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THE RELATIONSHIP AND ROLE OF VERNACULAR ARCHITECTURE IN ACHIEVING AND MANIFESTING SUSTAINABLE ARCHITECTURE

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ABSTRACT

The energy crisis was one of the environmental problems in the last century that affected on many human activities. Architecture design faces to difficult challenge in high energy consumption as an effective factor. Therefore, the issue of environment protection, future generation's need and enjoying from energy bring a new concept as sustainability in various sciences such as architecture. Sustainable architecture is one of the discussions in our country that has recently been come on the topics and considered. Principles of sustainable architecture in many buildings and vernacular housing are relatively compliance. Vernacular architecture includes unique features that in addition to considering the issues of beauty and protection of environment, it should also be responsive to climate needs. The principles used in architecture include many sustainable architecture sciences that thereby it can be has effective steps towards achieving sustainable development. In the present study, sustainable and vernacular architectures are considered and then, the values of architecture principles are studied that lead to achieving sustainable architecture and finally, lead to sustainable development.

INTRODUCTION

Addressing sustainable architecture and tools of forming such an approach in architecture designing is necessary for deeper understanding of goals and recommendations of sustainability. On the other hand, solving environmental, cultural and social problems and tightly integration of this issue, lead us to vernacular architecture and the approach of sustainability in comparison and measure each other to extract its teachings for designing today architecture. In vernacular architecture, it was tried to use the minimum facilities and the easiest energies efficiently. Sustainability of many vernacular monuments is culturally and socially one of the values that is able to develop in architecture. Vernacular architecture is one important issue in the field of aesthetics and respect for nature. Although vernacular architecture has been changed by transformative phenomena through history, it can maintain its specific identity and can be representative of their customs and traditions [1]. Sustainability is a concept that is used much as amount of value of a method and is a repetitive process. But vernacular architecture met its time needs and repetition of that is pointless. In order to achieve sustainable architecture as one of the most important resource considering vernacular architecture experiences of Iran that was responsive to human needs in specific environmental, historical, and technical situations clearly. This statement is not for repeating the past framework, but it means getting principles and finding proper interpretations of them in the present era [2].

KEY WORDS

Vernacular architecture,
sustainable architecture,
sustainable architecture,
environment, housing

Research Hypothesis

Vernacular architecture has a significant role in achieving society to sustainable architecture and development.

Research Method

In this study, the research method is based on library studies that are based on collected documentations of sites, articles and books.

Theoretical basis

Sustainable architecture

The concept of sustainable architecture is more related to increasing quality and standard of life than preservation of life. The best concept of sustainable architecture for the architects is that they can build the artificial environment based on increasing the present quality of life and providing the future

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generations' needs. On the other hand sustainable development is consistent with the climate and the conditions inside the building is based on human welfare in this type of architecture and it also does not harm to the environment. By understanding geographic, cultural, religious conditions and by responding to the welfare, cultural and religious needs in every nation, we can have sustainable architecture. Sustainable architecture is in harmony with the climate and does not disturb the environment and this is an architecture that respects to human and its culture and environment. Buildings that are designed according to sustainable architecture, unlike fixed and old buildings were flexible and somewhat mobile. So that according to Richard Rogers «Buildings like birds that tease their feathers in winter, adapt themselves to new biological conditions and adjust their metabolism based on it. Thus, order of this sensitive form of designing establishes a successful relationship between the world of nature and the world of humans [3]. The history of sustainable architecture is more in Iran than the West and traditional architecture of Iran is one of the best sustainable architectures in the world. Traditional architecture of Iran presents particular interest in the proper and effective use of renewable energy in ancient times that in every climate these methods were different based on conditions of weather, culture and etc [4]. Discussion is a discussion that is also rooted in the past and is not a new discussion. Sustainability definition is found outside of the major global congress and includes not only building, but also includes all resources of the earth that should be encouraged. Sustainability is one of the admitted principles of architecture that should be considered in all architectural styles and in various times. Sustainable designing deals with creating durable and healthy spaces economically, socially and etc. The important principles of this design respect to natural systems. In this way, understanding ecological processes that their trace is clearly seen in vernacular architecture helps the process of sustainability [5].

Vernacular architecture

Vernacular architecture can be referred to any type of architecture that belongs to a specific location. This architecture can involve simple rural-urban buildings to large buildings and even historical monuments and wrongly, in the majority of cases vernacular architecture and rural architecture are considered as equivalent. One of the pioneers of the debate in the world is Amos Rapoport. He offers specific definition of vernacular architecture. Rapoport considers vernacular architecture as architecture that is placed against official, unknown and monumental architecture. In other words, it is simpler, popular and overall is architecture that is responsive to the needs of general public. He also argues that monumental architecture could have roots in the vernacular architecture. About half a century, vernacular architecture is a part of theoretical discussions and is part of empirical researches of architecture. At first this topic was called as the various names of unknown architecture, traditional architecture, public architecture, folk architecture and even as architecture without architect. Although this architecture has been changed by various phenomena, it can maintain its specific identity. Since ecology takes into account as a valid certificate of people of a country, it is representative of customs, moral and feelings, ideas and beliefs, verve and elegance, and their art. In the formation of vernacular architecture, some social and economic relationships in natural environment and cultural symbols are deftly reflected, so that at the same time, simplicity and arraying are manifested in them. Vernacular architecture that is realized far from specialties is responsible for responding to the needs of a community in relation to natural factors and spiritual aspirations of human beings, because by their participation is created in designing and implementing and draws inspiration from their daily life and it is established far from glaring and appearance-decorating. Therefore, vernacular architecture without having style and far from a specific model and form preserves improvisational characteristics. Accordingly, we find artifacts and vernacular architecture facing to unknown lands in a mysterious, familiar and understandable link [6].

Studying traditional methods to perceive sustainable strategies used in vernacular architecture should have a valuable contribution in researches which are fundamental and systematic and study the real performance of vernacular buildings and their technology and give us a proper understanding of how to update these methods for applying in today sustainable buildings. Developing this issue in the new buildings in order to evaluate how to use the past de-active techniques can lead to improve their performance, decrease energy consumption, decrease performing costs and adapting them to climate changes [7].

Principles of sustainable architecture

Table 1: Principles of sustainable architecture, Aminzadeh [2003]

1	Providing human needs without acquiring natural resources and facilities of posterities
2	Improving the quality of life and physical and mental well-being and social and economic justice
3	Making security and comforting in architectural spaces
4	Flexibility and adaption to the environmental conditions and changes in different seasons and different times
5	Rational use of land and accommodation of architecture form with the form of ground and the environment around it
6	Preventing air pollution and environment pollution and avoiding the use of pollutants
7	Using designing method in harmony with the environment and considering local patterns in designing and constructing
8	Reducing the consumption of non-renewable energy and sources and increasing use of renewable energies
9	Using materials and elements in harmony with the climate in order to reduce energy consumption and reduce pollution and recyclability of materials
10	Using the elements of nature and combining green spaces with residential spaces
11	The maximum use of light, heat, humidity, wind, natural ventilation and controlling them indoors

Preparing sustainability basis

1. The basic use of existing materials and local transportation means.
2. Use of the resources that there are sufficiently in order to general and basic demands in a way that does not lead to destruction of environment.
3. Independency on equipments that they are simply not available.
4. Use of skills that can be developed and educated effectively in society.
5. It can be achieved according to socio-economic and local-native context.
6. Creating valuable results.
7. Responding to the effects of local weather.
8. Having the flexibility to meet local needs and habits [8].

Sustainability with its main and contagious slogans that they are global and aim at preserving problem of the earth recommends local approaches to achieve realistic and workable solutions on the one hand and supporting the diversity is in nature on the other hand, and it considers the slogan “think, but act locally” [9].

Process of forming vernacular architecture

The first- the creation of architecture products spreads over particular temporal space that sometimes is renewed. It has starting point and the other point presents as a moment that design, developing and building actions are finished. It’s not only because any building starts to change sensibly after ending its construction, but also it’s because the real life of buildings start with human life within them and effectiveness of this life on the figure of building is essential that gradually leads to different transformations. This is more because presence of human in a building that is designed, developed and built for him, from the beginning of designing, developing until the end of construction is achieved virtually. The presence of human in building is impossible without his thought, interests and needs which are changeable during the rime. Involvement of buildings to people who dwell in them is proposed as a fundamental principle.

The second- combining and effecting by nature along with impressionability and with respecting to it in allcountry take into account as the first features of vernacular architecture that can be accepted by all people as a basic principle. This is a principle that because of its effective concept, whether in the world of applications and reasoning or in the world of supernatural relationships and divine ideations is enforced without it being written. From the simplest forms derived from the combination of stones together to boastful of water, plant, light and the sun in order to sanctify buildings and show them as a symbol of life of that world is evidence of ruling the principles in man-made spaces.

The third- the distance between need determining and need providing, distance between imagination and realization of a space that can have more adaption to it, distance between moment of thinking about the ground, building and the moment of acquiring areas and objects are main characteristics of vernacular architecture.

The forth- reflecting the interests of people who building optimize architecture in shape, corners, decorates and in proportion of made figures is an issue that is so much overbearing which is indicator of ethnic culture and takes into account with that personal culture simultaneously. If ethnic culture is considered as the first factor of forming units and architectural collections, personal interests and insights can be nothing except variables in the field of that culture and this is where we can present two

characteristics that are in contrast and complement with each other: the first characteristic gives the units and collection of architecture integrity; and the second characteristic is maker of overbearing for identity of buildings and collections owners. In other words, people culture with its different aspects effects directly on colors and sizes, on building techniques and manners of space ordering, on how people enter and move and replace in the building, on outer form of made space and on way of the natural space replacing.

The fifth- during the process of forming a building, set of visual features made by tasty and intellectual delicacies and born by local customs and representative of history and culture of native people makes both city and buildings as a symbolic way of public wealth. What we can add to this category is in relation to the identities of individuals that is measured in an organic community in the body of improvisational architecture and is subtly woven [10].

Secrets of vernacular architecture durability

Identity and nature

In a chaos world of today, identity is an elusive secret. Today identity is mentioned more as humanity identity, artistic identity, architecture identity ... all due to the fact that "identity" is missing and all attempt to find it! In fact, identity is a concept that connects a work to its origin, root and source (Bork hart, 2002). From the perspective of traditional human, man is a creature of God and the world that is placed in it is the creations of God. Then, the origin of man and the universe is from a supernatural source. Therefore, a man to achieve his identity should be close to his cognatethat is nature [11]. The presence of man in nature, near to God and his origin has some symptoms. Its symptoms are signs of nature. Thus, man and his appearance like art and architecture as be more natural, he is more close to its identity.

Unity and harmony

The purpose of art is human environment and the world (which is made by man) benefiting of order which is manifestation of divine unity in the most direct way. It bright and refines the art of world, helps the soul to release it from the disturbing plurality of matters and return to boundless unity [12]. The purpose of Burkhardt can be got in vernacular architecture by intelligence. In vernacular architecture, all houses (while they are not alike) are in a unit order and create a coordinate and coherent collection.

Beauty

Vernacular architecture is beautiful and pleasant, because its maker thinks beautifully. Beauty of vernacular architecture is not in artistic skills. It means it deliberately did not want to make itself beautiful, but its beauty origins from its knowledge of the universe and cosmic; because by following what has been created at first, what he makes as his perceive from the universe be more sublime, his man-made artifact is more beautiful. Thus, the secret of beauty of vernacular architecture is hidden in the ratio of knowledge of universe. In the same proportion, anyone with any point of view that faces to it, unconsciously forced to admire it, but all viewers are not aware of the reason for all this beauty. To understand this concept, deep insight is needed [13]. Purposeful use of color make an order that in the absence of it, confusion is ruled in the viewer's mind and perceiving colors in art and architecture indicates intelligent awareness of quality and quantity integration. One of the main sources of this integration should be nature [14].

Maximum features of vernacular architecture

One way of understanding vernacular architecture is familiarity by empirical way. Dr. Mansour Falamaki studied three inseparable perspectives to empirical recognition: Creating a building regardless of direct and passive effectiveness from the environment, considering a comprehensive cultural environment or learning environment around the architect and architect's attention to the set of economic, official and productive relations of vernacular architecture environment according to this every tradition depends on its social and economic conditions, this case is used to organize solutions of meeting needs of every region. They arise among the communities that consider principles and have self-made architecture. For example, by specifying the characteristics of different parts of each site and aligning elected using of any point of building with the features of each site and also, aligning the materials used in buildings proper to climatic conditions and maximum enjoying that in order to create optimum conditions for users to local building in every point of the world is a respond to the problems such as structural problems. This architectural process is transmitted from one generation to other.

In general, vernacular architecture is derived from environmental features in order to meeting human needs. This architecture is affected by economic, cultural and climatic conditions and was performed by native architects to meet the needs of local communities. Cultural and social diversity and deference in climatic zones effect directly on form and technologies of local architectural constructions. In general, vernacular architecture includes conditions and features of every environment in relation to natural factors or human spiritual demands. The relationship between human's environment and natural environment is considered as the main key of vernacular architecture. This architecture contains all the houses, spaces and buildings that are made for man and these buildings that are made by owners or established by the community depend on environmental basis and available resources and benefit from all traditional technologies. All forms of vernacular architecture was built for meeting identified needs, a certain qualities of life, economy and life styles of cultures made them [15].

Importance of understanding climatic features of vernacular architecture

Projects in the field of architecture that was proposed after advent of industrial revolution and achieving fossil fuel by man, they had and have the least adaption to climatic conditions. Although technological advances resulted from industrial revolution lead to decrease effects of many conflicts and were a covering on weakness of projects of architecture climate in the present era, integration of architectural projects in all cities with different climate can be seen especially in some countries like Iran in this era. But the risk of decreasing fossil fuel and limitation of its supplying in the middle of 20th century cause to tendency of industrialized countries to nature and enjoying its forces in order to improve conditions of life that among them, considering to the aspects of energy consumption in buildings by the countries causes to invent types of climatic designing techniques. Of course without regard to vernacular architecture and enjoying its patterns, it was not possible.

Using the climatic techniques presented by experts of industrial countries without considering vernacular architecture does not have necessary efficiency. In addition, the experience of residence in Iran and brilliant history in the field of architecture consider necessary the attention to climatic techniques of vernacular architecture and using that with the modern method. In other words, the main identity of architecture is responding to the needs of man in place that has been developed by increasing experience of human during the history [16].

Principles of sustainable architecture in contrast to the native formed factors

The first principle: energy conservation

Every building should be designed and constructed so that its need to fossil fuel reduces to minimize.

The second principle: working with the climate

Buildings should be designed so that the use of climate and local energy sources can be possible.

Form and way of building placement and location of its interior spaces can be in a way so that cause to increase convenience level inside the building and at the same time cause to decrease fossil fuel consumption through the proper insulation of structures.

The third principle: reducing the use of new sources

Every building should be designed so that it can be minimize using new sources and create a source for making other structures at the end of its life.

The forth principle: respect to the users

Sustainable architecture respects to all people who use the building.

Form, plan, access, and ... should be formed all based on users' need and the way of users' usage and the maximum performance and flexibility can be seen in structure.

The fifth principle: respect to site

Each building should touch the ground in a quiet and light way. Forming textures along the ground, optimal use of natural resources and in general, a texture like the shape of environment can introduce the building as a part of nature.

The sixth principle: Holism

All sustainability principles need to participate in the holism process for building artificial surroundings [17].

The use of principles of vernacular architecture in line with the sustainable architecture

Although it is accepted that form, whether natural or social phenomena, belongs to the outside world and it has specific features or unique energy that can change anything into something else and if it is again accepted that man responded to his needs in providing made spaces by using forms, facilities and environmental limitations in the form of usages, in that case, it could be argued that vernacular architecture is applied at any point in history with considering the comprehensive physical and non-physical concepts (Roboubi, 2005). Reproducible values of vernacular architecture in each fields considered in sustainable architecture is as follows:

Social and cultural aspects

1. People enclosing: vernacular architecture has sensitive behavior in relation to the culture of community members; including inwardness that considering the needs of users is from the perspective of his need to privacy and security.
2. Compatibility: compatibility with building residents because of flexibility



Fig. 1: Human fitness proper to the building

3. Making nature meaningful in architecture that causes to create culture of proper consumption and contentment.
4. Retrospection (changing bad habits): avoiding unnecessary things which lower efficiency. Ability and our willingness to change our mind may can solve some problems, even more than finding a certain solution for a problem.

Environmental aspects

1. Considering semantic properties of nature are made that causes to make sense of respect to nature, contentment and making meaningful.
2. Considering physical properties of nature and climatic designing and compatibility with the surrounding environment.
3. Self-sufficiency of using local materials: using safe materials, healthy and local, existing technology, responding and possibility of performances that are arranged results in today constructional activities. The focused energy and some consequences such as concepts of sustainability, maintainability, serviceability and simplicity are considered.



Fig. 2: Using local materials

1. Avoiding from the futility of contentment that causes to saving consumption of resources and consequently, causes to reduce costs.
2. Flexibility of building that leads to increase its life, thus, it decreases the need to create new spaces and destroy useless spaces.
3. The need to build strong buildings that decreases costs of fixing and maintaining. Features that are mentioned can be considered as the reproducible values of vernacular architecture in the process of sustainable architecture in order to today construction (18).



Fig. 3: Application of the calculations for design

CONCLUSION

Sustainable architecture does not include preset and certain patterns that it can be repeated; but it is dynamic architecture and should be compatible and harmony with nature and climatic features of every region and what make our country's vernacular architecture lasting and unique is considering these features. In other words, sustainable architecture has various dimensions that considering all its dimensions is essential. Vernacular architecture is applied at any point in the history. Although vernacular architecture has been changed by different phenomenon throughout history, it could preserve to its specific identity and since it takes into account as a valid birth certificate of people of a country, it indicates their customs, spirit and emotions, thought and idea, interest, taste and art. What is mentioned as local values in sustainable architecture, because of its responding to climate, culture, society and generally sensitivity to its surrounding environment is more valuable in different dimensions. By relying on the correct, rational method in understanding national culture and back to ourselves, we can study and analyze accurately barriers to the creation of vernacular architecture through active thinking. They can be solved by considering sustainable architecture as a process and considering local grounds of its forming. Principles of local and traditional designing can be consistent and harmony with each other based on residents' needs in every region and sustainable development in construction, urban and locality designing. It can also provide a way to achieve sustainability by taking advantage of local sustainability. The key of sustainable future is in the use of low-energy systems of constructions and considering ecological and environmental necessities.

CONFLICT OF INTEREST

There is no conflict of interest

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