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The Interpretative Analysis of the “Garden” in the Matrakî’s Miniature of “Dargazine Gardens”

Azita Belali Oskoui*¹, Roya Mahmoodi²

1. Associate Professor at Department of Architecture and Urban Planning, Tabriz Islamic Art University, Iran.

2. Master of Islamic Architecture, Department of Architecture and Urban Planning, Tabriz Islamic Art University, Iran.

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Abstract

Problem Statement: The revitalization of the “garden” as a symbol of a permanent relationship with nature, requires recognition of the Persian Garden’s geometry. The people who have previously experienced the garden with its main function, have drawn pictures of the garden, and the investigation of their works can give us a complete perception of the garden’s geometry.

Purpose of the study: The current study aimed at explain the geometry of the “Dargazine gardens” in Matrakî’s miniature. Obviously, the provision of this geometry does not necessarily mean the use of the same geometry in the present setting in the same form, and it is only the indication of a part of the human-nature relationship’s history. Hopefully, this path would continue with the aid of the past people’s efforts and experiences.

Research Methodology: The present study employed the historical interpretation method with exploratory approach. This study seeks to answer this question “what are the features of the garden’s geometry in the time and place in which the miniature has been drawn?”.

Conclusion: The information of the miniature was retrieved in two levels. The cultivation system, the irrigation and fair division of land, architectural components of buildings, and the geographical orientation and slope can be perceived by the first glance. However, the measures adopted for the welfare, comfort, and security can be obtained through further analysis of the placement of the neighborhoods, the entrance gates gates, planning of different trees, and the water passage and supply forms.

Keywords: *Geometry, Persian Garden, Matrakî miniature, Dargazine.*

Introduction and the Statement of Problem

The garden has not played an active

role in the contemporary man’s life since the Qajar era due to the “failure in the generation of new concepts and non-conformity of its values with the context” (Sheybani & Hashemi Zadegan, 2017, 10).

* Corresponding author: +989144175006
a.oskoyi@tabriziau.ac.ir

The contemporary life's proportionate gardens have been used in the form of the home gardens, healing gardens, shared garden-parks, and the public gardens in the city to bring the nature to the contemporary man's life, again (Shahcheraghi & Islami, 2010, 44 & 52).

For revitalization of this phenomenon, which is proportionate to the Iranian culture and climate, comprehensive studies on the garden's structural geometry are needed. The geometry is the "essence" and "spirit" of any architecture and its perception would make understanding the various types of architectural bodes easier (Hojjat & Maleki, 2013, 6). The current study has sought to answer the question: "what have the features of a garden at the time and place of drawing of the miniature been?", and aimed at identifying and perceiving the dominant geometry of the historical gardens of Iran, to provide it for the architectures and landscape designers. It should be noted that perception of the geometry of any kind of architecture would lead to a successful designing of that type. In addition to the validity of the human imagination, the miniatures drawn in Matrakî's book contain real and valuable information on the architecture and urbanism, from the viewpoint of many researchers¹. The Persian Garden have been shown in the Matrakî's miniatures in two occasions. One is the royal garden of the Tabriz's Sahib-ol-Amr Square, and the other is the "Dargazine's gardens". The Dargazine's gardens depict a space similar to the Chahar Bagh (the four gardens) Kaempfer has shown in his drawings (Kösebay, 1998, 130).

The presence of multiple gardens on the two sides of a path confirms the similarity between these two spaces, one of them located in Isafhan and the other in Dargazine. and the antecedence of this miniature before the time of Chahr Bagh construction in the 11th century AH, reinforces the thought that the Dargazine has been the initial model for building the Chahar Bagh. The irrigation system, land division, the landscapes architecture, the plants cultivation system, and the connecting paths are all obvious in the Dargaznie's gardens and this same subject

paves the way for investigation and perception of its dominant geometry.

Literature Review

In the first step, the similar studies in terms of the objectives and methodology have been investigated. For understanding the miniature, the references that introduced the architecture language in the miniatures were selected.

The data of the Matrakî's miniatures have been extracted from the studies which have been focused on his miniatures.

In order to investigate the miniature's gardens with details, the studies which have evaluated the garden miniatures have been taken into consideration:

References for analysis and understanding of the miniature: Foroutan (2005) in an article entialed "the spatial structure of Persian architecture the cognition of Persian painters", provided the expressive features of the miniature. Also, Foroutan (2010) in An article entitled "architectural language of Persian paintings (Survey of Persian paintings as historical documents of Iranian Islamic architecture)", names the features of the Islamic Iranian miniature in the architectural expression. And Heydarkhani (2015) in An article entitled "scientific report: in the position of historical resource" has expressed the method for the use and understanding of the miniature.

The Analysis of the Matrakî's Miniatures for Obtaining the Truths of Architecture and Urbanism: Jafare & Balilan Asl (2015) in An article entitled "historical reconstruction of Khoy in the Safavid period, according to the Matrakî miniature from the perspective of explorers", has validated the Matrakî's miniatures of Khoy City by the use of the travelers's travelogues in early Safavid era. Hanachi & Nejad Ebrahimi (2006) in An article entitled "reviewing Sahib Abad square on the basis of the Chardin's and Matrakî's pictures and of the historic documents" have reviewed the Sahib Abad Square by the use of Matrakî and Chardin's paintings. Bani Masoud (2007) in an article named

“reconstructing the map of Bagh Shomal in Tabriz, according to historical documents of Qajar period” has used Matrakî’s miniature as an instrument for the restoration of the Bagh Shomal’s map.

The analysis and use of garden miniatures in the past studies: in the current study, due to the more comprehensive access to the analytical studies on the Iranian miniatures and the similarity of the Ottoman’s miniature language to the Iranian miniature of that era, the references introducing the language of Iranian miniature were used; what Farrokhfar, Khazaei & Hatam (2012) confirm in An article entitled “Ottoman Painting Approach to Achievements of Iranian Art: A Comparative Study Between Persian & Ottoman Paintings, First Half of 16th Century”. Teimouri Gorde & Heidar Nattaj (2014) in An article entitled “Nazargah”, consider the use of the perspective to be the Iranian miniaturist’s method for depicting the garden. Accordingly, they consider the landscape to be the most important depicted element among the Persian Garden’s elements in the miniatures. Maleki (2007) in An article entitled “Persian Gardens in Iranian miniatures” believes that the Persian Garden includes four elements as the water, building, decoration, and the lighting. Goudarzi & Halimi (2006) in an article named “a research about nature in the Iranian miniatures” categorize the nature elements under the two categories of the sky and the earth. In An article entitled “evolution of the landscape in the Iranian miniature”, Keyvani (2003-2004) names the trees, flowers, hills and rocks, water, and the clouds as the constituent elements of the landscape. Shah Hoseini (2010) in his article named “hiking in the nature in Iranian miniature” expresses the features of the nature depicted in the Iranian paintings with the nature background. In An article entitled “landscapes and panoramas in miniature”, Heydari, Moein-Al-din & Assar Kashani (2010) have investigated the various reasons behind the failure of the West in understanding the Iranian miniature. The garden analyzed in the current study, due to depicting the general aspects of the garden as well

as its details and its relationship with the other gardens, is comprehensive and novel. What adds to the importance of investigation of this miniature is the low number of studies in terms of the gardens in the cold climate of Iran.

Theoretical Foundations

In this chapter the Hamedan Dargazine’s garden miniature has been extracted, by the use of the introduced references in the review of the related literature and the other sources, the correct method for analyzing the garden miniatures, and to be precise. the city of Dargazine (due to not being a city at the present time) was introduced by the use of historical sources.

The Correct Understanding and Analysis of the Miniatures

The miniaturists have drawn the world in a proper and idealistic from (Foroutan, 2005, 73). In the miniature, the space is shown to the viewer from the top view. The image is drawn from the opposite, or simultaneously from the opposite and top, and sometimes, different times and places are set beside each other. The scope of view cannot be isolated to represent all that the artist wants to show (ibid, 77). of the features of the Iranian miniature are the equal importance of the floor and wall, the observance of the ration of details to the whole, compacting the space through reducing the distances, depicting the main components and some subsidiary components, and the use of the part Figure to represent the whole (Foroutan, 2010, 141). in order to examine the miniatures, paying attention to the texts on the miniature’s margin can be helpful. The architecture and miniature are both a kind of manipulation of the world. The miniaturist who depicts the architecture, represents the architect through another manipulation. The consideration for these successive manipulations are needed for understanding of the miniature. The restrictive rules of the architect and miniaturist are different and they should be considered in miniature-based analysis

of the architecture (Heydarkhani, 2015, 158). The investigation of the miniatures of the first half of the tenth century AH shows the high similarity between the Iranian and Ottoman miniature, which is due to modeling of the Iranian miniatures by the Ottoman court and the immigration of the Iranian artists to Istanbul (Farrokhfar et al., 2012, 19). Matrakî was educated in the Bayazid II's court during the childhood and adolescence (Matrakî, 2000, 14). his encounter with the Iranian miniatures in the Ottoman court is not unlikely. By recognition of the painter's working method, and the extent of his realism in some of his miniatures, his style can be understood and generalized to his other works (Heydarkhani, 2015, 159).

Analysis of the Garden Miniatures

In most of the garden miniatures, the miniaturist draws what is more important to him and his audience, with more details and precision (Teimouri Gorde & Heidar Nattaj, 2014, 17). In Iranian painting, nothing has priority over other things. All the elements such as the mountain, cloud, tree, and human have equal value. The Iranian painter shows all that exists in the world in his painting, to depict a subject (Shah Hoseini, 2010, 125).

• Matrakî's Miniature and Dargazine's Garden Miniature

Nasuh Al-Matrankî came from a Bosnian family. His father or grandfather was called to serve the government. He was a mathematician, historian, geographer, surveyor, a famous knight, calligrapher and engineer, thinker, writer, artist with a special style for illustrating cities, and a theorist. He has written some books in these fields (Ayduz, 2009, 1) besides providing a report of this campaign, He was one of the companions of Sultan Suleiman in his expedition to Iran. He, has mostly drawn the cities and villages on the path of the Ottoman campaign, and has recorded them in his book "the villages and cities in Suleiman Khan Arafîn trip" (Matrakî, 2000, 9). He, in this book, has drawn the maps with the least lines and in his other two

books, "the conquer of Shagheloos, Strugum, and Stalingrad" has used the same style (Ayduz, 2009, 4). Among his miniatures, which are also considered as geographical maps due to the high precision, the two gardens of Dargazine and "Sahib-ol-Amr" can be seen. The Dargazine gardens are some gardens with ordered geometric divisions. The mansion in each garden is located almost in the middle of it, opposite to the garden. Water passes through all the gardens. The way of planting the trees and flowers is the same which is indicative of a similar agricultural system in all gardens.

• Hamedan's Dargazine

Dargazine is located in Hamedan, in the Rezan region. It is enclosed by the Kharghan Mounts on the north, to Pishkhor Village on the east, Hajiloo village on the south, and Sardrood village on the west. Its height is 1830 meters and most of its lands are flat. The livestock, grains, and fruits, especially grapes, are major products of this village. "Zeinolabedin Shirwani" in 13th century AH, has introduced Dargazine as a prosperous place with a pure water that comes from Qanat. A town which has been once a city and has become abandoned over time. Hamdollah Mostofi also in the 8th century AH, has introduced Dargazine an elevated city with many gardens and products such as the grains, cotton, and grapes. "Olia Chalabi" knows the founder of Dargazine to be Yazdgerd and believes that it has been prosperous in the 11th century AH. However, he has visited the city in the 11th century AH. the Mansion of Dargazine that is attributed to the Sassanid according to the local narrations, has been actually reconstructed in the Sassanid era and it dates back to the Parthian Dynasty. if we assume that it has been prosperous in the 8th century AH, the reason can be its the military importance and being located on the Sultanieh-Isfahan road (Azkaei, 2012, 3-24). Matrakî, in the Sultan Suleiman's invasion of Iran, has passed through this city twice, and during this time, he has drawn three images of this city. Two of the images belong to the city and one belongs to city's gardens. in all three

miniatures, the flourishing of this cold region city is highlighted.

Methodology

The present study employed the historical interpretation method with exploratory approach. The historical document of the garden's painting has been analyzed after understanding the expression language of the garden miniatures and Matrakî's miniatures, based on the written documents of the place and time of the miniature. The garden is a phenomenon obtained from a combination of the natural system and the man-made systems (Shahcheraghi & Islami, 2010, 44). For reviewing this miniature, the geometry of the gardens in the drawn miniature has been analyzed, and it has been compared with the information obtained about the Dargazine's history and analysis of the garden miniatures.

Findings

• The Geometry of the Vision and the Landscape

The relationship between the viewer and the

landscape is expressed in a visional form through the geometry of the vision. In the garden miniatures, two kinds of perspectives are depicted. One is a vision of a garden in the background from inside the mansion, and the other is the combination of the garden with the mansion building or the nature outside the garden (Teimouri Gorde & Heidar Nattaj, 2014, 18). The landscape of this miniature is of the second type. In this miniature, two doors in each garden can be seen. The presumptive line between these two is along the water path. The mansions, stands, and porches are also along this line. The commute along this line has created the main axis of movement. On this line, the two elements of the landscape (water and the mansion) make the viewer move and stop, respectively (Fig. 1).

The second wall in the two gardens is not visible. By accepting this rule that the mansion is placed on the presumptive line between the two gardens, the line between the first door and the mansion can be extended to estimate the final border of the gardens. Or through cutting this line and the path between the gardens, the location of the second door can be guessed (Fig. 2).

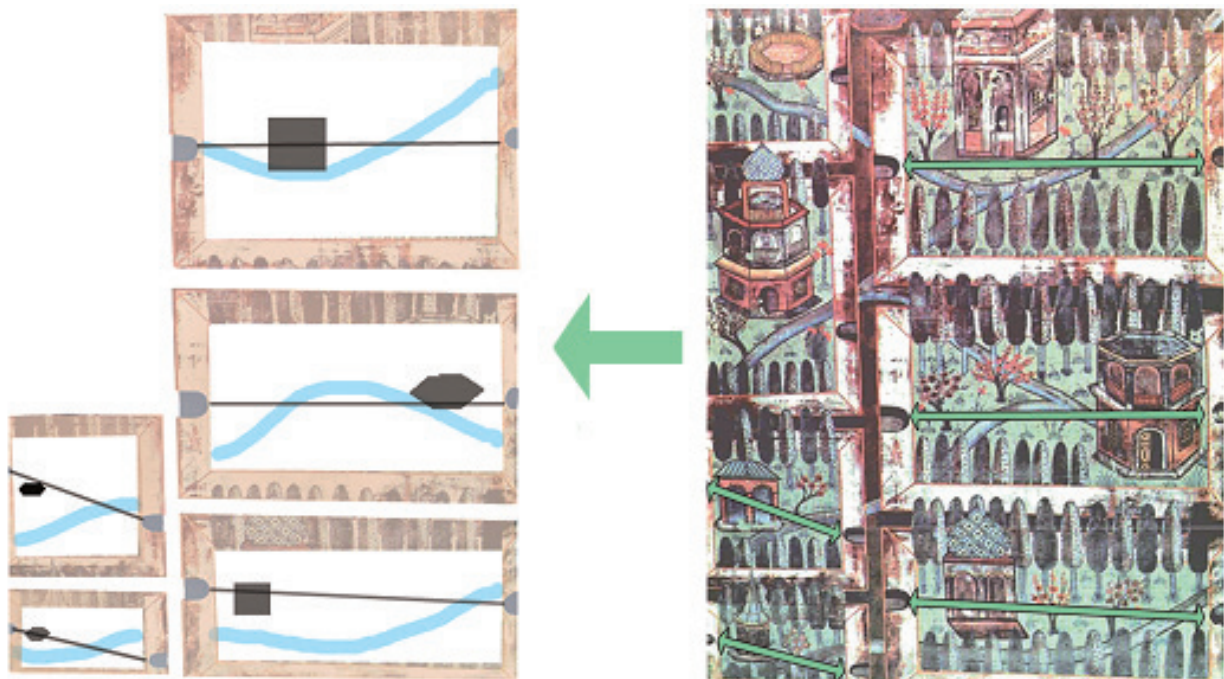


Fig. 1. the conformity of the presumptive line between the two gardens with the move-stop pattern. Source: Authors.

The common feature of the garden miniatures is showing the best vision and landscape of the garden. Therefore, elements such as the porch, summerhouse, and tent have become the most important elements of the miniature (*ibid*, 18). In the Miniature drawn by Matrakî, different types of landscapes from stands to the porches, and multi-story summerhouses have been drawn with high precision. The roof canals, Gutters, the frames of the windows and doors, the floor Paving, and even the bumps of the tents structure can be seen (*Table 1*). The pillar space pattern in front of the summerhouse in the Persian Gardens of the Achaemenid Era with the stone pillars until the Safavid era with wooden pillars and after that, in Zandieh era Qajar era can be identified in the double-pillar porches (*Alemi, 2008, 107*). The depiction of the pillared porches in the first floor of the one-story summerhouses and the second floor of the two-story summerhouses confirms the importance of the vision in the garden (*Table 1*). In the process of landscape design, the architectures have done their best to increase the vision of the surrounding. The octagonal plans have provided different perspectives in all directions of the garden. The building-s in the miniature are highly diverse. Accordingly, the roof covers of these buildings are also diverse. The three types of roofs as flat, dome, and pitched can be seen in the miniature.

Likewise, the spaces are also diverse. We have, from the open space under the sunlight to the open space in the shadow, and semi-open and covered spaces in the summerhouses (*see Table 1*).

Currently, the architectural monuments remained from the 8th century AH in Dargazine are the Azhar and Hood shrines (*Azkaei, 2012, 4*), which also existed at the time of 22-year wars between Iran and Ottoman in the 10th century AH. Investigation of these shrines would provide us with information about the building methods and the materials used in this geographical region. The similarity of the Azhar shrine building with the miniature's landscapes can be sought in the common stone foundations to the ground surface and Brick walls (Imamzadeh Azhar-Bin-Ali, n.d.). The remnants of mosaic and a turquoise bastion in the Hood shrine besides the brick walls shows the similarity of this building to what is depicted in the miniatures (*Mo'arefi-ye Imamzadeh Hood-e Razan, 2015*).

• The Land Ownership Geometry

The division of the land and the water between the gardens can be clearly seen in the miniature. For explaining the land ownership geometry, the three elements as the connecting roads, the wall, and the green trees have been used. In the margin of each garden, the cedar trees are planted and then a wall is built around the trees (*Fig. 3*).

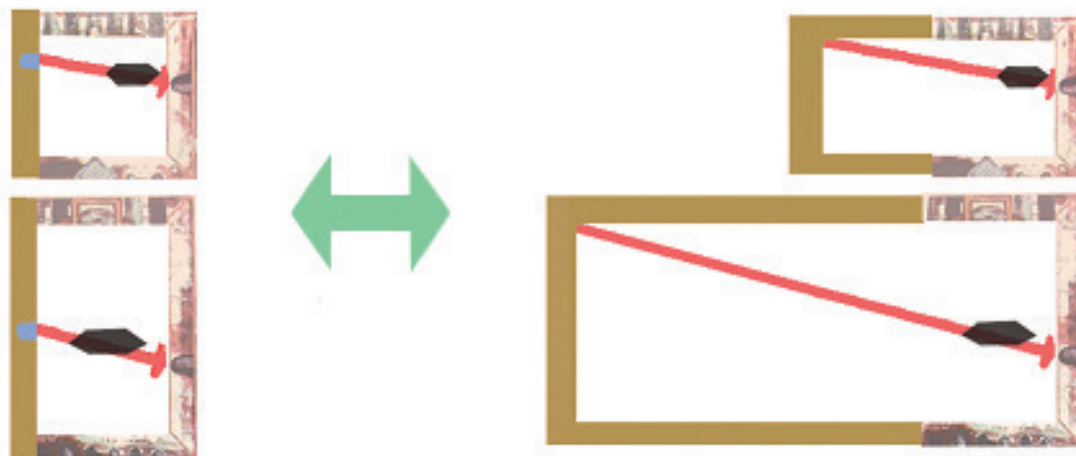











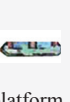

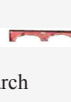
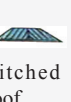


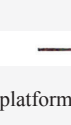

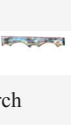
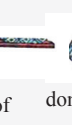
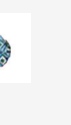





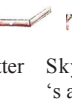
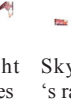
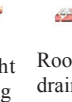
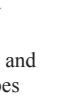

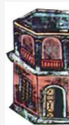






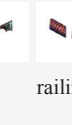

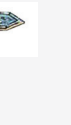









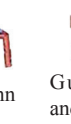


Fig. 2. guessing the location of the second door and the biggest size for the two gardens. Source: Authors.

Table 1. the details extracted from the landscapes. Source: Authors.

Landscape type	Architectural details									
platform										
	platform	Floor work	railing							
tent										
	platform	Main pole	Lateral poles	Connection of the poles to the structure 's cover						
porch										
	platform	column	arch	Pitched roof						
										
	pond	platform	column	arch	roof	dome				
Single storey mansion										
	platform	arch	walls	Door and window	gutter	Skylight 's arches	Skylight 's railing	Roof and drainpipes		
two storey mansion										
	platform	arch	Door and window frame	Door and window	gutter	column	arch	railing	roof	
three storey mansion										
	platform	arch	Door and window	gutter	OKB	arch	railing	gutter	column	Guardrail and arch
									dome	

The connecting paths along with the trees and walls, are located behind the wall. The avoidance of the locating two different Gardens' doors in front of each other has stabilized the psychological ownership of each garden. The left door in each garden has a view of connecting roads between the gardens. The feeling of supervision of the road brings special security and peace to the alleys (Fig. 4).

• Geometry of Irrigation

The water in garden has been used for leisure and production. In the miniature, the water passes through the gardens, and due to being located a way from cedar' trees shadow, there is the possibility that they grow flowers and fruits. The depicted water flow in different directions shows the slopes of the ground in these directions. The main and general flow of water is from top to the bottom in the

miniature. Thus, the farther gardens are located in higher points (Fig. 5). The main axis of water in the Fath Abad Garden of Tabriz which is located in a cold climate, and is a complete example of the Persian Garden, unlike the hot and dry climate gardens, does not enter the main summerhouse and rounds

it, to flows into a pool behind the building (Kabir Saber, 2008, 50). It also happens in the gardens and the water, without entering the summerhouse, flows in front of it. Except for one occasion (the middle garden on the right) which seems that water enters the summerhouse, flows, and exits from the other

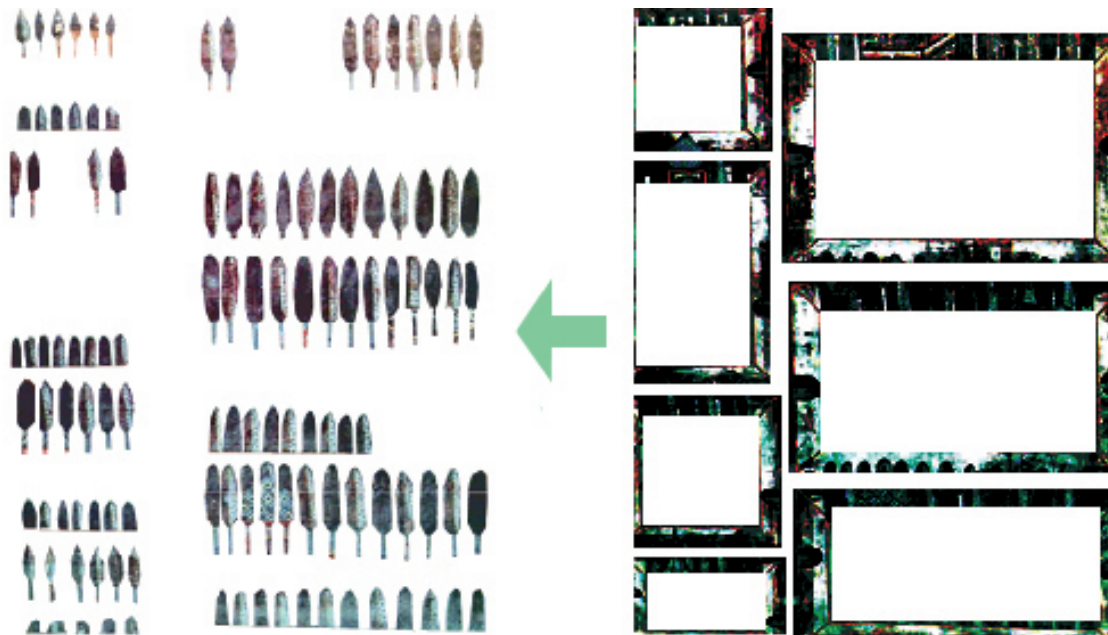


Fig. 3. the geometry of the borders of gardens with cedar walls and trees. Source: Authors.

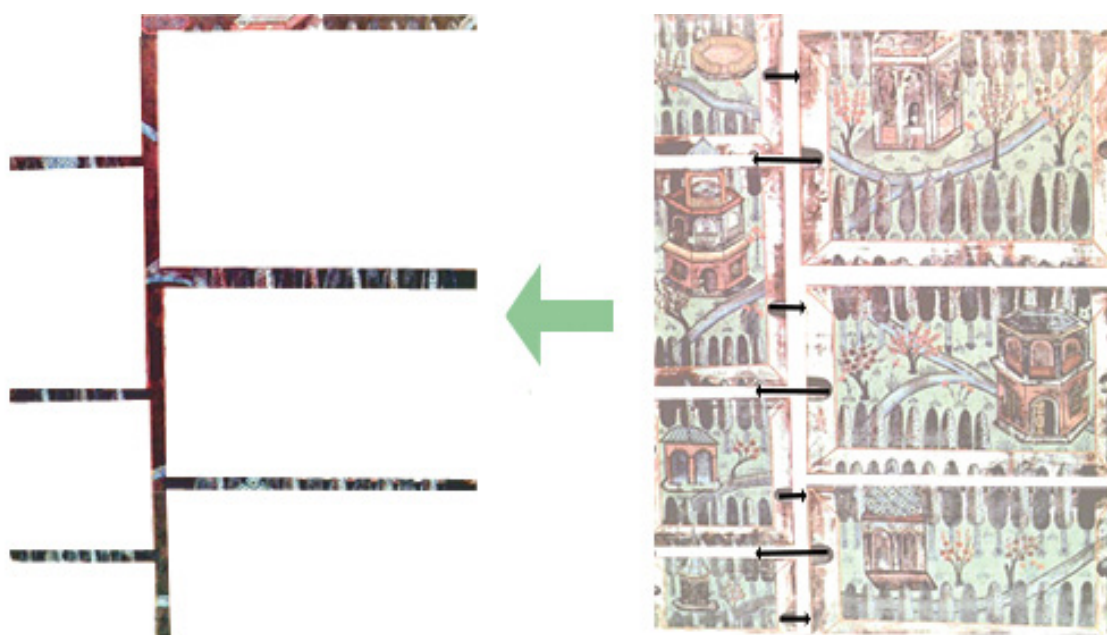


Fig. 4. the land geometry of each garden and the connecting paths. Source: Authors.

end. This summerhouse is located on the first floor in a fully covered space, and this enclosed prevents entering of the cold weather.

The location of the landscape opposite the water flow provides the pleasure of mist, coolness, and beauty of the water (Fig. 6). On the top of the miniature, on the connecting path, there is a water supply (Fig. 7), which is not located in the scope of any gardens and raises the doubt that this area is a public area. The water enters this pool with a low flow to be used for agricultural purposes after being being filled. The location of the pool on the top of the miniature increases the possibility that it is stemmed from the foothill.

• The Geometry of Lighting

One of the basic needs for the plants to grow is the light. The fruit trees as the main products of the garden have been planted in the middle of the garden and far from the shadow. To avoid the hot weather in the summer and cold weather in the winter, the simultaneous need for coolness of the shade and the warmth of the light are felt in the garden. The evergreen trees bring the permanent shade and the seasonal trees bring the coolness in

the summer and the warmth in the winter to the garden (Fig. 8). The shadow and the light have been depicted with dark colors on the trees and the building. A light that has lit one side of the tree and shaded the other side, is indicative of the sunrise or the sunset light (Fig. 9). Focusing on the reality, it is revealed that the left and right sides of miniature are the east and west directions. The north direction of the miniature is either the top or the bottom of the miniature. It was previously proven that the top of the miniature is located in a higher elevation compared to the bottom, and the drawn pool on the top of the miniature is the evidence for this claim (see Fig. 7). Therefore, these gardens are located on the slopes, facing the geographical north or south. If the slope is facing the north, the gardens would be deprived of the sunlight and climatically, They cannot be on the slope facing the north. As a result, the north in the miniature is on the top.

• The Use of Dargazine's Gardens

According to what is depicted in the Dargazine's gardens miniature, such as the ordered geometry, the enclosing plants and walls, and elevated landscapes facing the water and plants, this garden

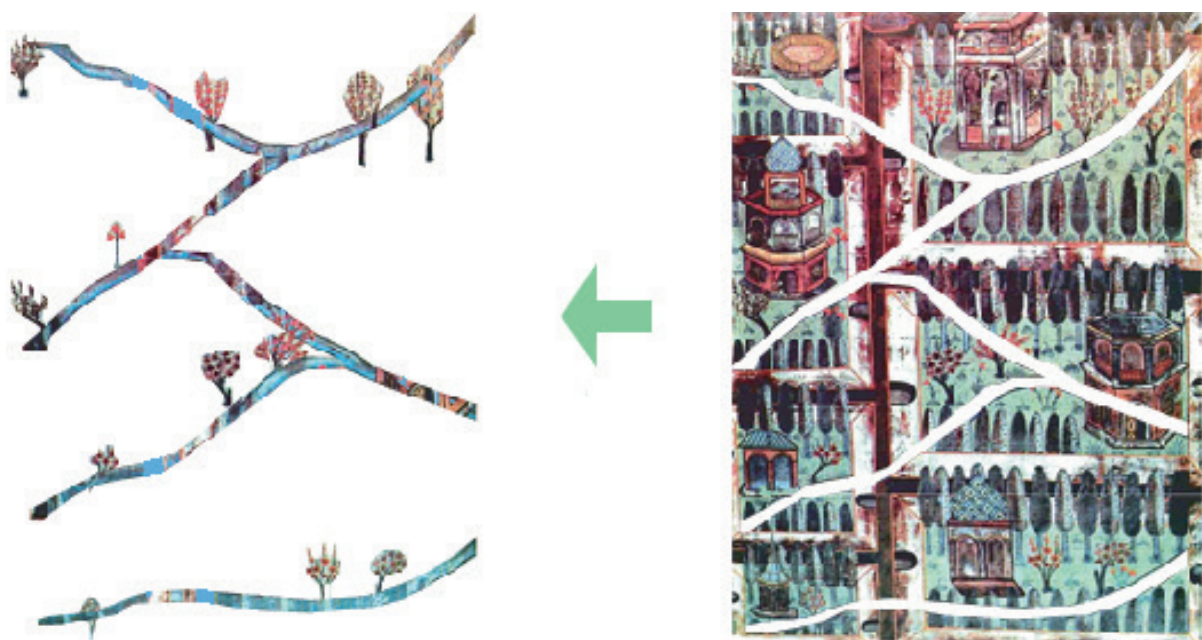


Fig. 5. the geometry of the ownership and division of water for production. Source: Authors.



Fig. 6. the geometry of water ownership for the leisure. Source: Authors.



Fig. 7: the water storage pool. Source: Authors.



Fig. 8. the light and shades of the trees. Source: Authors.



Fig. 9. the intense light on the right and the shade on the west. Source: Authors.

has been used for leisure, and regarding the properties of Dargazine in that era, the presence of leisure gardens is not unlikely.

Discussion and Conclusion

The geometry depicted in the drawn miniature by Nasuh Al-Matrakî contains valuable information about the architecture of the gardens. The trees planting system and the placement and geometry of the landscapes plan, the flow of water on the ground and the water supply sources, the fair division of the water between the gardens, the grid division of the lands and determination of the boundaries between the gardens, and depiction of various landscapes with precise architecture, can be directly understood from the miniature. By investigation of the relationship between the geometry of the architecture components and the geometry of the man-made nature of the garden, information on the relationship between the viewer and the landscape, the slopes direction, the geographical direction, and the irrigation system is obtained.

With further investigation and contemplation of the details and their relationships, the measures taken by the garden builders for creation of the comfort and peace can be understood. Planting the fruit trees near the water supply and with a proper distance, the direction of the sunlight which is vital in this climate, and the use of octagonal plans in the vision for a 360-degree view of the landscapes and following the sunlight during the day as well as the use of compact plans for creation of the least adjacent surface to the cold weather in this climate instead of the gardens with the middle yards, are among the cases of construction of the gardens proportionate to the climate. The use of natural factors such as the slopes for the complicated task of water division and improvement of this task by creation of the waterways and creation of the pools to collect the water, in addition to the use of roads system, and the architectural factors such as the gardens walls and fences besides the planting

of the tall trees on the boundaries to divide the lands and conserve the privacy are among the measures taken for obviation if the interruptions in the use of the common resources and easier use of the private resources. The current study, by investigation of the geometry of the garden from an authentic and very close-to-reality reference, provides the architects and urban planners with highly valuable information for designing the green area proportionate to the climate and culture of the modern life.

Endnote

1. "professor Juradane: Without any exaggerations, miniatures, are drawn based on the realities.

Albert Gabriel: the images can be used as urban maps. In addition to the topographic information, they indicate the type of architecture from the viewpoint of the Ottomans.

Walter Danny: some shrines, especially those located in the large cities, conform to the reality from the topographic and architectural point of view.

Franz Taschner: [this book] is the sole important document of the urban planning in the 16th century AD in the Near East from the topographic and architectural points of view" (Jafare & Balilan Asl, 2015, 37).

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