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Original Research Article

Flexibility, a Prominent Feature of the Persian Garden to Use in the Contemporary Period

Mehdi Fatemi

Assistant Professor, Faculty Member of Faculty of Architecture and Urban Planning, Imam Khomeini International University, Qazvin, Iran.

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Abstract | Persian garden is a well-known gardening style in the world. This style is distinguished from its other counterparts due to its special features. Many experts believe the Persian garden has undergone changes during different periods of evolution. Presently, the spatial desirability of the Persian garden is not seen in urban parks. Numerous reasons such as westernization and imitation in the late Qajar period and the use of Western designers in the Pahlavi period have created urban parks that not only their appearance has nothing to do with this land's past but also the basic principles of communication between man and nature in Iranian culture are ignored in them. Many of the Persian garden's perks have remained constant in different periods of its development, which shows its mental and spiritual value among Iranians. In this article, with an overview of some historical gardens of Iran and contemporary parks in Tehran, it has been shown that the fear of using the features and elements of Persian gardens due to their strong geometry, has caused the obscurity of urban parks. The results of this study indicate that Persian gardens, contrary to the prevailing perception of having dry and rectangular geometry in whole and in part, have shown a high degree of flexibility throughout history and have changed according to function or time. Ignoring this feature or not updating the concepts of the Persian garden has led to less use of this style in the design of urban parks, which has had a significant impact on citizens' relationship with urban green spaces as a part of nature they respect.

Keywords | *Persian garden, Flexibility, Traditional Patterns, Contemporary Needs.*

Introduction| Perceptual foundations related to identity-building elements in Iranian architecture have been the subject of many studies. In the field of landscape architecture in Iran, most researches have a traditional approach and look back at the past. The Persian garden has always existed in the eternal spirit and memories of the Iranian people. According to Arthur Opham Pope, there is a garden in the corner of every Iranian mind (Javaherian, 2004, 10). Therefore, it is quite obvious that many Iranian landscapes are associated with the Persian garden, and if the Persian garden is separated from the present as a historical monument, this field will be empty of magnificent works. This vacuum is very thought-provoking in a country where people have a common idea of historic gardens and the experience of creating urban green space in their background. There has not been much discussion about urban parks as a place where people interact with the work of landscape architects in the city, and the main research has been done on issues such as botany, social harms, and the per capita urban planning system. Urban parks have become important as a place of connection between nature and urbanized man. Therefore, urban green space is one of the services that municipalities can provide for citizens, and green space per capita is one of the characteristics of urban development. Due to the per capita system's attention to quantity, since the early Pahlavi period and after the Islamic Revolution, the development of urban parks has been based on the Western-style and citizens practically do not establish a mental relationship with them. The predominant mental image of Iranians of historical gardens and their special spatial quality are the missing links in the design of urban parks, and for this reason, these parks have sometimes suffered from social harms. Design criteria and indicators in the past landscape of

Corresponding author: +982833901819, fatemi@arc.ikiu.ac.ir

Iran have not yet been systematically reviewed. Some standards of Iran's Islamic architecture have been included in this field and developed by experts. Most of these discussions have dealt with the spiritual aspects of these criteria and have called the Persian Garden paradigm a space with a dominant sacred aspect, which has caused its incompatibility with the recreational parks of cities. The fact that these criteria can be obtained by visiting these works and through their bodies, shows that the physical manifestation of the criteria can be generalized and the viewer can understand them if presented in similar places. Of course, a mere imitation of the body of the Persian garden is not recommended at all, but just as the Persian garden itself has evolved in different eras, it can be the source of inspiration for urban park design in the present age by maintaining standards that are still effective and being updated in the physical elements. This article tries to examine the continuity of criteria and indicators of the past landscape of Iran by looking at the parks of Tehran, on the one hand, and the historical gardens of Iran, on the other hand, and seeks to prove its hypothesis by comparing these examples. Among the functional, historical, and sensory criteria, sensory criteria are understood and recognized in the first place based on Fielden's theories. Therefore, in this article, those physical and formal characteristics of the Persian garden have been paid attention to that are perceived sensually earlier. Using these characteristics will lead the user to imagine himself in a space similar to Persian gardens faster, and the designer's secondary goals, such as mental images, will be understood behind these sensory criteria.

Research background

The first researches in the field of the Persian garden are related to foreign archaeologists who have been excavating cultural heritage in Iran. In his excavation of Pasargadae, David Stronach wrote an analysis of the structure of its garden (Stronach, 2000). Wilber described Persian gardens in his book entitled "Persian gardens & garden pavilions" (Wilber, 1969). Most of these researches have considered and analyzed the body of Persian gardens as a royal design. Later, Iranian researchers conducted numerous studies in the field of Persian gardens and showed the semantic dimensions of the Persian garden. There are many experts in this field and it is not possible to mention all the researches that have been done, and only the most important ones will be discussed in the following.

Ansari introduces different types of Persian gardens in his thesis (Ansari, 1999). In several articles, Pourjafar has studied the influence of religious concepts on the Persian garden, and considers many of the concepts in the Persian garden as a result of the designers' attention to the promised paradise with reference to the verses related to it (Pourjafar, Rostami, Pourjafar & Rostami, 2013). Mansouri with an aesthetic analysis of the elements of the Persian garden, has introduced the aesthetic characteristics of the Persian garden (Mansouri, 2005). Heidar Nattaj has also criticized the Iranian Charbagh model (Heidar Nattaj & Mansouri, 2009). Alemi believes the existence of the axis in the garden is necessary and considers the numbers attributed to the garden as symbolic and does not consider it necessary to implement the Charbagh plan physically (Alemi, 2006). In some sources, such as (Khansari, Yavari & Moghtader, 2004) and (Naeima, 2006), maps of the Persian garden have been drawn and revised.

In the field of the Persian garden, some criteria have been expressed sporadically in some researches. But these references and analyzes are not as impressive in the field of Persian gardens as are in similar historical cases, like Islamic architecture in Iran. On the other hand, the landscape architecture of present-day Iran, like the design of urban parks, has been neglected in research. In the field of landscape, Soltani refers to the process of transition from the garden to the park in the Qajar and Pahlavi eras in an article and considers westernization as the reason for the obscurity of parks, and their non-compliance with Persian gardens (Soltani, 2007). Therefore, in this article, an attempt has been made to investigate the reasons for the non-continuity of the Persian garden pattern in contemporary parks in Tehran.

Hypothesis

It seems that the non-continuity of criteria and indicators of the Persian gardens' design patterns to the urban parks in Tehran is due to the misconception of the Persian garden pattern as a fixed geometric pattern or its incompatibility with the needs of today's users.

Research questions

- Has the Persian garden pattern with the image of a strong geometric structure been fixed and unchanged in all eras?
- Are the elements and functions of the Persian garden sustainable or renewable in the present era?
- Can flexibility and change as one of the characteristics of the Persian garden, be the basis for measuring its effectiveness and functionality as a model in the design of contemporary parks?

Research methodology

In this research, using descriptive-analytical research method and by reviewing library documents, the opinions of many experts in the field of Persian garden

have been extracted analytically, and an attempt has been made to extract the criteria of landscapes, and then determine their physical manifestation as indicators. Major scholars cite concepts such as unity due to geometry, order in planting plants and water display, privacy and confinement, simplicity while diversity and populism, and avoidance of extravagance in Persian gardens. Many refer only to the religious causes from which these spiritual concepts are derived, and consider the criteria used in the Persian garden to be due to the religion of the Iranian people and their worldview towards nature. "The symbolic concepts associated with gardening have a religious connotation and derive their characteristics from the attributes of the ideal paradise of the religion that governs societies, and it is these differences that lead to different physical patterns at each point in time" (Hamzehnejad, Saadatjoo & Ansari, 2014, 57). In some cases, these principles have led to the classification of Persian gardens in the conclusion of the discussions. "Persian garden is known for its unique style in the world's history of gardening art. Its shaping principles, dating back at least 2,500 years obtained from archeological sites, have been the subject of numerous writings in recent decades. Writings that have often described, praised and at best classified the form of Persian gardens" (Mansouri, 2005, 58). In addition to religious reasons, economic, political, governmental, as well as recreational reasons seem to have played a role in the formation of historical gardens. Most of the writings about Persian gardens are about the beliefs of religions and their perception of paradise, and it can be concluded that the gardens, although based on spiritual beliefs, are designed to meet the material needs of human beings, including recreation, ostentation, and the manifestation of glory and power, and even the desire to cultivate and farm. It should be noted that most of this research, even in the field of religion or the decomposition of garden elements, has paved the way for a better understanding of the meaning of this archetype.

Persian Garden; the basis of modern design

Today, the human need to connect with nature has led to the fact that in societies, nature is considered as a cultural heritage; Among the natural elements, water and plants are more important and affect other elements. "The intelligent combination of water and plants in the atmosphere of Persian gardens shows the observance of all three conceptual, functional and aesthetic approaches" (Zamani & Leylian, 2009, 25). Therefore, these gardens can be used as a model for the proper use of water and plants, and other criteria of the Persian garden, such as "enclosure, extent, and geometry that make the Persian garden have a sense of place (spirit of place)" (Medghalchi, Ansari & Bemanian, 2014, 25). On the other hand, the special aesthetics of this archetype and the desired mental image left by it can be useful in strengthening the relationship between citizens and nature. That is why Mansouri considers these elements as the creators of this special aesthetic. "In a comparative study of the remnants of the Persian garden, from the Pasargadae, the oldest and from the Achaemenid era, to the last century, when the last examples based on the Persian gardening tradition emerged, common elements can be found that form the aesthetic premise of the Persian garden" (Mansouri, 2005, 58). In all the opinions about the Persian garden, it is still mentioned as a successful experience in the history of the Iranian landscape, and based on this desirable performance during different periods, it can most likely be successful in the present era, too. "The Persian garden, as a transcendent example from the Iranian landscape, is the image of Iranian-Islamic human's beliefs in the heart of history, which, despite adversity, is still remembered as a successful model" (Medghalchi, Ansari & Bemanian, 2014, 25).

Based on the criteria and indicators extracted from the opinions of experts in this field, these criteria will be briefly reviewed. This review is brief and covers the whole of each concept. The basis of this article is to find the cause of failure in the contemporary parks in Tehran, which the author considers as a result of not following the landscape style of the past.

• Unity

Many experts consider the unity between the elements of the Persian garden as the reason why the Persian garden is significant and well-known. These interpretations consider the geometry of the Persian garden as the unifying factor of the garden elements in its right-angled structure. Therefore, the rectangular geometry, the use of straight lines, and the quarter divisions in the construction of some examples are among the main features of the Persian garden that distinguish it from other types of gardens. Some people consider the right-angled geometry system to be specific to the Persian garden, and for some, the four-part or two-part design in the geometry of the Persian garden is evident through attention to detail. In this context, some of the changes that are related to the design of the plan, axis, pavilion, and location of the garden throughout history have been examined.

• Plan geometry and its various interpretations

Charbagh is generally introduced as a symbol of Persian garden geometry. Some considered this pattern to have merged in pre-Islamic religions, and believed that the remaining motifs from the Sassanid era were the reason for its existence. Ardalan & Bakhtiar (2002, 137) says

about this plan: "The Sassanid Charbagh plan was in the form of a cross, which is a symbol of the quaternity of the world". "There was an intersection at right angles and the axes where the main landscape (the palace) was built at the point of collision," says Pope, without mentioning an example of these gardens (Pope, 1997, 1429). "Wilber also attributes Charbagh building to the Sassanid period without presenting any documents and only by referring to a clay bowl" (Mansouri, 2010, 25). Those who discussed post-Islamic Persian gardens have considered it a continuation of the traditional Charbagh plan; "The Muslim conquerors, after choosing a place, divided it into four parts and followed the tradition of the Sassanid gardens" (Faghih, 2004, 32). "Most writers have sought the closeness of this model with Islamic ideas and teachings to confirm their views; therefore, the existence of four heavenly streams described in the Qur'an has made the acceptance of this model more plausible" (Mansouri, 2010, 26). For example, in his article, Labibzadeh relates the emergence of four-part divisions to Qur'anic concepts and considers them as a criterion for the emergence of this model. "After the advent of Islam and relying on Quranic concepts, four-part divisions have appeared in the plan of Persian gardens" (Labibzadeh, Hamzenejad & Khanmohammadi, 2012, 10). Mahvash Aalemi, by drawing a garden described in Irshad al-Zara'a, believes that "passages and atmospheres formed a right-angled combination with checkered grids, but they were not necessarily four-part" (Alemi & Yazdi, 2008, 6). Mansouri explains Charbagh as just one of the common patterns of Persian gardens and believes that "the rectilinear geometry of the Persian garden with the axes and the orderly planting plan has created the concept of Chaharbagh by looking at the Iranians' beliefs about the number four" (Mansouri, 2010, 28). Citing Stronach's mistake and the conversion of the dashed line axis to the real axis by Hub House, Mansouri emphasizes in his article that Charbagh is a model in the structure of the Persian garden and can be analyzed in its own right. The idea of a very precise geometric system in the division of terraces and the division based on the four-part system of the Persian garden is far from its reality throughout history, and what seems to be reliable, continuous, and visible is the use of a rectangular system based on straight lines in almost all Persian gardens (Fig. 1).

In the latest claims in the field of the interior geometry of Persian gardens, Motadayen (2017) in the book "History of World Gardening", divides Persian gardens into the following (Fig. 2) four general patterns by examining the theories, and background of methods that were used to organize the interior elements of the Persian garden.

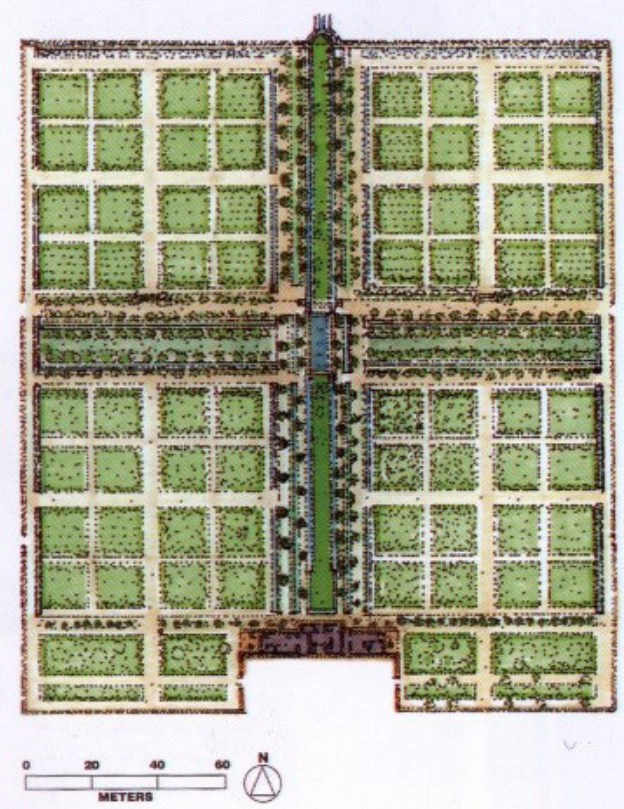
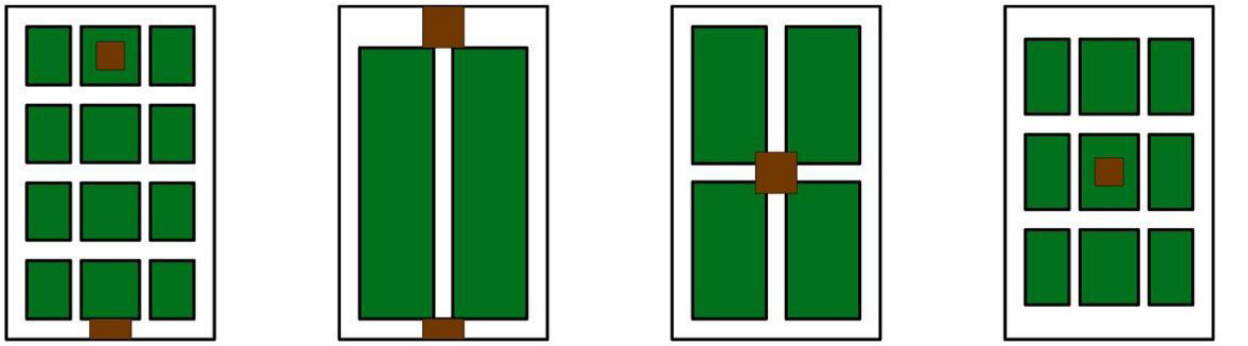


Fig. 1. Golshan Tabas Garden as an example of modular four-part divisions. Source: Khansari, Yavari & Moghtader, 2004.

• Main axis and vision span

The Persian garden had a geometric system and used smooth lines in order to have a wide view (Fig. 3). "The geometric structure of the Persian garden defines direct and purposeful axes that, based on environmental psychology research, give such pathways a sense of purposefulness, reflection, and exploration" (Shahcheraghi, 2009, 78). "Since this axis plays an essential role in creating perspective, it makes the garden look longer and increases the size of the garden psychologically" (Heidar Nattaj, 2013, 10). "The axis, without attempting to show a landscaped view of the garden, takes advantage of all the possibilities provided by virtual and built-in perspectives in space, and creates a vast landscape. From Pasargad, as a field stretched in front of the palace, to the Shahzadeh Garden of Mahan, in the form of a narrow passage, and the gardens of Birjand, without the presence of water, the garden's street takes various forms" (Mansouri, 2005, 59). Apart from acting as a backbone, the axis of the Persian garden plays a role in creating a wide view. This wide view was mostly created virtually due to the human scale of historic gardens and through optical illusion. It seems that the purpose of creating these axes is to emphasize infinite vision and landscape.



Checkered system
Example of Farahabad or Hezar Jarib Garden

Axis oriented system
Example of Shahzadeh Mahan Historical Garden

Centralist system
Example of Jahan Nama

Nine-Part system
Example of Homayoun Tomb-Garden, India

Fig. 2. Four different readings of the Persian garden pattern. Source: Motadayen, 2017.

Fig. 3. The main axis of Delgosha Garden. Source: Khansari, Yavari & Moghtader, 2004.

Therefore, by exploring the geometry of Persian gardens, we come across axes with different lengths and proportions, different roles on both sides of the pavilion, parallel axes with different degrees of importance, etc., which show the changes and developments of this important and main element in the structure of the Persian garden. Most Iranian private gardens provide the desired view relying on the main axis, and the main activities and focus are in this direction; But in public gardens, such as Farahabad and Hezar Jarib in Isfahan, we are faced with numerous longitudinal and transverse axes of equal importance, which shows the dominance of free movement instead of focal concentration. This shows that a key element such as the axis can have less value in the public aspect of gardening, than in private gardens and be somewhat flexible against the expectations of the garden.

Therefore, the Persian garden axis should be used in the contemporary urban green spaces with both approaches of creating focus and unbounded view, or with the approach of free movement.

• Pavilion and viewpoint

The construction of the pavilion in Persian gardens, in addition to its residential function, had stronger reasons, in terms of landscape (Fig. 4). In Mirsalim's words, "it was preferred to place the buildings inside the garden in a location with the best views" (Mirsalim, 1996, 590). In garden design, although the ground conditions are highly influential, determining the location of the pavilion and viewpoints can be totally conscious, symbolic, and semantic. There are theories based on ritual beliefs about the presence of pavilions in the Persian garden, in which the pavilions are considered as allegorical symbols of the heavenly pavilions promised to the believers. "Qurfah is the name of the highest houses of paradise. Therefore, the Qurfah has better weather, better views, and is a quieter place to live. The Qurfahs in pavilions in the Persian garden have acquired these characteristics of paradise" (Ansari, 1999, 109).

This building may not have a residential use in some cases, and may be used only as a viewpoint. Examining the architecture of Persepolis and the temple of Anahita in Kangavar, etc., we find that creating a building at a

Fig. 4. Pavillion of Hasht-Behesht Garden. Source: Norani, 2008.

height and even placing it on handmade plates has had a higher purpose than honoring the building. The important goal is to provide a selected view to the observer. The position of presenting this favorable view has changed in different periods from porches to pavilions.

Examining the position of the pavilion in the garden, the type of architecture, and the structure of its building, it can be concluded that the pavilions were subject to being placed at a location in the garden where the observer could have a favorable view. In terms of shape and structure, the pavilions have been dependent on the type and extent of housing in them, and in a way, the function of its interior spaces originated from the expectations that were placed in them. In some gardens, such as the Chehel Sotoon Palace of Isfahan, the role of the pavilion's porch, as a wide viewpoint, justifies the form and orientation of the pavilion. In a garden like Hezar Jarib, there were several types of buildings, according to Homayouni and Vali Beyg, and in addition to the main pavilion in the middle of the garden, which was the tallest building, there were other pavilions and buildings in the garden (Homayooni & Valibeig, 2021, 19). This shows that the pavilion is not just a service building, and there have been other buildings contrived or added in the gardens accordingly for this purpose.

The main role of the pavilion in the garden is related to its viewpoint, which becomes more apparent by the number of floors, the number and shape of the porches, and the angles of the porches' positions relative to the garden and its axes. Therefore, the use of buildings as pavilions can give way to viewpoints with different shapes and geometries in contemporary parks, and the service role of buildings in the garden can be transformed into service and cultural functions in parks. The position of the pavilion at the intersection of the axes and key points of the garden at the present time, thus, indicates a suitable point to find the desired view, which can be strengthened with different strategies and measures, in which there is no building as large as the pavilion.

• Locating the garden

Due to the basic need for water for the development of gardens, it was quite logical to position them at the appearance points of Qanats (aqueducts) or springs (Fig. 5). For this reason, permanent water is a necessary condition for the construction of a Persian garden. "In the past, the water needed to build a garden was provided only from natural springs" (Ansari, 1999, 46). The slope of the land has also influenced the formation of the garden. One of the reasons for this is the possibility for the natural movement of water in the garden. In addition, the sloping ground also causes the geometric orientation of the garden. "The presence of sloping land is another necessary condition for irrigating the garden, and the direction of the garden is formed accordingly" (ibid, 155).

The location and construction of a Persian garden have been affected by the slope of the land, the source of water supply to the garden and …. In most cases, the Persian garden was formed in an empty bed and did not need to be in harmony with the man-made environment around it. The overall rectangular and right-angled geometry of the garden also contrasted with the surrounding natural environment. In this case, the construction of this special geometry, which is known as the archetype of the Persian garden, has been obvious and simple. In special cases and under the influence of the topography of the land, the garden was sloping or in rare cases, such as Isfahan's Charbagh on the banks of the Zayandeh-Rood River, the natural forms around the bed have affected

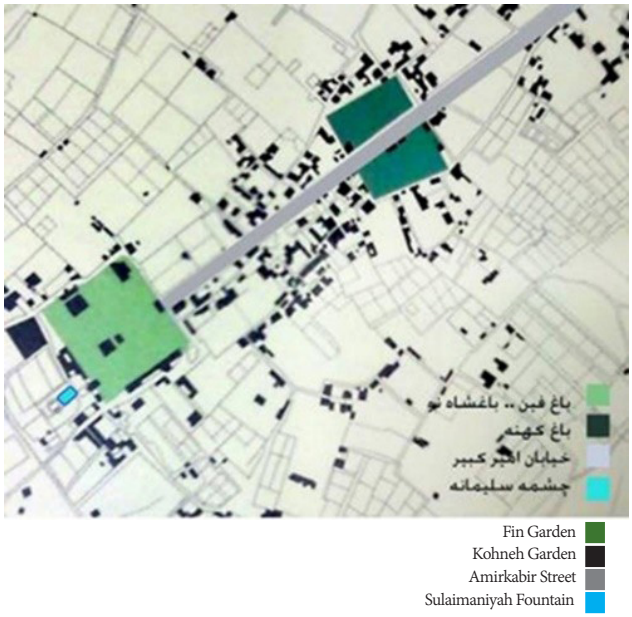


Fig. 5. The situation of the old and the new (Finn) garden relative to each other and the Sulaimaniyah spring. Source: Tariveh, 2010.

this geometry and changed it (Fig. 6). Therefore, the creation of this geometry in cases where the site and location of the garden did not allow it to be created has changed according to the bedding, and this geometry has been insisted on to exist as much as possible. In the contemporary period, reviving the pattern of the Persian garden is much easier than other traditional patterns; Because this pattern, due to a special coincidence, is in harmony with the checkered and vehicle-based structure of modern contemporary cities and can be easily placed in urban blocks. On the other hand, proximity to the water source for watering the garden is not a priority at the present moment as one of the factors in locating an urban park, and urban water supply networks have neutralized this factor.

• Symmetry and balance

Symmetry has been used in traditional Iranian architecture in various forms. The Persian garden is no exception to this principle. This symmetry is evident in the geometry and method of planting trees. "Iranians from the Achaemenid period wanted to create orderly gardens based on straight lines and symmetrical plantings" (Pechere, 1982, 20). "Terraces, buildings, entrances, sides of pathways, streams, fountains, many plants, and the garden as a whole generally exhibit varied manifestations of symmetry" (Naghizadeh, 2013, 8).

By examining the plan of most Persian gardens; Symmetry is evident in the totality of their geometry. The axis of symmetry in most gardens is the main axis of the garden and "the pavilion as the main building of the garden is located on its axis of symmetry" (Heidar Nattaj, 2010, 89). By being located in the geometric center of the garden, the pavilions play an important role in completing its symmetry.

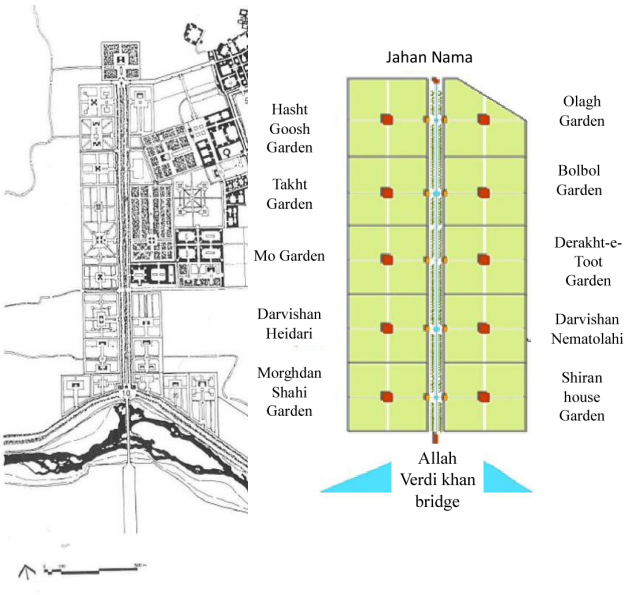


Fig. 6. Left: Drawing of Isfahan's Charbagh, by Donald Wilber. Source: Wilber, 1969, 85. Right: The Charbagh axis in the Safavid period based on Chardin's descriptions. Source: Rezaeian & Kaboli, 2012. The change in the right-angled geometry of the garden in dealing with the external factors of the site in Isfahan's Chaharbagh is evident in two narrations.

In examining the geometry of many Persian garden plans such as Hasht Behesht and Finn, the symmetry is generally visible and recognizable. But sometimes, apart from the symmetry on both sides of the main axis, the requirement for symmetry is reduced by moving away from this area, and generally, the garden follows more of its function and other requirements instead of adhering to symmetry. Where this symmetry is seen in the geometry of the terraces, the vegetation around these terraces plays a key role in creating symmetry, and inside the terraces, this symmetry is not seen in the use of similar plants. Therefore, there is symmetry in the Persian garden in key points such as the center and the main axis, and the micro-spaces resulting from symmetric geometry have their own unique personality and function; For this reason, symmetry can be considered in the general geometry of the garden, only in both sides of an axis, or around the center according to the necessity and characteristics of the bed of the urban green space. Even if necessary, it can be ignored and only create a symmetrical view with elements such as trees. According to the explanations provided, the components of urban park spaces can, in addition to the role they play in symmetrical geometry, act completely independently in their function, and it is not necessary to repeat similar spaces for maintaining symmetry, and this symmetry was sufficient in terms of shape and general geometry in Persian gardens.

• Security and privacy

The general image of the Persian garden in mind is an area enclosed between walls. This fence was built for various reasons and, like other elements of the garden, has changed in different periods. In many sources, the Persian garden has been compared to paradise (Fig. 7). In Zoroastrian texts, heaven is mentioned to mean Ferdows, which Klaus Herdeg considers "Ferdows means enclosed garden in Persian" (Herdeg, 1997, 49). Some believe that the reason for the wall around the garden is due to the climate. "The wall in the Persian garden implies a deep meaning, which is the development of water for the creation of a compositional world in the hot and dry climate of Iran" (Masoudi, 2003, 303). The above view is questionable after examining historical examples. Most gardens are enclosed regardless of the climate in which they are located. The Shahzadeh or Finn Garden in the middle of the desert are as enclosed by a fence as the Safi Abad Garden in the heart of the forest, or the Jahan Nama Garden in the center of the city (Fig. 8).

Fig. 7. Entrance of the Shahzadeh Garden of Mahan. Source: Norani, 2008.

Fig. 8. Mesh wall around Prince Shahzadeh Mahan's Garden. Source: Norani, 2008.

Elsewhere, the garden fence is considered to be the result of two factors: belief and use. "These fences were boundaries that not only morally prevented others from entering them, but also prevented visual and even auditory communication between two adjacent spaces in some cases" (Naghizadeh, 2013, 8). Introversion and privacy of gardens of the Islamic era were due to adhering to the Quranic descriptions of paradise. In the Az-Zumar Surah, verse 73, mentioning the gardens of Paradise, it is mentioned that when the pious enter, the gates of Paradise are opened and the guards say to them: "Peace be upon you! ... Enter Paradise and abide forever" (Makarem Shirazi, 1974, 553). This indicates that the gardens of paradise have various doors that in Persian gardening is displayed through the physical enclosure. In the garden, walls and entrances have played a key role in providing security. For these reasons, most Persian gardens have high walls to deal with environmental factors, and dealing with human factors has turned some gardens into castles in flat areas. Therefore, whenever security-disrupting variables are reduced, or political or environmental security is provided, the severity of these restrictions is reduced. "The political security provided during the Safavid period led to the creation of Tajir (screening) Gardens as gardens with lattice walls" (Ansari, 1999, 187). But, Shahcheraghi does not consider the existence of security as the only condition for removing the fence. He considers the generalization of gardens during the Safavid period as the reason for this transparency in the walls. "Lattice walls of the gardens made it possible for pedestrians to see inside the garden" (Shahcheraghi, 2008). The security factor alone could not explain why the fence existed because the kings' gardens were also enclosed in protected areas, such as Abbasabad. Even in gardens intended for public use in the Safavid era, such as Farahabad and Hezar Jarib, we see fences and walls. For this reason, both the issue of security and the issue of privacy in the Persian garden, which could be provided sometimes with high walls and castles, sometimes with short layers and sometimes with lattice walls, were responsible for the existence of walls and fences. Also, the methods changes depending on the climate, the level of security, and the time of construction. Due to the changes and developments of the garden fence, it can be given a minimal role as a boundary. But in the contemporary period, the meaning of creating security in a public space has completely changed, and in fact, transparency and non-confinement play a role in increasing the feeling of security. For this reason, the fence of Persian gardens may not have a place in modern times and may even be problematic. However, in some cases, it may be used to determine the boundaries of the park or to direct users to specific entrances, and in terms of its shape and image, it can certainly be reduced to a low-rise sitting area, which also works with the sidewalks of the park.

• Humanizing and avoidance of extravagance

Proportions based on human scale are a principle in Iranian architecture. In Persian gardens, the proportions are such that when you need to have a wide view, the pavilion is built on several floors or in a high place of the garden so as not to disturb the desired view, and on the other hand, to ensure security, the fence around the garden is embedded in humanized proportions. According to the inference made from the writings of Pirnia (1994), visual spaces and corridors are formed based on human proportions in the Iranian landscape. Comparing this landscape with other types of gardening, we find that in Persian gardens, due to the preservation of human proportions and scale, the dimensions and distances are such that one can easily walk in the garden and achieve a certain understanding of space. "In religious values, as well as avoiding extravagance, special attention has been paid to size. Man also tries to maintain

size and balance in the environment by observing proportions in the dimensions of the space created by his own hand" (Pourjafar et al., 2013, 10). In order to avoid extravagance, activities such as the cultivation of fruitful and native plants as well as reasonable use of water, based on its presence in the region, can be mentioned. "Iranian gardeners avoided futility, used flowers rationally, and never planted anything for no reason" (Alexander Clouston, 2007, 121). For this reason, Persian gardens are designed to be extremely sustainable and their maintenance is not expensive. In the hierarchical system of urban planning, titles such as urban, regional, and neighborhood scale parks refer to the size and scale of parks, as well as the type of activities taking place in them; While in traditional Iranian gardening, the scale always remains at the level of human understanding through using a hierarchical system, geometry, terraces, and spatial segregation in different scales and areas, and the readability of the garden will not be damaged in any scale. Therefore, since the end-users of urban parks at any scale are citizens, a hierarchical segregation system should be considered to avoid large, incomprehensible scales in the urban environment. Obviously, natural sites with pristine landscapes are not intended, and it only refers to large man-made environments. Issues such as attention to water scarcity, the use of shade plants, etc. as sustainable representations have been emphasized in the last century due to lower energy consumption or low maintenance costs. Looking back at Persian gardens, we find that the use of natural resources to organize the garden space is affected by the frequency and cost of work, and therefore the diversity of the presence of an element such as water in Persian gardens varies from its removal in Khorasan gardens in eastern Iran, to its use in a lake scale in the garden of El Goli in western Iran. Therefore, the optimal use of an element was considered essential, which is fully consistent with modern sustainability principles. Issues such as not using water or shade plants with inefficient water consumption have been solved centuries ago in the Persian garden. These gardens are designed in an almost sustainable manner based on the climate, and many sustained cases can show this so far.

• Simplicity and variety

The simplicity of design in Persian gardens is more tangible than in the Islamic architecture of this land. Creating a pure and earnest space by combining elements that are used in their most natural form, leaves no room for complexity and ambiguity for the audience (Fig. 9). Naghizadeh explains this simplicity by comparing Persian gardens with other types of gardens in the world. "Unlike the complex and labyrinthine geometric forms of the western gardens, in the Persian

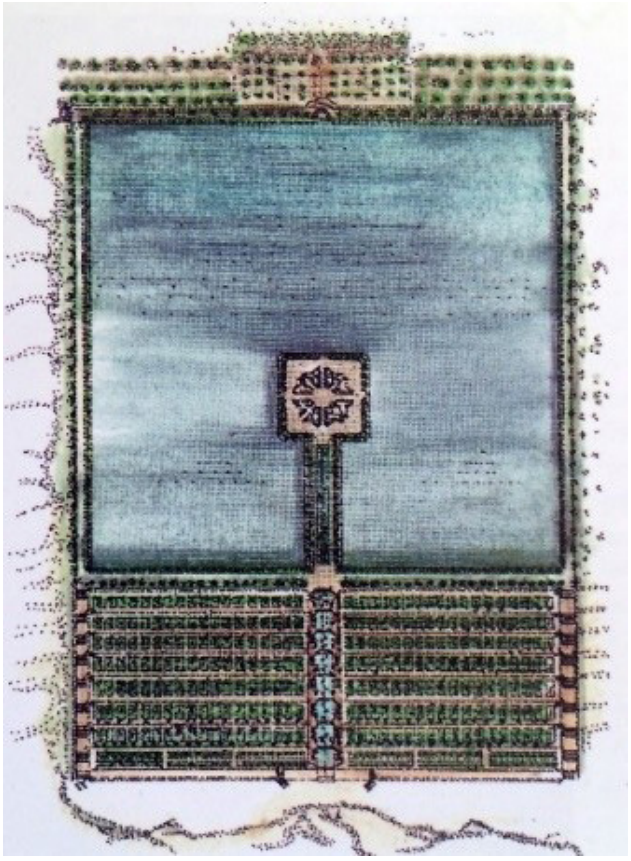


Fig. 9. Plan of the El Goli Garden of Tabriz. Source: Khansari, Yavari & Moghtader, 2004.

gardens, the planting method caused the garden not to be seriously distinguished from the pristine nature in terms of beauty and simplicity" (Naghizadeh, 2013, 7). "Persian gardens may look similar in design, but with a little scrutiny, the various forms of their design become apparent" (Alai, 2010, 20). Persian gardens are highly readable due to their simplicity and have undergone changes in different eras. But these developments have not affected the overall understanding of these gardens. This diversity and variety, while maintaining simplicity, may be the reason why they have lasted until the present age. Many consider these developments necessary and emphasize the recognition of these developments. "Numerous documents show that the Persian garden has reproduced itself for centuries in various forms" (Barati, 2011, 12). "Persian garden during its experimental life has all the characteristics of a phenomenon: it undergoes transformation and affects the overall human environment" (Falamki, 2010, 662). The issue of simplicity in the Persian garden, as one of the principles of Iranian architectural design, is one of the secrets of its durability and readability. Readability in a large space increases the sense of security and quick understanding of the place. For this reason, perhaps

Table 4. Offering suggestions in the form of different environmental. Source: Authors.

there is room for the simplicity of Persian gardens in the design of urban green spaces. The design approach in this type of space in the contemporary period has mainly gone toward complexity and variety of forms and shapes, which itself has become the reason for unreadability, and consequently, the lack of a two-way relationship between the modern man and nature. Therefore, simplicity and purity in presenting nature in the Persian garden can be a modern design model through which the sustainability of the artificial space is increased, and at the same time, its connection and readability are maintained.

The issue of variety in shape and geometry, arrangement of elements, size, and scale in Persian gardens, shows that creating new varieties to meet new material or semantic needs is accepted in the Persian garden pattern, and the seemingly consistent and organized structure of Persian gardens has undergone many changes over time, and has left behind a diverse set of variations. The interruption of the historical course of using gardens has deprived us of the new varieties that could be formed due to new technology and needs, and in a way, this historical break has caused the fear of creating diversity and change in this flexible pattern.

Summarizing the criteria in Persian gardens through time

-The general geometric structure of the Persian garden pattern in most cases uses straight lines and is right-angled, due to its location in a pristine environment and the absence of influential elements, but in the internal structural system of the garden, the geometries are diverse and some designs are four-part, two-part, elongated and .... Of course, the general structure has also changed according to the bed and to harmonize with the environment.

- In most gardens, the axis, in interaction with the pavilion as a viewpoint, offers a wide and comprehensive view to the audience. However, the existence of axes parallel to the main axis, or multiple sub-axes perpendicular to the main axis as movement corridors, is evident in the public examples of the garden, which itself indicates the conversion of the axis into a passageway in this type of historic gardens.

-Most gardens are enclosed and this enclosure is subject to factors such as climate, security, etc., and has undergone many changes, and their role has diminished in a period of time.

-The amount and volume of water used in gardens are proportional to the climate and the amount of water existing there permanently. The ways in which water is displayed in various forms in gardens vary according to the aesthetic type or landscape function of the water.

- In most cases, the planting of trees and plants follows a precise order and defines the geometry of the terraces, and the order of the garden.

- In all gardens, local materials have been used and efforts have been made to minimize interference with the bed. The main plants of these gardens, apart from their landscape role, have also been fruitful.

- Gardens have different scales in terms of size. These scales vary from small public and private gardens to 1,000-acre public gardens and have changed greatly depending on their function.

The sum of the above features and characteristics in the Persian garden shows that the general indicators and the internal organization of the gardens have shown flexibility, and changed over time based on material, functional, or even semantic requirements.

History of urban parks

Contrary to popular belief that Persian gardens were private until the early Pahlavi period and that people did not use these spaces, the first example of public green space was established in the Safavid era. "Gardens such as a Hezar Jarib, urban spaces such as Charbagh Street, Chehelsotoon, and Hasht Behesht have been examples of these spaces. According to the writings, these gardens were open to the public on some days" (Motadayen, 2010, 59). "The word park first entered the vocabulary of urbanization in Iran during the reign of Nasser al-Din Shah. During this period, new spaces appeared in the city, which have been called parks in writings, documents and maps ever since" (Majlesi koopaei, Ansari, Bemanian & Fkhar Tehrani, 2013, 3). "A relatively complete plan of Boehler's plan for the expansion of Tehran during Nasser al-Din Shah's period was drawn by Abdul Ghafar Khan Najm al-Mulk" (Saeid Nia, 2009, 227), (Fig. 10). "In this map, three spaces are specifically named as parks: Zelle Sultan Park, Conte de Monte Forte Park - Nazm-ol-Molk - known as Naseri Park, and Amin al-Dawla Park" (Mansouri, 2010, 28). "Despite the use of the word 'park' in these gardens, it does not appear that these spaces are for public use, considering the concept of the park, but they may have been named so, due to the design and elements used in them or the possibility of public access at certain times under the supervision of the park owner" (Soltani, 2007, 53). The emergence of urban parks in the modern sense dates back to the Pahlavi period. With a brief look at the design of urban parks in Tehran, we find that in most cases, the design has been done regardless of the culture and relationship of Iranians with nature, and in the following decades, it has been the cause of many social harms.

Lack of continuity of standards in contemporary parks

Parks have been introduced in many sources as Tehran's urban green space, and their design background can also

Fig. 10. Tehran in Nasser al-Din Shah's period. Source: Mojtaba Ansari's personal archive.

help in content analysis. Most of the parks in Tehran are located according to the per capita system and according to conditions such as the existence of large land for construction. In most cases, the checkered and block geometry of the city has affected their boundaries. Examination of the plan of parks in Tehran shows that most of them do not have a specific geometric structure and the communication paths between the spaces in them are completely preferential and created unorderly (Figs. 11 & 12). These amorphous spaces and the paths branching from them are based on the western pattern of park building, and are the causes of the unreadability of the park. In most parks in Tehran, there is no order in planting plants and sometimes the plants are pruned in different ways, which contradicts the criterion of simplicity. This irregularity in planting prevents the formation of a mental image of the garden in the mind of the observer.

The use of large fountains in the parks of Tehran without the Iranian aesthetic function and the production of a soft sound in the low rain bed is a perfect example of extravagance. In most of these parks, all paths lead to its central space, which is often a fountain or pool. Of course, the destination is not recognizable in the routes and the audience does not even perceive what awaits at the end of the route. After reaching the destination, unlike the Persian gardens, the viewer is not given a wide view and only a fountain can be seen. The lack of destinations and viewpoints in the parks adds to the audience's confusion in understanding them.

The following can be extracted from an overview of some design criteria in parks of Tehran:

- Some parks have a rectangular structure in their totality, which is also due to the urban checkered block system. Of course, this rectangular structure is not generalized in details and internal organization, which requires a more detailed examination to determine its desirability or undesirability.
- In parks, there is no special interaction between the main axis and the pavilion, building, or viewpoint to create a wide view, and often due to the lack of axis or viewpoint, the landscape view in the parks is not understood.
-The location of these parks is not consistent with the presence of water at the construction site and most of them are fed by digging wells. This does not seem logical given the principles of sustainable development and the concept of avoiding extravagance.
-The presence of water in the parks is focused on large pools and fountains, and water does not flow on the surface. This type of presence of water and, of course, the sound of huge fountains has distorted the dominant mental image of Iranians in the face of nature.
- Park fences have existed until a few decades ago and are now removed due to the change in the concept of security in public spaces and the use of social surveillance, which is a correct action.
-The use of non-native, non-fruitful plants and sometimes in contradiction with the climate of Tehran has caused extravagance and imposed high costs.
-The large scale along with aimless paths in some parks makes it practically impossible to understand their totality and the audience uses and understands only a part of it.

Conclusion

Comparing the existing criteria in Persian gardens and urban parks, we conclude that the general concepts and variable organizations of Persian gardens have not been extended with the same historical flexibility in the construction of recreational spaces in contemporary cities, and only their environmental aspect has been used in cities. By examining the historical course until the end of the Qajar period and even after the Nasser al-Din Shah's period, these patterns have been extended in the construction of private gardens of princes and courtiers, and we see the westernized internal organization in a limited way, such as Amin al-Dawla, etc. Prior to this, in the Qajar period, the most westernization was manifested in the decoration of plants or the shape of ponds, which again shows the flexibility of the garden. But contrary to expectations, with the beginning of the Pahlavi period and contrary to the claims of returning

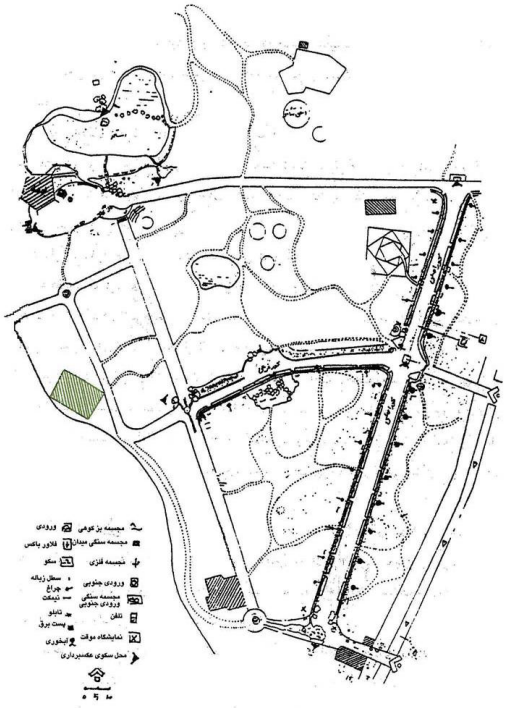


Fig. 11. Jamshidieh Park. Source: Tehran gardens and green spaces Organization.

Fig. 12. Laleh Park, the existence of curved paths and lack of clear geometry. Source: District 6 Municipality Archive.

to the values of ancient Iran, and despite the boom of special postmodern architecture in Iran in which reference to historical elements occurs with a new approach or function, no attention is paid to the past and there is not even a formal interpretation of past examples in creating urban green spaces. Perhaps the reasons for this inattentiveness can be found in the use of architectural designers, or in the idea that the royal model of historical gardens can not meet the needs of modern man in the city. Though, there are examples of using the Persian garden model in shaping the system of a city in the Safavid period in the present era. The lack of awareness or lack of knowledge of the capacities of the Persian garden can not be considered as a criterion for their non-continuity. However, the gap in the Pahlavi period is the beginning of the obscurity of urban parks.

If based on the provided explanations, we consider Persian gardens as a variable, flexible, and diverse phenomenon, we can see the nature of being modern, which means it can change in the direction of sustainability and improving performance or updating them. It seems that the solution for escaping from the obscurity that was formed from the early Pahlavi period and continues until now is to refer to the criteria that existed in the past landscape of the country, which can be easily generalized to the present based on their flexibility. This article presented minimal cases, for example, for how to benefit from the concepts, form, and archetypal elements of the Persian garden in urban green spaces, under each of the indicators. However, the use of this archetype can bring many other variations and manifestations based on the designer's own thoughts, climate, and creativity. It should also be noted that the use of all concepts or elements and functions of the Persian garden is not necessary for contemporary urban parks. The use of the Persian garden pattern should not inevitably force the designer to borrow geometry, pavilions, water system, and planting method, etc. in the contemporary design. It should be so that, just as Persian gardens throughout history have reduced or even removed some elements according to their requirements, the designer is free to only use a specific element or function in the present age, and consider it an update of an archetype. Fear of not interfering in a historical style or pattern in order to sanctify and construct purely semantic stereotypes of historical elements, while protecting a spiritual heritage can lead to its stagnation and freezing in time, which will cause the heritage to be forgotten in the course of history, and it will be wiped out of the minds of nations and destroy them forever. Examples such as the sanctity of the elements of the architectural model of mosques as models of Islamic architecture, or the semantics and

non-compliance with modern needs of the Persian garden model are among these cases.

A holistic view of history shows that if our predecessors had taken this conservative approach, there might not have been a legacy of Islamic architecture or a Persian garden for our nation today. The secret of the permanence of these archetypes is in their updating, innovation, creativity, and in their adapting to the new society and time, which should continue in the present age. The design of some urban parks with different scales with various patterns of Persian gardens in recent years can be a good starting point to test this flexible pattern for use in the present era and may break the stereotypes of formal or objective use of some traditional elements.

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