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Prof. Dr. Ayşe Sirel

Mapping The Evolving Peripheries Of Lahore Through Urban Trajectories


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Abstract: *Lahore presents a unique case regarding its urban evolution and transformation. Various factors have influenced the expansion and growth of the city. A city with population explosion through rural to urban migration and economic growth resulted in a morphological metamorphosis of its urban form and trajectory in its development towards a specific direction. The research focuses on the urban transformation and evolution of Lahore city by mapping the itinerary with the help of road networks identified as peripheries developed during different eras. The paper aims to broadly comprehend, document, and map the urban transformation of Lahore city and the role each identified edge has played in its evolution. It investigates roads and their development with a critical approach, i.e., where there are often viewed as mere modes of transportation and communication but as significant factors contributing to the growth, transformation, and expansion of cities in the global south. The study explores and establishes its case with the help of maps, pictures, and other relevant documents. The research methods include a temporal cross-section of the city. Each era marking a significant tangible peripheral change determines the urban discourse to understand the city's peripheral growth pattern, trajectory, and scale. The cross-section will start with the first boundary of the walled city of Lahore, studying various forms of edges shaped due to city expansion and ending at the latest border of the city. The study is essential as the rapidly evolving city has not been documented from this perspective; also, the research seeks to become the foundation for future planning, further study, and visual analysis of the boundaries of the city of Lahore.*

Keywords: *Urban Trajectory, Urban Periphery, Urban Boundaries, Urban Transformation, Roads as Itineraries*

Kentsel Yörüngeler Üzerinden Lahor'un Değişen Çeperlerinin Haritalanması

Özet: *Lahor, kentsel gelişimi ve dönüşümü açısından benzersiz bir örnek teşkil etmektedir. Kentin genişlemesinde ve büyümesinde çok sayıda faktör etkili olmuştur. Kırdan kente göç ve ekonomik büyüme yoluyla nüfus patlaması yaşayan kent, kentsel formunun morfolojik bir metamorfoz geçirmesine ve gelişiminin belirli bir yöne doğru ilerlemesine neden olmuştur. Araştırma, Lahor kentinin kentsel dönüşümüne ve evrimine, farklı dönemlerde gelişen çeperler olarak tanımlanan yol ağlarının yardımıyla güzergahı haritalandırarak odaklanmaktadır. Çalışma, Lahor kentinin kentsel dönüşümünü ve belirlenen her bir kenarın kentin evriminde oynadığı rolü geniş bir şekilde kavramayı, belgelemeyi ve haritalamayı amaçlamaktadır. Yolları ve gelişimlerini eleştirel bir yaklaşımla, yani genellikle sadece ulaşım ve iletişim aracı olarak görüldükleri, ancak küresel güneydeki kentlerin büyümesine, dönüşümüne ve genişlemesine katkıda bulunan önemli faktörler olarak incelemektedir. Çalışma, haritalar, resimler ve diğer ilgili belgeler yardımıyla vakasını araştırmakta ve ortaya koymaktadır. Araştırma yöntemleri kentin zamansal bir kesitini içermektedir. Önemli bir somut çevresel değişime işaret eden her dönem, kentin çevresel büyüme modelini, yörüngesini ve ölçeğini anlamak için kentsel söylemi belirler. Kesit öncelikle surlarla çevrili Lahor kentinin ilk sınırından başlayacak, kentin genişlemesine bağlı olarak şekillenen çeşitli kenar biçimlerini inceleyecek ve kentin son sınırında sona erecektir. Bu çalışma, hızla gelişen şehrin bu perspektiften belgelenmemiş olması nedeniyle önemlidir; ayrıca araştırma, gelecekteki planlama, daha fazla çalışma ve Lahor şehrinin sınırlarının görsel analizi için temel oluşturmayı amaçlamaktadır.*

Anahtar kelimeler: *Kentsel yörünge, Kentsel çevre; Kent sınırları, Kentsel dönüşü, Seyahat programları olarak yollar*

1. INTRODUCTION

The city of Lahore may be understood as essentially an Urban Palimpsest [1]. Its fragmented, violent, but ardent history is a testament to the city's struggle to define and redefine its role as a place of vital cultural, economic, political, and social significance in the sub-continent and even worldwide. It is established that Lahore has been a seat for political, cultural, and economic importance for centuries. However, the city observed the peak of glory during the Mughal and Sikh regimes; its significance was acknowledged earlier by various invaders who came to conquer and rob the town before the Mughals. We see that the urban morphology of Lahore is a diverse mixture of different urban textures, highlighting that the reason and the era of their development have differed. These textures also point toward the multiple forces and agents involved in their evolution over time. Thus, at one end, one observes organic urban form based on pedestrian itineraries developed during the Mughal era and further elaborated during the Sikh regime.

On the other hand, a rigid urban form based on a gridiron pattern was imposed on the urban structure of Lahore in the shape of a Cantonment by the Colonial British. It is done to facilitate car movement and establish autonomy. The Post Partition / Post-Colonial era is a mixture of organic and regular urban forms rapidly appearing on the city's urban fabric.

Roads are one of the enthralling factors connecting these diverse urban forms in Lahore. A road is a *route or way to an end, conclusion, or circumstance* and *an open path for vehicles, persons, and animals* [2]. If seen in the context of pathways, roads are then defined as the channels along which the observer customarily, occasionally, or potentially moves [3]. Thus, the definitions limit the use and scope of roads as only "a route for the movement of people". Therefore, roads are often seen merely as a tool for the transportation and movement of people. However, roads have much more to offer, especially in the global south. They are instrumental tools in developing the city, acting as itinerates defining the city's trajectory, growth, and scale.

Western theory has been forefront in theorizing cities and their development over time. This has impacted the overall comprehension of towns in the east which are vastly dissimilar from the west. To superimpose western philosophy onto the east has led to the oversimplification of eastern culture and its link to the urban fabric. The role of roads in these theories is also categorized, while roads play a diverse pivotal role in eastern urban. To understand this in-depth, it is required that eastern cities and the character of routes may be studied and comprehended from their perspective of culture, growth, and development. Also, as the paper analyses, these roads are often responsible for marking the periphery and limit of the cities, especially in the global south.

The research then primarily questions the significance of political and economic factors that have contributed to the development of selected itinerates as roads responsible for transforming and expanding the city's periphery. How the evolving trajectory and scale of Lahore have impacted the selected itinerates as roads and the link between roads and the city's growth. The aims of the study include identification, documentation, and analysis of the evolving trajectory and periphery and providing a critical approach to the factors that have contributed to the development of these roads within the scale of Lahore city, resulting from the development of selected itinerates as roads developed in specific eras.

Cities are constantly in flux, yet it's a fact in a state and time [4]. They are living organisms that breathe, evolve, change and even deform. The western theory linearly understands cities as cause and effect where they can be read and interpreted through a chain of events or historical movements. In contrast, the eastern cities cannot be read through the eyes and perspectives of theories manifested from the study of western cities. It is primarily due to the chaotic and superimposed events (like colonization) which change the notion of the linear path of development that a city might take. A case in point is Indian histo-

ry, which, when colonized by the west, changed the social structure, cultural identity, economic growth, and the country's politics and the continent at large. It can be better understood as a superimposition of the western mindset driving towards industrialization in a mainly rural society. Spivak [5] explains in her chapter on "Can the subaltern speak?" which reinforced the line between the east and west, black and white, elite and subaltern, colonizer and colonized, ruler and local with brutal force.

Said (1978) better explains the conditions of eastern cities in his concept of "Orientalism" [6]. According to him, Orientalism can be best understood as a way of coming to terms with the Orient based on the Orient's unique place in the European Western experience. Hence it is crucial to understand the role of the east within the theory of western cities and the diverse complexity which may or may not configure to existing philosophies, eventually being termed as Orient. In Soja's own words, Orientalism is expressed as a western-style of dominating, restructuring, and having authority over the Orient [7]. Said (1978) further employs Foucault's (1991) ideas in Discipline and Punish [8] to identify the Orient. Foucault (1972-1977) is influential as he establishes the notion of the other in society which forms the basis for power and authority [9].

Conzen (1960), on the other hand, understands the city's growth through its physicality [10]. It presents an interesting theory of fringe-belt regarding the city's periphery and role. However, the approach cannot be directly implemented to understand the towns of the global south, as the boundary cannot be divorced from the centre. The periphery has an active role which can only be understood through its context. Although, there are authors who reject the usefulness and centrality of edges. They stress *planetary urbanization* [11] and the global level of cities. The argument is valid from the western view, but the behaviour of towns of global cities negates the theory. The changing peripheries identify the cities' growth, and the social impact may be diverse and even shift the physical growth patterns of any urban space.

Further, ideas like the '*other*' [7] also aim to distinguish between east and west. Hence, a significant gap in theory and urban practice is present when reading and understanding the development of eastern cities. Understanding the evolution of cities of the global south and its cities independent of the west may produce original knowledge deeply rooted in the land and context. Therefore, it is pertinent to understand the cities of the global south, their development, evolution, and even spatiality independent of the light of western philosophies and through the lens of their historical trajectories that have helped shape the eastern human geographies.

2. MATERIAL AND METHODS

The research employs two methods for collecting, documenting, and analyzing the data and information vital for the study.

- Literature review of existing material such as reports by the Lahore Development Authority, research papers, books, thesis dissertations, and journals.
- Analysis of visual material such as maps, photographs, videos, etc.

The research methodology starts with identifying important eras and roads as peripheries (Table 1) that have contributed to the demarking and evolution of the urban morphology of Lahore. Each period and periphery identified for the research highlights the road's change and contribution to defining the scale, edge, or trajectory of Lahore City. The cross-section of the eras and streets as peripheries will start from the earliest traceable boundary of Lahore City. The analysis will conclude with the development of the recently developed Ring Road, which has marked the limit of Lahore in recent times and has provided a trajectory for the city to grow south on a definitive scale. The following peripheries will be taken into consideration and define the outline and scope of the research:

Table 1. Identification of itinerary and time era for the research analysis.

Itinerary identified	Time/Era
Circular Road	Mughal
Mall Road (first expansion)	Colonial
Jail Road & Ferozepur Road	
Raiwind Road	Post-Partition / Post-Colonial
Ring Road (Closing the Loop)	

3. MAPPING AND ANALYSIS

3.1. Mughal Era: Circular Road

Nowadays, circular roads represent a chaotic dream ready to be sorted and organized irrespective of the changes incorporated in its width, i.e., from 1 lane to 4 lane road and added infrastructural details during 2014. The chaos has sprung due to its context's unregulated traffic and commercial activity booming. The Southern Circular Road has organized itself into the largest wholesale market in Punjab Province [12]. The road is roughly 7.25 Km long, is located northwest of Lahore, and follows the periphery of Lahore's walled city known as Androon Lahore (Figure 1). The Road borders the contrasting traditional and contemporary neighbourhood to its north and the river Ravi. The northern vicinity features Lahore's Lari Adda (General Bus station), industrial units, central inter-road city junctions, i.e., Bund and Grand Trunk Road at one end, and the World Heritage sites such as Lahore Fort and important historical buildings such as Badhshai mosque at another. Data Darbar shrine is an important cultural and religious site which attracts hundreds of visitors daily. It is located to the south, with the vicinity identified as the commerce hub bordered by the Railway Station [13]. Thus, the multi-use, historical, and culturally important context around the circular road is perplexing and challenging to understand. The road also connects the walled city with the rest of Lahore and provides access to the walled city by connecting all the gates of Lahore. However, the urban road also acts as a barrier between the old Lahore and the new Lahore sprawled away towards the city's south. The road also connects the new and old Lahore with other cities with the help of G.T Road and the recently developed Ring Road of Lahore in the northeast and northwest parts of the road.

Figure 1. Location of Circular Road in Lahore

Circular Road is juxtaposed on the itinerary sketched by the Mughal rulers around the fortified city (now walled city) of Lahore in the shape of the fortified walls. The walls were erected as strategic built tools against any possible attack. It can be viewed as the first attempt to give a recognizable boundary to the city of Lahore Mughals in the shape of a fortified wall around the city. During Maharaj Ranjit Sikh's regime, a moat was developed around the fortified walls. The mount was established to tackle and resist attacks and was filled with water to keep the enemy at bay. The moat remained the sole successor of the itinerary on which the current circular road was based until Maharaja Ranjit Singh's regime [14]. After the annexation of Lahore by the colonial British in 1849, the fortified wall around the city was vandalized for its material, which was to be used to construct a new building. The moat was filled and converted into a garden. Due to their shape and location, the gardens were known as Gol Bagh, i.e., Circular Gardens, thus transferring the name to the road that would soon engulf them (Figure 2). After 1914, a road for cars was developed around the periphery of the Walled City and Gol Bagh. It can be considered the first attempt to mark the city's urban form in terms of boundary (of Lahore) using road infrastructure as a tool. Although the attempt was colonial, it followed the peripheries of the existing walled city of Lahore. Thus, it didn't help the town provide any trajectory or scale to grow in a specific direction. It constrained the city in its scale and trajectory. It can be assumed that the development of the road following the circular course of the walled city was a political decision to contain and segregate a) the locals from the colonials and b) the old urban form with the upcoming colonial morphology.

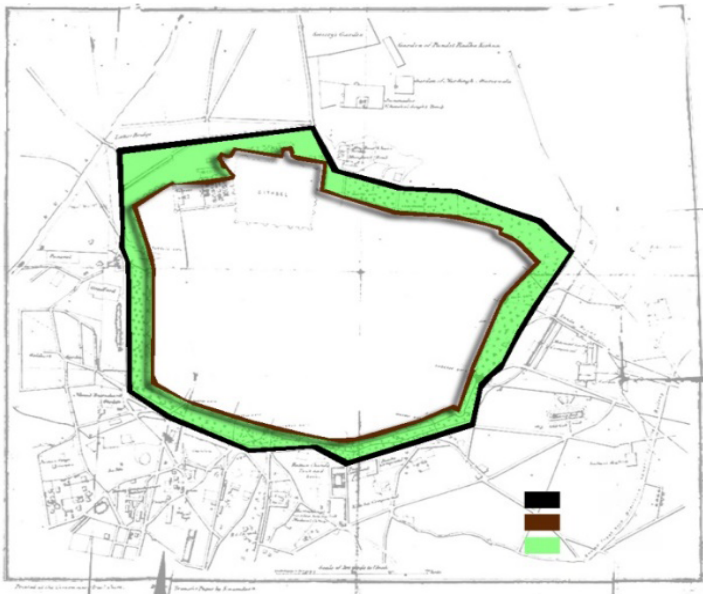


Figure 2. The itinerary around the walled city, which will later be converted into a circular road

3.2. Colonial Era; Mall Road

The strategic geographical location, land, and economic value brought Lahore to light during colonial rule. By the end of Mughal rule, Lahore had gained importance as an important city with a rapidly growing trade market, skilled workers, and craftsmanship. The society at large remained agrarian, with vast untouched countryside and gardens around the walled city. 1848 saw the British establish their seat in Lahore and initially used the existing tombs and buildings for administration, housing, and even religious use. The walled city was the first challenge the British faced as the intricate fabric of the medieval town in the east starkly contrasted with the typical cities of the west. Hence, the British spent the first few decades understanding the city and its working and eventually decided against intervening within the fabric (except for proposing specific improvements to the infrastructure and services).

The city was also expanding, with well-to-do Hindu communities residing outside the periphery of the wall in areas such as Gowal Mandi, Mozang, Kila Gujar Singh, etc. The task at hand was to establish an efficient rule in the Punjab region through the seat of Lahore. The obvious solution was to build outside the city and as far away from the webbed city with wide-spreading disease (Cholera spreading widely at that time) as yet close enough to maintain control. Henceforth, in 1851 Mall Road (previously known as "Lawrence Road") was proposed by Colonial Napier [15], which connected the Mian Mir Cantonment in the southeast with the walled city, bringing together the fragmented city and the scattered communities around the walled city. Interestingly, the original Mall Road was not directly connected to Walled city and divided into three portions: Lower Mall, Mall, and Upper Mall. Each section of the mall housed important buildings and had a significant character that played an essential role in the governance of the Raj. The road was proposed to be a straight paved road instead of the zig-zag roads of the inner city and wide enough to withstand the fast-moving horse-driven carriages.

Presently, Mall Road is a 6.5 km (4.1m) long, dual carriage road which acts as one of the primary spines for the whole city. (Figure 3). The road cuts through Nasir Bagh (previously known as Gol Bagh) and directly connects with the Lower Mall and Walled city. Mall Road is important for two primary reasons. It marks the first colonial imprint, giving future direction to the expansion and growth of the town.

Consequently, it forcibly stretched the city when Cantonment was placed some 6 miles away from the inner city. Does the question then arise: How can it be read as a periphery of the town? The Mall Road was not just a thoroughfare or a link between the old (walled city) and the new (Cantonment). Still, it represented the *colonial spatial imagination* [16] through its design, location, and spatiality. It was built as a symbol of power and control to state the difference between the locals and the rulers. Although maps may not act or spell out a periphery, in reality, they marked the town's start (from Walled city) and the end (till Cantonment) limits.

Figure 3. Location of Mall Road in Lahore

3.3. Ferozepur Road and Jail Road

Lahore was a significant city as it stood at the junction of trade routes with other cities towards the east, west, and south. One of these routes connected Lahore across borders to the Indian town of Ferozepur. This

road now presently connects Lahore to Kasur but is known as the Ferozepur Road to date. (Figure 4) The initial trajectory seen in the early maps of Lahore marks the road not as part of the city turbine but as an inter-city road. The route traced another city boundary when a new development based on Ebenezer Howard's Garden city [17] was planned some 6.4 km (4 mi) southwest of the town. N. Varma proposed the plan in the 1920s following the circular plan with roads crossing the radial geometry. Inspired by the English homes and the new shifting paradigm of a car-oriented city, the development offered an opportunity for the affluent locals to build houses on large open plots with wide roads and beautiful gardens. The Model town marked another end to the city, and the Ferozepur Road manifested into a periphery, engulfing the Icchra to the ever-expanding city.

Figure 4. Location of Jail and Ferozepur Road in Lahore

On the other hand, the Jail Road (5 km in length) on the other hand is sometimes read as another ribbon among the emerging roads in Lahore. To understand it as a border and periphery to the city, one needs to closely look at the fragmented town of that time and its role in enfolding and encompassing the various communities spread around Lahore. The road starts from the Mozang area (an established area of the time) and follows the eastward direction culminating at the Mian Mir Cantonment. A minor (in length) road enforces the city's expansion towards the southeast, crossing over the Canal. Still, it does not bypass the established boundary of the Cantonment.

Presently, both of these roads are amongst the main trajectories of Lahore, handling heavy traffic loads and forming vital connections within the city. In 2013 and 2016, projects were initiated to make Ferozepur Road and Jail Road signal-free, and Rapid Bus Transit System was introduced on Ferozepur Road. Where these projects aimed to facilitate the city's people and guarantee smoother traffic flow, it cannot be argued that they favoured and supported the dominant car culture in Lahore. The result is congestion or fast-moving traffic zooming through the city without regard for its counter-movement of pedestrians, generating isolated islands of long roads. At peak times, the heavy traffic jamming on the wide streets acts more like a border of cars, further sub-dividing the city and causing more nuisance than necessary for its people.

3.4. Post-Colonial/Post-Partition Era: Raiwind Road

Raiwind road is an important road that links the old north part of Lahore city with the upgraded and recently developed south part. Raiwind used to be the district of Lahore, not part of the city itself. It was a major agricultural trade center before Ferozepur Bhatina Road was opened and recorded as an area with industrial importance [18]. The Raiwind vicinity still holds factories and agricultural land compressed between residential colonies, a thread linking the Raiwind to its past. The Raiwind road connected the district of Raiwind with the central city, thus bearing its name from the community. The late development unfolding in the context of Raiwind road and ultimately affecting the Raiwind district has made the section a vital part of the city itself; we see the city expanding more from Raiwind towards the southwest.

Figure 5. Map indicating the location of Raiwind and Raiwind road in Lahore

The roads connect Canal Road from one end to the Ring Road and pass through many newly emerged residential vicinities of Lahore. (Figure 5) The road, which runs parallel to National High Way, is 27 Km long and varies in width from 02 to 04 lanes throughout its running length. The road is essential not only because of the role it has played in determining the trajectory and scale of the city but also because it links the "once" residential Lahore to the once "industrial" (Raiwind district) zone of the city. One of the primary reasons for the development and up-gradation of the road was because it was the only road that linked the political seat (residence) of one of the ruling parties of Pakistan, i.e., Pakistan Muslim League N, with the rest of the city. The road has also played an instrumental part in determining the trajectory, i.e., towards the south, and urban morphology, i.e., exclusive gated communities, of contemporary Lahore. With the development and up-gradation of this major road, the periphery of Lahore city was stretched towards the south, and the city saw an unprecedented pace of growth in terms of scale (Figure 9). It is also interesting to note that the road has played a significant role in the gentrification process of the various villages and agricultural land near its running length. As with the up-gradation of the road, exclusive gated communities started developing along and off the road, and rural land facing the road was sold for commercial activity. Many industrial units and factories have also relocated, and more universities and restaurants have sprung up along the route.

3.5. Ring Road

The project Ring Road was initiated in 2004, and it took the government approximately 13 years to complete the 85 km long, six-lane road encircling the city. The project was completed in 2 phases, namely the northern loop (built first) and the southern loop (recently finished) (Figure 6). The Road is 103 km long and has as many as 20 interchanges and emergency lanes which may be accessed through the existing points [19]. The Ring Road aimed to provide a faster, quicker (in terms of time, not distance) route around the city for people wanting to access from the periphery or from one end to another. Numerous communities, projects, and agricultural land were cut through, destroyed, and even bulldozed to make way for this Haussmannian project.

The need for Ring Road arose with the expanding city stretching its boundaries, causing traffic congestion on the main access routes and limited public transport. The result is an elevated mass of concrete enclosing the city in a tight ring. Ring Road, in reality, was a necessary evil that does facilitate everyday users. What is essential to notice is that a megaproject like this is still designed and built for the speeding car and bikes, which are in multitudes, and public transport is not allowed and discouraged from entering the Ring Road.

Figure 6: Map indicating the location of Ring Road around Lahore

4. DISCUSSION

The predicament of post-colonial cities is the struggle to overcome the colonial effect. Many societies don't recognize the ever-lasting impact that a few years have had on generations. The years passed in suppression, and being a colony leaves a permanent, tangible, and intangible impression on their culture, politics, economy, built environment, and traditions. Rapport [20] insists on the importance of cultural landscape defined by cities built and their history. To study the people and the city of Lahore, it is integral to understand the town first and foremost as a post-colonial by-product, the struggles it has surpassed, and the difficulties it has overcome. The research analysis highlights those roads in one of the global south cities, i.e., Lahore, connecting the diverse urban textures scattered within the city limits and influencing the city's growth patterns. The impact of roads as itineraries responsible for sketching the urban growth pattern of Lahore city can be understood through the following:

4.1. Periphery

The city of Lahore experiences its first-ever periphery, marked by the Circular Road around the walled city (Table 2). The first periphery loops around the city of Lahore, making Lahore a city restricted and defended by the boundary. Mall Road marked the colonial texture and era of Lahore city rather than providing the city with a closed physical border. Ferozepur, Jail, and Raiwind Road also provided the city with the itinerary to grow towards the south rather than marking the definitive periphery around the city (Table 2). Ring Road is the latest attempt to once again ark the boundary of Lahore using a road as an itinerary, this time with a vast and different scale compared to the first attempt (Figure 7).

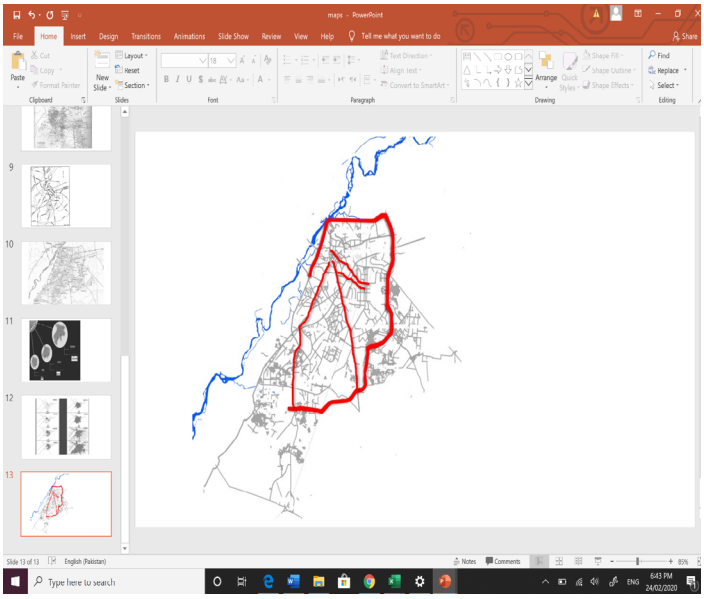
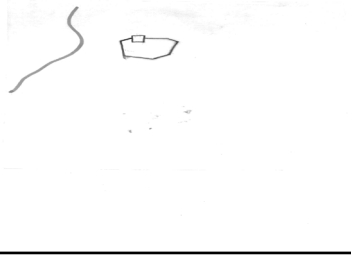
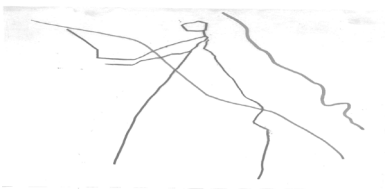


Figure 7: The evolving periphery of Lahore city overtimes.

4.2. Trajectory

Vis (2018) argues the significance of boundaries in the cities in his work [21]. The categorization and hierarchy presented through these edge impact cities at the social, cultural and economic levels. The journey of Lahore as a physical reality on the map of the world started in the northwest part of the city, where the city grew organically within a definitive fortified boundary towards the east of River Ravi. (Table 2). Mall Road marked the colonial era and the future direction of the city. The Road traces its movement towards the southeast, distinguishing between the new and the old, the colonized and the colonizer. The town's focus was forced towards the southwest, crossing the BRB Canal Road and spreading towards the south (Table 2). Ferozepur and Jail Road directed the city's trajectory towards the southeast and connected the city of Lahore with other cities. (Table 2). However, the Raiwind road triggered a fierce development towards the southwest and stretched the city's urban fabric towards the southwest at an unprecedented rate. (Table 2). The ring road has also not closed its loop from the southwest part of the growing Lahore city, encouraging it to grow further in this direction. The trajectory of Lahore city now and in the future will be towards the southwest, further away from the border and river Ravi (Table 2).

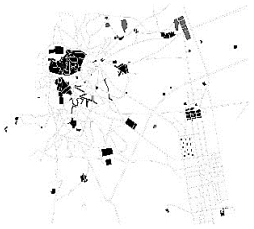
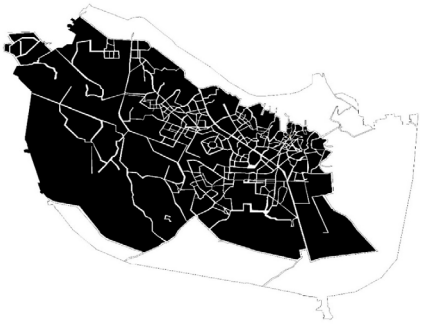
Table 2. Trajectory of Lahore city in the identified time era

Sr No	Time Era	Comparative analysis of the trajectory in the identified era
1.	Mughal Era: The Walled City was developed on the north-west side towards the east of Ravi.	
2.	Colonial Era: Mall Road marked the city's colonial era and future direction.	
3.	Colonial Era: Development of Jail and Ferozepur Road further establishes the trajectory of the Mall Road	
4.	Post-Colonial / Post-Partition Era: The Raiwind road shoots straight from the walled city and expands the city to its peri-urban areas like Raiwind. It stretches the town towards the south.	
5.	Post-Colonial/Post-Partition Era: The final Trajectory encircles all the previous trajectories, closing the loop around the city. The map indicated the city's natural and man-made boundaries, including River Ravi, BRB Canal, and the six peripheries. The map also clearly marks the comparative scale of the first and last loop of the city of Lahore.	

4.3. Scale

Scale is the most prominent and absolute tool to mark the growth and expansion of any city over time. The city of Lahore started expanding in the early stages of colonization when the British started expanding the town towards the south and developing the rural landscape. The city's population has increased from 120,000 during British times to approximately twelve million (Table 3). It marks an increase of 9900% in less than 200 years which states an increase of almost 50% annually (Table 3). In response to that, the city has also stretched its physical boundaries. It can be understood with a comparative analysis of the physical scale of the city where the Walled City was approx. 2.6 km2, and the present Lahore boasts an area of approx. 1772 km2 (Table 3). It shows an increase of 6800% over the last 200 years (Table 3). The final maps indicate the comparative scale of the city from the pre-colonial era to post-colonial/post-partition times. It clearly shows the rapidly expanding city, which has stretched towards the southwest of the Walled City. The maps also mark the contrasting urban fabric of the town, where different fabric marks an era of history, leaving their imprint through their physical built (Table 3).

Table 3. Comparative analysis of the Scale of Lahore city mapped 125 years apart

Sr No	Time Era	Comparative Analysis of scale of the city
1	Lahore 1893: The scale and urban fabric are traced through figure-ground mapping. Source: Mapping done by Students of 4th-year Architecture, NCA, 2018	
2	Lahore 2018: The figure-ground map marked the city's fabric, scale, and expansion compared to 125 years ago. Source: Mapping done by Students of 4th-year Architecture, NCA, 2018	

5. CONCLUSION

In conclusion, the study identifies different time eras and their impact on the development and expansion of Lahore city with the help of three key parameters, i.e., periphery, trajectory, and scale. In the context of global south cities such as Lahore, the roads have been studied and analyzed as a critical factor in defining the city's periphery and determining its trajectory and scale. The city of Lahore has evolved from a hamlet town and morphed its shape into a fortified city at the edge of the river Ravi. The road network introduced by the colonial powers and further developed by later governments has helped increase the city's scale at

an unprecedented rate and has given clues for the cities to grow in a specific direction. The research is a pioneer in this regard as it provides proof of the unique expansion of towns impacted by colonial rule in the global south and its distinction from a typical western city growth. The paper establishes the need to read cities of the global south cities through their narrative and context and uses different parameters other than one established (in the west) to read the cities of the global south. The methodology also presents cities and their historic expansion in a new light. The study further urges scholars to explore other agents and parameters to read and analyze the cities of the global south to produce a more inclusive and comprehensive knowledge of global urbanization.

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Formation of Spatial Identity on the Axis of Avant-garde Movement

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Abstract: *The article is shaped around the questions of how the conceptual relationships between the avant-garde essences that contribute to the formation process of spatial identity diversify and what spatial potentials they have. In this context, prominent avant-garde themes are discussed through the way they relate to each other and potentials are discussed. Examining the avant-garde movement in a spatial context requires evaluating the palette of hybrid concept sets that can mediate the development of architectural productions. In the study, the avant-garde movement is examined in two basic steps. The first set of figures includes Baudelaire, Lautreamont, Cheval, Gaudi, Rousseau, Chirico, Duchamp, Picasso, Schwitters, Freud, Breton, Apollinaire, Magritte, Aragon, Tzara, Ernst, Kiesler, Dali, Lefebvre, Bataille, Benjamin, Lacan, Deleuze, and Guattari. It is related with how Tanguy, Matta, Brassai, Delvaux, Maddox, Cornell and Agar's productions, mainly painting, sculpture and interior architecture, bring the avant-garde approach to the art environment and, accordingly, contribute to the transformation of spatial identity construction in the artistic context. In the second part, it is discussed how the potentials and possibilities provided by the figures discussed in the first step are used directly or indirectly by the leading actors in the contemporary architectural scene. In this context, leading actors such as Le Corbusier, Invernizzi, Niemeyer, Tschumi, Hadid, Hejduk, Eisenman, Koolhaas, Libeskind, Coop Himmelblau and Diller Scofidio + Renfro are discussed according to the frequency and variety of which avant-garde orientations they use in the construction of spatial identity. This whole evaluation process is developed by discussing the ties between the figures and the way they affect each other. As a result, it is seen that the conceptual richness of the palette and newly produced relational schemes, which avant-garde orientations can offer in the construction of spatial identity in the near future, provides a basis for reference to work areas such as "liquid architecture", "biomorphic architecture", "cybernetics".*

Keywords: *Avant-garde architecture, Spatial identity, Contemporary architecture*

Avangart Hareket Bağlamında Mekânsal Kimliğin Oluşumu

Özet: *Makale, mekânsal kimliğin oluşum sürecine katkı sağlayan avangart özlerin arasındaki kavramsal ilişkilerin nasıl çeşitlendiği ve hangi mekânsal potansiyelleri taşıdığı soruları ekseninde şekillenir. Bu bağlamda öne çıkan avangart temalar, birbirleriyle ilişkilenme biçimleri üzerinden ele alınır ve mekânsal potansiyeller tartışılır. Gerçeküstücü hareketin mekânsal bağlamda incelenebilmesi, mimarlık üretimlerinin geliştirilebilmesine aracılık edebilecek melez kavram setlerinden oluşan bir paletin irdelenmesini gerektirir. Çalışmada gerçeküstücü hareket, iki temel adımda incelenir. Bunlardan ilki, Baudelaire, Lautreamont, Cheval, Gaudi, Rousseau, Chirico, Duchamp, Picasso, Schwitters, Freud, Breton, Apollinaire, Magritte, Aragon, Tzara, Ernst, Kiesler, Dali, Lefebvre, Bataille, Benjamin, Lacan, Deleuze ve Guattari, Tanguy, Matta, Brassai, Delvaux, Maddox, Cornell ve Agar'ın, resim, heykel ve iç mimarlık ağırlıklı üretimlerinin, gerçeküstücü yaklaşımı sanat ortamına nasıl taşıdığı ve bu doğrultuda, sanatsal bağlamda mekânsal kimlik inşasının dönüşümüne nasıl katkı sağladığıyla ilgilidir. İkinci adımda ise, ilk adımda ele alınan figürlerin sağlamış olduğu potansiyel, imkan ve açılımların, çağdaş mimarlık sahnesindeki öncü aktörler tarafından doğrudan ya da dolaylı olarak nasıl kullanıldığı tartışılır. Bu bağlamda, Le Corbusier, Invernizzi, Niemeyer, Tschumi, Hadid, Hejduk, Eisenman, Koolhaas, Libeskind, Coop Himmelblau ve Diller Scofidio + Renfro gibi öncü aktörler, mekânsal kimlik inşasında hangi gerçeküstücü yönelimlerden ne sıklık ve*

çeşitlilikte faydalandıklarına göre ele alınır. Tüm bu değerlendirme süreci, figürler arasındaki bağların ve birbirlerini etkileme biçimlerinin de tartışılmasıyla geliştirilir. Sonuç olarak, yakın gelecekte gerçeküstücü yönelimlerin mekânsal kimliğin inşa edilmesinde sunabileceği paletin kavramsal zenginliğinin ve üretilen yeni ilişkilenme şemalarının "liquid architecture", "biomorphic architecture", "cybernetics" gibi çalışma alanlarına referans sağlayacak bir zemin sağladığı görülür.

Anahtar Kelimeler: *Avangart mimarlık, Mekânsal kimlik, Çağdaş mimarlık*

1. INTRODUCTION

Avant-garde movement describes a field that has produced and is producing its own unique pool of concepts for the comprehension of reality. Before making the definition of avant-garde movement, Breton (1924) addresses the problem of seeing dream and reality as complete opposites in daily life and deepens his discussion in this context. These two forms do not define separate and completely opposite fields, but they are two concepts that interact, affect and transform each other. In his manifesto on the subject, Breton, who defines one of the branches of avant-gardism as psychic automatism in its pure form, expands this definition with his emphasis on the actual functioning of thought. According to this definition, avant-garde perspective is defined as the reflection of reality that does not involve the intervention of control dictated by thought and is exempt from any aesthetic orientation or moral concern. The figures, on the other hand, are highlighted as producers who have made productions according to this definition: Breton, Aragon, Baron, Boiffard, Carrive, Crevel, Delteil, Desnos, Eluard, Gerard, Limbour, Malkine, Morise, Naville, Noll, Peret, Picon, Soupault and Vitrac. At this point, Breton also reminds the encyclopedic definition, emphasizing that avant-garde movement is a disinterested thought game played by considering the combination of neglected connotations. So avant-garde perspective also means the representation of production processes that can replace all psychic mechanisms [1].

In order to draw a framework on how avant-garde movement information is produced in a spatial context and how the produced information can be derived, first of all, it is necessary to deal with the association schemes of the relevant data. The fact that some avant-garde examples emphasized the aim of destroying the "rational causality" phenomenon, which came to the fore with the existence of modern architectural productions, by direct or indirect methods [2], It shouldn't hurt that this view can be read as a "leap" from avant-garde theory. When the historical perspective, which includes examples that provide space for avant-garde productions, is expanded, it can be mentioned that there are works and groups whose effects extend to today's architectural productions [3]. Within this approach, leading figures should be evaluated.

2. LEADING FIGURES AND SPATIAL POTENTIALS

Baudelaire and Lautremont with their similar literary approaches before avant-garde movement, then Cheval, Gaudi and Rousseau with their representations of organic space; Chirico, Duchamp, Braque, Picasso and Schwitters play an important role in shaping the theory of avant-gardism with their approaches that trace the movement in space [4]. The importance of writing and the emphasis on the unconscious reminds Freud, Breton, and Apollinaire [5]. While Magritte, Aragon, Tzara and Ernst stand out with their explanations of new trends that may emerge after dada, Kiesler tries to explain the irrational and modern balance by associating it with street and house dualities (Figure 1). The concepts of avant-garde automatism and "exquisite corpse" are fed by Dali's explanations of paranoid activity and fed by the art nouveau movement [6]. In addition to all these, parallel studies on the various social and public equivalents of avant-gardism come from Benjamin, Lefebvre, Bataille, Lacan, Deleuze, and Guattari [7].

While Tanguy and Matthew define the stylistic side of their work with hybrid expression techniques that serve multiple fields and movements, the theme of desolation in addition to melancholy is applied as a supporter of Chirico's work in the works of Maddox, Brassai and Delvaux [8]. Cornell and Agar, on the other

hand, offer various perspectives on how avant-gardism can be represented in the interior through installations and exhibitions [9]. Considering all these components, it is clear that before examining avant-gardism in architectural practices, these approaches, which will allow a more consistent evaluation of this workspace, offer hybrid production processes that include painting, sculpture, interior architecture and the intersections of these workspaces (Figure 2). Similarly, these premises mediate avant-gardism to present essences that can affect daily life and can be evaluated in direct relation to space [10].

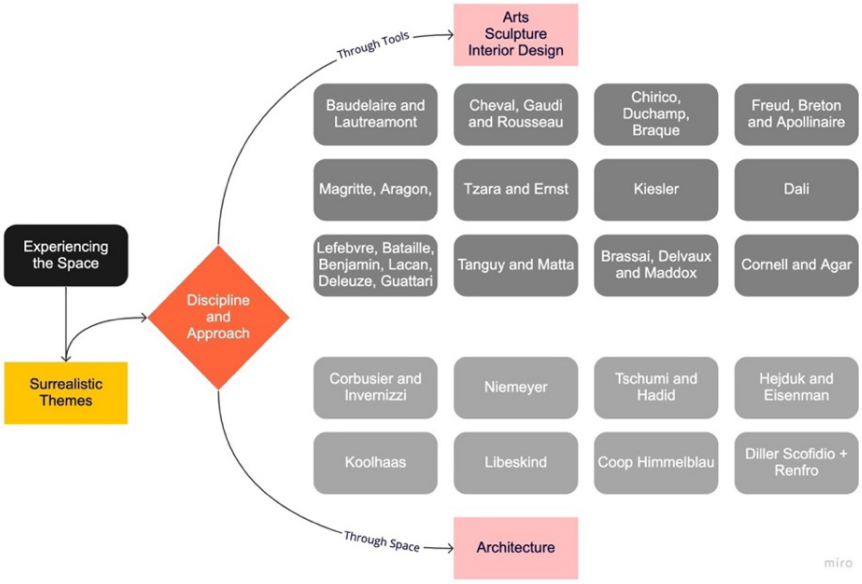

Figure 1. Pioneers contributed to the intersection of avant-gardism and space (Improved by author)

Figure 2. Chirico's Piazza d'Italia, Gaudi's La Pedrera and Kiesler's Endless House, from left to right [URL-1, URL-2, URL-3]

Baudelaire is one of the figures who played a major role in describing the distinctive characteristics of avant-gardism by reading the concepts of strangeness and surprise over the big city [11]. Lautreamont, on the other hand, deals with the themes of darkness and the uncanny, by associating his experiments on the streets with the theme of space [12]. For Cheval, the concepts of spontaneity and naivety indirectly came to the fore and these concepts were interpreted in a unique language that included various partial fragments and inspirations from temples, bungalows, medieval castles, giant statues and caves [13]. Gaudi, on the other hand, pursued rare form combinations in daily life, working with walls leaning on slopes, viaducts and trees carved from stones, in his architectural language, which he nurtured from the theme of fluency. At this point, it can be said that the reason why Gaudi is handled under a sub-title that includes the combination of interior architecture, painting and sculpture titles, rather than directly within the scope of architectural practices, is that his works, which position his language at a unique point, stand out with their features

based on ornamentation and diversification. In addition, the actors of the pioneers in the field of plastic arts working on the subject stand out with their collages, assemblages, poems and paintings, which are parallel to the productions of Gaudi [14].

Another pioneering figure working on the subject, Rousseau's mastery of emphasizing the concepts of uncanny, silence, speed and haste stems from the fact that he chose the nooks and crannies and wild forests as his representational backgrounds. On the other hand, Chirico opens up a unique space for surreal language with its squares, arches, factory chimneys and trains, where he blends the concepts of stillness, silence, abandonment, desolation and melancholy, away from this description of a humid and warm atmosphere. Another contrast, similar to the one between Rousseau and Chirico, but with a different theme palette, is between Chirico and Duchamp. Duchamp reads the themes of mobility and censorship through threads, glass and fragments. A similarity to the multi-partness here can be read in the original language that Picasso captured by matching fastastic images and prisms. On the other hand, Schwitters has produced original assemblages by interpreting the concepts of redundancy and multiplicity as big data and residuals of the city.

Just like the chairs and windows that Freud refers to as inspired by the uncanny and the return of memory [15], Breton's handling of the house-street-"poeme objet" relationship to strengthen the effect of timeless dreaminess [16] and Apollinaire's use of typographical deformation and mirroring on pieces of writing to create new ideas [17]. Creating textual combinations are effective examples in this context. However, it is seen that Magritte conveys the witty representation languages that he developed through timelessness, tension between spaces and the existence of human beings with the help of elements such as rooms, fireplaces, windows and chairs. All these show the sharing role of objects or pieces of space in creating a holistic perception of spatiality [18]. Aragon's use of the city-passage dichotomy to express the theme of uniqueness and Tzara's use of writing and stains to express two difficult concepts such as imagination and fragility similarly reveal how the chosen space or tools increase the representation power of the theme [19]. Ernst's work on the themes of darkness, blotchyness, warmth, rustiness, petrification, and contagion similarly depicts a realm expressed by forests, shells, crystals, and lost boundaries [20]. While expressing the concepts of envelopment, shelter, fluidity and superstition through the house, sphere and cave, Kiesler furthered his work with forms that evoke some of Dali's prominent representations [21]. While Dali shows in his works that sensations such as paranoia, criticality, exoticism, excitement and lack of control can be expressed through horizon, dissolving bodies or transforming parts, he also solidifies the prominent theoretical features of avant-gardism and mediates this field of study to be more consistently debatable [22]. This rich palette of material, sensation and expression has been developed over time by diversifying the ways in which the connections between the elements that appear in dreams are surreal [23]. Lefebvre's work process, which he reads by evaluating the relationship between daily life, action and the city on the axis of logic, includes surreal themes that indirectly contribute to avant-gardism [24]. Bataille, on the other hand, explains the absence of contrast with the help of the "dust" metaphor [25]. Benjamin's mention of lost borders while dealing with the themes of liberation, escape from collective dreams and wakefulness [26], and Lacan's focus on the positive outcomes of nature while addressing the reflections of paranoia are among other important approaches [27]. Deleuze and Guattari refer to the power and potential of lines while dealing with the theoretical weight of organizing against reason, themes of flight-escape, and nomadic feeling [28]. Tanguy points to new geometries and biomorphic landscapes, where syntheticity, softness and wetness are most strongly felt, for similar effectiveness reasons [29]. Similarly, when dealing with plants and technological pieces, Matta concentrates on challenging unique and under-studied themes such as vegetation, the psychological landscape [30], and the stance against gravity (Figure 2). Of course, all these are approaches that have more positive connotations besides the representations of singularity, abandonment, oppression and exclusion in Avant-gardism, existing as hybrid combinations rather than being completely pessimistic. At this point, the feeling of pessimism that Brassai reflects through the pieces now comes to the

fore in a way that can be evaluated in a common area with Delvaux's expression of the concepts of fatality and corporeality, which he aims to represent through ruins and temples, by including the adjectives that expand the boundaries of avant-gardism into the pool [31]. In addition, challenging theme sets such as cryptography and duality are also expressed in Maddox's work through walls, squares and courtyards (Figure 3). Cornell's work on childhood, confinement, fantasy and antiquity is represented through ready-made objects, old photographs, miniatures, space and birds [32]. Agar, on the other hand, reads his quests on illusion, sociability and coincidence by developing discussions on interior space and socialization areas [33].

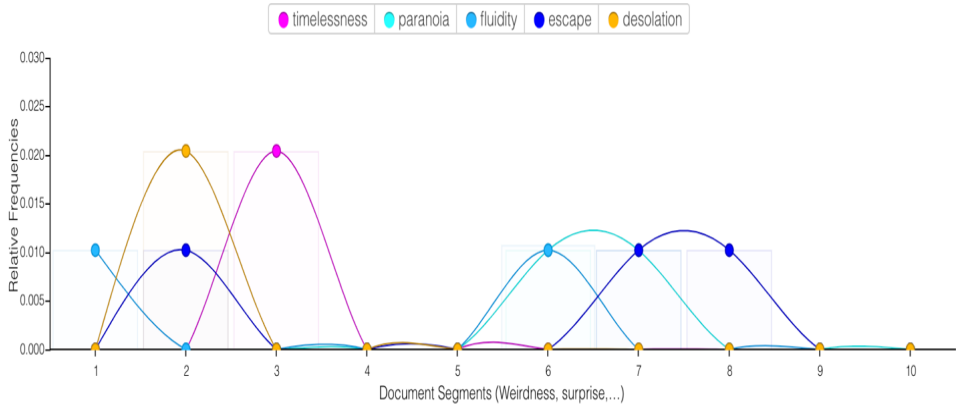

Figure 3. Surreal themes in the context of spatial potentials: relative frequencies of themes and number of intersections of a theme (Improved by author)

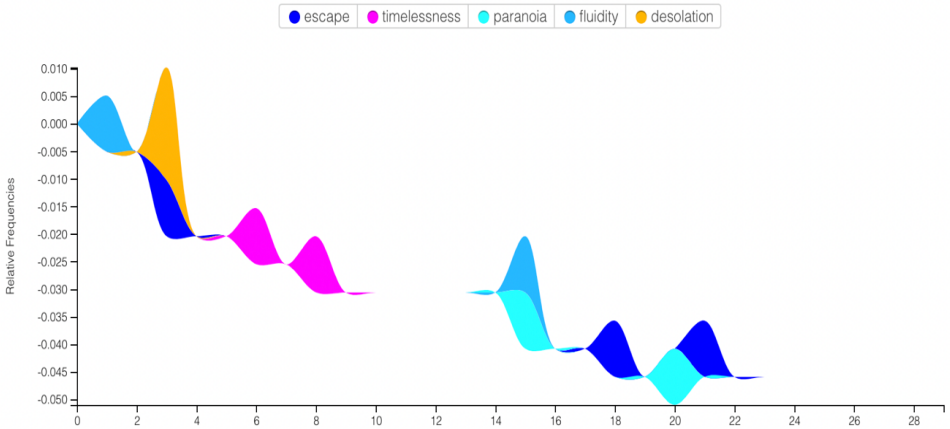

Figure 4. Relations of surreal themes in the context of spatial potentials: relative frequencies of similarities and intensity of similarities of a theme (Improved by author)

3. SPATIAL IDENTITY FORMATION THROUGH SURREALITY IN CONTEMPORARY ARCHITECTURE

It cannot be said that pioneering figures always feed the relationship that contemporary architecture establishes with avant-gardism with primary tools and directly. On the other hand, thanks to these works, which have the opportunity to be represented in the fields of painting, sculpture, interior architecture and civil architecture, the view of contemporary architecture on the spatial reflections of surreal themes has developed and its perspective deepened. In this context, how prominent figures of contemporary architecture produce in terms of situation-object-space-concept can be summarized as follows (Figure 4).

When the leading concepts of avant-gardism that contribute to the construction of spatial identity are taken together, an extremely diverse and deep collage emerges. If the concepts that make up this collage are to be listed collectively, it is seen that a list of themes consisting of the following components is obtained: Strangeness, surprise, darkness, uncanny, spontaneity, naivety, fluency, silence, haste, speed, escape, stagnation, abandonment, desolation, melancholy, activity, uncensorship, multiplicity, redundancy, the return of memory, timelessness, imagination, typographical deformation, mirroring, timelessness, tension between spaces, human presence and absence, uniqueness, dreaminess and fragility, darkness, stainedness, warmth, rustiness, petrification, contagiousness, enveloping shelteredness, fluency, superstition, paranoia, criticality, exoticism, excitement, lack of control, rationality, lack of contrast, liberation, escape from collective dreams, alertness, paranoia, organization against reason, flight-escape, nomadism, syntheticity, softness, wetness, vegetativeness, psychological landscape, anti-gravity, singularity, abandonment, oppressed, thrownness, solemnity, corporeality, cryptology, duality, childhood, confinement, fantasy, antiquity, illusion, sociability, and coincidence.

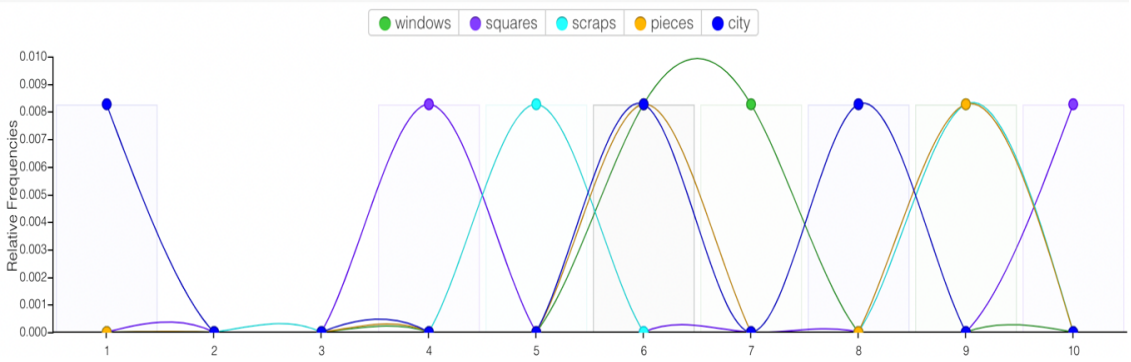

Figure 5. Most relative architectural components in the context of avant-garde potentials: relative frequencies of themes and number of similarities of a theme (Improved by author)

A single collage consisting of any or all of the themes with different characteristics and depths will not be sufficient to define avant-garde movement. On the other hand, the way these concepts come together and relate can find grounds that can reflect the semantic intensity of avant-garde movement with subtle spatial orientations. In order to carry out a discussion about which objects, spaces or concepts can better display the contextual intensity of the above-mentioned themes, these objects and spaces must first be listed (Figure 5).

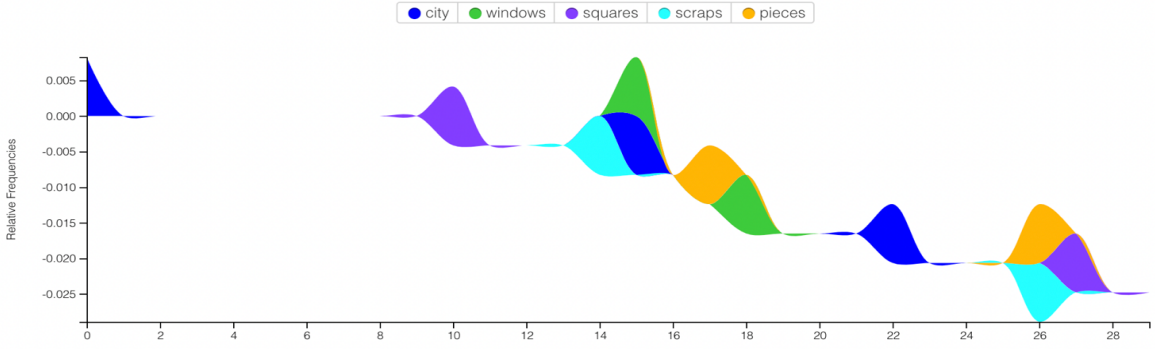

Figure 6. Relations of architectural components in the context of avant-garde potentials: relative frequencies of intersections and intensity of intersections of a theme (Improved by author)

In this direction, a list is formed as follows: The big city, streets, experiments, space, temple, bungalow, medieval castle, giant statues, maison carree, cave, pocket, wall leaning on the hillside, viaduct, stone carved tree, nooks, wild forests, squares. , arches, factory chimneys, trains, ropes, glass, fragments, fantastic imag-

es, prisms, fragments, remnants of the city, chairs, windows, house, street, "poeme objet", pieces of writing, rooms, windows, fireplaces, chairs, passages, patches, forests, shells, crystals, lost borders, sphere, cave, horizon, dissolving bodies, transforming parts, everyday life, city, dust, lost borders, positive nature, lines, new geometries, biomorphic landscapes, plants, technological fragments, scraps, ruins, temples, walls, squares, courtyards, old photographs, stock photography, miniatures, birds and socializing areas.

It is known that Corbusier, who described the dimensionality and formality through machines, dwellings, prime shapes and grids, furthered his work with the aim of creating a universal and systematically applicable language [34]. Considering the actors who tend to more autonomous themes than such universal views, Invernizzi and Niemeyer can be mentioned (Figure 7). Invernizzi emphasizes that the theme of "surrationality" can be represented through autonomous parts, geometric tracks and moving building parts. Niemeyer, on the other hand, highlights his geometries, which include connotations of monumentality, fantasy and desolation, by constructing singular buildings with the aim of creating a city of desire. Hadid, who uses a dynamic field of study such as suprematism as a source of inspiration in youth work, expresses the visual reflections of emancipation, arbitrariness and randomness through abstraction to make sense of her quest for cosmopolitan nature [35].

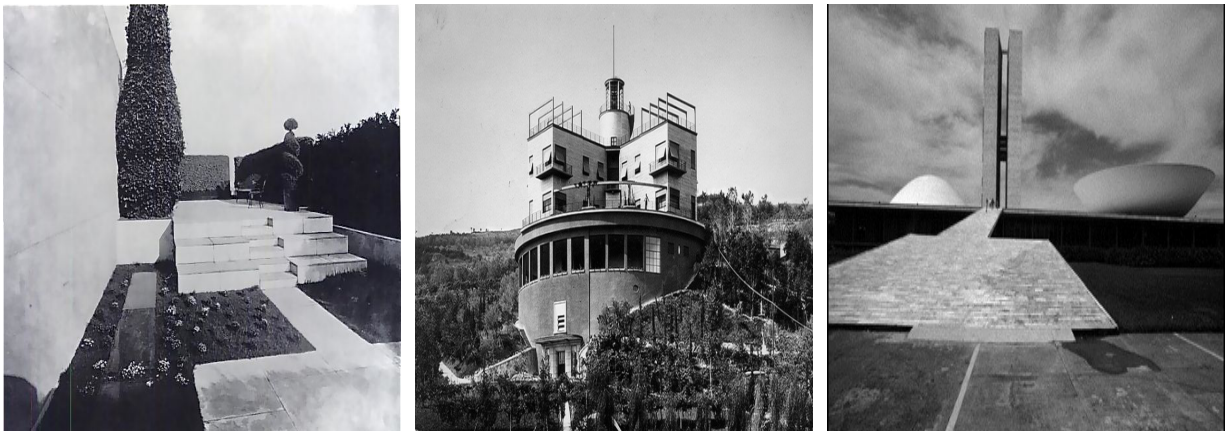

Figure 7. Corbusier's Beistegui Rooftop, Invernizzi's Villa Girasole and Niemeyer's Brasilia, from left to right [URL-4, URL-5, URL-6]

Hejduk, on the other hand, is known to use traces, x-ray theme and metamorphosis moments to reinforce the themes of duality and opposition [36]. Touching on a much more comprehensive area than the limited perspective pointed to by Avant-garde movement, Eisenman examines the particles on the axis of the discussions of meaninglessness, contextlessness and modellessness, and makes formal attempts that can shatter the meaning of the whole [37]. Koolhaas's work on the metropolis theme, which he furthered through New York, is detailed with discussions on the most radical forms of concentration, agglomeration, and chaos [38]. At this point, it is Libeskind who mentions that the metropolis as a whole, consisting of the contradiction, overlap and intersection of countless images, produces countless symbols and that the symbols point to a much longer time period in the historical context [39]. Libeskind deals with the themes of expansionism and chance, with traces without identity, symbol sets resembling hieroglyphic traces, and by discussing the theoretical counterparts of invisible floors (Figure 6).

Of course, all these discussions have also worked as supporters for some avant-garde approaches that describe the more speculative study areas of the near future, expanding the theoretical field. Coop Himmelblau's work on improvisation and vulnerability is a good example of this while he deals with the ruins together with the search for an intense sense of reality [40]. Observation and performance orientation, which Diller Scofidio + Renfro evaluates on the axis of the concept of doubt, also contributes to this field, which makes it easier to read the spatial counterparts of the conceptual palette of avant-garde movement [41].

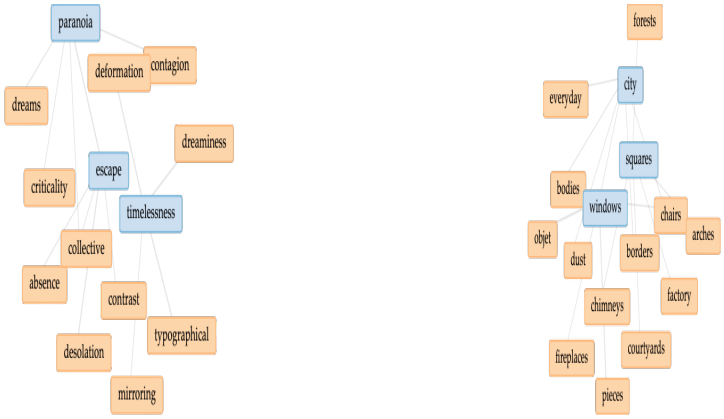

Figure 6. Relations of components in the context of avant-garde potentials (Improved by author)

4. FINDINGS

When the relations between the figures and the detailed bonds are examined, it is seen that the pioneering productions in the field of painting, sculpture and interior architecture, which took place in the light of the guiding theory from literature, poetry and philosophy, affected the creative processes in parts of contemporary architectural superpositions that could be considered as related to avant-garde movement. Architecture is a ground where rationality and irrationality often overlap and/or intersect. Avant-garde movement also includes a data field that can neither be explained only by rationalism nor by irrationalism alone. Concepts that help define avant-garde movement stand out as details that define the processes of experiencing space and action in architecture. The contrasts and similarities reveal a series of products of immediacy, fed by the intertwining of dream and reality, as the decrepit Breton described in 1924 manifesto. Directness is an indispensable tool for avant-garde movement to be included in the discussion platform in a space. Evaluating immediacy together with the concepts of autonomy and automatism enables the knowledge of avant-garde movement from the past to be associated with concept sets of contemporary themes in a way that can be transferred to the future. The concepts that enable the figures who make pioneering productions for the spatial potentials of avant-garde movement knowledge to contribute to the character of today's architectural production by transferring them to contemporary architectural producers can be listed as follows: Dimensionality, formality, surrationality, monumentality, imagination, desolation, fragmentation, autonomy, pluralism, autonomy , emancipation, arbitrariness, randomness, suprematism, duality, opposition, meaninglessness, contextlessness, modellessness, concentration, agglomeration, chaos, expansionism, luck, improvisation, vulnerability, observance, performance orientation (Figure 7).

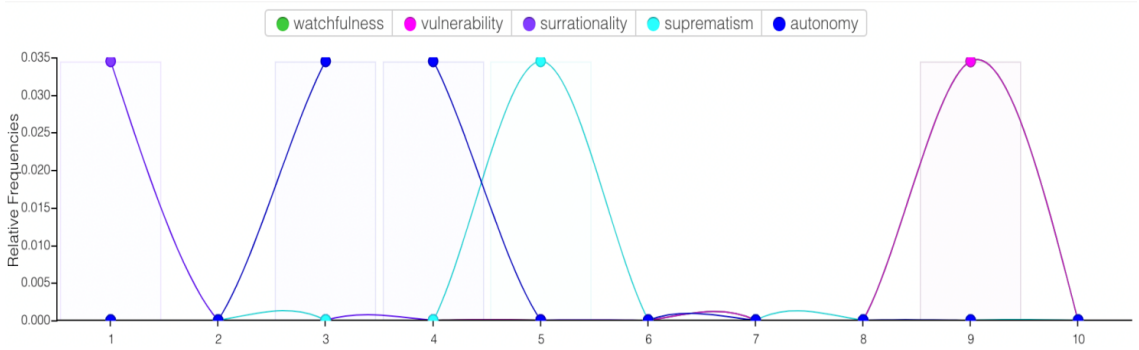

Figure 7. Hybrid themes in the context of spatial potentials: relative frequencies of themes and number of intersections of a theme (Improved by author)

The spaces and objects in which the concepts mentioned above and which affect the production of contemporary architecture can exist on/in and enable the formation of new areas of derivation by being related more rapidly and effectively, form a list as follows: Machinery, dwelling, prime forms, grids, autonomous parts, geometric traces, acting buildings, singular buildings, cities of desire, fragments, borders, cosmopolitan pieces of nature, x-rays, moments of metamorphosis, particles, metropolises, traces without identity, traces of hieroglyphs, invisible floors, ruins, striking facts and doubts (Figure 8, 9, 10).

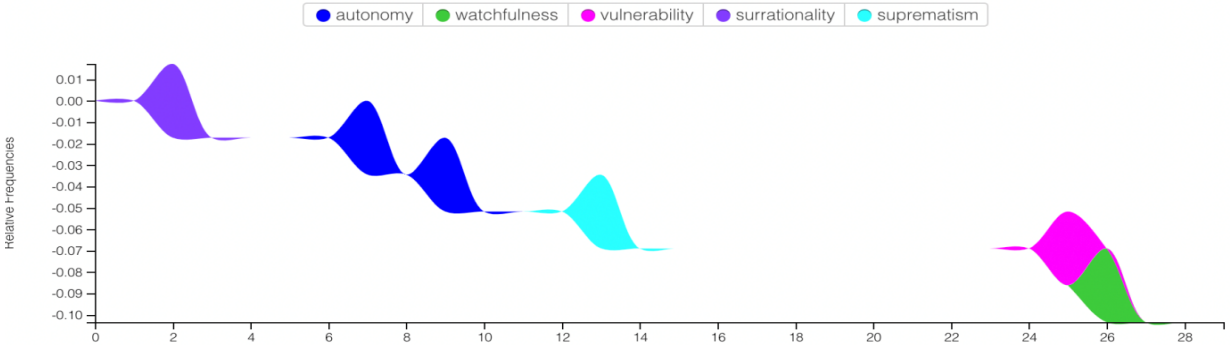

Figure 8. Relations of hybrid themes in the context of spatial potentials: relative frequencies of similarities and intensity of similarities of a theme (Improved by author)

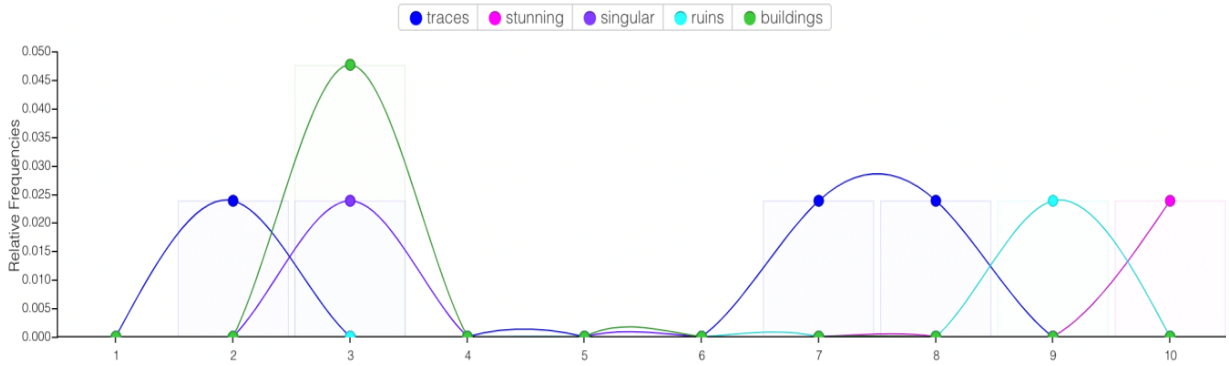

Figure 9. Most relative hybrid components in the context of avant-garde potentials: relative frequencies of themes and number of thematic similarities (Improved by author)

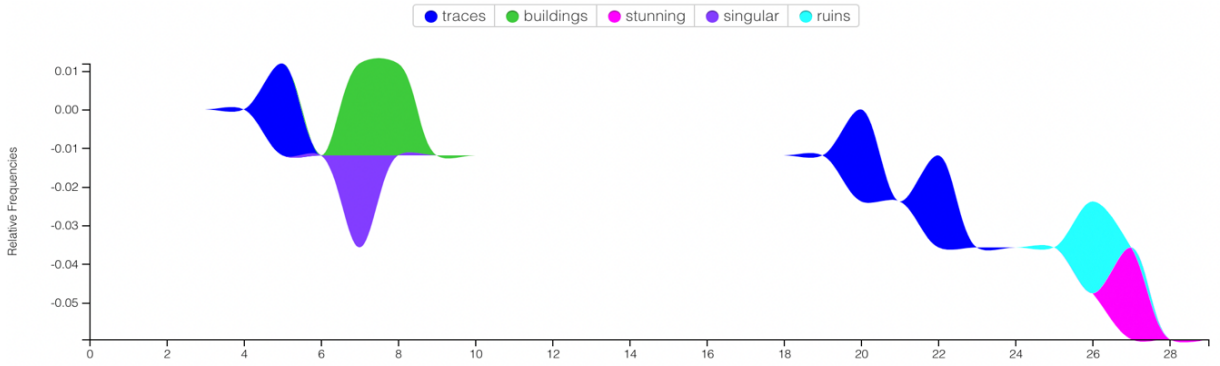

Figure 10. Relations of hybrid components in the context of avant-garde potentials: relative frequencies of intersections and intensity of intersections of a theme (Improved by author)

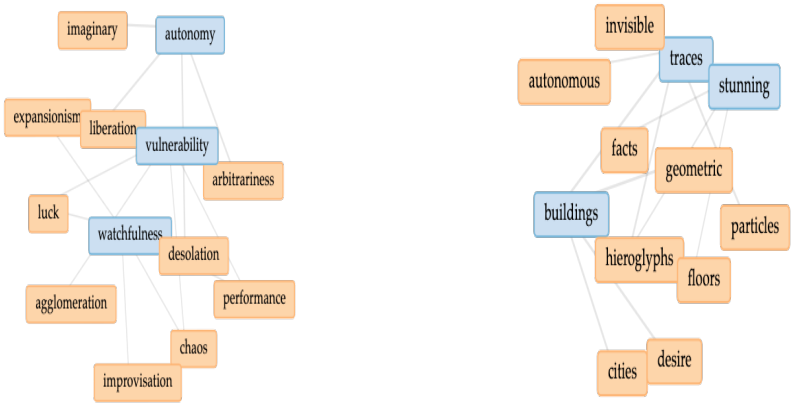

Figure 11. Relations of hybrid components in the context of avant-garde potentials (Improved by author)

5. CONCLUSION

When all data sets are evaluated together, the numerical emphasis will be more prominent in the relationship that avant-garde themes will establish with space in the near future. Thematic groups are listed as: 1. Imaginary, expansionism, liberation, arbitrariness, luck, desolation, agglomeration, desolation, performance, chaos and improvisation. 2. Autonomous, invisible, facts, geometric, particles, hieroglyphs, floors, desire and cities. Smaller groups also demonstrate specific spatial potentials as imaginary; expansionism, liberation and arbitrariness with autonomy; luck, desolation, agglomeration and performance with vulnerability; expansionism, improvisation and chaos with watchfulness; autonomus, hieroglyphs and particles with traces; cities, desire and geometric with buildings; and facts, geometric and floors with stunning. Headlines work as the multiple connectors as “autonomy”, “vulnerability”, “watchfulness”, “imaginary”, “buildings”, “traces” and “stunning”.

While Rabiger says that excessive control in the creation process is one of the most important obstacles, he mentions that dreams are important because of their uncontrollability and directness in conveying data about the subconscious. It emphasizes key goals such as celebrating the downright strangeness of reality and setting aside stereotypes, recalling the dadaist and avant-garde strategies of the early 20th century. In this sense, open-endedness, fragmented clutter, visual and metaphorical situations excite the person who will experience the creative product by inviting them to a solution process and make the product more attractive in terms of experience. Since dreams contain interpretations of surreal experience, symbols and metaphors mediate the unseen, unconsidered and undiscussed aspects of reality. At this point, the leading concepts (2016) arising from the basic questions suggested by Rabiger provide important ideas about the context in which the conceptual palettes of avant-garde figures that can be used in the construction of spatial identity can be brought together. These questions often refer to the structure of the dream, whether there is a crisis point in the dream, whether the associated concepts are connected with a myth or folktale, the hidden factors that make the prominent figures in the dream central, the volatility, the constancy, allusions and challenges [42].

With the title he defines as “visionary architecture”, Spiller touches upon how the ways of imagining the future affect spatial understandings. While reminding that for this it is necessary to feed on a very wide pool of concepts, he mentions a concept called “avant-cybernetics” long before today’s “cybernetics” theme. The 1992 redefinition of the function of certain areas of the body by imaginary organs by Chard points to the potentials of the idea of the living organism. These works evoke the actionable potentials of fluid states in Dali’s work. It is very important in defining the architecture of the future in terms of representing

the cooperation of movement, science and dreams. In this context, in addition to machines, autonomy and the "ornamental savagery" that progresses with them, Gaud's relationship with "morphogenetics" can be defined as "visionary". Spiller associates Diller+Scofidio's 1996 work "Mutant Bodies" with this context, and when he continues to follow the movement, he pursues a new definition of freedom. Thanks to a similar point of view, the definition of "visionary housing" becomes able to find application areas through a language that combines with the space planning of the future. In Ivanovic's "The Farnsworth Machine", Mies van der Rohe's work is reconsidered, and the intense fluidity-slippery-holism represented by interlocking fragments indicates the inspiring potential of reinterpretations. Tschumi's 1983 La Villette models and Hadid's 1983 works for La Villette, which Spiller also mentioned in the context of "visionary architecture", are pieces that contain essences fed by the common concept palette of "visionary architecture" and avant-garde movement. By citing Woods' 1984 Epicyclarium as an example, Spiller reminds us that visionary architecture is not always composed of fluid, intricate and progressive elements, but can sometimes be extremely mechanical. On the other hand, in both cases, there is a distinct poeticism that avant-garde movement uses as a reflection of dreams. Spiller cites Bunschoten's 1985-87 work as an example (Figure 11). When all these are evaluated together, it is seen that at the beginning of the nineties, there is talk of digital dreams, the fantastic effects of light, and the dynamic combinations of parts resembling cables. Similarly, inflatable structures, parasitic structures, visionary representations of nanotechnology, and "cyber-space" studies provide clues about formal and functional collaborations in which future representations can take place [43]. Strategies clustered around workspaces such as liquid architecture and cybernetic organisms [44] will be developed for speed-oriented systems in order to shorten the response time of the systems [45]. In this direction, the inferences that the next agenda will be shaped around human-machine discussions and the desire to reflection of vivid reality still remain valid for the contemporary productions.

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Rethinking the Role of the Street: A Framework for Developing Liveable Streets in Urban Fabric of Turkey


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Abstract: *The streets have been converted into substantial traffic thoroughfares in contemporary cities, although the prevailing belief that the street is just a channel for movement has expired. Streets provide possibilities contributing to social interaction as a part of public life. They are "more than physical transit roads" because of their wider role and impact on activity patterns and social life by ensuring harmony and dynamism in the urban fabric. This study aims to rethink streets and explore the socio-spatial characteristics of vibrant and liveable street design. Following this aim, a literature review has been conducted through looking at several theories of liveable streets and their role in urban fabric to define an analytical framework which has been used to analyze the street. This framework has been defined in three main categories: physical, social, and functional attributes. Within the scope of this framework, a street in Gaziantep has been chosen as a case study to examine strengths and weaknesses through observations. In conclusion, concrete recommendations for determining problems have been proposed with the help of illustration/visualization techniques following the framework's criteria. Moreover, these can provide a guideline for future designs.*

Keywords: *Liveability, Liveable street, Characteristics of liveability, Urban design, Social interaction, Social sustainability, Gaziantep city.*

Caddenin Rolünü Yeniden Düşünmek: Kentsel Dokuda yaşanabilir Caddeler için bir Değerlendirme Çerçevesi

Özet: *Caddelerin sadece hareket için bir kanal olduğu yönündeki yaygın algı sona ermiş olsa da, günümüz caddeleri önemli trafik yollarına dönüştürülmüştür. Kamusal yaşamın temel bir parçası olarak caddeler, sosyal etkileşime katkı sağlayan imkanlar sunmaktadır. Kent dokusunda sağladığı düzen ve dinamizm neticesinde davranış biçimleri ve sosyal yaşam üzerindkie önemli rolü ve etkisi dikkate alındığında caddeler fiziksel geçiş yollarından çok daha fazlasıdır. Çalışma caddeyi bu bağlamda yeniden ele alaraka canlı ve yaşanabilir sokak tasarımının sosyo-mekansal özelliklerini keşfetmeyi amaçlamaktadır. Bu amaç doğrultusunda yaşanabilir sokaklara ve bunların kentsel dokudaki rolüne ilişkin teoriler araştırılarak caddeyi analiz etmek için kullanılan analitik bir değerlendirme çerçervesi oluşturulmuştur. Bu çerçeve üç ana kategoride tanımlanmıştır: fiziksel, sosyal ve işlevsel özellikler. Bu çerçevede tanımlanan unsurlar doğrultusunda, Gaziantep'te bir cadde alan çalışması olarak incelenmiş, güçlü ve zayıf yönleri gözlemlerle ortaya koyulmuştur. Sonuç olarak, analitik çerçeve unsurları takip edilerek, problemlerin belirlenmesi ve çözümüne yönelik örnekleme/görselleştirme teknikleri yardımıyla somut öneriler sunulmuştur. Caddenin kamusal etkileşimdeki önemine dikkat çeken çalışma bulguları, gelecekteki kentsel tasarımlar için bir kılavuz niteliğindedir.*

Anahtar Kelimeler: *Yaşanabilirlik, Yaşanabilir cadde, Kentsel tasarım, Sosyal sürdürülebilirlik, Gaziantep.*

1. INTRODUCTION

Streets are essence, public spaces of the urban environment that influence people's daily activities. They have served as the first setting beyond the home where most children have been reared [1]. Since ancient times, the street has provided a public space network in a city [2] and acted as a platform for social interaction by hosting various activities that bring people together [3, 4]. The street is recognized as a public space used for social and commercial activity, communication, political activity, ritualistic and symbolic place in a city [2, 5].

By examining the street, one can understand the city and the society in which the street is located, contributing to constructing a sense of place and identity of the city [2, 3]. As Jane Jacobs (1961) cited: "Streets and their sidewalks, the main public places of a city, are its most vital organs. Think of a city, and what comes to mind? Its streets. If a city's streets look interesting, the city looks interesting; if they look dull, the city looks dull."

Later, the growing vehicular traffic started conditioning all aspects of urban life in the city. For decades, streets have struggled with fast-moving or heavy traffic [5, 6]. Moreover, the function of the street as an interaction place has been socially neglected. With the needs of the growing cities with dense populations, the street was considered just a vehicles road. Vehicular traffic requirements and functional requirements based on separation of the uses were believed as a design dogma. One of the leading modern movement members was Le Corbusier, who said: "Our streets no longer work. Streets are an obsolete notion. There ought not to be such a thing as streets; we have to create something that will replace them". Later he said: "No pedestrian will ever again meet a high-speed vehicle. " Moughtin (2003) criticized that fast-moving traffic cannot be accommodated within a street [5], while Stein labeled cars are a "menace to city life" [6].

As a result, today, these streets have turned into unsafe, dangerous, noisy, polluted, and impersonal domains [1]. This dramatic change in urban planning led to the absence of a human-scale environment for the sake of vehicular traffic, which led to the deteriorating liveability of the built environment [7]. Furthermore, the uncontrolled nature of transport construction often negatively impacts urban spaces, causing uninhabitable tracts of public space [8]. However, the streets have been converted into huge traffic thoroughfares in contemporary cities, although the prevailing belief that the street is just a channel for movement is not true. Streets provide possibilities contributing to social structure as a part of public life. They are "more than physical transit roads" because of their broader role and impact on socio-spatial life and dynamics.

It is vital to find urban design options and attributes in urban design in order to improve the quality of urban life [9]. In relation to this, it is important to ensure liveable and vibrant streets in order to contribute to the quality of the urban design and enhance the city's "quality of life." In order to achieve this goal, several social and recreational functions should take place on the street with the minimum negative impact of fast-moving vehicles.

This study aims to rethink the current role of the streets and demonstrate the opportunities of the streets by defining indicators/criteria for alive-liveable streets which contribute to the quality of public spaces. Moreover, proposals in the study providing efficient design concepts on urban fabric of the case study following the criteria will provide guidance for the future designs with concrete applications. The case study has been chosen from one of the metropolitan areas in Gaziantep, Korutürk Caddesi, which is a primary location for shopping and gathering.

2. MATERIALS AND METHODS

This paper focuses on the role of streets for liveable environments, which impacts social interaction. A literature review has been conducted through looking at several theories of liveable streets, which describe their primary characteristics and their role as public spaces in urban fabric to define an analytical framework used

to analyse the street. This framework has been defined in three main categories: physical, social, and functional attributes. The case has been investigated through observations in the scope of the framework proposed by the authors. This analysis of the case study, Korutürk Caddesi as a main road in Gaziantep, reveals the area's physical, natural, functional, and socio-economic conditions and gaps in terms of planning. The observations and accurate studies of the physical aspects of the studied street have been conducted through field notes and photos. The data were compiled during the observations on the site, and each aspect identified has been examined and classified in the proposed framework. In conclusion, the potential in Korutürk Caddesi for being a more liveable and vibrant street will be explored, and concrete recommendations will be represented with the help of illustration/visualization techniques following the criteria of the framework. Moreover, these can provide a guideline for the future street designs.

3. LITERATURE REVIEW AND ANALYTICAL FRAMEWORK FOR THE EVALUATION OF THE STREET

3.1. The Concept Of Urban Liveability And Liveable Street

Liveability is a common concept of urban planning [10]. Even there is no standardized definition for the concept of liveability and liveable city [11]. But there is, a primary condition for a place to be liveable has been broadly accepted "the well-being of a community and represents the characteristics that make a place where people want to live now and, in the future" [12]. While many writers defined liveability as "one of the aspects that could contribute to a high quality of living" [10]. Liveability emphasizes the importance of quality of living because it affects citizens' lifestyles and health conditions within the built environment [10]. It can be concluded that the concept of liveability is mainly focused on the "quality of life" issue. Therefore, the principles or criteria of urban design that should be identified must enhance urban design quality. The prompting calls for urban planning to be liveable is one of the most critical aspects of the city [9]. As urban components influence urban liveability and "quality of urban life" [13, 12].

One of the comprehensive definitions of liveability as mentioned by Crowhurst Lennard and Lennard (1987), "Liveable cities pay attention to the creation of architecture, streetscape, and public space design that facilitate the presence of city dwellers in the public domain and the heart of the city. Such cities are also committed to reducing traffic and resolving safety, pollution, and noise problems utilizing a variety of mechanisms" [9].

As seen, the concept of liveability in urban design can be obtained on a small scale through urban street design [9]. Streets are vital components of liveable and appealing communities. Streets aren't simply movement channels for cars, bikes, or foot; they're also social gathering places. Liveability related to streetscapes first made an appearance in Donald Appleyard's book Liveable Streets, published in 1981 [7]; he emphasized the importance of liveability, particularly in the streets, as a critical goal in achieving a pleasant urban environment. As he stated, the street is "the most important of our urban environment" [9]. Since then, the idea of liveable streets has become quite popular. Definition of the liveable street or living street is a street concept that compares to the conventional urban street concept, places more concern and focus on pedestrians and cyclists so that the street can be equally used for all [6].

Liveability is linked to specific features related to streets, such as ease of orientation and movement, to reduce the stresses caused by pollution and crowding, in addition to designing a built environment that is responsive to the varying needs of residents [14, 13].

Appleyard's study identified seven indicators of street liveability, amongst them, the street as a sanctuary safe and secure; a healthy environment; a community where communal life strives; a sense of community and belonging; a place to play and learn for children; and, a historic place with a "special identity for residents or the city at large. " [10, 15].

3.2 Analytical Framework

Based on the theoretical discussions in the literature review, a framework has been proposed to examine the street and develop design typologies and zones for vibrant and adequate street design in terms of liveability. The prominent characteristics of liveable streets have been categorized into three main elements in the literature review. These are physical, social, and functional attributes [12, 16, 17, 18]. Accordingly, the analytical framework has been created following these three attributes to evaluate Korutürk Caddesi in terms of liveability.

physical attributes affect the street's design, quality, and liveability [18], as most social problems emerge from physical issues [4]. Street should focus on design in terms of physical and spatial improvements in relation to this. Moreover, many studies have extensively emphasized the social attributes of the street as an indicator for liveability [1, 2, 16].

Since no specified approach is detected in selecting the attributes and depending on the literature [18, 17, 8, 19], this study mainly focuses on the most significant examined practical characteristics of the liveable street. Although there are some general aspects for designing liveable streets, these should be intended in a flexible way according to local needs, instead of prescriptive methods or regulations to develop street standards.

Overall, particular physical attributes that form this study's framework include traffic management, parking space, sidewalk, crossing facilities, facilities for disabled people, street greenery elements, and improved physical attributes (paving, street furniture, vegetation, etc.). Moreover, to enhance liveability, social attributes are the essential points that should be considered. As streets provide the optimum place for public life and social inclusion, impacting street liveability. Furthermore, many studies have stressed the street's social attributes in its liveability [1, 2]. The social characteristics of liveable streets concern additional safety and comfort, the social interaction and activities occurring in the street, and considering inhabitants' feelings of privacy, belonging, and responsibility for their streets [16, 19]. There are a variety of functions that take place along the street. When the space's quality improves, these functions will be developed. Functional attributes of liveable streets are related to many features such as Accessibility, mixed-use and density, and active and passive edges.

Table 1.Attributes of livable streets

Physical Attributes	Functional Attributes	Social Attributes
▪ Traffic management ▪ Parking space ▪ Sidewalk ▪ Crossing facilities ▪ Facilities for disabled people ▪ Street greenery elements ▪ Improved physical attributes	▪ Accessibility ▪ Mixed-use and density, and active and passive edges	▪ Safety and comfort ▪ Human Activities

4. CASE STUDY

4.1. Study Site Location

Gaziantep city is the sixth-largest in Turkey and the eighth-most populous, located in the country's south-eastern part (Figure1). In the last decades, it has had a rapid population growth and urban extension due to its high migration rates from Syria and the surrounding countryside [20]. The city's new residential

neighbourhoods emerged to accommodate population growth. As a result, the number of car users rose, causing many issues such as traffic congestion, traffic accidents, bad pedestrian and cycling conditions, and poor social relationships.

Karşıyaka district is one of Gaziantep's low-income neighbourhoods. The main street in Karşıyaka, Korutürk street, is a very lively, mixed-use, commercial street with numerous markets and shops (Figure 2). The mayor of Gaziantep emphasized the importance of Korutürk street as she considered Korutürk Street to be the brain and reflection of Şehitkamil [21]. It is one of the most important neighbourhoods in our city. In 2015, the urban renewal process had carried out in the street as part of Gaziantep Municipality's strategy to boost the city's commercial streets. The renewal was limited to improvements regarding infrastructure and superstructure. The street includes mixed uses, residential, commercial, and administrative.

The commercial areas are dominated by different shops: grocery shops, clothing stores, gold shops, food shops, etc. The street has multi-story buildings, in which shops occupy the ground floor and the first to third floors house apartments. It also includes a mosque, post office, banks, police center, intermediate school, traditional Turkish restaurants, and many other activities. The street has been selected as a case study due to its economic importance and the location's potentialities, which can increase the vitality of the street and improve its functional performance efficiency. As this street is located near the Zeugma Museum, the most famous and iconic place in Gaziantep city. For evaluating the attributes, the survey was conducted to obtain people's viewpoints on the identified attributes. In addition, in-depth open interviews with participants, who were very familiar with the streets, were questioned to understand more about people's perspectives on their neighbourhood and life issues.

Figure 1. Turkey map and Gaziantep city boarder

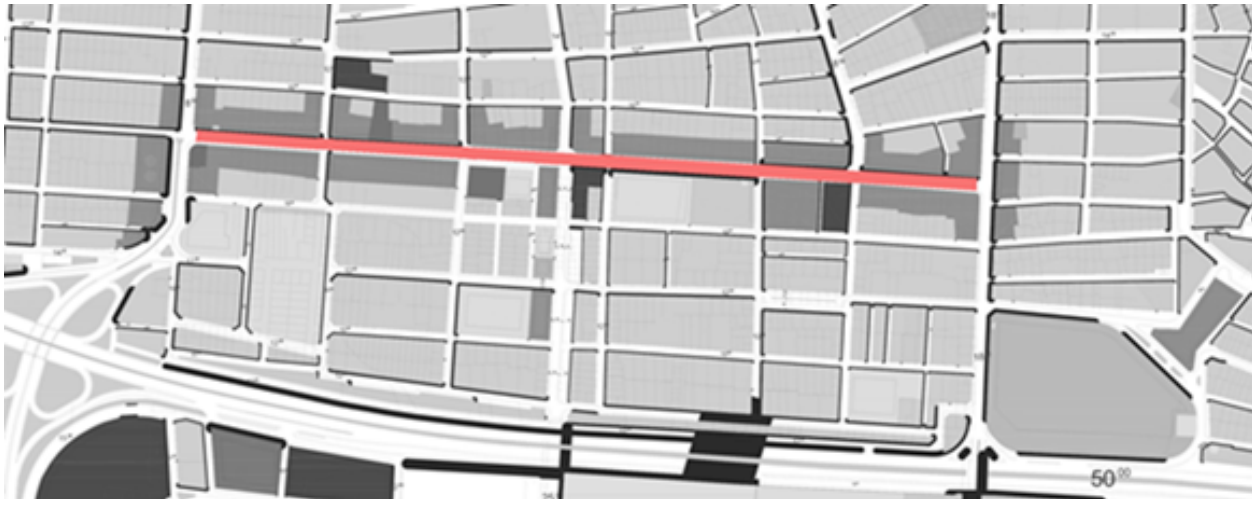


Figure 2.Korutürk Street

Figure 3.Traffic and Accessibility along street showing primary and secondary streets

4.2. Evaluation Of The Livability Of Korutürk Street

A framework has been defined based on the literature review regarding streets and their role in social interaction in terms of liveability. In the framework, sub-indicators have been classified into three main categories: physical, social, and functional attributes. In the scope of the framework, the socio-spatial characteristics of the case study have been analysed through observations of the authors, including field notes and photos. The weaknesses determined in terms of physical, social, and functional attributes that affect the streets' design in terms of quality and liveability have been represented in Table 2.

Table 2.Summary of finding and resulting attributes of Korutürk street (Photo by Authors)

Problem	Description	Photo
Physical attributes		
Traffic management	Traffic in the street is two-way, including public transportation and private cars, without separating the traffic lanes. It has high traffic causing traffic congestion and environmental pollution for residents. The street's width is not suitable for a two-way street	
Crossing facilities	The street lacks crosswalks and traffic calming; there are no signs to warn pedestrians and drivers or restrict vehicles' speed. Moreover, the traffic doesn't consider the danger of traffic, speed, and accidents with no calming traffic techniques. That affects widely and negatively the safe of the children who use the school in the street.	
Parking zone	Car parks are available on both sides of the street, creating a dead space. Parking on the street causes substantial traffic congestion and pollution. Furthermore, the cars parked on sidewalks obstruct pedestrians' movement. Another issue is that users park on unoccupied lands in the back because the street does not have enough car parking space.	

Sidewalk	The sidewalk is narrow, limiting pedestrian mobility and making it difficult for two or more persons to walk together comfortably. In addition, sidewalks are always taken by the shops, or street vendors, which pedestrians can't use for a suitable comfortable walking	
Street greeneries	The street greeneries fall short of expectations. There is a small number of trees planted and have no order along the street and hardly any landscape features. Furthermore, there are no green areas, and the majority of the surfaces are covered in concrete tiles	
Improved physical attributes	The street lacks sitting, shading elements, bike lanes, and barriers to keep people safe. There are no seats available on the street, even though there are numerous banks and administrative offices where one must wait. The lack of bike lanes on the street is due to the street's width, which is insufficient to accommodate bike lanes. There are no ramps or special materials on the street walkways to safely help physically and visually impaired individuals navigate the street and sidewalks	
Visual Image of facades along the street	The street is in a poor area and suffers from urban decay, which gives the road a bad image. Moreover, building heights vary along the street and do not create a strong sense of place and enclosure. Additionally, the poor condition of shops facades which have no order along the street, makes the street less enjoyable to walk through.	
Social attributes		
Human Activity	People use the street for necessary activities such as shopping and vehicular access without sufficient open space for neighbourly activities. In addition, the street is suffering from a lack of gathering nodes, sitting areas, recreational facilities, and play spaces to do optional and social activities.	
Comfort and Security	Physical and environmental problems mentioned previously affect the street users, such as lack of seating elements, narrow sidewalks, shortage of greenery, and others. These make the street not comfortable when walking.	
Safety	The ground floor is always dedicated to commercial uses, which offer a lively space all day and increase safety through the street watchers (shopkeepers). In contrast, the level of safety decreases at night due to the lack of activities and functions on the street.	

Functional attributes		
Functions and Land Use	The street is a residential street with additional functions on the ground floors of the buildings. These functions play an essential role in creating a lively street. But during the night, this street is completely passive because most of the functions on the ground floors are closed. There is a negative point in the street: the lack of cafés, restaurants, and plazas for social interactions.	
Accessibility	The street is one of the primary streets of the Karşıyaka district in terms of Accessibility. The analysis of Accessibility in the street shows that the number of secondary and auxiliary streets which are connected to the street help to increase the permeability of the street (Figure3). However, while public transportation and private cars have easy access to the roadway, no one uses bicycles due to the absence of bike lanes. Furthermore, sidewalks obstruct pedestrians' movement as mentioned previously. In addition, the existence of many intersections and not enough crosswalks along this street. This situation reduces the street's overall safety	

As a summary, the street is considered one of the most important commercial streets in Gaziantep city as it presents a good economical aspect. Moreover, it offers several services for street residents and visitors. Even though the mentioned physical problems keep the street from being liveable, the diverse and lively functions encourage people to use the street. Therefore, the next part will suggest recommendations and strategies that would help enhance the street situation.

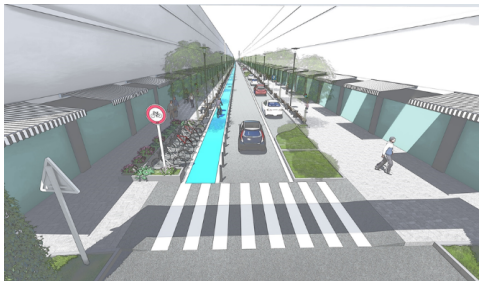
5. PROPOSED IMPROVEMENTS AND DISCUSSIONS

Within the concept of liveable streets, this paper assessed the physical, social, and functional attributes of Korutürk Street. The results showed many urban elements should be enhanced in terms of the liveability of the street. The proposed improvements need to be considered by several actors such as designers, local municipalities, and decision-makers. These concrete improvements present a part of the street with the help of illustration/visualization techniques following the criteria of the framework.

1.1 Improving the Physical Attributes

Instead of prescriptive new methods or regulations for developing streets, these criteria are designed to be flexible to local demands.

Table 3. Recommendations for Improving Attributes of Street

Items	Intervention	Imaginary photo
Traffic management	Traffic management strategies include traffic reduction ordinances and speed limits. Also, the street should be closed part of the street in front of the movement of cars and make them in one direction. There is a possibility to use a parallel street oppositely. Moreover, bicycle lanes should encourage more people to cycle and walk, thereby achieving Accessibility through multiple transportation options. Furthermore, drivers' awareness can improve that they are entering a slower-speed, pedestrian-oriented street environment.	
Crossing facilities	The street needs traffic calming at the entrance to slow entering vehicles and discourage through traffic. Gateways are suited and valuable for all roadway transitions to slower-speed environments. The number of crosswalk lanes along the street should be expanded, and they should be designed for ambulatory disabilities and children as well.	
Sidewalk	The sidewalks on the street must be improved, especially with regard to accommodating the use of pedestrians. They should provide enough space for people to use the sidewalk in various ways: walking, socializing, accessing buildings, etc. They should be designed following the minimum global standard for livable streets, which is 4 meters.	
Parking zone	Car parks are available on both sides, but they must be organized and designed to reallocate for other uses. As it can be served as an extension of natural elements and improve pedestrian accommodations. So, the parking zone can be increased on the secondary streets.	
Improved physical attributes	Physical qualities such as (paving, seating, lighting elements, waste bins, and so on) landscape and vegetation contribute to providing a safe and friendly environment for pedestrians.	
Improve visual Perception	Suitable design criteria should be developed to display commercial signages to get the visual consistency and the harmony to reduce randomness and visual pollution in the commercial street	

5.2. Improving Social Attributes

1.1.1. Improving the Human Activity

Outdoor human activity is divided into necessary and optional activities. People tend to engage with optional activities and encourage interacting with other people when the environment is pleasurable. The presence of commercial stores offering basic utilities, such as corner stores, local cafés, and restaurants, in between residential neighbourhoods is critical in sustaining life on the street [22]. Thus, the businesses on the ground floor should support liveliness and generate and sustain social activities and others that support these activities include cafés, restaurants, and other types of food outlets.

In addition, social activities along the street should be improved in order to attract a diverse group of people with different backgrounds and age groups, such as residents, tourists, and students. Moreover, more attractive functions must be introduced, such as street activities (plazas, street corridors, etc.), which are essential in attaining liveable streets.

1.1.2 Improving safety and security

To achieve liveability in the street, it should be a comfortable place where people can learn and perceive the nature and social connections in the neighborhood. Streets full of people are safer as residents of the street act like great street watchers and sidewalk guardians. Moreover, storekeepers and small businessmen take care and ensure the safety of the street heavily because it influences their business individually. The safety and convenience of using the street can be improved by drawing a clear demarcation between public and private spaces. Furthermore, improving safety elements (traffic and crime prevention) can provide a sense of safety when using the street.

5.3. Improving Functional Attributes

Diversity is one of the most important indicators of liveability; this diversity increases interaction between people and leads to variation in their activities and stimulation [4]. Diverse and lively functions encourage people to use the street and increase interaction between people and leads to variation in their activities. The combination of several uses in the area attracts people and makes the environment safer, especially at night. These functions could include providing high-quality public facilities and playgrounds for children and cultural activities. Moreover, the connection between the Zeugma Mosaic Museum and Korutürk street should be improved to attract more tourists to the street. The museum is an important icon to the city and an attraction point to tourism. The connected street should be well designed and clearly defined to invite people to the street (Figure 4).

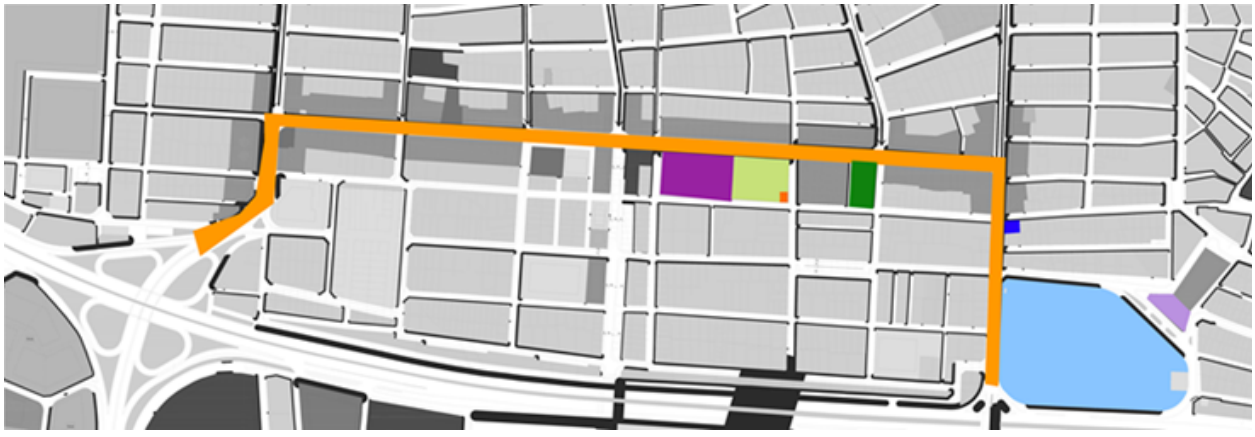


Figure 4.The photo shows the connection between Korutürk street and Zeugma Mosaic Museum (In Blue color)

6. CONCLUSION

The study has addressed the importance of street and the relationship with liveability and proposed an analytical framework to evaluate the streets. In the scope of this framework, indicators of liveable streets have been categorized into three main attributes physical, social, and functional. A case study has been selected to apply this evaluation concretely with the help of illustration/visualization techniques following the criteria of the framework. This research provided a review of the theoretical literature addressing the concept of liveability and liveable streets as an essential factor in upgrading streets and creating an analytical framework for the most important physical, social and functional indicators to raise a street's liveability. Recommendations which concretely applied on the case study for increasing its liveability reveal the potential to be liveable streets, which can play a significant role in adding to the overall liveliness of the Gaziantep city. Thus, the street must first and foremost continue to exist as a place for human contact through improved land-use policy, open space design, infrastructure and streets. This means "Everyone must use the streets" [2]. A street on which our children will bring up, adults live, and older people spend their last days.

It is important to emphasize the socio-spatial diversity that characterizes the area in which the study was conducted. In conclusion, concrete recommendations for determining problems following the criteria of the framework can provide a guideline for the future street designs. However, it is worth emphasizing that these implementations should be intended in a flexible way according to local needs instead of prescriptive methods or regulations to develop street standards. Although there are some general aspects for designing liveable streets, specific solutions should be developed for each different area. But it cannot be considered to represent the entire city. Thus, research needs to replicate the current study in other areas of Gaziantep city. However, it highlighted some of the shortcomings in the street design and planning that are needed to be considered by local decision-makers. For future studies, the authors plan to include in-depth interviews for a better understanding of people's perceptions of street design and how it affects their behaviour and activities.

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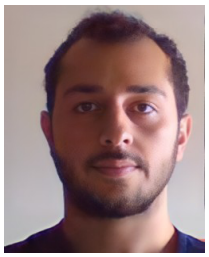
Usage of Water in Islamic Gardens and Sustainable Examples in the UNESCO World Heritage List

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Abstract: *This study aims to explore the relationship between cultural landscapes, Islamic gardens, water-sensitive cultural heritages, and sustainability seeking to capture a multilayered understanding of sustainable land use-scape techniques that these cultures could develop over time through their creative and elaborative interaction with water. This study handles an eight-phased evaluation process involving collaboration between text mining technology, UNESCO documents, and literature reviews. Benefitting from the official documents and query engine of the UNESCO World List, 16 cultural landscapes from 5 countries are selected and then examined by Voyant Tools- text mining technology based on the data UNESCO declared about them. Water-based landscape components, techniques, approaches, and terms that are extracted for each of the sites are supported by scholarly readings to lead to a qualified comparison between the heritage sites and countries. Comparative studies followed by the identification of the unified landscape system formed by the collective data of the heritage sites. The terms related to water-based techniques and rural landscapes are more commonly used than those pertaining to architectural features. This trend can be seen in terms such as oasis, palm, agriculture, qanat, irrigation, river, and hydraulic. Although water has always had a spiritual dimension, considering the environmental challenges related to water, it is seen that technical issues related to accessing water and using it sustainably clearly come to the fore according to the evaluations of the historical spatial patterns and implementations. Focusing on the necessity to develop adaptive spatial studies, this study is an attempt to further water-sensitive landscape architecture studies for the benefit of sustainability.*

Keywords: *Water-sensitive Studies, Islamic Garden, Cultural Landscape, Text-mining, UNESCO, Sustainability*

Suyun İslam Bahçelerinde Kullanımı ve Unesco Dünya Miras Listesindeki Sürdürülebilir Örnekler

Özet: *Bu çalışma, kültürel peyzajlar, İslam bahçeleri, suya duyarlı kültürel miraslar ve sürdürülebilirlik arasındaki ilişkiyi keşfetmeyi amaçlamaktadır. Bu kapsamda, kültürlerin su ile yaratıcı ve ayrıntılı etkileşimleri yoluyla zaman içinde geliştirebilmiş oldukları sürdürülebilir arazi kullanımı - peyzaj tekniklerine yönelik çok katmanlı bir anlayış yakalayabilmek mümkün olabilecektir. Bu çalışma, metin madenciliği teknolojisi, UNESCO belgeleri ve literatür taramaları arasındaki işbirliğini içeren sekiz aşamalı bir değerlendirme sürecini ele almaktadır. UNESCO Dünya Listesi›ndeki resmi belgelerden ve sorgulama motorundan yararlanılarak 5 ülkeden 16 kültürel peyzaj seçilmiş, UNESCO›nun onlar hakkında açıkladığı verilerden hareketle Voyant Tools-metin madenciliği teknolojisi ile incelenmişlerdir. Miras alanlarının her biri için çıkarılan su temelli peyzaj bileşenleri, teknikler, yaklaşımlar ve terimler, seçili alanlar ve ülkeler arasında nitelikli bir karşılaştırma yaratılabilmesi için bilimsel okumalarla desteklenmiştir. Karşılaştırmalı çalışmaları takiben, miras alanlarından gelen verilerin toplanması ile oluşturulan birleşik peyzaj sisteminin tanımlanması gerçekleştirilmiştir. Bus sistemde, su temelli teknikler ve kırsal peyzajlarla ilgili terimler, mimari özelliklerle ilgili terimlerden daha yaygın olarak kullanılmaktadır. Bu eğilim; vaha, palmiye, tarım, kanat, sulama, nehir ve hidrolik gibi terimlerde görülebilmektedir. Suyun her zaman manevi bir boyutu olmasına rağmen, su ile ilgili çevresel zorluklar dikkate alındığında, tarihsel mekansal örüntüler ve uygulamalara ilişkin değerlendirmelerde suya erişim ve sürdürülebilir kullanım ile ilgili teknik konuların net bir şekilde ön plana çıktığı görülmüştür. Adaptif mekansal çalışmaların*

geliştirilmesi gerekliliğine odaklanan bu çalışma, sürdürülebilirliğin yararına olacak şekilde suya duyarlı peyzaj mimarlığı çalışmalarını ilerletmeye yönelik bir girişimdir.

Anahtar kelimeler: *Suya Duyarlı Çalışmalar, İslam Bahçeleri, Kültürel Peyzaj, Metin Madenciliği, UNESCO, Sürdürülebilirlik*

1.INTRODUCTION

The 21st century will be a time of tumultuous environmental changes, which are likely to prove challenging and require innovative solutions. Water and climate appear to be the globally leading ones among these challenges. At this stage, the most crucial parameter determining our future is how much priority we give to water-sensitive works and whether spatial planning and design disciplines are in an effort to develop strategies for solving problems.

It is seen that international official platforms and treaties emphasize adaptive studies sensitive to land, heritage, water and climate. Beyond many credible others, three international treaties constitute a basis for the preparation of this research, which are the World Heritage Convention, the European Landscape Convention, and the 2030 Agenda for Sustainable Development.

Encouraging the identification, protection, and preservation of both the worldwide cultural and natural heritages, The United Nations Educational, Scientific and Cultural Organization (UNESCO) takes its roots from an international treaty titled the Convention concerning the Protection of the World Cultural and Natural Heritage declared in 1974. A follower of it, in 1992, the World Heritage Convention became the first international legal instrument for recognizing and protecting cultural landscapes [1].

Today, many cultural landscapes are at risk due to a variety of factors. In addition to the effects of disruptive human activities, increasing hybrid disaster risks and the impacts of climate change have become major threats to these areas around the world. This subject is sure capable of generating a vast amount of scholarly studies, but this study is focused on developing a multilayered understanding of sustainable land-use techniques that these cultural heritages could build throughout the centuries through their creative and elaborative interplay and equilibrium with the water.

Cultural landscapes are a visual representation of the range of human-nature interactions over time. They illustrate how different physical constraints and opportunities have affected our relationship with nature [2].

Within this study, it is decided to study Islamic gardens in regard to cultural landscapes as they have a high spiritual interplay with water and could have produced characteristic spatial fabrications under harsh environmental dynamics. This study pays a specific concern to not the figural patterns or replications but their experiences with nature and water in the context of sustainability.

Islam regards water as the source from which all life originates [3]. Water is an essential part of the Islamic faith and is used in daily religious ceremonies. It can be difficult to find water due to the desert climate in Saudi Arabia, where there are few plant species that can extract groundwater. Therefore, no area surrounding Hejaz has a history of garden design because there was never any vegetation present for this purpose. Thus, date trees and water were considered an oasis garden [4].

The surroundings of natural freshwater resources have always been ideal living and production areas for people; thus, such places have been used for centuries by people of different religions. Since Islamic cultural landscapes generally spread in arid or semi-arid regions, areas close to the natural water resources have a multi-layered and multi-cultural structure. These areas may exhibit patterns of cross-cultural transitions, adaptiveness, or accumulations. The reason to define these areas as Islamic gardens is that probably the best-read layer within this multi-layered landscape is the Islamic one.

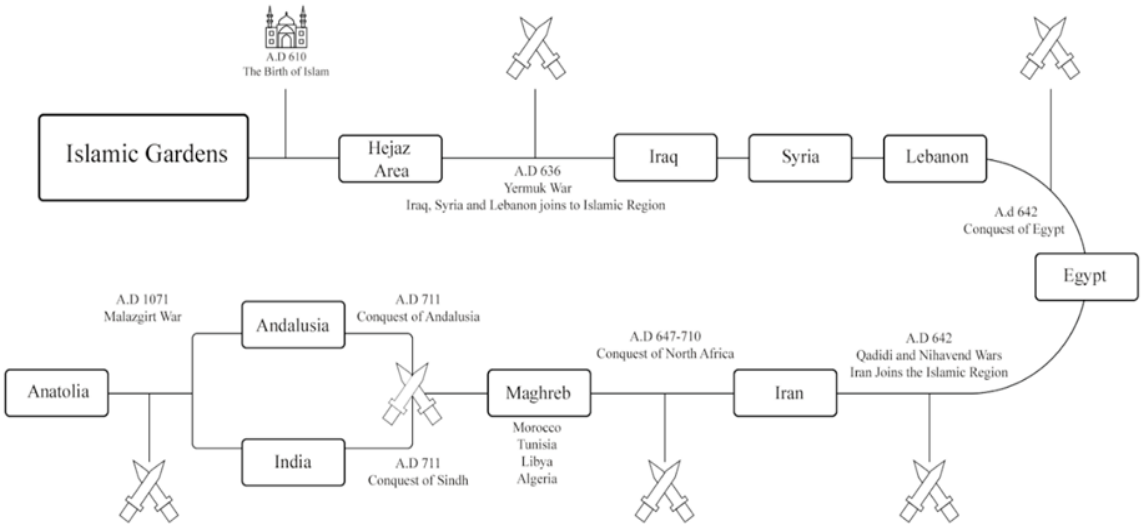

Figure 1. The Spread of the Religion of Islam

Figure 1 illustrates the Islamic civilization spread over a large geographical area where it has witnessed and interacted with different cultures. Gardens reflect both the differences and connectivity with the cultures and geographies. According to [5], "Islamic gardens can be divided into Maghrib, Turkish, Middle Eastern, Iranian, Central Asian and Indian groups".

Where natural water sources do not exist, people have developed innovative techniques with sedulous efforts to improve their water provisions. Moreover, they have succeeded in creating living spaces for themselves out of almost none. One of the motivations for developing this research is to discover and understand these techniques, which may stand at the interface of landscape planning and landscape engineering. To start a scrutinisation process, this study focuses on the projects that are known and titled with their cultural identities but survived for centuries due to their respectful design towards natural data.

Landscape architecture is a field that is well-suited for conducting multiscale studies, which makes the profession competent to participate in multi-disciplinary research projects [6].

In such a period when there is a need to find solution strategies for climate and water-based problems, landscape architecture, as a discipline that has the training to carry out multi-disciplinary and multi-scale studies, should fulfill its responsibilities in the name of sustainability.

This study aims to gain a multilayered understanding of the interplay between the discipline of landscape architecture and historical Islamic gardens- cultural landscapes toward their water-sensitive settings.

2. Materials and Method

The method of this study has taken shape from the interplay between the keywords of the cultural landscape, Islamic garden, water-dominant cultural heritage, and sustainability seeking. Due to its credible presence toward heritage-based issues, this study has taken UNESCO's knowledge for the development of the method.

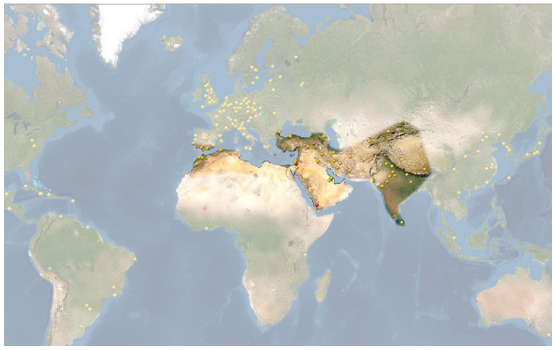

Figure 2. Regions with UNESCO Heritage sites where the first Islamic civilizations are shown

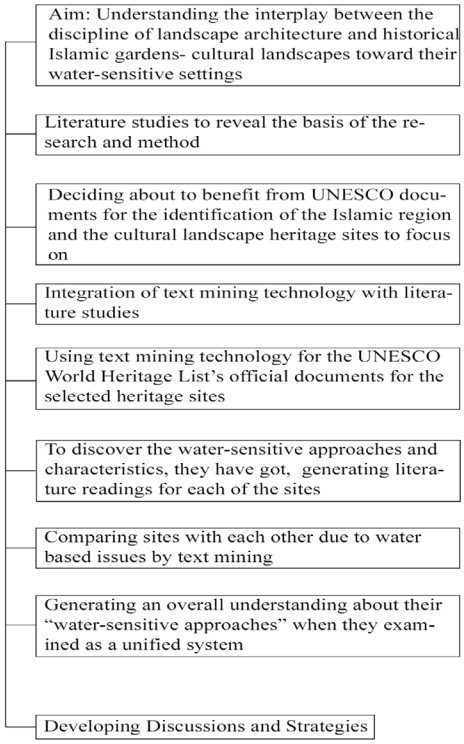

Figure 3. Regarding the aims declared in the preceding section, this study benefits from a 8-phased process available.

Via the map in Figure 2, it is available to see the fabrications of Islamic civilizations protected by UNESCO. Islamic impact covers many countries with a total number of 235 heritage sites. Regarding the 25 countries holding these heritages, cultural, climatic, and topographical variations take place; thus, altogether, they represent a dashing lushness [7].

Although Islam has a worldwide extension, this study defined and focused on a specific boundary, a region representing the chronological expansion of the Islamic garden culture.

This internationally leading association forwards a query engine for discovering heritage sites with their attributes. Benefitting from this occasion, this study conducted a query for the keywords of Islam, Water, and Garden. Overlaying the received results of the queries and the boundary selected within this research, protected areas within the boundaries of 5 countries as 16 heritage sites were gathered. This study did not

solely rely on the results of the queries but also conducted a text control within the official pages of the related heritage sites for proofing their nominal contact with the water-dominant heritage character.

These 16 different heritages [7] are selected by UNESCO due to their attributes corresponding to 6 different criteria among the overall 10 criteria. According to [8], these criteria are as follows:

> I- to represent a masterpiece of human creative genius;
>
> II- to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
>
> III- to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
>
> IV- to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
>
> V- to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
>
> VI- to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria).

Following the detection of the heritages to study on, literature studies revealing their relation with water were conducted to generate a multilayered understanding for each of the areas. Another question of this study is also the official visibility of the water-dominance within their character via their pages within the UNESCO website. Therefore, Voyant Tools as an open source text mining software was operated. Using a computational algorithm, the Voyant tools platform is capable of extracting linguistic and statistical information from texts of all sizes, types, and languages. All extractions are available in visual formats [9].

This text-mining tool was beneficial for comparing the heritage sites with each other due to water-based characteristics and how they represent a unified stance about this specific subject. Although this study focuses on a particular topic that is getting increasingly important within this decade, these heritage sites are valuable due to several aspects and criteria. Thus, this study also tried to understand the proportion of water-sensitive characteristics of these cultural landscapes within their characteristic richnesses and scholarly studies. Following these phases, standing as the last phase, revealing discussions and strategies did finalize the research.

3. RESULTS AND DISCUSSION

This section examines the heritage sites within the borders of 5 countries in the context of their interaction with water, while its final part conducts both a comparison between the cases and the final discussion holding the Voyant tools extractions.

Saudi Arabia

The variety of plants grown in Saudi Arabia, including the Hejaz Region, where Islam was born, is limited. Saudi Arabia is experiencing an acute water shortage due to its limited and non-renewable groundwater resources, as well as the country's arid climate [10]. However, when searching with the keywords "Islam, garden and water", one region appears: "Al Ahsa" region.

Figure 4. Al Ahsa region, Date gardens and water canals [11]

Figure 4, illustrates a part of the Al-Ahsa region. Most recently, in 2018, as the biggest oasis in the world with 2.5 million date palms, the Al-Ahsa oasis was inscribed as a cultural landscape heritage. Traditional farming systems, such as wells, canals and springs, have been in use at this oasis since the Neolithic era. These systems are still used today to manage crops for traditional farming practices. Al Ahsa is home to a rich cultural heritage, including historical and archaeological structures dating back to the early Islamic era. In addition, it features fortresses and mosques from that period [12].

There is a cultural landscape idea with an agricultural organization based on the distribution of spring water through a network of open-air channels for the continuity of the oasis tradition. The oasis is a notable example of traditional human settlement located in an arid environment, illustrating the close relationship between landscape, natural resources, and humanity's struggle to establish dominion over the land. Thus, it is included in the UNESCO Heritage List due to Criteria III, IV, and V. [13].

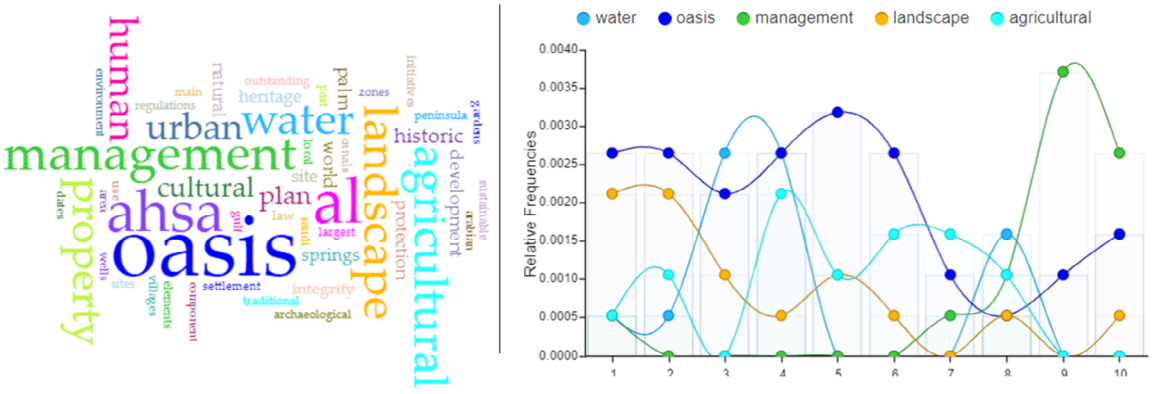

Figure 5. and Table 1. Comparing Usage of the Words With Wordcloud and Graph for Saudi Arabia Which was in the UNESCO Heritage List

In Table 1, we see the most commonly used words and the comparisons of the texts written for the Al-Ahsa region on the UNESCO website via the "Voyant tool". Regarding the relative frequency levels of the related terms, "water", and "oasis" together with the "landscape and agricultural" terms, appear significant even in such a desert and harsh geography. Apart from these, the words "property and management" are apparent due to the official role of UNESCO. When we examine the figure above for the other keywords, palm, springs, dates, wells, gardens, and sustainable are visible.

Iran

Garden design dates back to pre-Islamic Iran. We see that the roads and canals are perpendicular to each other and surrounded by high walls in the gardens we encountered during the Persian and Sassanid periods [14]. The most substantial elements of these gardens are flowers and water. To use the water in the garden, pools or channels are made. The pools are placed on the main axis of the gardens and courtyards [15]. Charbagh is the most important model of the Persian garden and is an "archetype" [16]. Always divided into four sectors, where water plays a vital role for both irrigation and ornamentation, the Persian garden symbolizes Paradise and the four Zoroastrian elements of sky, earth, water, and plants [17; 18]. We see four of Iran's works related to garden and water use in the UNESCO Heritage List.

Figure 6. Isfahan, Naqş-ı Cihan Square [19]

Naqş-ı Cihan Square, one of the largest examples of Chahar Bagh seen in Figure 6, has great dimensions of 520 m in length and 160 m in width [20]. It was built by the Great Shah Abbas at the beginning of the 17th century. Monumental buildings are connected by a series of two-story arches; the Royal Mosque, Sheikh Lütfullah Mosque, the Qaysariyyeh Portico and the 15th century Timur Palace [21]. With its diagonal features, sharp walkways and green spaces, the square has a dominant pool element at the intersection of the Chahar Bagh. It is included in the UNESCO Heritage List due to Criteria I, V, and VI.

Figure 7. Persian Qanat System [22]

Further than 5.000 years ago, Persians devised a sustainable groundwater system, named Qanat. This ancient water management system was used to provide a reliable amount of water to human settlements and for irrigation in arid and semi-arid climates. Currently, there are scholarly studies indicating that the Qanat system is an Asian masterpiece for climate change adaptation [23].

Iran's arid regions; thanks to the water filling the alluvial spaces at the beginning of the valleys, the law of gravity is calculated and transmitted through underground tunnels. In Figure 7, we see the Persian Water Qanat, which includes eleven qanats representing this system, rest areas for water tanks and water mills. These water qanats continue on an axis. There is also a pool with a fountain in front of the main entrance door [24].

Another invention in Iranian civilizations using water qanat, water channels and gravity-based waterway systems is the Shushtar Historical Hydraulic Water System. The Historical Hydraulic System dates back to Darius the Great in the 5th century BC. It is used to convey water to the city of Shushtar through a series of tunnels that supply water to the mills. It creates a magnificent cliff from which the water flows downstream. It then enters the plain in the south of the city, where it provides orchards and farming on an area of 40.000 hectares [25, 26]. It is included in the UNESCO Heritage List due to Criteria III and IV.

Unesco heritage site Takht-e Soleyman captures its name from a robust travertine spring lake with a great volume of water. There is a travertine platform on the site where it is available to see the remains of a castle, a gorgeous palace related to the Sassanid era, and a Zoroastrian fire temple constructed during the Sassanid period named Azargoshnasb. With a lake at the center of it, this volcanic geosite, with its tangible cultural and intangible facts, still attracts the respect of both the Christians and Muslims [28].

Figure 8. Takht-e Soleyman, Iran [27]

With its worship history, this heritage site is specific, with its power coming from a multicultural landscape integrated with a unique natural water body and geographical environment. Thus, it is one of the heritage sites well-known as one of the representative sites of geomythology [29]. With a date of inscription 2003, this heritage site is accepted as significant based on Criteria I, II, III, IV, and VI. [30].

Figure 9. Persian Gardens, Iran [31]

It exemplifies the diversity of Persian garden designs that have adapted and evolved to different climatic conditions while preserving principles that have their roots in the times of Cyrus the Great in the 6th century BC. It is an important example that water has an important role for both irrigation and ornamentation [17, 18]. The Persian Garden, which we see in Figure 9, is an outstanding example of a kind of garden design that is achieved by using natural and human elements and integrating the important achievements of Persian culture with a physical and symbolic-artistic expression in harmony with nature. This garden has become the prototype for the geometrically designed garden layout spread around the world [18]. It is included in the UNESCO Heritage List due to Criteria I, II, III, IV and VI.

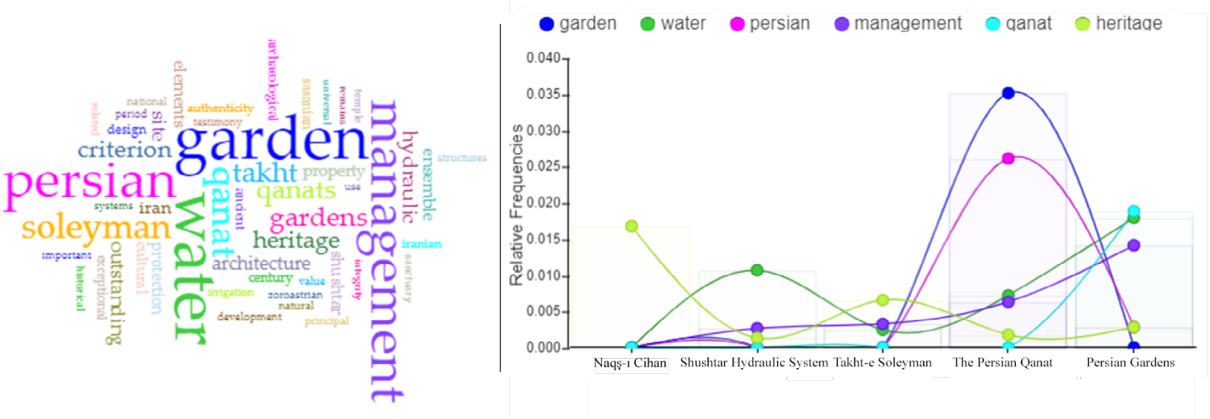

Figure 10. and Table 2. Comparing Usage of the Words With Wordcloud and Graph for Iran Which was in the UNESCO Heritage List

Persian Garden has been associated with the idea of Earthly Heaven, constituting a sharp contrast to its desert setting. We see the word cloud "hydraulic, qanat, water and gardens" in Table 2, which was made for Iran and also made with the "Voyant tool". In the Iranian region, some parts of which are deserts, the Persians gave great importance to water and used the "hydraulic system", one of the first examples, for water transmission. The emergence of the word garden is also important. In fact, "Char Bagh", which is one of the main plan schemes of Islamic gardens, is a planning scheme learned from the Persians but did not take place at the table beyond expectations. The table refers to the six keywords identify them as garden, water, Persian, management, qanat, and heritage. In between the system of the Persian Garden Heritage Sites, the qanat is essential together with the term water. Shushtar Hydraulic System appears to be the second heritage site handling the term of water. Within this word cloud, attention should be given to plural forms of two keywords: qanat and qanats, garden and gardens. The term irrigation also takes place in the system, although not firmly.

Turkey

Turkish gardens are designed in such a way that nature and adamite are used together skillfully without establishing a strict architect and landscape relationship. They considered the garden as a whole, a core area to be designed regarding both the qualitative and quantitative parameters [15, 32]. As the Ottoman Empire's capital for centuries, Istanbul also has an important place in other countries. The philosophy of landscape understanding throughout the centuries in the capital has the potential to do a lot of other scholarly work. Its multi-layered grift and rich system have been not powered solely by the water issue. Therefore, this study focuses on Diyarbakır Fortress and Hevsel Gardens Cultural Landscape, which were announced by the results of the inquiry of the UNESCO interactive map described in the materials and methods section of this study. Witnesseth, the strength of this heritage site comes from the physical and conceptual character of the interaction between water and landscape morphology.

Even though the Ottoman gardens have the same purpose as the gardens created in other Islamic countries, to make the rivers described in the Qur'an resemble the image of paradise filled with blooming trees, Ottoman gardens are neither like Isfahan nor large areas like Agra. The vessels are not as ornate as in Spain [32].

Figure 11. Diyarbakir Walls ve Hevsel Gardens, Turkey [33]

Diyarbakır City Walls are among the oldest and strongest walls in the world. They stand behind China's Great Wall, Istanbul Walls, and Antakya Walls when it comes to length, but they possess a unique place within Turkish history with their spectacular reliefs on the walls and bastions as well as inscriptions and gates. As such, Diyarbakır City Walls, beyond being a plain wall surrounding the city, are a cultural heritage, an open-air museum that bears the most beautiful traces of many civilizations that have lived on these lands since its foundation [34]

Hevsel Gardens, situated in a region where garden culture is highly esteemed, have been considered as civic gardens continuously since ancient times. With their existence as a garden for 8 thousand years in a region bearing the traces of more than 30 civilizations, this set of gardens has a unique cultural and historical place besides the agricultural value. The vital cooperation generated by the Diyarbakır Castle and Hevsel Gardens and the pattern of cultural landscape constituted by the Hevsel Gardens are the most influential factors in the uninterrupted life of the city for thousands of years, thus the inscription to the UNESCO heritage list [35].

Diyarbakir and its surroundings have been an important center since the Hellenistic period. The property includes the impressive Diyarbakır City Walls with a length of 5800 meters with many towers, gates, buttresses and 63 inscriptions from different historical periods (Alper, Karadoğan, & Soyukaya, 2015: 379). The site also includes the Hevsel Gardens, the Anzele spring, and the Ten-Eyed Bridge, a green link between the city and the Tigris that provides food and water to the city [36].

Hevsel Gardens, with an area of 300-350 hectares, is located within the boundaries of Diyarbakır city in southeastern Turkey. It is irrigated by using hydraulic systems from the Tigris River. Poplar tree production takes up a 100-150 hectares area of land close to the riverbank, while the rest of the farmland nearby is dedicated to growing vegetables and orchards[37]. It is included in the UNESCO Heritage List due to Criteria IV.

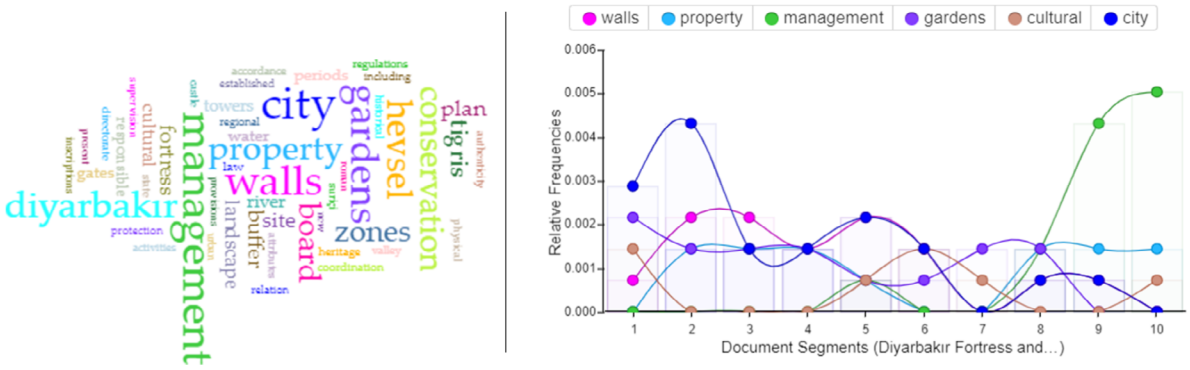

Figure 12. and Table 3. Comparing Usage of the Words With Wordcloud and Graph for Turkey Which was in the UNESCO Heritage List

This heritage site involves two major components, which are a fortress and a garden. The fortress is not shaped by a modest wall system but rather a complicated and multilayered one. Thus, while the keyword of "walls" takes the first place, "water" can enter the word cloud but merge into the background. Instead of the water, the terms of river, Tigris, and valley take place in the word cloud referring to the flowing water impact on the surrounding gardens of the fortress.

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South Spain and Northern Africa

The areas where the Maghreb gardens have spreaded most are Marok, Morocco and Andalusia. These gardens are small in size and arranged on the basis of "Chahar Bagh" protected by walls, terraces and gazebos [5].

Throughout history, Muslims have built many masterpieces in Andalusia, inspired by the East. The understanding of the garden, inspired by the East, has survived to the present day. In the 10th century, they arranged magnificent gardens and courtyards around Cordoba and the capital city of Seville. Despite the expulsion of Muslims from Spain in the 15th century, these gardens have survived to the present day without any deterioration or destruction [15].

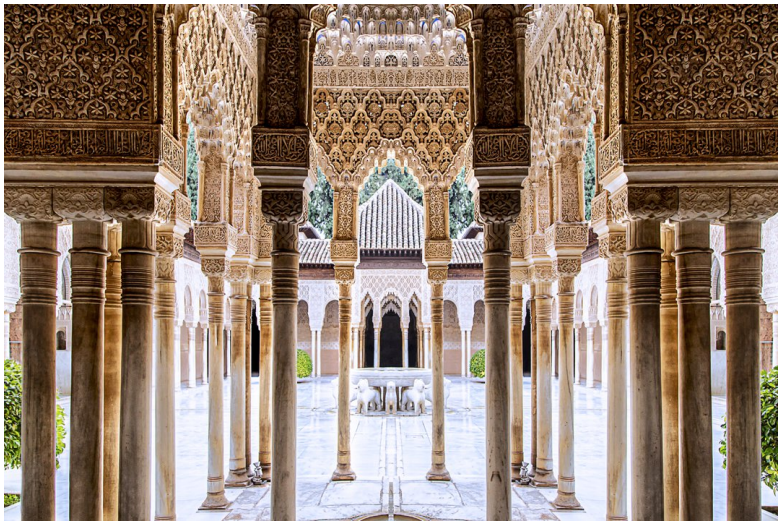


Figure 13. Alhambra Palace [38]

The first heritage site related to South Spain is titled "Alhambra, Generalife and Albayzín, Granada" by the UNESCO World Heritage List.

Settled on two adjacent hills, The Alhambra and Albaycín form the medieval parts of Granada. Within this setting, Albaycin represents the historical residential area of Granada. The Generalife gardens located to the east of the Alhambra fortress and residence are a magnificent sight, dating back to the time when this part of Spain was ruled by emirs from these rural areas in the 13th and 14th centuries [39].

The Alhambra, a palace and Generalife gardens located in Granada, Spain, incorporates the Moorish gardening traditional style that features beautiful water displays and terraced garden plots used for both production and leisure activities. This particular area, the Generalife, is one of the oldest surviving Moorish gardens. The exhibit showcases both the Renaissance period and more contemporary gardening techniques as a result of growing concern for preserving botanical design traditions. The Alhambra and Generalife are both home to a vast collection of Islamic artistry, including all known techniques employed by the Hispano-Muslim world [39, 40].

The Alhambra palace is often praised for its stunning views of the fertile Granada plain and snowy Sierra Nevadas, which makes it a good example of Nasrid artistry with its architecture and decorative aspects [39, 41]. Inside this castle, there is a vast amount of courtyards and, on this occasion, many gardens. These gardens host pools of varying types. It is one of the courtyards we see in Figure 13. The most important of the courtyards is the Lion Courtyard, which occupies an inner location on the property. It reaches a central fountain involving a pool with twelve lions, well-coming water from all four sides of the courtyard flowing through four channels [4]. This system is reminiscent of the four rivers mentioned in the Qur'an - all of which flowed from Paradise. Although there are no Islamic motifs present, this scene depicting paradise is an important concept to understand when viewing this courtyard. Somewhere in the Alhambra it is written: "The central fountain is like the soul of a believer immersed in the remembrance of Allah" [42].

There are more courtyards in Alhambra, and those names are the Court of the Myrtles and the Court of Cuatro Dorado. The abundance of pools in this castle is due to the fact that there are no such mountains in Arabia; thus, the snow which melts there contributes to their creation. The construction of aqueducts and water storage tanks helped the inhabitants of the castle access a reliable source of fresh water during periods when snowmelt from Sierra Nevada Mountain [43]. This site is included in the UNESCO Heritage List due to Criteria I, III and IV.

Figure 14. Cordoba, Spain [44]

Cordoba's most significant period of development began following the Moorish conquest in the 8th century. During this time, 300 mosques were constructed as well as numerous palaces and public buildings that rivaled those in Constantinople, Damascus, and Baghdad [45].

In 1523, the largest mosque in Cordoba was converted into a Catholic church by completely demolishing its prayer areas. But, the citrus and date palm trees in its garden have been carefully preserved, as they are a part of the historical heritage of the area. In Figure 14, we see the trees, water channels and the triangular roof of the building. They lived by the accumulation of water pouring from this roof in cisterns and watering from there. It is highly probable that the vegetation of the former mosque was carved into the soil in connection with small surface channels, and the trees were in the form of a grid [46]. It is included in the UNESCO Heritage List due to Criteria I, II, III and IV.

Figure 15. Seville, Alcazar Palace, Spain [47]

The third heritage site from Spain is titled "Cathedral, Alcázar, and Archivo de Indias in Seville. " The Alcazar Gardens were built in the 10th century as an Islamic palace, and feature a Chahar Bagh system. [48].

The garden's central water supply system originates from Sevilla's Real Alcazar, an aqueduct built in 1172. It will show us the discovery of a significant water distribution box at the end of the aqueduct [49].

The gardens underwent a series of renovations between the 11th and 14th centuries, preserving their original plan-design scheme. We see one of these gardens in Figure 15. They perfectly represent the "Golden Age" of Spanish culture, which is a perfect synthesis of Islamic influences, centuries of religious power, royal rule, and the trading prowess accrued through Spain's colonial possessions in the New World [48]. It is included in the UNESCO Heritage List due to Criteria I, II, III and IV.

Figure 16. The Palmeral of Elche, Spain [50]

The Palmeral of Elche, in Figure 16, is a landscape consisting of groves of date palms that was formally laid out in the tenth century A.D. at the time the Muslim city Elche was erected. The complex irrigation systems were put into place at that time to ensure prosperity. The Palmeral is an oasis that exemplifies Arab agricultural practices on the European continent. Dating back to at least the Iberian era, settlers in Elche have been cultivating date palms there. This knowledge has likely been passed down for centuries. When we regard the irrigation system, it preserves the organization of the orthogonal plot, defined by the intersection of rows of palm trees, by adapting to the layout of the canals [51].

The plants used for agricultural purposes were typically grown inside a square orchard consisting of palm trees as the marginal ones. The plants of interest for agriculture were cultivated inside a square orchard where the palm tree constitutes the marginal plant. However, from the palm trees, many materials, products, and byproducts were obtained, and usage of them was a sustainable practice over nine decades [52].

This is also one of the unique samples of Arab farming practices in Europe. Muslim engineers mastered the use of hydraulic techniques to build water distribution dams (rafas). These structures consisted of fixed or movable flow dividers (tallamares), allowing diverted water to be transported through a vast network of irrigation canals. Elche's successful management of its scarce water resources is a textbook example of the sustainable use of the environment and the evolutionary adaptation of cultural landscapes in response to historical changes [51, 53]. It is included in the UNESCO Heritage List due to Criteria II and V.

Figure 17. Medina of Marrakech, Morocco [54]

The Medina of Marrakesh is particularly well-conserved due to its original, protected conception; its construction materials and decoration that remain in constant use; as well as the natural environment featuring Gardens of Aguedal (Agdal), Ménara, and Palmeraie. All these initial components contribute to making the Medina an Outstanding Universal Value. Marrakesh is home to an impressive number of masterpieces of architecture and artworks, each of which would merit recognition as an Outstanding Universal Value on its own. Figure 14 illustrates the Kutubiyya Mosque, as one of the most important symbols of the urban landscape and the symbol of the city [55].

Agdal Gardens were built around 1130-1269. Water is sourced from the Atlas Mountain range, as one of Marrakech's primary water sources. The Agdal today is a large and extensive enclosure comprising 340 hectares of land. It is surrounded by a wall that stretches for 9 kilometers. The land on which the estate stands has been cultivated primarily with olive, citrus, and pomegranate trees; these are species that have been present at Agdal from its inception. The enclosed area within this boundary contains another space that is bounded by a 1.5 kilometer perimeter wall and constituting a palatial center, known as Dār al-Hanāʾ (palace of happiness). Both of these enclosures contain a diligent setting for historical recreational facilities, reservoir, hydraulic structures, and industrial installations [46, 56]. The Medina of Marrakesh is included in the UNESCO Heritage List due to Criteria I, II, IV and V.

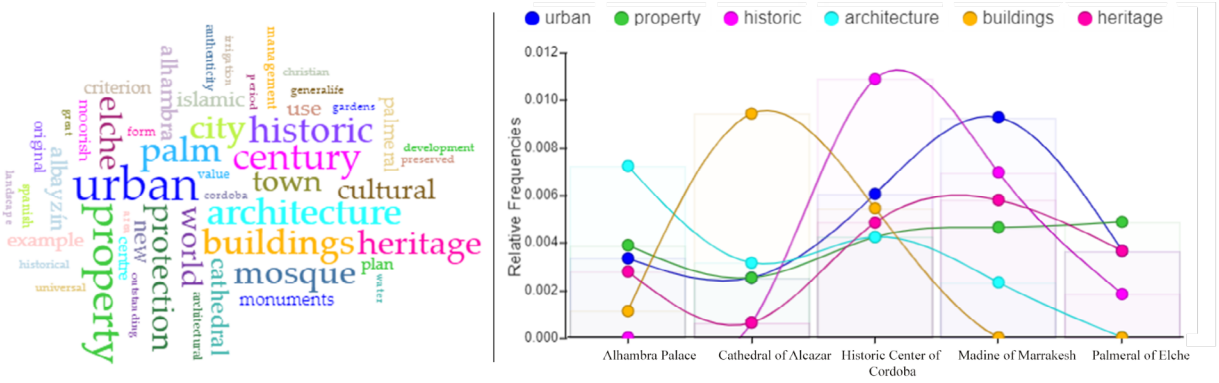


Figure 18. and Table 4., Comparing Usage of the Words With Wordcloud and Graph for South Spain and Northern Africa Which was in the UNESCO Heritage List

In the table here, we see the comparison graph of the heritage sites; both involve hard and soft scape components generating unique patterns illustrating the harmony between green and built-up spaces in Andalusia and North Africa. Not all but some of the historical terms captured through the examination of South Spain and Northern Africa heritage sites are aqueduct, water mill, oasis, traditional irrigation system, terraced garden, water distribution dam, reservoir, and hydraulic structures. Although these sites represent some unique samples for the sustainable use of the environment by considering water circumstances, due to the dominancy of the city-based components and characteristics, the first six terms can not reveal the related details. The table above identifies them as urban, property, historic, architecture, buildings, and heritage. When we search for the existing inside the word cloud backwardly, they are palm, palmeral, water, and gardens.

India

During the 13th century, after the Mongolian invasion of Iran led to their domination of India, they also established Kabul as their capital. Later in that century, Babur Khan moved the country's capital from its traditional location to Agra. As a result, Iranian architecture and garden design experienced a significant change due to this shift in geography. [57]. Indian gardening art typically falls into two categories. The initial one is the terrace garden. This was a Central Asian-originated concept, wherein the garden was laid out on a slope, blending with the landscape of the region. Design benefitted from the ascending terraces to place main buildings. The second type of garden is the traditional char bagh garden [58].

Figure 19. Taj Mahal, India [59]

In Figure 19 we see the Taj Mahal, an impressive white marble mausoleum located in Agra. It is the jewel of Muslim art in India and one of the world's universally appreciated masterpieces [60]. The building should be viewed as a "figure in the landscape," with an intention to create a sense of spatial unity throughout. "Landscape" is inferred to be not only the neo-colonial version of Mughal gardens that dominates the foreground of Taj's ubiquitous imagery but also includes a much larger cultural landscape, including the river Yamuna and its floodplain, rural hamlets and farm fields, and the streets and open spaces in Agra city [61].

In the Taj Mahal and other tombs, the person who built the tomb actually had a deep understanding of the concept of burial, viewing it as an act of entering into heaven. It represents a structure in the symmetrical "Chahar Bagh" system. The water is drawn from the river in successive rehants [62]. The storage tank used for watering the garden is located outside of the complex. It first receives a full load of water, and then it is delivered to where the gardens need it most. In addition, this tank also exists in hydraulic welding - but it's not its main source of supply [46]. It is included in the UNESCO Heritage List due to Criteria I.

Figure 20, Humayun's Tomb, India [63]

In Figure 20 we see Humayun's Tomb, Delhi. This tomb represents a particular cultural significance due to its location within a cross-axial garden as it stands as the first example of a tomb set within a cross-axial garden in India. This character brings about naming the tomb as garden-tomb. The massive scale and symmetrical design of the Mughal royal mausoleum building style makes it one of the most iconic examples in that style [64; 65]. The tomb located in the middle of the Chahar Bagh plan was designed within the "hesht bihisht" (perfectly planned) plan of Islam. The Chahar Bagh plan is a series of four interconnected quarters. Each quarter is divided into nine units, each with wide walkways and water channels that open up land pools at the intersections [46]. It is included in the UNESCO Heritage List due to Criteria II and IV.

Figure 21. Fatehpur Sikri, India [66]

In Figure 21 we see Fatehpur Sikri. It takes place in Agra District in the State of Uttar Pradesh in northern India. It was built on the sloping levels of the ridges of the Vindhyan hill, on the southeast of an artificial lake. As the first planned city of the Mughals, it is known as the "city of victory". The city is shaped like a rectangle, with evenly spaced streets and lanes that are cut at right angles. It also features an efficient drainage system and a well-managed water supply [67]. It is included in the UNESCO Heritage List due to Criteria II, III and IV.

One of the unique features of Mughal architecture pertinent to natural ventilation is Panchmahal, located in Fatehpur Sikri. The five-story pavilion has an asymmetrical form with decreasing size from the bottom to the top and is covered by a dome-shaped canopy [68].

Figure 22. Red Fort Complex, India [69]

The Red Fort Complex was originally constructed as the palace fort of the city Shahjahanabad, Shah Jahan built this in the 17th century. The structure is made of red sandstone, which gives its name to it [70]. The private apartments of the fort consist of a series of pavilions attached by a continuous water channel known as the Nahr-i-Behisht (Stream of Paradise) [71]. The complex had a spacious lawn and various artificial features, such as canals and fountains, which were located on the eastern side of the city. Additionally, there was a large green space separating it from other areas of the city [72].

As illustrated in Figure 22, the Red Fort Complex is a classic example of the Chahar Bagh style, a raised pool in white marble at the intersection of axial walkways. The water flows from the terrace down to another pool in the form of a lotus, poured into the water basin over a tile in the panel, and finally, from there, it flows to the rest of the garden [46]. This heritage site is included in the UNESCO Heritage List according to the Criteria II, III and VI.

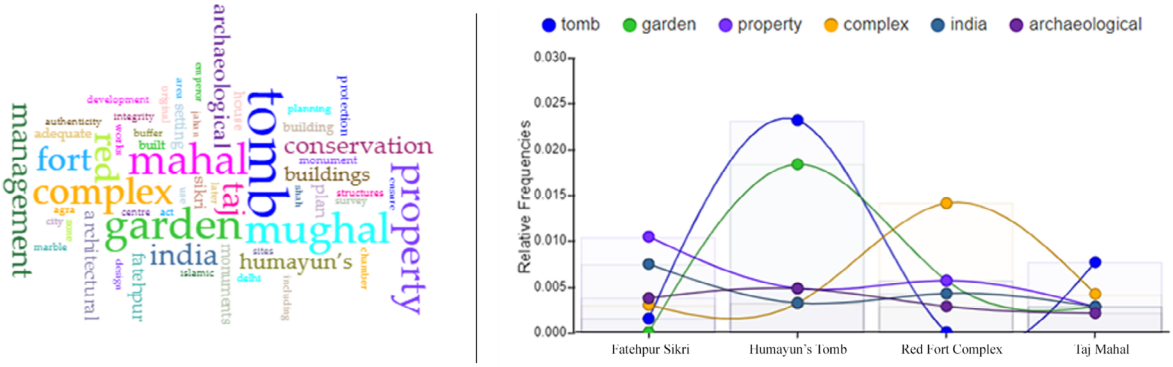


Figure 23. and Table 5, Comparing Usage of the Words With Wordcloud and Graph for India which was in the UNESCO Heritage List

There are four heritage sites in India, and water's existence within their systems is eye-catching. Via "Voyant tools", it is possible to see in Figure 23 that the most frequently used words are detected as "garden, tomb, property, complex, India, and archaeological". As a result of the dominancy of architectural features mentioned, water-related can not even take place backwardly within the Indian cases.

4. FINAL REMARKS, COMPARISONS AND DISCUSSIONS

This part of the study aims to conduct a brief comparison between the case studies examined so far to develop a multilayered understanding of their water-dominant design approaches. Thus, this section of the study begins with the brief comparison illustrated by Table 6. It describes the heritage sites according to their geographic position, climate, continuity, water use pattern, garden, and Islamic content. At this stage, it should be noted that as these areas are historical places, they are the transition and adaptation examples of the overlapped format of the different cultures, religions, land-use, and water-use types. Thus, the characters declared by the table refer to the most obvious ones for each of the sites but not all the varieties they handle. In such a geography, a heritage site carries the tangible and intangible layers of both the current and past cultures. Thus a heritage site can hold not only the attributes of Islamic landscapes but also others. Each of these heritage sites operates micro and macro landscapes constituting a pattern. Thus, an area representing Char Bagh Plan will for sure hold an integrated system with other water systems. Similarly, it should be regarded that advanced and combined water technologies are vital for arid and semi-arid geographies.

Table 6. Basic characteristics of the heritage sites

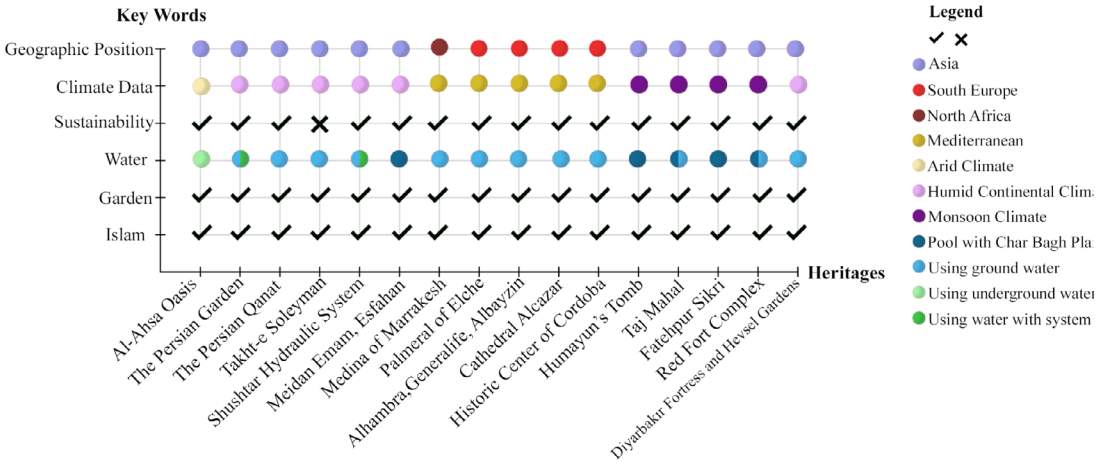


Table 7. Inscription Criteria for the selected 16 Heritage Sites of UNESCO

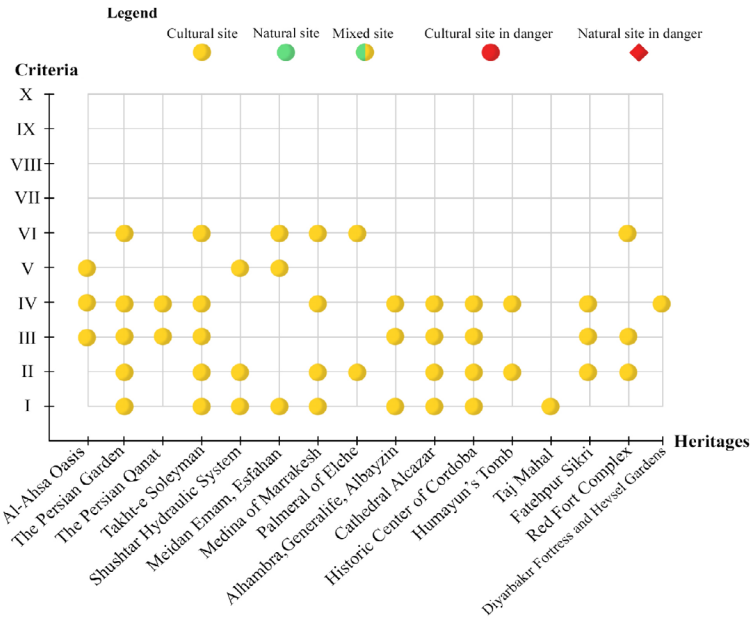


Table 7 illustrates the dispersion of the criteria pertinent to the selected heritage sites. It also forwards information about the categories of the sites and the condition of being in danger.

This study focuses on the representative character of these heritage sites for water-sensitive landscape planning, designing, and managing principles and techniques they have got. Still, if we look at the amount of criteria owned by each site, it is available to understand that the Taj Mahal, and Diyarbakir Fortress - Hevsel Gardens are the ones with one criterion, while Persian Qanat and Palmeral of Elche have got 2 criteria.

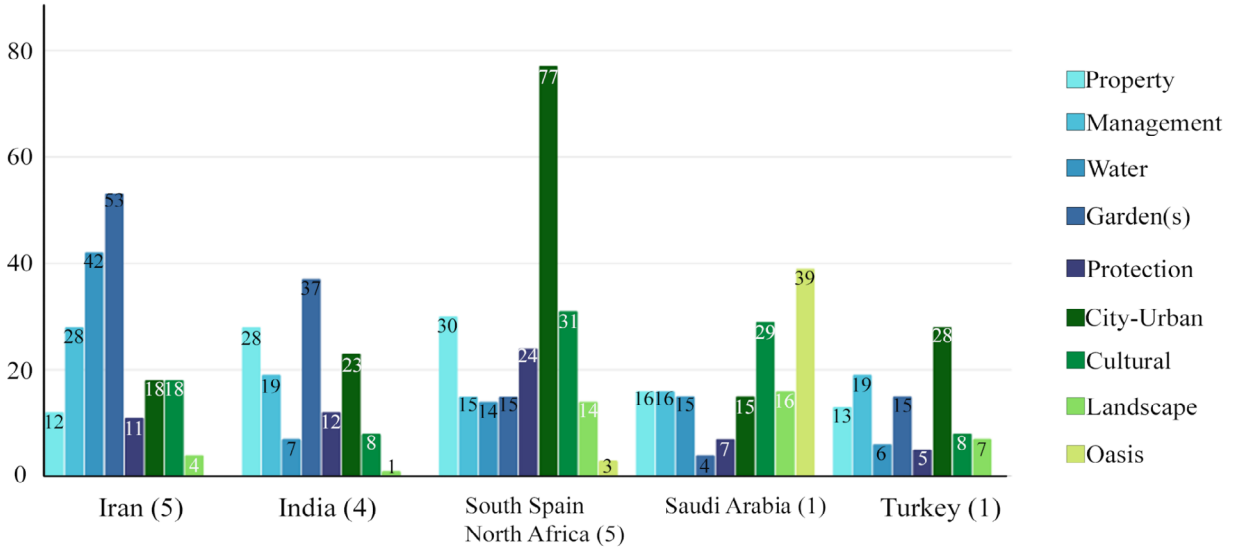
Another review of this table can be carried out on the criteria that most define these sample areas. In this context, while criteria 4 and 2 come to the fore, respectively, criteria 3 and 1 come in the 3rd place with the same number. When these results are examined, it is seen that criteria 4 and 2 are in the first two rows, which is compatible with the presence of the expression "landscape" in the parameters that define them. In the 5th criterion, which has the least number of heritage sites compared to other criteria, it is seen that the term sea-use is included in its expression. This amount of it is related to the fact that Islamic gardens focus on the design, planning, and management of freshwater resources.

This phase of this study focuses on heritage sites to generate an overall understanding of their "water-sensitive approaches" when they are examined as a unified system. Voyant tools allow us to analyze each heritage site, but similar to this, it is also capable of generating a unified text-mining analysis and forwarding a general collective frame of them. Uploading source data by combining each heritage site's documents into a big one provides a source to Voyant tools.

Figure 24. Word cloud representing the unified stance of the studied heritage sites

We see the most frequently used words given to us by the examples we have seen in Figure 24 above. Management and property take the first places, followed by the city-urban, heritage, protection, century, cultural, and conservation keywords properly referring to the missions and vision of the UNESCO association. As this study focuses on cultural landscapes, they are highly related to the cities-urban and garden terms. When we examine the figure due to the subject of the study, water and oasis are the available terms. This text-mining analysis forwards us the first six keywords as property, management, water, garden, protection, and city-urban, respectively. Table 8 illustrates the distribution of the keywords according to the homelands of the heritage sites.

Table 8. Dispersion of the mostly used terms according to the countries



When we regard the stance of the garden term within the table above, it is interesting to see the sharp frequency level differences among countries. This is undoubtedly related to both the conceptual value of gardens inside these countries and the inner dynamics of the heritage sites. Besides the significantly different ones, property and management terms represent a balanced distribution and thus receive a high score in the end. This table helps to identify the differences between the countries' natural and cultural landscape parameters. The city-urban term is efficient for revealing the interaction between the built-up spaces and heritage sites. Within the expressions of Diyarbakir Fortress and Hevsel Gardens, the city-urban word takes place 28 times. When we look at the Iran and South Spain - North Africa regions, both have five samples each, and the value is 18 in Iran while it is 77 in Spain. Another apparent term is the oasis, as among all other concepts and techniques associated with water use, oasis is the only one that could enter the word cloud bunch. It is seen that solely in Saudi Arabia and Spain-North Africa, the oasis becomes a landscape component.

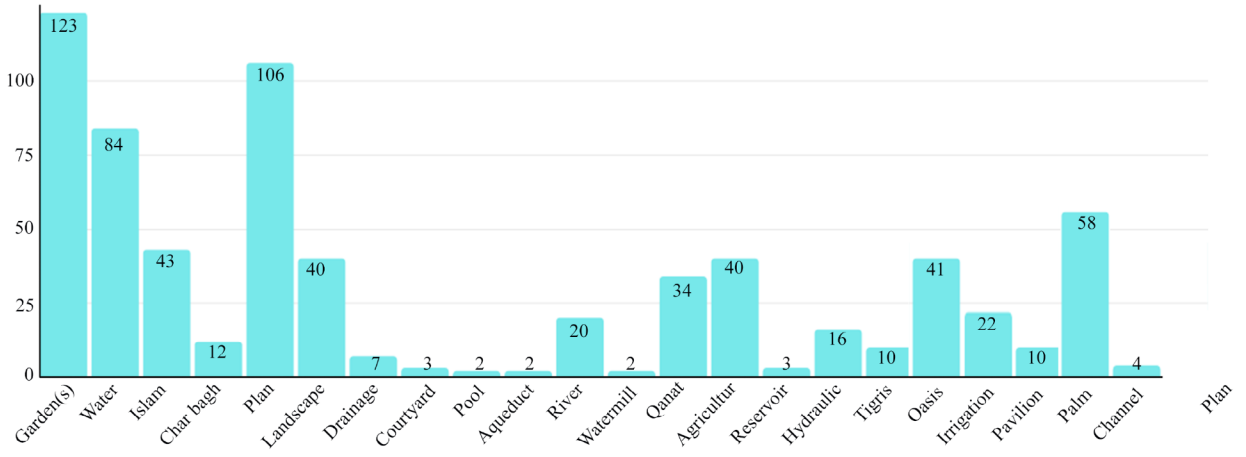
"Each landscape generates a unique signature on the Earth" [73]. This study relies on the diversity in landscape thus such differences mentioned above seem to have great potentials to discuss.

"Cultural landscapes are at the interface between nature and culture, tangible and intangible heritage, biological and cultural diversity—they represent a closely woven net of relationships, the essence of culture and people's identity" [1]. In order to gain an overall understanding of such a woven net, the occupancy of water-sensitive landscape practices, concepts, and techniques forwards a potential for evaluation and discussion.

When we examine table 9, it is understood that some concepts and techniques turned out to be significantly lower than expected. The first of these are the terms of Charbagh and courtyard. The existence of the term Pavilion is critical at this stage as the word pavilion is frequently used in cases with char bagh and larger water surfaces. Aqueduct is a word that is expected to be at least more in number due to the fact that they are prevalent in ancient Roman geographies and around the Mediterranean. Water scarcity and geographical characteristics may have a considerable impact on their recessiveness. It was already expected from the concepts of oasis and qanat to be remarkable, and it is possible to say that the palm was considered together with oasis and agriculture to a certain extent. The existence of words like irrigation, hydraulic, and drainage are precious as they refer to the technical dimension of the study area. In arid and semi-arid

environments that have got harsh environmental circumstances, the generation of landscape patterns like an oasis, pam, and agriculture represents the support of water engineering techniques. Referring to the existence of flowing waters, river and Tigris terms are remarkable. As everything starts with the aim to access surface or groundwater resources and in their existence even far distant places or in scarcity, the struggle to access them without harming the entity motivates people to develop innovative techniques blended with their culture. From a certain point of view, the critical situation is not the number of techniques used but rather the fact that they are performed in the right place with the right formula, which is easy to understand as they survived through the centuries more or less in a sustainable way.

Table 9. Comparing Usage of the Words in UNESCO Heritage List for 16 Examples



Cultural landscapes are often reflective of specific sustainable land-use techniques, taking into consideration the characteristics of the natural environment. This illustration can help to protect a spiritual connection between people and nature, as well as maintain or enhance landscape qualities such as biological diversity. The protection of traditional cultural landscapes is also beneficial for modern practices in sustainable land management and helps to protect human welfare [2].

This research did not handle the case studies involving the interplay between the Islamic garden and cultural landscape but the cases with a specific concern about the water presence and usage as declared by the UNESCO World Heritage List. In this context, terms that are not related to the spiritual dimension but technology have become prominent. Therefore the received results are the ones appropriate to the scope of this study and capable of generating a platform to open discussion. For the development of studies carried out within this paper's scope, increasing the number of heritage sites and parameters may support statistical studies for further studies.

4. CONCLUSION

This study searches for new ways to develop sustainability and thus focuses on the cultural landscapes that are well known due to the water-sensitive approaches and techniques they involve. Since it has an official stance focused on management and conservation, heritage world lists from the UNESCO database have been examined. The text-mining technique was used in the research process to bring together qualitative and quantitative data, along with the information available from UNESCO. Supporting them with scholarly documents, quantitative evaluations were made for each heritage site and country. Although water also has had a spiritual dimension, considering the environmental challenges related to water, it is seen that technical issues related to accessing water and using it sustainably clearly come to the fore according to

the evaluations on the historical spatial patterns and implementations. Focusing on the necessity to develop adaptive spatial studies, this study is an attempt to further water-sensitive landscape studies for the benefit of sustainable development.

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