

ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE
ENGINEERING AND TECHNOLOGY

**A STUDY ON THE PATTERN OF PERSIAN GARDENS (CHAHAR-BAGH),
AND EVALUATION OF THEIR DESIGN SYSTEMS**

M.Sc. THESIS

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Department of Landscape Architecture
Landscape Architecture Programme

Thesis Advisor: Assoc. Prof. Dr. Yasin Çağatay SEÇKİN

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İSTANBUL TEKNİK ÜNİVERSİTESİ ★ FEN BİLİMLERİ ENSTİTÜSÜ

**İRAN BAHÇELERİ’NİN DOKUSU VE TASARIM İLKELERİ
ÜZERİNE ANALİZ ÇALIŞMASI**

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To my spouse TORKAN,

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A STUDY ON THE PATTERN OF PERSIAN GARDENS (CHAHAR-BAGH), AND EVALUATION OF THEIR DESIGN SYSTEMS

SUMMARY

The Persian gardens have been analyzed from different aspects, in this study, the aim is to make a framework and to present patterns for the Persian gardens. For this reason, it is necessary to evaluate them according to their history, area, usage, and their users.

The Persian gardens can be observed in urban scales, neighborhood scales, and small scales like a house yard. Their users can be the inhabitants of a house or residents of a neighborhood or a city. Moreover, Persian gardens can be used as a courtyard, palace, castle, cemetery, orchard, hunting ground, zoo, national park, or city park.

Based on these facts, the usage of the Persian gardens can be divided into three main categories: personal, neighborhood, and urban gardens. A personal garden is for individuals' use and provides services only for private users. A garden having a neighborhood usage provides facilities for a neighborhood or a local area. However, an urban garden belongs to all residents of a city. It is obvious that urban gardens cover vast areas. Some of the gardens with personal use may also cover vast areas; however, over time, they have been turned into urban gardens.

In this regard, the home garden, the palace garden, and the castle garden have been defined as the subsets of personal use of Persian gardens. The orchard garden, the hunt garden, the zoo garden and the cemetery garden have been defined as the subsets of neighborhood gardens. And the national-garden and the city garden defined as subsets of city use of Persian gardens to categorize Persian gardens.

In order to analyze the pattern of Persian gardens in the mentioned scales with different usages, evaluation of the main elements in the design of Persian gardens was inevitable. Pavilion, Andaruni, Sar-dar, walls, and their diversity have been evaluated in the architectural elements part of the dissertation. Trees, flowers, shrubs,

and land cover plants, which are used in Persian garden, have been studied in the planting section of the dissertation. In the water system section, subterranean canals, pools, channels, and different types of fountains and their locations in Persian gardens have been evaluated. At the end, based on the pattern of Persian gardens and their elements and by evaluating them with three different aforementioned scales (residential, neighborhood and urban), six patterns will be defined for the Persian gardens, two of which (extroverted courtyard and introverted courtyard) are related to the design of gardens in the architectural scale and have already been presented by Lale Bakhtiyar and Ardalan Nader. Patterns of the water garden, terrace garden, and pavilion garden are related to the gardens in neighborhood scale and the garden-in-garden pattern is related to the gardens in the urban scale.

İRAN BAHÇELERİN DOKUSU VE TASARIM İLKELERİNİN ANALİZ ÇALIŞMASI

ÖZET

Bugüne kadar İran bahçeleri değişik yönlerden araştırılmıştır. Bu çalışmada İran bahçelerinin dokusunu belirlemek amacıyla organize etmeye ve tanımlamaya çalışılmıştır. Bu sebeple bu bahçeler kullanım, ölçek ve kullanıcı açısından araştırılmıştır.

İran Bahçeleri kullanım ve büyüklüklerine göre değişik ölçeklerde görülebilmektedir. Bu bahçeler bazen ev bahçeleri ölçeğinde, mahalle ölçeğinde ve bazen şehir ölçeğinde tasarlanmıştır. Kullanıcıları bir şehrin sakinleri, mahalle sakinleri ya da ev sakinleri olabilir. Aynı zamanda İran bahçeleri ev avlusu, köşk, kale, mezarlık, meyve bahçesi, avlak, hayvanat bahçesi, milli park ve ya kent parkı olarak tasarlanmıştır.

Bu gerçeklere dayalı İran bahçeleri kullanımı mimari ölçek, mahalle ölçeği ve kent ölçeği olarak ayrılmaktadır. Mimari ölçekte olan bir bahçe kişisel kullanıma sahiptir ve daha çok bireysel kullanım için hizmet vermektedir. Mahalle ölçeğinde bir bahçe yerel ve bölgesel bir kullanıma sahiptir ancak kentsel ölçekte olan bir İran bahçesi bir şehir sakinlerinin tümüne aittir. Bu bahçeler geniş alanları kapsamaktadır.

Bu çalışmada İran bahçelerinin tasarımında listelenen üç ölçekte kullanılan modellerine göre tanımlamak amacıyla tasarım elemanlarının incelenmiştir.

Bu amaçla, İran bahçelerini bir nizama koymak için Avlulu bahçe, Saray-bahçe ve kale-bahçe bireysel kullanımın alt kumeleri olarak, Meyve bahçesi, avlak, hayvanat bahçesi ve Mezarlık mahalle kullanımı olarak tanımlanmıştır. Bu doğrultuda kent bahçeleri ve Milli bahçeler bir kent kullanımı olarak değerlendirilmiştir.

İran bahçelerin doku analizinde bahsedilen üç ölçekte değişik kullanımlarda olan İran bahçelerinin tasarım analizinde önemli unsurların değerlendirilmesi kaçınılmaz oldu.

Sayvan bahçesi, Andaruni, Sar-dar, duvarlar ve onların çeşitliliği Mimari elemanları bölümünde değerlendirilmiştir. Çeşitli ağaçlar, çiçekler, çalılar ve değişik bitki örtüsü ekim bölümünde analiz edilmiştir.

Su sistemleri bölümünde çeşmeler, sukemerleri, çeşmeler ve havuzlar yer almaktadır. Çalışmanın sonucunda, İran bahçelerin doku ve onu oluşturan unsurların analizine dayanarak ve onları önceden anılan üç farklı ölçeklerle (konut, mahalle ve kent) değerlendirerek İran bahçeleri için altı farklı doku tanımlanmıştır. Bu dokuların ikisi “İçe dönük Avlu Bahçesi” ve “Dışa Dönük Avlu Bahçesi” Mimari ölçeğindedir ve daha önce Lale Bakhtiyar ve Ardalan Nader adlı mimarlar tarafından önerilmiştir.

“Sayvan Bahçe Dokusu” “Teraslı Bahçe Dokusu” ve “Su Bahçe Dokusu” mahalle ölçeğinde ve “Bahçe içinde Bahçe Dokusu” kent ölçeğindedir. Ayrıca adı geçen tüm altı doku “Çaharbagh” alt kümeleridir.

1. INTRODUCTION

The shape of the Persian garden has always been in harmony with the nature, weather condition, and the level of water of its surrounding area.

Gardening phenomenon has existed in this land since ancient times. For example, in Shush some motifs like water ponds and woodlands were found on the discovered pottery jars. All these finds (antiques) represent the importance of gardens for Iranian people.

In her article, *Passenger to Tehran*, which was published in 1991, Victoria Sackville-West refers to a pottery which was found in Samarra and writes: "On the discovered bowl, which is believed to belong to 2000 B.C., there are some cross-streams of water that demonstrate four garden plots, and in each there is a bird and a tree."

However, this type of design is the formal and typical type of garden design that Iranians have been using since the Achaemenid Empire. Actually, almost all of the Iranian gardens have been designed based on this geometric division. They all have mystical aspects from the ancient times. According to this mystical aspect, the universe has been divided to four parts, and four rivers separate them from each other.

Iranians, earlier than other nations, have discovered the fact that gardening is the basis of agriculture. It comes from an ancient legend that Persians' origin was a green land covered with forests, but due to drought, they migrated to the new land, and named it after their race.

According to the writings of Greek historians, nearly 3000 years ago, the houses of most Iranians were surrounded by gardens, and the word "Pardis" was the term used to call these gardens. Later, this way of gardening became a model for other nations and the word "Pardis" faded away.

Allame Ali Akbar Dehkhoda writes about this word: “Pardis is a word derived from the word “Paradise,” which means Garden. It has two components: Pairi, which means “surrounding” and Daeza, which means “accumulation” and “wall”; the combination of these two words means “planting and plotting surrounding buildings.”

This kind of gardens didn’t exist in Greece and in many other regions. As it became a model in regions other than Iran, their people began to use the same word. Today, in Greek language, this word is used as Paradeisos (παράδεισος), which means “garden.” In French language, it is being used as “paradis,” meaning heaven.

Man started his life in the paradise (green nature) when he was created; however, one of the issues causing high concerns is the fading relationship of man and nature; while nature had always kept man like a cradle. Much could be said in connection with nature, the principles governing it, inspiration of nature, the characteristics and values of natural elements, their cultural basis and the impact of nature on the living of human being and his relationship with nature and natural elements. In this subject, the Iranian garden is a canal towards the most inner layers of thought and dream, and a wise interpretation of the Iranian philosophy of life. In the Iranian philosophy of life, nature is a rank of the whole hierarchy of existence and passing through it is a step of knowledge. Based on the Aristotle's logic, the source of all differences of artistic works starts from this set of factors, or in another word, this subjective cause. The set of ideological and cultural fundamentals is the factor that gives form to that cause. Therefore, one may say: The full structure of the garden in the environment reveals the close and tied relationship between natural and Iranian philosophy of life and culture. (Behbahani, 2004, 19) And in this context, science is converted into a higher figure by its impact on the environment and helps man in reaching wisdom and perfection. The Iranian beliefs come from his ideological beliefs and, in turn, create a divine and heavenly philosophy of life. The basis of all abstractive and cosmological characteristics in the Iranian civilization is based on our cultural beliefs. (Dadabe, 2004, 32), these beliefs create the sets of superficial causes by its effects on the structure and forming elements.

1.1 Purpose of Thesis

The purpose of this research is to study and to review the pattern of Persian gardens. The basis for achieving this aim is a greater understanding of various theories related to Persian gardens and their design systems.

1.2 Methodology

The research methodology of the thesis requires combining and gathering all relevant data from the specified documents and databases in order to analyze the established material in depth and ultimately arrive at a possibly complete understanding of the Persian gardens. For this reason, the concepts of Garden, Pardis, Chahar-bagh, and their Iranian identity will be discussed from different aspects at first. Then, the patterns of Persian gardens, their characteristics and their constituent elements will be evaluated through collecting and drawing their plans. Finally, the semantic aspects of the Persian gardens, their spatial organization, architecture and features in different historical periods, are evaluated, studied and compared separately.

1.3 Outlines

In order to have a deeper insight into the Iranian philosophy of life, the effects of Iranian culture on the structure and elements of the Iranian garden are studied. After considering the cultural factors, Persian gardens are analyzed in four different aspects: functional, skeletal, historical and semantic. In the first chapter some important concepts related to Persian gardens have been defined and different given ideas about the concepts of Persian garden and the pattern of Chahar-bagh have been evaluated. In the next chapter Persian gardens have been analyzed in a historical order. It is important to mention that; in this study almost all of Persian gardens have been a subject of case study. In the third chapter the main goal was to focus on the garden plans, functions, patterns and the most effective elements in design of Persian gardens. Last chapter is dedicated to the evaluation of the studies and also design patterns of Persian gardens has been extracted and presented.

2. DEFINITIONS AND LITERATURE REVIEW

2.1 BAGH (BĀĠ)

In Iranian agriculture, the word *bāġ* means garden, more precisely, an enclosed area bearing permanent cultures— all kinds of cultivated trees and shrubs, as opposed to fields under annual crops.

2.1.1 Etymology

Bāġ, the Middle and New Persian word for “garden,” strictly meant “piece” or “patch of land,” corresponding to the Gathic Avestan neuter noun *bāga-* “share,” “lot” (Y. 51.1; see Ch. Bartholomae, *Altiranisches Wörterbuch*, Strasburg, 1904, col. 952)

The diminutive *bāġča* means “small garden” or “vegetable patch.”

The old word for “garden” *paridaiza-* (Old Persian **paridayda-*), literally “walled” (whence *pardēz*, Greek *ho parádeisos* “park for animals,” “paradise,” Arabic *ferdaws*) survives in the New Persian *pālīz* “vegetable garden,” “melon bed,” though today this most often denotes an unenclosed patch.

Other words for “garden” are the New Persian *būstān* (from *bō’istān*, whence the Armenian *burastan*), literally “place of perfume,” Arabic *bostān* (plur. *basātīn*), and *golestān* “rose garden” or “flower garden.” (Eilers, 1974).

In toponymy, *bāġ* occurs frequently in either the fore or the rear position, e.g., *Bāġ-e Amīr*, *Bāġ-e Now* or *Kārīzbāġ*, *Nowbāġ*.

2.1.2 General

In Iranian agriculture, the word *bāġ*, though usually translated as “garden,” means more precisely an enclosed area bearing permanent cultures-i.e., all kinds of cultivated trees and shrubs, as opposed to fields under annual crops (*zamīn-e zīr-e kešt* or *kešt-e sālāna*) -in land-use statistics (the Village Gazetteer of 1966) as well as

in everyday speech. It includes orchards (bāḡ-e mīva), vineyards (bāḡ-e mow), olive groves (bāḡ-e zeytūn), tea plantations (bāḡ-e čāy), but not vegetable gardens (sabzīkāri or šayfīkāri).

The most conspicuous and best-known form is the irrigated gardens of old sedentary settlements (piedmont oases and mountain villages) in interior Iran and Afghanistan (Planhol, 1964, p. 96). The small or large plots are generally enclosed with high mud walls, or terraced in hilly areas, and served by a dense network of footpaths and irrigation channels. Most gardens are not cultivated between the trees, but some are sown with grass or alfalfa or include small patches of vegetables. Wheat and other staple crops are sown in gardens only in mountain settlements having too scarce cropland. Temporary dwellings may be built in remote gardens (Balland, 1974, pp. 178-79).

2.1.3 In Persian Literature

Bāḡ appears both as an object of description and as the prime source of nature imagery in Persian literature. As a poetic image, bāḡ stands for order and beauty, and the link between man and nature. In modern poetry it can be a locus for social criticism. It is also a source of book titles and musical modes (e.g., čahār-bāḡ). Under the influence of mystical thought, bāḡ becomes a symbol of Paradise. Finally, bāḡ as conventionalized in literature summarizes the Persian attitude toward nature.

Persian poets never hesitated to mix images of paganism with images of Islam. The profusion of colorful flowers and the glittering surface of the watercourses were often likened to jewels.

More complex however, are the images of the garden as Paradise. It is likely that the form of Persian gardens was influenced by descriptions of the archetypical garden of Paradise in the Koran, which stress its green color, shade, fruits, fountains of running water, and cool pavilions where the inhabitants may drink a wine that does not intoxicate (Dīvān, ed. 'A. Eqbāl, Tehran, 1318 Š./1939-40, p. 315).

From the image of the garden as an earthly Paradise, mystical poets and prose writers extended it to symbolize Paradise itself. Again the Koranic passages provided the model, and features of the actual garden such as the watercourses and cypress trees

corresponded to the divine archetype. The cypress tree, for example, is likened to the Ṭūbā, and then, in a line from Ḥāfeẓ, associated with his beloved: “You think about the Ṭūbā tree and I about my beloved’s stature; everyone thinks according to his aspiration” (Dīvān, ed. M. M. Qazvīnī and Q. Ġanī, Tehran, 1330 Š./1951-52, p. 40). The beloved was frequently described as one of the houris who were promised to the faithful for their enjoyment. For Jalāl-al-Dīn Rūmī, the garden becomes a symbol of divine beauty which both displays and conceals the eternal beauty of the archetypal gardener, God. The mystical lover and his divine beloved are like a rose and its thorn. When the lover becomes one with the beloved, the rose becomes one with the thorn and all duality is resolved.

In modern poetry, the garden continues to be a prominent image, but now it often appears in contexts of social criticism as well as of love. In 1932 Abu’l-Qāsem Lāhūtī wrote a poem entitled “Bāgbān” (The gardener) in which he compares Stalin to a wise gardener who knows best what to prune in the garden and what to encourage. More recently, Forūḡ Farroḡzād in “Del-am barā-ye bāḡča mīsūzād” (My heart bleeds for the garden) used a withered and dying garden at the back of her house as a symbol of Iranian culture and society in her time.

2.2 Chahar-Bagh

2.2.1 Definition

ČAHĀRBĀĠ, lit. “four gardens,” a rectangular garden divided by paths or waterways into four symmetrical sections.

The Encyclopedia of Dehkhoda defines Chahar Bagh as such: “Four adjacent gardens which are only separated by streets or are around a mansion. Two parallel streets, which harbor trees on their both sides, are separated by a pedestrian area or walkway in the middle.” This is quite different from the common technical definition of Chahar Bagh. Another definition—which recognizes a religious link between the Chahar Bagh layouts and Iranian people’s beliefs—defines it as two streets which are separated by two lines of trees in the middle, which creates a pleasant and graceful atmosphere (Barati, 2004: 15). Examples of such street layouts can be found in Chahar bagh Street of Isfahan, Iran,-which is not going to be the focus of this study.

The origin and the time of coinage of the word “Chahar Bagh” are not clear. A popular idea about its etymology states that the word Chahar Bagh “might have entered Persian language during the Seljuq Dynasty. Like the schools, mosques, and caravansaries which had four Terraces, Chahar Bagh is the product of this period. ” (Osanloo, 2002)

Referring to the historical roots of the word, Mir Fendereski states that Chahar Bagh is originally an Persian-style garden: “In settlement systems, two perpendicular axes divide a garden to four sections. Being divided to four parts has a long history, which has a mythological indication of the Garden of Eden where water flows from and goes to all four corners of the world. Another definition also states that if a garden is divided to four parts by four main axes, four main streams, four main tree lines, or four main walkways, the word Chahar Bagh can be used.” (Mir Fenderesky, 2005: 10)

Another definition of the word “garden” states, “The art of building gardens is inspired by a fixed number of layouts: the garden is on the hillside, walled all around and divided to four parts. This is achieved by building gutters and fountains with decorative waterfalls or mansions at their intersection. (Faghih, 2004, 28)

Besides accepting Chahar Bagh as the basic structure of a garden, some have further developed the layout in details, stating that each of the four areas of the garden is also divided to four smaller ones: “An Iranian garden consists of several main axes, at the center of which there is a mansion, and each area is divided to smaller ones. It was common to divide gardens to four parts to honor the four sacred classical elements: Earth, Water, Air, and Fire.” (Daneshdoust, 1369: 221] Sometimes the secondary divisions are done by a combination of parallel lines. In a large garden, the design details should be extended by subsets of path lines. Persian gardens had a four-season design. There was a set of lines parallel with both axes. The horizontal axis was designed wider, and the dividing lines usually passed through it. Some of these walkways had superiority to others. Two of these designs are used in Bagh patterns of Persian carpets. (Pope, 1997: 1430)

Some recognize Chahar Bagh not as a mere combination of lines but as the most ideal design for Persian gardens. A Chahar Bagh is generally a walled garden which

is divided ideally, but not necessarily, to four areas by intersecting paths. (Koch 1997: 140)

With keeping the system of division to 4 areas, the Chahar Bagh design can be further extended to shapes other than just squares. The origin of Chahar Bagh—with four gardens which are separated by streams that remind us of the four rivers of Paradise—is unknown... In addition, the concept of Chahar Bagh is not restricted to a square garden divided to four smaller ones. Rather it is usually an oblong garden divided to two areas by its main stream, and other streamlets divide the garden to many other areas whose number is a multiple of four. (Porter, 2005: 23)

2.2.2 Roots of Chahar Bagh concept

From pre-Islamic times, gardens and green areas have been a symbol of Heaven in Iranian people's religions, and since the Islamic period, an Iranian garden—as many scholars believe—is an exemplification of Heaven in its physical appearance. Such a garden is divided to four areas by streams of water, symbolizing the Four Rivers of Heaven or the four directions of the universe (Barati, 2004: 14).

Koranic words describe the Four Rivers of Heaven. One can easily notice the features of Heaven in all four areas of gardens. Islamic carpets also follow the same pattern. In Iran, there is a carpet whose design is called Chahar Bagh... Classical Persian gardens follow the same layout. Their streams are designed in a way that they are surrounded by trees and flowers. There are water ponds or buildings where the streams meet (Adrian von Roques, 2002, 97).

The origin of Chahar Bagh is not restricted to the myths mentioned above. In an old version of geographical world description which describes the world as consisting of four parts, there is a mountain in the center. This layout is observed in many Persian gardens and also Mughal gardens in India. The mansion built on top of the hill in gardens like this make the garden stand out among others (Pope, 1997: 1432).

2.2.3 Historical analyzing of the Chahar-Bagh pattern

Recent excavations at both Pasargadae and Susa suggest that the history of the Chahar-Bagh begins in the Achaemenid period. The clearest evidence comes from the Palace Area at Pasargadae. There the surviving elements of several stone water

channels help to define the plan of a major garden, which was founded in the later years of the reign of Cyrus the Great (559-30 b.c.). Those stone channels that have been uncovered so far describe the outline of two contiguous rectangular garden plots and the limits of a broad pathway that once enclosed the whole on at least three sides (Stronach, 1978, pp. 107-12). Furthermore, a fresh analysis of the plan of the Palace Area reveals that a required “line of sight” down the long axis of the garden, as defined by the fixed throne seat of the king within the “garden portico” of Palace P, would have bisected the long sides of the two rectangular plots (Stronach, 1989). Such dispositions would necessarily have provided four separate plots, each nearly 70 x 50 m in area, within the confines of a rectilinear garden flanked not only by Palace P but also by two ancillary “garden pavilions.”

The regularities in this innovative Pasargadae design seem to find an echo in Xenophon’s account of Lysander’s visit to the park of Cyrus the Younger at Sardis, where he marveled at the trees “finely and evenly planted” and at the way everything was “exact and arranged at right angles” (*Oikonomikos* 4.20f.). The grounds of a palace of Artaxerxes II (405-359 b.c.) at Susa may be more confidently associated with a quadripartite plan. The design of this monarch’s “pleasant retreat,” located on the right bank of the Shaur River, appears to have included an almost square garden with axial sight lines intersecting at right angles. The two key vistas can be presumed to have extended from the “garden portico” of a large hypostyle hall marking the east side of the garden and from a vantage point probably preferred by the king in the portico of an elevated pavilion that once overlooked the north side of the garden (Boucherlat and Labrousse, 1979).

In view of the previously unsuspected antiquity of the quadripartite garden plan it is certain that such gardens (and even the sequence of two such gardens along the principal axis) were familiar to the Sasanians, energetic builders who particularly delighted in the creation of very elongated garden designs (cf. Pinder Wilson, 1976). The Koranic conception of the “eight gardens of Paradise” may thus have been partly connected with an evolved, formal garden of this type with eight plots that was already well represented in the Near East at the beginning of the Islamic era (David Stronach, 1990).

The design of a quartered garden, Chahar-Bagh, was probably not conceptualized much before the death of Cyrus in 401 BC. However, the existence of this pattern in early times is confirmed by Herzfeld's discovery of a pottery bowl at Samarra thought to date from 2000 BC and showing "crossed canals defining four beds each with a tree and a bird." This is the orthodox plan of a chahar bagh design of extreme formality, emphasizing the accuracy and the regularity of the rows and angles.

The oldest artifact which has been the basis of numerous speculations about the geometry of Persian gardens and the Chahar Bagh layout is an ancient clay bowl found in Samarra, Iraq. Drawn on this artifact, which is thought to date back to 2000 B.C., are intersecting streams which create four areas of a garden, and in each area, there is a tree and a bird. Sackville-West believes that this layout has commonly been used since the Achaemenid Empire, and as Lysander describes the accurate arrangement of its elements, one can say that it was a rigid layout. This layout was so widely used in nearly all Persian gardens that it was accepted as a mystical concept. The shape of this layout resembles a cross, and its origin is the ancient Asian belief that the world was divided to four regions separated by four rivers (Sackville-West, 1957: 403).

The earliest known example of a garden with the Chahar Bagh layout is Pasargad Garden. The Chahar Bagh layout can be mentioned as one of the most long-lasting innovations of the Achaemenids, which was implemented in the second half of the first millennium B.C. (Bermanian et al., 2008: 105) facing the garden, probably there was a building across from the horizontal path of the garden. The geometrical shape of the building explains the possibility of a garden with four areas (Eva Subtelny, 2008, 17).

Pasargad Garden is the clear example of the Chahar Bagh layout from the Achaemenids, but some writers have also mentioned the Sassanid gardens as Chahar Bagh. From the Sassanid period, it became a norm to divide hunting grounds to four areas, and in the middle, a mansion would be built. Therefore, whenever the Persian gardens or the gardens built in the territories of then Persia are observed, the Chahar Bagh layout is visible (Daneshdoust, 1993).

An accurate layout of gardens was improved and achieved symmetry, since the early layouts had been well-developed during Achaemenids. With the Sassanid Gardens, Persian gardens reached magnificence and had plus sign-like designs and mansions at the junctions of the garden paths. This layout was developed based on the old beliefs of Central Asian people about the universe (Ardalan; Bakhtiyar, 2001: 68). The Sassanid Charbagh was a cross-like layout with the ruler's palace in the middle. The same layout can be found on Achaemenid clay potteries, and it symbolizes the four main areas of the world (Ardalan; Bakhtiyar, 2001: 68).

As it is apparent in Sassanid gardens, there was usually a palace at an intersection of axes with right angles. By implementing this layout, the Sassanid architects were actually following the path of their ancestors' traditions because the drawings on clay pots belonging to times before the establishment of Persepolis show irrigated circular fields divided to four areas. Behind this layout, there had been an ancient Asian belief about the universe, the belief that the world was divided to four areas by four rivers (Pope, 1997: 1429).

In his book, which is still regarded as the best translated works about Persian gardens, Wilber, referring to the clay bowl drawings, attributes the art of building Chahrbagh to Sassanids. On some clay pots, there are drawings of a pond with trees around it, and on some, the drawings depict the world divided into four areas with an occasional pond in the middle. In such a layout where one axis can be longer than the other became a staple in designing Persian gardens and was later called Charbagh. This layout became a tradition after the Sassanid period when it was common to build a palace in the hunting grounds where two axial paths met (Wilber, 1969: 19, 20).

Scholars who studied the Persian gardens after the arrival of Islam regard them as a continuation of the traditional ones. Whenever the first Muslim conquerors captured an area, to show their victory and domination, they would choose a land, steer the waters to it, divide it to four areas, wall the garden, dig ponds and create stream beds, put up their tents and build mansions there. (Faghih, 2004: 28). "These gardens had an obvious geometrical structure and were divided into four areas. Some very narrow paths surrounded by dense trees, which were called Charbagh, connected the palace to the residences. . . The Muslim conquerors were actually following the Sassanid traditions." (Faghih, 2004: 32) "In future periods, the palaces, the royal Sassanid

gardens, and the Islamic Charbaghs retained this geometrical quality.” (Eva Subtelny, 2008, 17)

In 1508, Babur commenced building Bagh-e Wafa, which he called a Chabagh. He writes, “In the garden, there is a permanent stream of water whose power can operate a water mill. The Charbagh layout can be seen at the entrance of the garden.” (Wilber, 1969: 91)

About Babur’s gardens in India, Wilber also states that Babur could introduce and impose some of the elements of northern gardens to Indians. He made such elements as the Charbagh layout, use of streams, and symmetry traditions very common and widespread in India. These characteristics remained in Indian gardens for a few centuries, and irrigated gardens, where water was abundantly used, became widespread in northern India (Wilber, 1969: 98).

The oldest description of Charbagh and its design is in a book called *Ershad al-Zeraat*. It describes the Charbagh and mansion layout, “All around the garden, three Zaar (one Zaar equals to 104 santometer) from the wall, a stream of one Zaar in with is made. And in the middle a main stream flows towards a water pond, and it is surrounded by spring flowers and lilies.” (Heravi, 1967: 281-2)

It is obvious that the garden described in *Ershad al-Zeraat* is not of general characteristics. It is specifically a preplanned Charbagh which also includes a palace. Charbagh is not an innovation of the Timurid period, since as mentioned above, this layout is of ancient Persia, belonging to Achaemenids. The Timurids only spread the Charbagh layout, like many other cultural and artistic manifestations, through Persia; therefore Charbagh, which was not so well-known before the late 15th century, became a common concept (Eva Subtelny, 2008, 20).

The remodeling of the Charbagh described in *Ershad al-Zeraat* suggest an oblong plan with the main building on its southern side at the end of the main axial path. The building also has a pavement area around it (Illustrations 9, 10, and 11).

Many Indian gardens were called Charbagh, and this might be because the author of *Ershad al-Zeraat* moved to India. After the fall of Timurid dynasty, Mir Sayyed Ghayyath immigrated to Transoxiana and took the Charbagh layout there. Later, in 1528, he went to Zahir-ud-din Muhammad Babur’s court in India and made this type of garden common in that area (Eva Subtelny, 2008, 16). This is obvious evidence that the Persian Charbagh became a widespread concept in India.

3. BRIEF INTRODUCTION OF PERSIAN GARDENS

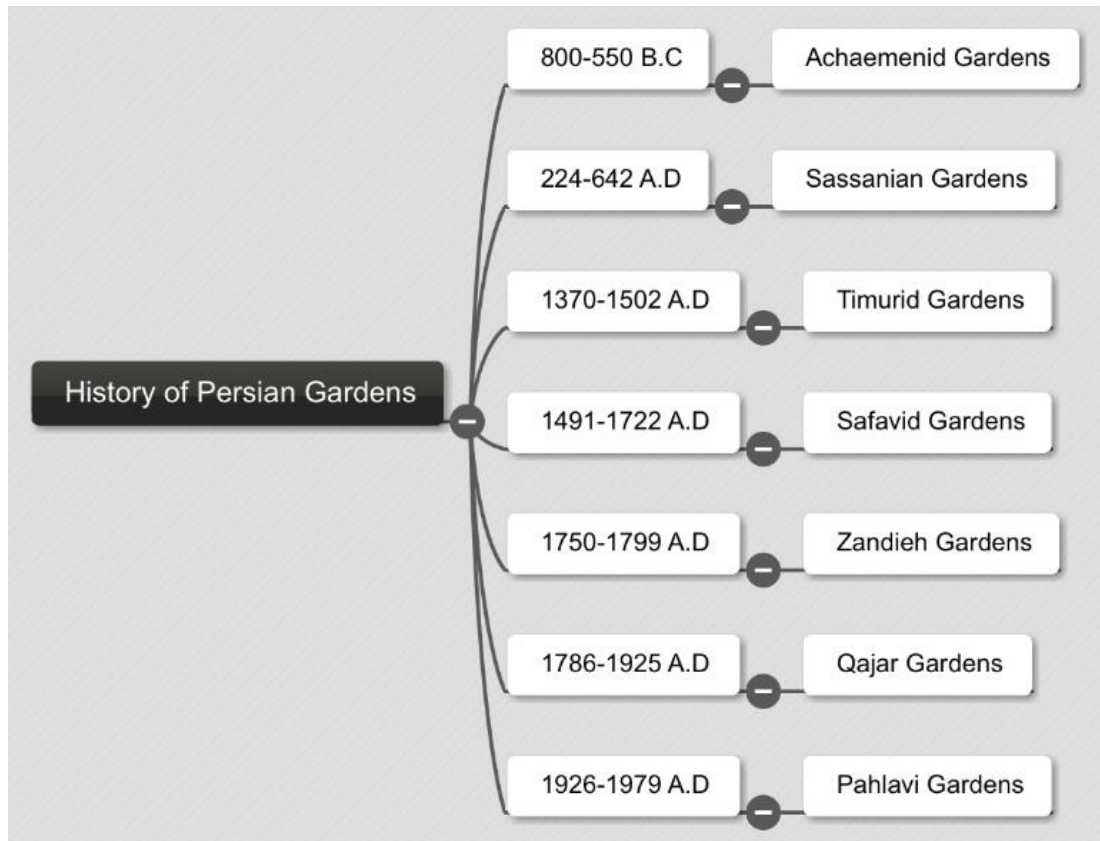


Figure 3.1 : Historical System of Persian Gardens

3.1 Achaemenid Gardens

The Achaemenian royal city of Pasargadae was located and built in Marqab plain, which is a high plain at the foot hills and the mountains branching from Zagros mountain range in North West of Fars province. The Polovar River is crossing this plain. The city of Pasargadae was found and established by Cyrus the Great founder of Achaemenid Empire in 6th century BC and was set as the capital of this empire. Researches show that the city is based on an area between hunting gardens, palaces, gardens, tombs and temples. The great Tal-Takht platform and its exterior rampart and battlements, royal palaces, watercourses and the mausoleum of the Cyrus the Great can be named among the main remains of Pasargadae.

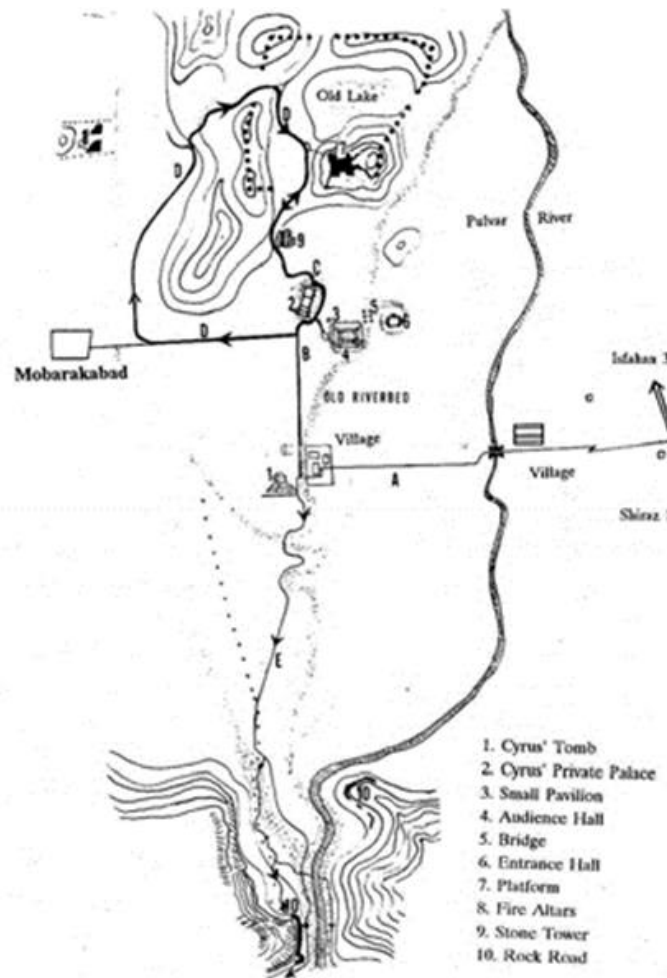


Figure 3.2 : Map of Passargad (Pechère, 1973)

The Pasargadae palace-gardens complex consists of a resident palace, levee palace, audience hall and portal. There is about 200 m distance between each building. The central Chahar-bagh with an area of 250 m by 300 m is located in the center of this complex. The watercourses, 20 cm in width each, were made out of stone blocks and square shaped pools, with the dimension of 80 cm by 80 cm, were located within 14 m from them; that is a sign and evidence for their picturesque and deluxe role and function because for the purpose of irrigation, unpaved watercourses would have been adequate. Researches and surveys carried out by Stronach on what remains from this organized network of stone watercourses suggest that besides the deluxe and scenic role of these watercourses, they have shaped the organized quadripartite geometry of the garden that evoke and recall the order of the universe and four basic elements (water, dust, wind and fire) that shaped the whole world. As a result of a study on Greek historian books and writings and archaeological researches, with an emphasis on what Stronach have done, we may indicate and suggest that the garden

with quadripartite order appeared to be as a refreshing garden. This quadripartite order of Pasargadae gardens has been transferred to Timurrid gardens in Samarkand, gardens that were created and shaped in India during Mongol empire era and Andalusian gardens in Spain.

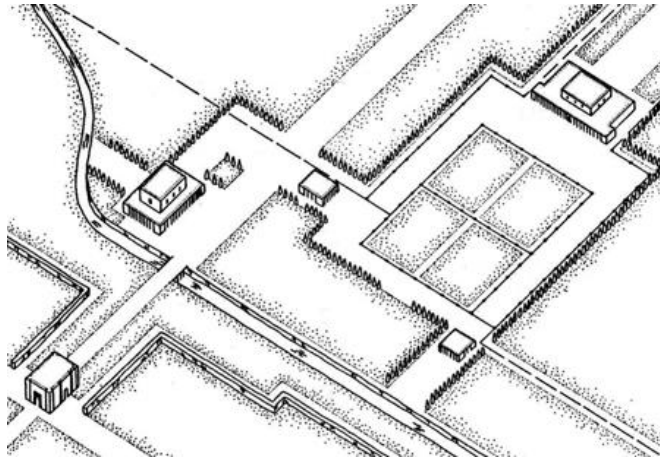


Figure 3.3 : General map of Passargad (David Stronach, 1978)

The tomb of Cyrus the Great in Pasargadae was located in the centre of a rectangular area that surrounded by a variety of trees and flowers. Tomb of Cyrus the Great can be considered as the first mausoleum-garden style and pattern that have inspired the religious tombs and mausoleum in Islamic period. Great and wide royal hunting parks and gardens that was enclosed and walled were created besides refreshing gardens and mausoleum-gardens during this era.

3.1.1 Ancient garden of Pasargadae

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Figure 3.4 : General map of Passargad (Drown by The Author)

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3.2 Sasanian Gardens

Like Achaemenians, Sasanians also rooted in Fars province. The Zoroastrian religion set a high value for nature, specially admiring and respecting the water, that was guarded by the goddess of Anahita ; its mythical role has had a great influence on palace-gardens of this era. Most of the gardens in this era were founded next to springs and ponds, like Takht-e Soleyman, Firouzabad palace and Bistun that were founded and created in attractive natural basis and in the vicinity of springs and ponds.

During the Sasanid era (1st and 2nd century) gardening and garden making have grown and developed widely. Sasanian kings preferred to construct and built their own palaces in a place that dominated the big pools that were filled with natural springs and fountains and in such way that manmade structures could complement the natural formation and structure. Probably these natural pools and ponds have inspired the pools in the Islamic gardens. Geometrical Variety is the most distinctive characteristic of the gardens of this age and the axial, central and quadripartite order and organization have been improved during this era.

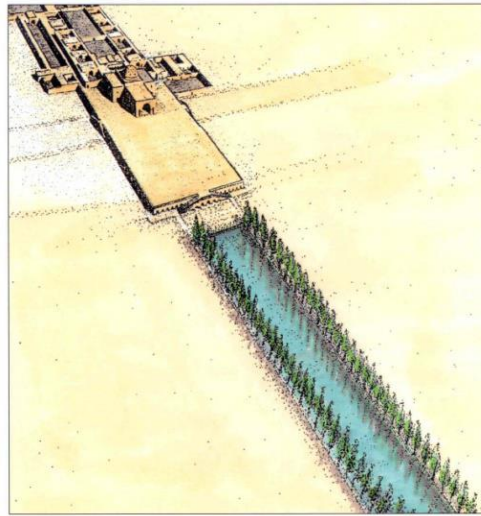


Figure 3.5 : Palace-garden of Firozabad



Figure 3.6 : Palace-garden, Takht e Solimant

3.2.1 Bagh-e Emarat-e khosroparviz

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Figure 3.7 : Palace-garden of Firozabad (Drown by The Author)

3.3 Timurid Gardens

Timure Tamerlane (Timure the Lame) chose Samarkand as his own capital after he came to power in 14th century. This city was located in a vast plain and in the vicinity of the vineyards and apple orchards; there were pastures and lawn at the extension of those gardens. In comparison to dry and arid climate of Iran, there were considerable amount of water in Samarkand. The Zarafshan River ran through the north of the city of Samarkand and the whole suburb area was irrigated by a vast

number of watercourses and runnels. By his knowledge and understanding of the principles of the Persian gardens, Timure created a number of gardens around the city as a green belt which was unique and exceptional in the whole world. There is nothing left of these gardens but they have been explored and identified through travel logs, miniatures and archaeological researches. The existence of quadripartite spaces in the palace and or a seat located at its center confirms the theory of taking the inspiration of these gardens from Persian gardens. These gardens were designed and created on the basis of Persian gardens patterns, the Mongol cultural background (the nomadic tradition, summering and wintering) and climatic condition of the city of Samarkand. Timurid gardens had a considerable influence and impact in the next eras on the art of gardening. Babur, the grandson of the Timure and the Mongol ruler of India, had created similar gardens, taking inspiration from Samarkand gardens.

Taken from Persian gardens, the Samarkand gardens had rectangular and square geometric form and were organized in the forms of Chahar-bagh or on the basis of a longitudinal axis. As Persian gardens were conformed and coincided the basis of the Mongol culture, therefore this specific pattern was answering to the new circumstances and conditions of the Timurid rulers and was the most appropriate and proper space to be linked and close to the nature. Also the compact geometry of the Persian garden and the position of the palace in the point of intersection of the two main axes of the garden which divided the garden into four parts could be referred to the four Eden Rivers and also as a symbol and sign of the supremacy and power of Timure.

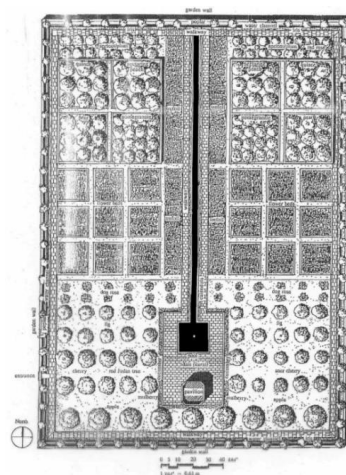


Figure 3.8 : Model of Timurid garden

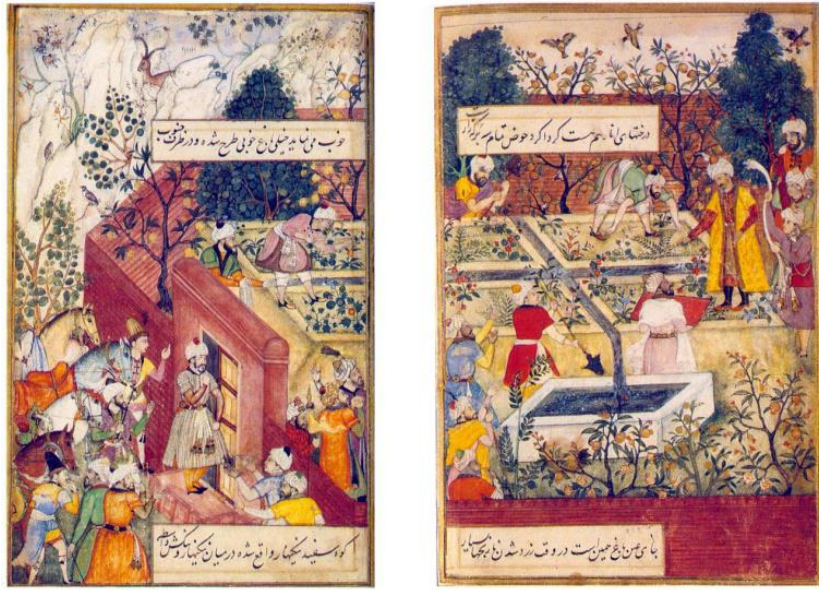


Figure 3.9 : Quadripartite garden in a Moghol miniature

In 1526 Babur, the ruler of the northern part of India founded the Mongol dynasty which was the most important Muslim empire in the Indian subcontinent up to the 18th century. Babur was a poet, a musician, fond of environment and the designer of luxurious and splendid gardens. He described the gardens in his notes and diaries known as “Babur-naame”.

The choice of open spaces and broad and wide Chahar-baghs with precise structures in contrast to close spaces of palaces influenced the development of the process of gardening and garden making in Kabul and the advancement of gardening and garden making in India and Kashmir. These gardens were surrounded by high walls which protected them against progression of jungle, sands and dust.

Mongol Chahar-baghs were organized with pools, fountains, bowers and pergolas which were mostly build on stone platforms and on the intersection of two main axes that were perpendicular to each other. The mausoleum-garden and the tombs of kings were the extension and the continuance of the mausoleum of the Cyrus the Great in Timurrid era which used geometry in the form of Chahar-bagh and quadripartite.

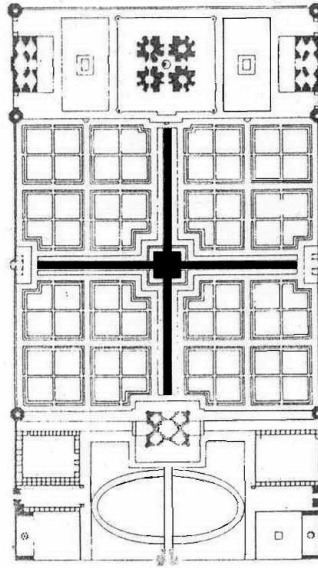


Figure 3.10 : Taj Mahal

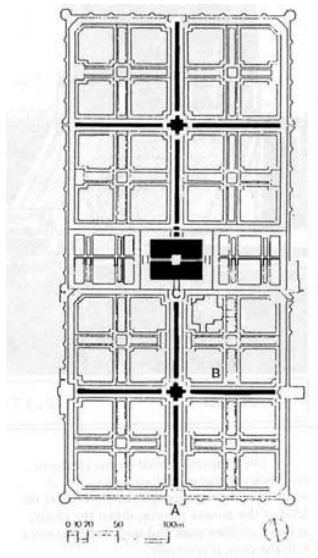


Figure 3.11 : Shalimar

3.3.1 Bagh-e Golshan (Afifabad) - Shiraz

Termed a ‘rose garden’, this extensive garden is located west of the city. Set out in the mid-19th century, it has a pavilion of local stone with many rooms and a large internal reception hall. Large pools with fountains are adjacent. Formerly owned by the Shah, it has been well maintained. There are extensive areas of grass, many stately trees and numerous rose bushes. (Lehrman.1980,P 128)

One more of the large, existing gardens of Shiraz deserve attention. Sometimes known as Afifabad, and sometimes as the Bagh-i-Gulshan, or Rose Garden, the foundation is assigned to 1863 and to the command of Qavam ol-Molk Mirza.

The garden is situated a considerable distance to the west of the town. With the elements of imposing pavilion, great pool, and subsidiary pavilion. The design blends motifs from the Achaemenid period with tile work of the nineteenth century, and the result is stately but austere and gloomy. With its many rooms and its vast interior reception hall, the structure has lost the spirit of the garden pavilion. While the lower pavilion displays a use of the same materials, it remains light, airy, and attractive even in ruin. (Wilber, 1979)

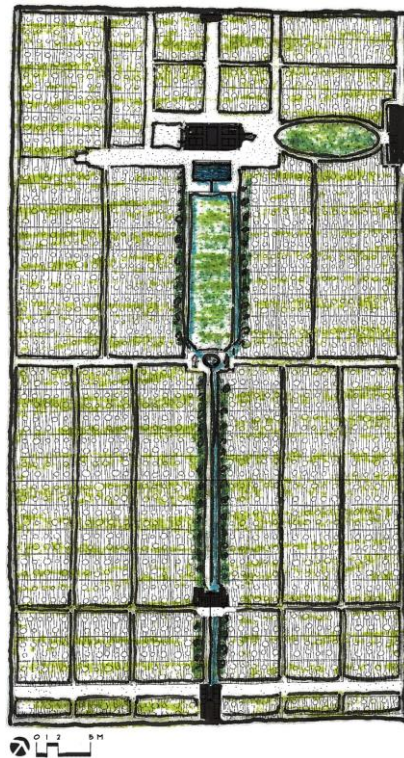


Figure 3.12 : Bagh-e Golshan (Drown by The Author)

3.3.2 Bagh-e Shomal - Tabriz

Tabriz was noted for its gardens as early as the visit of Marco Polo in 1300, and when the rulers of the so-called Ak Koyunlu (The Ağ Qoyunlu or Ak Koyunlu, also called the White Sheep Turkomans (Persian/Azerbaijani: آق قویونلو), was an Sunni Oghuz Turkic tribal federation that ruled parts of present-day Eastern Turkey, Armenia, Azerbaijan, northern Iraq, and Iran from 1378 to 1508.) dynasty made Tabriz their capital near the end of the fifteenth century, they adorned it with a

marvelous garden called the Hasht Bihesht (Eight Paradises). Some accounts ascribe the garden to the ruler Uzun Hasan and some to his son Yaqub, but all agree on its magnificence. In scale it must have rivaled the much later Hezar Jarib and Farahabad gardens at Isfahan; much of the total area was taken up by complexes of palaces and by service quarters. A Venetian merchant who visited Tabriz not long after the garden had been completed described it in some detail-too much in the way of detail for quotation at this point. He wrote of a series of courts and of a great pavilion situated at the points of intersection of the cross plan. The pavilion was a single story in height and displayed many rooms around a huge, central hall of audience or reception: built of marble, the walls of the pavilion were decorated with mural paintings and the central hall was crowned by a great dome, gilded on the exterior. In adjacent pools, ships and boats could be manipulated to demonstrate naval battles.

In later centuries this same site acquired the name of the Bagh-e Eshratābad and before the end of the nineteenth century the name had changed again-this time to the Bagh-e Shomal, or Northern Garden. Curiously enough, this garden was situated on the southern outskirts of town. During the period of the Qajar dynasty it was customary for the crown prince of the line to act as governor of the province of Azerbaijan and to be in residence at Tabriz. Several of these princes lived in this garden. The restored plan, made after an old map, shows the garden reduced in area with only a single large structure remaining.

Some of these Qajar princes did show an interest in embellishing the vicinity of Tabriz. Before the middle of the nineteenth century one English visitor was charmed with the Garden of Delight, situated a few kilometers from the town. Although lamenting the way its structures were allowed to fall into ruin, he was sufficiently impressed by the natural setting to give his translation of a description of the site made by a local poet:

“Behold the sweet groves, beautiful gardens, and flowing streams. Is it not a spot for the abode of heroes? The ground is like velvet and the air breathes perfume-you would say that the rose had imparted its scent to the water of the rivulets- the stalk of the lily bends under the weight of the flower, and the whole grove is charmed with the fragrance of the rose bush -from this moment time has no meaning. May the flower beds of these banks resemble the bowers of Paradise?”

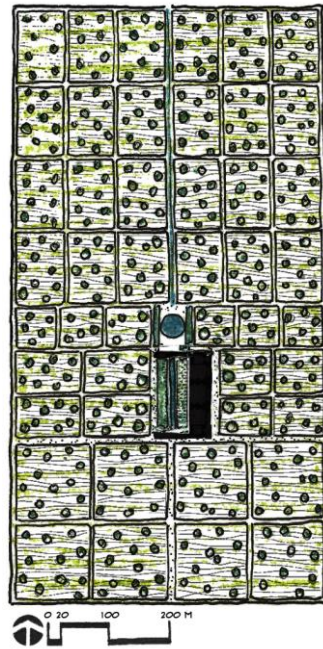


Figure 3.13 : Bagh Shomal (Wilber, 1979)

3.4 Safavid Gardens

Many years after the Mongol invasion, in 16th century, the central government of Safavid dynasty was founded and established and Islam was made an official religion of the country. This brought relative peace and welfare for Iran and Iranians. In the early period of Safavid era, the topic of garden and gardening was well discussed and considered in scientific, literary and historical works; during this period garden had a high value and importance as one of the main elements of reconstructing the cities.

Many researchers consider the Safavid era (16th century) as the most magnificent period in gardening and garden making in Iran since the dominance of Islam. In this period, gardens were considered as the element that formed the physical structure and shape of the city and like a green impact system which influenced the whole city. In Safavid era gardening and garden making began from city of Qazvin as the capital of this dynasty that was organized and formed as a city-garden but now there is nothing left of those royal gardens except for few buildings. In 17th century and during the Shah Abbas time, the capital shifted from Qazvin to Isfahan. By association of urban spaces, streets, squares and gardens in Isfahan, the city-garden structure and pattern of this city, which was one of the most important innovations in Safavid era, was formed.

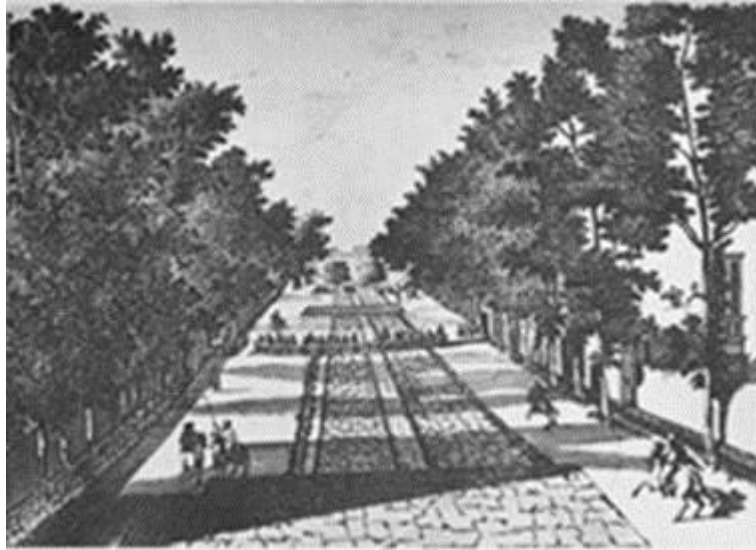


Figure 3.14 : Main Avenue of Isfahan (J. Chardin, 1965)

3.4.1 Bagh-e Ashraf and bagh-e Farahabad - Behshahr

In the fall of 1611, Shah Abbas ordered construction begun at the village of Tehran on the banks of the Yijan near where that rivet emptied into the Caspian, and gave the site the name of Farahabad, or Abode of Joy. That it was an extensive development may be learned from description made some two hundred years later by James Fraser. From his words it is apparent that the area was developed along lines similar to that of the square and of the surrounding structures of Shah Abbas at Isfahan. At Farahabad the square had its long axis from north to south, and was two hundred meters long and more than one hundred meters in width. On the northern side, adjacent to the Caspian, was a vast walled enclosure, divided by a high wall into a section for official receptions and court functions, and a private residential area for the ruler. Baths and service structures were near the square while in the private area and close to the sea was the palace called Jahan Nema, or View of the World. To the south of the square rose an imposing mosque crowned by a dome. The square itself was arcaded on every side, so that a later traveler described it as a vast caravanserai. Shops gave onto these arcades, and to the east and west of the square a town with the sole function of serving the court came into being. At the same time, work was started on a causeway toward Sari, a distance of some thirty kilometers.

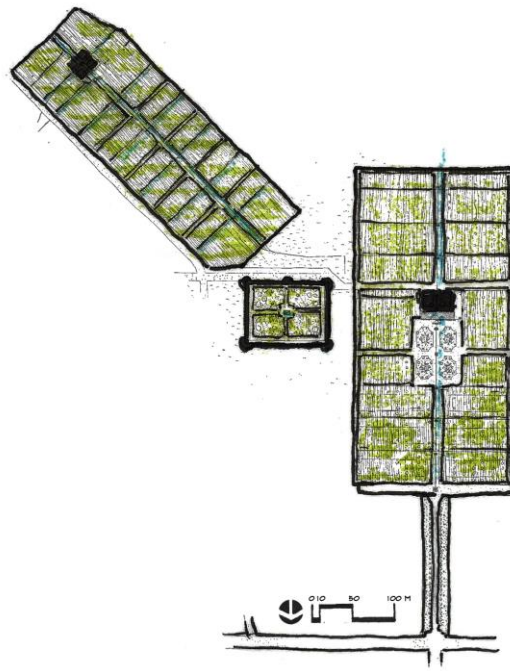


Figure 3.15 : Bagh-e Ashraf (Drown by The Author)

Work was rushed on the many buildings and when the development shone in its freshness and splendor an Englishman, Thomas Herbert, visited the palace in 1628. He wrote: “(the) sumptuous palace of the Emperors at the north side of the City . . . extends to the Caspian. It has two large courts (comparable to the Fontainebleau) either of them which express an elaborate Art in the skillful gardener.

Another of the valuable sources for this period, Chardin, visited the palace in 1666; He is speaking of a *hauz* or *tang*, both Persian words for a pool, situated in a main zoom of the palace.

The palace seen by Herbert and Chardin was the Jahan Nema, and from later accounts we can be sure that it was similar in plan and scale to the palace of the Sahib-Zaman, or Lord of the Age, at Ashraf. Its crumbling ruins were seen and sketched until well into the nineteenth century, although its decline began as early as 1668 when a horde of Don Cossacks landed and sacked the site. Continuing to the east, the causeway of Shah Abbas led to Ashraf, flow called Behshahr. This garden complex lies at the foot of wooded mountains, some five miles from the Caspian and enjoys a fine view over the bay of Astarabad; there were only scattered farm houses in the area until Shah Abbas, in 1612, gave the order for work to start. The date was commemorated in the chronogram of Dowlat-i-Ashraf or Dominion of Ashraf, the proper name for the site, which is usually known as the Bagh-i-Shah.

The identification of the various gardens making up the entire dominion seems quite certain, although a few minor points have not been resolved. These have to do with the extent and form of the Bagh-i-Shomal, or Northern Garden, whether the Bagh-i-Tappeh, or Garden of the Mound, was intended as a private garden for the royal ladies or as a site for the baths; and whether the Bagh-i-Haram, or Garden of the Women's Quarters, bore that name at all periods or was commonly called the *anderun* (women's quarters), and attached to the Bagh-i-Khalvat, or Private Garden.

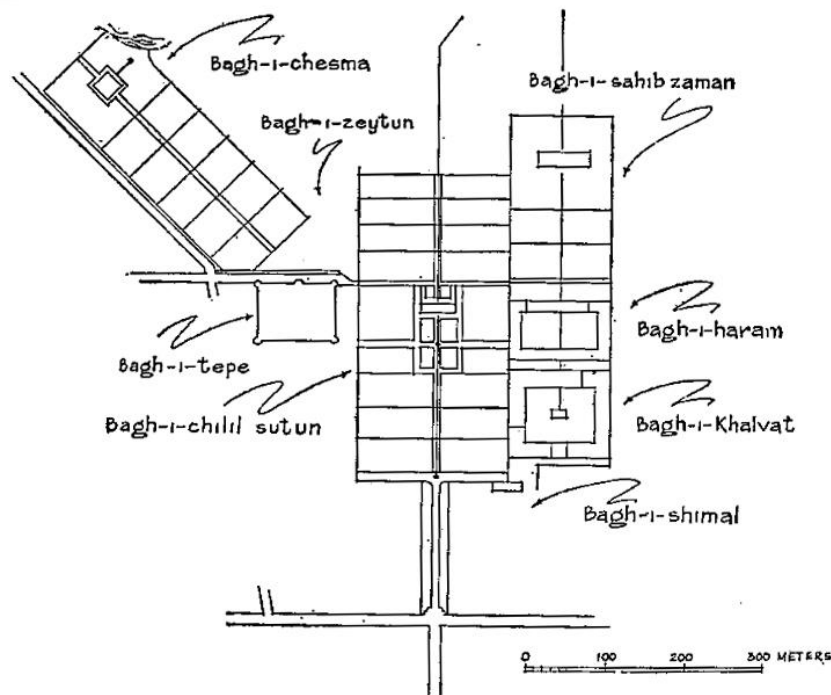


Figure 3.16 : Ashraf garden complex by Wilber

3.4.2 Bagh-e Fin - Kashan

Kashan is located near the arid Great Kavir, but the city receives its water supply from a spring and Qanats. A few miles outside the town are the Bagh-e Fin. Although established in the 16th century by Shah Abbas I, the early buildings have disappeared. The present garden dates from the time of Fath-Ali-Shah at the beginning of the 19th century. Restoration work is slowly taking place. Within the walls is a small paradise. Walks are lined with plane and cypress trees, and flowers bloom in abundance. There is a constant flow of water into a pool in the far corner of the garden. This supplies a further pool, bordered by great trees, as well as several tiled channels. There are fountains galore: in the large pool, down the center of several channels and in runnels along their border. With its shade, planting and

constantly running water, this paradise garden is literally an oasis in the desert.
(Lehrman.1980, P 126)

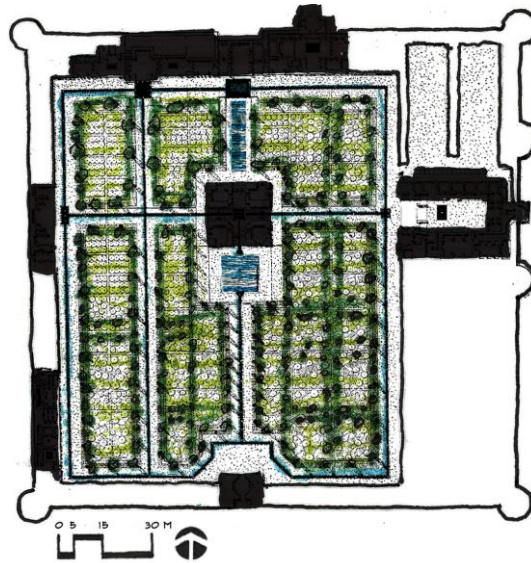


Figure 3.17 : Bagh-e Fin (Drown by The Author)

3.4.3 Chahar Bagh - Isfahan

Located west of the palace area, this avenue is now a main traffic artery, although it was built to serve as a promenade. It runs at a slight gradient for about a mile down to the Zayandeh-Rud River, where it is continued by the 17th-century Bridge of Allahverdikhan to the opposite bank, which at one time contained further royal gardens. Originally, the avenue was lined with palatial apartments and kiosks with gardens behind. It was over fifty meters wide, and contained a canal down its center, which cascaded from successive terraces and was bordered with wide stone paving. The avenue was framed by poplars and several rows of plane trees, many of which were cut down at the end of the last century; there were tanks of various sizes and shapes, and many fountains. Today the wide avenue remains, hut it is somewhat ordinary, commercial in character and a major route for dense traffic.
(Lehrman.1980, P 118)

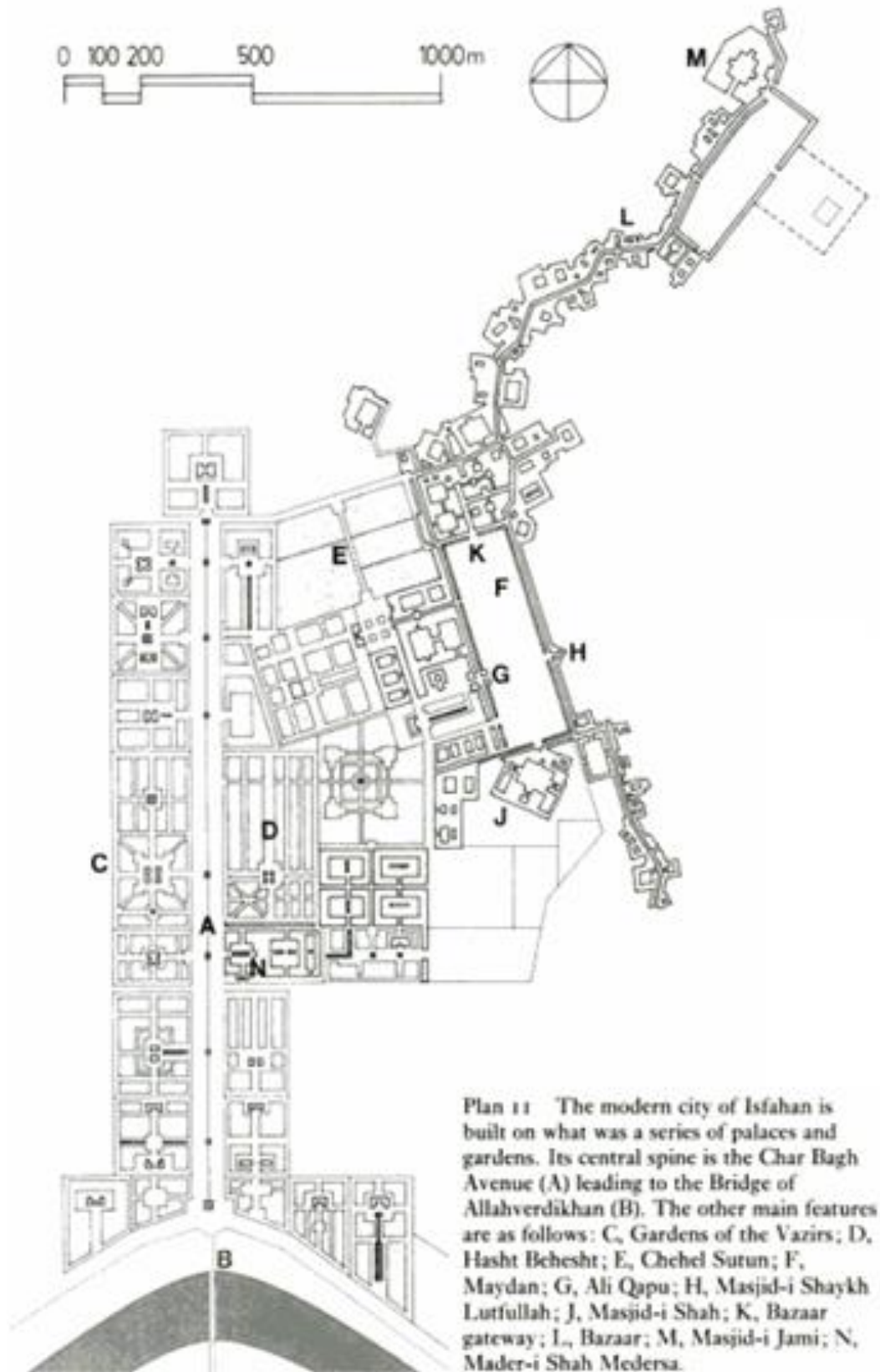


Figure 3.18 : Chahar Bagh Avenue of Isfahan

The modern city of Isfahan is built on what was a series of palaces and gardens. Its central spine is the Char Bagh Avenue (A) leading to the Bridge of Allahverdikhan (B). The other main features are as follows: C, Gardens of the Vazirs; D, Hasht-Behesht; E, Chehel-Sutun; F, Meydan; G, Ali-Qapu; H, masjid-i Shaykh Lutfullah; J, Masjid-i Shah; K, Bazaar gateway; L, Bazaar; M, Masjid-i Jami; N, Mader-i Shah Medersa.

The Chahar Bagh continued up rising ground to end at the entrance to the Hazar Jarib, a garden laid out about the middle of the seventeenth century. According to Chardin, it was a mile square and arranged in twelve terraces, each a few feet higher than the ones nearer the river. Twelve avenues ran parallel to the direction of the Chahar Bagh and there were three east-west transverse avenues. Along every fourth avenue was a stone-lined canal with a basin of a different shape on each terrace. Water fountains were everywhere and there were at least five major pavilions. In the spring the entire garden was carpeted with flowers, especially along the canals and around the pools and “one was surprised by so many fountains appearing on every side as far as one could see, and was charmed by the beauty of the scene, the odor of the flowers, and the flight of the birds, some in aviaries and some among the trees.” Much of the construction was in mud brick and only lines of low walls remain today.

To the west of the Hazar Jarib and on higher ground well back from the river was an even more extensive royal garden known as Farahabad, or Abode of Joy, which had been built to the orders of Shah Husain about 1700. It laid a good long horseback ride, nearly ten kilometers, from the Isfahan square.

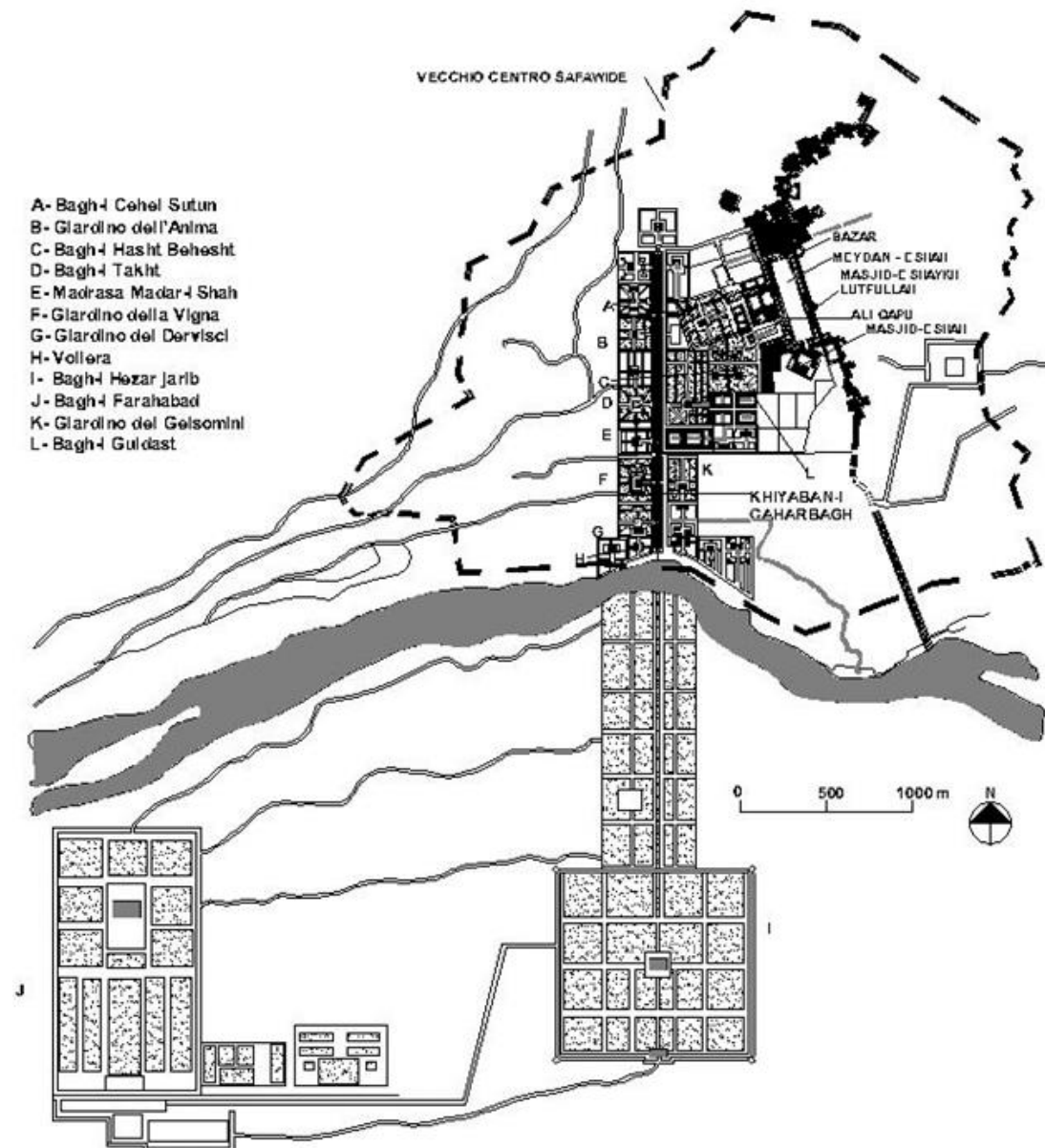


Figure 3.19 : City Garden of Isfahan

About 1930 2 French architect strolled back and forth across the site, sketching lines of walls, plotting the locations of islands in vast reservoirs, and establishing the major and minor axes of the original plans. His drawings do much to bring the ephemeral site back to life; the site where hundreds, if not thousands, of servants once waited upon royalty. The extensive service area, studded with dozens of courts and separate units, was on the highest ground and from there to the river on the north the distance was about the same as that from the Washington Monument to the Capitol building. Huge groves of trees and plots of orchards filled the area, as well as

two exceptionally large *daryacheh*, or little seas, each with a summer house on an island. (Wilber, 1979)

3.4.4 Bagh-e Hasht Behesht - Isfahan

Of all the airy palaces and pavilions built along the Chahar Bagh only the Hasht Bihesht, or Eight Paradises, remains. It was erected in the vicinity of the earlier Garden of the Nightingales during the reign of Shah Suleiman and was seen by Chardin in 1670. The restored plan shows the location of the pavilion within its own spacious grounds (Wilber, 1979)

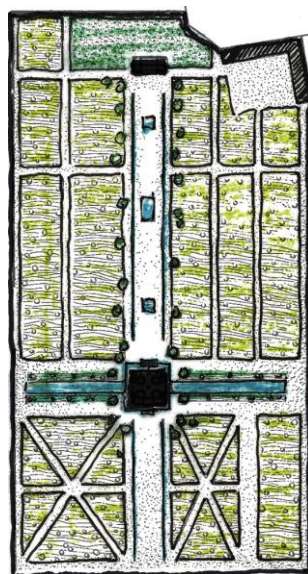


Figure 3.20 : Bagh-e Hasht Behesht (Drown by The Author)

3.4.5 Bagh-e Chehel-Sotun - Isfahan

Part of this royal pavilion may have been built, and its garden lay out, as early as the end of the 16th century. The pavilion was extended by Shah Abbas II in the 17th century, and repaired after fire at the beginning of the 18th century. The indoor space of the pavilion and the outside garden are completely interrelated. The great porch, with its painted wood mosaic ceiling inlaid with mirrors, overlooks a long reflecting pool. In the center of the porch) supported by slender fluted cedar columns, is a white marble basin into which four carved lions spouted water. A throne used to be located at the rear of the porch, behind which is a banqueting hall containing large oil painting. The garden, which originally had more than one pool, several fountains and additional entry pavilions, has undergone several changes since it was first designed,

but the grand pool remains, and there are extensive areas of grass, well treed.
(Lehrman.1980, P 119)

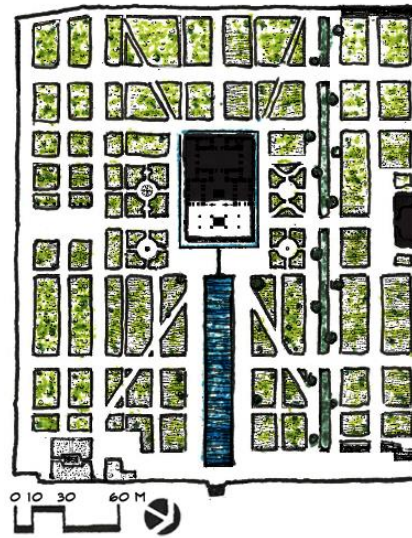


Figure 3.21 : Bagh-e Chehel sotun(Drown by The Author)

3.4.6 Bagh-e Farah abad - Isfahan

This garden was built to be a refuge from the urban city of Isfahan by the command of Shah Sultan Hussein Safavi in 1694. It was called the new city at the time and Shah Sultan Hussein intended to spend most of his time there. The site is situated at the base of Saffeh Mountain. The garden was destroyed after the attack of Afghans in 1730. (Zandian 2007)



Figure 3.22 : Bagh-e Farahabad (Drown by The Author)

3.4.7 Bagh-e Delgosha - Shiraz

This 18th-century garden is in north-east Shiraz near the Mausoleum of Saadi. Its name means 'Garden of the Heart's Delight'. At one time there had been a long canal, a pool and fountains, flower beds and orange trees, as well as a Qajar home. Presently, the garden is overrun and dry, but it is in the process of being restored. Mountains form a barren backdrop to the north. (Lehrman.1980, P 128)

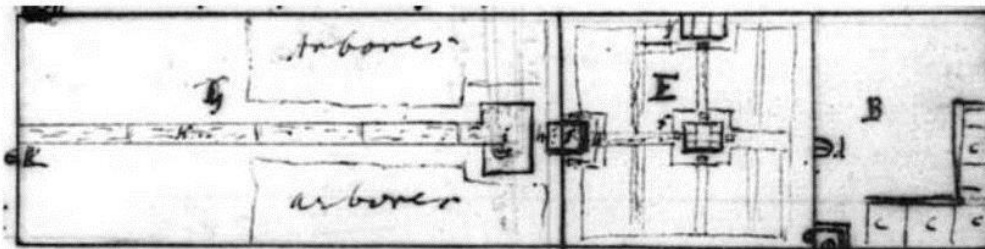


Figure 3.23 : Bagh-e Delgosha by Kaempfer

3.4.8 Bagh-e Ghadamgah - Nishabour

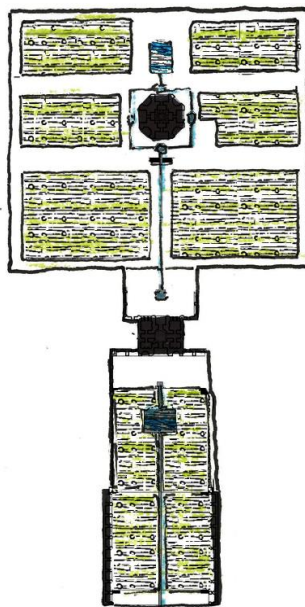


Figure 3.24 : Bagh-e Ghadamgah (Drown by The Author)

3.5 Zand Gardens

By the downfall of Safavid dynasty and governments in the early period of 18th century, Zandieh gardens were designed and created in Shiraz according to Safavid garden pattern and style, during Karim Khan Reign. Most of the gardens built during the Karim Khan time like Delgosha garden, Eram garden and Jahan-Nama garden were actually the old gardens which were renovated and revitalized. The main elements of Persian garden and mono-axial and or biaxial geometric order were employed in the gardens of this era with no change.



Figure 3.25 : Main axe of Eram garden



Figure 3.26 : Jahan Nama garden

3.5.1 Bagh-e Shah Goli - Tabriz

The city of Tabriz in the north-west receives more precipitation than the plateau, and water supply is adequate, The Royal Pond (Shah-Goli) is located east of the city and dates from the 18th-century Qajar period. Its main feature is a large artificial lake, square in shape, fed by hillside springs. An octagonal two floor pavilion is located near the center of the lake and is linked to one side by a causeway. The adjacent hill contains fruit trees on its terraces, and from its crest the view is panoramic. The water level of the lake is near the rim of its retaining wall, and as a result it seems to be poised over the surrounding valley. (Lehrman, 1980)

The name Shah Goli is a combination of Persian and Turkish words with the meaning of the Royal Pond. Of course the principal feature is the artificial lake, just over seven hundred feet on a side. According to a local history of Tabriz, it was built by an unnamed king in 1785- probably it was made at a considerably earlier date. This same source goes on to say that the lake was cleaned out, the terraces built, and the pavilion erected prior to the middle of the nineteenth century.

The similarity to the Bagh-e Takht at Shiraz is immediately apparent, although here the scale is much greater. The vast pool was not excavated from a fairly level spot of ground but the northern side was built up by moving great masses of earth into place. Foliage forms a screen which conceals all the earth along the edge: as a result, as one looks across from the levels of the terraces, the spreading sheet of water appears to hang suspended far above the valley beyond.

As in the Bagh-e Takht at Shiraz, the water supply comes from a spring which gushes from the living rock above the highest terrace. From reservoirs the water is conducted into five channels which create as many waterfalls at each change of level. Each terrace has a row of poplars along its back wall and willows along the water channels. The rest of the area is divided into numerous plots covered with fruit trees, and, according to the seasons, crops of clover or alfalfa grow under the shade of the trees.

The causeway leads out to a pavilion of unusually elaborate plan. The central hall is a generous octagon, some twelve meters across, entered on each side of the structure. However, each corner angle is broken up into a series of rather small chambers, niches, and reveals. Originally the pavilion must have been crowned with a dome. Although the dome has vanished, the structure itself was put into good repair when the garden was rented to serve as an outdoor coffee for the residents of Tabriz.

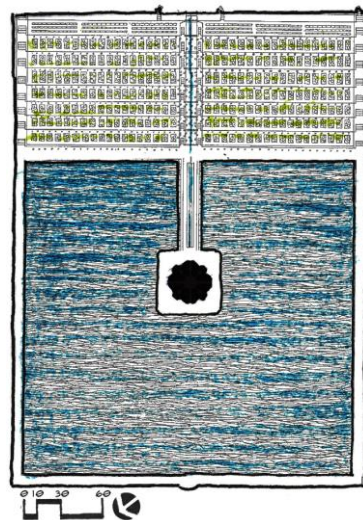


Figure 3.27 : Shah Goli, Wilber, 1979

3.5.2 Bagh-e Doulat-Abad - Yazd

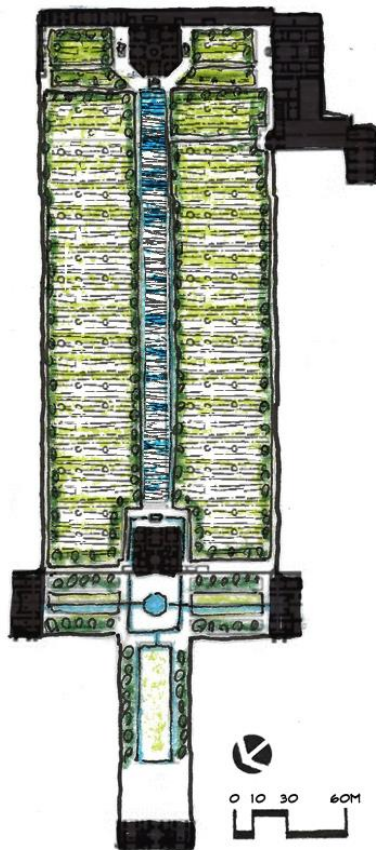


Figure 3.28 : Bagh-e Doulat Abad (Drown by The Author)

3.5.3 Bagh-e Jahan Nama - Shiraz

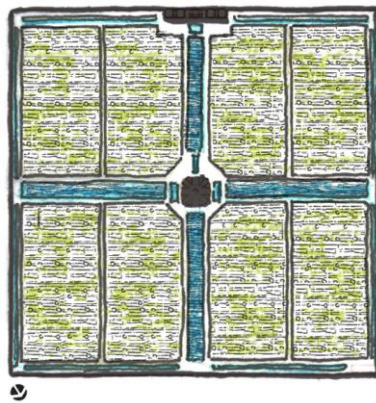


Figure 3.29 : Baghe Jahan Nema (Drown by The Author)

3.5.4 Bagh-e Haft Tan - Shiraz

‘Haft Tan’ Meaning ‘Seven Bodies’, respectively, the names refer to the graves contain. Possibly the 18th century, this garden is hidden behind the customary high walls. At the end is a pavilion across the full width, with a pool in front. The main

rooms of the pavilion are above the level of the garden and face south. There are orange trees and tall pines. (Lehrman.1980,P 130)

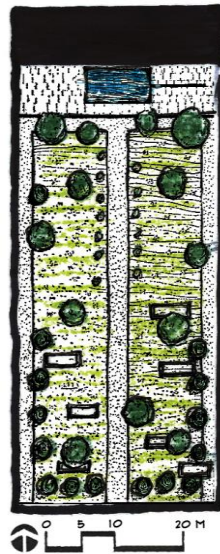


Figure 3.30 : Baghe Haft Tan (Drown by The Author)

3.5.5 Bagh-e Golshan - Tabas



Figure 3.31 : Bagh-e Golshan (Drown by The Author)

3.6 Qajar Gardens

In the late 18th century, Agha Mohammad Khan, the founder of Qajar dynasty chose Tehran as his own capital city. By creating and constructing new palace-gardens, streets and alleys, this city faced a new phase and form. During Fathali-Shah's reign, the development of the city accelerated and being well shaped and with more order, the city earned considerable importance. Fathali-Shah was with no doubt the founder

of Tehran. During this time the western culture affected all aspects of life in the royal court. it impacted not only the architecture and urban designing but also influenced gardening and garden design that could be observed in the form of constructing and creating vast and extensive palace-gardens in suburb and foothills of Alborz mountain range. The interest in garden making and garden arrangement grew so great and strong that the Qajar princes, nobles and aristocrats challenged and competed each other in garden and flower arrangement and where ever they found any new plant and or vegetation they tried to bring it into their own gardens.

Figure 3.32 : Map of Tehran at the end of 19th century

opportunity that it has provided, this innovation considered the view to distant landscape in garden making and garden design.

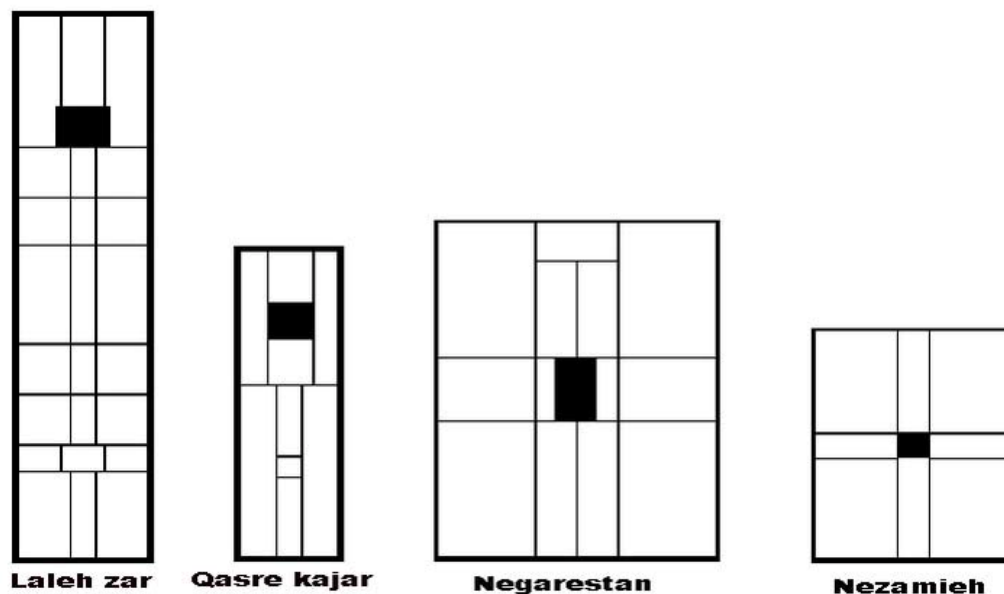


Figure 3.33 : The geometrical order of Tehran gardens, during 19th century

The organization of the garden, the disposition of the axes and the location of buildings all have been chosen in accordance with the view to distant landscape. A swimming pool and or a big pond can be seen in most of the gardens of this era where, in addition to its function as water reservoir, it acted as focal point of the garden. By picturesque and deluxe role and function of water in different forms (still and flowing water) in these gardens, the man has emphasized his power over this vitalizing, clear, transparent and cooling element of nature. Probably these changes were due to the influence of the western culture, especially Renaissance and Baroque gardens, so that the relation between the gateway and building with the main axis was not necessarily considered as it was in traditional gardens. In addition to the main element of garden structure, axis was the main factor for landscaping in picturesque and ceremonial part of garden and also it connected the residing buildings in private and inner part of the garden. This form of creating and composition of the space could be observed in some gardens including Farmaniyeh Garden, Masoodiyeh Garden and Niyavaran.

Considering what has been mentioned before, it seems that in comparison to the introvert tradition of the gardens of previous times (especially Safavid and Zandid

eras), the visual relation between garden and the distant landscape (urban landmarks, agricultural landscape and mountainous landscape) replaces the visual relation and continuity of internal landscape of the garden, along with the axis between the building and the gateway. In the gardens that were located in the foothills of the mountain, the water was shown and exhibited in the form of cascades as the swimming pools and or deep ponds were used for their reflecting role as it was in old gardens. Besides that, gradually near the end of Qajar era, it became common for the rulers and governors of Iran to import ornamental plants and to use lawn in front of the buildings and planting the ornamental plants in open spaces.

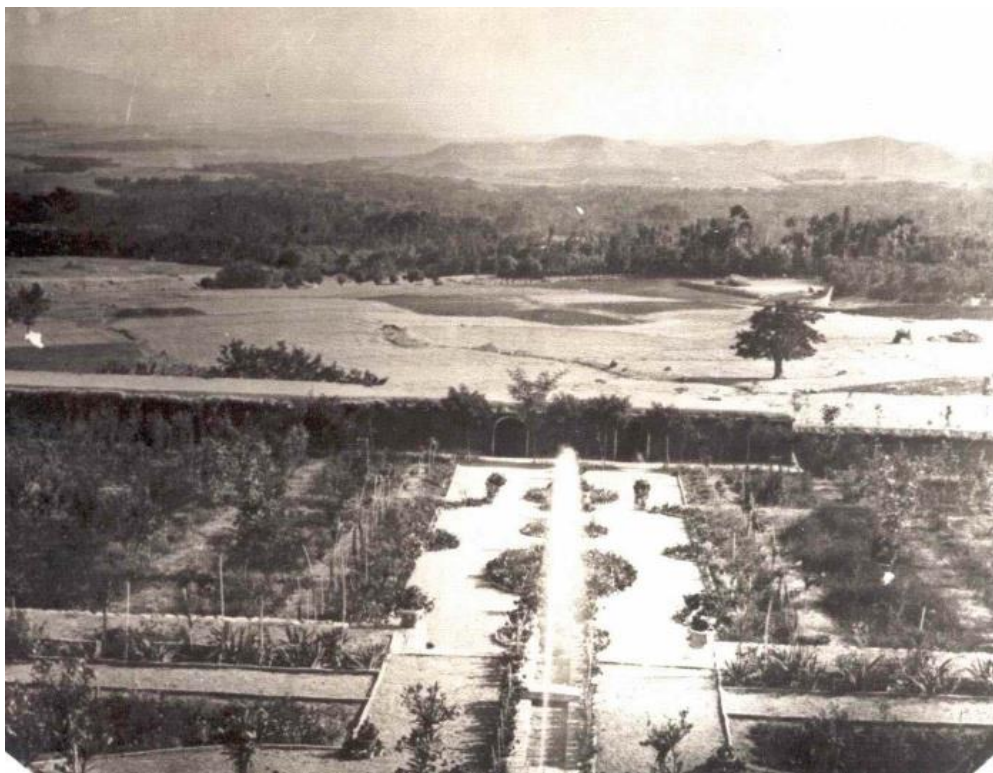


Figure 3.34 : The vista from the garden towards the remote landscape

3.6.1 Bagh-e Eram - Shiraz

The large 19th-century ‘Garden of Paradise’ is located in west Shiraz, with a mountain range to the north. Containing orange and lemon groves, its main walk is bordered by cypress trees. A Qajar pavilion contains a tiled summer room at a lower level, through which a water channel runs. A large reflecting tank in front of the pavilion supplies a narrow channel. There are many flowers, including a garden of roses. Well maintained, the Bagh-i Eram is typical of Iranian architecture and garden art of the last century. (Lehrman, 1980)

On the north of the Shiraz but nearer to the river were-and are-other well-known gardens. One that was frequently mentioned was the Bagh-i-Rasht Bihesht, or Garden of the Envy of Paradise, which has laid out about 1824. This garden may have been in the near neighborhood of the Bagh-i-Eram, today the best known to the general visitor of the Shiraz gardens. It takes its name from a fabulous garden of Arabia, cited in the Quran as "Iram adorned with pillars," held by the 'Ad tribe dwelling in the region to the north of Mecca. Upon occasion the name is misquoted as the Bagh-i-Aram, or the Garden of Tranquility, and this name seems appropriate to the atmosphere of the garden.

Local historical sources are not as clear on the history of this garden as on others at Shiraz. There is no agreement as to the name of the founder of the garden, although it is generally ascribed to one of the heads of the nomadic Qashqai tribe. The main structure is assigned to a local architect, Hajji Muhammad Hasan, who was without a peer in the design of garden pavilions. For at least seventy-five years the garden remained in the hands of the Khans, or chiefs, of the Qashqai tribe, this same structure is the focal point of the garden, as is shown in the plan of the garden, measured and drawn in 1945.

The Bagh-e Eram owes its continuing popularity to its groves of orange trees, its long avenue of stately cypresses, and the impressive structure which has been the scene of Qashqai hospitality so freely offered to so many visitors. Every few years more of the orange trees fall victim to heavy frosts but the cypresses is as impressive as at any time in the last fifty years. In the plan arrangement the long axis is pronounced; indeed it is along this axis that is to be found all the interest of the garden, the balance of the area being taken up by irrigated plots crowded with citrus and fruit trees. It is easy to imagine the earlier owners leaving the main pavilion and strolling down the water-lined avenue as far as the lower pavilion, where they rested from their exercise.

Today the main pavilion is the focal point of interest. The lower rooms are just below ground level and the central room is designed for hot-weather comfort: the water channel passes right through it-filling a pool on its way-before emptying into the great basin, and the walls and floor are lined with enameled tiles. Steps lead up to the living floor and to the passageways into the great central rooms; to the south the view is prolonged down the main axis; and to the north it opens onto the hills that rim the

river valley. As in so many structures at Shiraz, glazed tile and carved stone revive the ancient heritage. The pediment area depicts a Sassanian scene in colored tile, while at the ground level slabs of limestone display somewhat distorted copies of figures from the processional reliefs at Achaemenid Persepolis. Throughout the extensive area few flowers bloom in beds. Instead, the greenhouse with its stepped rows of planks provides potted plants for distribution at key points inside and outside the pavilion. (Wilber, 1979)

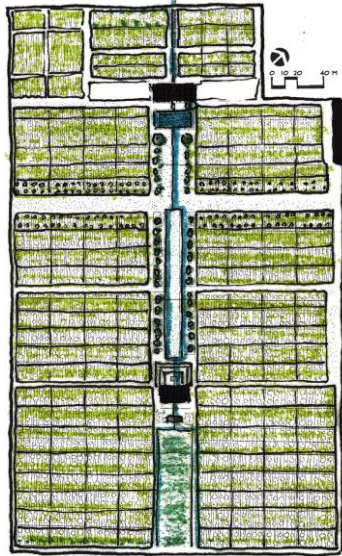


Figure 3.35 : Bagh-e Eram (Drown by The Author)

3.6.2 Bagh-e Shahzadeh Mahan - Kerman

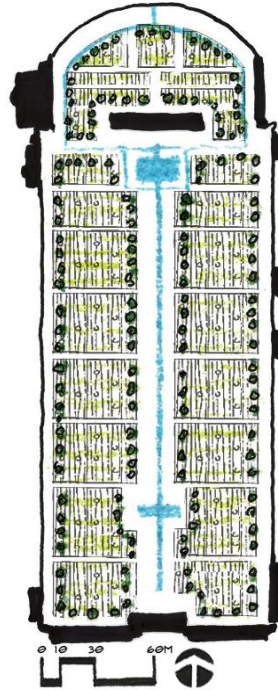


Figure 3.36 : Bagh-e Shahzadeh Mahan

3.6.3 Bagh-e Narenjistane Gavam and Divan-khaneh - Shiraz

As would be expected, town houses in Shiraz reflect the type that is now so familiar, the open-center pavilion facing south. Long vanished, with its name forgotten and preserved only in a very old photograph, the carved and colored bas-reliefs portraying ancient heroes and kings are sheltered in the museum at Shiraz.

Somewhat later in date was the structure known as the Divan-Khaneh, or Hall of Audience, belonging to the Qavam-Shirazi family. Note the characteristic pediment treatment with its scene inspired by antiquity and the curtain in place to shade the porch on hot days. The plan illustrates another familiar arrangement; featuring the pool, the central, decorated path, and the flanking foliage. The main block houses the living quarters, while the kitchen and the servants' quarters are along the street. Of interest is the typical manner of concealing the interior court from view from the street. Again in Shiraz style are the elegantly attired servants offering fruit and drink to guests, the figures executed in enameled tile.

Just across a narrow lane from the Divan-Khaneh is another early nineteenth-century town house, belonging to the same Qavam-Shirazi family. This structure, called the Narenjistan, is very similar to the Divan-Khaneh in plan, except that it is on a much

smaller plot of ground and departs from the usual pattern in having the main rooms facing toward the east rather than the south. A series of rooms lines the four sides of the open court. Fine wood paneling and the famed Shiraz inlay work feature the reception rooms and the largest of these is completely covered-walls and ceiling-with mirror work. There are pools lined with blue enameled tiles at either end of the court, one provided with a decorative fountain. (Wilber, 1979)

The name of this small garden refers to its orange trees. A central canal links a series of pools lined with blue enameled tiles to a straight-sided tank in front of an elegant 19th century house. As customary, the principal rooms face south and are above the level of the pool and garden. The garden is flanked by palm trees, with high walls on the boundary, a set of rooms behind an arcaded wall cuts out the activities of the busy street to the south, while a right-angled turn in the entry lobby to the garden affords visual privacy. (Lehrman.1980)

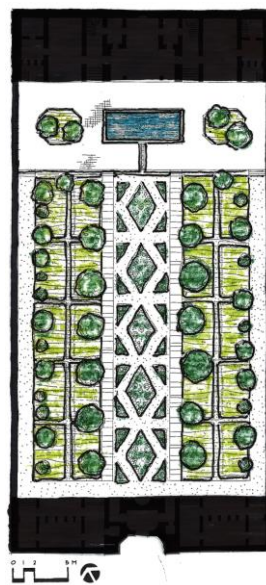


Figure 3.37 : Bagh-e Divan khane (Drown by The Author)

3.6.4 Bagh-e Takht - Shiraz

About the year 1665 John Baptiste Tavernier describes a Garden of Paradise which can be identified with this site. Tavernier writes: “Without the City, upon the North-side, at the foot of a Mountain, is a Garden belonging to the ancient kings of Persia, called Bagh-i-Ferdaus. It is full of fruit trees and rose trees in abundance. At the end of the Garden upon a descent of a Hill stands a great piece of Building and below a large Pool affords it water.” In 1705 Cornelius Le Bruyn wrote of “the amiable

palace of Ferdaus,” but just a hundred years later the garden had acquired the name Takht-i-Qajar, or Throne of the Qajar (dynasty). At that time its foundation was ascribed to the Qajar ruler Muhammad Shah and to the year 1789; on the left of the area was an enclosed ground for antelope and other game. At some unknown date after 1800 it acquired its present name, the Bagh-i-Takht. However, the great pool now stands empty and dry. Even in ruin the garden is of real interest for it is thoroughly typical of the type of garden fed by a spring, the flow of which is collected into a large pool. Such a pool was called *daryacheh*, or little sea, and it is certain that it was made as large as possible. Descriptions emphasize that all such pools were provided with small boats; in these boats the proud owners navigated across the open sea, leaving their arid shores far behind. The type of hillside garden appears in Azerbaijan and then again in India where Persian influences may have been grafted onto the plans established by Babur so long before. There is no way of knowing when this type of garden appeared in Iran.

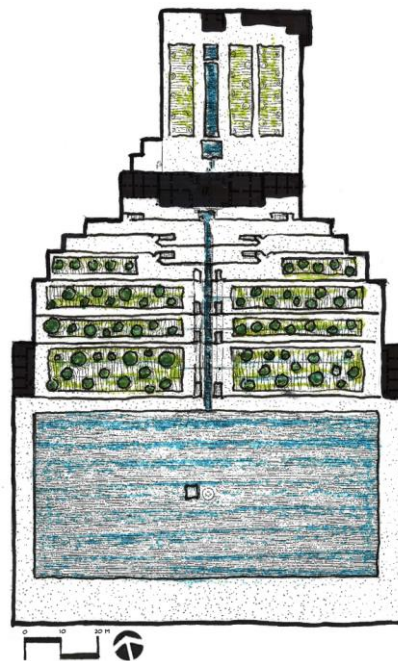


Figure 3.38 : Bagh-e Takht (Wilber, 1979)

3.7 Pahlavi Gardens

In mid 19th century during the Reza Shah's time, the use of garden as a temporary protocol and ceremonial residence was taken into consideration, so that in Pahlavi's time, due to new recreational needs, the spatial arrangements of the gardens have changed to a totally different approach than Qajar era.

Constructing and establishing new buildings inside the garden relative to different activities and programs caused a change in spatial arrangements of the garden. The entrance gateway of the garden was ignored and neglected as a result of shifting the direction of the main axis of the garden. Administrative, recreational and military buildings besides athletic fields were constructed and distributed within the whole area of the Qajar gardens as per need of royal family with no respect to the structure and organization of Qajar gardens. Vast and large open spaces that were covered with lawn and exposed to the sun light replaced the spaces that filled with deep and dense shadow of the old trees. One started forming the trees and shrubs, through pruning and trimming and planting nonnative and ornamental trees in the form of massive group instead of linear planting of them in Qajar era ; therefore, the type of plants and the way they have been planted caused changes in geometric order and organization and consequently changed the main and original plan of the Qajar garden. In 20th century and during the Shah time (Pahlavi the second), the space of the garden was segregated and separated due to recreational needs (such as swimming, tennis, horse riding and so on) regardless to traditional geometric structure and then each part was organized and ordered for a specific function and role. Different roles and functions like relaxing space (bowers and pergolas), athletic fields (like tennis courts), collective spaces for royal courtier celebrations and greenhouses for fostering the specific vegetations of the gardens were added and allocated into different parts of the garden. As a result, in Pahlavi era the space of the garden has been divided and separated according to new recreational needs.

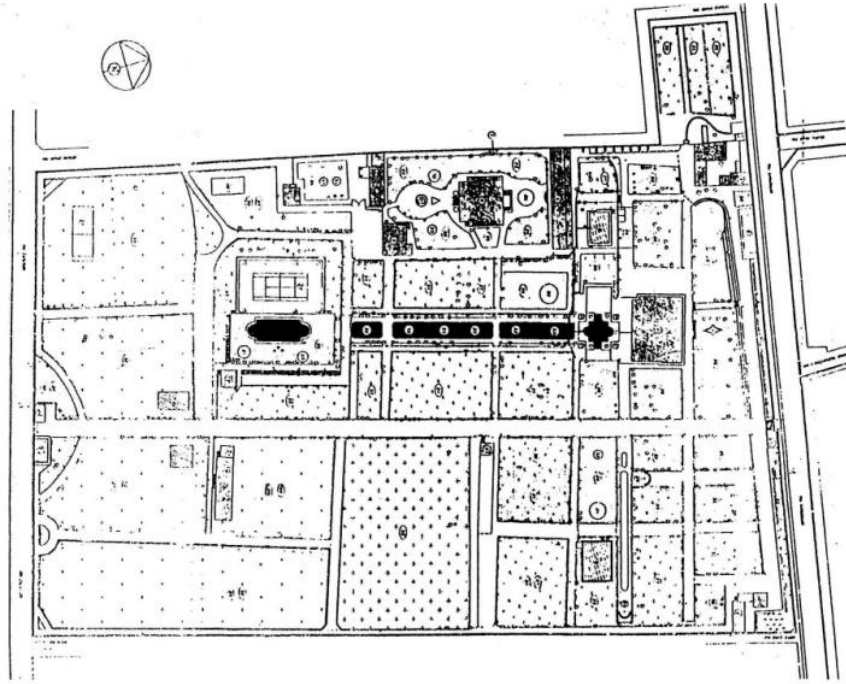


Figure 3.39 : Map of Bagh-e Farmanieh

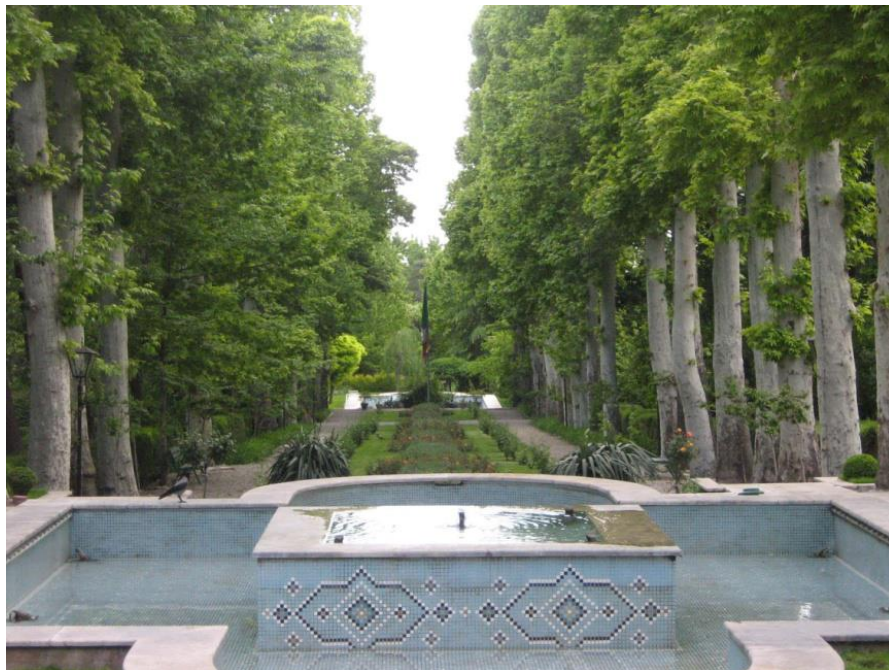


Figure 3.40 : The principal axe of Bagh-e Farmanieh

4. FACTORS AND PARAMETERS

4.1 Functions of Persian Gardens

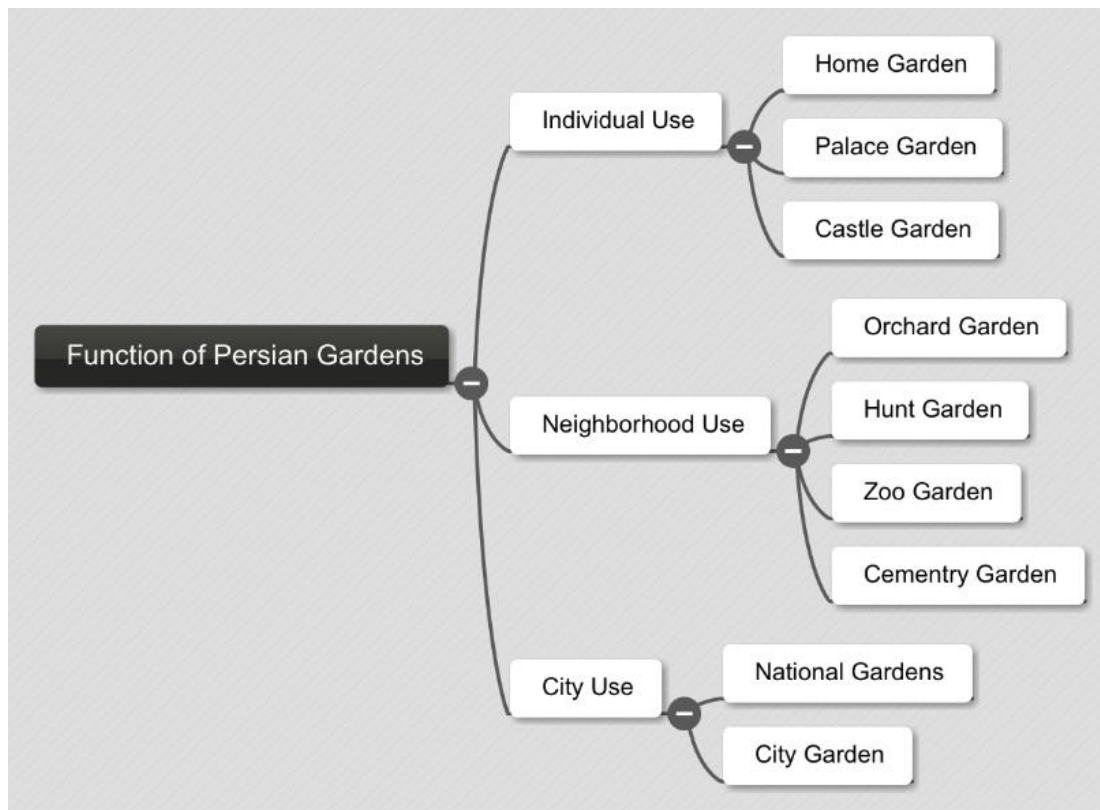


Figure 3.41 : Functional System of Persian Gardens

4.1.1 Individual gardens

4.1.1.1 Home-Garden

The pattern of home gardens is inspired by the pattern of extensive gardens, but due to their usual placement in dense urban textures, they have been made on much smaller lands, and their major function is residential. The main buildings of these gardens with residential functions were studied and evaluated as Iranian houses, like Qavam House in Shiraz. (Shahcheraghi, 2011)

4.1.1.2 Palace-Garden

The pattern of this kind of gardens, like pavilion gardens, is based on the pattern of open gardens, but in direction of main axes, a greater building is built in the garden as a palace with functions for bureau, ceremonial, and governmental affairs. A good example to mention is the palace garden of Chehel-Sutun in Isfahan belonging to Safavid dynasty. (Shahcheragi, 2011)

4.1.1.3 Castle-Garden

A confining wall is one of the main components of extensive Persian gardens. In some historical periods and some cities, due to some certain conditions and also for protecting gardens against animal attacks, for protecting the residents of gardens, and for creating mental calm and a quiet atmosphere for a private life, the walls were made so thick and as high as a tall castle wall and sometimes turned into fortresses and watch towers which were built inside the walls.

The garden of Hassan-i Sabbah in the Alamut Castle, Fin Garden in Kashan, and Shiraz Gardens in the Safavid period are among this type of gardens. In general, the security aspect is dominant in the castle gardens. (Shahcheraghi, 2011)

4.1.2 Neighborhood gardens

In Iran, sometimes garden was considered to be an area of land in nature which was used for agricultural purposes to yield economic profit or a place for growing and keeping animals and plants.

4.1.2.1 Orchard-Garden

The orchard garden has been one of the most economically beneficial types of gardens and has merely agricultural and farming function. It may or may not include a building. (Shahcheraghi, 2011)

4.1.2.2 Hunt-Garden

Hunt gardens are of two types: those which have been built in the habitat of animals and its surrounding areas. Some examples are the kings' resorts in various periods or extended gardens that animals of different species were kept in. In these

kinds of gardens, hunting was done inside the garden, like part of Hezar-jarib Garden. (Shahcheraghi, 2011)

4.1.2.3 Zoo Garden

Zoo gardens were places for keeping wild animals given to kings as gifts in different periods. The pattern of this kind of gardens is similar to that of extensive gardens; however, instead of a pavilion, the animal cages—which were mostly made of rolled gold bars—were relocated. Some examples are House of Lions, some parts of Saadat Abad Garden belonging to the Safavid Period.

4.1.2.4 Cemetery-Garden

A cemetery garden is a kind of garden all or a portion of which is often dedicated to tombs. There has not been a sufficient body of research on the causes and development philosophy and formation process of cemetery gardens. According to Shahnameh, it can be conjectured that in some regions of Iran, in ancient times when burial was considered as indecent, perhaps there were some cemetery gardens.

In any case, it can be stated that giving importance to Heaven and its definition were effective in the emergence of this kind of tombs. This phenomenon can be seen as a reflection of people's desire to go to heaven. One of the oldest documents in the post-Islamic period is related to the burial of Sultan Mahmud of Ghazni in Victory Garden in Ghaznein in 421 AH. Apparently, this garden was one of the governmental and formal gardens of that period, which was used for government affairs and for spending leisure times. It probably also had settlement functions. Based on some resources, Sultan Sanjar Mahmudi's tomb in Marv was also located in a garden with Chahar-bagh design. According to the documents, since the IL khanate period, more attention was given to building tombs and also to the cemetery gardens.

It seems that most current cemetery gardens in Iran used to be used either merely as gardens or as tombs, but they have gradually changed their usage to cemetery gardens.

Mossala graveyard in Naein and Gadamgah in Neishaboor are two instances of such cemetery gardens. There is not any large and magnificent cemetery garden in Iran

that has been designed and built for the purpose of being used as a graveyard. Shah Nemataallah Wali's tomb in Mahan, Kerman, and Fatima Masumeh's tomb in Qom, which consisted of 4 courtyards, is also considered as cemetery gardens (Naima, 2006).

4.1.3 City gardens

Beautiful houses, springs, and running streams are signs of heaven and have always been considered as human's desire and interest. Therefore, in the building of cities, the planners were trying to always create an incarnate this imagination (Moayed, 1977). The pattern of Persian gardens' design was the basis for the design of cities and towns in the past. The structural relationship between the development of a garden and city is in a way that that a city can be called a garden or vice versa. On the other hand, gardens are considered as places where the basic blueprints for city design are set (Mirfendereski, 1997, P.124). This could be added that gardens as the prototype of city pattern, has been recreated from an architectural scale to urban scale.

4.1.3.1 National Garden

The word "national park" referred to public promenades in city centers which mainly had public usage, a trend which started from the Safavid period. But since Qajar period, types of modern parks called "National Garden" were introduced. One such instance is the National Park of Tehran, whose entrance still remains. The National Park of Old Tehran was constructed as Mashg Square, which was a public promenade, and its entrance still remains.

4.1.3.2 City-Garden

So far, no exact theory is proposed about the city gardens' pattern and their construction time based on garden design. David Stronach, in the report of his research on Pasargadae Royal Garden, expresses that Cyrus the Great was going to make a capital full of gardens. Also, according to the conducted research about the Sassanid period, some cities were built full of gardens. Considering the fact that a garden is a cultural product of a civilization, the reflection of changes in the structural relationship between the garden and city is clearly observable in the first

post-Sassanid basic designs which were built by Abbasid caliphates. For example, a considerable area of Samarra used to be covered with chains of vast gardens. It is as if the whole town was built based on an infinite replication of the same pattern of “garden in garden.” (Mir Fendereski, 1995, P.124)

According to research, city garden is one the main urban design patterns of Iran in the Safavid period and takes a logical form. This pattern can be observed in the urban development based on the gardening system in Gazvin, and in the city of Isfahan. It is necessary to explain that this type of pattern affects all the organization of the urban system. [4:58:22 AM] The Garden of Isfahan City is one of the most complete experiences in the field of urban design, which was built about 400 years ago in Iran. With this kind of design, the regular structure of the new city, out of the old city, forms through applying the principles of "a garden in a garden" and through a major division of a city according to two main axes, which creates the Chahar-bagh.

4.2 Elements of Persian Gardens

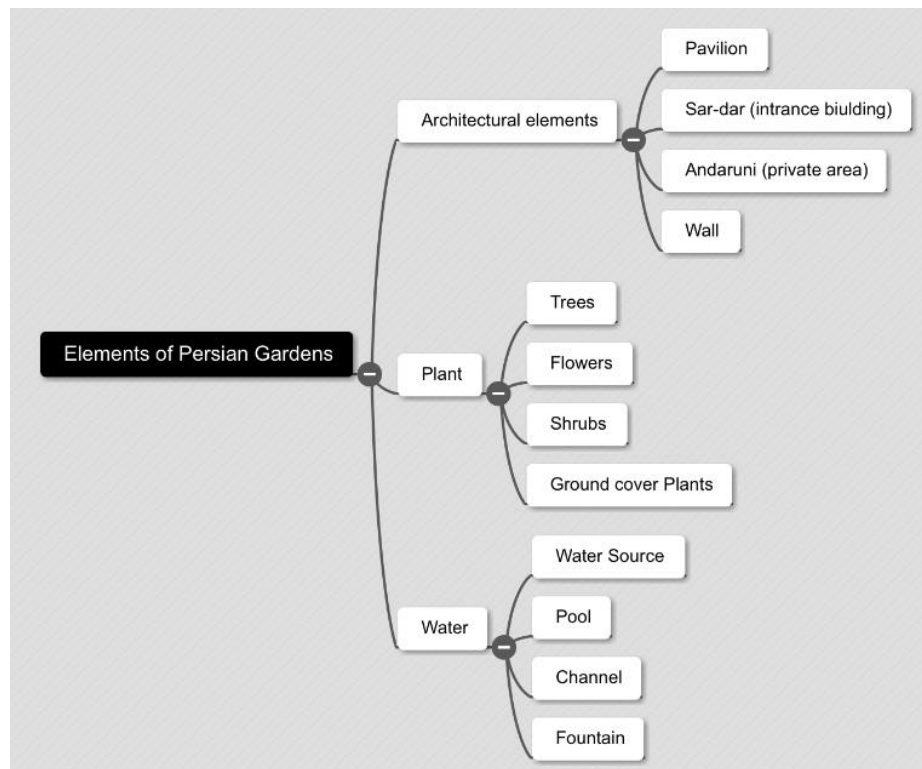


Figure 3.42 : Elements of Persian Gardens

4.2.1 Architectural elements

4.2.1.1 Pavilion

Pavilion may refer to a free-standing structure sited a short distance from a main residence, whose architecture makes it an object of pleasure. Large or small, there is usually a connection with relaxation and pleasure in its intended use

4.2.1.2 Andaruni

In traditional Persian residential architecture, the *andaruni*, is in contrast to the *biruni*, and is a part of the House in which the private quarters are established. This is specifically where the women of the House are free to move about without being seen by an outsider (*na-mahram*). The only men allowed in the *andaruni* are those directly related to the Lord of the House (his sons) and the Lord himself, which may include boys under the age of puberty, and guests allowed in under special circumstances. The court (usually located in the *talar*) of the house would usually be situated in the Andaruni.

4.2.1.3 Sar-dar

In the governmental gardens, a building was constructed in the entry space that in most cases was residential location for the guardians or for service staffs of the garden. The edifice located in the entrances, only in a very small number of gardens and for the main inhabitants of the garden, was built in a bigger size.

In most of the residential gardens, only government had the right to use a building which was constructed in the entry space of the Governmental Gardens. In this case, the rulers and bureaucrats could deal with court affairs in the same building that one of its sides was opened to the interior space of the garden and the other side was along a passage or a square. Thus, participants didn't have to enter into the domestic part of the garden and the privacy was preserved.

In some of the governmental-residential gardens that was usually located in the capital or a major city, in the front side of the Court building which was located in front of the portal building (*sar-dar*), a square like field was made for the governmental ceremonies or parades.

4.2.2 Planting system

In 1818, Sir Robert Ker Porter describes the rose plant in Persian gardens:

... in no country of the world does the rose grow in such perfection as in Persia; in no country is it so cultivated, and prized by the natives. Their gardens and courts are crowded with its plants, their rooms ornamented with vases, filled with its gathered bunches and every bath strewn with the full blown flowers, plucked from their ever replenished stems (Brooks, 1987)

4.2.2.1 Native plants of the Persian plateau

More than 10,000 plant species have been identified in Iran despite seventy percent of the land being categorized as not arable. Most are bulbous plants requiring specific environs. Many are difficult to grow in Persian gardens and rate highly with collectors with esoteric botanic gardens worldwide. Plants are rarely seen beyond the main routes that cross the plateau, thus they mark sharp contrast – trees in particular – when they blossom in spring and leaf in summer, their colors standing out against buff mud walls. Even gardeners in the smallest villages will harvest figs, walnuts, pistachios and pomegranates. Across Central Asia, close-set rows of white-stemmed poplars (*Populus Alba f. pyramidalis*) take to the *sardsir*, “cold land,” indicating water and lining wheat fields. Similarly, Oleaster (*Elaeagnus angustifolia*), willows, alder and ash indicate water. Date palms appear in the *garmsir*, “warm land,” in the semitropical lowlands of the southern provinces as do the Kunar tree (*Ziziphus spinachristi*), acacias, prosopis and others. Although the overwhelming expanse of the plateau is unrelentingly brown, eye-catching oases do occur in valley dips. The original traveling salesman, Venetian Marco Polo, (c. 1254-1324) cited “fine groves of date palms, which are pleasant to ride through” between Yazd and Kerman (Hobhouse 2004, 25). The temperate climes of the Fars produce citrus groves and give Shiraz the productive lush that lets poets carry on about roses and nightingales. Hydrology of the day allowed Shah Abbas tap the Zayandeh-Rud, the river that flows through Isfahan, to water his gardens and fountains.

The array of cover on rocky hills and nearly treeless steppes at lower elevations include pistachio stands and shrubs like almond, berberis, lonicera and lycium. But even that plant presence shrinks to nothing on lower sweeps where rainfall measures fewer than four inches per year or where *kavir*, saline swamps, preclude growth.

Spine-laden bushes or brushwood such as the gum-emitting *Astragaleta* and *Acantholimon*, and sometimes gum Arabic (*Acacia nilotica*), are found among grasses and herbaceous plants like *Artemisia* on the steppes above 6,000 feet. Across the plains, the scrub finds mostly wormwoods such as *Artemisia herba-alba*; dwarf bushes, grasses and herbs scatter along intermediate elevations. Rockier environs support only the likes of *ephedra* such as redflowered *E. intermedia*, or occasional camel thorn (*Acacia girkffae*, syn. *A. erioloba*), whose bare branches sport red flowers in spring. Vegetation must be cultivated (Hobhouse 2004, 24). The Dasht-e-Kavir, like any good desert, seems to support nothing but a few defensively spiky, thorny or prickly plants until rare spring rains coax forth a fuzzy blanket of unexpected greenery.

4.2.2.2 Trees

Shade trees formed a major feature in the Iranian garden, and large numbers of sycamore and plane were planted to cast their shadow over water, against walls and over paths, which were therefore narrow. Other trees frequently found were the poplar, used for building since it grew quickly, and the cypress, appreciated by poets as a symbol of eternity and death, since it did not rejuvenate after being cut. In Contrast, the delicate rosy sprays of the almond or silver flowering plum were emblems of life and hope. Elm, ash, pine, oak, maple, spruce and willow together with hawthorn and myrtle bushes were also found in the Iranian garden. Trees were regularly planted in rows, one particular species at a time being used to border an avenue or define or fill a distinct section.

Fruit trees were prized not only for what they produced but also for their decorative qualities. Of the fruit trees that were planted in the Iranian garden apple, apricot, mulberry, cherry, fig, lime, and orange, lemon, peach, melon, pear, plum, pomegranate, grapes and quince were among them many were appreciated for their blossom. On walls and pergolas grew the grapevine, since the Quran's strictures against wine were not always interpreted too strictly. Nuts, such as the almond, hazelnut, pistachio and walnut, were also grown. Flowers depicted or referred to with possible ceremonial significance in Achaemenid and Sassanian times, offered color and fragrance. New plants, vegetables, fruit and anything exotic, were always

welcomed. Such gifts were brought to the Shah from Europe, as well as from other parts of Asia. (Lehrman, 1980, P 114)

4.2.2.3 Ornamental plants

Not man's flowers were named in early works on gardening, but from poetry, carpet designs and pottery it was possible to discover which flowers were grown. Firdausi's *Shahname* is such a source. Often mentioned, and therefore presumably widely grown, were lilacs, lilies and roses, irises, marigolds and, especially in Isfahan, jonquils and tulips were grown in Iran for many centuries. Also common were jasmine, narcissus, anemones, carnations, crown imperials, cyclamen, daffodils, hollyhocks, hyacinths, violets, larkspur and poppies.

Pride of place went to the rose. Planted informally, or massed in bowers, it was universally popular and even formed the subject of festivals. Praised by poets, it provided a popular theme. Hafez, describing the Persian spring, wrote, 'Earth rivals the Immortal Garden during the rose and lily's reign', and the beloved was often compared to a rose. The word for rose was *gul*; it was also used as a generic term for flower, and as such is also found as a compound word, such as *gul-i-narges* (narcissus). Colors ranged from amber and orange through to yellow and white, with all shades of red, and many combinations. Garden Plants were appreciated in their original form, or were improved by selective breeding rather than through cultivation of hybrids. The Iranians remained as conservative in their attitude to plants as in their approach to architecture.

All flowers were precious, especially since in the hot, dry climate the blooming season was so short. Contemporary miniatures show the disposition of flowers in the Iranian garden. Flowers were planted in mass display for their scent as well as color (rose-water was used as perfume), and were also set out individually or in informal groups among the sparse grass, sometimes, with the exception of roses, under trees. The few parterres evident in the Iranian garden were probably of European influence, and there were no regular rows or herbaceous borders. A 14th-century description of narcissus meadows near Kazarun and Jirra in Fars, describes the grass as 'all full of self-sown narcissus, so that all the plain is covered with flowers. It is most famous,

and such is the sweet smell of the narcissus in these meadows, that, while it goes to the head, the heart is rejoiced thereby.' (Lehrman, 1980, P 114)

There are all kinds of flowers in Persia that one finds in France and Europe. Fewer kinds grow in the hotter southern parts but by the brightness of coloring the Persian flowers are generally more beautiful than those of Europe. Along the Caspian coast there are whole forests of orange trees, single and double jasmine, all European flowers, and other species besides. At the eastern end of the coast, the entire land is covered with flowers. On the western side of the plateau are found tulips, anemones, ranunculi of the finest red and imperial crowns. Around Isfahan jonquils increase by themselves and there are flowers blooming all winter long. In season there are seven or eight different sorts of narcissus, the lily of the valley, the lily, violets of all hues, pinks, and Spanish jasmine of a beauty and perfume surpassing anything found in Europe. There are beautiful marsh mallows, and, at Isfahan, charming short-stemmed tulips. During the winter there are white and blue hyacinths, lilies of the valley, dainty tulips and myrrh. In spring yellow and red stock and amber seed of all colors, and a most beautiful and unusual flower, called the clove pink, each plant bearing some thirty blooms. The rose is found in five colors, white, red, yellow, Spanish rose, and poppy red. Also there are 'two-faced' roses which are red on one side and yellow on the other. Certain rose bushes bear yellow, yellow-white, and yellow-red roses on the same plant. (Brookes 1987, 200).

Flowers prove so attractive that their collections multiply easily. Chardin's catalogue is such an example. An early English traveler could have added clove gillyflower, daffodil, hollyhock, lilac, poppy and saffron. From elsewhere, grape hyacinth, miniature Persian iris, species tulips, pink and evening primrose, additionally: primula, oenothera, delphinium, tuberose and musk flower. Three times as many can be tracked by Persian names alone. Less noted are the relationships of Persian flowers to native environs. So many varieties were imported from so many places, particularly in recent times that a complete account might be unattainable. Persian names in some cases seek to describe plants theretofore unknown. Herbaceous plants might be scattered through ground cover or they might be edging, to wit, anemone, bluebell, hibiscus, larkspur, tulip, violet and wallflower. Carnation, daffodil, hyacinth, jasmine, lily and rose rate highest for scent. Some plants are used

medicinally. Mint, saffron and sweet marjoram are used for seasoning. Poppy seeds are edible. Hollyhock and iris provide vertical accents as well as color; they offer contrast with low, massed cyclamen and lilies of the valley. Less thought of as flowers, grass and moss are chiefly ground cover. Unique is the lotus, floating enigmatically on still water.

4.2.2.4 Shrubs

Shrubs offer qualities that differ little from trees. The key distinction is one: fragrance. Almond and quince shrubs bear fruit and offer color. The lilac is a veritable riot of color and smell. Myrtle, too, offers a fragrant presence. Blossoming hawthorn adds color. Shrubs in the Persian garden are used to edge space. Box and hawthorn can be trimmed sufficiently to respect the geometric dimensions of the Persian garden.

4.2.2.5 Ground cover plants

Little speaks the volumes of climate distinction in Iran as grass. Throughout Europe, grass is a given. In Iran, it is a luxury requiring constant water and care. As a medium in a Persian garden, grass is a jarring consideration. Great base for an English garden, where the sweep of lawn is a customary feature, grass is out of sync in Iran. Dust is better considered as the medium of a Persian garden. A Persian garden cannot include grass and remain faithful to indigenous plants.

4.2.3 Water system

Thomas Herbert describes City of Shiraz in 1628:

... the earth dry but green; the air salubrious, though sharp a little. .. and nothing more complained of by the inhabitants than want of water.
(Hobhouse, 2004)

Irrigation was indispensable, and the canals of the garden echoed the systems used for watering crops. A geometric layout was commonly used for the canals, even on gradients. Straight canals defined areas of grass and planting. With great economy of means, the water in these gardens played more than a mere functional role. Dark deep ranks and tiled basins, flowing channels, thrusting fountains and splashing cascades all added to the attraction.

Water was appreciated in many different ways. In pools, its dark reflecting quality was preferred, whereas in channels, its movement and clarity were emphasized by blue tiles. The pleasant noise of water was enjoyed when it gurgled through runnels, or was broken up by a chute. When motionless, the glossy sheen provided a textural contrast as well as a mirror to the varied foliage. Petals of roses or other flowers were strewn on the water's surface, and apples were placed on the top of fountain sprays, or set to float on the pool below.

Pools were found in the gardens of the rich, and in the courtyards of the urban dweller. They were filled from storage tanks, from which they were drawn, or from open channels, which in the city flowed down streets and lanes. In gardens they served as reservoirs, and in mosques they were used for ablutions. The sides of the pool were built above the surrounding ground, and there was a peripheral gutter to take the overflow. This gutter was necessary since, in order to appear shimmering and unconfined, the pool was filled to its brim, the edges were precisely leveled and water flowed over on every side. When filled to its edge, the scale of the pool seemed larger. Reflection and reality merged, and because there was no coping to cause disruption it supplied a striking symbolic representation of image on substance, of heaven on earth. (Lehrman, 1980)

Pools varied in size from the large straight-sided "little seas" (*daryaches*) to very small basins. Often they contained a single fountain, sometimes a number of fountains. There was also a great range of shape, although always geometrical and never freely formed. Most frequent was the rectangular tank, but square, octagonal, circular, lobed and cross-shaped tanks were also found. Sometimes a pool would be located within a pavilion, where it would clearly reflect the elaborate ceiling.

Although multiple fountains and a wide variety of nozzles may have been unknown, great use was made of water pressure, and patterns were made by opening and closing individual valves. Fed by lead pipes, fountains were located both indoors and out, contributing both form and delightful sound. (Lehrman, 1980)

4.2.3.1 Subterranean canal (Qanat)

This system supplies underground water through a series of shafts that uses gravity to bring water to the surface. Developed by the Persians, Qanats are typically dug

where no surface water exists. A main shaft taps deep into the water table. Water runs down a gently sloping tunnel, gaining volume until it finds alluvial fans and surfaces. This spot where soil has been enriched by sediments is a likely emergence point. Farmlands and settlements needing the water situate at lower points than where the water surfaces. The surface point, or outlet, is where people take the water; it might be in the main square of a village. The outlet point must be well kept to ensure access, and water use must be monitored to ensure availability. Water is diverted to fields through a tunnel called a *payab*. A corridor slopes from the surface to the payab. The main access point for drinking water is the first payab. A series of smaller *payabs* connects to the main tunnel.

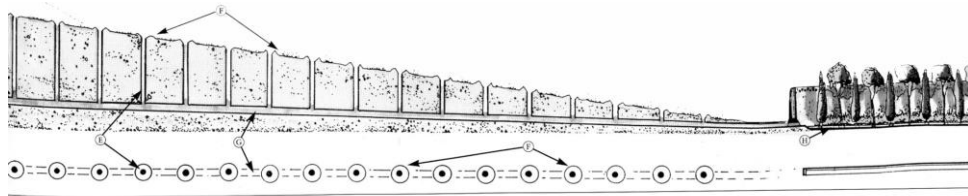


Figure 3.43 : Up: A Cross Section Down: A Plan of a Qanat

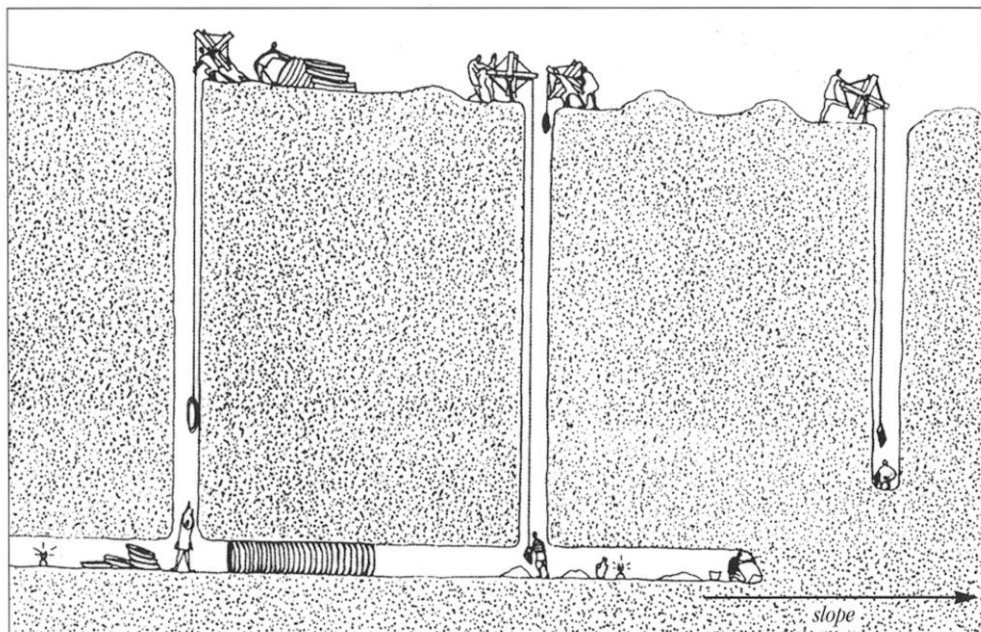


Figure 3.44 : Construction Proseses of Qanat

Qanat history - Achaemenians (560-330 B.C) enlarged irrigation systems to include their gardens and to expand agriculture. In areas such as Babylon, they further developed a canal system that delivered water between the Euphrates and Tigris rivers. But on the high, dry Iranian plateau, where surface water typically evaporated,

the water system consisted of subterranean channels called Qanats. This irrigation method, which dates to the ancients, tapped into aquifers and used gravity to deliver water to settlements and farmlands. The system of tunnels by which water was directed was dug by hand by workers using simple tools. An excavator used the shadow of a candle, for instance, as a plumb line (Moynihan 1979, 25-26).

Lives depended on Qanats. Diminished water flow could spell the end of a village. When that happened, people moved on. This at times semi-nomadic life-style explains ruins of mud houses discovered some distance from foot hills. It explains why caravans were at hazard of finding abandoned Qanat lines the hard way, at night when many desert travelers were on the move. Accounts of early travelers record tragedy and comedy in regards to such events. Frequently, multiple Qanat channels run parallel to one another. The untrained eye might not immediately comprehend a Persian landscape marked by regularly spaced mounds of dirt surrounding the access shafts of Qanats.

Cyrus the Great (559-529 B.C.) and his successors extended Qanat networks across the Persian Empire. Until recently, this ancient water management system supported desert life and sustained rural communities of Iran. More recently used mechanized schemes have supplied increasing amounts of water for industry and urbanization. These methods have exhausted many old Qanat networks.

Qanat water in Persian gardens - The direct, ancient means of Iranian irrigation consisted of watering orchard tree roots, bordering gardens or lining avenues by a series of water channels called Jouies or, more commonly, Jubes. These open ditches that delivered water to roots via seepage were furrows or trenches between rows of trees. Jubes are still in use in Iran and can be found in the capital, Tehran. The system of Qanats and Jubes spread across the Persian Empire into regions that previously had not had reliable water supplies. Qanat lines have been spotted snaking across southern Arabia, outlining the old route to Samarkand north of the Kara-Kum desert, dotting Afghanistan and crossing Central Asia. They are known as *kariz* Jubes, Aryks and Juis. By any name, they remain the common method of irrigation in those areas.

Typically, a Qanat tunnel surfaces and becomes an open channel a few hundred yards from a village. On an upper slope, an abundant water supply can be tapped by Qanat owners or by buyers of the largest shares of water. The channel flow becomes pools in front of pavilions that are surrounded by orchards and gardens. From there, the water is used to turn the wheels of mills. On the rural areas of larger communities, water divides into rivulets that border narrow lanes. Below villages, small channels spread across field until all the water is used.

Qanat Management – Qanat systems are big operations. They are labor-intensive, expensive to build, cover large areas, require detailed planning to construct, and require long-term administration. In short, they are a bureaucracy unto themselves. Supervision calls for a central director or a communal committee or authority that can organize labor and arrange to pay for it, such as by levying taxes. Working apportionment is required to fairly distribute benefits of a hydraulic system. Construction calls for skilled labor. In some parts of Persia, the allocation of water was measured in time units based on land ownership to ensure fair distribution, such as a half-day of water per week. In other areas, farmers took their water in turn, each farmer opening a sluice gate to flood his fields before the next farmer in line took his turn in a rotation. A third system, independent of land ownership, counted water rights as a utility measured in time units that could be sold or traded like commodities.

4.2.3.2 Pool

Pools carry great importance in Persian gardens. Not for drinking, this water is in reserve for watering the garden and settling dust on walkways and terraces. Pools vary in size and shape. Deep pools tend to be straight-sided. Basins are shallow. Typically situated along the garden's long axis, they sit at right angles to larger areas. Sited on slopes, they are gravity fed with capacity similarly equalized: overflowing basins create falls or chutes of water that add to the garden's effect. Pools fill from storage tanks and serve as reservoirs.

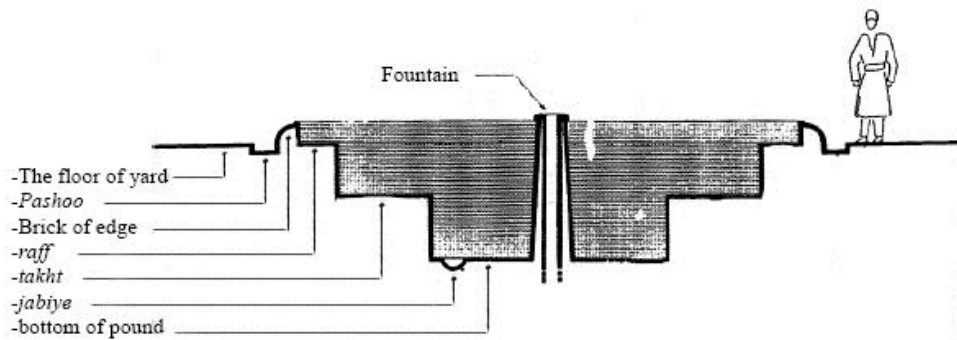


Figure 3.45 : Pool Section

Water's edge is an understandably attractive area in a Persian garden. Custom provides for access and a hard edge that mirrors the line of the channels. Pool sides often sit higher than surrounding ground and bear elaborate engravings. Water scarcity keeps pools shallow, but the discovery that murky water appears deep – thus infinite – gave designers options. Sky reflecting on still water surfaces brings light and an illusion of space. Clouds drifting across a still pool add an ephemeral sense. Because making a pool appear unconfined requires filling it to brimming, gutters must be set along pool peripheries to take overflow. Such filling also makes pools seem larger. An expanse of water allows reflection to merge with reality, provoking images of heaven merging with Earth. Examples of these presentations can be found in existing gardens as well as in artistic representations, notably miniatures that date from the 15th Century. Evidence of the elaborate thought put into pool design can be found in Safavid period (1491-1722 A.D) gardens at Isfahan: Tiered pools with as many as four levels used different shapes for each pool. So-called free-form pools were not used in Persia. A typical shape was rectangular, square, circular, octagonal, and lobed or crosses. When pools appeared within pavilions, they were there to reflect ornately decorated ceilings.

4.2.3.3 Channels

Water originally flowed through Persian gardens in narrow, shallow channels, broad expanses of paving extended to either side. The evolution of design let these channels become wider, changing how water was used in the structure. So strong was the meaning of water to Persians that even when no water is intended through channels, the presence of water is felt. Channel decoration such as zigzag or wave patterns gives the illusion of water movement. Textural choices in or along

watercourse can disturb moving water, producing a patterned effect. Water sent tumbling over rocks can be made to mimic mountain streams. The choices available to designers are endless once the manipulative effects are understood.

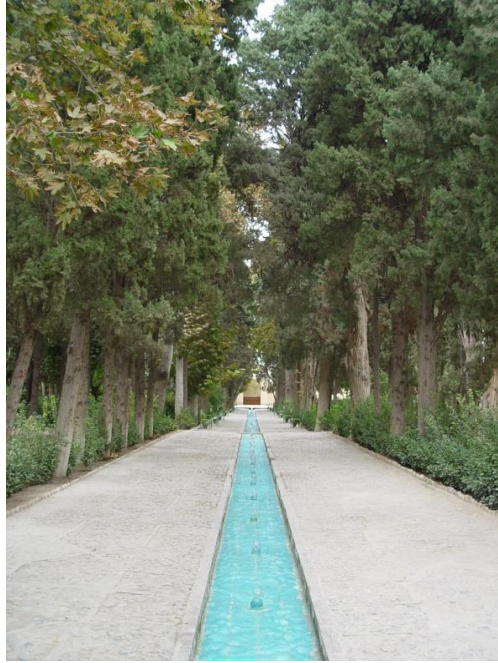


Figure 3.46 : Water Canal of Bagh-e Fin

4.2.3.4 Fountain

Water fountains had places in indoor and outdoor pools; as many as five hundred fountains served the Hazar Jarib garden of the Safavid period in Isfahan. Lead pipes fed the fountains. Elaborate patterns could be created by grouping nozzles and opening and closing valves to the pipes. Or, as in Isfahan, column bases would bear patterns of holes through which water would shoot from the columns into pools at their bases. Various examples demonstrate water under pressure enjoyed extensive use. At Ali Qapu Palace in Isfahan, a fourth-floor fountain rested on an open porch. Reports at the time described oxen power as hoisting the water in a series of buckets from a below-ground cistern to holding tanks on the fifth or sixth floors of the palace. Certainly for every pleasing show of dancing water, a behind-the-scenes engineering project was required to produce it (Wilber 1979, 15). The sound of different water fountains in the Iranian garden, while forming the space of garden by their figures and volumes, are beautiful sounds for ear, particularly with the fact that in each flow of water in the water canals, water fountains and waterfalls, water

creates special sounds (Daneshdoost, 1984). Perhaps, water could come from higher level or flows in a lower level in order to show boiling figures.

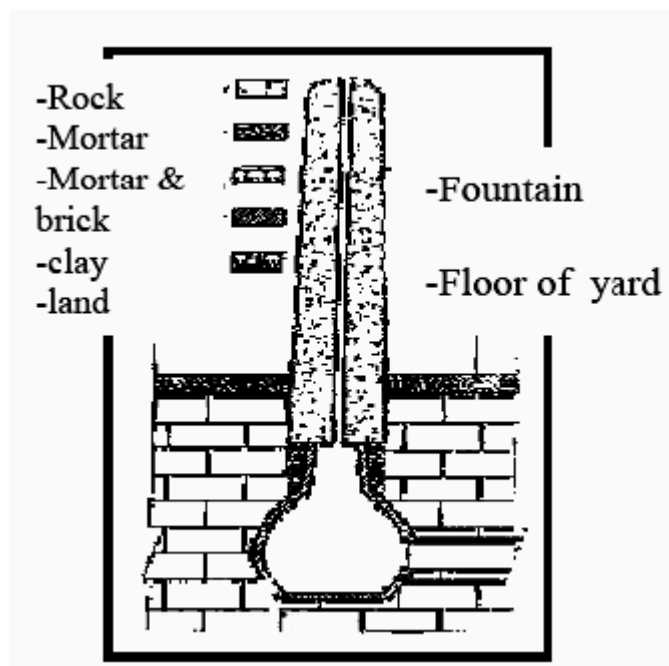


Figure 3.47 : Cross Section of Elements of a Water Fountain

4.3 Patterns of Persian Gardens

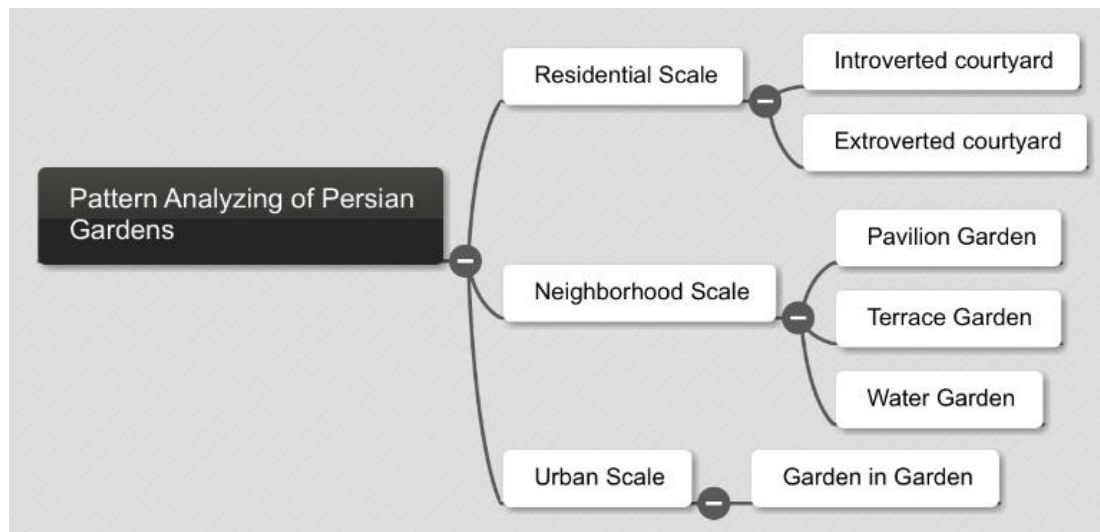


Figure 3.48 : Pattern Analyzing of Persian Gardens

4.3.1 Residential scale

Similar to that of home gardens the pattern of courtyard gardens is inspired by the pattern of the extensive gardens, but due to their usual placement in dense urban textures, they have been made on a much smaller lands, and their major function is residential. The main buildings of these gardens with residential functions were studied and evaluated as Iranian houses, like Qavam House in Shiraz. (Shahcheraghi, 2011)

4.3.1.1 Extroverted Courtyard-garden pattern

In this type, Indoor spaces are located in an outdoor restrict (a tiny garden) such that surrounding area of the closed spaces is wide open. This combination of an artificial and a natural environment is like the pattern of open gardens, that a pavilion garden is located in a garden and its surrounding area is open.

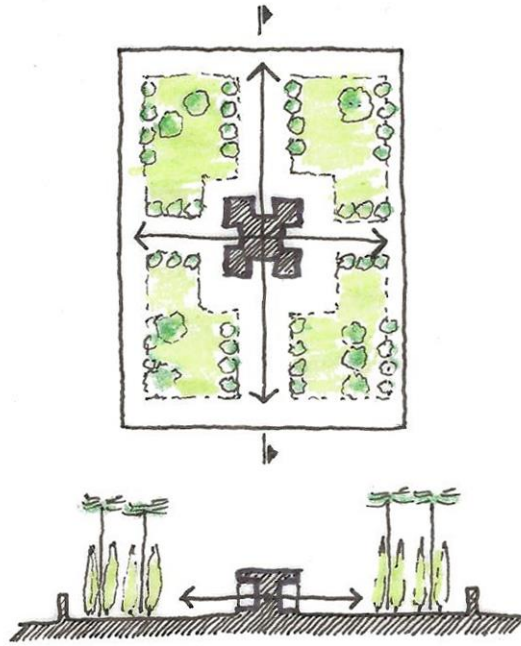


Figure 3.49 : Extroverted Courtyard-garden pattern, by Nader Ardalan and Laleh Bakhtiar

4.3.1.2 Introverted Courtyard-garden pattern

In this type of gardens, indoor spaces are usually located around an introverted courtyard. In addition to creating unity among the elements, court yard also creates a relationship between them. This connection takes place, from the entrance through the other spaces scattered around the courtyard or by dividing the main enclosure in to a summer space and a winter space on different fronts.

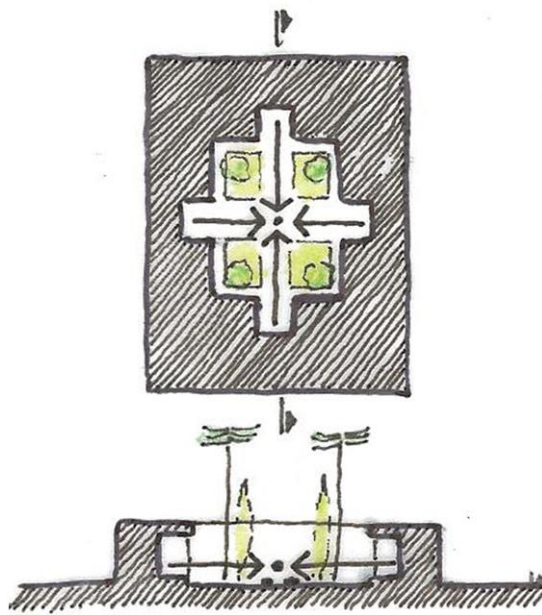


Figure 3.50 : Introverted Courtyard-garden pattern by Nader Ardalan and Laleh Bakhtiar

4.3.2 Neighborhood scale

These gardens are the most well-known types of Iranian gardens, and all throughout this research, this type of Persian gardens is referred to when we discuss Persian gardens. Since the past times, gardens of this type are built in the format of master pattern of Persian garden with specific functions.

Open gardens generally have been built on an extensive land in a rectangular shape and outside of dense urban fabric and have had various functions, residential, governmental function, syncretistic (residential/governmental), or with the function of a grave-garden. This group of gardens has been used for temporary or permanent habitation. While as in some historical periods, open gardens with the governmental function, some spaces for ceremonial affairs, bureau affairs for temporary habitation of soldiers had been considered. There are various and specific concepts to classify open gardens. (Shahcheragi, 2011)

4.3.2.1 Pavilion-Garden pattern

Most of the historical open gardens have been designed in regard to the placement of the pavilion in the garden. This kind of design is more similar to the master pattern of

Persian garden. (Shahcheragi, 2011) The restriction of gardens with high walls and sometimes in a castle-like shape is one of the main characteristics of Persian open gardens. This pattern coincides with master pattern of Persian garden, and it provides security and restriction. It is stated that the netted-wall gardens were the result of the political security and economic boom of the society during the Safavid period, for constructing such walls around gardens would not be possible without political and social stability. (Ansari, 1999)

In this period, the combination of public and private functions presented a new meaning to Persian gardens. As an example, "without creating restriction of vision, netted-walls in both sides of public axes created pedestrians the possibility of viewing inside of the garden." This point is important in the development of the architectural pattern of Persian gardens in urban scale, and it is possible to say that architects and urban planners have given importance to the view and urban landscape with the design of netted-wall gardens in Safavid period." (Shahcheragi, 2006)

Open gardens of Tent-Garden type became common at the time of Mongols' invasion of Persia. Mongols' interest in a habitat in natural green areas made them erect tents in such areas. This fact caused the substitution of the tent element for the pavilion element even in the construction of gardens based on the pattern of open Persian gardens even for permanent habitation in Herat and Samarkand. The unsustainability of the tent element was the main reason why it was short-lived. There are some documents related to this kind of gardens in the pictures of travel literatures and paintings. For example, Clavij has presented an overwhelming description about Timur's tent in these gardens. This kind of gardens has been famous in Safavid period. Generally, the tent garden has been used for temporary habitation of military and had habitation/military function. In the Safavid period, construction of tent garden continued. Khargah garden is one of the tent gardens which was located at the entrance of Char-bagh in Isfahan and was the station for the military and king's entourage (Ansari, 1999). In some travelogues, it is mentioned that the erection of tents and Khargah has also been common in other gardens. There were also separate tents with detailed decorations and were erected as harem for the habitation of harem women (Sanson, 1683)

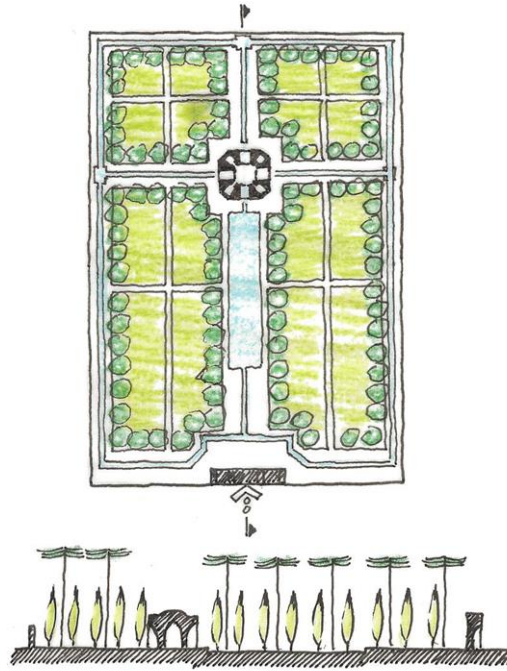


Figure 3.51 : Pavilion-Garden pattern by the Author

4.3.2.2 Terrace-Garden pattern

From extensive gardens, a specific plan, terraced and affected by the steep slope of the land, has been shaped. In this kind of gardens, water movement on the terraced land, is manifested in the form of small waterfalls.

The pavilion is located at the highest point at the end of the garden. Shiraz Terrace Garden is one of the maiden Persian terrace gardens, which was made in 480 AH by Atabak Garache. Its other name is Garache Terrace Garden. (Shahcheraghi, 2011)

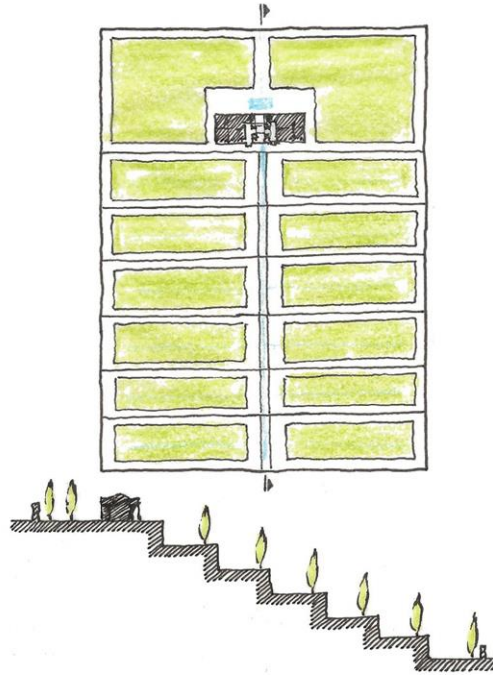


Figure 3.52 : Terrace-Garden pattern by the Author

4.3.2.3 Water-Garden pattern

The water garden is a garden in which a big basin is constructed in some parts of its field by artificial or natural features. For creating an exquisite landscape view, a pavilion building was constructed on the platform, where the pond was established with water resistant materials. And to provide access to pavilion, a crossing or a bridge was usually constructed between the pavilion and the area located next to the pond. Water shortage in many areas of Iran was the main reason for the construction of only a small number of these gardens. Shah Goli Garden in Tabriz is one of the remaining instances of such gardens (Naima, 2006).

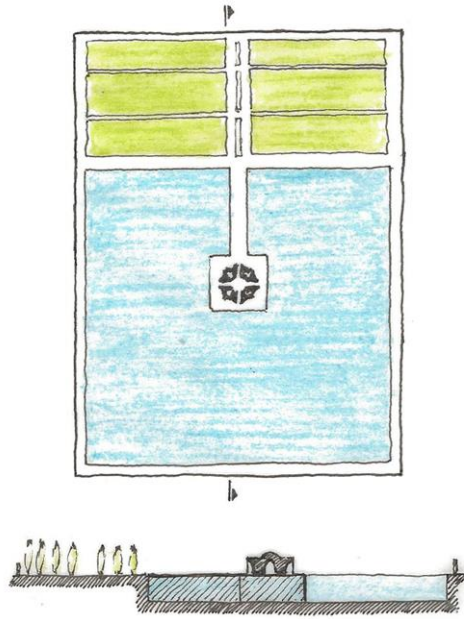


Figure 3.53 : Water-Garden pattern by the Author

4.3.3 Urban scale

4.3.3.4 Garden in Garden pattern

A garden in rural or urban areas can be designed as a solitary one from which water usually flows to the surrounding homes and farms. If another garden forms on the way of the water flow, that is also considered as a single garden and will be located in a not a long distance from the previous one. Another situation happens when in the natural or urban ranges a continuous development of a garden is proposed. In this situation, the water route and topography of the land play important roles in the direction of the development, and form the garden in the gardens (Mir Fenderski, 2001, P.6). One of the examples of such gardens, which forms part of a city structure, is Loyal Gardens of the Safavid period, next to Naqsh-e Jahan Square. The structure of some cities like Shiraz is closer to this concept.

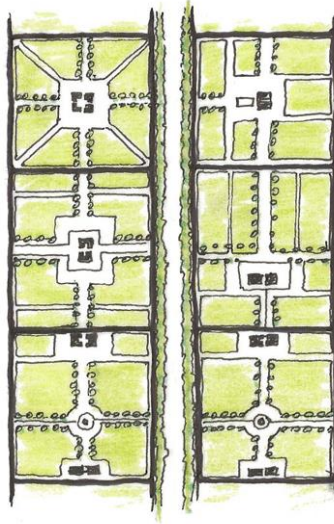


Figure 3.54 : Garden in Garden pattern by the Author

4.3.3.1 Grove Garden (Baghmishe)

Garden groves (Baghmishe) are also those Persian gardens where the trees and plants are not planted in a geometric order but in a mixed way to give an interesting spontaneity to the arrangement and structure of the garden. (Ansari, 1980, P 194)

An example which can be mentioned here is Saadat Abad Garden along the Zayanderud River, and it belongs to the Safavid period.

5. EVALUATION AND CONCLUSION

Conducting studies on the design of Persian gardens requires an evaluation of various aspects of their design system. Hence, first a review on the design concepts has been done. According to the studies, it became evident that before and after Islam, Chahar-bagh has been a symbol of heaven in the design of the Persian gardens. By evaluating other influential parameters in the design of a Persian garden, it was concluded that not only did Persian gardens have private functions, but they also have been designed for a community or in an urban scale for the inhabitants of a town. Finally, by evaluating the main elements in the design of a Persian garden, including garden plants, water elements in a garden, and architectural elements, considering the scale of their design, we reach six basic patterns of the design system, two of which, introverted courtyard garden and extroverted courtyard garden, are designed by Nader Ardalan and Lale Bakhtiyar and indicate the design pattern of Persian garden in the residential scale.

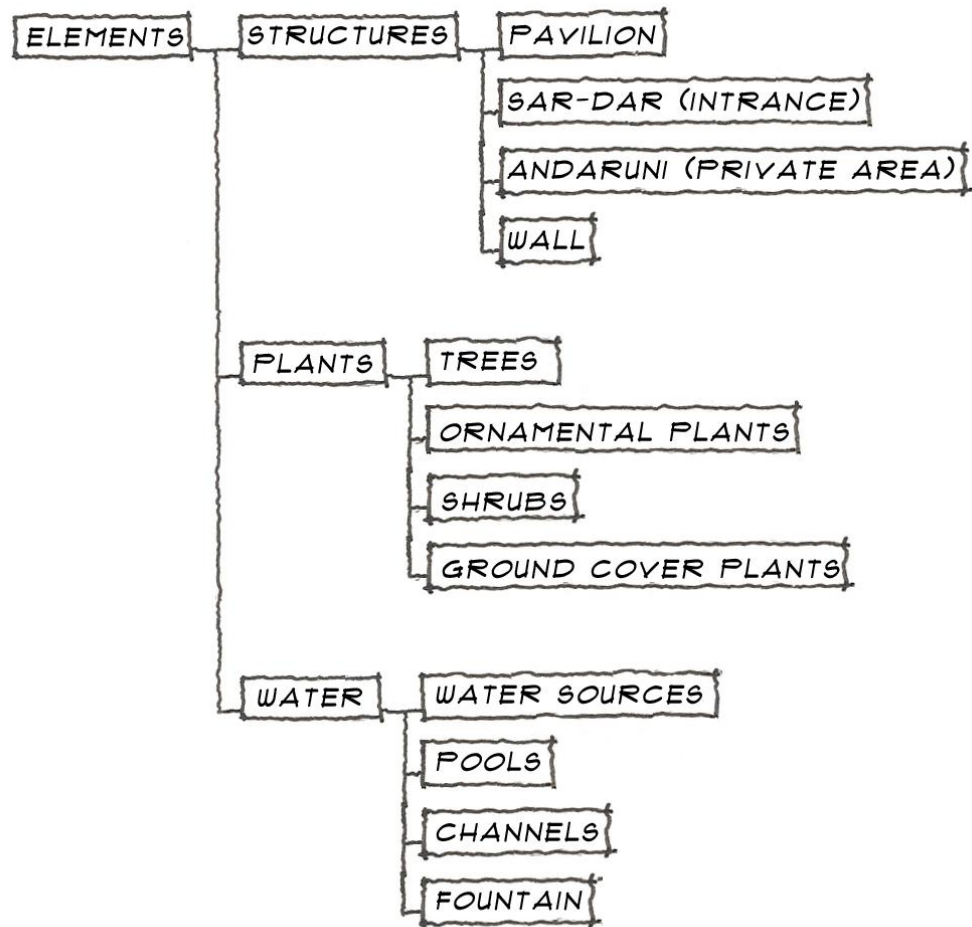


Figure 3.55 : Elements of Persian Garden

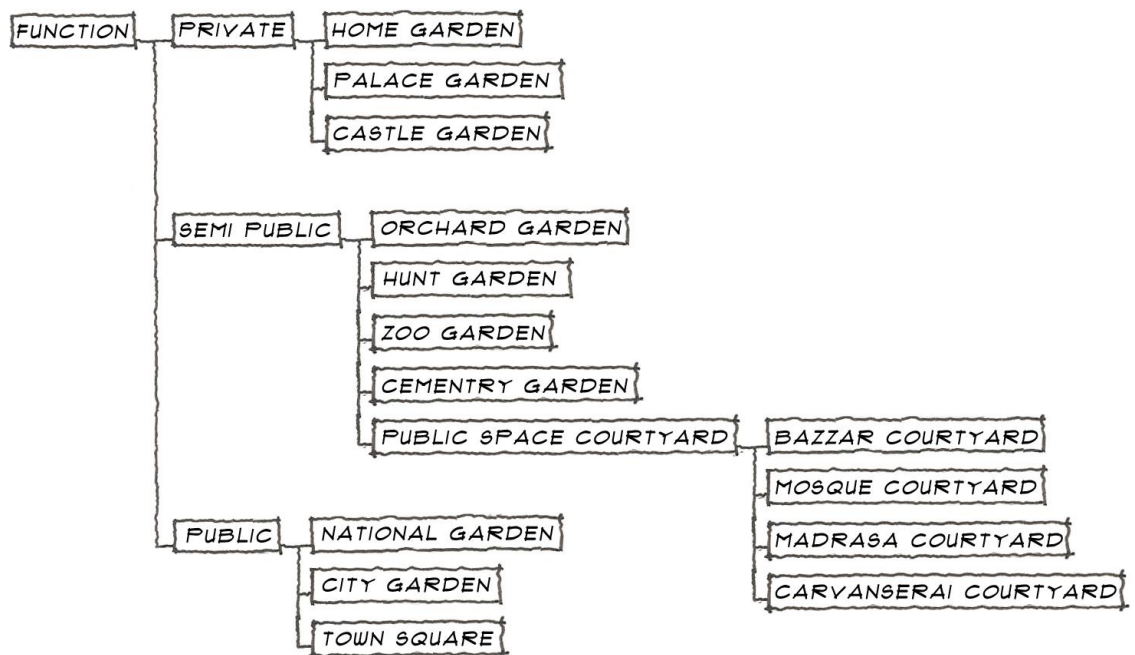
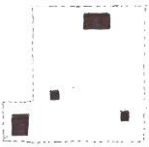
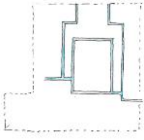
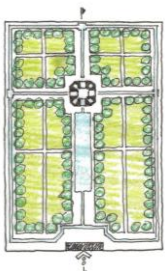
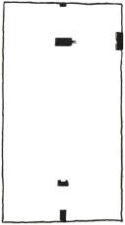
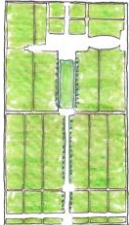
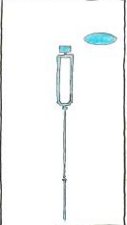
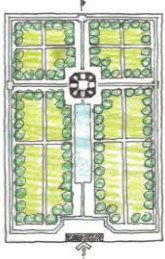
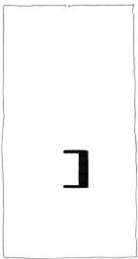
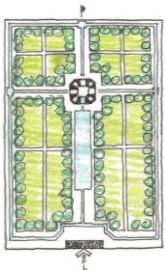
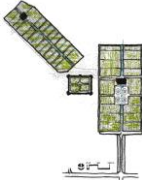
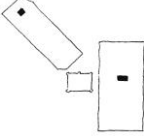
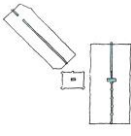
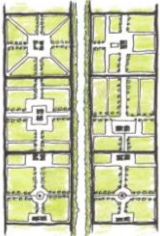
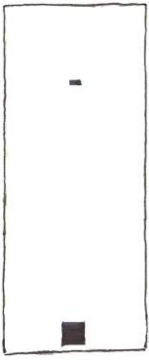
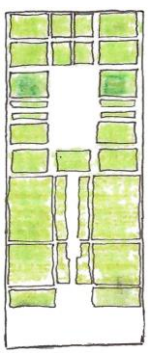
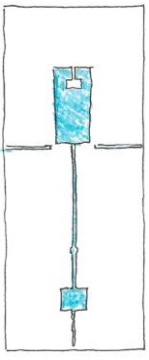
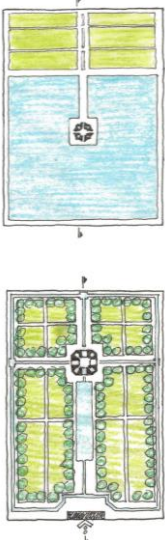
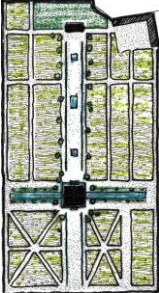
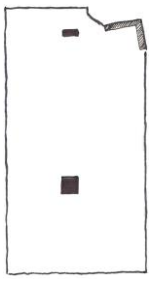
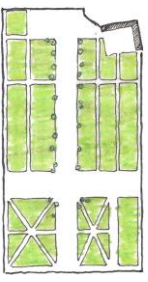
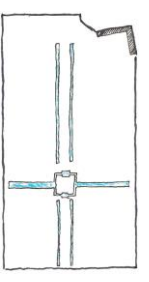
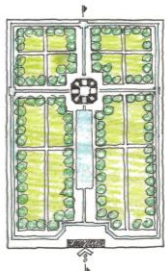
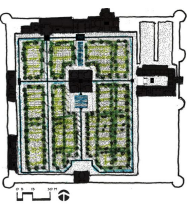
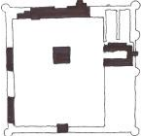
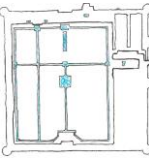
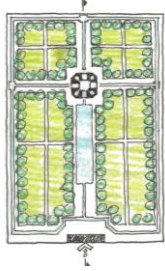


Figure 3.56 : Function of Persian Garden

Figure 3.57 : Main parameters in a persian gardens design and their pattern
(Designed by the author)

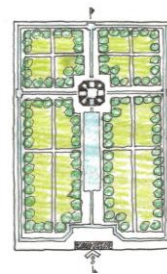
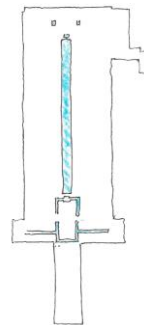
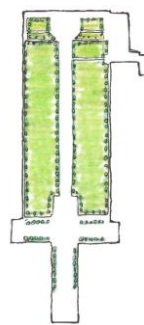
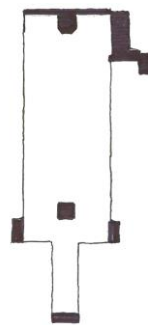
Date	Name	Function	Plan	Elements			Pattern
				Architectural	Planting	Water	
1363 A.D	Pasargadae	Palace-Garden					
	Afifabad	Palace-Garden					
	Bagh-e Shomal	Palace-Garden					
1501 1736 A.D	Bagh-e Ashraf	City-Garden					

1694-1722 A.D	Farah Abad	Home-Garden, Castle-Garden					
1785-1925 A.D	Hasht Behesht	Castle-Garden					
1501-1736 A.D	Bagh-e Fin	Castle-Garden					

1160-1747 A.D

Dolat-Abad

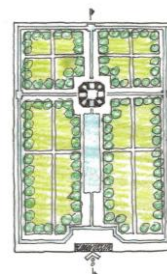
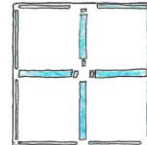
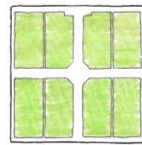
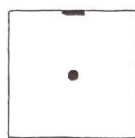
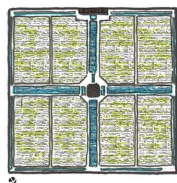
Palace-Garden



1750-1794 A.D

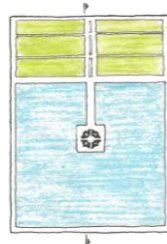
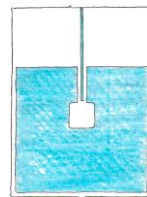
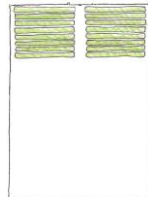
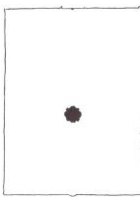
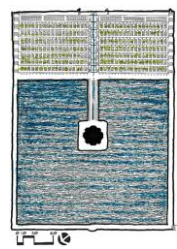
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Palace-Garden



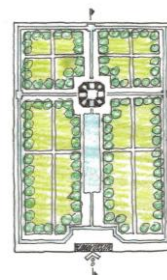
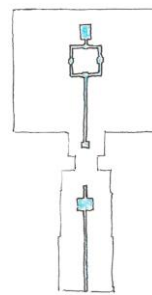
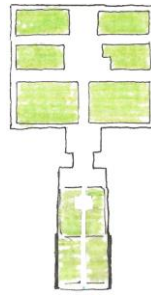
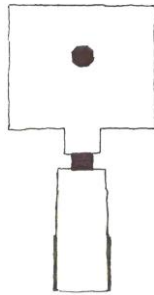
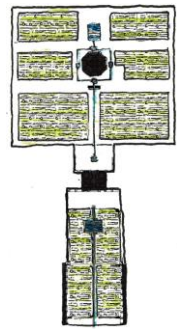
Shah Goli

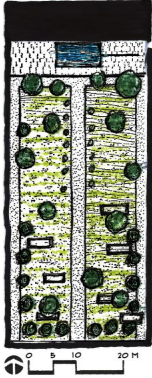
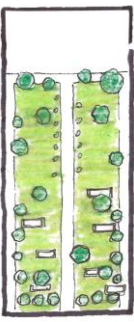
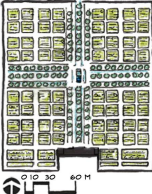
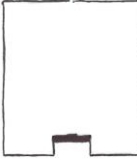
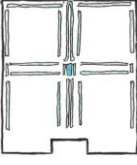
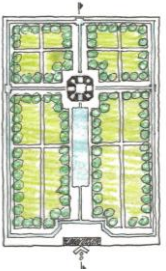
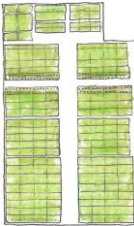
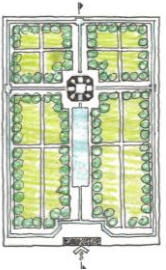
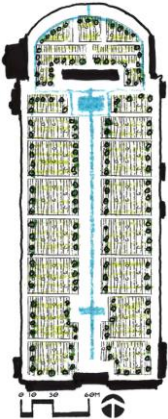
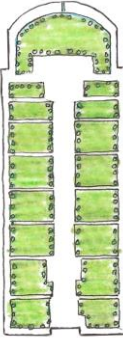
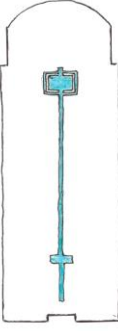
Palace-Garden



Ghadamgah

Cemetery-Garden



1750–1794 A.D	Haft Tan	Cemetery-Garden					
1750-1925	Golshan	Palace-Garden					
1785-1925 A.D	Bagh-e Eram	Home-Garden					
1785–1925 A.D	Shahzadeh Mahan	Home-Garden Palace-Garden					

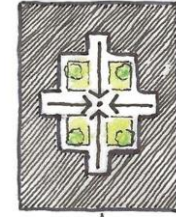
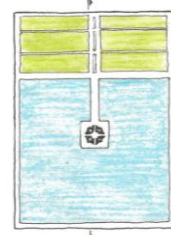
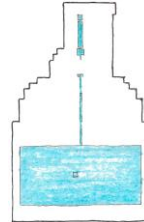
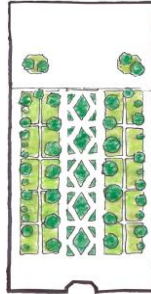
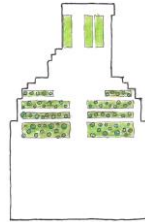
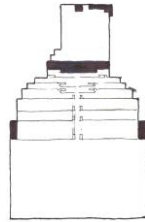
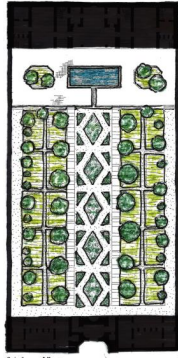
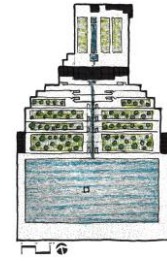
1785-1925 A.D

Bagh-e Takht

Divankhane

Castle-Garden

Home-Garden Orchard-Garden



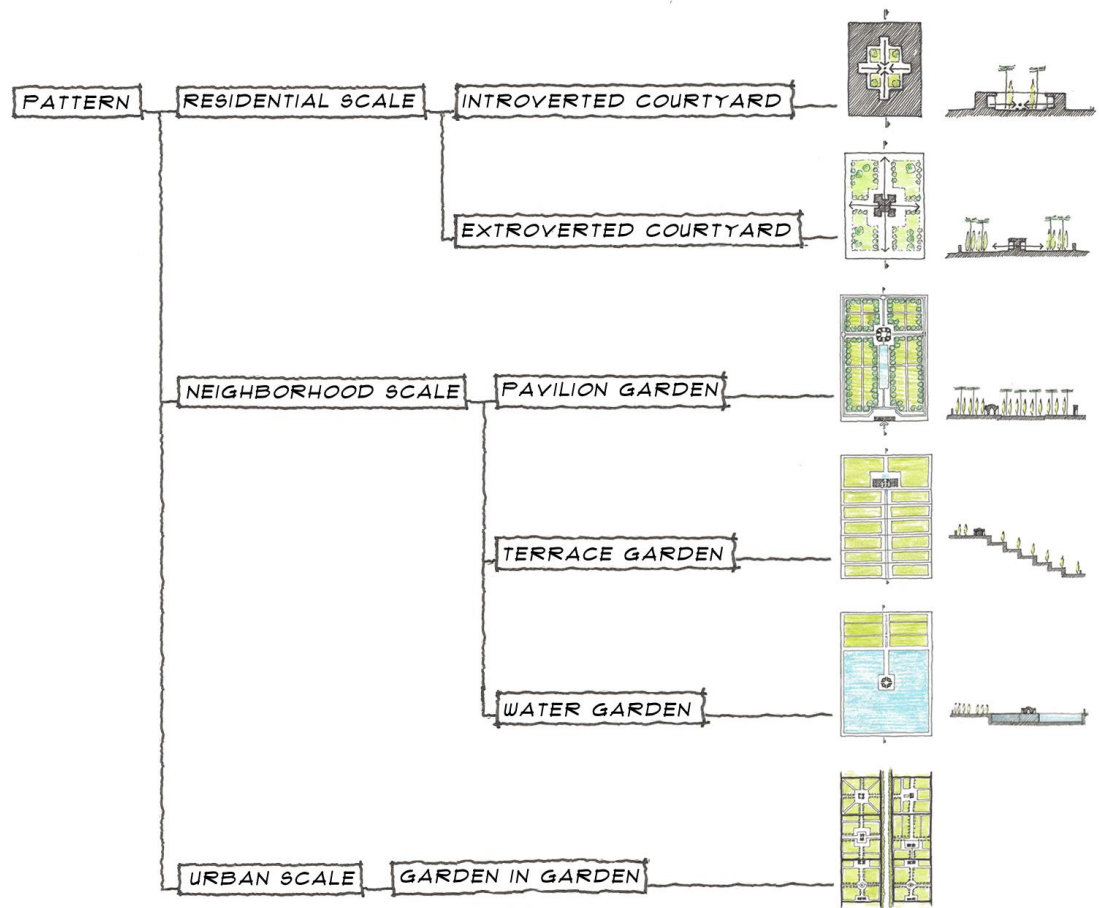


Figure 3.58 : Patterns of Persian Garden (Designed by the Author)

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