Methods and Tools for Data Analysis

- Using Giyani method,
- Location theories for better analysis of the position of residential units,
- Using descriptive and inferential statistics.
RESULTS AND DISCUSSION

Findings
To create a dynamic residential complex and to meet emotional needs of residents, given the modern standards of urbanism, we give priority to green space, playground and cultural, artistic and sporting places.

The requiring spaces of each residential complex may include the following ones:

– Green spaces such as parks, playgrounds, local parks, green belts and so on,
– Constructing sidewalks and separating them from the roadway, with the aim of welfare for residents as well as providing a place for morning exercises, biking, skating, pedestrian path and so on,
– Designing commercial spaces at the overall scale of sets and neighborhoods,
– The study and design of multi-purpose sports complexes in the form of opened and closed,
– The design of public parking, taxi and bus stations at the entrance of complex,
– Arrangement of urban furniture in the entire of complex,
– Creating green spaces between the units as walking space and separating it from the roadway,
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The design of different units with a variety of colors and textures and with alternating and dynamic rhythms,

Creating niche and nesses in the view for privacy, dynamism and beauty,

Putting together different units and creating rhythm in height besides consideration of climate issues,

Using inexpensive, light and quality materials with respect to the climate and customs of the region,

Using of in-situ concrete structural system, because of its architectural issues as well as its quick and accurate implementation,

Production of light prefabricated concrete roof in factory with modular dimensions that are approved by the housing council,

The use of double-glazed windows as well as roof-garden for optimization of energy consumption,

Geological studies for the design of the intended structures,

The use of modern technology in order to use more and more clean energies such as solar, wind and so on.

**Human Scale**

**Definition of Human Scale:** The proper study and design of architectural issues according to the needs and structure of the human body and giving priority to the meeting all the needs of human being besides respecting for the environment with the aim of keeping alive the nature and creatures.

**Design Idea**

Making interaction between the past cultures and traditions with those of modern society by construction of sideways for strengthening interactions between different societies through association and meeting at this locations with the overall objective of providing pleasant and relaxed places for the residents of these areas.

The positive and key points that are considered in this design are as follows:

- Making social cohesion among different communities,
- Great high flexibility and unison,
- The use of lightweight and low cost materials, which are commensurate with the region and new energies,
- Design of independent units according to the needs of residents and the region's traditional culture,
- Flexibility to design spaces with appropriate dimensions and separating private from public spaces,
- Compliance with climate problems by placing the unit in the correct order,
- Respecting the urbanization issues by separation of sidewalk from the roadway,
- Construction of spaces relevant to the units including commercial, recreational, artistic, sporting, cultural, educational, sanitary and services spaces,
- Design of various and different units independent of each other,
- Making urban furniture with respect to three aspects: beauty, performance and quality.

**Conclusion**

Models that planners and builders use in the design and construction of residential environments represent special cultural realities and expectations that are obtained with the cost of losing and ignoring other realities and expectations. However, community should not expect that planners to resolve all the community’s problems. The serious problem of low-income class of community is not only the problem of housing, but they usually have their roots in economic, social problems as well as unemployment, especially among young people that are the really national capitals. Planners as consultants of governments and constructors can issue problems that are not considered by others. For example, they can revise in the design of residential complexes to make clear whether these requirements provide problems for the low-income members of the community who are seeking for housing or not. Possibility of revising in the state managerial policies of inexpensive housing design can also be taken into consideration.

The success of the cooperative movement in providing plans to build affordable housing by the management of their future residents is a pattern that could widely be used in the future. The green countryside and the controllable city models are powerful embodiments of the social values.
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In this study, the issue of human equality was also considered. Housing is one of the first rights of all members of society that regardless of their race, gender, social class and moral backgrounds they should have access to it. Therefore, it should be an effective tool for the equal access of people to the services, success, welfare and security. Social services such as health care, child maintenance, household management and legal services as well as cultural facilities such as libraries, theaters, religious and sport centers should also be included in the form of housing programs.

In relation to the standardization of housing, it should be considered that quality should not be sacrifice for quantity. Strong demand for housing as a result of population growth and migration influences local planners and managers to add to the production rate and sometimes causes the quality to be considered in the secondary priority. To avoid wasting funds, and protecting the life of residents and providing proper conditions of health and other issues it is necessary to note that housing standards be taken into consideration. There are three essential and important factors in mass building: speed, precision and light-building. The idea of the design and construction of buildings with the lowest cost by using the modular system and industrialization is arisen from the construction of similar shape cells and placement of these cells next to each other. This design model caused from one hand, the climate and customs issues to be taken into consideration and from the other hand to take steps for its optimization and its proper implementation.

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