

# The Traditional Iranian Courtyard: an Enduring Example of Design for Sustainability

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## Abstract

This paper describes the traditional Iranian domestic courtyard. It demonstrates its significance as an architectural form that is not only functionally appropriate for the harsh climatic conditions in which it is found, but also culturally significant in terms of social considerations and substantive values related to notions of a meaningful life for the individual. The paper considers the environmental, socio-ethical, and economic aspects of this form of architecture, as well as its relationship to higher values, which include legend and myth, religion and spirituality, aesthetics and psychological aspects, and relationships to nature. The findings that emerge from this study of an enduring architectural form can be instructive with respect to our contemporary understandings of, and responses to, sustainability.

**Keywords:** traditional Iranian courtyard, sustainability, culture, substantive values, contemporary

# 1. Introduction

The courtyard is an architectural element that is commonly found within the traditional Iranian home. Its origins are lost in history, but it has been a characteristic of Iranian domestic architecture for thousands of years (Ardalan, 1973, p.68). This discussion examines this typical architectural element from a number of perspectives. Firstly, the development of the courtyard, within the larger context of domestic architecture, is described in terms of its relationship to the climatic conditions of Iran. This is followed by a discussion of socio-ethical and cultural issues, including economic considerations that make use of local materials and labour, and the mythological, religious and spiritual associations that this built form has acquired over time. In addition, the psychological aspects of the courtyard are discussed, including aesthetics and our relationship to the natural world. The significance of this study lies in its relevance to contemporary ideas of *design for sustainability*, which is discussed in the final section.

## 2. Environmental considerations and context

To understand how the inner courtyard of the traditional Iranian house has become an appropriate architectural form for living in a hot dry climate, it is necessary to consider the climate conditions of the region, the characteristics of the urban and rural contexts, and the generalised forms of buildings. These considerations will enable us to understand how the traditional Iranian courtyard - as the focus of this discussion - evolved over thousands of years to become a fitting answer to the environmental context in which it was developed.

The climatic conditions, in which the traditional Iranian home design developed, with its inner courtyard as a significant architectural element, can be characterised as hot and dry, with relatively little annual rainfall; such areas constitute one seventh of the country and mostly in the centre and eastern parts (Ghobadian, 1995, p123). Specifically, these climatic conditions, especially for the Isfahan region, can be summarised as follows:

- Hot to very hot summers with peak daytime temperatures reaching 36-37 degrees C in July and August, with night time lows at 19-20 degrees C.
- Cold dry winters with daytime temperatures in January reaching 6-12 degrees C, dropping to -4 degrees C at night or lower.
- Low annual rainfall – precipitation occurs mainly in the months December to March where it averages 15-25mm per month. In the summer months precipitation is rare.
- Dry air and low relative humidity. Daytime relative humidity ranges from 60-74% in the winter months, and the low 40s during the summer. However, due to high summer temperatures, humidity can cause discomfort.
- A relatively large diurnal range —as much as 20 degrees C in the summer months.

- Dusty winds mainly in the summer months

(BBC, 2009)

Such conditions mean that vegetation is sparse. Thorn bushes are present in the deserts areas, characterised by sand dunes, but in the oases there are tamarisk, poplar, date palm, myrtle, oleander, acacia, willow, elm, eucalyptus and fruit trees such as fig, pomegranate, plum, mulberry and vines.

To cope with these climatic conditions, traditional Iranian domestic architecture developed over thousands of years and attained forms that were the result of practical experience. The architecture that evolved offered ways of living and domestic environments that suited the conditions, to enable desirable ways of living in the region.

In general, urban and rural contexts have the following features (Ghobadian, 1995, p.128):

- Concentrated building forms – with houses and other buildings in close proximity or attached. This decreases the amount of external surfaces but maintains the internal volumes - thus reducing thermal exchange through external walls in both summer and winter
- Public spaces (squares and courtyards) and private spaces (domestic courtyards enclosed by built form).
- Narrow and covered alleys and streets – reducing sun penetration and increasing opportunities for air movement due to thermal currents.
- The orientation of buildings is based on the direction of the sun's rays and the directions of the prevailing winds – allowing primary living rooms to remain shaded and comfortable during the hot summer months, but allowing sun penetration (due to the low sun angle) during the winter months.

The characteristics of the building forms are:

- Enclosed and inwardly oriented
- A planted courtyard within each building - that sometimes has a basement and wind catcher, which directs the winds down to a below-ground water cistern. In this way the air entering the courtyard, and surrounding rooms, is cooled via natural processes that do not require artificial sources of energy.
- The courtyard is an excavated inner area that lies below the level of the surrounding rooms and passages.
- Use of thick walls and use of high thermal capacity materials such as unbaked mud and baked bricks. These create a high thermal mass which helps maintain a more constant internal

temperature by attenuating temperature fluctuations between night and day and winter and summer (Energy and Resources Institutes, 2004, p.113).

- High walls that provide shade in the open spaces – both the public alleyways between buildings and the private spaces, including the inner courtyard.

Thus, the traditional domestic home built around an inner courtyard, has evolved over the generations into an architectural form that appears to be singularly appropriate for the prevailing climatic conditions (Koenigsberger, 1974). For example, overnight cold air - that is heavier than hot air - remains in the courtyards. During the daytime, high walls around a courtyard means that much of the surface of the courtyard remains shaded. Thus, the courtyard, especially when planted with trees and when it features a water pool (a common element) effectively maintains a comfortable, shaded, and humid micro-climate. In addition, all the rooms are open to this enclosed space and in this way the interior rooms of the house remain sheltered from dusty winds in summer and from cold winds in winter.

Thus, in the arid climate of the Iranian plateau, the courtyard is a way of creating a desirable living environment that includes shade from trees, water pools, shade from high surrounding walls and a gentle breeze. These elements are rarely found in such a climate and so the courtyard is an invaluable space inside each house, even though it is likely that many of the people of Iran, rich or poor, do not realise the many other meanings and associations of this courtyard design (see below).

### **3. Socio-ethical considerations**

The group dynamic of those who lived in the traditional Iranian house with an inner courtyard can be divided into two main types:

- An extended family: including father, mother, children, grandparents, aunts and uncles etc.
- A group of workers who work for an employer.

In both groups there was a community in which people helped each other (e.g. cooking and looking after their children), as well as sharing spaces and tools (such as kitchen, pool of water, garden, yard). There was cooperation, collaboration, and mutual support, with collective activities between men (repairing the house, tending the garden) and women (preparing ceremonial meals together, sewing, and weaving). Sometimes everyone, men and women together, would prepare and decorate the house and yard for festivals, such as for 'Moharam' (an important Shia festival) or a wedding. Also, the courtyard would be regularly used for communal entertainment. Such activities are consistent with contemporary understanding of sustainable lifestyles that entail communal activities and sharing of resources (Manzini, 2003).

## 4. Economically viability

Traditionally, houses were built by local people or the home-owners themselves from basic, affordable, locally available materials. Earth was removed to create a courtyard at a lower level than ground level. A water pool in the courtyard would serve as the water supply for the household. The earth from the courtyard excavation would then be used to make bricks for the construction of the house. Due to the generic style of architecture, from the external appearance of the house, it was not possible to gauge whether the residents were rich or poor. In the public realm, this helped create a sense of social equity among the various inhabitants. Such perceptions of social equality are important aspects of communal wellbeing and of sustainable ways of living (Wilkinson & Pickett, 2009, 263).

## 5. The traditional Iranian courtyard and substantive values

The physical and mental effects associated with the open space of the traditional Iranian courtyard are also important aspects to be considered. In spite of all the benefits that the traditional Iranian courtyard has in terms of its environmental, social and economic consideration, it also has important philosophical and spiritual meanings. These can be appreciated from a number of different, but related, perspectives:

- **Philosophical Meanings:** within the Islamic culture of Iran, the notion of the ‘void’ has an important philosophical meaning. The void is significant in pattern and decorative styles, in music - as the silence between sounds, and in calligraphy between black and white. The traditional Iranian courtyard is an example of the void in architecture. The “negative space” of the courtyard, surrounded by rooms as “positive”, built forms, has roots in the “metaphysical principle of unity” of Islam. The void has spiritual significance and the courtyard as a void is a symbol of the presence of the divine in all things (Nasr, 1987, pp.185-186).
- **Legend and Myth:** the courtyard has a number of ancient symbolic meanings that refer to essential aspects of life.  
Firstly, in pre-Islamic and pre-Zoroastrian Iranian culture the presence of the god of the sun, Mitra, and the goddess of water, Anahita was found inside the house (Ahmadi, 2009). Sunshine, which is abundant in this region, penetrates the courtyard. Water, which is rare in this arid climate, is continually present in the courtyard pool. This presence of sun and water is important symbolically as well as functionally. According to Ahmadi (2005), sun and water, two essential life-giving natural elements, have shaped much of the mythology of the central Iranian plateau along with the creation of spaces in Iranian architecture, including the domestic courtyard. The courtyard is seen as a place to meet Mitra and Anahita.  
Secondly, the rectangular courtyard, which is oriented to the four cardinal points, is symbolic of the “place” as the centre of the world and of “time” and its passing (day, season, and year). Thus, the courtyard manifests “place” and “time” together. “Place” is the symbol of durability and “time” the symbol of ephemerality. So the courtyard became an archetype which simultaneously represents both (Ahmadi, 2005, p.93).

Thus, we see that the mythological meanings of the open courtyard - a 'place' of permanence and change – represent essential aspects of life.

- **Religion and Spirituality:** the courtyard came to be seen as a symbol of a lost paradise (Ardalan, 2002). According to Sufi beliefs, human beings were cast out of Paradise, and throughout history up to the present, they have been searching to find it again and settle down. However, they have only a vague memory of that lost paradise, and almost all traditional artists and artisans have attempted to create it in their works; in paintings, carpets, cloth and even in architecture. The Iranian walled-garden was designed and built with a pavilion in its centre, just as Paradise is described in the Koran (47:15).
- **Aesthetics and Psychological Aspects:** the various aesthetic aspects of the courtyard, such as the beauty of nature, and the sounds of birds and flowing water, combined with spiritual understandings help nurture and contribute to the higher needs of the individual. This is referred to as self-actualization by Maslow in his well known Hierarchy of Needs (1975, p.194). Drawing on Maslow's work, it is evident that a traditional Iranian household courtyard covers many human needs, both as an individual and as a member of a social group. Specifically, it satisfies the basic physiological needs of adequate shelter in an arid climate, as well as water and food; the needs of safety, love and belonging; and those of esteem and reputation (the traditional house design, and particularly the various rooms, was based on a hierarchy within the household, which centred on the inner courtyard). Aesthetic needs, beauty, balance, form and self-actualisation are also satisfied within the courtyard. As Ahmadi (2005, p.95) points out, the courtyard is a secluded place for a Sufi to be in a relationship with the universe. This relationship occurs through the courtyard, which is connected to the earth (place) and to the sky and sun (time). The Iranian people can experience a true sense of freedom inside their own houses, as they often have strong feelings of belonging and responsibility to their family, even though outside the house they may feel restricted by rigid social rules (*ibid*, p.95).
- **Humankind's relationship to nature:** the courtyard provided a way of bringing natural elements into the centre of the home. This includes the growth of plant life, awareness of the seasons, and so on. Throughout history people have tried to settle down in a place where they have easy access to water, soil for planting, as well as temperate living conditions – all in order to remain healthy. Wherever they were able to settle and make their lives, people have always done their best to create acceptable conditions, which would enhance their surroundings. And in the arid climate of Iran, people have for centuries created a distinctive form of dwelling. Within this domestic architectural form, it is through the courtyards - by inviting the sun, water, air and earth (the four basic elements of life) inside their houses – that they have been able to live in a serene and calming environment, despite the extreme climate conditions outside. It has brought them a sense of tranquillity, peace and comfort, which means their body and soul have been in balance. Day (2002 p.29-76) writes in detail about these four basic elements. He points to the four "levels of place" that are essentially elemental levels. He maintains that substance, flow, mood and spirit are the principles of earth, water, air and fire. Earth is ageless and about roots. Human kind is rooted in the earth as Adam was

formed of clay; earth anchors us and offers a sense of stability. Water washes both soul and body. Water is more (symbolically) necessary for the soul than the body to make it clean, free and restful. Air is mobile, like water; for life, it is more important than food, water and warmth. Air is also closely connected with the transfer of emotion. Fire is transient but it connects us, again symbolically, to a basic archetype - both for nature as a principle and as flame for developing of humankind. Day believes that these are important archetypal qualities both for creating a healthy place as well as a healthy person (Day, 2002, p.30). The presence of these four elements is immediately apparent in the courtyard; the adobe walls and buildings that surround it, the pool of water, the presence of the sun and the air, because the courtyard is an open space. To live with the four elements on a daily basis, which Day believes are important for human health, is readily provided by the traditional Iranian courtyard home (*ibid*).

## 6. Conclusions

The courtyard, which is the core of traditional domestic architecture, especially in the desert regions – is a housing element that is common to many Islamic countries. It is found in North Africa, the Middle East and Persia. It can be traced back to the pre-Islamic period in Iran, and as far back as 3000 years ago, so it has been sustained for thousands of years.

The traditional Iranian courtyard evolved and developed over the centuries being adapted through environmental considerations, cultural values, and the changing social context. Micro-climate control is achieved through natural processes. The seasonal positions of the sun and the direction of the prevailing winds create natural cooling effects, shaded areas and comfortable humidity levels. In terms of socio- economic considerations, the traditional courtyard is constructed from basic, affordable, locally available materials, and usually by local workers. Most commonly, an extended family would live in this kind of traditional Iranian housing. In this family-based community, cooperation, collaboration, mutual support between men and women, as well as collective activities and the sharing of spaces and tools, all contributed to its socio-economic sustainability .Current principles of sustainability align well with the traditional courtyard, and include environmental adaptability, social responsibility and economical considerations.

Beyond these utilitarian considerations, however, the courtyard has acquired an extraordinarily rich set of cultural meanings that contribute to, and are essential for, social and individual wellbeing. These include aspects related to mythology, religious understandings and spiritual needs, as well as aesthetics, psychological considerations and our relationship to nature. Its presence as a 'void' within the building refers to a philosophical meaning and religious belief in Iranian culture, a symbol of lost paradise within the domestic setting, a place for communing with sun and water - two gods of legend that have mythical meanings. The courtyard is a place that invites water, air, fire(sun), earth into the heart of the home-the four elements that human beings needs to survive and be healthy. It is a place that provides a spectrum of all human needs, from the basic physical need of shelter to the highest needs of self-actualisation; with respect to the latter, the courtyard is a secluded place in which one can be in relation with the universe. Hence, the courtyard can be categorised as an example of an

enduring artefacts that includes all the characteristics of three broad groups, the Functional, the Social/Positional, and the Inspirational/Spiritual, as classified by Walker (2006, pp. 39-51).

Contemporary discussions of sustainability are often considered in terms of the so called triple bottom line i.e. economic viability, social responsibility and environmental care. We see in the traditional Iranian domestic courtyard an example of design that is not only in complete accord with these three elements but which surpasses this rather inadequate understanding of what constitutes a sustainable way of living. The traditional Iranian courtyard *also* contributes to and nurtures our highest needs as individuals – the aesthetic, the spiritual, the psychological and our relationship to, and awareness of the natural world. Alexander (1976 & 2004) has called such a characteristic in things "*the quality without a name*" in the "timeless way of building".



Figure 1: A Traditional Iranian Domestic Courtyard (photo by P. Yazdanpanah , September 2009)



Figure 2: The Courtyard Water Pool (photo by P. Yazdanpanah, September 2009)

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