

## ACHIEVING SUSTAINABLE CITY BY THE CONCEPT OF PERSIAN GARDEN

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### Abstract

*In these days of worldwide political stress learning to cope gets more and more difficult. Most of us crave moments of peace and security, a chance to mediate and smell the air, or quite literally experience the scent of flowers. We can find this peace in an enclosed garden.*

*The main goal of this research is to find a solution to have more balance between Persian Garden and contemporary city to achieve sustainability.*

*So, this article tries to bring sustainability to cities by the concept of Persian Garden. Because one of the basic concepts of achieving a sustainable city in the theoretical framework of the sustainable development is the impacts of urban green spaces. So, principles and components of sustainable development and sustainable city are studied with relation to the Persian Garden.*

*This approach proposes a practical solution for architects, how to re-create Persian Garden in contemporary cities. In this research, qualitative content analysis method is employed.*

*Hence, city sustainability requires sustainable elements in different dimensions to ensure its sustainability in addition to establishing relationship with the elements in urban system. Also, with due observance to the concept of sustainability theoretically and practically and considering human need in all physical and metaphysical dimensions, Persian Garden is seeking to meet the human needs.*

*This paper shows that the role of the garden in increasing the sustainability in city and permanence of ecological balance is very evident and undeniable. Finally, we come to a conclusion of sustainability feature in Persian garden.*

### Rezumat

*În zilele noastre marcate de stresul politic din lumea întreagă învățăm să facem față problemelor din ce în ce mai greu. Cei mai mulți dintre noi tânjim după momente de liniște și pace, după șansa de a medita și a simți aerul curat sau pur și simplu după experiența de a mirosi florile. Putem găsi această pace într-o gradină închisă.*

*Țelul acestei lucrări este acela de a găsi o cale pentru a combina în cel mai bun mod Grădina Persană cu orașul contemporan pentru a atinge sustenabilitatea.*

*Așadar, acest articol încearcă să aducă sustenabilitatea în orașe cu ajutorul grădinilor persane. Pentru că conceptul de baza pentru a avea un oraș viabil cu ajutorul unui program de dezvoltare*

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*durabil este implementarea spațiilor verzi în mediul urban. Principiile și componentele dezvoltării viabile ale orașului sunt studiate în baza Grădinii Persane.*

*Aceasta propune soluții practice arhitecților prin care ei pot re-crea Grădina Persană în viața contemporană. Aici vom aplica metoda de analiză din punct de vedere calitativ.*

*Așadar, sustenabilitatea are nevoie de elemente viabile de diferite dimensiuni pentru a asigura dezvoltarea durabilă și a forma o relație între elementele urbane. Pe lângă aceasta, folosind conceptul teoretic și practic al sustenabilității și luând în considerare nevoile fizice și metafizice ale omului, Grădina Persană încearcă să atingă toate nevoile umane.*

*Această lucrare încearcă să arate că rolul grădinii de a crește viabilitatea orașului și echilibrul ecologic este incontestabil. În final se ajunge la o concluzie în ceea ce privește viabilitatea în Grădina Persană.*

**Keywords:** Persian garden, ecological balance, sustainable development, urban green spaces.

## 1. Introduction

In the Persian garden, the garden architecture system is consisting of organizing, operational, physical and semantic systems. Also, systems of landscape, perspective, light, shadow and sound are combining and mixing the resulting quality of physical system. They are specific to Persian gardens.

Most researchers emphasize that "in the Iranian garden materialism will be improved to spirituality" [3]. In fact, Mirfendereski concludes that the Persian garden creates a pure, calm space. It is a space without any tension and an environment of great thinking [4]. It can be said that the quality of comfort and relaxation and its quality as a place for thought, contemplation, meditation and creativity are created by structural elements such as number, geometry, color and material. The Persian garden is both physical and spiritual experience. The aroma of succulent plants, the melody of water and birds, the smooth tiled texture and taste of wet earth and the sun, the fruits, the flowers and the colorful mosaics that are reflected in a calm catchment, are all outstanding. These characteristics exist both at a symbolic and abstract level and at an experimental level, in the same time [5].

## 2. Research methodology

From the point of view of motivation for research, however, is considered to be a pure theoretical research. In this research, qualitative content analysis method is employed. From the point of view of research nature, this paper is classified as a historical- psychological-scientific-field study.

The Persian garden is considered to be an example of sustainability in Iranian's ancient cities from 6<sup>th</sup> century BC. So, the articles related to Persian garden are reviewed through librarian studies and their theoretical contradictions and deficiencies (internal validity) are identified and compared to each other by using evidence.

Then, author concentrated on Persian garden and sustainable parks features, to compare them in different terms such as: ecologic, sustainability, geometrical structure, etc.

At the end, principles and components of sustainable development and sustainable city will be studied by relation to the Persian garden.

## 3. The use of green architecture in urban life

Green architecture (sustainable architecture) describes architectural designing techniques that are in line with environmental attitudes and is shaped by the idea of respect for nature. Green architecture is not a new trend as it has been fundamentally present in ancient civilizations and traditional architecture, including the traditional architecture of Iran. Its prominent and systematic examples can be seen in Feng Shui science. Today, in the face of the negative outcomes of the industrialized world (such as the increasing pollution of the air and the environment, the reduction of natural resources and the energy crisis) the preservation and sustainability of the world's natural resources have become one of the most important concerns. Green architecture is designed to minimize the negative effects of industrial materials on the environment by increasing the efficiency and optimizing the use of them. With the progress of human life, environmental degradation continues and the biological balance of environment is disturbed. These environments should exist in the lives of humans and in the current urban texture as forest and national parks with a sustainable approach. All these points occur when the level of the general culture of society increases and the members of the modern society themselves, reduce the environmental degradation factors. In this situation, it is essential to build parks in accordance with sustainability principles in today's societies to speed up this process. (Table 1)

Table 1: Sustainability criteria in the environmental sector [2]

Objectives of Sustainable Development	Sustainability Criteria
Healthy environment	<ul style="list-style-type: none"> <li>- Protecting natural habitats,</li> <li>- Protecting existing green belt,</li> <li>- Reusing land</li> <li>- Reducing light and sound pollution</li> <li>- Protecting quality agricultural land areas</li> <li>- Protecting water and its quality</li> <li>- Protecting landscape and view</li> <li>- Protecting cultural heritage</li> <li>- Protecting and promoting specifications of settlements</li> </ul>

#### 4. Persian garden sustainability

The background of design in Iran shows that with the approach of sustainability<sup>2</sup>, Persian gardens,

<sup>2</sup> The term “sustainability” has been taken from the Latin word named “sustenerere” which is meant “guarding” and “supporting”. Also, in Longman Dictionary, the term “sustainability” is meant ability to survive for a long time [6] and/or leaving a positive impact on community, economy and environmental condition of people in future and/or in other places. [7]

buildings and landscape were designed to be most adapted to the dry and semi-arid climate of Iran. (Fig. 1) Inappropriate conditions in the environment and natural resources have led the Iranian to management of resources and solutions that are consistent with nature. These solutions are such as building "Ganat", building gardens in ditches, using rain water, building water storage and designing beautiful gardens.



Figure 1: "Shazdeh e Mahan", Kerman city, Iran [8].

In Iran, achieving sustainability should be planned based on the culture and climate of the region. For this reason, due to the harmony between sustainable architecture and Iranian architecture, Persian Garden is a typical indicator of sustainability that has the best relationship between nature and artifact space. Also, the use of clean and indigenous resources and energies, without destroying nature, will bring ultimate calmness and comfort to human.

Features and characteristics of sustainable architecture and its adaptation to Iranian gardening including items such as:

1- Energy Conservation: Persian Garden is based on the principles of native architecture, and the climate-cultural and renewable energy sources-creates a desirable environment for humans. (Fig. 2)

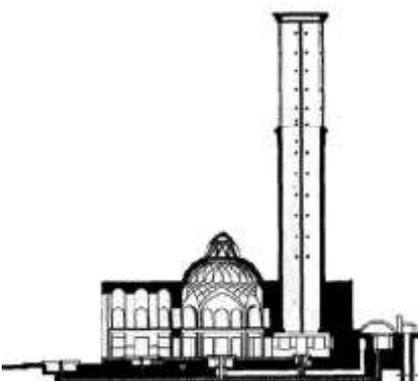


Figure 2: "Dolat Abbad" Garden, section of pavilion [9].

2- Climate: In the Persian Garden, the climatic and natural elements are used with respect.

3- Renewable Energy Use: Designing of the buildings (Pavilion) in Persian Garden are based on using renewable energies like as Solar and Wind powers. (Fig. 3)



Figure 3: “Shazdeh e Mahan”, Kerman city, Iran

[10].

4- Respecting users: The geometry applied to the Persian Garden is a four-dimensional geometry. This is the geometry that the human mind can easily understand. (Fig. 4)

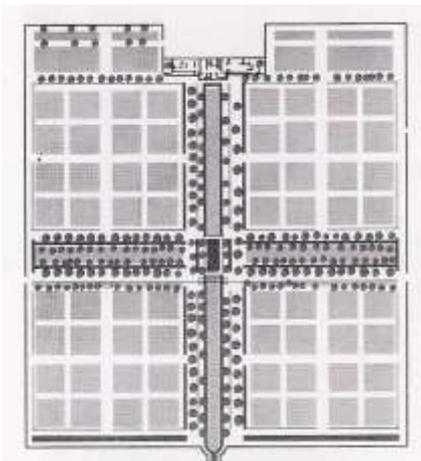


Figure 4: “Golshan” Garden, Tabas city, Iran [11].

5- Holism: There is complete harmony in the relationship between human and nature. The garden reflects the order of nature and the world in its regular form like as: The use of native plants, storage and reproduction of floods and other natural resources, infrastructure conjunction with the appropriate technology, preservation of the life cycle and wildlife conservation.

## **5. Sustainability of urban spaces and parks**

The hallmark of cities in the third millennium is planning and designing in accordance with the nature and principles of sustainable development. Therefore, the necessity of introducing ecological issues in contemporary cities are perceived to be tangible. These ecological issues are embodied in concepts such as sustainable development, ecological city, ecological and sustainable parks. The symbol of sustainable urban development is the construction of urban parks consistent with ecological and sustainable indicators. As the population is growing, more communities are looking for spaces that are beautiful and sustainable. For this reason, sustainable parks are much more attracting.

## **6. Compliance of Persian garden with sustainable parks**

1- The sustainable park can have straight-line geometry, curved or natural. Persian Garden also has straight-line geometry in accordance with nature. (Fig. 5)



Figure 5: “Fin” Garden, Kashan city [10].

2- The sustainable park connects components of the outer spaces in a way that they provide intelligible networks for living organisms and natural systems. In the Persian Garden, the spaces are interrelated and there is no separation. Also, all the components are connected to each other. (Fig. 6)



Figure 6: “Narenjestan” Garden, Shiraz city [10].

3- The Sustainable Park is trying to provide an old view of the city as a garden. Persian garden is a symbol of originality, civilization and historical document of the country.

4- Sustainable urban parks can reduce adverse effects such as air pollution and traffic noise. These parks are self-sustaining. The native plant species are planted. It is not recommended to plant foreign ones. The spaces inside the garden are well separated from the outside of the garden. (Fig. 7)



Figure 7: “Golshan” Garden, Tabas city [10].

5- In a sustainable park, flowers often have therapeutic properties. They also produce grain for birds living in the area. They also have an ornamental aspect for users and their audience. In the Persian Garden, the flowers are not used just only as beautiful plants, but also have applications such as therapy, color production and etc.

6- In the sustainable park, floods and water falls are collected, stored and refined to be used in streams or pools. In the Persian Garden, the irrigation system has been rolled around the entire garden, preventing flooding. In order to irrigate the garden in this system, splits are available at specific locations for each plot. (Fig. 8)



Figure 8: Persian Garden's irrigation system [12].

7- In a sustainable park, buildings are placed in a way that are close to paths, bike paths and roads. These buildings are designed to use the sun's thermal energy, natural ventilation, the natural light of day. Also all used materials are native. In Persian Garden, the passage of water from the inside of the pavilion and the connection between the interior and exterior of the buildings cause natural air conditioning. (Fig. 9)



Figure 9: "Fin" Garden, Kashan city, Inside the pavilion [12].

8- In the sustainable park, restaurants serve organic meals from the vegetable planted in the park. In the Persian Garden, the fruit trees and vegetables are planted in there.

9- In these parks, the parking lots are minimized and, where necessary, penetrating materials are used. These materials absorb rain water and prevent water flows to the surface. Grains and gravel are used in passages. In Persian Garden, in the passages, gravel and soft soil are used to make it easier for people to pass and the plants grow there easily.

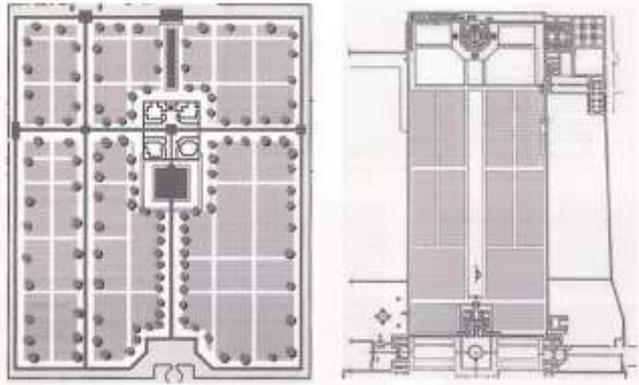
10- In these parks, thought, sports, the appreciation of nature and culture and art becomes very noticeable. Persian Garden is also a place of thought, privacy, relaxation and security.

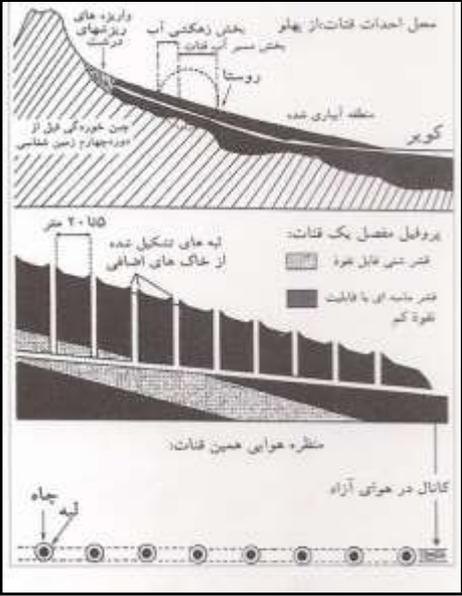
## 7. Conclusions

Sustainability is not a common concept to all societies and cultures. In fact, any society should achieve a definition of sustainability in relation to its culture, civilization and the specific environmental conditions in which exist. Considering the existing environmental potential as well as Iran's ancient history of gardening, it is hoped that environmental and landscape designers keep with the principles of sustainability in planning and designing. The rehabilitation of Persian gardens, along with respect for the principles of sustainability and consistent with sustainable urban planning, can play an important role in the development of urban green spaces and, consequently, sustainable urban development. To achieve comprehensive urban sustainability, all dimensions should be studied and analyzed in interaction with each other. The sustainable development and urban sustainability has a process concept which is running at the end of city as a result of a systematic approach and with considering various capacities of the city. Hence, city sustainability requires sustainable elements in different dimensions to ensure its sustainability in addition to establishing relationship with the elements in urban system. In the present study, principles and components of sustainable development and sustainable city were studied with relation to the Persian Garden. (Table 2)

Finally, it can be said that Persian Garden can be known as wise relationship of human and the heavenly nature. Recognizing secrets and mysteries of this relationship is possible in a systematic approach through the identification of Iranian traditional culture [1]. Hence, with due observance to the concept of sustainability theoretically and practically and considering human need in all physical and metaphysical dimensions, Persian Garden is seeking to meet the human needs.

Table 2: Studying the role of Persian garden in sustainability of city

Sustainability Dimensions	Sustainability Feature in Persian Garden	Related Pictures
Social Sustainability	- Separation of spaces such as public, semi-private and private.	 <p>Figure 10: Structural system of "Dolat Ababd" &amp; "Fin" Gardens</p>
	- Relationship of religion and structure	

	<ul style="list-style-type: none"> <li>- Observing respect particularly in exterior garden which has been planned as cemetery.</li> <li>- Establishing relationship with the current city (time sustainability)</li> <li>- Paying due attention to the individual personality of Garden and establishing relationship with internal and external parts</li> <li>- Boosting joyfulness and freshness among citizens</li> </ul>	<p>Figure 11: Taj Mahal Tomb garden in India, Agra, built based on the pattern of Persian Garden.</p>  <p>Figure 12: “Dolat Abbad” Garden, Yazd city [13].</p>
<p>Ecologic Sustainability</p>	<ul style="list-style-type: none"> <li>- Focusing on irrigational system with appropriate positioning such as water of underground channel (Ghanat) and river</li> </ul>	 <p>Figure 13: Long Section of Qanat [14].</p>
	<ul style="list-style-type: none"> <li>- Increasing environmental greenness and pleasure</li> <li>- Using local and aboriginal construction materials</li> <li>- Focusing on role of Garden to improve</li> </ul>	

	<p>environmental conditions especially in city</p> <ul style="list-style-type: none"> <li>- Creating respiration place in city</li> <li>- Boosting health of citizens</li> <li>- Improving urban landscape</li> <li>- Following gardens from land topography</li> </ul>	<p>Figure 14: “Fin” Garden, Kashan city, Iran [13].</p>
<p>Economic-Structural Sustainability</p>	<ul style="list-style-type: none"> <li>- Establishing structural relationship with surrounding environment</li> <li>- Positioning in consistency with the elements of Garden (water, trees and main structure)</li> <li>- Promoting international tourism and ecotourism</li> <li>- Observing sustainable architectural principles</li> <li>-centrality, symmetry, hierarchy and repetition in monument</li> <li>- Land use amalgamation in gardens (residential, trade, recreational and tourism)</li> </ul>	  <p>Figure 15: “Fin” Garden, Kashan city, Iran [13].</p>

- Formation of garden in consistent with the surrounding environment



Figure 16: “Shazdeh e Mahan” Garden, Kerman city, Iran [13]

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