The Islamic Garden

كون فـ ايـ ٮاكون

Above, "*kun fayakun*" written in Arabic. In the Qur'an, Allah commands the universe to be ("*kun!*" !كن), and it is (*fayakun* يـكن فـ).

Seminar 2011

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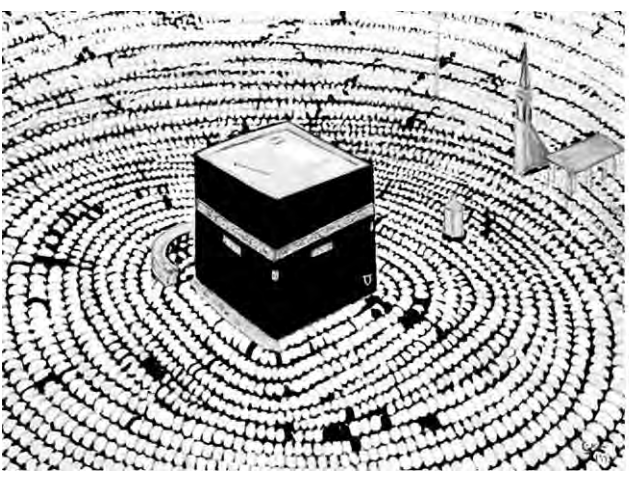
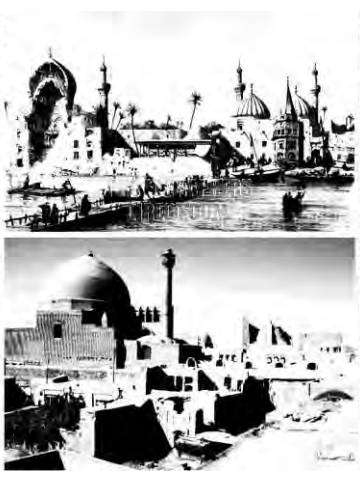

"Bread feeds the body, indeed, but flowers feed also the soul."

Prophet Muhammad, (Peace Be Upon Him)

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DEPARTMENT OF LANDSCAPE ARCHITECTURE
FACULTY OF LANDSCAPE STUDIES
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CERTIFICATE

This is to certify that the Seminar titled:

The Islamic garden

Submitted by : **NAZIA ANSARI** (LA 9010)
In partial fulfilment of the requirements for the award of Masters degree in Landscape Architecture.

This is a bonafide work by the student and has not been submitted to any University / Institution for award of any Degree / Diploma.

Date : July, 2012

Guided by:

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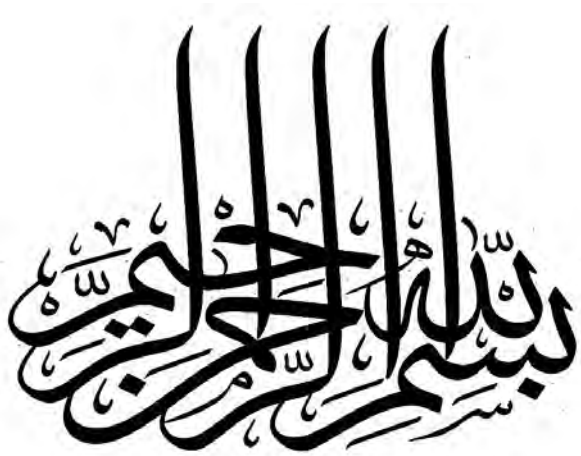

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Acknowledgement

This seminar is a compilation of works of many scholars who have very keenly studied the Islamic design principles. The study would never have been possible without the help of all the works, papers, publications and discussions in the form of Symposiums, conducted by various celebrated scholars over the world.

I would like to extend my humble thanks to all those authors whose work has been included in my endeavour to understand the garden philosophy working under the force of Islamic thinking. The thinking that evolved over a set of reasons directing the way of life guided by Islam and the physical and social factors.

I would also like to thank **Prof. Prabhakar B. Bhagwat** for providing me with the idea and courage for pursuing this topic as my seminar study. Also, for his time, guidance and his interest which helped me to come to various conclusions which would not have been achieved without his help.

Also, I would like to acknowledge the guidance of the Faculty of Landscape studies and the CEPT Library, which helped me to access various studies and documents, for developing my study.

Lastly, I would like to thank all friends and family for being there for me at all times and believing in me.

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*__Bismillah__ written in Arabic. It is an Arabic word meaning "In the name of God, Most Gracious, Most Merciful".

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Preface

Since the establishment of Islam as a religion in the 7th century C.E., many elements shaped the arrangement of human life on those lands. The pattern of life was shaped by three main constraints:

- the earlier settlements
- the present context, climate and geography
- the way of life suggested by the religion

The study here, presents the evolutions, creations, alterations and changes made along with time with the onset of Islam in the Arab region.

'Gardens are (at once) highly meaningful, expressing the position of humankind with respect to the Earth and the Cosmos, and basically ordinary, reflecting the need to produce a food crop in order to survive the fallow season and plant fresh another year. In Islamic history there is really only one formal garden plan, with a few variations in it. This is the so-called ***chahar-bagh****, or the four part garden laid out with axial walkways that intersect the garden in the center.....*

The gardens started as a secular endeavour evolving from the practical and functional needs. These needs led to the taming of the surrounding landscape and organise it in a way to enhance the earth's yields. This also involved creation of a legible map on which all the resources were distributed and organised. The Islamic garden was not an exclusively Muslim production. It arose from a specific set of climatic conditions clubbed with the techniques used for controlling the landscape which later reflected in the regional concerns that were common to all the people sharing that particular landscape.

The Muslims inherited practical and intellectual knowledge from the Roman past, the built landscape on which they now inhabited; they learned also from their diverse brethren, for these were areas populated by Byzantine Christians, Jews, Copts, and adherents of various polytheistic religions such as Zoroastrianism and Judaism. However, while human cultural practices changed with the advent of Islam, many aspects of the land itself did not, for the climate of the Mediterranean rim has not changed significantly in the past 2000 years. Thus, early Muslims could build upon ancient and

Figure 1 Iskandar at the talking tree, from an Ilkhanid Shahnameh, ca. 1330-1340, Smithsonian.

Figure 2 Palace garden in a river landscape: late Mughal, Oudh, ca. 1785; opaque watercolour and gold on paper.

(source: http://www.columbia.edu/itc/mealac/pritchett/00routesdata/1700_1799/avadh_early/painting/painting.html)

existing knowledge of agriculture and land management techniques.

Here, this study is an attempt to understand the evolution of agriculture and hence, Islamic gardens through time and places.

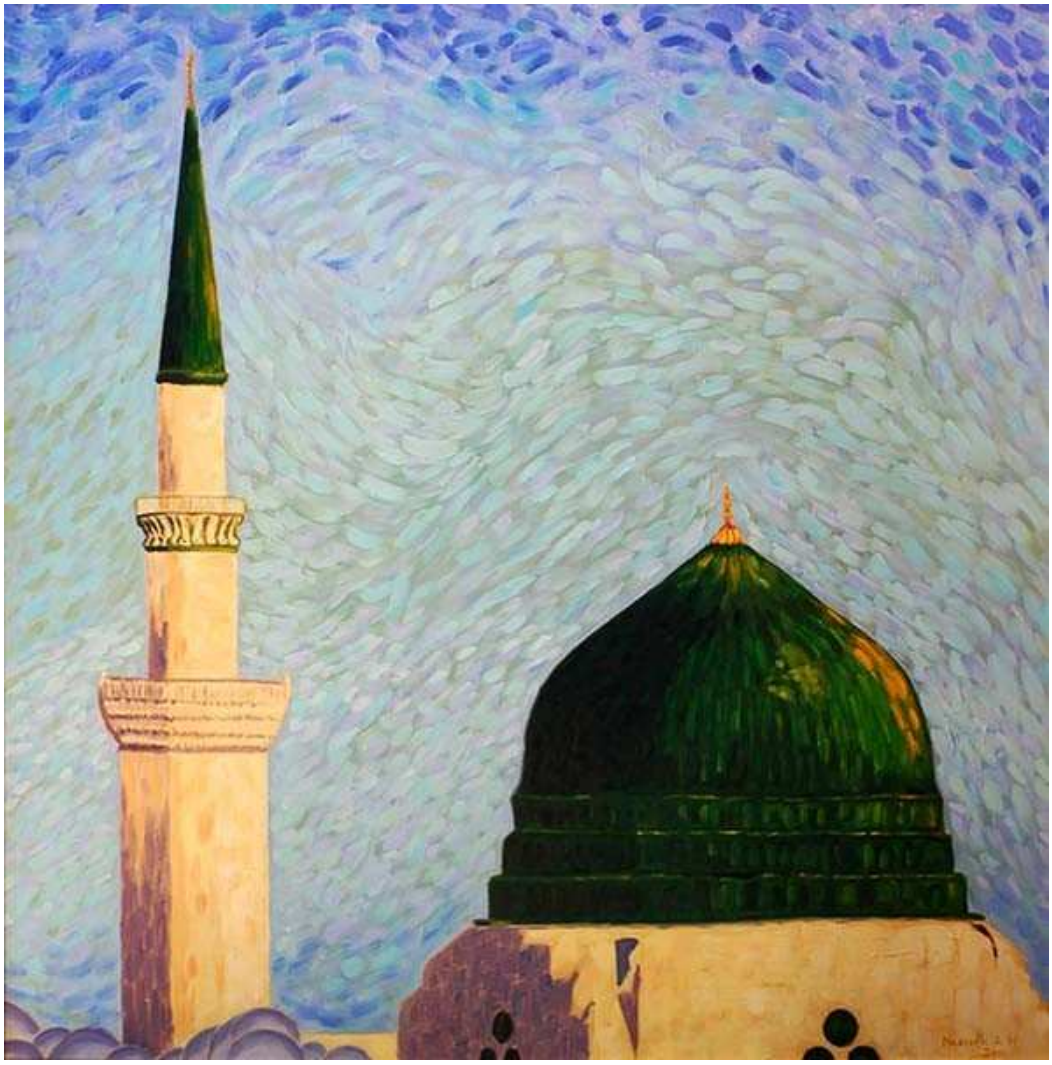

Figure 3 Shows the Mausoleum of Prophet Mohammud(PBUH) **in Medina. The Green dome in the painting symbolises the love of the Prophet for the nature. In the end of the 6th century C.E., there was a patch of greenery on the barren desert lands, which happened to be Medina.**

(Source: art.state.gov/artistdetail.aspx?id=100648)

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ISLAM: GARDENS AND ITS INTERPRETATIONS

INTRODUCTION

Since the arrival of Islam as a religion in the 7th century C.E., Gardens have been described as a metaphor of Paradise or *al-janna* (the garden). Every time heaven is mentioned in the holy book of Qur'an, there is a description of flowing water and fruit bearing trees, signifying their importance to man. The reward for good deeds according to the Qur'an is a place of shaded trees, flowing water, gardens with sweet fruits (*bostan*) and fragrant flowers (*gulistan*).

As the religion evolved in a desert climate, Water became the main resource to conserve and utilise in the most optimum way possible. Also, the process of water evaporation from the earth's surface and then coming down in the form of rains has been given great importance, as it marks the arrival of greenery in the most bountiful manner.

AIM

To understand the description of Paradise in the Book of Qur'an and study the ways it has been interpreted by people around the world.

OBJECTIVES

- To study the Holy book of Qur'an, and understand the various instances where description of gardens have been given.

- To study the impact of Islam on the Garden design principles worldwide.

- To study the methods of irrigation used within an Islamic garden.

- To arrive at inferences from the study for a better understanding of Garden design.

SCOPE

The gardens will be studied as of case studies from worldwide basis. Limited examples which have been considered as good by historians and landscape designers will be studied to arrive at a result of the study.

**art work extracted from Google images*

Ideology of garden and its importance

The Qur'an gives 8 different names which Muslim theologians take to be 8 different levels or stages of Paradise.

a. Jannatu-al-khuld (al-furqan, 25:15), can be called as "Garden of eternity"[1] or "the Garden of Immortality"[2]
b. Darul-as-salam (al-anam, 6:127), can be called as "the Abode of Peace"
c. Darul-al-Qarar (al Mu'min, 40:42), can be called as "the Garden" or "The Garden of Bliss"
d. Jannatu-al-adn (al-Bara'ah, 9:72-73), can be called as "the Garden of Eden" or "the Garden of Everlasting Bliss"
e. Jannatu-al-Ma'wa (al-Sajdah, 32:19), can be called as "the garden of Retreat" or "the Garden of Hospitable homes"
f. Jannatu-al-nain (al-Maidah, 5:70), can be called as "Paradise" or "Heaven"
g. Illiyin (al-tatfif, 83:18), can be called as the same.
h. Jannatu-al-Firdaus (al-kahf, 18:107), can be called as "the Garden of Paradise"

The above translations indicate that Paradise, in all levels is a garden. The Garden which is the final destination of all humans who conduct their worldly life in a way described as pious in the Holy book.

1. QUOTES FROM THE *QUR'AN* ON GARDENS

QUR'ANIC VERSES

Some quotes from Qur'an, indicating water and plants as the main source of our well-being:

- *And He is the One Who sends down water from the sky. Then by means of this (rain) We bring forth vegetation of every kind out of which We produce green (foliage) from which We bring forth clustered grain packed one over the other, clusters of date-palm hanging low from its spathe and gardens of grapes, olives and (also) pomegranates (which from many aspects look) alike but (in products, tastes and effects) are unlike. Look at the fruit of the tree when it bears fruit, and (also observe) when it ripens. Verily in these are Signs for those who believe.*

- *And relate to them the example of two men, one of whom We provided with two gardens of grapevines, and We*

hedged both from all sides with date-palms and We grew between them (rich green) cultivated fields.

- *Both these gardens yielded (abundant) fruits and their (produce) did not fall short of the mark. And We (also) made one stream flow in the middle of (each of) the two.*
- *Then by means of this We caused to grow for you (step by step firstly herbs, then plants and then trees and) the gardens of dates and grapes. (Furthermore, We created) for you many (other) fruits of which you eat (now).*
- *And indeed those who believe and keep doing pious deeds, for them are Gardens with streams flowing under them. This is the Great Victory.*
- *Then We brought forth with that the fruits which have different colours. And similarly in the mountains there are white and red streaks with a variety of shades and there are deep black (streaks) as well.*
- *And He is the One Who has produced trellised and untrellised gardens (i.e. plants climbing up with supports and those not climbing up) and (also created) date (palms) and vegetation with a wide variety of fruits and olive and pomegranates (that) resemble (in shape) but differ (in taste). When (these trees) bear fruit, eat of their fruits and (also) give away its due (as appointed by Allah) on the day of harvest (of the crop and the fruit) and do not spend wastefully. Surely He does not like those who spend extravagantly.* ***(al-An'ām, 6:141).***

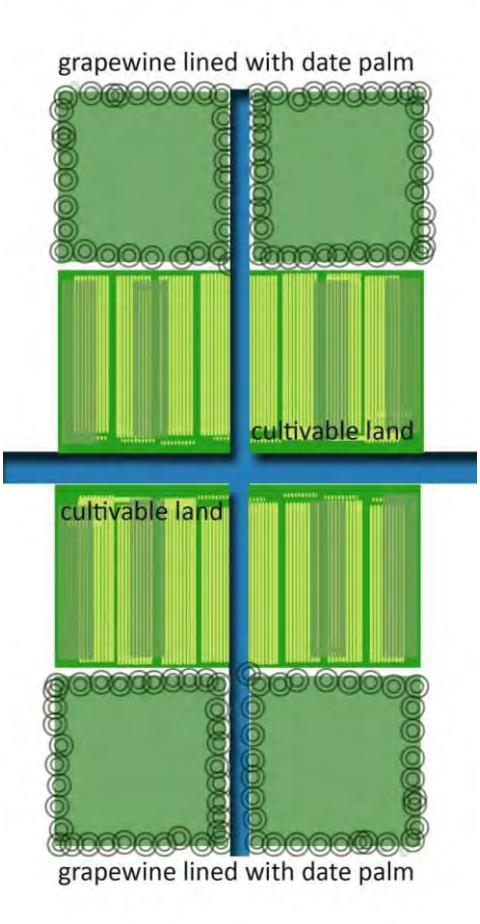


Figure 4 shows the plan of the lands of 2 people as described in the Holy Qur'an.

- *So, suck the juice of all kinds of fruit and then follow those routes (suggested) by your Lord (which lead to these fruits and flowers of which you are to suck the juice, leading other bees also to the source) for their convenience.' There oozes from their bellies a syrup (that is honey) of diverse colours. It has healing properties for the people. Therein is indeed a Sign for those who apply their minds.* ***(an-Nahl, 16:69)***

- *Then by means of this We caused to grow for you (step by step firstly herbs, then plants and then trees and) the gardens of dates and grapes. (Furthermore, We created) for you many (other) fruits of which you eat (now).* ***(al-Mu'minūn, 23:19)***

- *A feature of the Paradise which is promised to the Godfearing is that there are in it streams of (such) water as will never putrefy (in smell or colour), and (in it) will be streams of milk whose taste and flavour will never change and streams of (such a pure) wine that is an absolute delight for all who drink it and streams of purified honey; and (in it) will be fruits of every kind (for them) and forgiveness (of every sort) from their Lord.*

- *Then by means of this We caused to grow for you (step by step firstly herbs, then plants and then trees and) the gardens of dates and grapes. (Furthermore, We created) for you many (other) fruits of which you eat (now).*

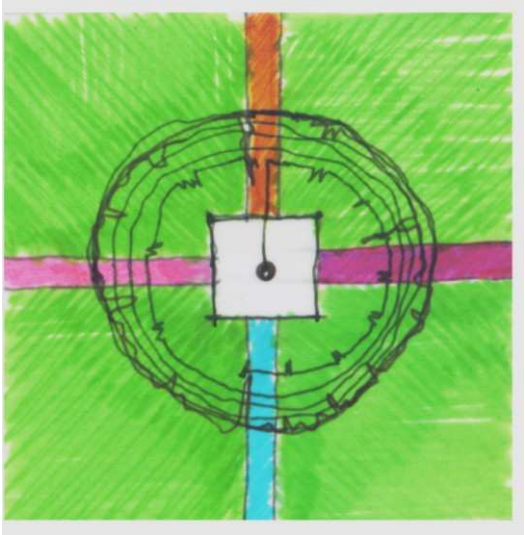


Figure 5 Plan showing the four different rivers flowing, with trees that provide permanent shade and various fruits to eat.

Some of the features of this promised paradise as seen in the Koran and its commentaries, which have a bearing on our discussion and have an effect on gardens, should now be mentioned briefly:

1. in paradise there flow streams and canals with golden banks and beds of pearls and rubies, toiled soil of which has a smell sweeter than musk.

2. There is perpetual shade which is tamed to move according to the will of man.

3. There is no extreme heat from the sun or bitter cold.

4. There are trees which are so green that they appear to be black.

5. Trees such as the thorn less lotus, tangled myrtle, palm and pomegranate have been mentioned.

6. There are high buildings unique in the world.

7. The dimensions of paradise may be likened to the width of the sky and the earth.

8. There is an extraordinary abundance of unforbidden and perennial fruit which may be freely eaten.

Figure 6 the perception of heaven with its various elements.

2. AN OVERVIEW

"Islamic civilization *brought dramatic changes to the landscape it inhabited. With the skilful acquisition and transportation of water, the parched lands of the middle-east and northern Africa flourished with man-made verdant oases that not only transformed the economy with their agricultural products but also became a powerful form of cultural expression. The techniques employed to effect this transformation originated among ancient Persians and Romans. But, Muslim communities implemented them more broadly for a complex web of motivations having to do with the system of land ownership and labour, inheritance laws, taxation, urban growth and an idealized vision of country life.",* ***Fairchild D. Ruggles****.*

The newly conquered Islamic world was a predominantly arid landscape (the Arabian Peninsula, Syria, Jordan, the Anatolia Plateau, much of Iran, and but the coast North Africa) where small amounts of rain fell seasonally but not regularly even during the supposed wet season.

Islamic gardens, is a complex of various layers of time and essences compacted together, which gives the '*idea of unity in diversity, multilayered over centuries of seemingly unimportant mutations',* as said by Attilio Petruciolli.

Water and gardens in Islamic Desert Culture:

Gardens in ancient Persia were based on the availability of water. At first gardens were used to grow orchard trees for fruits and shade, as well as for crop sustenance.

The water was obtained from springs, sinking wells and was transported through a network of underground conduit system called 'qanat', which was introduced in Persia in the 7th century C.E. Getting water from far away sources required a high degree of hydraulic manipulation and skill. After the arrival of Islam in Persia in 8th century C.E., the Persians invented the water wheel, to raise water for irrigation, utilising fast moving river water or oxen or sometimes ostriches. This was how the ancient gardens of Baghdad and Samarra came into being.

The earliest example of a desert garden was that of the King of Achaemenid, Cyrus the Great (590-530 B.C.E.), at Pasargadae built in 550 B.C.E., at least 1000 years before Islam came.

Figure 7 Conception of Islamic garden

The ingenious technology

The Achaemenids also made qanats by sinking a shaft down to the water table beneath the mountains to create a tunnel which might run for 80kms to a desert settlement. This was essential on the high plateau of Iran; as there was very little rainfall and river water, and the water table was dependent upon the amount of snow melt occurred. The qanats fed water into a reservoir which was slightly higher than the highest point in the garden. This would help in gravity driven irrigation system.

The water was then put to multiple uses; some rills were very narrow and used for irrigation, others went underground and were used for periodic flooding of sunken flower beds and still other were used to cool the air.

If there was plentiful supply of water, cascades and waterfalls decorated the gardens, like the gardens in Kashmir, made in the 17th century.

Figure 8 water distribution from hills of Persia towards the land

(source: www.irrigationmuseum.org)

HISTORY

Before the birth of Islam, gardens, besides being affected by geographical conditions, were influenced by tradition, ritual, and the cultural background of the people.

To understand how gardens of Islamic interpretations came, one must understand the,

3. SPREAD OF ISLAM

"The first Muslims came from the inland desert of Arabian Peninsula. They were the followers of the charismatic leader from Mecca, Muhammad ***(PBUH), 570-632,*** *who in about the year 61 experienced a revelation in which God conveyed to him a new vision of the world. This and subsequent revelations, communicated orally to him over the course of next 20 years comprise the Qur'an. The messages that Muhamma****(PBUH),*** *as God's prophet, preached to the people of Mecca angered those entrenched members of Meccan society who did not want to submit to the changes demanded by the new religion, causing Muhammad****(PBUH)*** *to flee for his life to Medina. There the faithful gathered to pray in his house, a rectangular enclosed compound with thatched roof on palm trunks along the southern wall, which was the prototype for the first congregational mosque. For centuries thereafter, congregational mosques followed this model of a hypostyle, roofed prayer hall oriented to Mecca, preceded by a walled open-air courtyard. The Muslims of Muhammad's****(PBUH)***

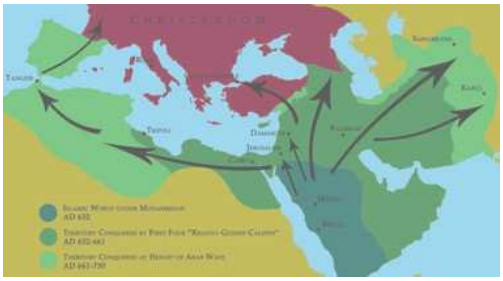


Figure 9, (Source: zenpundit.com)

Figure 10 The above two figures show the Islamic empire and its expansion, which occurred in two waves or two major periods in time; one being the Umayyad expansion in the 7th century and another in the 12th century CE. (Source: zenpundit.com/?p=4194)

generation were a small cluster of Arab traders and urban merchants in Mecca and Medina with little or no farming experience. But, in the mid-seventh century the Muslim armies led by the Umayyad (661-750), the first hereditary dynasty of Islam, conquered the lands that are today known as Syria, Jordan, Israel, Palestine, Lebanon, Iraq and most of Iran, and the burgeoning population of Muslim converts began to include city dwellers, nomadic tribes people, and settled farmers. By the early 8th century, this territory extended from Syria westward across northern Africa to Morocco and the Iberian Peninsula, and eastward through Iran to Central Asia." ***Ruggles D., Fairchild.***

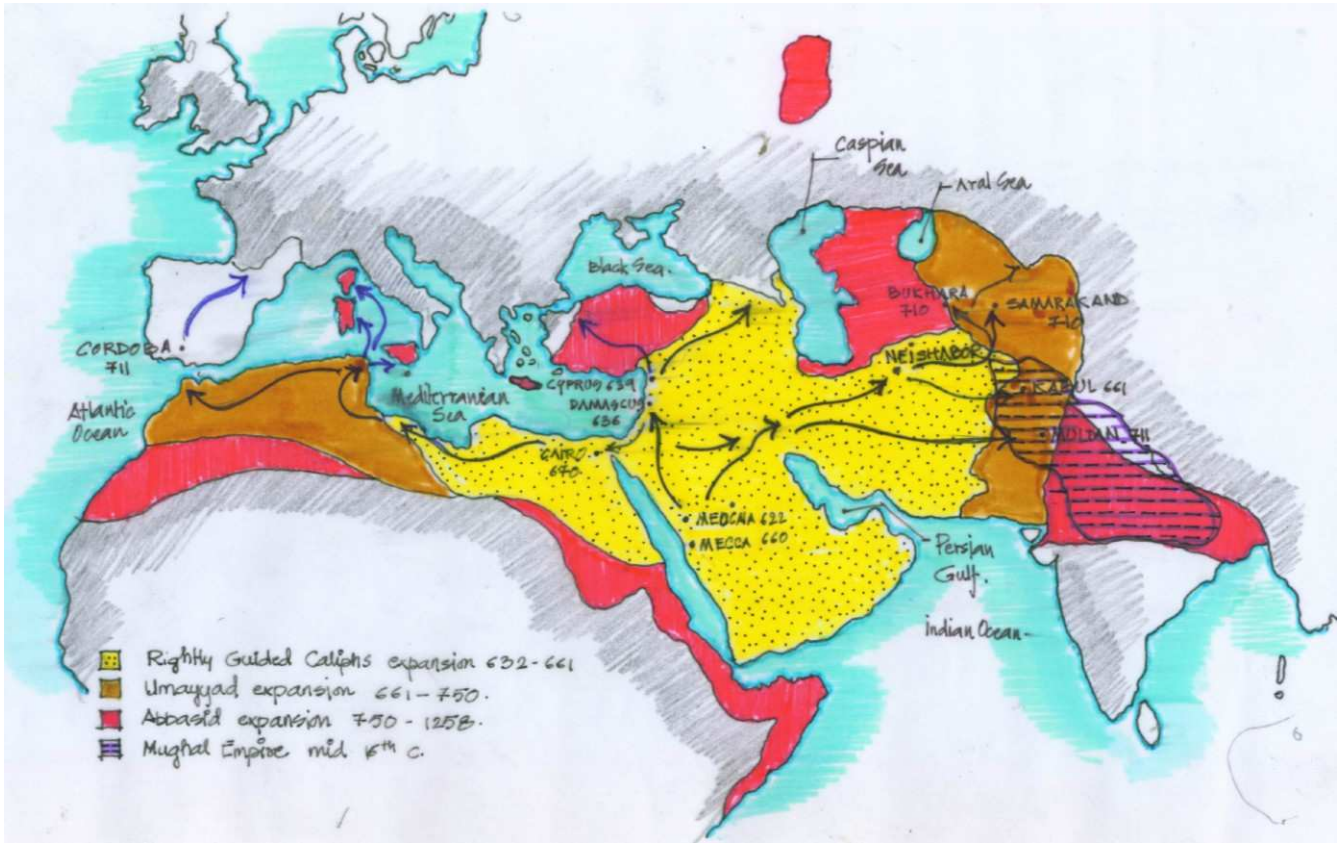


Figure 11 the map shows expansion of Islamic empire from its beginning in the 7th century till 16th century Mughal expansion.

Many ideas and methods in Islamic gardens seem to originate from the Persians. By the middle of 7th century C.E., the Muslim Arabs had conquered Persia, converted the population into Islam and started using the crafts and skills developed by the Persians.
Muslim Arabs also conquered North Africa and during the 8th Century CE they conquered Spain and set up an Arab state there.

At first, it was ruled from Damascus to Syria, which for a time was the Capital of this growing Muslim super state. Though far apart, there are many similarities between the arts and crafts of Arab Spain and Syria.
From the 9th Century CE, an era of beautiful Islamic gardens had begun in the countries which today are Iran, Iraq, Syria and Spain. Baghdad became a city of gardens. By the 10th Century CE, the Arabs in Spain had formed a separate government of their own. It had its capital in Cordoba, southern Spain where a very large and beautiful mosque was built. Other famous cities in Arab Spain were Seville and Granada and all three had fabulous gardens. Persian cities, like Shiraz, also had many beautiful gardens.

But from the 13th Century CE, Spanish Christians from northern Spain were gradually conquering Arab Spain. Granada alone remained a small independent Arab state till 1492 CE, when it was finally conquered by Christian Spain. Much of the Alhambra palace and gardens and Generalife gardens at Granada were built in the 14th Century CE, during the latter part of this period of Muslim rule in Spain. However, there were later additions, especially at the Generalife.

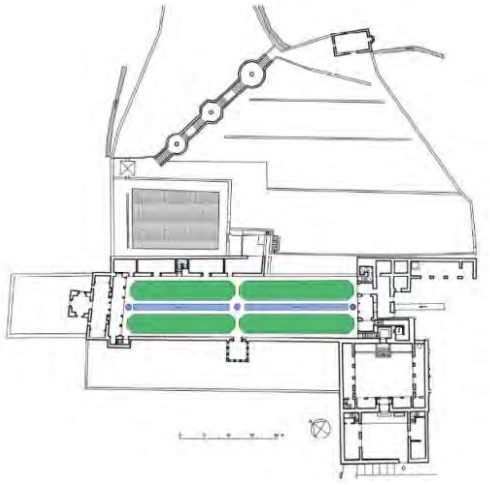


Figure 11 the patio gardens of Generalife

(Source:http://www.spanish-fiestas.com/alhambra-palace/generalife.htm)

At the eastern end of the Islamic world, there were also invaders – though these were to become great builders of Islamic gardens themselves. From the 11th Century CE, successive waves of Turkish-speaking peoples migrated westwards from Mongolia. An early wave founded the Ottoman Turkish Empire. Later invasions in the 13th and 14th Centuries, led by Jenghis Khan and then Timur, for a while devastated the area which today is Iran, Iraq and Syria. But Timur wanted to use the craft skills of the people he conquered for his own Muslim society. He drew many skilled craftsmen to build an enormous city with grand gardens in the Islamic style at Samarkand in Uzbekistan. There are detailed descriptions of Timur's gardens written by a Spanish ambassador, who visited in 1403 and liked very much what he saw.

Figure 12 The above work of art is from the Timurid gardens, called "Prince seated in a garden", from 1425-1450 century. The bird highlighted with blue is an art from borrowed from Chinese painting from that particular time.

(Source: http://evenuntochina.blogspot.com)

The next great phase of garden-building began later part of the same century when Babur, one of Timur's family, conquered what is today Afghanistan, Pakistan and the north of India (16th century C.E.). He set up what was called the 'Mughal' Empire, derived from 'Mongol'. The Mughals were Muslims. Babur was intensely keen on Islamic gardens and personally designed and built them. Three other Mughal Emperors – Akbar, Jahangir and Jahan – were also extremely keen on creating gardens. Jahangir was rather more of a garden-builder and botanist than an Emperor. Between

1483 and 1658 C.E., these Mughal Emperors produced a golden age of garden-building in north Hindustan (today's Pakistan and India). Some of the largest, boldest and most imaginative gardens in the Islamic world were created under their rule. Two of the most famous works – Shalamar Gardens in Lahore and the Taj Mahal, Agra - were completed by Emperor Jahan in the middle of the 17th century CE.

According to Attilio Petruccioli the archetypes of gardens of Islam belong to three different pre-Islamic roots: the Arab, the Persian, and the Turkish—three concepts of nature, and consequently of space.

"*In **Arab** geographers' and travelers' reports, we note their excitement about tame and well-ordered nature, but also their lack of enthusiasm for the wilds. Locus amoenus coincides with locus ferax. But pleasure is possible only through contrast: if green gardens stand for paradise, hell wears the yellow sand of the desert. The concept of space in a culture evolved from the desert is by necessity based on protecting living space, thus transforming the enclosure into an archetypal sign of distinction—not only separation—between the nomadic and the sedentary, between oasis and desert, irrigated and arid land. Sheltered by high walls, the Arab can enjoy the perfumes and colors of his paradise in solitary sensual pleasure.*

*The pursuit of order in the Arab garden is taken to the extreme in **Persia**. Here a biaxial symmetry—although a third zenithal axis is always implied—is the means of drawing earth and cosmos together.*

Everything is organized according to this principle: the layout of architectural elements, the hierarchical organization of decorative symbols, even the practice of gardening. Sophisticated and passive, the Persian garden is a place for contemplation: "Persians don't walk in gardens as we do, but look at them from one viewpoint only," writes the 16th century traveller and merchant Jean Chardin. Excluding the hectic commercial city by a well-defined enclosure, the geometrical order simultaneously materializes and fosters the dreaming and making of love.

*The **Turkish** world, settled in the high plains, is inspired by the wide open space of the prairies: a landscape to explore rather than contemplate. The garden becomes a resting spot in a never-ending journey. Its types and techniques, foreign to the nomadic world, had been imported from nearby Iran. The fundamental difference between the Arabs and the Turks can be exemplified by their*

Figure 13 map of Islamic empire drawn by Arab geographers.

(Source: http://en.wikipedia.org)

Figure 14 painting from the 12th century CE showing a group of women in a Persian garden.

(source: http://womenandthegarden.blogspot.com/2010/11/magic-carpet-ride-persian-gardens.html)

opposite relationship between dwelling and garden—the first based on the introverted patio-house with the garden in the center, the second based on the hall between two gardens, open toward them on both sides."

The three different cultures influenced each other in a way apparently impossible to retrace. In the Abassid period, the Persians extended their domain to the whole Mediterranean, all the way to Gibraltar. After 1453, the Turks started dominating the same sea, as still evidenced by the periphery of Algiers and Istanbul, and by the Dalmatian coast of the Republic of Venice. On the other side, they met Iranian culture and, at the time of the Timurids, merged the static and centripetal conception of Iranian space not only with Turkish wide open spaces, but also with its dynamics and centrifugal exploration. This process further gained complexity when it fused with the Indian culture, where nature was already practiced as a cultural belief.

Figure 15 garden of one of the courts in Alhambra, Spain.

(Source: www.gardener.ru/?id=1224)

4. RISE OF AGRICULTURE and its golden era under the Islamic empire

In Qur'an, there are many descriptions of 'Paradise', which literally means "a wall around"; based on ancient Persian gardens which became the symbol of Paradise and spiritual inspiration.

An Islamic aesthetic rooted in the descriptions of the gardens of Paradise in the Qur'an, spawned an Agricultural Revolution in the Mediterranean. The enchantment of greenery and description of gardens of Paradise led to purchase and exchange of plants among the Arab rulers, for their kitchen gardens.The kitchen garden was not only a garden supplying food, but natural beauty as well.

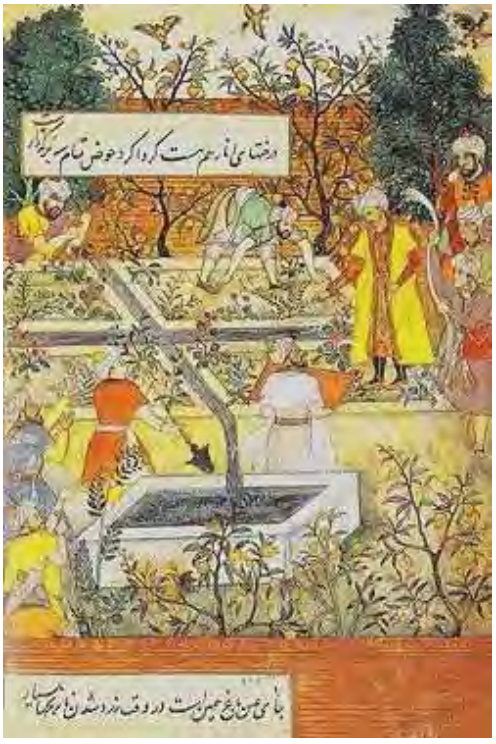


Figure 16 painting of an Islamic garden, showing the Mughal king Babur with his gardeners exploring new ways of gardening.

(source: en.wikipedia.org/wiki/Babur)

Figure 17 Turkish painting. The gardeners brought a float, which consisted of a small rectangular garden on a wheeled cart. The "garden" is interesting because it is a good model of an idealized Ottoman garden at the time. On each corner there is a single cypress tree rising proudly, its top slightly bent. The ground was planted with grass and laid out with paths. In the very center was a pool with spouts. (Source: www.turkishculture.org)

Water Carrying System

Irrigation was essential for gardening in the dry climate of North Africa and Middle East.

Except during rainy season, water was drawn from catchment basins, rivers, canals, rainwater cisterns and even from water table itself.

Ideally, the source of water was above the destination point, a surface canal led to a basin on high ground near the palace, where it could be released as needed, flowing by gravity into the palace and the gardens.

When the source of water was lower than the field, a garden or a residence where it was to be used, either a *Noria*(water wheel) or *Shaduf (*pole and lever) was used to lift the water in the buckets.

Alternatively, in some landscapes, a *qanat* (subterranean canal) could tap the elevated water at the base of the mountain and carry it underground for many miles to a human made oasis of farms and gardens. The mutual reliance on irrigation is but one indication of close connection between garden and farming.

Due to the ephemeral nature of plant life, no gardens survive from the medieval era, but historical descriptions, botanical treatise, agricultural manuals and even poetry reflects the importance of gardening.

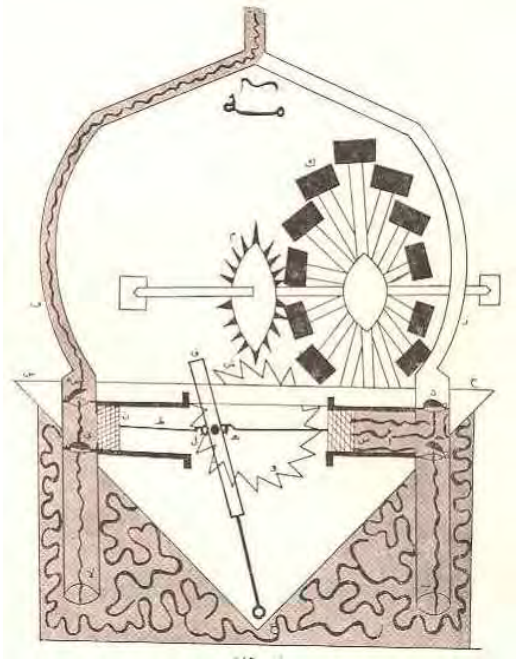


Figure 18 Evidence for the continuation of a tradition of mechanical engineering is provided by a book on machines written by Taqi al-Din about the year 1552.

(Source: http://www.history-science-technology.com/Articles/articles%2071.htm)

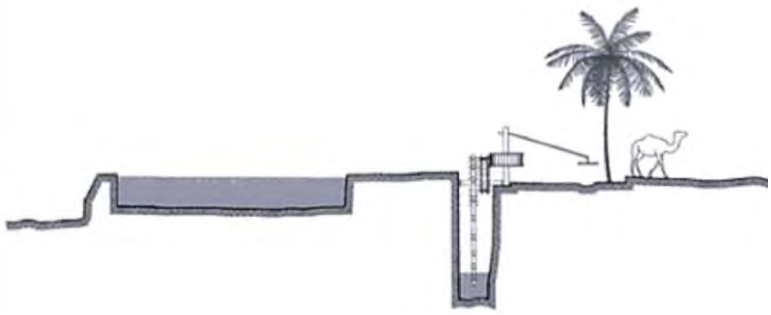


Figure 20 shows Top water wheel with chain of buckets; middle: a series of two *shaduf*; bottom: siphon

(source: Ruggles and Variva, after Thorkild Schioler)

Figure 19 *Noria,* water wheel of Cordoba.

(Source: http://www.history-science-technology.com/Articles/articles%2071.htm)

Qanat

Type of underground irrigation canal between an aquifer on the piedmont to a garden on an arid plain. The word is Arabic, but the system is best known from Iran.

To make a qanat, one needs a source of water, which may be a real well, but can also be an underground reservoir (e.g., a cave with a lake) or a water-bearing geological layer, which can be recognized as a damp area in an otherwise arid region. When one has identified this source, a tunnel is cut to the farm or village that needs the water.

Shafts are added for three reasons: as air supply, to remove sand and dirt, and to prevent the tunnels from becoming dangerously long. The shafts are not very far apart, and as a result, a qanat seen from the air gives the impression of a long, straight line of holes in the ground - as if the land has been subjected to a bombing run.

Typically, the qanat becomes a ditch near its destination; in other words, the water is brought to the surface by leading it out of the slope. In fact, one creates an artificial artesian well and an oasis.

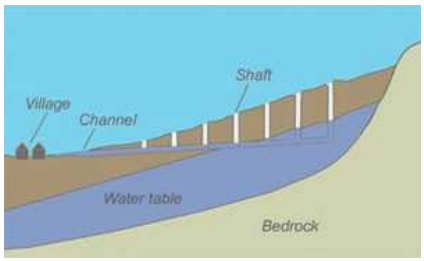


Figure 21 showing working of a qanat.

(source: www.semp.us/publications/)

Figure 22 shows the underground water channel, qanat.

(Source: www.sikanart.it/en/altri_itinerari.htm)

Figure 23 the oulet of a qanat

Figure 25 plan shows the remnants of a qanat network.

(Source: www.semp.us/publications)

Figure 24 shows further distribution of water into the main settlement. (Source: andscapeofaztlan.wordpress.com/)

Islamic contributions to Agriculture

When Abbasids took over the ruins of the Caliphate in 750 A.D., they moved the Capital from Damascus to the Sassanid city of Baghdad, a small town in central Mesopotamia. The Abbasid Caliph, Al-Mansur (754-75), built the new capital surrounded by round walls (the city of Baghdad was the first circular city in the history), within 50 years the population outgrew the city walls, as people thronged the capital to become part of the Abbasid's civil service to engage in the trade.

After the defences of the city were complete attention turned to how Abbasids would feed not just Baghdad, but the enormous population of the Empire.

The development of Agriculture under Abbasids then took place, which was a phenomenon.

The scarcity of water had converted the barren Arab lands into a vast desert, which had never yielded any substantial agricultural produce. Agriculture in Arabia had been very primitive and was confined to those tracts where water was available in the form of springs. Medina, with its springs and wells was the only green spot in the vast desert.

The Abbasids dealt with this water scarcity by controlling the flows of Tigris and the Euphrates rivers.

The Abbasids reconstructed the existing canals, lakes and reservoirs, which were first built under Hajjaj bin Yusuf in 702 C.E. After this, the swamps around Baghdad were drained, freeing the city off malaria. Muslim engineers perfected the water wheel and constructed elaborate underground water channels called '*Qanat*'. Requiring a high degree of engineering skills, *qanats* were built some 20 metres underground with a slight inclination over long distances to tap underground water and more number of manholes were provided so that they could be cleaned and repaired.

The irrigation system in the land was thus greatly improved by digging a number of new canals, the largest of which flowed between the Tigris and the Euphrates. This canal was Nahr Isa (Isa canal) and was open to ships for transportation between Syria and Iraq.

This led to navigation routes opening to India and Persian Gulf.

Figure 26 Seville Spain with olive plantations; With the agricultural techniques which came along with Islam, Spain learned to grow olives. The above picture shows present day olive plantations.

(source: gerril16.blogspot.com)

Figure 27 shows the conception of the city of Baghdad at the time of the Abbasids around the 8th century CE.

(Source: en.wikipedia.org/wiki)

The result of this was that, Abbasids set under motion as ***Agricultural revolution***, which stimulated developments in other parts of the economy. Later on further studies and experiments were carried out to new agricultural practices, which are described below.

Agriculture and Horticulture

"*after such fruit trees as Lemons, Oranges and Palm trees, comes the legumes and Cotton and finally, the aromatic herbs, with Coriander, Sesame, Cumin, and Saffron being mentioned, as well as some ornamental plants*"[1].

Experiments involving horticultural techniques were specially developed in the area of Seville in the so-called A*l-sharaf*. This was an elevated table land with surface of approximately 1650 km^2 which was bordered with water. Its soil was made with sand mixed with lime and local layers of clay and it was highly fertile. The area which was occupied by about 800-2000 villages was cultivated by a dense population working for wealthy families, who hired agronomists and agriculturalists to improve cultivation techniques and production.

A complete encyclopaedia has been written in those times about agricultural and horticultural practices to be adopted for better crops and yields called, '*The book of Nabatean Agriculture'*.

Quality of earth, manures, vegetable production, and growth of flowers, improving the production of olive tree, grapevine, pruning and viniculture were practiced and improved upon by further research and developments.

Agricultural science

Although the lands conquered by the Arabs in the seventh and eighth centuries embraced a wide variety of soils and climates. They were for most part characterized by light and friable soils and climates, hot and dry summers and low rainfall which came almost entirely in the winters. Agriculture, in the form of crops was practiced mainly in winters and tended to be concentrated along river valleys and around oases, where artificial irrigation could be provided, and in such regions where annual rainfall exceeded 300mm.

Lands with poor water were used for grazing animals, usually by Nomadic people.

Figure 28 Names and diagrams of various plants and herbs with medicinal properties in the books written by scholars from 12th to 15th century.

(Source: http://www.algeria.com/forums/health-science/17728.htm)

Figure 30 shows the method to extract tree sap for medicinal purposes.

(source: www.islamic-study.org/politics.htm)

A high portion of land could not be used to produce either crops or animals. Settlement was densest where agriculture was most productive, namely along the great river valleys and around large oases. In rain fed areas, its density varied directly with rainfall, the relatively dry areas having almost no permanent settlement.

Challenges to agriculture and people

The result was a highly discontinuous pattern of land occupation in which larger or smaller agricultural areas, where some were densely inhabited, were separated from one another by greater or lesser expanses which produced little or nothing.

Such patchwork settlements had implications for defence, administration, communications and economic life, and through these for agriculture itself.

Even in those areas where it could be practiced with relative ease, agriculture was exposed to many risks: some natural, some man-made and some created by interaction of man with his environment.

The most obvious natural hazard was the wide variation from year to year in rainfall and river flow, which in dry areas could leave land without enough moisture for inadequate, or even any yields.

Other natural dangers were, excessive heat or cold, which were often intensified by the effect of winds and infestations of rodents, locusts and other insects. The advent of sedentary agriculture exposed the soil to erosion by wind and water, a problem which became more acute when in both pre-Islamic and Islamic times, the pressure of population led to over-cultivation of arable land and over-grazing of pastures.

The appearance of the so called 'waste-lands' on the lower valleys of rivers, feeding into the many parts of the Mediterranean suggests that one period of very great loss of soil cover was in the late 6th century, before Arab conquests. By the Islamic times, much of the soil had been lost from hilly areas which could, thereafter, be farmed only through the use of terracing or alternatively given over to grazing.

Comparable damage to the soil was done by prolonged irrigation of lands by waters that were somewhat saline, in Iraq, for instance, land could generally be irrigated only for a few centuries before it needed extensive cleansing, or more commonly- it was abandoned.

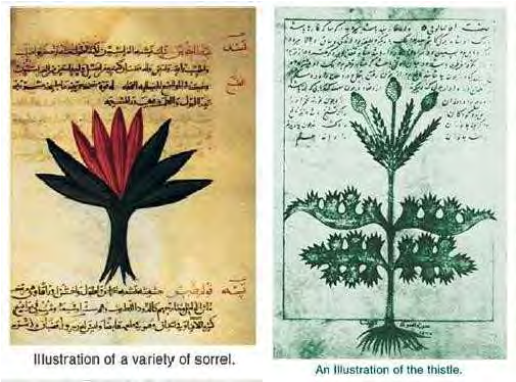


Figure 29, Description of plants and herbs in the books of Botany in the 13th century.

(source: www.islamic-study.org)

Strategies for improvement of Agriculture

To face the challenges of the environment, farmers in West Asia and North Africa had, during the millennia between the beginnings of agriculture and the rise of Islam, devised a wide range of strategies. Most of these were directed towards the conservation of soil and water.

The Book of Nabatean Agriculture, written around 9th century, suggested extensive use of Green manure for specific cases, example, the sediment from olive oil, seeds, straw, husk, leaves, rags, shavings, different kind of ashes and unused part of plants which was to be grown.

The soils also required much working, both before cropping and when it lay fallow. Cultivating the soil allowed the sun and air to have their proper effects and it permitted the correct penetration of rainfall irrigation water and fertilizers. It could repair the damage done by putrid manures, stagnant water, excessive dryness and heat, and it improved soil that was sandy, rocky and sterile earlier.

Turning and breaking the soil were seen as partial substitute for fallowing and fertilizing, and on occasions were deemed preferable.

According to the circumstances, working the soil might consist of ploughing, digging or raking, and these operations might be followed by harrowing, raking or levelling. On large agricultural undertakings, frequent ploughing was the most common way of working the soil.

According to *Ibn Bassal*, land should be ploughed ten times before cotton is planted and if the land is not under crops, it should be ploughed four times between January and March.

"*Andalusian harvests yielded six grains for each grain sown. The profit margin in this 1:6 ratio even taking into account the capital outlay for draft animals and seeds, was far greater than the 1:3 ratio of medieval France.", D. Fairchild Ruggles.*

In Syria and Jordan there are Umayyad ruins with Olive presses, housing for a sizeable population

Manuals such as the Ilkhanid *Asar va ahya and the Safavid Irhad al-zira* make it possible to recreate the agricultural tableau for particular regions of greater Iran.

Figure 30, Scene of agricultural work in an Arabic manuscript, from Islamic Spain.

(source: http://www.muslimheritage.com)

"As early as the 9th century, an innovative agricultural system became central to economic life and the organization of production in the Muslim land. The great Islamic cities of the Near East, North Africa and Spain, Artz explains, were supported by an elaborate agricultural system that included extensive irrigation and an expert knowledge benefiting from some of the most advanced agricultural methods known so far. The Muslims reared the finest horses and sheep and cultivated the best orchards and vegetable gardens. They knew how to fight insect pests, how to use fertilizers, and they were experts at grafting trees and crossing plants to produce new varieties." **Scott, S.P.; History of Moorish Empire in Europe, J.B. Lippincott company, London, 1904.**

The advances in agriculture and agricultural technologies led to the development of gardens in the form of leisure gardens, well defined kitchen gardens, gardens in the small courtyards and later on gardens with scales as great to fit in an entire city in it. But, the basics of gardening lay on the engineering through which the source of life 'water' could be made available to the whole area.

4. Evolution of *Chahar-bagh*

A Paradise Garden was based on the classic Char-bagh design, in which the garden was divided into 4 parts by water channels; the 4 water channels being the 4 rivers of paradise, as described in Islam. Plantation of fruit trees and roses and other flowers lay in geometrically arranged beds below the level of flanking pathways, making irrigation simple and also giving a sensation of walking on a carpet of flowers.

"Before the birth of Islam, gardens, besides being affected by geographical conditions, were influenced by tradition, ritual, and the cultural background of the people. For example, before Islam the figure 4 was representative of the four sacred elements, water, fire, wind and soil; from the days of the Sassanids (224-641 A.D;) onwards it was common to divide hunting grounds into four sections, in the middle of which a kind of mansion was constructed.
As a result, when we observe ancient gardens in Iran, or in the territories which were under Iranian influence, we notice this quadruple division...."[1]

"*climatic conditions were same almost throughout the Islamic empire, and Persia had already developed a model for garden responding to the climatic conditions"* [2]

"Chahar bagh: concept of the ***Mandala*** *with four corners... a mandala represents 'wholeness', an organic entity, a harmonic balance. At the centre of the Mandala is the* ***source of energy****.....It is from this energy that the thought is nourished. The analogue of this energy source in a garden if the fountain, as water is the central source of the life of the garden, the energy source of the mind is central to the life and renewal of human soul.....*
For the garden to flourish, this ***'water of life'*** *must be channelled and distributed to all parts of the garden in a balanced and harmonious way."*[3]

"*A feature of the Paradise which is promised to the Godfearing is that there are in it streams of (such) water as will never putrefy (in smell or colour), and (in it) will be streams of milk whose taste and flavour will never change and streams of (such a pure) wine that is an absolute delight for all who drink it and streams of purified honey; and (in it) will be fruits of every kind (for them) and forgiveness (of every sort) from their Lord."*
(12.23), Qur'anic verse.

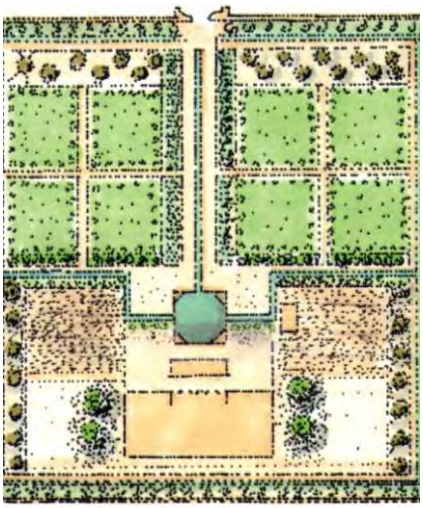


Figure 31 showing the layout of a Chahr-bagh, considered to be a prototype of Islamic gardens all over the world.

(source: www.rozanehmagazine.com)

Figure 32 The Bagh-e Vafa (Garden of Fidelity) was Babur's first garden. It was a charhar-bagh. He wrote in his memoirs that "* ***In 1508-09, I had constructed a charbagh garden called Bagh-i-Wafa on a rise to the south of the Adianapur fortress. It overlooks the river, which flows between the fortress and the garden. It yields many oranges, citroens and pomegranates*****."**

(source: www.gardenvisit.com)

Mandala:

Mandala, symbol of circle later developed to the highest degree in mandala by combining the other three most significant symbols circle, square, cross and centre.

The *irshad al-zira*

It was composed in 1515 in Heart in eastern Khorasan (present day north-western Afghanistan, Eastern Iran and Southern Turkmenistan) by Qasim B Yusuf Abu Nasri.

Although much information has not been disclosed yet, there are descriptions as to what were the areas of interest up to which the study expanded. One such description says that "*the contents of Irshad al-zira relate specifically to the nine districts of Heart region and reflect agricultural practices in Khorasan during the late Timurid period, more precisely the reign of Sultan-Husain-i-Bayqara Mirza (1469-1506), the Timurid ruler of Heart. The main body of work is divided into eight chapters called* ***rauza*** *(literally gardens), which cover the following range of topics:*

1. *The different types of soils;*
2. *The best times for planting according to astrological and meteorological considerations; prayers recited at times of planting; the methods of storing cereal grain; the means of warding off insects;*
3. *The cultivation of different types of cereals (wheat, barley, millet, rice, etc.) and pulse (beans, lentils, chickpeas, etc.), including the types of fertilizer best suited to each;*
4. *The cultivation of grapevines and the varieties of grapes;*
5. *The cultivation of market vegetables, including melons, cucumber, lettuce and spinach, radishes, onions and garlic, beets, eggplant, various kinds of herbs and aromatic plants, hemp, trefoil, and plants used for dyes such as madder, indigo, henna, etc.;*
6. *The methods of planting trees, flowers, and aromatic flowers, and aromatic plants from seeds, cuttings, bulbs, and saplings; the cultivation of olive trees and other fruit trees, such as pomegranate, quince, pear, apple, cherry, fig, mulberry, pistachio, etc.; ornamental trees and bushes such as Plane, Poplar, Jasmine; ornamental flowers, such as many varieties of rose, violet, saffron, iris, tulip, narcissus, etc.;*

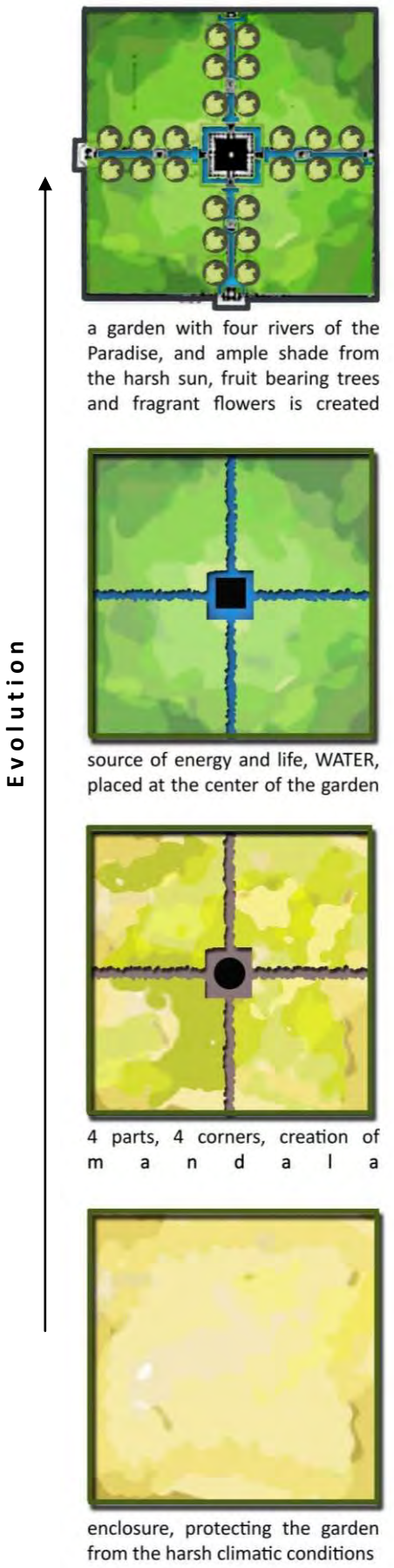


Figure 33 Evolution

7. *The grafting of trees (both fruit bearing and non-fruit bearing) and vines; the methods of picking fruit and their storage; estimating the yields of field crops; the preparation of condiments; beekeeping and*
8. *The layout and planting of chahar-bagh.*

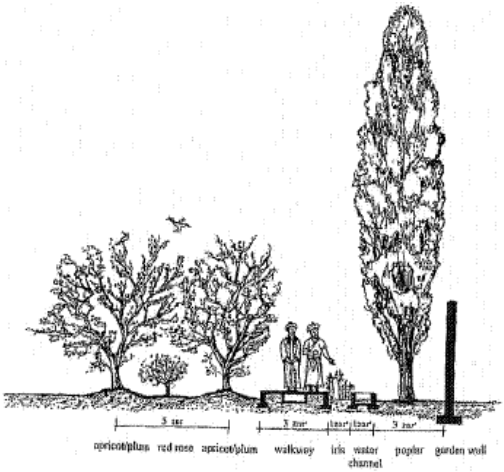


Figure 35 Cross-sectional representation of a perimeter water channel and walkway with mounded rows of Apricot trees.

Drawing by Wiktor Moskaliuk.

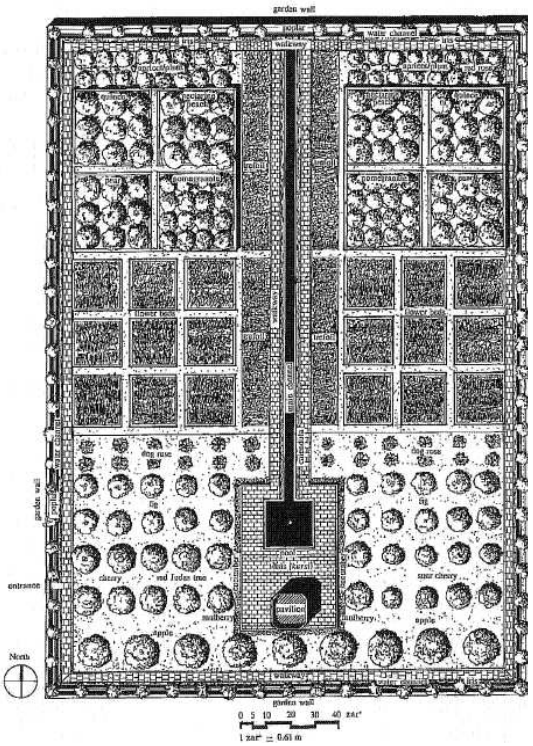


Figure 34 shows the reconstruction of the Timurid Chahar-bagh based on Irshad-al-zira; drawn by Wiktor Moskaliuk, plan extracted from the document 'Agriculture and timurid Chahar-bagh. Drawing by Wiktor Moskaliuk.

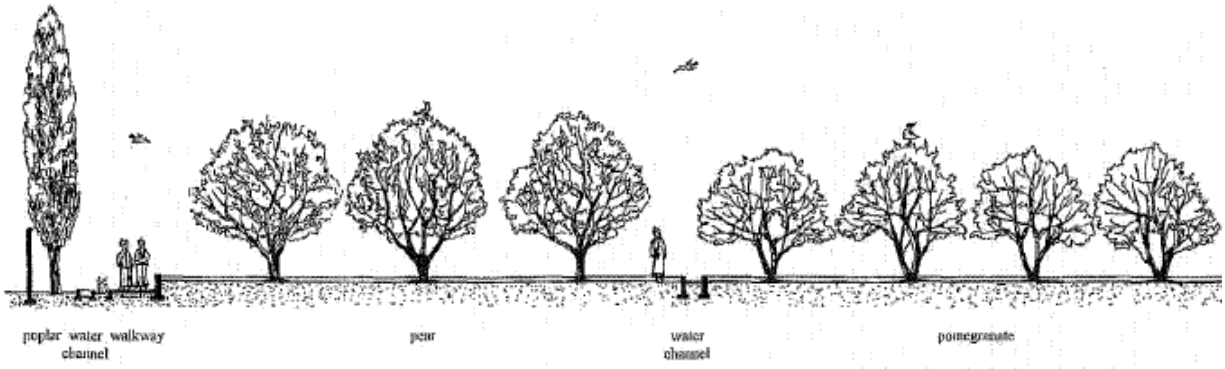


Figure 36, Cross-sectional representation of raised terraces on one side of the main water channel. Drawing by Wiktor Moskaliuk.

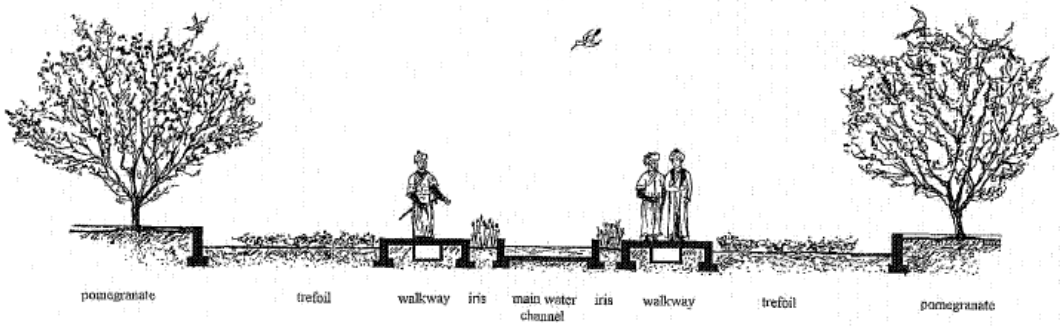


Figure 37 Cross-sectional representation of main water channel flanked by walkways and lawns of trefoil.

6. Gardens of Islam: a way of life and life as a religion

In Arabia, at the time of coming of Islam in the 7th century, a garden was conceived as a walled orchard or vineyard, and was irrigated by a channel of water or a well.

However, in the most basic sense, a grove of Palm trees and a source of water catering to them, would be considered as a garden too. For both, the pre-Islamic Arabs and the early Muslims, the walled garden; the *'hadiqa',* was a gift of the Perso-Mesopotamian civilization.

Islam absorbed the already well established Persian tradition of hunting parks and royal pleasure gardens and invested them with a new spiritual vision. It was through this vision, as portrayed in the Qur'an, that Islamic gardens were born. The first Muslims came from the deserts and towns of Arabia and Syria.

The pleasurable aspect of Islamic gardens- the sensory delight of sight, sound, scent and refreshing spray were balanced with their ability to yield useful fruits and to display the process by which fertility was transformed into profit.

The Umayyad Palace at Rusafa, in Syria is the earliest example of char-bagh, where a raised pavilion stood at the intersection of the walkways in an irregular garden enclosure.

Thereafter, the quadripartite plan spread across the Islamic world, from Spain and Morocco to Afghanistan, culminating in the great gardens of Timurid and Safavid Iran and Mughal India.

There are certain features common to all Iranian gardens:

1. The garden is laid out on a sloping ground.
2. The area of the garden is surrounded by a wall.
3. There is a main canal in it.
4. The area of the garden is divided into four parts.
5. There is a mansion or palace in the middle.
6. The planting of rose-bushes is common.
7. A close relation with nature is maintained in a simple manner and there is no interval or boundary line between the mansion and the rest of the garden, so that it cannot be seen where one begins and the other ends.

Figure 38, a Persian miniature painting

(source: www.mage.com/non-fictionbooks.html)

8. A large number of trees are planted for providing shade, and as a result the garden contains narrow walks.

9. Canals are so designed that the flow of water creates a sound.

10. The design of garden is based on the use of straight lines.

11. Provision is made for the flow of water to be visible, and grooves are cut in the bottom of the canals to cause the water to flow roughly as if it were flowing over rocks.

12. There are large number of fruit trees; the bigger the garden the more the fruit trees are planted.

One of the gardens designed mainly for religious purpose, which was influenced by religious factors was laid out during the time of Safavid dynasty. This garden was unique in two ways:

1. It was laid out in religious precinct, and

2. It was a public garden.

The garden is 25km from Nishaborr, and is called "Qadamgah" because on the left hand side, in a southern portion of the wall inside the mansion, there is a piece of black stone on which two footprints hae been carved. The Qadamgah garden is composed of three sections which are described as under:

a. The area surrounding the mansion: this area is rectangular in shape and measures 102 by 115 metres. It is surrounded by walls. A canal which waters the garden enters from behind the mansion and, after filling a pool measuring 13 by 16 metres and flowing through several channels and four smaller pools around the building, takes its course along the main axis of the garden. The large cool is also used as a reservoir. All sections of this garden are on steep ground and it therefore consists of several different levels which are connected to another by stairs. Except for a few Apricot trees, the area is planted only with Plane trees and Pines.

b. The general area of the garden: this area is laid out on both sides of the axis in a symmetrical manner and on each side there are twenty booths for the use of caravans for pilgrims. The trees in this part are mostly Mulberry, which according to the common belief, were planted only for charity, so that everyone was free to eat their fruits.

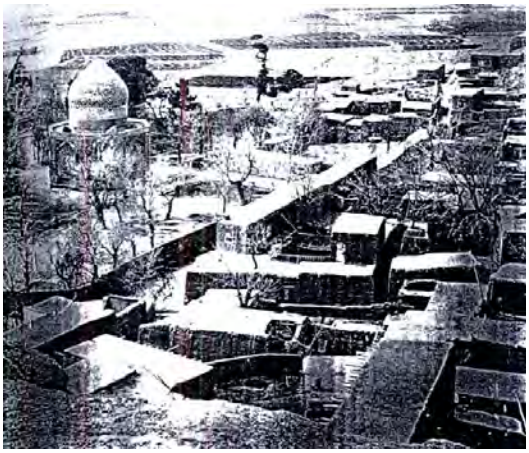


Figure 39 showing the stepped terraces of gardens of Qadamgah in Nishaborr.

Figure 40 showing the steep water channels in the gardens of Qadamgah.

Figure 41, Qadamgah was a safe, sacred and affluent stop along the Silk Road on the way to the sacred city of Mashhad; over time, an entire complex of caravansaries, washrooms, and rest houses were built there. The garden itself is linked to many religious legends; it has been expanded and developed into the form we see today, a turquoise gemstone in the green fields of Nishaborr, creating a unique historical space for travellers.

(source: www.archnet.org)

The axial canal continues through this area, and, after passing between two huge Plane trees, enters a pool measuring 11 by 8 metres. When this has filled, it again flows as a narrow canal along the axis. The Mulberry trees are planted in three distinct rows. The middle one, being a double row, lines both sides of the axial canal, providing shade in accordance with Iranian taste. The two other rows are planted in front of the pilgrim booths.

7. REPRESENTATION OF THE GARDEN IN A HOLISTIC WAY

Private spaces:

A lush garden with fountain and shade giving trees and the gentle green everywhere as depicted in the kind of Char-bagh in miniature, there may be room for many plants and flowers, but, there is always water, usually a small fountain or a small pool in the centre with possibly one palm tree and a few pots.

The houses were often quite high, with 4-stories or more and a flat roof on which one can sleep on hot summer nights, the windows opening up into the courtyard, a miniature *Paradise garden* within.

Figure 42, a traditional Muslim house in Jordan.

(Source: Steele, James, The Architecture of Rasem Badran: Narratives on People and Place. London, 2005, pp.70-72.)

Under Muslim direction, this architecture also reflected the separation between private and public spaces. This distinction between the private and public spaces, eventually, has become a hallmark of traditional Islamic architecture.

As there two ways to look at a human, so do the architecture;

***Zahir (Persian)**:* meaning exterior, or worldly attitude.

***Batin (Persian)**:* meaning interior, or contemplative aspect of human nature.

Therefore, we can also say that, if a Muslim house has no windows onto the street and is normally built around an inner court from which the rooms receive the light and air, this is not only simply a response to the climate, but is clearly symbolic too.

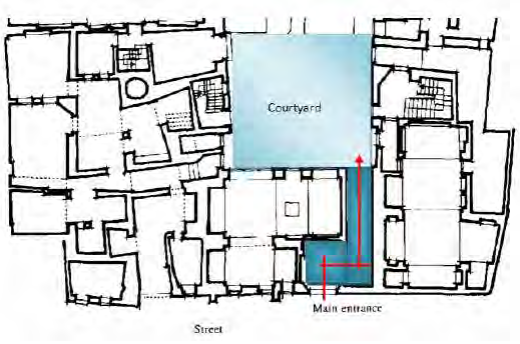


Figure 43, The entrance opens into the courtyard, Al-Suhaymi house, Cairo, 1648.

(Source: International Journal of Civil & Environmental Engineering IJCEE-IJENS Vol:10 No: 04, pg. 16)

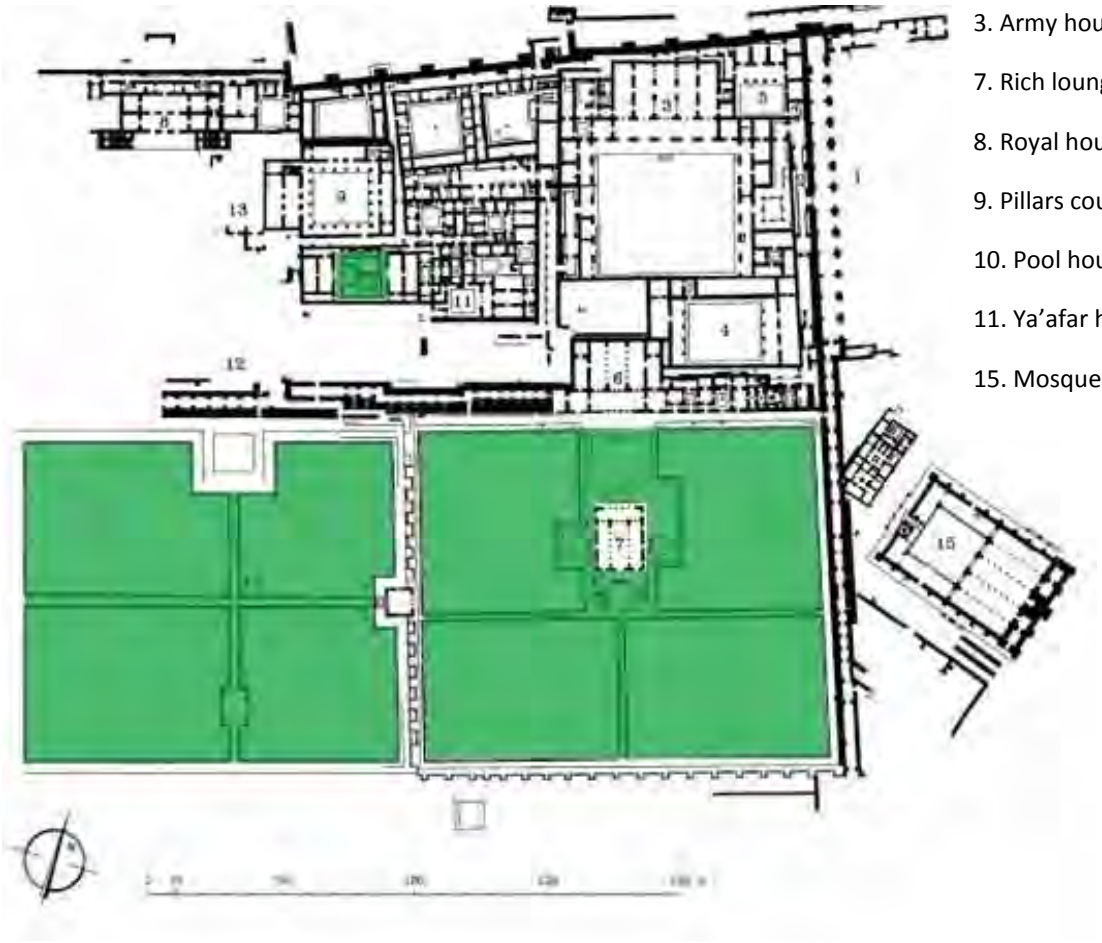
The four-fold plan also recalls the fundamental *Mandala* of Vedic tradition, which is divided into nine squares and symbolizes the terrestrial realms. The plan of the Heavenly gardens always includes the four rivers of Paradise flowing towards the four quarters of heaven, or from them towards the centre.

Gardens as a City

Madinat al-Zahra, a planned palatine city located a few kilometers west of Cordoba, was founded by 'Abd al-Rahman III in 936 **C.E.** shortly after the proclamation of the Umayyad caliphate in al-Andalus.

Figure 44, View of Madinat al-Zahra

The city is composed of three terraced platforms, separated from one another by walls, and enclosed by fortified walls. The uppermost terrace contained various buildings for government administration and royal ceremony, as well as residential quarters and gardens for the caliph and the court. The middle terrace was composed mainly of gardens with pavilions and pools, and orchards, while the lowest terrace contained the congregational mosque, markets, and probably residential quarters for the military and for the merchants associated with the market.



3. Army house
7. Rich lounge and top garden
8. Royal house
9. Pillars court
10. Pool house
11. Ya'afar house
15. Mosque Alhama

Figure 45, plan of Madinat al-Zahra, (source: *otraarquitecturaesposible.blogspot.com)*

Figure 46 shows an aerial view of the tenth-century palace of Madinat al-Zahra, the residence of Ummayad Caliphs of Cordoba, five kilometres outside the city of Alhambra. The Palace extends down a hillside and the caliph's own rooms and the ceremonial chambers were at the top of the hill and commanded a view of the rest of the palace complex. The caliph's ministers were accommodated at a lower level and servants and garrison at a yet lower level.

(source: unknown)

Figure 47 and Figure 48 (below) showing transverse and longitudinal sections of the Madinat-al-Zahra.

(source: author)

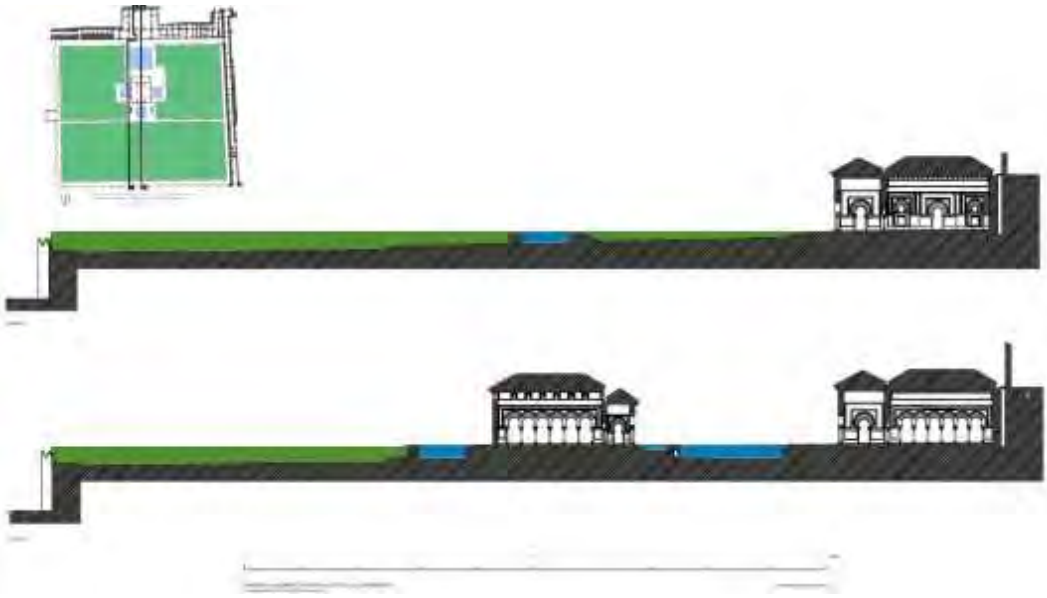
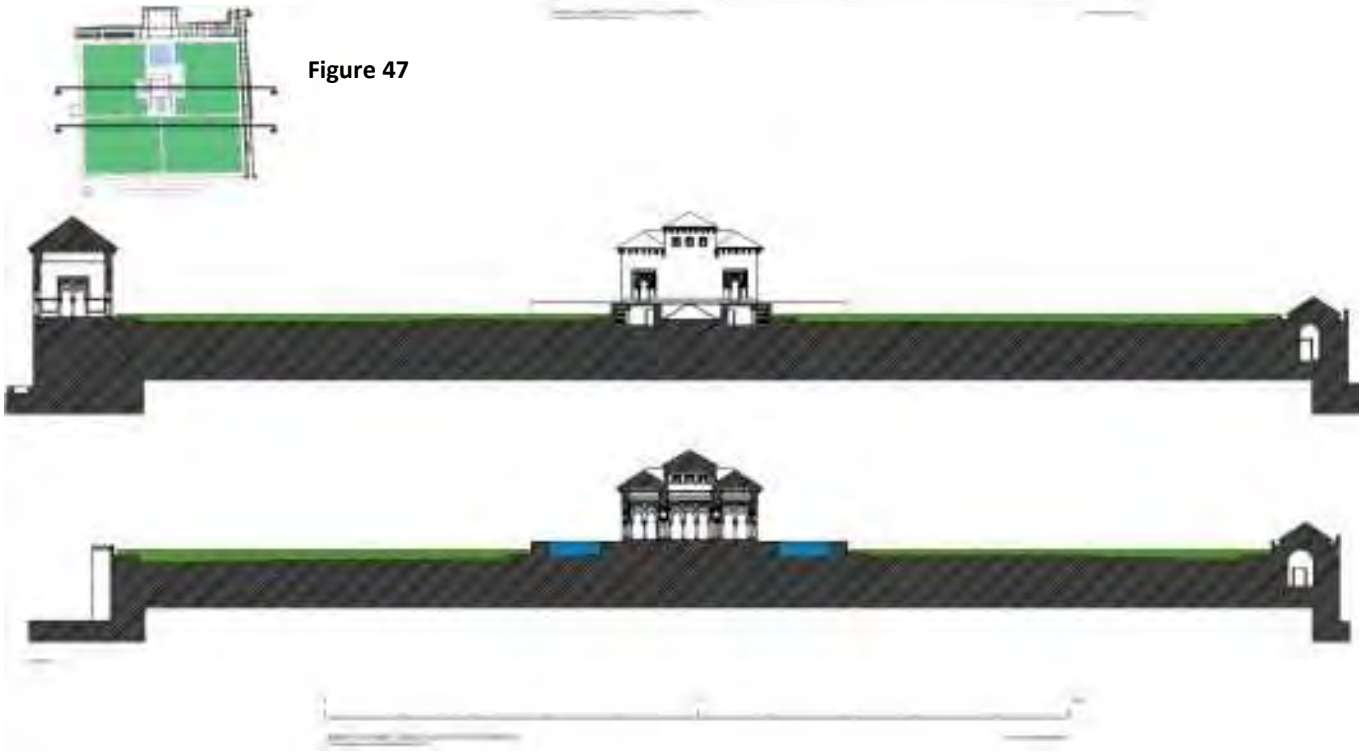


Figure 47



The **Alcázar of Seville** was constructed during the 12th century Almohad reign, but was rebuilt in 1364 for the Christian ruler Pedro I ("The Cruel"). All that remains of the Almohad palace is a section of wall and a cross-axially-planned garden, but the rebuilt palace's plan, gardens, and decorative programme place it squarely within the tradition of Islamic palaces on the Iberian Peninsula.

Figure 53, Plan

The block on the west side of the entrance courtyard contains the square, vaulted Hall of Justice. The interior of the Hall opens onto the Patio del Yesso (Court of Stucco), whose name refers to the court's decoration in carved stucco. The two spaces are connected by water - a shallow fountain basin in the Hall's pavement flows into the pool of the Patio del Yesso along a shallow channel, much like the pavilion water features in the Alhambra's Court of the Lions. Though the Islamicizing appearance of the A traditionally attributed to the work of Muslim crafts from Granada, it is not clear that the visual language created by the Nasrids at the Alhambra was only executed by Muslim craftsmen. The existence of churches, monasteries, and synagogues on the Iberian Peninsula that utilise this visual language suggests that such forms were widely appropriated by non-Muslim patrons and craftsmen who could work in the popular idiom.

Figure 55

Figure 50 shows one of the lush green courts in Alcazar.

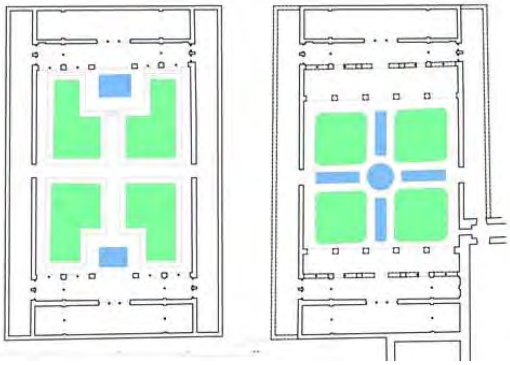


Figure 51 shows the layout of the two courtyard gardens in Alcazar.

Figure 52 shows courtyard garden of Alcazar Seville, called Patio yeso

The Garden as Power

The **Garden Palace Complex of Alhambra**, Granada

The Palace complex in Granada in south-west Spain is known for being one of the most beautiful examples of Islamic architecture.

The name Alhambra - the Red Fort - The city of Granada first rose to importance in 1012 as the capital of the Zirid dynasty who established their base on the site of the Alhambra. Later in 1231 the city was capital of the Nasirid dynasty under Banu al-Ahmar who ruled the province of Andalucia until the final conquest of Ferdinand and Isabella in 1492. As rulers of the last Muslim state in Spain the Nasirids were able to collect some of the most able craftsmen in the Peninsula.

Figure 54, one of the courtyard gardens of the Palace of Alhambra

(source: ogerdi-archivo-gotan-tanbr.blogspot.com)

Figure 55, the Partal Garden through the Alhambra entrance Palacio.

(source: ogerdi-archivo-gotan-tanbr.blogspot.com)

Figure 57, view of Alhambra as a garden, as a fort. Oil an casein painting by Allen Ullman, 1966 c.a. (source: http://www.alhambra.org)

Figure 56

(source: ogerdi-archivo-gotan-tanbr.blogspot.com)

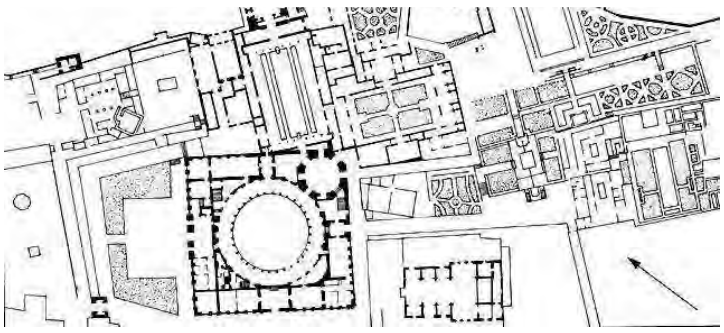


Figure 57 plan of Alhambra, Spain. Many scholars and researchers believe that the Architecture of Alhambra was meant to intimidate the people who visited that place. (source: www.paleizen.nl)

The Gardens of the Taj Mahal

"*A famous article by Begley on the Taj-Mahal demonstrates how emblems of power were an everyday Mughal obsession, and shows that the equation between architectural forms and celestial prototypes (always viewed in terms of the celebration of the deified image of the king) was the real spur to any architectural enterprise. What could not be stated by the orthodox Muslim, vicar of Allah, was left to the metaphor of stone. Playing continually on the ambiguity between Divine Throne and royal throne (an unbridled vanity) transformed tombs and monuments into symbols of glory and called for the laying out of gardens, replicas of the Qur'anic paradise, to exalt the figure of the holy demiurge*."

Article extracted from https://archnet.org

Figure 58 Shows the Taj Mahal from the river front.

(Source: http://www.logoi.com/pastimages/taj_mahal.html)

Figure 62, showing the Taj with its beautiful orchards and Indian gardeners working in the gardens. It was painted around 1860 CE. (source: unknown)

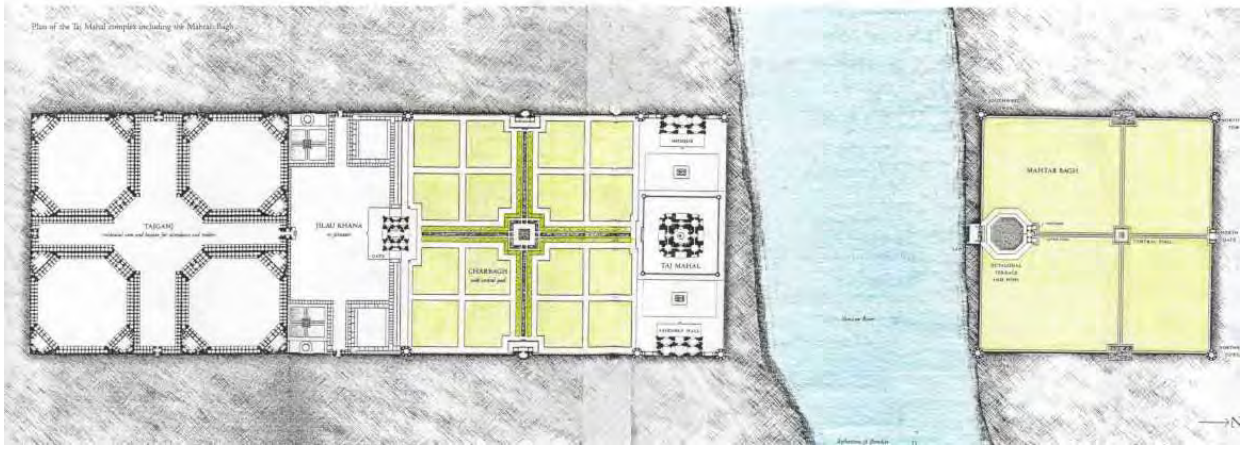


Figure 59 showing the gardens of the Taj mahal extended beyond the river Yamuna.

(source: www.kamit.jp/25_dictionary/xmahtab.htm)

The Taj Mahal gardens have been found to be extended across the river which is called the Moonlit Gardens or the Mahtab-e-bagh, which was supposed to be the evening destination for viewing the magnificent Taj in the moonlit night.

The Garden as Pleasure

The Muslims, in around the 14th century, took a turn towards the pleasure the gardens could provide. The Mughals turned out to be the ones in pioneering the art of garden designing for the purpose of pleasure. Babur, who somehow considered himself to be a gardener had built several gardens in his empire around the 16th century C.E.

Later on, many types of gardens evolved like the Zenana gardens, *Shikar maidans (*hunting grounds), which actually was Islamic version of the Hunting grounds of the early Persians.

In Bundi (Rajasthan)*, Rawala* (Queen's cottage outside the city with a view of lakes and gardens), are very famous for their architectural as well as garden design.

Figure 60 shows the Rawala, queen's resting space meant for leisure. The fort is actually a Rajput fort, but the deisgn is influenced from the Chahar-bagh concept. Built around 17th century.

Figure 61 painting in Bundi

Figure 62, (source: author)

Bagh-e-Babur, Kabul

The 11-hectare terraced garden on the western slopes of the Sher-e-Darwaza Mountain south of Kabul was laid out by the founder of the Mughal dynasty, Muhammad Zahir al-Din Babur (c.a.1526-1530). It was his favourite among the ten gardens that he built in and around Kabul, and he decreed that it be his final resting place. Babur was buried in Agra upon his death and was reburied in the Kabul garden by 1544 C.E.

Figure 63, shows the extension of garden from the foothills towards plain land.

(Source: www.darulaman.de)

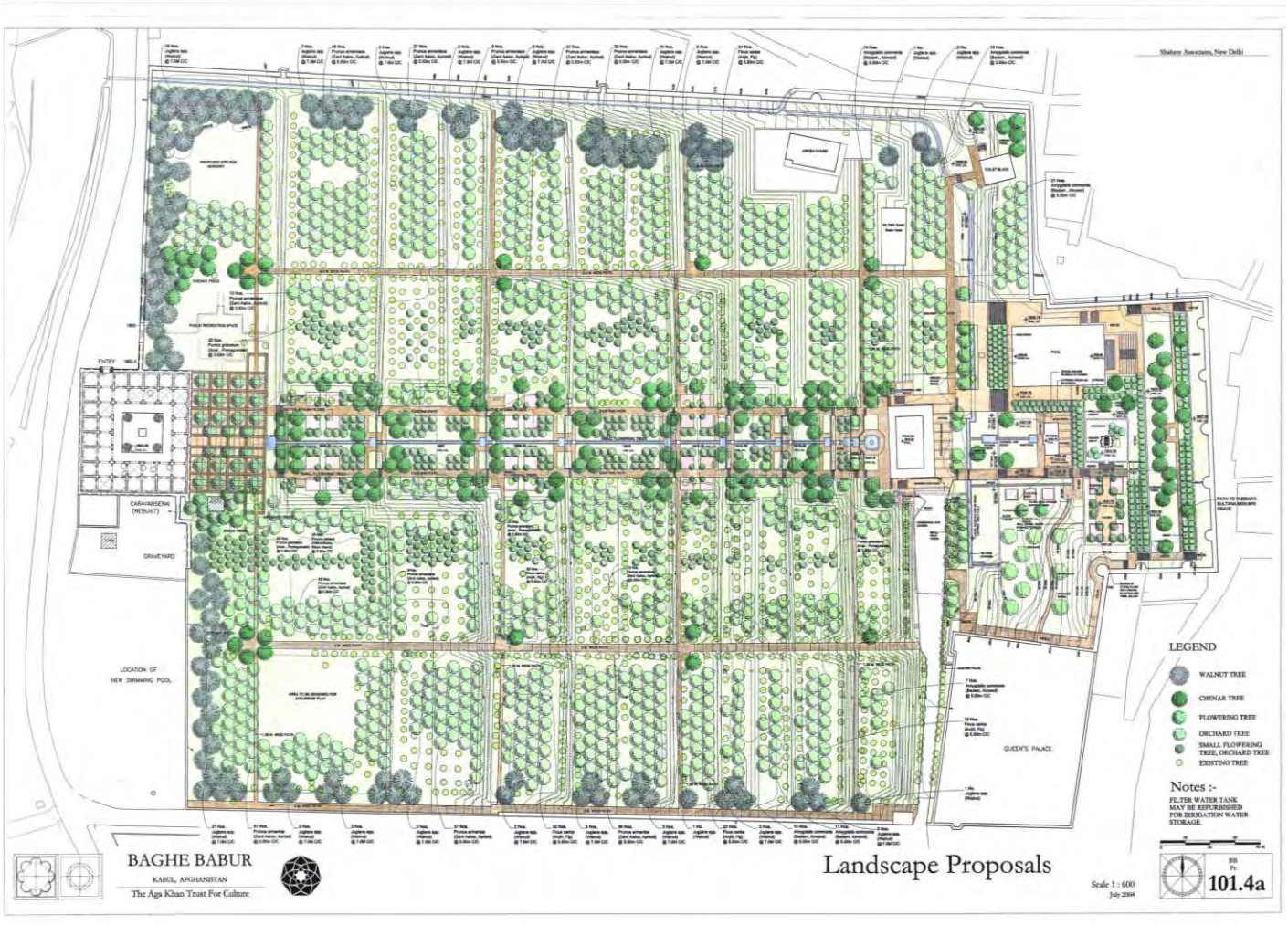


Figure 64, shows the planting plan of Bagh-e-Babur in Kabul. (Source: http://archnet.org/library/files)

The above drawing has been a regeneration of the Bagh-e-Babur.

Figure 65 shows the flower garden or the '*gulistan',* in the garden. (Source: www.darulaman.de)

Figure 66, shows various terraces that line the garden. (Source: www.darulaman.de)

Figure 67, shows the conceptual view of the planting along the central water channel along the Bagh-e-Baur in Kabul

(source: work from Mohammed Shaheer's regeneration of the Bagh-e-Babur, courtesy Dwaipayan Bhattachrya)

The Shalimar-bagh

"The Shalimar Bagh is the celebrated royal garden of Kashmir. The name Shalimar ("abode of love") can be traced back to the name of the structure built by Pravarsena II in the 6th century CE, when the garden was a Hindu sacred site. The Emperor Jahangir was so fascinated with the garden that he called it "one of the sights of Kashmir."

Covering an area of approximately 12.4 hectares, the garden is rectangular in shape and measures 587 meters long by 251 meters wide. It is oriented northeast to southwest, with the highest point located along the northeast side. Although it is not located directly on the lake shore, it is connected to Lake Dal by a long canal, and the formal approach to the garden is through this canal.

Like other Mughal gardens around Lake Dal, Shalimar adapts the chahar bagh to the mountainous topography by emphasizing the central water channel; the secondary channels are minimized or removed from the design, and the source of water shifts from the center of the garden to its highest point. Thus the central water canal of the garden (shah nahar) forms its main axis, uniting the three terraces with their regularly placed fountains and chinar (sycamore) tree-lined vistas. Beginning at the top of the garden, the canal runs through each of the baradaris (pavilions) in the garden. At each terrace, the canal flows into a larger pool, highlighting its baradari. Within the Shalimar Bagh, each of the three terraces had a different function and level of privacy: a public garden (first terrace), a private garden, also called the Emperor's Garden (second terrace) and the zenana (harem) garden, on the third terrace."

Article extracted from https://archnet.org

Figure 68, shows exterior view looking northeast from the main entrance, showing the first garden terrace and the water basin.

(source: archnet.org)

Figure 69, View of the second terrace garden

(source: archnet.org)

Figure 70 View of the cascade on the third garden terrace, Shalimar Bagh, Kashmir.

(source: archnet.org)

Figure 71, View looking northeast ward showing the women's pavilion (zenana) and its water basin

(source: archnet.org)

Gardens classified according to plant materials

Gulistan and Bostan

The *Gulistan (arabic); (Gul-Rose & istan-place);* is a garden meant for sensory pleasure of sight and smell planted with various kinds of flowers.

The flowers may be used to create carpets of colors of for creation of some art work of Persian carpets.

The *Bostan* is a more functional version of Islamic gardens, literally meaning 'orchard gardens'. They have dual purpose of shade and fruits to the people passing by. These gardens came into being around the Mausoleums of Kings, which were open to public and the travellers.

Figure 72 flower gardens with flowering trees

(source: www.keyimagery.com)

Moonlit gardens

These gardens were a further step to the Gulistan, traditionally calle '*mahtab-bagh',* which were meant to be visited at night. These gardens had plantations including white flowering plants only. Fragrance was another dimension added to the function of such gardens. One of the famous moonlit gardens is the Mahtab-e-bagh of the Taj Mahal, built opposite the Mausoleum across the river.

Figure 73, flower gardens as flower carpets.

(source: www.keyimagery.com)

Evolution of garden in Islamic empire

There are some key points which led to the evolution of gardens in the Islamic reign of the then Islamic cities:

The climate and need of food

Development of agriculture as a means of occupation of people

Development of new methods and technology for the propagation of agriculture

Development of the water system for better irrigation needs.

After the cities became self-sufficient the Kings began to construct huge gardens as a symbol of prosperity and health of their kingdoms. (bringing up of Bostan and Gulistan.)

Later on gardens began coming up in private areas, like the courtyard gardens.

Later on, cities were looked up as a landscape design element fused with the urban development of the later cities.

The spread of Agricultural knowledge was seen on the periphery of entire Gulf region, as there came to being a Green Revolution in the Ancient Islamic era.

Ending Note

The garden design of Islamic culture was an output of the way of life as guided by the Prophet, in a way which was directed by the existing conditions of those times and the holy book of Qur'an. Taking into consideration the factors like climate, topography, geography, geology and the social ones, like public and private lives, the design of the gardens and architecture was moulded.

Here, it is to say that, the design of spaces evolved out of certain matrix of Islamic laws which set the boundaries of garden design. Even though the technology and typology of gardens remained the same which were practiced by the earlier people of Persia and Arabia, but, the essence was directed towards the principals as guided by the Holy Qur'an. It can also be said that, the evolution of Chahar-bagh is not in itself a purely Islamic design concept because concept of the precious **water** irrigating the barren **lands** was not unknown to the previous settlements in that area. The Paradise gardens could have been an entirely different design rather than the Chahar-bagh, but it was the guiding religion which changed the ideology, but the palette of design elements remained same.

Glossary:

IMPORTANT TERMS

1. **Islam**: is the monotheistic religion articulated by the Qur'an, a text considered by its adherents to be the verbatim word of God (Arabic: الله *Allāh*).
2. **Muslim**: is an Arabic term for "one who submits to God".
3. **Prophet Muhammad:** c.a. 26 April 570 – 8 June 632, was the founder of the religion of Islam and is considered by Muslims to be a messenger and prophet of God**. (PBUH: Peace Be Upon Him).**
4. **Qur'an:** the sacred writings of Islam revealed by God to the prophet Muhammad during his life at Mecca and Medina.
5. **Umayyad Caliphate (661-750 C.E.):** was the second of the four major Arab caliphates established after the death of Muhammad. It was ruled by the Umayyad dynasty, whose name derives from Umayya ibn Abd Shams, the great-grandfather of the first Umayyad caliph. Although the Umayyad family originally came from the city of Mecca, their capital was Damascus. At its greatest extent, it covered more than 13,000,000 km^2, making it one of the largest empires the world had yet seen.
6. **Abbasid Caliphate (750 to 1258 C.E.):** was the third of the Islamic caliphates. It was ruled by the Abbasid dynasty of caliphs, who built their capital in Baghdad after overthrowing the Umayyad caliphate from all but the al-Andalus region.
7. **Timurid's:** The self-designated *Gurkānī* Central Asian Sunni Muslim dynasty of Turko-Mongol descent whose empire included the whole of Iran, modern Afghanistan, and modern Uzbekistan, as well as large parts of contemporary Pakistan, North India, Mesopotamia, Anatolia and the Caucasus. It was founded by the militant conqueror Timur (*Tamerlane*) in the 14th century.
8. **Mughals:** The Mughal emperors were descendants of the Timurids. The Mughal Empire began in 1526; at the height of their power in the late 17th and early 18th centuries, they controlled most of the Indian Subcontinent—extending from Bengal in the east to Balochistan in the west, Kashmir in the north to the Kaveri basin in the south.

Other important words:

1. **Al-sharaf:** the best-known olive-growing region in al-Andalus was the area to the west of Seville called al-Sharaf or Aljarafe, *"situated upon a high plateau of red earth, of an area approximating forty miles square, which can be traversed walking always in the shade of olive and fig trees.",* **Glick, F. Thomas** Islamic and Christian Spain in the early middle-ages; Library of Congress, 2003 , Pg. 73.
2. **Noria:** it is an Arabic word which stands for a machine for lifting water into a small aqueduct, either for the purpose of irrigation.
3. **Shaduf:** it is an Arabic word. The shaduf is an irrigation tool consisting of an upright frame on which is suspended a long pole or branch, at a distance of about one-fifth of its length from one end. At the long end of this pole hangs a bucket, skin bag, or bitumen-coated reed basket.
4. **Qanat:** A **qanāt** (Arabic) is a water management system used to provide a reliable supply of water for human settlements and irrigation in hot, arid and semi-arid climates.
5. **Book of Nabatean Agriculture:** *The Nabatean agriculture* is a treatise of agronomy written in the III-IVth century of our era in Syriac (Aramean) by Qûtâmä, and translated into Arabic at the beginning of the X^{th} century by Ibn Waḥšiyah (Ibn Wahshîya). The translation was achieved in 904 and dictated to a copist in 930, a date at which the translator was dead ; the copist finished his work on the basis of the translator's manuscripts.
6. **Nahr-Isa:** the great navigable junction canal constructed between the rivers Euphrates and Tigris much earlier than the start of Abbasid Caliphate in the 8^{th} century C.E. This great canal was revived by the Abbasids to encourage trade and commerce in Baghdad.

List of Plants:

S.no.	Common name	Botanical name
1.	**Barley**	***H**ordeum **v**ulgare*
2.	**Beans**	***P**haseolus **c**occineus*
3.	**Beet**	***B**eta **v**ulgaris*
4.	**Cherry**	*Prunus **s**erotina*
5.	**Chickpeas**	***C**icer **a**rietinum*
6.	**Coriander**	***C**oriandrum **s**ativum*
7.	**Cotton**	***G**ossypium **h**erbaceum*
8.	**Cucumber**	***C**ucumis **s**ativus*
9.	**Cumin**	***C**uminum **c**yminum*
10.	**Eggplant**	***S**olanum **m**elongena*
11.	**Fig**	***F**icus **c**arica*
12.	**Garlic**	***A**llium **s**ativum*
13.	**Grapevine**	***V**itis **v**inifera*
14.	**Hemp**	***C**annabis **s**ativa*
15.	**Henna**	***L**awsonia **i**nermis*
16.	**Indigo**	***I**ndigofera **t**inctoria*
17.	**Iris**	***I**ris **g**ermanica* and many more.
18.	**Jasmine**	***J**asminum **o**fficinale* and many more.
19.	**Lentils**	***L**ens **e**sculenta*
20.	**Lettuce**	***L**actuca **s**ativa*
21.	**Madder**	***R**ubia **c**ardifolia*
22.	**Melons**	***C**ucumis **m**elo*
23.	**Millet**	***P**ennisetum **t**yphoides*
24.	**Mulberry**	***M**orus **a**lba*
25.	**Narcissus**	***N**arcissus **p**apyraceus* and many more.
26.	**Onion**	***A**llium **c**epa*
27.	**Palm tree**	***P**hoenix **d**actylifera*
28.	**Pear**	**P**yrus **c**ommunis and many more.
29.	**Pistachio**	*Pistacia **v**era*
30.	**Plane tree**	***F**icus **s**ycomorus*
31.	**Poplar**	***L**iriodendron **t**ulipifera*
32.	**Quince**	***C**ydonia **o**blonga*
33.	**Radish**	***R**aphanus **s**ativus*
34.	**Rice**	***O**ryza **s**ativa*
35.	**Rose**	***R**osa **d**amascena Mill (RDM)*
36.	**Sesame**	***S**esmum **i**ndicum*
37.	**Saffron**	*Crocus **s**ativus*
38.	**Spinach**	***S**pinacia **o**leracea*
39.	**Trefoil**	***L**otus **c**orniculatus*
40.	**Tulip**	***T**ulipa **g**esneriana*
41.	**Violet**	***V**iola **a**rvensis* and many more.
42.	**Wheat**	***T**riticum spp.* Family: ***G**raminae*

References:

- *Hobhouse, Penelope; Water and gardens in Islamic desert culture,* the British Library, 1997.
- *Corbin, Henry; History of Islamic Philosophy,* the Islamic Publications.
- *Hossein Nasr Sayyed; Islam: religion, history and civilization*, State University of New York Press, 2006.
- *Ruggles, D. Fairchild; Islamic Gardens and Landscapes.*
- *Hannaway Jr., William L; Paradise on earth: the Terrestrial garden in Persian literature.*
- *Syed, Soraya; Art/Architecture the Art of Islamic Garde, Emma Clark Crowood Press, 2004.*
- *Cornell Vincent J.; Voices of Islam: Voices of Art, Beauty and Science, British Library, 2007.*
- *The Islamic Garden: History, Symbolism and Qur'an*
- *Fairchild, Ruggles D.; Garden; landscape and vision in the palaces of Islamic Spain, Pennsylvania State University Press, 2003.*
- *Petruccioli, Attilio; Islamic Environmental Design.*
- *Lehrman, Jonas Benzion; Earthly Paradise: garden and courtyard in Islam.*
- *Singh, N.K. & Kirmani, M. Zaki; Encyclopaedia of Islamic Sciences and Scientists.*
- *Bailey, Gauvin; Sweet smelling Notebook*
- *Beazley, E. & Harverson M.; Living with the Desert, Warminster, U.K., 1982.*
- *Wullf, H.E.; the Qanats of Iran, <Scientific American>, 218(4), 1968.*
- *Stronach, D.; Pasargadae, Oxford, 1978.*
- *Curatola, Giovanni & Scarcia, Gianroberto. The Art and Architecture of Persia*
- *Hattstein, Markus and Delius, Peter. Islam: Art and Architecture*
- *George Braziller, Inc., 1965. New York*
- *Hillenbrand, Robert. Islamic Architecture: Form, Function, and Meaning, Columbia University Press., 1994. New York*
- *Michell, George. Architecture of the Islamic World: Its History and Social Meaning*
- *Thames and Hudson., 1996. London*
- *Pope, Arthur Upham. Persian Architecture.*

"If I had but two loaves of bread, I would sell one and buy hyacinths, for they would feed my soul."

Prophet Muhammad, (Peace Be Upon Him)

Painting of hyacinths extracted from *www.marnimaree.com*