

Original Research Article

The Role of Street and Its Components in Iranian Garden*

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Abstract | The main street of the garden is one of the four important elements of the Iranian garden (entrance, street, pavilion, wall) and connects the entrance to the pavilion. But on what basis is this important element designed and what is the reason for the diversity of street in Iranian gardens? The answer to this question can open the way for street design in projects with the idea of an Iranian garden. The element of the street itself includes important components such as land, water and plants. Each of them has roles that summing up the role of these components results in the role of the street. Until now, many researches have been done on the components of Iranian Garden Street and they have been looked at from different angles. But which of these angles has been the most attention of the Iranian landscape architect for the design of each component of the street. To investigate this issue, ten gardens have been selected in different places and times, and through the investigation of these gardens, conclusions have been drawn for the design of the street and its role. The defined roles include functional-climatic, formal, spatial, socio-cultural and semantic. The role of each component of the street in the selected gardens has been qualitatively evaluated and finally the dominant role of that component has been concluded. Based on this, the component of earth has a dominant semantic role, the component of water has dominant roles of spatial, socio-cultural and semantic and the component of plant has a dominant roles of spatial and socio-cultural. But in general, the dominant roles repeated in the components of the street is the socio-cultural role. Also, the street role of each garden and as a result the reason for its design has been determined in this way. Iranian garden Street is a space of the garden where natural elements are honored, human beings are also honored, and the most human presence and social interactions take place there.

Keywords | *Iranian garden, Street, Street's components, Components' role.*

Introduction | The main street of the garden is one of the four important elements of the Iranian garden, including the entrance, street, pavilion, and wall, and serves as a connector between the entrance and the pavilion. These four elements are specifically presented by the author as all of them are designed and constructed by the garden architect and hold significance in the design and construction of an Iranian garden. Furthermore, these four elements are directly interacted with by the audience from outside the garden to the pavilion (the main destination of the garden), and thus the garden architect has put the utmost effort into their design. Among these elements, only the street has natural components. The two natural elements of water

and plants, along with the artificial element of the ground, are the main components of the garden street that the garden architect has specifically focused on in their design. Therefore, it can confidently be said that it is the most significant part of the garden, where the audience establishes a direct connection with the main components of the garden, and it is in this place that the close relationship between humans and water and plants occurs. But what are the characteristics of this element? Why does it appear differently in various Iranian gardens, and what factors should be considered in designing the Iranian garden to make the right decisions for its street and its components? The answers to these questions can help design the street in Iranian garden-inspired plans. It seems that the garden street appears differently

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based on the role it plays, and if the role of the street is correctly identified in a design, it will have a proper and harmonious design with Iranian gardens.

Research Background

So far, there hasn't been direct research specifically addressing the reasons for the variations in street designs within Iranian gardens. However, there have been repeated studies on the components of the street, such as the ground, water, and plants. For example, in the article "Recognition and Analyses of the Persian Gardens' Elements with Respect to Ethical Principles" (Zamani et al., 2009), aspects of water and plants in the Iranian garden are discussed. The article "Importance of Water, Its Elements and Pools in Persian Garden" (Soltanzadeh & Soltanzadeh, 2017) and the article "The Role of the Water System in the Eternity of the Persian Garden" (Yarahmadi et al., 2022). address the role of water in the Iranian garden. The article "The Productive Landscape in Persian Gardens; Foundations and Features" (Khalilnezhad & Tobias, 2016) discusses the role of plants in the Iranian garden, and the article "Analysing the Perception Process of Persian Garden's Environment, According to the Echologic Psychological Theory" refers to the role of the street in the Iranian garden (Shahcheraghi, 2019). Additionally, the article "Spirit of Place in Persian Garden" (Medghalch et al., 2014) explores the characteristics of the Iranian garden street.

Theoretical Foundations

The term "role" means function or performance. The functions and performances of the street in an Iranian garden and its components have a hierarchical structure from subjective to objective or from material to spiritual, and it is not limited to a modernist perspective of materiality. Thus, the role or function of the street in an Iranian garden and its components embody the underlying theoretical foundations. The role can also be considered equivalent to the design purposes.

To support the research hypothesis, roles can be categorized into five groups: functional-climatic, formal, spatial, socio-cultural, and symbolic. Similar phrases have been previously used by Dr. Memarian in the book "An Overview of the Theoretical

Foundations of Architecture"; perspectives that have been of interest to specific groups of architects throughout history (climatic perspective, formal perspective, historical-evolutionary perspective, spatial perspective, socio-cultural perspective, and symbolic perspective) (Memarian, 2005). By reviewing these perspectives and considering various aspects of systemic architecture (holistic perspective) (Noghrekar, Jahanbakhsh & Hamzehnezhad, 2016), the mentioned titles have been obtained. According to the systemic (holistic) approach, a hierarchical structure from subjective to objective or from material to spiritual can be considered for these five categories of roles or functions, as shown in Fig.1.

Furthermore, the street in an Iranian garden can be examined in three parts: "ground," "water," and "plants". The reason for examining the street by separating these three components is the direct involvement of the architect or garden designer in their design. The extracted information from the previous research background regarding the street components (ground, water, and plants) and their roles is presented in Table 1. As observed, instead of the mentioned titles for the roles, other titles such as "comforting and securing," "beautifying and unifying," "space-making and landscape creating," "inviting and interactive," and "calming and thought-provoking" can be used. However, for the sake of simplicity, they are not changed.

Research Methodology

To study the street in an Iranian garden, a number of Iranian gardens from different periods and geographical locations (representing the eight climatic regions of Iran) are first selected. Then, the study focuses on the components of the street in the Iranian garden within these gardens. In this research, each component of the Iranian garden street is qualitatively valued through a descriptive-analytical method. The valuations are conducted in a way that establishes a relationship between the roles and the physical characteristics of the components of the Iranian garden street. In the tables, the color representing the physical characteristic of the component and the related role are selected similarly to indicate the prominent role of

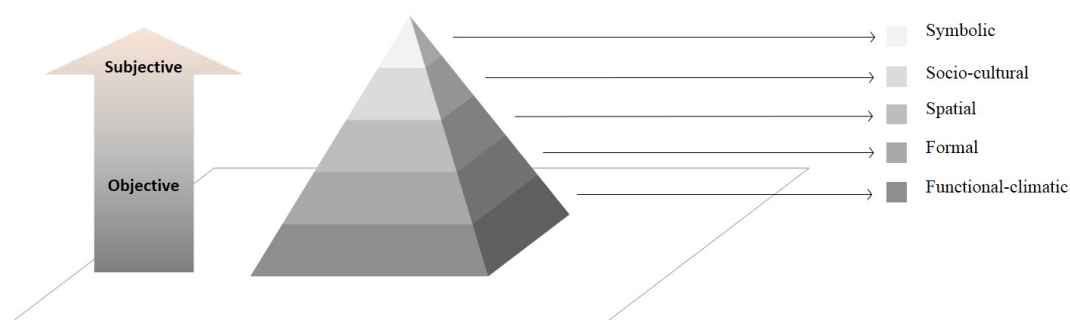


Fig. 1. Hierarchy Pyramid of Street Roles in an Iranian Garden. Source: Author.

Table 1. Street Roles in an Iranian Garden, Extracted from Research Background, with the Most Emphasized Role for Each Street Component Highlighted in Gray. Source: Author.

Roles	Description	Ground in Street	Water in Street	Plants in Street
Functional-climatic	-Depending on performance, climate, and environment	-The slope of the land to move water (Medghalchi et al., 2014)	-Irrigation and use of coolness (Zamani et al., 2009) -Washing, recreation (Soltanzadeh & Soltanzadeh, 2017) -Readability and orientation, contentment and saving (Yarahmadi et al., 2022)	-Shading (Shahcheraghi, 2009; Zamani et al., 2009) -Fruit-baring, use of wood, windbreak (Zamani et al., 2019) -Having healing properties (Nili et al., 2013) -Recreation, attracting birds, multi-functionality, climatic (Khalilnezhad & Tobias, 2016)
Formal	-Related to the body -Formal aesthetics	-The slope of the land and its steps (Medghalchi et al., 2014)	-Reflection (Zamani et al., 2009) -Appearance beauty, diverse displays of the presence of water such as still, flowing, and fountain, spatial diversity, innovation (Yarahmadi et al., 2022)	-Garden decoration, color diversity in the combined use of deciduous and evergreen trees, beauty and eye-catching (Zamani et al., 2009) -Diverse composition (Khalilnezhad & Tobias, 2016).
Spatial	-Depending on the definition of space -Visions -Arousing the senses	-Stepped terrain and creation of single-point deep perspective (Medghalchi et al., 2014)	-The sound of water, reflection of water (Zamani et al., 2009) -Movement of water on the slope of the ground (Medghalchi et al., 2014)	-The fragrance of blossoms and flowers (Zamani et al., 2009) -Single-point deep perspective (Medghalchi et al., 2014)
Socio-cultural	-Dependent on social interactions, customs	-	-Recreation, various ceremonies honoring water, symbolic pond in front of the building (Soltanzadeh, & Soltanzadeh, 2017) -Legends of water and goddess Anahita, identity, naturalism, place of solitude and contemplation, social interactions, creation factor of vitality (Yarahmadi et al., 2022)	-
Symbolic	-Dependent on transcendental, mental -Symbolic concepts -Virtual and unreal	-The natural slope and placement of the pavilion at the high point of the garden and an allegory of the meaning of Ferdows (Medqalchi et al., 2014)	-The manifestation of goodness, blessing, purity, heavenly waters, the spiritual aspect of water in mysticism (Zamani et al., 2009) -Water gives a sense of place (Medghalchi et al., 2014) -One of the four elements of life (Soltanzadeh & Soltanzadeh, 2017) -Sanctity, a manifestation of the essence of God, memorable, the factor of belonging to a place, inner beauty, reflection of the world above, a symbol of the renewal of the world (Yarahmadi et al., 2022)	-Honoring the tree in the Quranic verses and knowledge sources, the evergreen tree is a symbol of immortality, strength, and the power of reproduction, the flower is a symbol of divine manifestation (Zamani et al., 2009) -sense of place (Medghalchi et al., 2014).

that component in the garden street. The selected gardens are described as follows:

- 1- Pasargadae Garden (Achaemenid period): Semi-arid climate
- 2- Jahan Nama Garden in Shiraz (Zand period and possibly earlier than the Timurid period): Bordering between semi-arid and hot-dry climates
- 3- Fin Garden in Kashan (Safavid period and possibly Buyid dynasty): Bordering among three climates, semi-arid, hot-dry, and cold
- 4- Chehel Sotoun Garden in Isfahan (Safavid period): Bordering between semi-arid and cold climates
- 5- Chehel Sotoun Garden in Behshahr (Safavid period): Temperate and rainy climate
- 6- Gulshan Garden in Tabas (Afsharid period): Hot-dry climate

7- Dolat Abad Garden in Yazd (between the Afsharid and Zand periods): Semi-arid climate

8- Akbarieh Garden in Birjand (Qajar period): Bordering between semi-arid and cold climates

9- Pahlavanpour Garden in Mehriz (Qajar period): Cold climate

10- Shahzadeh Garden in Mahan (late Qajar period): Cold climate

Investigating Street's Components in Iranian Garden

• Ground in street

Based on the research background, the stepped street and the subsequent creation of the sense of place in the street give it functional-climatic, formal, spatial, and symbolic roles. However,

do all garden streets have steps? How does the ground play a role in flat streets? Does it have a noticeable effect or not? Now, let's examine the ground of the street in selected gardens (Fig. 2.) (Table 2). The ground in the garden streets from the entrance to the pavilion is considered in this study.

-It appears that the pavement of the streets in Pasargadae Gardens was made of gravel since no specific pavement has been discovered in archaeological excavations. Gravel was chosen for ease of movement with horses. Only at the edge of the pool, where the street is at the same level, stone carving has been used. The role of the ground in the street and the main courtyard is functional-climatic. Due to the change in pavement materials at the edge of the pool, it has a symbolic role. It also has a socio-cultural role due to the possibility of gathering in front of the pavilion. It has a weak spatial quality, and its form is not particularly prominent.

-The four pathways leading to the Jahan Nama Garden's pavilion, despite their geometric symmetry, differ from each other in detail. The ring and subsidiary streets also have pavements similar to the main street. These pavements are made with local materials. The small gardens either have no edges¹ or have minimal edges, and the pools are edgeless (with or without a foot-bath). The edges are made of cut stone. The paving of the main courtyard is different from the street. The main courtyard is entirely paved with cut stone and is more formal. The cut stone does not have a strong local character. The pavement of the street has a functional-climatic role, and the difference in paving between the main courtyard and the edge of the fountain has a symbolic significance. The formal nature of the pavement in the

main courtyard also has a socio-cultural role. It does not have a strong spatial quality, and its form is not particularly prominent.

-In the details of the paving in the Fin Garden streets, it can be observed that the same materials (cut stone, pebbles, and bricks) have been used, but the texture created with these materials is different in different axes. The diversity in texture is a prominent feature of the paving details in this garden. The ground covering of this garden somewhat resembles a gravel pavement that may have been used in the past. The edges of the small gardens are often raised and adorned with simple cut stone or brickwork in a herringbone pattern. The fountains are edgeless (with or without a foot-bath) and are paved with cut stone. The paving of the main courtyard is similar to the paving of the streets. The ground of the Fin Garden streets has a functional-climatic role due to the use of local materials. It also has a symbolic significance and evokes the image of a dry gravel pavement. It has some socio-cultural role and, due to its slight slope and steps, has a certain spatial and formal quality.

-The paving details of the Chehel Sotoun Garden in Isfahan have been different in the past compared to today. In the past, it consisted of gravel and pebbles, but now it has been transformed into paved stone. The contrast between the pebbles and the cut stone edges of the fountains has added a special beauty to the space. This detail was probably influenced by the ease of movement of horses, which has changed over time. Today, the paving of the main courtyard of Chehel Sotoun Garden is similar to the street paving and is made of cut stone tiles. This paving makes the garden more formal compared to the past, although the garden was originally designed for ceremonial purposes.

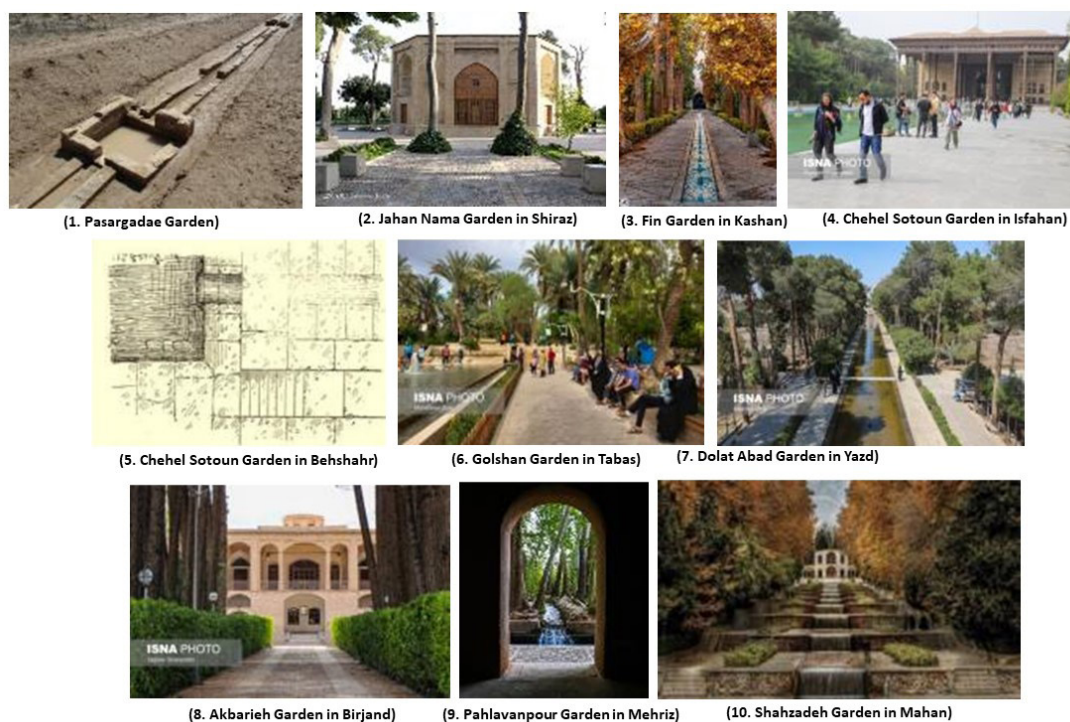


Fig. 2. A part of the land in the streets of selected gardens. Source: (1): www.pasargadae.info, (2): www.yjc.ir, (3): www.mashreghnews.ir, (4), (6), (7) & (8): www.isna.ir, (5): Mansouri Roudkoli et al., 2016), (9): www.farsnews.ir, (10): www.sinapress.ir.

Table 2 Roles of Street and Main Courtyard Paving in Selected Gardens and Their Abundance (The dominant role and its associated architectural feature in each row are indicated by a specific color. Each star assigned in the table is equivalent to 5% of the role)². Source: Author.

Case	Flooring of the main street/courtyard		Street width and yard size	Having steps	Edge connected to the fountain	Edge connected to the garden	Role				
							Functional-climatic	Formal	Spatial	Socio-cultural	Symbolic
Pasargadae	Gravel		High	None	Stone Wide	?	*****	**	**	*****	*****
Jahan Nama	River stone & Brick/Stone		Medium	None	Same level Stone	Same level or higher stone	*****	**	**	*****	*****
	Berm/Cut										
Fin	Generally, Riverstone		Medium	Low	Same level Stone wide	Same level or higher stone or brick	*****	***	***	***	*****
	In various compositions with brick										
Chehel Sotoun Garden in Isfahan	Stone	Cut	High	None	Same level same material	Higher same material	**** Formal function	**	**	*****	*****
Chehel Sotoun Garden in Behshahr	Stone	Cut	Medium	Medium	Same level same material	Higher Same material	*****	*****	*****	*****	*****
Golshan	Brick	Khaab Nama	Medium	Medium	Same level Same material	Same level or higher Same material	*****	*****	*****	*****	*****
Dolat Abad	Sand-patterned mosaics &		Medium	None brick &	Same level Brick	Same level Brick	*****	**	**	*****	*****
	Brick	Herringbone/Brick herringbone									
Akbarieh	River stone,		Medium	None	Same level Brick	Same level Brick	*****	**	**	*****	*****
	Stone	Cut/Brick Khaab nama									
Pahlavanpour	Gravel/ River stone &		Medium	None	Same level Brick	Same level Same material	*****	**	**	*****	*****
	Bricks										
	Higher courtyard										
Shahzadeh	Sand patterned mosaics &		High	Relatively High	Same level Stone	Same level or higher stone	****	****	****	****	****
	Stone										
The abundance of dominant roles of street ground							9	3	3	9	10

The main courtyard does not have a fountain but is surrounded by water streams and canals. The garden pool is located in the street, and its edges are not raised. Today, the role of paving in Chehel Sotoun Garden is primarily symbolic and socio-cultural, as it represents non-native and powerful symbols. It has some functional role as it aligns with the ceremonial function of the garden, but it is not climate-responsive or locally influenced. It does not have a significant spatial or formal role.

-What can be inferred from travelogues is that the floor of the Chehel Sotoun garden in Behshahr was made of stone. The remaining stones on the edges of the water canals can somewhat indicate the dimensions, material, and arrangement of these stones. Demorgan has also provided details of the stone pavement of the garden during the Qajar period (Mansouri Roudkoli et al., 2016). The ground of this garden has functional-climatic aspects because stone flooring is suitable and desirable in a moderate and humid climate, although it may not be entirely indigenous. This flooring also has socio-cultural significance as it facilitates pedestrian movement. The stepped nature of the street ground adds a spatial dimension to it. It also highlights its form and, therefore, has a significant symbolic meaning due to its stair-like structure. Therefore, it encompasses all these roles equally.

-The flooring of the Golshan garden is made of bricks, and the edges are also entirely made of bricks. The edges are often at the same level as the flooring, but due to the lowered level of the ground in the main axis, they are raised and act as a sitting area. Therefore, the role of the ground is functional-climatic and socio-cultural, suitable for pedestrian traffic and gathering. Due to its stepped structure, it also has significance in terms of form, spatiality, and symbolism, and it encompasses all these roles equally.

-In the main axis of Dolat-Abad Garden, brick pavement is used, and for the secondary axes and rings, a mosaic of sand pattern is used, but bricks are used in the margins. The fountain and the garden area have raised edges and are made of bricks. The main courtyard of the Dolat-Abad garden has a brick pavement with stone edges for the fountain. The role of the ground is functional-climatic. Due to the variation in flooring in the main courtyard, main axis, and edges of the fountain, it has symbolic and socio-cultural significance and is not particularly notable in terms of form and spatiality.

-Street paving in Birjand's Akbarieh Garden is done with cobblestone and cut stone. The ground covering in this garden can resemble gravel pavement that may have existed in the past. The garden and fountains have been constructed without raised edges. The main courtyard of Akbarieh Garden is paved with brick, and the fountain edges are also made of brick. The layout of Akbarieh Garden is similar to the Dolat-Abad Garden.

-Street paving in the Pahlavanpour Garden combines wood with gravel, and the garden paths are mostly edgeless. The roots of the plane trees along the street cover the edges of the water canals. The main courtyard of Pahlavanpour Garden is paved

with cobblestone, and the fountain edges are made of brick. The paving design is functional and suitable for the local climate. The diversity of street and courtyard paving has symbolic and socio-cultural significance, with minimal formal and spatial effects.

-Street paving in the Shahzadeh Garden of Mahan is done with mosaic tiles featuring a sandy design. The retaining walls are made of cobblestone, but the stairs are made of brick. The fountain foot-bath and garden edge are raised and made of stone. On both sides of the main street in the garden, the edges are raised to the knee level. The paving around the front fountain of the pavilion is made of stone. The role of the garden is similar to the Chehel Sotoun garden in Behshahr.

Summary: It can be observed that sand, river stone, and sandy patterned mosaic tiles are used for street paving. Stone, in a moderate and rainy climate, has functional-climatic significance. Stone, brick, and the width of the streets have socio-cultural significance due to their ability to accommodate gatherings. The cut stone and various arrangements of brick have transformed them into symbolic elements. The wide stone edges of the fountain also have symbolic significance due to their width and contrast with the street pavement. The presence of staircases in the streets adds formal, spatial, symbolic, and socio-cultural roles. Thus, the ground in the streets primarily has symbolic significance, followed by functional-climatic and socio-cultural roles.

• Water in streets

According to the research background and Table 1, it can be observed that water plays a dominant symbolic role in the Iranian garden street. But what physical characteristics give meaning to water? Is water equally symbolic in all Iranian garden streets? Now we will examine water in selected gardens (Fig. 3) (Table 3).

-In Pasargadae Garden, flowing water circulated on both sides of the streets and around the central garden. It also passed through the middle of the central garden. The water being seen in streams and basins frequently, in flowing and emblematic form, has had a symbolic role. Due to its proximity to the streets, it had a social-cultural role, and it also had a spatial aspect due to the sound of water movement. Additionally, because of its rhythm and decorative nature, it had a formal role, and the presence of basins gave it a functional-climatic role as it provided the sedimentation of mud and water.

-Gushing water is seen on both sides of the pavilion, one of the streets, and the entrance of the Jahan Nama Garden. These fountains gave a formal aspect to the garden. As they are gushing fountains, they have spatial, social-cultural, and symbolic roles. Due to their repetitive jet patterns, they also have a formal role. In terms of functional-climatic significance, they have a relatively weak role and only serve as connectors.

The flowing water can be seen in the belts and boiling water in the main axes of the Fin Garden. Elegance in the number of jets and sometimes even in foot-bath gives the garden a formal aspect. The gushing water of Fin Garden has played an important

role in terms of spatial orientation, and because of the symbol of the four heavenly streams and providing gathering space, it also has a socio-cultural and symbolic role. Also, because it has repeated jets, it has a formal role. From the functional-climatic point of view, it has a lesser role and only is a connector.

-The flowing water in the main courtyard and the reflective water in the street are among the characteristics of water presence in the Chehel Sotoun Garden. The orderly flow and expansiveness of the water in the main courtyard give it a ceremonial aspect, and the expansiveness of the reflective fountain also adds a doubled ceremonial and formal aspect to the wide street of the garden. The flowing water around the pavilion has a symbolic and emblematic role, emphasizing the pavilion. Additionally, due to the sound of the flowing water and its orderly shape, it also has a spatial and formal role. The pool in this garden, due to its symbolic and imaginative nature, has a symbolic and socio-cultural role, and due to its reflection and expansion of space, it also has a spatial and formal role. In terms of functional-climatic significance, it has a weak role because its water volume disregards the available water supply.

-Based on available documents and evidence from the Safavid to Qajar periods, the main courtyard of the Chehel Sotoun Garden in Behshahr had a relatively large fountain, possibly with a stone floor. This fountain had a great depth and a reflective role. In an article of Mansouri Roudkoli et al. (2016), the approximate location of the fountain has been determined

based on Henry Viollet's map (Fig. 3). This fountain was located precisely in front of the pavilions' facing gardens. Therefore, there existed flowing and cascading water in the main axis and reflective water in the main courtyard of the Chehel Sotoun Garden in Behshahr.

-Water flows downhill in the garden from the upper part to the lower part. Probably due to climatic reasons, there was no gushing water in this garden, as Pietro Della Valle does not mention them in his travelogue (*ibid.*). The use of carved stones in the location of the breakwaters is one of the unique features of the fountains in this garden. The role of these fountains, primarily due to their reflective and cascading nature, is mainly formal, spatial, socio-cultural, and symbolic. However, they have a limited functional-climatic role.

-Flowing water along the streets and a gushing fountain in the main courtyard, which is the center of the Golshan Garden of Tabas, create a joyful atmosphere. The flowing water and the placement of the gushing fountain in the center of the garden hold symbolic and meaningful significance. The gushing fountain in the central courtyard has a limited functional-climatic role due to its display nature, but the flowing water has a functional-climatic role due to its simplicity. The sound of the flowing and bubbling water also contributes to a spatial role. Additionally, the fountain in the central courtyard serves a socio-cultural role due to its ability to attract people for gathering and interaction.

-The gushing fountain in the main courtyard and the streaming



Fig. 3. Part of the water on the street of selected gardens. Source: (1): www.nujaa.com, (2) & (3): www.yjc.ir, (4) , (6) , (8) & (9): www.isna.ir, (5): Mansouri Roudkoli et al., 2016, (7): www.mehrnews.com, (10): www.farsnews.ir.

and flowing water with an orderly geometry in the inner street of the Dolat Abad Garden of Yazd give it a formal and ceremonial aspect. The role of water in this garden is spatial and symbolic due to its gushing and flowing nature. The geometrically flowing water and the repetitive basins of the gushing fountain have a formal role. They also have a socio-cultural role as they attract people for gathering and sightseeing. The fountain in this garden does not have much significance in terms of functional-climatic aspects because its volume disregards the available water supply. However, the flowing water has some functional and connecting roles.

-The gushing fountain in the main courtyard and the street of the Akbarieh garden in Birjand are seen in a concentrated form. It is symbolic and has a symbolic role. Due to its gushing nature, it has a spatial and socio-cultural role and a limited functional-climatic role. The fountain has a unique shape and a formal role.

-The flowing water in the main axis and the main courtyard of the Pahlevanpour Garden of Mehriz has easily created a delightful atmosphere in the garden. The role of this water is primarily functional-climatic as it is simple and unpretentious. The functional aspect of the flowing water has advanced to the point where plane trees have been planted right next to it. Due to the placement of the stream water and the pool in front of the pavilion's porch, it also holds symbolic and socio-cultural significance. The sound of the flowing water contributes to the spatial role, but its form is not particularly prominent.

-In the main axis of the Shazdeh Garden of Mahan, cascading and gushing water can be seen. The main axis is highly formal due to the presence of relatively wide waterfalls and fountains. The role of water in this garden is formal for its cascading form, spatial for its ability to generate sound, and significantly symbolic for its deepening effect on the main axis of the garden. It also has a socio-cultural role for its ability to attract people. However, it is not particularly significant in terms of functional-climatic aspects.

Summary: The symbolism of water in the Iranian garden cannot be denied. Alongside this symbolism, water can create a space through familiar sounds and shapes that are heard and seen in nature, and through this spatial quality, it becomes an attraction for people in the garden for recreation or contemplation. The formal role of water is more prominent in reflective and cascading waters in the Iranian garden, while its functional-climatic role is less noticeable as fountain design is not typically necessary for this purpose. In analyses, flowing water has a spatial and symbolic role. Gushing water has a spatial, socio-cultural, and symbolic role. Cascading water has a formal, spatial, and socio-cultural role. Reflective water has four roles: formal, spatial, socio-cultural, and symbolic. If the fountain is "by the street" or "in the middle of the street enclosed by trees," it has a functional-climatic role. If it is by a building, in front of a building, or in the middle of the street, it has a socio-cultural role. If it surrounds the building, it is symbolic. If it is repetitive, geometric, or has a distinct shape, or if it has elevated edges, it has a formal role. If it is grand in scale

(such as a canal or pool), it is symbolic. Finally, considering Table 3, it can be said that water in the Iranian garden primarily has three roles: spatial, socio-cultural, and symbolic.

• Plants in Streets

Generally, two categories of trees, shade trees, and fruit-bearing trees, were planted in the Iranian garden, respectively on the two sides of the streets and in the terraces. Among the garden trees, shade trees on the sides of the streets have more authenticity and have undergone fewer changes. On a smaller scale, the flowers at the base of the shade trees are important but lack authenticity and have changed over the years. Great attention is paid to the selection of trees and flowers based on the climate, and their functional role is significant (Table 1), but these plants also have other roles. The following examines the plants in selected gardens (Fig. 4) (Table 4).

-In the main streets of Pasargadae Garden, cypress trees were likely planted. The role of the cypress tree is primarily symbolic, socio-cultural, formal, spatial, and to a lesser extent, functional-climatic. Its evergreen nature adds to its formal and spatial role, and the meaning of the cypress tree is influential in the social-cultural and symbolic roles among Iranians.

-In the main streets of Jahan-Nama Garden, both cypress and bitter orange trees were planted. The cypress tree holds a sacred status in Iranian culture. The bitter orange tree is a fruitful and evergreen tree that significantly contributes to the fragrant atmosphere of the garden, especially in the spring season. It seems that maintaining the evergreen nature of Jahan-Nama Garden has been a goal for the garden designers. On the terraces, in addition to the orange tree, there was also a pomegranate tree³ (Nili et al., 2013; Rezaei & Shahcheraghi, 2021), which could be seen as a background from the street. Thus, the role of street trees in the Jahan-Nama Garden is similar to that of Pasargadae Garden.

-In the Fin Garden, cypress trees were planted on both sides of the street, and according to available records, pomegranate trees were present on the terraces (Jeyhani, 2017). Therefore, the role of the cypress tree in this garden is similar to that of the Pasargadae and Jahan-Nama gardens.

-In the Chehel Sotoun garden in Isfahan, plane trees, cypress trees, pine trees, black poplars, willows, and others (Nili et al., 2013; Fadaei Tamijani et al., 2020) are planted on both sides of the street, but there doesn't seem to be a specific order among them. Fruit-bearing trees such as mulberry trees (Nili et al., 2013) and fig trees (Fadaei Tamijani et al., 2020) are also seen in the terraces. The role of non-fruit-bearing trees on both sides of the street is primarily formal and spatial, as they direct the gaze towards the pavilion, and as they are indigenous and provide shade, their roles are functional-climatic. Additionally, they have some social-cultural and symbolic significance in attracting people to gatherings.

-In the Chehel Sotoun Garden of Behshahr, cypress trees are planted on both sides of the street, and in terraces, citrus trees are predominantly seen, along with some pomegranate and walnut

Table 3. Roles of water in selected gardens and their abundance (The dominant role and its associated architectural feature in each row are indicated by a specific color. Each star assigned in the table is equivalent to 5% of the role). Source: Author.

Case	Display of Water	Form of Fountain	Depth of Fountain	Edge of the Fountain	Location	Role				
						Functional-climatic	Formal	Spatial	Socio-cultural	Symbolic
Pasargadae	Flowing	/Stream	Shallow/ very shallow	Simple	Along the street &	****	****	****	****	****
		Basin			Next to the building					
		Repetitive								
Jahan Nama	Gushing	Stream/	Shallow	Raised & with foot placement	In front of the building	***	****	****	****	****
	Repetitive	Pond								
Fin	Gushing	Stream/	Shallow/ very shallow	Simple/ Raised & with foot placement	Middle of the street/ in front of the building	***	****	****	****	****
	Repetitive	Pond								
Chehel Sotoun Garden in Isfahan	Flowing	Stream/ Canal	Shallow/ very shallow	Simple	Around the building	***	****	****	****	****
		Geometric								
	Reflective	Pool	Relatively deep	Simple	Middle of the street					
Chehel Sotoun Garden in Behshahr	Cascading	Stream/ Basin	Shallow/ very shallow	Simple	Middle of the street	***	****	****	****	****
	Reflective	Pool	Relatively shallow	Simple	In front of the building					
Golshan	Flowing	Stream	Shallow	Simple	Along the street	****	***	****	****	****
	Gushing	Pond	Relatively shallow	Simple	Center of the garden					
Dolat Abad	Flowing	Stream/ Pond	Shallow/ relatively shallow	Simple	Middle of the street	***	****	****	****	****
		Geometric								
	Gushing	Stream/	Relatively shallow	Raised & with foot placement	Middle of the street/ in front of the building					
	Repetitive	Pond								
Akbarieh	Gushing	Pond	Relatively shallow	Raised & with foot placement	In front of the building and center of the garden	***	****	****	****	****
		Has special form								
Pahlavanpour	Flowing	Stream/	Shallow/ relatively shallow	Simple	Middle of the street covered with trees/	****	***	****	****	****
		Pond			In front of the building					
Shahzadeh	Cascading/	Canal/	Shallow/ relatively shallow	Simple/	Middle of the street	***	****	****	****	****
	Gushing	Pond		Raised & with foot placement						
The abundance of dominant roles of water						4	8	10	10	10



Fig. 4. Some of the plants on the street of selected gardens. Source: (1):Stronach, 1991, (2): www.irna.ir, (3): www.tasnimnews.com, (4), (8) & (10): www.mehrnews.com, (5): www.mazineh.ir, (6): www.isna.ir, (7): www.iscanews.ir, (9): www.yazdnews.com.

trees (Mansouri Roudkoli et al., 2016). The role of cypress trees in this garden is similar to that of the Pasargadae, Jahan Nama, and Fin gardens.

-Palm trees and cypress trees are the most prominent in the Golshan garden. However, according to evidence, cypress trees were added later. Fruit-bearing trees such as pomegranate, citrus, and mulberry trees are also present in this garden (Ghasemi & Mehrbani Golzar, 2018). The role of palm trees is functional-climatic due to their climate adaptation, formal and spatial for the provision of shaded spaces and their unique shape, and social-cultural and symbolic for their contribution to creating spaces for gathering and interaction.

-In the Dolat Abad Garden in Yazd, two rows of pine trees are planted on both sides of the garden street. These trees serve functional-climatic and social-cultural purposes by providing shade and their evergreen shape, as well as having some spatial and symbolic significance. The fruit-bearing trees in this garden include fig, mulberry, citrus, etc. which act as a background for the shade trees (Fadaei Tamijani, 2020). Additionally, the presence of shrubs and tall evergreen bushes on both sides of the garden street obstructs the view to the back terraces and compensates for the height of the pine tree canopy.

-In the Akbarieh Garden in Birjand, pine trees are planted on both sides of the main street, similar to the Dolat Abad Garden in Yazd. The fruit-bearing trees in Akbarieh Garden include pistachios, pears, apricots, etc. (Farzin et al., 2020). Like the Dolat Abad Garden, the bushes under the pine trees

in the garden street obstruct the view to the further terraces and create a continuous evergreen wall.

-Two rows of plane trees are located close to each other on the main axis of the Pahlavanpour Garden in Mehriz, which stands out prominently. Pomegranate, mulberry, fig, and others are the fruit-bearing trees in this garden (Khalilnezhad & Tobias, 2016) that serve as a background for the plane trees. The plane trees in Pahlavanpour Garden have functional-climatic significance due to their placement on the garden axis and social-cultural significance due to their shade-providing function. However, they have relatively less formal and symbolic significance.

-Plane trees and cypress trees are seen as a pair on both sides of the main street in the Shazdeh Garden of Mahan. This contributes to the greenery of the street walls, even in winter. Various fruit-bearing trees, including apple, pear, apricot, etc., can be found in this garden. The role of the row of plane trees and cypress trees as a pair is both spatial and symbolic, creating a deep perspective, and through color contrast in different seasons, is formal. They also serve functional-climatic and social-cultural purposes.

Summary: There is a strong inclination to use evergreen trees on both sides of the main axis. Evergreen trees signify the vitality of the garden, even in winter. In the Chahar Bagh Gardens (Chehel Sotoun Garden, Fin Garden, and Golshan Garden), bitter orange and pomegranate trees are planted. Perhaps the reason for choosing evergreen trees like bitter orange is the fragrance of the blossoms in spring and the red color of pomegranate flowers and fruits from spring to autumn. It seems that fruit-bearing trees have had both symbolic and spatial roles, in addition to

their functional-climatic role. Fruit-bearing trees usually have a functional-climatic role and serve as a background for street trees that are green in spring and summer and leafless in autumn and winter. The cypress tree has received special attention in the garden street. One of the reasons for this is the tree's resilience in any climate. Another reason is its ceremonial and sacred nature in Iranian culture and its evergreen and everlasting characteristics. Ultimately, it can be observed that Iranian garden street trees have a greater social-cultural role due to their evergreenness and shading function. They have also a spatial role because of their train shape, defining the wall of the street space, whether they are evergreen or deciduous, and drawing attention to the pavilion. In the analysis, the shading function is indicative of functional-climatic, social-cultural, formal, and spatial roles. Evergreenness is indicative of formal, spatial, and social-cultural roles. Deciduousness is indicative of formal and spatial roles, and the ceremonial nature is indicative of symbolic roles. Trees in the train row and drawing attention to the pavilion are also indicative of the spatial role, which can be seen in all selected gardens.

Discussion

Perhaps the most apparent role of a street is its functional and climatic role. If there is a pool in an Iranian garden, it symbolizes water storage. If there is flowing water, it symbolizes the movement of water for irrigation and the preservation of the garden. If there is a direct and shaded axis leading to a pavilion, it is intended to guide people to the pavilion for climatic comfort. The use of trees in the same way they exist in nature is an undeniable principle in an Iranian garden. Trees are chosen based on the region's climate. The architect only organizes them, primarily for easy irrigation and the functional role of water. In fact, the existing order in an Iranian garden is derived from this functional role; A kind of order and discipline that is necessary to optimize water consumption and land use in the garden. It seems that in the past, a significant portion of the street's land was covered with gravel. This was due to the ease of movement of horses. The functional nature of the street's floor ultimately directs the viewer's attention to the garden space, not the ground. Even the floor in areas designated for pedestrian passage, such as the main courtyard in front of the pavilion, is paved with stone or brick flooring.

After the functional-climatic aspect, there is the formal and spatial aspect of the Iranian garden street. The use of water in various forms, but not exaggerated, changes the atmosphere of the garden. The emergence of water, very close to the emergence of various water forms in nature, captures the human senses and creates a delightful space. Garden streets, defined by natural bodies and often lined with evergreen trees, are spaces that guide the viewer. These bodies humanize the scale of space and, by deepening the perspective view, provide a greater sense of tranquility to the viewer.

The social-cultural role of the street is also highly significant. It can be said that the street and its components have been created with the purpose of social-cultural interaction and providing a space for it. The floor of the street, water on the street, and plants on the street attract the audience to be present in the street space. For example, the land leading to the pavilion with formal ceremonial simple flooring, the various displays of water, especially against the building and the main axis of the street, the regular rows of evergreen plants or shade trees on both sides of the garden street, all contribute to attracting as many audience members as possible.

Symbolism is another characteristic of Iranian gardens that is also observed in garden streets. The reflective role of water in the garden seeks to explore the transcendental realm. The sensory experience present in the Iranian garden elevates the human spirit to the realm of meaning. Creativity in Iranian gardens generally occurs with the intention of symbolism. Creativity is directed towards playing with water and fostering a deeper connection between humans and water. The use of cypress trees aims to convey a sacred meaning in gardens of different climates. Additionally, the formal flooring of garden streets is a form of symbolism and respect towards the audience.

Now the question arises as to which role is dominant in each of the components of the Iranian garden street. The answer to this question can be seen in [Table 5](#). The floor of the Iranian garden street is predominantly symbolic, water in the Iranian garden street is mostly spatial and social-cultural, and the plants in the Iranian garden street are more focused on spatial and social-cultural aspects.

Conclusion

Thus, the dominant roles observed in the selected components of garden streets are spatial, social-cultural, and symbolic roles. The street, more than anything, owes its spatial and social-cultural roles to the two natural elements of water and plants. Water and plants have multifunctional roles in Iranian culture, and in the Iranian garden street, the various functions of water and plants are well displayed. In the Iranian garden street, nature serves humanity, but this service of nature to humans does not cause damage or alter the natural components. Water and plants appear in the street just as they are seen in nature. They are simply arranged. This order brings comfort and tranquility to humans while also resulting in optimal use of water and land. The role of symbolism in the street is also largely the result of the symbolism of the two elements of land and water in the Iranian garden, which architects and garden designers have strived to use optimally for greater effectiveness of the garden. In [Table 6](#), the role of the street in each of the selected gardens is summarized.

Table 4. Roles of Shade Trees in Selected Streets and Their Abundance (The dominant role and its associated architectural feature in each row are indicated by a specific color. Each star assigned in the table is equivalent to 5% of the role). Source: Author.

Case	Name of trees along the street	Type of trees	Manner of use	Role				
				Functional-climatic	Formal	Spatial	Socio-cultural	Symbolic
Pasargadae	Cypress	Ceremonial & Evergreen	A row of trees on one side of the street, around the garden	***	****	****	****	****
Jahan Nama	Cypress & bitter orange	Cypress: ceremonial & Evergreen Bitter orange: Fragrant & Evergreen	A row of cypress and a row of oranges	***	****	****	****	****
Fin	Cypress and boxwood	Both ceremonial & Evergreen	A row of cypress and a row of boxwood on each side of the street	***	****	****	****	****
Chehel Sotoun Garden in Isfahan	Elm, plane and...	Deciduous & shading	Mainly elm trees on each side of the street	****	**	****	****	**
Chehel Sotoun Garden in Behshahr	Cypress	Ceremonial & Evergreen	Rows of cypress trees on each side of the street	***	****	****	****	****
Golshan	Palm tree	Ceremonial & Evergreen	A row of palm trees on each side of the street	****	****	****	****	****
Dolat Abad	Pine, bitter orange and boxwood	Evergreen pine: shading Bitter orange: Fragrant	A row of pines along with oranges and boxwood on both sides of the main axis of the garden	****	****	****	****	***
Akbarieh	Pine and boxwood	Evergreen pine: shading	A row of pine trees and a row of boxwood on each side of the street	****	****	****	****	***
Pahlavanpour	Plane tree	Deciduous & Shading	Rows of plane trees in The main axis of the garden	****	**	****	****	**
Shahzadeh	Plane and Cypress	Plane: Deciduous & Shading Cypress: ceremonial & Evergreen	Rows of plane-cypress trees one by one on each side of the street	****	****	****	****	****
The abundance of dominant roles of unfruitful trees				6	8	10	10	6

It can be observed that more precisely, the dominant role of the street is the social-cultural role. The street in the Iranian garden is a place where the highest presence of the audience occurs, and perhaps more than having a spatial or symbolic function, it

is a place for interaction. It can be seen that throughout history, the functional-climatic role of the street has been added and its symbolic role has been diminished. However, the social-cultural role of the street has always been maintained.

Table 5. Dominant roles of street components in Iranian gardens. Source: Author.

Elements \ Roles	Functional-climatic	Formal	Spatial	Socio-cultural	Symbolic
Ground in Street					
Water in Street					
Plants in Street					

Table 6. The frequency of dominant roles of the street according to selected gardens. Source: Author.

Cases		Roles					Cases		Roles				
		Functional-climatic	Formal	Spatial	Socio-cultural	Symbolic			Functional-climatic	Formal	Spatial	Socio-cultural	Symbolic
Pasargadae	Ground						Golshan	Ground					
	Water							Water					
	Plants							Plants					
	Sum							Sum					
Jahan Nama	Ground						Dolat Abad	Ground					
	Water							Water					
	Plants							Plants					
	Sum							Sum					
Fin	Ground						Akbarieh	Ground					
	Water							Water					
	Plants							Plants					
	Sum							Sum					
Chehel Sotoun Garden in Isfahan	Ground						Pahlavannpour	Ground					
	Water							Water					
	Plants							Plants					
	Sum							Sum					
Chehel Sotoun Garden in Behshahr	Ground						Shahzadeh	Ground					
	Water							Water					
	Plants							Plants					
	Sum							Sum					
Dominant Role of Street													

Endnotes

* This article is taken from the ongoing research project at Nazar Research Center for Art, Architecture and Urbanism with the title "Detailed Design of Iranian Garden Landscape Elements".

1. The meaning of the edge in this article is the raised edge. Otherwise, most of the time, if the edge is not raised, it is marked with a different material or with a different arrangement of

materials.

2. In this way, the sum of stars (percentage of roles) in each garden is equal to 20 stars (one hundred percent) for the relevant architectural element as much as possible.

3. The pomegranate tree is evergreen in climates that do not have cold winters.

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