

## **The Interaction among Vernacular Architecture, Nature & Contemporary Lifestyle (Case Study: Abyaneh, Iran)**

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**Abstract:** One of the perennial debates in architecture that has had influenced on theoretical and practical architecture design, is its relationship with nature. The relationship between architecture and nature fosters creativity, and depicts the framework of architectural design. This relationship is sometimes expressed in the form of respect for nature, and sometimes openly violatenature. Aside from the relation between architecture and nature, one of the important approach in design in architecture and in other sciences, is how to interact with the nature. Today, the interaction with nature is important. Nowadays, the architecture considered as part of the nature that surrounds with and harmony with the environment is one of its main goals, and perhaps the most important goal. It is worth noting that many of the buildings and urban spaces in the central plateau of Iran are very good model for how to interact and adapt to harsh environmental conditions and over time by minimum facilities have been able to provide the best comfort for humans, such as Kashan, Meibod, Ardekan, Meymand, Ardestan and many other central cities of Iran. Abyaneh village, that is one of the significant villages in the Central Plateau of Iran, in addition to these properties, is a special place in terms of its monuments, tourist location, natural resources (colorful soils) and its particular customs, which doubles its significance. Due to these reason Abyaneh is chosen as the project site, from all the options, in this study. Abyaneh, is a village of natanz city, in Isfahan province. The village is in 40 kilometers northwest of Natanz, in the Karkas Mountain and is one of the highest residential areas in Iran. The village is 2222 meters above sea level and due to its validity of vernacular architecture and its monumental buildings, is one of the famous villages in Iran. Abyaneh with temperate climates has a favorable natural location. According to what is said, the interaction with Abyaneh nature has been selected for this research. Abyaneh is chosen because it's one of the architectural masterpieces of the land in the desert. In this regard, the study of the literature of the research and achieve knowledge of Abyaneh architecture is essential. Moreover, study of nature, history and the present of architecture in the form of theoretical and conceptual models with a typical architectural design (design of residential buildings), based on models derived from nature, could be useful.

**Keywords:** architecture, Abyaneh, nature.

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### **INTRODUCTION**

As we know, in the past, the most important factor in the formation of places was the interaction with nature and achieve a balanced life conditions for survival. From long time ago like the caveman era and after that people have created spaces in compatibility with the environment and tried to improve that, and sometimes have created a hearty spaces such as Shazdeh Garden in Mahan. In this way, nature can be the best and most complete design patterns, because every phenomenon in nature is the result of the sum of all environmental factors, which regularly is compatible with them. On this basis, having a complete reference that introduce the proper way to interact with nature could be useful to architects. This introduction could

offer ideas and approaches in design as well as, provide contexts for the theory issues.

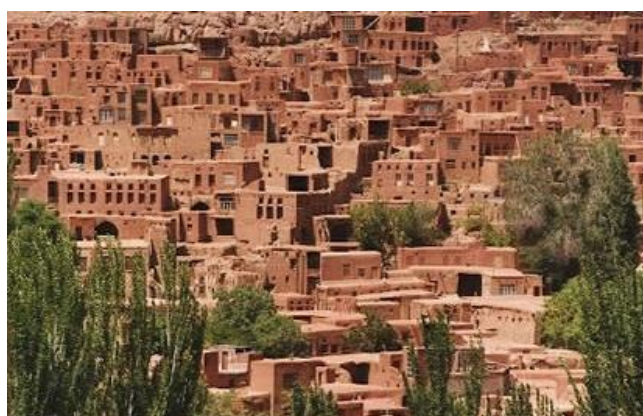
The idea of Architectural design in adaptation with the climate, is not a new idea. Throughout the history, human beings have always sought to create the conditions for their own welfare. So during the periods they have faced with numerous solutions for their works by their own creativity and experience. In the natural world, there are different climates (and different classifications, each of which are based on the different bases) that show climatic variability in different parts of the world, either the cold or the warm climates have some advantages and disadvantages. In this way, creative people have made the relationship between the

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natural environment and their living places to find out a reasonable solution to face with these climatic disadvantages and to make full use of advantages.

Using energies in each area helps architects, and the process to use them has been more developed throughout the history. But with the emergence of the industrial revolution in the industrial societies, the form of life styles progress increasingly, so the use of natural energies has been quickly replaced by the use of fossil fuel. Ease of the use and the availability of the new energies in the modern cities, accelerated this process.

But the negative effects of these fuels, including air pollutions, have emerged gradually as a fundamental problem, and on the other hand, due to being non-renewable, made the experts to think for new choices. So the process of saving and precise control of energy consumption in buildings taken into attention as one of the essential issue in design of buildings that are compatible with the nature. It should be noted that what is now considered as a developed method, is the result of past achievements and is extremely dependent on the new innovations[1].



**Fig- 1: wide perspeh of Abyaneh**

This means that current knowledge is achieved from past experiences and achievements but we use advanced methods (in terms of design and manufacturing process) and build with the most efficient construction materials. Essay is to investigate the importance of climatic conditions in the design and construction of buildings in Abyaneh. Climatic conditions and their characteristics affect the formation of the building that are important from two sides: On the one hand, climatic building design, gives better quality to human thermal comfort; variation of daily and seasonal changes in light, temperature and air flow in the buildings create pleasant and varied spaces in the building. On the other hand, harmony with the climate, saves energy consumption of these buildings to control environmental conditions.

Various types of buildings, depending on the scale, performance, and usage, as well as the economic possibilities of the buildings, influenced by the climatic conditions differently. Small buildings, are more influenced by the climatic conditions. Buildings with a simple function that their form are less dependent on their internal functions are found more dependent on the climatic conditions. Abyaneh village has very special climatic conditions, without taking attention to the climatic solutions, utilization of mechanical utilities in the interiors would be necessary in most of the year. So by taking advantage of the climatic condition and reasonable cost, we can provide optimal conditions.



**Fig-2: main view of Abyaneh**

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## THE IMPORTANCE OF RESEARCH

Designers and architects are always looking for projects that can create an environment that are more suitable for humans. People today, despite of numerous advances, live in the buildings with the least spirit of living and flexibility, because of that the importance of creating suitable environment is emerging increasingly. Spaces that is no longer meet his physical and mental needs. Thousands of the years before the 19th century, humans have lived alongside the nature and have less damaged the nature but after that (industrial revolution) humans have damaged the nature badly that its effects have ruined the environment and the planet.

In addition, issues such as the environment, energy saving, avoid of using too much non-processing industries, recycling of waste and etc. that the human society today is dealing with, shows the necessity of such research further. The nature comprise the critical characteristics that we are looking for, such as: compatibility, optimization, effectiveness, economy, diversity, etc., then, studying of these endless resources can be so efficient for the architects.

According to the design and construction of the buildings that are not in harmony with the environment today, is to architects to seek proper design solutions that are capable to create consistent, safe and beautiful buildings; Buildings that are part of the nature. To achieve this goal, smartest way is to speculate on the nature and get inspired of its techniques, laws and endless beauties. Necessity of getting ideas from nature in one side, and lack of proper modeling of the nature by contemporary architects, (they just looking for formal and abstract manner, regardless of the geometry of the nature and its forces), in other side, the importance of this research reveal more vividly.



**Fig-3: building in abyaneh**

## HOW TO INTERACT BETWEEN MAN, NATURE AND ARCHITECTURE

In order to achieve accurate imitation of nature in architecture, understanding of human attitudes towards nature and also understanding of the nature and variety of the patterns and modeling, moreover, nature

## HISTORY OF RESEARCH

In the field of architecture in harmony with nature or nature-oriented architecture, extensive and comprehensive studies have been done. In this context, books, theses, reports and research are diverse. Researches have been done on the subject of imitation of nature in architecture can be divided into three branches. These researches were conducted with different goals and led to different results. Generally, about imitating nature, scientists, and their results are divided into three categories: The first category are theorists that have done the analogy between architectural forms and natural specimens. "Paolo Portoguy" in the book of "Nature and Architecture" and "George Hersey" in the book of "eternal motives" have done these analogies.

Second category are the theorists that widely studied architecture and nature, not merely natural patterns. Attention to the local architecture, non-destructive construction and development of the nature and the interaction between architecture and nature are concerned by this group." Aldo van Eyck "and" Maurice Smith ", believe that the best architecture is the one with all the environmental features which have arisen from, including the culture of the land. They also refer to myths, cultures, technologies, etc.

The third researchers are like "Bruno Zevi", "Peter Collins" and "Philip Steadman" that worked on the analogies between nature and architecture or biological analogies in architecture. "Philip Steadman " studied more comprehensive than others to the topic. Despite of that, his main focus is on the biological roots of modern architecture[2].

of different intellectual attitudes towards nature and monuments based on imitating of nature are essential. This section is paid to the relationship between man and nature in different school thoughts, historical patterns in the face of nature, explaining the characteristics of natural systems and similar issues.

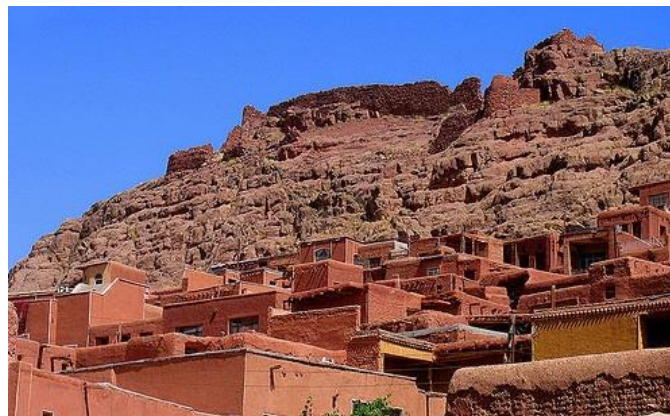
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Climatic design is not a new issue that we are trying to find innovative and far-fetched ways for it, but it is something that has been used in the past. For this purpose, climate-control methods should be used for providing human comfort in the environment and minimizing the effect of annoying conditions that these conditions are different in summer and winter.

In the winter the use of radiation and keep the heat inside and in the summer reducing the radiation and the use of wind flow in ventilation and cooling of

the interior are important which in various ways will be discussed in this context[3].

In contemporary architecture, climatic changes and sustainability criteria become more important every day. Speaking of sustainability in architectural design and construction, interpreted by imagination of the future, not only with physical stability of the building, but also with the stability and preservation of the planet and its energy resources. Thus, this seems to be a model of sustainability based on the idea that the materials and resources that are available be used more efficiently than before.



**Fig- 4: red color of Abyaneh context**

#### **The relationship between man, nature and architecture schools of thought**

To understand the relationship between buildings and the environment, the human point of view to the environment and the nature should be cleared. Construction is based on the interference to the nature. The sort of interference is dependent to the human thinking about nature.

In many Eastern cultures, there are a close relationship between nature and human. This relationship continues to be seen in the East. Eastern human have been as part of the nature and in a very close relation with nature.

The relationship between human and nature was existed in the West, but Christian worldview, then changed this relationship and attitude. Its dual relationship was changed through Christian thoughts into a triangular relationship. According to this thinking, God has created nature and man should also use it. While at Western Trinity, a series of bilateral relations were created, God- nature, human-nature, object - subject, body - spirit etc. that each of these relationships was generated by eliminating one of the Trinity axes [4].

#### **The history of the relationship of human with the nature**

Throughout history mankind has tried to expand its domination over nature and the progress achieved in this regard. But to understand the spiritual aspects of nature, not only was no significant progress, but has also decreased. Altogether, the relationship with nature can be divided into four historical periods. The paradigm of organic nature (hunting period or Stone Age): In this era he was dominated by the nature and the nature dominated on all aspects of life. Humans were to meet their needs, the needs of the security and survival.

The paradigm of over-organic: human expectation level of security was reached to comfort. Human was not able to tolerate adversity and tried to coordinate his nature or himself to the nature. (Aligning their nature and to the benefit of both).

This period is divided into the two period (Mobile life) and agriculture (inhabitants).

The paradigm of mastery over nature (the industrial revolution): In this period human expectation was gone beyond the comfort and security, seeking to well-being and pleasure. Man seeks to maximize the exploitation of the nature for his benefits and set the ground for the damage to the nature.

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The paradigm of organic semi-industrial nature: the motivation of wellbeing is existed during this period. But the understanding of environmental damages is higher than before. World population are trying to adapt industry to the nature [5].

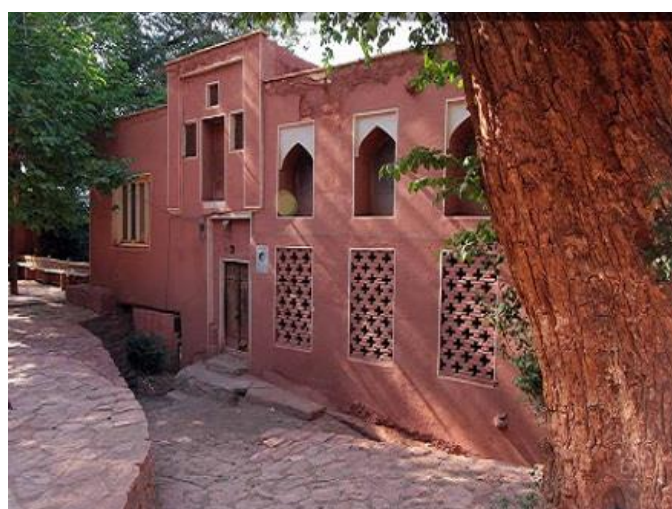
Although new styles and approaches are emerged to adapt architecture to the nature and the early architecture is trying to use natural patterns, but natural tendency is just formal and led to the emergence of virtual nature. This period may be called as the mechanical, apparent and formal ages [5].

As long as our philosophical perspectives on the nature is not corrected and we do not consider

supernatural and metaphysical dimension of it, it is not possible to save the population at present time and the efforts in this field will not be found to be satisfactory [6].

In fact, organic architectural features are the most important principles governing the natural organisms, which are valuable agents and stabilizers.

In this architecture, attention to the man is only in his natural aspect and human was considered as a part of the nature and his architecture is in a higher stage of architecture of other animals and shape according to his biological evolution [5].



**Fig-5: texture of building in Abyaneh**

From the perspective of a holy attitude, because the existence of human being and the nature is not limited to their physical organism, but more important layer, a deeper and more hidden at the same time can be seen in human and nature. In fact, the distinction of the man from natural organisms is for understanding their nature and nature's meta-layer [5].

Thus, the field of architecture can be classified in the following three layers:

- Non- organic: emphasis on overcoming nature and ignoring its principles (mechanical and machine architecture)

- Organic: emphasis on naturalism and the principles of nature.
- Beyond organic: the preservation of nature and the principles of nature, facing it and to restore supernatural layers in man [5].

Analysts and researchers in the field of architecture, describe previous architecture from organic and beyond-organic view, but often do not provide accurate and complete classification and definition. On this basis, some features and organic and beyond-organic principles that flow in nature, man and architecture are introduced, as follows:

**Table 1: Characteristics of four encounters with nature**

Nature 4	Nature 3	Nature 2		Nature 1	
Formal Nature-oriented with industry	Domination of nature	Beyond-organic		Organic (Naturalist)	The system
		Agriculture	Animal husbandry		
Industry critics	Industrial, disposable, Swinger	functional	functional	Wild	Relationship with nature
Domination with friendship	domination	Training	hunting	hunting	Relationship with plants
Domination with friendship	domination	Training	Training	hunting	Relationship with Animals
Hegemonic, inevitably apparent harmony with nature	Hegemonic, powerful and against nature	Adapt the nature while respecting its principles		Part of the system of nature	The definition of man
Secular and godless	Secular and godless	abstract definition of God		Natural goddess with iconic figures of animals	The definition of God
well-controlled prosperity	prosperity	Comfort		Security,	The need
Industry combined with natural forms	The invention rather than discovery	Iconic	Based on the needs of mobile life	Live dance exercises and games, but not with the intention of hedonic	Art Features
The apparent idea of nature in architecture	Mass production of urban buildings and disregard for nature	stable and building harmony with the climate	light and with animal materials (animated)	A cozy place	Architectural features
The second half of the twentieth century	Since the beginning of the industrial revolution	About 8000 years ago	About 10,000 years ago	Stone Age man	Time period

**THE ROLE OF NATURAL PATTERNS IN THE FORMATION OF CONTEMPORARY ARCHITECTURE**

Increasing advances in the areas of the growth of practical expertise on the one hand and in understanding the wonders of nature on the other hand, opened new perspectives in front of us. These views also show the subtleties and mysteries of the great machine creation, and are illustrators of numerous successes in sustaining human civilization [7]. Imitation of nature can have distinct advantages. It can be assumed that every organism present the two thousand million years of evolution. Evolution in nature has made mechanisms that can be used as prototypes. What is

good for the live system should be good with the same size and similar grade for the synthetic systems. In emulation of nature, the main problem is not to use one hundred percent of natural model details, but it is important to recognize applied principles of natural processes [8].

The last decades of the twentieth century, was about fundamental changes in human thought and his view of the world. In The modern attitude, world is organic and space, time and matter are changing, associated with each other and have non-linear connections. Experts and scientists to understand and explain the world, do not cite only classical science and

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mathematical certainty of the worldview. Today, issues such as uncertainty, chaos, fractal and non-Euclidean geometry, complexity theory and nonlinear physics,

deliver a different world than ever before in front of the people. [8].



**Fig-6: nature of Abyaneh**

Nowadays move towards ecology by saving energy is increased. Robotics and new materials and advanced technology make it possible to create the curve forms simpler and cheaper as well as the right forms. Ecology and trends that move towards the creation of curve forms, and organic shapes are the movements that gradually change from high-tech to organic -tech [9].

Man can answer many questions, through experience, experimentation and creation to find a new assumptions. But perhaps nature is the best source for finding these answers. Nature has all the answers and the people can learn how to get answer from nature. This issue is true in design and construction of buildings and urban spaces and Engineering Sciences.

#### **CONCLUSION:**

Type of man's confrontation with nature, is very close to his way of thinking about nature. In many Eastern cultures, there is a close relationship between nature and man. The relationship between man and nature in the West due to worldview of Christianity, changed to the triangular relationship. In dealing with the world of nature, we face to different systems on earth. In the course of its development, these systems have their own levels 1-static 2- dynamic 3- cybernetic 4- protozoa 5- plant 6- animal 7- human 8- society

Throughout history mankind has tried to expand its domination over nature and the progress achieved in this regard. But to understand the spiritual aspects of nature, not only have made significant progress but also has decreased.

The most important geometric patterns in all four categories of creatures including (human - animal - plant - inanimate), is the combination of irregular and

geometry. Secret of different geometry of structures and systems is in their different members' behaves and functions that give the effects and special features to its members. Intrinsic geometry is the fixed principles and unchangeability. The habitual patterns geometry of nature, which are interpreted as the natural geometry or "sacred geometry" and the free geometry, resulting from external forces (physical and conceptual) in environment that is formed to meet environmental needs. Understanding the geometry of nature, as a chaotically geometry, is misunderstanding of nature.

The balance between man and nature in the Islamic civilization is known to be very direct form of human Location. One of the main arguments in Planning and Architecture is a man-made landscape and nature are in harmony. Towns and villages of the world of Islam, like other traditional civilizations, long before has been met this goal.

In order to promote environmental sustainability, the building is designed to meet three principles, human design, saving resources, and design cycle based on holistic manner in the design, construction, operation, and maintenance, recycling and reuse of resources. These principles form the conceptual framework for sustainable design in architecture. Such a framework, Instead of putting a set of ready-made solutions, helps designers to find suitable solutions. In fact, specific solutions to the problem of the design and implementation are derived from these principles.

Finally, we can say that interaction with nature and the natural patterns and achieve a harmonic architecture have led us to a more stable architecture and can better meet the needs of individual people and the environment.

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Characteristics of organic architecture, in fact, the most important principles governing the natural organisms that are valuable secret agents and stabilizers.

In "imitating from nature in architecture", further stated that the most corrected and appropriate manner is to use the process of formation and use of the rules governing natural systems in architecture.

Because natural systems have the common rules and principles and depending on external factors, their shape, form and characteristics found different; in the pattern of the desert, nature of the rules and principles fixed in natural systems identified then according to physical factors (climate, geographical factors, etc.) and contextual factors (culture, tradition, ...) the patterns got shaped. In terms of imitating of nature, important point is that the natural structures lack the moral and spiritual dimensions, but due to metaphysical and supernatural human needs, they shape the most important dimension of life and therefore his architectural forms.

In other words, in emulation of nature, the rules and principles can only be used and for humanitarian architecture it must follow the principles of beyond-nature and pursue creation of beyond-organic. Death and Immortality (based on time) is evident in the works of man, what is not existed in the natural system. Iranian desert architecture are full of architectural masterpieces that are in full harmony and coexistence with nature. The built environment went beyond the principles and laws of nature created spaces that fulfilled psychological and metaphysical dimensions of the man in the best way.

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