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"CHAR-BAGH" Gardens through the AGES

Sadikova Sitora-bonu Nematdjonovna

Ph.D of Architecture, ass. prof. of the chair "Theory and history of architecture"
Samarkand State Architectural and Civil Engineering Institute, Samarkand, Uzbekistan

ABSTRACT: This article covers the main methods of designing the «Char- bagh» gardens. Being based on historical evidence and ancient authors' methods, this article gives to architects and landscape designers the bright methodological recommendations how to plan and design this traditional gardens.

KEY WORDS: landscape design, «Char- bagh», traditional gardens, historical evidence architects.

I. INTRODUCTION

«It is almost impossible to be conscious of yourself having no knowledge of the veracious story... So, how to start creating such story? First of all, it is necessary to define the holistic concept, which is, the research program of our thousand-year rich past...»¹

It has been proved by the psychological researches the importance of having the balance between stimulus and feelings for the sake of good health and well-being of people. In urban life style senses of vision and audition are "overloaded", whereas the senses of stimulation (smell and touch) are not enough stimulated. Modern recreation parks were developed for the spiritual public life improvement, but today it does not serve internal human inquiries like-intimity and contemplation. Then, as organized lay-out of «Char- bagh» garden, isolated from the outside world with a fence or a green hedge, with blossoming trees, flowers and flowing water is pleasant for the eyes, and delightful for the soul.

According to this principle the majority of gardens of Timurid in Samarkand, Herat (XIV-XV centuries), as well as gardens of Safavid Iran (XVI-XVII centuries), and Babur in Northern India (XVI-XVII centuries), Arab Caliphate gardens in Syria, Morocco, Southern Spain, Turkey (VIII-XIII centuries).

However, today all aspects of landscaping in «Char - bagh» style in Uzbekistan, and all other Central Asian countries are not fully known. In this regard, to meet the various needs of the population, it becomes essentially important to revive the traditional "Char-bagh" gardens for solitude with a nature, meditation and rest, surrounded by historical monuments, mausoleums, mosques, and national parks.

Combination of climatic factors (temperature, solar radiation, air relative humidity, speed of its movement, rainfall amount), together with landscape features, create various environmental conditions which should be considered during the selection a suitable site for laying the «Char - bagh» garden, and its architectural and planning concept as well as selection of the range of vegetation.

II. SIGNIFICANCE OF THE SYSTEM

Site selection and planning organization of «Char-bagh» garden. Before starting to design a traditional "Char-bagh" garden, the territory (site), having in mind the cardinal direction, nature of soils, an availability of water

¹ The President of the Republic of Uzbekistan I.A. Karimov. "Mulokot" magazine, 1998.



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for watering, the environment is carefully studied and analyzed, and also to which zone this site belongs and the resulting this requirements (fig. 1).

The main concepts of «Char-bagh» gardens style are the pattern, proportions, harmony and solidity forming a basis for its design as well as for practical, technical and aesthetic solutions, where the benefit, beauty and symbolic forms which are closely related. The various components of the «Char-bagh» garden such as - water, plants, architecture and design decisions are unifying by "Solidity" concept (a principle upon which all Islamic art, architecture and garden design is based). This concept serves as a basis for a harmonious composition creation, giving a special contemplative character to the garden. Precise geometric pattern of the main plan at the designing of traditional «Char-bagh» garden has a fundamental importance. There should not be winding roads, and to achieve the species diversity the elements of nature plasticity in the form of leaves of plants and flowers are served.

III. LITERATURE SURVEY

The solidity is revealed through formation and harmony between the geometrical design (pattern) and planting, water basins and architecture. To fulfill this, a design of this garden, as in the period of greatest prosperity of garden art and architecture of the Eastern Renaissance - Timurids Renaissance (XIV-XVI), it has to be implemented a concept of a symmetry, balance, harmony and proportion. *"According to the Al-Kandi, Al-Farabi and Avicenna, (IV-X centuries), organized proportional system in eurhythmy and conformity of parts and the whole, the similarity of figures, balance of mass, all these were most closely related to the concept of harmony."*² Harmony in Middle Ages architecture, including gardening is symmetrical, centered composition and it's equal balance, a collateral subordination of the whole and all elements. It can be achieved by an allocation of the main axis of "Char-bug" composition and proportional partition of the territory, using repeating module, possibly through a «dynamic square», forming square or rectangular areas of "Char-chamans" for green plantings, reservoirs, paths, alleys. The central pool or a fountain with four water channels, going from the center to the walls perimeter can be as an initial basis of a garden lay-out.

IV. METHODOLOGY

Defining the garden sizes, it is necessary primarily to consider square or rectangular areas with a ratio of 1,0x1,0; 200x200; 100x150; 100x200; 100x250; 300x300; 1,5 or 2,5. And with a long and narrow section of the garden (such as a residential house or office: 10.0 x 20.0 m), to achieve well-proportioned garden it is necessary to divide a garden into three equal sections, according to a proportional rectangle. Large gardens with sizes 1000x1000, 1000h1500; 1000h2000m may consist of a stylistically and composition unified, with the above mentioned parameters. Mystery - the effect of unexpected disclosure - the garden lay-out, like a house in an Islamic style or mosque, has the typical line - the darken entry elements with the curved axis, protecting private quarters and indwellers life from prying eyes. At the inside entrance, the visitor has a feeling of an anticipation which leads him to the flowing light and a garden beauty, suddenly opens to him. The use of an unexpected disclosure effect increases the emotional impact of a garden. Garden surrounding with walls provides protection and solitude of indwellers from the outside world. Therefore the traditional «Char - bagh» garden is to be considered hidden, mysterious, as «a paradise garden», called «Jannat al-Firdaus», mentioned in the Qur'an (VII century d.c.) which was a symbolical example for Middle Ages gardeners.

Bases of «Char - bagh» landscaping, where the central place is for water, shades and contemplation, were formed referring to the mentioned in the Qur'an grasses and flowers, of the botanists list - Ibn Vafid (1075), Ibn Bassala (1080), Ibn al-Abbala (1180), a father of the Arabian botany Abu Hanif al Dinavari (820-895) Ibn al-Baytar (1248), and as it was written in «Irshad-az Zir'a» - the agricultural treatise in Herat (1515-1516). The analysis of the above-stated sources and remained parks give us the ground to recommend the following principle of green landscaping where traditional «Char - bagh» gardens, except those which were part of the mausoleum-tombs, consisted both - fruit and decorative trees.

Fruit-bearing trees: apricot (*Prunus armenica*), plum (*Prunus domestical*), cherry (*Prunus cerasus*), prunes (*Prunus damascend*), apple-quince (*Chaenomeles*), pear (*Prunus communis*), apple (*Mahus app*), walnut (*Mespilus germanica*), mulberry (*Fugkas regia*), peach (*Prunus persica*), pistachio (*Pistacia vera*), persimmon, pomegranate (*Punica granata*). For many centuries their new breeding varieties have been bred. Citron trees - a lemon, tangerine and grapefruit are essential components of «Char - bagh» traditional garden. However, in cool climate areas of Uzbekistan they grow only

in containers that in the winter they could be transferred to warm premises? including orange tree (*Citrus sinensis*). But the orange kind - "kalomandin" (*Calamondin Citrus fortunetta microcord*) endures cold up to -7°C .

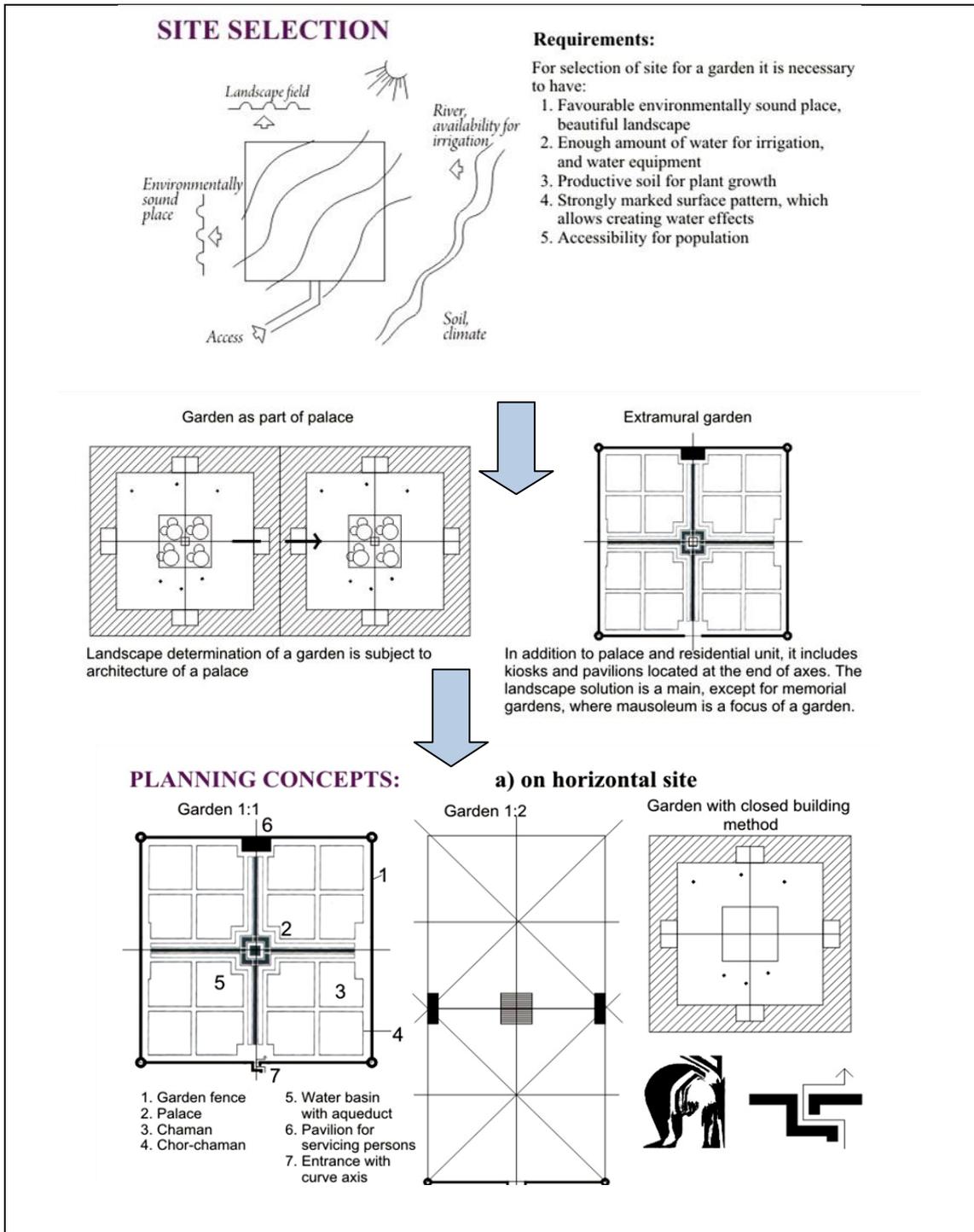


Fig. 1 planning organization of «Char-bagh» garden



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Ornamental trees - the most common and is often shown in miniatures oriental plane tree (*Platanus orientalis*), cypress (*Cupressus sempervirens*), poplar (*Populus alla*), white poplar-Safidori Samarkandi, red maple (*Acerrubrum*), as well as lenkoran acacia. If plane trees make an excellent shade, and maple trees create gorgeous dark color in the autumn, the cypress, with its stature, gives rest to an eye and pleasure to a soul. Cypress should be planted so as to have enough space and its relevance was felt, with the desired impression of elegance, harmony and nobleness. Cypress alleys emphasize the strict planning of the garden, along with flowing water channels; create the spirit of the «Char-bagh» garden. Juniper (*Juniperus comminis* or *Puramidalis*) and symmetrical cedar (*Jucense*). These evergreen, columnar, coniferous trees, with properly way of planting, cut and watering will be well integrated with the "Char-bug." Planted cypress trees, in contrast with sweeping, thin branches of rose-colored almond or a silver blossoming pear, will symbolize life and hope. Enduring trees are ash (*Fraxihus excelsior*), holm oak (*Quercus ilex*), cork oak (*Quercus guber*), elm (*specis ulmus*). Coniferous species - umbrella pine (*Pinus pinca*). (Fig. 2).

Ornamental shrubs can be planted in the form of a fence, increasing together with the water channel geometry of a garden lay-out and its symmetry. Oleander (*nerium oleander*), dark - red hibiscus (*Hibiscus rosa*), Plumbago (*Pleumbago auri-culata*), Gardenia (*Gardenia jasminoides*) - all these shrubs can create an atmosphere of oriental flavor. Persian lilac (bead tree) or Chinese berry (*Me-lia azedarach*) - this is a big shrub that loves the sunshine, it blossoms with scented star-shaped pale lilac flowers in the spring. Lavender (*Convolvulus cneorim*) with white in the center yellow flowers and cotton lavender (*Santolina cbamoec yparissus tencriump uticfns*) with blue flowers, which blossom throughout the summer are very popular. Other useful types of shrubs, emphasizing the symmetry and geometry are Juniper (*Buxus sempervirens*), Spindle tree (*Euonymus* or *buonymus jononicus Vacrophullus*) and fragrant bay tree (*Lourus nobilis*). Simple fence can vary with Yew (*Taxus baccata*) or Privet (*Ligustrum*), which leaves get reddish in the autumn. Just as in «Char - bagh» traditional garden there should not be statues of people and animals and the topiary should be limited to the creation of geometric patterns or shapes. (Fig. 2)

Flowers and grass. As the concept of "Char-bag" garden comes from the contraposition to the extreme outdoor environments, the oasis idea for having rest and relaxation in coolness and green shade with noise of the flowing water, inclusion of «a wild garden» is completely extraneous to the concept of "Char-bag" gardening. Therefore desert plants, such as Cactus (*kaktus*), Opuntia (*opuntia*), Agave (*agave*) and other plants with thorns and prickles, will be hardly fitted in. (Fig. 2).

In traditional Central Asian «Char-bagh» gardens flowers were selected considering blossoming continuity: some faded, others began to bloom. This is why, selecting them it is important to know the periods of their growth and blossoming.

In hot climatic conditions of Uzbekistan, with the scorching sunshine, the summer for gardening, except for rare types of flowers, is the "sleepy period" whereas the spring and autumn is the long flowering period with a huge variety of types: roses, tulips, carnations, hyacinths, jasmine, narcissuses, violets, acacia copiousness, anemone, lilies, iris, poppy, camomiles, oleander, rosemary (*Rosmarinus offieinalis fuscan blue*), lavender (*lavandula*). Widespread of herbs: mint, basil, marjoram, thyme and saffron, wallflowers (*chberantbus*, Khairy in Arabic), delphinium (*Delphinium elatum*), sweet peas, violet flower (*Latburus odaratus*).

The love for flowers was expressed in architecture of a garden itself. Flowers were displayed in the form of floral ornament "islimi" or "rumi" which balanced geometrical forms, served one of the harmonization means of greens, architecture and garden pavilions.

E.Clark notes: «*The floral ornament in Islamic art expresses the nature not in a specific form of realism, without identifying on a concrete type of a plant or flower, but avoiding naturalism, embraces a fragrant essence*».²

Medieval poets considered a violet as a personification of sheepish manner, poppy – a symbol of eternal life, narcissus – expression of longing, cypress – eternity, clover – the veil of God's favor, rose –unfaithfulness, and hibiscus which is blossoming in a warm climate all year through – constancy. (Fig. 2)

²E. Clark "The Art of the Islamic Garden" / transl. from English. - M.: "Niola Press". -2008. 208c.



Fig. 2 Symbolical aspects of floral composition

Planting. As it was noted before, there are two the most important elements in "Char-bug" garden-water and strict geometric layout plan. However, the last one should not be unduly extended to planting. Otherwise the garden



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will look over-organized. Without assigning a task of exact copying of an ancient "Char-bagh" style planting, we must strive to repeat its atmosphere of contemplation, calmness, concentration on beauty of the nature.

Differences in temperature and humidity conditions in the area at change of height of some regions of Uzbekistan will affect the selection and planting of the vegetation variety. So, in some south regions of the republic (Termez, Surkhandarya) if the garden is focused on the southeast and it is closed from the cold north winds, there is a chance to grow some thermophilic shrubs and trees without their moving into a house for a winter. By trial and making mistakes it is possible to define the optimal conditions for the growth of various plants.

Pathways. In a traditional "Char-bagh" garden straightforward paths together with channels are part of the order and geometry of the plan, providing quaternary lay out. On a classical traditional canon, curved and an organic form of paths are not usual for "Char-bagh" gardens. For paths paving, it is preferred to be used stones, burned bricks, cobble-stones, terracotta or ceramic tiles laid in a geometrical pattern. The use of modern materials is also possible if it's imitated by brick, terracotta color laid in the same geometric patterns. It is necessary to focus on three main conditions: first, the material should not contradict surrounding architecture; secondly - the use of natural materials is preferable; thirdly – materials with its geometrical pattern should be artly coordinated to a structural landscape of a garden.

From the design point of view the use of only two or three firm materials and not a big number of small details, will correspond to the right order and beauty of "Char-bagh" traditional garden.

Natural materials are more practical and have ancient quaveringly inspiring aura. Over time the stone, terracotta, cobble-stone get a nice patina. The skill of the handicraftsman who has put in the work spirituality, serves a refinement of a materia and the whole garden.

Depending on the budget and geometry of the plan, options can be applied: bricks with cobble-stones, bricks with marmorates of one or two colors, natural block-stones.

The concept of water devices. Without doubt, water – the most important element of the traditional "Char-bagh" garden, both in practical, and symbolical aspect. Flowing water can improve a microclimate-air is purer and cooler, and the sound of water in the fountains, cascades and channel rapids, calms the mind (Fig. 3, 4):

In hot conditions, in Uzbekistan, water basins and fountains were and remain an indicator of level of culture. Except the practical necessity, beauty and mystery, symbolical value of water in hot climate conditions got the meaning of the Supreme Being gift, as means of physical and spiritual purification. The most effective form of an irrigation is the straightway channels which have not been surrounded with plantings. Each "Char-bagh" garden breaks symmetrically around a central pool; four auxiliary channels (ditches) take water in each quarter of a garden, and then to each tree. At the fountain installation it is necessary to provide a water pressure so it is always overflowing. Water use outside the garden context as means of demonstration of technical achievements (rapid streams of falls, fountains, creating a turbulent sight) is not relevant.

As it is in Shalimar garden in the city of Lahore, it is necessary to achieve balance between rest and water movement on the one hand, the harmony between water, architecture and a landscape on the other. The secret of "Char-bagh" garden beauty is not only the water, but also a fact that the pools, as well as garden houses must have a «human scale», reserved design (for example: low carved white marble pool $d=1.5-2.0$ m). With softly streaming and bubbly wave water strikes from a lotus bud in the fountain center, creating calming sounds.

The shape of a pool depends on garden design, its size and location, and it should be based on the oriented straight lines, to have correct (twelve - eight - tetrahedral or round) outlines. During the fountain installation it is necessary to consider its orientation, where will pump and water basin take place and how water of the pool will be used for the further use (like watering plants, etc.). It is necessary to provide a proper bias for water flowing channels, and basin for runoff water to raise slightly above the ground level.

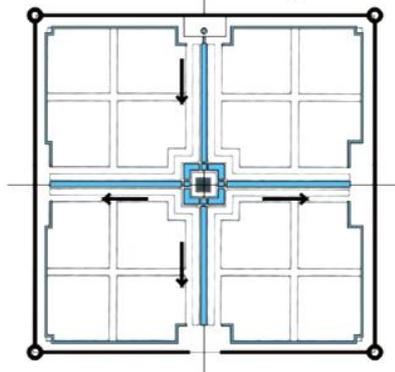
It has been practice the following techniques and devices to transfer water, turning it into streams, drops, bubbles, so that it bickers, wanders and falls forming patterns (Fig. 5):

Chadar – a stone-carved plate with the geometrical patterns, encrusted with marble on which water is falling into the pool where sunlight, reflected in water, complex patterns makes dazzling impression. In terraced gardens each

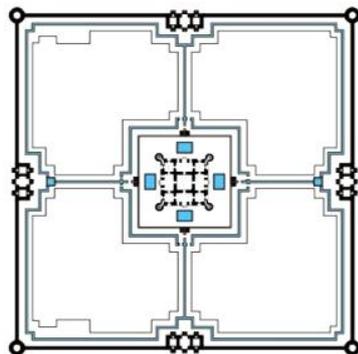
PLANNING CONCEPTS:

a) on horizontal site

Water enters Aramgah pavilion, where from it is distributed over a garden

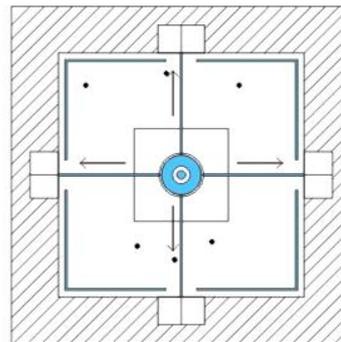


Water organization in memorial garden

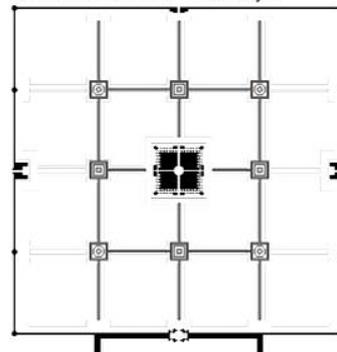


b) Garden with closed building method

Water enters the central pool, where from it is distributed to all 4 sides



Reservoirs in Chor-chamanah may be added to the main waterways



Requirements:

1. The central pool with four channels departing from it, going from the center to perimeter, defines garden sites.
2. Water should have activation – movement – rest – movement and respectively narrowing – expansion – narrowing of water channels.
3. Square, rectangular, octagonal forms of pools are preferred.
4. On differences of garden relief carved plates of Chadar, Salsbil, Chinni khan are used which murmur, wander and create patterns of falling water.
5. The rough streams of falls creating an uneasy show, and also curvilinear forms of the pool, are inappropriate in Chor-bagh garden.

Fig. 3 The concept of water devices

level can be connected by Chaddars. If there are no natural slopes "shadirvans" can be the alternative - carved plate with a gentle slope;

Salasabil - wall-mounted fountain, where the carved flagstone increases the area under the flowing water, and the evaporation rate of air coming from the built in ventilation shafts;

Chinni - hana – a few small niches cut in rows on the stone plate located behind a waterfall, where at night in each niche candles or oil lamps with the shimmering lights, shining through a veil of falling water, creating a romantic effect.

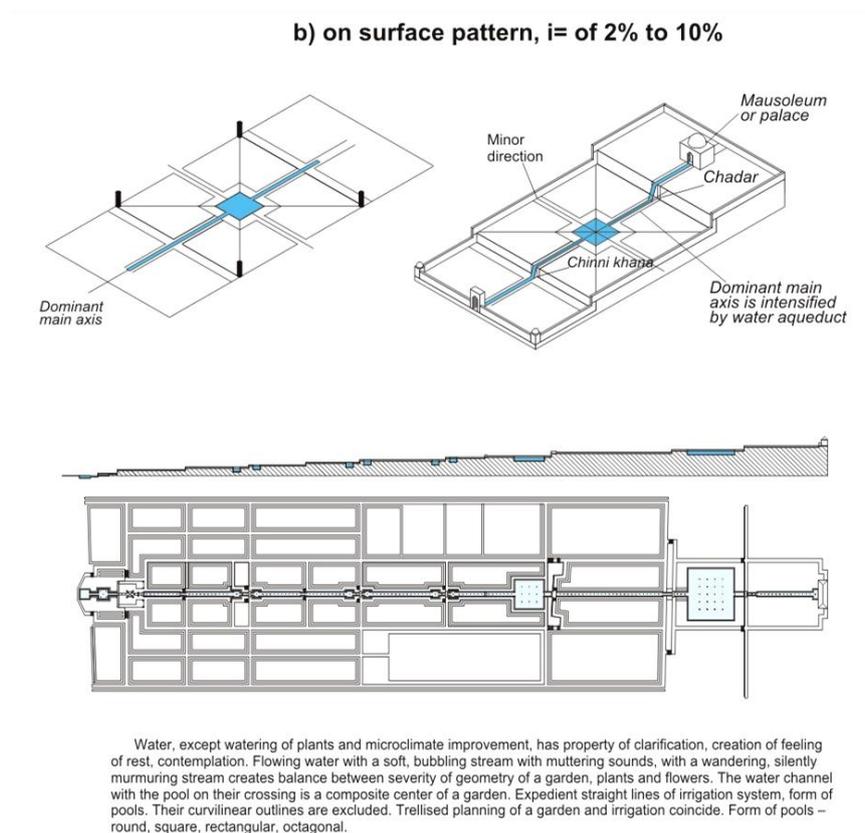
Chabutra-marble platform at the edge or in the center of the pool, it is for the rest or meditation. The one who sits on it has the illusion that he is completely surrounded and floating over water.

VI. CONCLUSION AND FUTURE WORK

«Char - bagh» gardens revival in landscape architecture of Central Asia will help to restoration of regional stereotypes of architecture with which our ancestors - the Timurids have made a great contribution to the world of landscape and gardening art.

The art of building Chor-Bagh gardens and Hiaban boulevards is a value in itself, because it contains a symbolic meaning, linking the function of the garden and its spiritual content. Therefore, the introduction of Chor-Bag Gardens and Hiaban Boulevards into the practice of modern landscape architecture can be characterized as a revival of the invaluable historical heritage of the peoples of all of Central Asia.

The reviving Chor-Bag gardens, Hiaban boulevards and their ensembles can include intensive gardens of agricultural farms, which will undoubtedly improve the ecology, more efficient use of valuable irrigated land and water resources of the Republic, will facilitate the export of competitive products and the development of rural farms.

**Fig. 4 The concept of water devices**

**Fig. 5 Types of water devices****REFERENCES**

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AUTHOR'S BIOGRAPY

1983- was born in the family of architects in Samarkand, Uzbekistan.
1990- 2000 studied at state secondary school - gymnasium #45, and finished it with honor diploma.
2000-2005 - Student of Architectural faculty of Samarkand State Architectural and Civil Engineering Institute.
2005-2007 - Master student in Landscape architecture direction of Samarkand State Architectural and Civil Engineering Institute.
2005-2009 - Architect in Bureau of Architecture "Sharqevoproekti", Samarkand.
2009-2012 - the trainee researcher of the department "Theory and history of architecture" of Samarkand State Architectural and Civil Engineering Institute.
2012-2018. - Assistant of the Department of "Theory and history of architecture" Samarkand State Architectural and Civil Engineering Institute.
2015-2018 - Independent doctoral candidate (Ph.D) of the Department of " Theory and History of Architecture" Samarkand State Architectural and Civil Engineering Institute.
2018 - nowadays - Associate Professor of Samarkand State Architectural and Construction Institute, Department of Architecture, Department of "History and Theory of Architecture".