

Full Length Research Paper

Concepts of permanency in Persian domiciles of Muslims and Zoroastrians

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Accepted 22 November, 2011

One of the most crucial and important subjects in Persian architecture is permanency of traditional domiciles. The goal of creators was to obtain the best building that met the needs of the time. Also, permanency is conditions and characteristics which determine the permanent structure of a building through the years. Environmental sustainability mostly emphasizes less consumption of fossil fuels, energy waste on environment, producing harmful substances for human health and using more renewable resources; therefore, first, we discuss sustainability features and proposition of desert and then we move to the deliberate architectural situation and city planning based on the aforementioned items. This research aimed at finding out whether culture and religion act as an important factor in the shaping and permanency of domiciles or climate? According to the functional parameters on domicile transformation of town textures, climatic circumstances in traditional methods have been especially important and considerable. Studies have shown that almost all of the aforementioned factors are affected by climatic conditions and are parameters that make buildings permanent. In addition, considering and reviewing the old constructions in which utilizing fossil and non renewable energies were not customary, can be useful in providing much valuable resolutions in effective utilization of pure energies.

Key words: Zoroastrians, sustainable development, permanent concepts, sustainability.

INTRODUCTION

The history of architecture is commonly viewed as an analysis of its artefacts. Seldom is the history of architecture and building viewed as a history of the way in which people have used buildings (Ballantyne, 2004). In Asian developing countries, some factors are responsible for the risks to cultural heritage (especially residential domiciles). The most important are Natural causes, Economic causes, Social causes and Institutional weaknesses (Hejazi, 2008). One of the most significant current discussions in studying traditional and historical domiciles is their permanency. There is a romantic view that vernacular buildings offer a path to the development of sustainable architecture. Vernacular architecture does make the use of local materials but such buildings will survive only if they are well maintained (Ballantyne, 2004). Persian architecture as culture of

society has internal manner, acceptable nature, inspire attachment, continuity component, stable integration and well grained with function. Most of the studies in the field of studying traditional domiciles focused on sustainability, but it is so important to know and find the most important factors that made those buildings permanent through out the years. Therefore, we should view the past architecture of such countries openly, learn of them and utilize thought backgrounds in architecture and our new building techniques.

Keywords' definitions

Sustainability

Adjective "sustainable" is used in state and condition description that supported or has always sustained by living provision. The meaning of this word that we consider in discussion is: "what can be survived in future."

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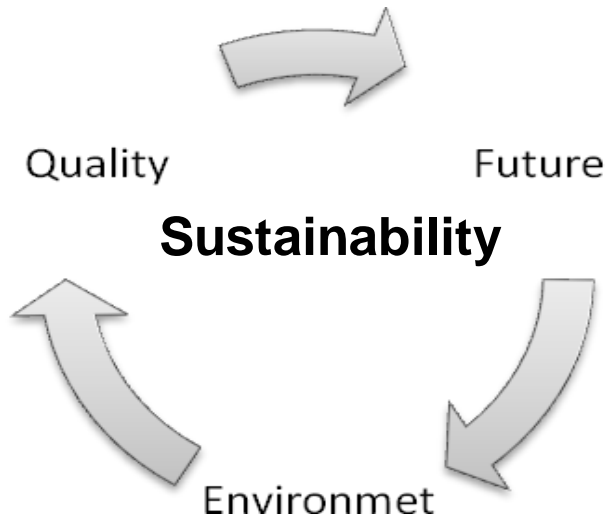


Figure 1. Components of sustainability.

Sustainable development

There is no agreement on definition. However, the most functional definition can be stated as: a kind of progress that does not decrease the next generation ability to supply their needs without elimination of recent society requirements. This process includes the following rules:

- 1) Decreasing use of non renewable resources.
- 2) Expansion (development) of natural environment.
- 3) Elimination or reduction consuming toxic substances or destruction on nature at building industry.

Permanent concepts

Those concepts are at one hand, sustainable (with climatic approach) and at the other hand, have cultural, social and mental continuity, existence and persistence.

Zoroastrians

Followers of Zoroaster (Persian Prophet who started to conduct people in ancient Iran to God worship, truth and..., also show them the norm of existence 3748 years ago).

MATERIALS AND METHODS

Human beings, in all parts of the world and in all types of society, seek shelter—a building, a tent, or some other structures that keep us safe and comfortable (Knowles, 2006). It has been said, 'in Persia old houses are bad houses, and that 'houses that are not totally new are always more or less tumble-down'; but it is plainly

somewhat exaggerated. The traditional materials of domestic architecture, mud-brick and wood deteriorate quickly without good maintenance; but if houses built with these materials together with well-cared-for, they can last for centuries (Boyce, 1960). Permanent architecture, as architecture with special characteristics has lasted through years and centuries and also, has had healthy and perfect relationship with ecology and especially humankind. Successful planning requires the circumstances of the locality, its centers of life, the needs of general vitality, and the number, habits and customs of the population should be studied (Miles, 2008). At the moment, permanency is one of the most significant cases in this field and will be so useful in future architectures, because concepts which have been permanent through years, have those traits that should be analyzed and used. Also, with studying affections of factors, knowing the main factor and then analyze its parts will be possible. It is clear that every building must communicate with surrounding natural environment. The type and quality of this communication is arguable. When the term "environment" is used in architecture, it refers generally to the surrounding landscape and context of the buildings. In both legal and professional architectural practice, "environment" may refer narrowly to health concerns such as indoor air quality, or broadly to the ecological impacts that building may have on regional air and water quality and ultimately on global climate (Piotrowski, 2001). To do this research with more accuracy, two societies with similar climate but different religions and cultures were studied to find the dominant influence. To find the answer, both qualitative and quantitative methods were used in this investigation.

According to the same climate of most countries of Middle East and a broad part of the world, the results would be useful in improving condition, characteristics and structure of cities and domiciles in suchlike regions.

RESULTS

In constructing suitable and sustainable human environment, Iran desert architecture attained methods and principles that not only impose damage and destruction on environment, but also give more perfection to material. Fundamental condition to achieve environmental and economical disciplines is establishing dynamic equilibrium between different environmental systems. The main purpose of these principles and also sustainable architecture is providing comfort (physical) and peace (mental) and consider several essential points (Figure 1): this research showed that climate is the most important factor in morphology of residential buildings; and also, climatic approach with some secondary affective factors (like culture, religion and...) makes buildings permanent through years.

DISCUSSION

Each community has its own present aspect, the product of the past that has created it. To understand its present, we must understand its history (Knowles, 2006). "Our culture has adopted a design stratagem which essentially says that if brute force or massive amounts of energy does not work, you are not using enough of it," says the architect William McDonough, among the best known practitioners of sustainable architecture (Stang, 2005).

Table 1. Detailed analysis of domiciles in Ardakan.

Factor	Similar	Different	Bungled
Space	23	6	5
Sanctum	25	3	6
Energy	29	2	3
Material	33	0	1
Structure	32	1	1
Plants	25	1	8
Orientation	34	0	0
Color	29	1	4
Total (average)	28.7	1.8	3.5
Percent	84.4	5.3	10.3

Table 2. Detailed analysis of domiciles in Kerman.

Factor	Similar	Different	Bungled
Space	43	3	3
Sanctum	40	5	4
Energy	46	1	2
Material	45	1	3
Structure	46	0	3
Plants	41	4	4
Orientation	47	1	1
Color	42	1	6
Total (average)	43.7	2.0	3.3
Percent	89.2	4.1	6.7

Architecture art has had old precedent in Iran towns and countryside until previous century. Accordingly, sustainable architecture is based on sustainable environment approach using sensitive architecture to environment. It is necessary to address constant design principles here:

- i) Bioclimatic design.
- ii) Indoor air quality.
- iii) Recognize site.
- iv) Communicate with nature.
- v) Recognize humankind.
- vi) Pollution mitigation.
- vii) Recognize natural processes.

The main purpose of these principles and also sustainable architecture is providing comfort (physical) and peace (mental) and consider several essential points: the definition of 'the healthy built environment' incorporates both of the urban environment outdoors and the indoor surroundings (Soflaie, 2003). The fields which should be noticed in designing suitable buildings for humankind are listed as part of this notion:

- 1) The quality of indoor air.

- 2) Thermal comfort.
- 3) Acoustic comfort.
- 4) Visual comfort.
- 5) Functional comfort (Kunstz, 2003).

In this stage, 132 houses in arid and semi arid zones of Iran became selected and were studied at field and also library research, as: 64 houses with Muslim owners (16 houses in Ardakan, 24 in Kerman and 24 in Yazd) and also, 68 houses of Zoroastrians (18 Houses in Ardakan, 25 in Kerman and 25 in Yazd). The primary data are collected through several field surveys. The researches locations are cities which still have traditional houses. In recognition and analysis of residential architecture in this climate, numerous factors are effective such as: variation of spaces, variation of human activities, sequence, synthesis and flexibility of spaces, different values of spaces, different life levels, elements of architecture. These factors in afore-mentioned buildings are studied and according to the type of residents' thoughts in this climate and kind of their relationship with buildings, effective and basic concepts of design in these regions are as follows (Tables 1 to 4: about 87% (115 of 132 houses) of those domiciles had special and similar characteristics, such as form, direction (according to local

Table 3. Detailed analysis of domiciles in Yazd.

Factor	Similar	Different	Bungled
Space	40	4	5
Sanctum	38	6	5
Energy	48	0	1
Material	47	1	1
Structure	47	1	1
Plants	34	10	5
Orientation	49	0	0
Color	38	5	6
Total (average)	42.6	3.4	3.0
Percent	86.9	6.9	6.1

Table 4. Detailed analysis of all domiciles.

Factor	Similar	Different	Bungled
Space	106	13	13
Sanctum	103	14	15
Energy	123	3	6
Material	125	2	5
Structure	125	2	5
Plants	100	15	17
Orientation	130	1	1
Color	109	7	16
Total (average)	115.1	7.1	9.8
Percent	87.2	5.4	7.4

conditions), materials, lightening method, circulation, color and ..., in spite of different religions, because of similar climate; and also, they had variable space organization in some secondary (not main) spaces. Aforesaid factors at one hand, have affection on axis of buildings' orientation, space types, establishment of spaces and space components, and at the other hand, are affected by cultural, social and ritual concepts. It is important to be noticed that, these cultural and ritual concepts are generally shown on components and have no noticeable affection on whole structure of domiciles. In this stage of research, it became clear that climate is the most significant and effective element in shaping, morphology and organization of buildings, countryside and town textures; but it is more important to notice that, culture and religion can affect social communications and quality of thinking of society members. Now it is crucial to notice properties of arid zone vernacular architecture of Iran:

Spatial structure of domicile

The main measure of Persian native architecture is interior consideration. This kind of architecture has enclosed courtyard and rooms located in every side, as

an example, in this climate the plan shape should be compact thus, less sides encounter sunlight.

Sunlight and air flow effect

In hot and dry climate as Kerman that has severe sand wind and hot summer, cold winter, consistency with nature and environmental conditions becomes essential, a ventilation-staff (Badgir or windward) at corner of domicile built in order to ventilate interior space and courtyard commonly is orchard. Families living in traditional courtyard houses of arid zone, without mechanical ventilation or heating, migrate by day and season for comfort. In September or October, they move around the courtyard to rooms facing south. In April or May they shift to the north-facing rooms. In summer there is a daily vertical migration, "the afternoon siesta being spent at the lowest levels and the nighttime sleep traditionally being taken on the roof under the stars" (Knowles, 2006).

Materials

They have special function in every climatic condition,

Table 5. Simple but effective resolutions to control temperature in arid zone.

Control methods in winter	Control methods in summer
Decrease heat movement flow	Decrease heat movement flow
Decrease outside airflow	Use of land coolness
Decrease air penetration	Decrease heat penetration
Use of sun heat	Decrease sun heat absorption

while at a considered hot and dry climate, the material kind effects more on habitant comfort. It should be noticed that, Local climate affects the indoor thermal environment very much in domiciles. So, appropriate air movement through the building is necessary to decrease indoor discomfort due to overheating conditions. (Rajapaksha, 2002). The selected materials in this climate must be more heat-resistant and have high thermal capacity. Besides we should consider the following points:

- 1) Utilizing and not displeasing impact of discarding materials.
- 2) Easy transport and having no pollution for environment.
- 3) Thickness of made septum.
- 4) Color of construction and septum.

Another possible explanation for this is 'thermal control methods' in domiciles of arid zone (Zhang, 2005) (Table 5): accordingly, it is essential to scan general characteristics of civic and countryside texture in this region, also some used resolutions in base of regional climate and without using fossil energies:

- 1) Continuity and integration of traditional constructions, also narrow and nonintegrated alleys with long walls surround them.
- 2) Roofed pathways.
- 3) Surrounded spaces of houses which have enclosed yard.
- 4) Correct use of sunlight.
- 5) Implemented right details in this region vernacular architecture (such as long shelters).
- 6) Using brick and soil as insulator.
- 7) Using arch and domes (because at first, their coves and spherical shape is perfect, suitable in emitting thermal radiation and they easily become cool during night and second, half of dome is at the shade of the other side during day, early morning and afternoon and play an important role in decreasing roof temperature. Also, because of its shape, dome encounters wind blowing and therefore, heat radiation has less affect on it).
- 8) Building very high roofs.
- 9) Two layer roofs.

Conclusion

Most studies in the field of traditional domiciles survey

have only focused on sustainability and also Muslims domiciles; but it is so essential to compare domiciles of different societies with various religions in the same climate to find out what the most important factor in shaping domiciles and permanency of them is. The purpose of the current study was to determine permanency and the main factors which make vernacular buildings permanent. It is so significant to know permanency as the most important parameter in morphology of vernacular domiciles and also, cities in arid zone. Returning to the question posed at the beginning of this study, it is now possible to state that climate is the most significant factor that shapes domiciles and affects culture of habitants. Knowing the concepts and parameters that make domiciles permanent can improve our cities and buildings structure and also, it will be possible to build suitable domiciles for posterity. In spite of different 'religions and cultures', Iranian people have known climatic characteristics and also, climate has been the most important part in the morphology of domiciles. However, more research on this topic needs to be undertaken before the association between climate and permanency is more clearly understood. Future research should be done to codify permanent concepts of domiciles of Muslims and Zoroastrians in arid zone and also, percentage of their effect on permanency.

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