

## CONSERVATION ISSUES IN A MULTI-LAYERED HISTORIC URBAN LANDSCAPE: CİLİMBOZ VALLEY, BURSA (1)

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1. The historic research of this article was presented in the X. International Contemporary Urban Issues Conference / CUI' 22, organized by DAKAM Eastern Mediterranean Academic Research Center.

These sites are named: (1) Tombs of Osman Gazi and Orhan Gazi (in Tophane District), (2) Yeşil (Mehmed I) Complex (in Yeşil District), (3) Orhan Gazi Complex and its surrounding Khans (in Historic Trade Center), (4) Muradiye (Murad II) Complex (in Muradiye District), (5) Hüdavendigâr Complex (in Çekirge District), (6) Yıldırım (Bayezid I) Complex (in Yıldırım District).

### INTRODUCTION

Urban watercourses have long served as essential resources for civilization, supplying water, preventing floods, treating wastewater, and protecting habitats from disease. They also define conservation areas in towns and villages by embodying the historic, aesthetic, technical, and social values of traditional neighbourhoods (ISCWater, 2025). As key elements of the urban landscape, watercourses should be integrated into sustainable development strategies, particularly in historic cities. However, increasing urbanization has physically and socially altered the surrounding terrain through vehicular infrastructure, mass tourism-driven construction, and natural hazards due to climate change (Fowler, 2003; Findlay and Taylor, 2006; Ahern, 2013). Besides, political influences and economic constraints in urban planning activities have further posed serious challenges to preserving the continuity of cultural landscapes along urban waterways, which function as resilience corridors for climate adaptation and biodiversity enhancement. These watercourses also act as drivers of sustainable heritage conservation, supporting the adaptive reuse, and regeneration of their surrounding landscapes. In this sense, watercourses symbolize sustainability by uniting conservation with ecological renewal and can be understood as cultural infrastructures that connect nature, culture, community, and sustainability within a defined landscape.

Heritage sustainability has been a central theme in global conventions since the 2000s (UNESCO, 2005a; UNESCO, 2011; The ICOMOS TICCIH, 2011; ICOMOS, 2014)), building upon earlier international regulations (UNESCO, 1976; ICOMOS, 1987; ICOMOS, 1999) aimed at the preservation of historic areas. Documents issued by UNESCO, ICOMOS, and TICCIH have emphasized the importance of holistic conservation, introducing key concepts such as 'cultural landscape' and 'historical urban identity' (Jones, 2003; Taylor, 2018; Rössler and Chih-Hung, 2018). UNESCO (2005b, 2011) defines the cultural landscape as expressions of collective identity,

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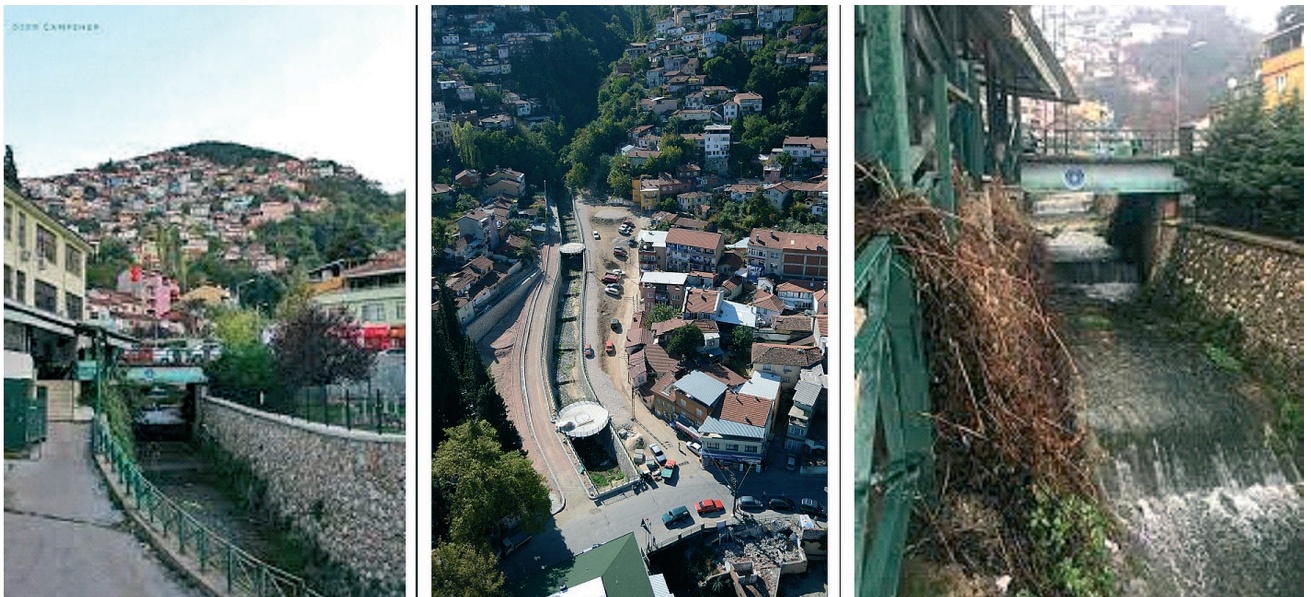
2. These foreign travellers that visited Bursa are named: George Wheler (1675); Domenico Setsini (1779); Ignaz Brenner von Felsach (1793); Joseph von Hammer-Purgstall (1804); Otto Friedrich von Richter (1816); Julia Pardoe (1837); Georgers Perrot (1864).

reflecting the creative, social, and spiritual development of humanity. The term historic urban landscape (HUL) is defined as the cohesion and value of natural and ecological context, including archaeological, architectural, historic, scientific, socio-cultural, or aesthetic points of view, highlighting its importance for understanding the changes within a cultural landscape. While traditional human settlements may reflect the cultural and aesthetic contexts shaping the identity of HULs, cultural landscapes encompass a broader range of human-nature interactions and cultural expressions.

A deep understanding of the history, culture, and architecture of a HUL is crucial for identifying the typologies and morphologies that define its traditional texture. This study focuses on Cilimboz Creek, an urban watercourse, selected to assess the impacts of urbanization on the sustainability of its surrounding landscape and to highlight the need for preserving the cultural properties along its valley (**Figure 1**). Due to its location in Bursa, an Ottoman city that hosts UNESCO World Heritage Sites (WHS) with six components (2), this watercourse has experienced continuous and permanent changes, despite encompassing archaeological, natural, architectural, and water-related industrial heritage. Recent urban development practices have often neglected the authenticity required for conserving diverse types of cultural heritage. Whereas local studies have documented and restored the 19th-century silk factories as elements of industrial heritage in the historic city center of Bursa (Yalılı and Akal Solmaz, 2004; Oral and Ahunbay, 2005; Akkuş, 2011; Karadeniz, 2020), there is still an insufficiency in understanding the historical background and morphological development in and around the Cilimboz Valley.

Consequently, this study aims to examine the values and challenges associated with Cilimboz Creek, an urban watercourse that reflects the sustainability issues facing its surrounding HUL of Bursa, by evaluating the drivers and outcomes of urban transformation and conservation activities throughout urban history. First, the study presents detailed information about the study area. Second, different tools are used to construct a timeline of stream rehabilitation and urban transformation projects, comparing them with methods applied in similar cases. Finally, a detailed value assessment concerning the current state of the study area is followed

**Figure 1.** The study area along Cilimboz Creek (Bursa Metropolitan Municipality, 2024).



by recommendations offered for the holistic conservation of water-related heritage, which would contribute to the understanding of the sustainability challenges.

### THE STUDY AREA

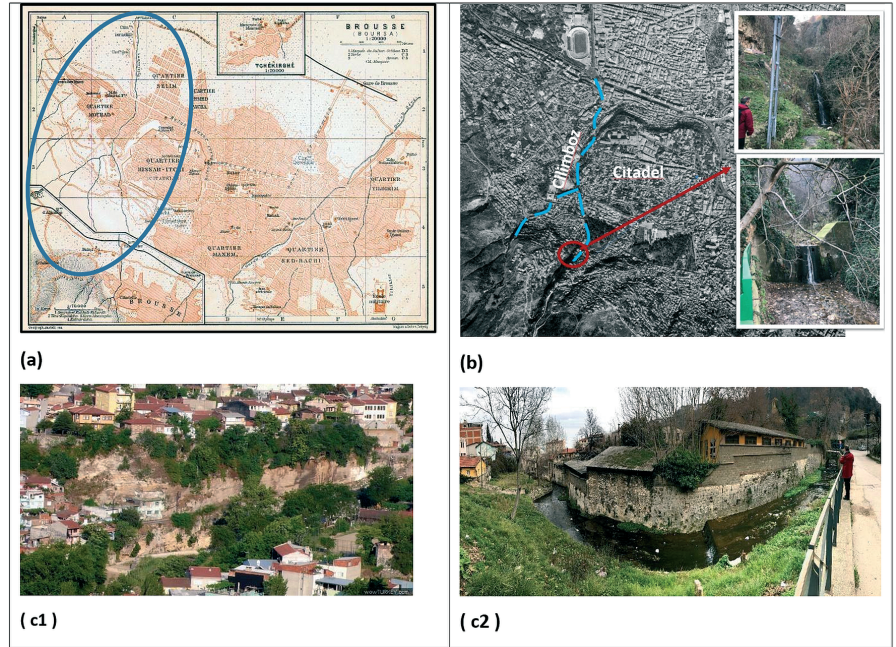
As the first capital of the Ottoman State, Bursa contains a wide range of historic structures, primarily from the early and late periods of the Ottoman Empire, as well as archaeological remains from Bithynian-era Prousa (**Figure 2**) (The Byzantine Legacy, 2016). Its historic city core is geographically divided into three parts by the Nilüfer and Gökdere streams, which have shaped the city's fertile terrain. The Nilüfer Stream, a vital water source for agricultural fields to the north of Bursa, merges with Cilimboz (Phillippo)z) Creek before flowing into the Marmara Sea. Originating in the foothills of Uludağ (the Great Mountain), its waterway runs along the western borders of the Citadel, which forms the historic city center of Bursa (**Figure 3**). The study area is the HUL that situated along an approximately 2.5 km part of this urban watercourse and includes houses, mosques, and factory buildings primarily from the Ottoman period. However, many of these cultural properties have been lost due to disasters, including fires and floods, as well as continuous urban transformation.

### The Historical Background of the Study Area

Cilimboz Creek is a historic urban watercourse that was transformed into an artificial canal during the Byzantine period to serve as a defensive ditch along the western side of the castle walls and to regulate the flow of Pınarbaşı spring water. Nineteenth-century travellers noted that its valley was lined with hermitages dating back to the late 7th century (Uzer, 1941; Lowry, 2004; Baykara, 2005). Recent excavations uncovered two dungeon

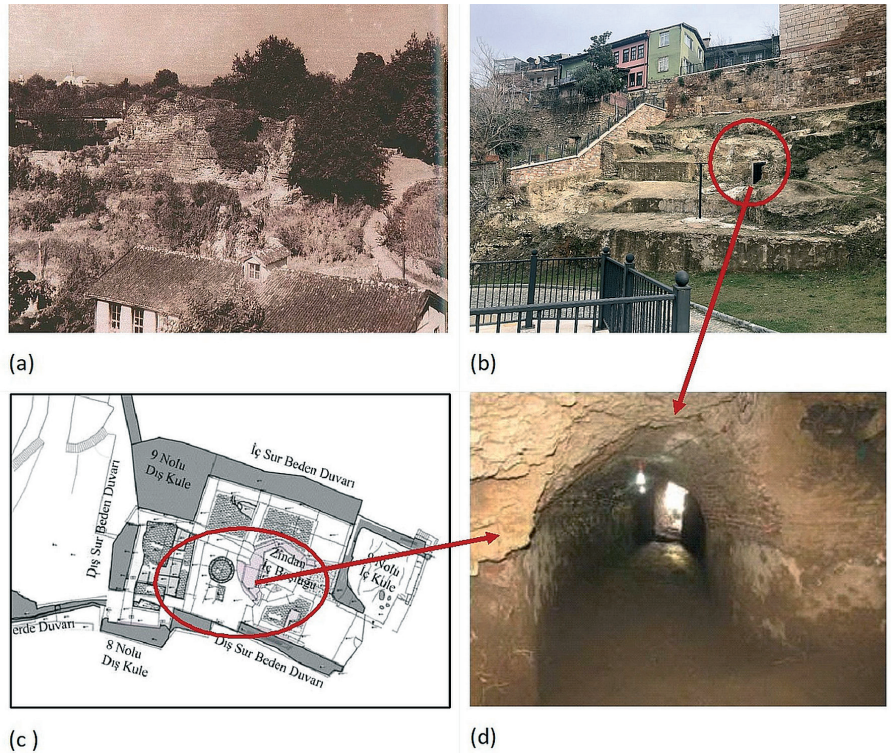


**Figure 2.** (a) Membership Document of Bursa as one of the UNESCO World Heritage Sites in Turkey (Bursa Site Management Unit, 2024) ), (b) Location of Bursa in Turkey (Wikipedi; Bursa, 2024) (c) Current view of historic city core of Bursa (Wikipedi; Osmangazi, 2024).



**Figure 3.** (a) The locations of Cilimboz Creek in the historical map of Bursa, 1905 (Archive of Bursa City Museum) (b) The Pınarbaşı spring water at the beginning of Cilimboz Creek (Aerial photo from T.C. Directorate General for Mapping; Photos by S. Çakıcı Alp). (c1 and c2) Views of the Cilimboz streambed (Photos by S. Çakıcı Alp).

walls on the east side of the travertine rock slope (**Figures 4a and 4b**). The tower's outer shell stones and the walls of the Zindankapı (Dungeon Gate) section are still visible, embedded in the hill's massive travertines. According to Yılmaz (2007); the Citadel conceals a tunnel-shaped cellar with a brick-vaulted ceiling measuring 3 meters in width and 2.75 meters in height, which was used to transport supplies from the streambed (**Figures 4c and 4d**). This watercourse continued to supply clean water to residents until the late 19th century, and according to various sources, the natural



**Figure 4.** (a) Before the excavations around Zindan Gate (Archive of Bursa Metropolitan Municipality), (b) After the excavations around the Zindan Gate (Photo by S. Çakıcı Alp), (c) the documentary plan drawing (Yılmaz, 2007), (d) the interior photograph of the tunnel (Yılmaz, 2007).

spring water benefited numerous baths, factories, public fountains, and domestic water features since Byzantine times (Yalılı and Akal Solmaz, 2004; Karataş, 2008). In the Hisar District, the water flowed through houses, exiting inner gardens and passing via a conduit beneath doors into neighbouring properties. It was then transported and discharged into pools or wells of adjacent gardens through overhead channels. This abundant and clean water source was also used to irrigate crops, although its lime-rich mineral content made it less suitable for drinking.

During the later Ottoman period, Bursa became a pioneer in urban development, particularly in water and sewer infrastructure. Westernization efforts reinforced infrastructural and ecological projects, especially in the Muradiye District. In 1889, Governor Mahmut Celalettin Pasha oversaw additional improvements focused on the drying, irrigation, flooding, protection, water supply, and energy generation of the urban streams in Bursa. Italian engineer Ravotti was appointed in 1891 to prevent flooding in the Bursa Plain and drain its wetlands, and in 1921, Rüştü Bey, Chief Engineer of Water Works, proposed the construction of the Sarıkaya Dam to monitor and regulate future Nilüfer Stream floods (Yalılı and Akal Solmaz, 2004; Akkuş, 2011). In the following years, the Bursa Municipality created new departments to manage and maintain the city's principal water sources. By 1917, a special commission under the General Water Administration oversaw the collection and distribution of spring waters such as Pınarbaşı, Kavak, Akçağlayan, and Devrengeç. After the founding of the Turkish Republic in 1923, the responsibility for the rehabilitation of water resources was assigned to the Water Administration within the Bursa Municipality. From the early 1930s to the late 1950s, public improvement and infrastructure projects led to the covering of several urban waterways, like Cilimboz Creek, with asphalt roads.

The coexistence of diverse ethnic groups in and around the Cilimboz Valley shaped both the social, educational, and commercial structure of its cultural landscape (Sevim, 1996; Çakıcı Alp, 2022b; Karataş, 2025). In addition to the missionary schools in this neighbourhood, tanneries, watermills, and silk factories, established through collaborations between Ottoman tradesmen and Levantine investors, were accompanied by the construction of bridges, including the Cilimboz Bridge, to facilitate transportation and trade access across this watercourse. As most silk industry workers were of Armenian and Greek cultures, minority communities settled near the newly built regions close to the factories. The travellers accounts (3) noted that the Yahşibey and Miskinler Neighbourhoods were predominantly Greek between the 16th and 18th centuries (Günaydın and Kaplanoğlu, 2000; Kutlu Dilbaz, 2023; Demirci, 2024). Additionally, a Jewish community lived between the traditional commercial center and the emerging industrial area along the streambed of Cilimboz Creek, reflecting the multicultural composition of its surrounding HUL.

### The Conservation Status of the Study Area

The initial conservation development plans prepared for Hisar (1985) and Muradiye (1991) Districts, hosting two of the six components of the UNESCO WHS in Bursa, were approved following an action plan endorsed in 1979 by the High Council of Real Estate, Antiquities, and Monuments (Gayrimenkul Eski Eserler ve Anıtlar Yüksek Kurulu-GEEAYK) (4). In this plan, the historic urban areas within the study area were designated as historical urban and natural sites. With the approval of the Conservation Development Plan (CDP) of Muradiye District in 1991, the built and

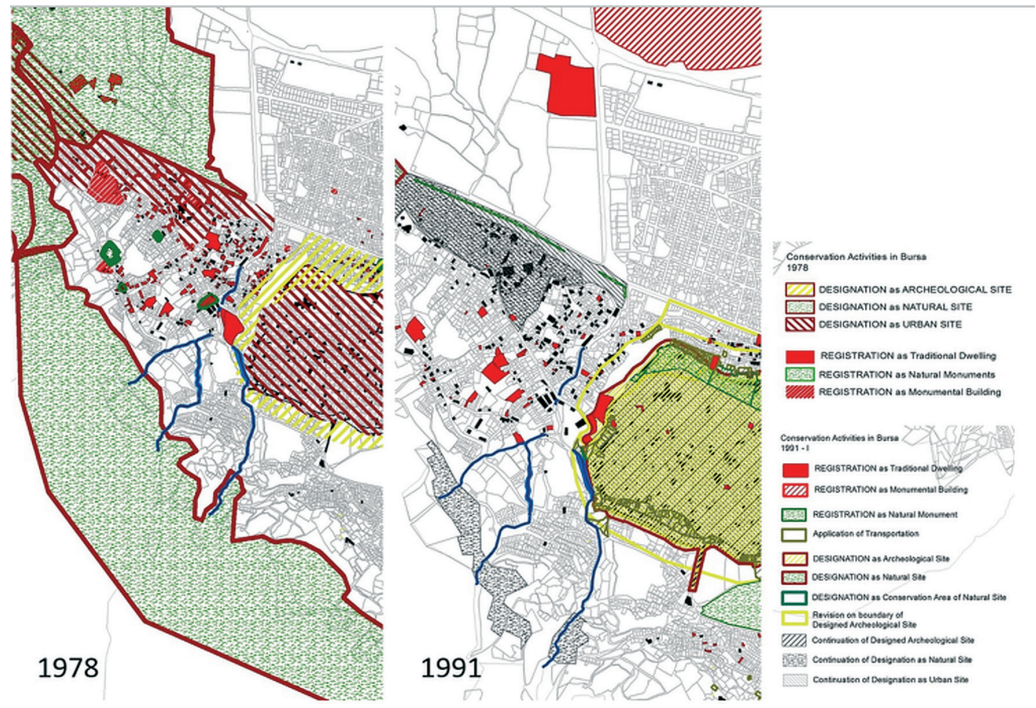
3. This High Council was the major responsible institution taking conservation decisions for the cultural heritage in Turkey, from 1951 to 1983.

4. The decisions approved by RCCB: (1) A-1072 / 15.04.1978; (2) 10662 / 13.10.1978; (3) 1730 / 04.05.1991; (4) 3704 / 09.11.1991

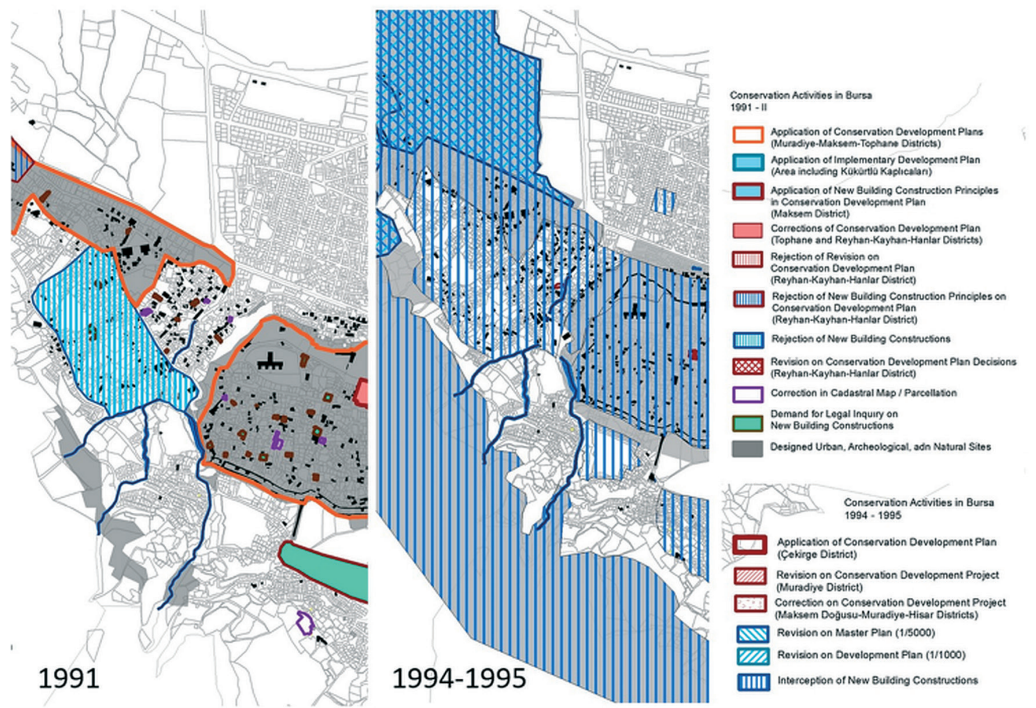
5. The decisions approved by RCCB: (1) 3235 / 23.06.1993; (2) 3443 / 25.09.1993; (3) 3861 / 24.12.1994; 4119 / 11.03.1995.

6. The decision approved by RCCB: 942 / 13.07.2012.

natural environment settled along Cilimboz Creek was initially considered by the Regional Conservation Council of Bursa (RCCB), although the archaeological remains, a few historic houses, and silk-factory buildings were registered from 1978 to 1991 (5) (Figure 5a). Besides, the new building constructions were intercepted, and the revision demands for this CDP were rejected in the 1990s (6) (Figure 5b). In the early 2000s, the decisions



(a)



(b)

Figure 5. (a) Registration and designation activities within Cilimboz Valley (b) Interception of the new building constructions around Cilimboz Creek.

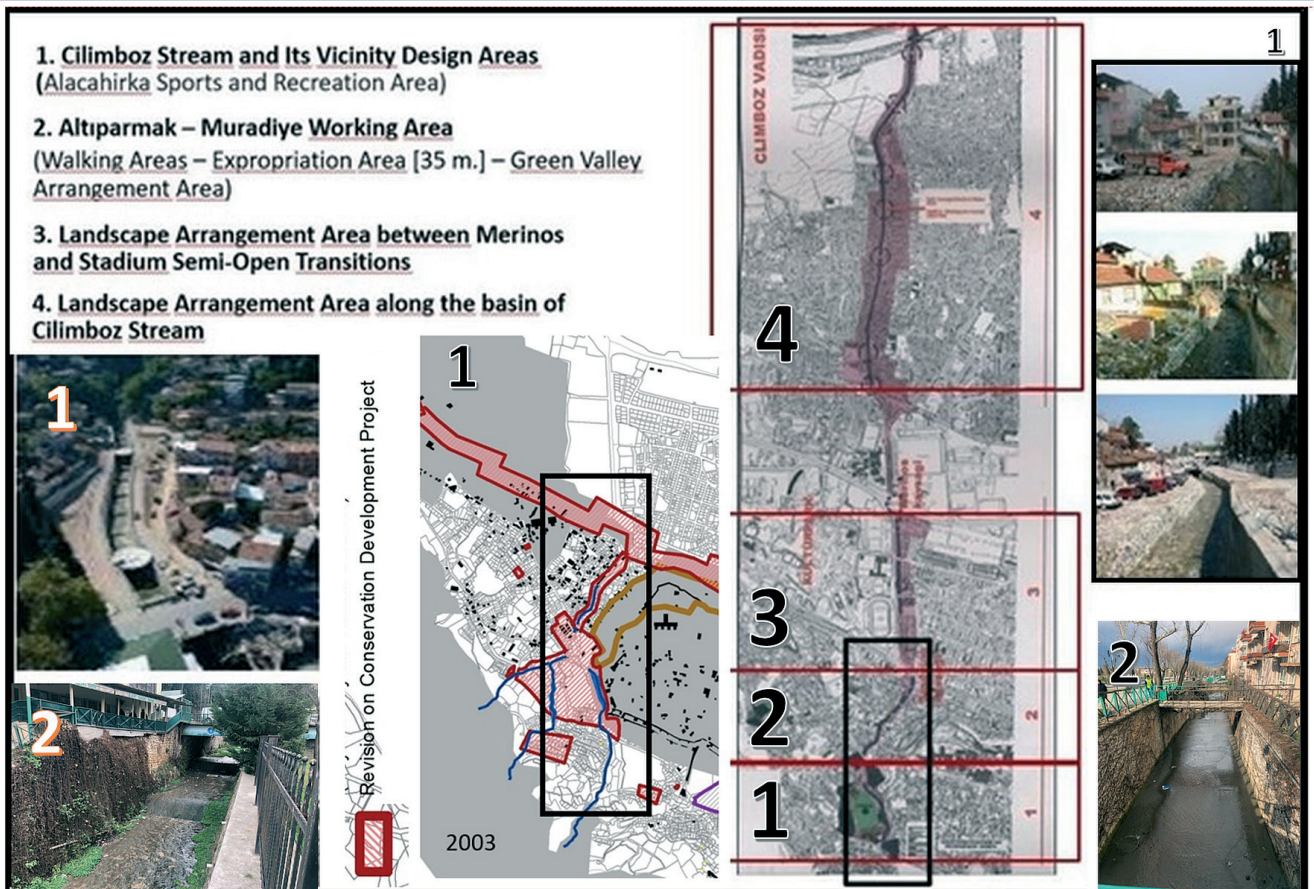
7. These institutions are 'the Bursa Regional Directorate of the State Hydraulic Works', 'Bursa Metropolitan Municipality', 'Regional Conservation Council of Bursa', and 'Bursa Cultural Heritage Preservation Regional Board'.

on the parcels surrounding its streambed were revised due to the need for expropriation and stream rehabilitation works along its waterway.

Meanwhile, a series of environmental regulations and stream rehabilitation initiatives, collectively titled the Cilimboz Valley Urban Design Projects, were implemented through three sub-projects aimed at transforming vacant areas into public squares and natural leisure spaces (Figure 6).

1. The Muradiye Cultural Area Project, which was approved in 2003, focused on preserving public spaces between the Alacahurka Neighbourhood and the Merinos Factory area by renovating and repurposing industrial buildings adjacent to the creek. Silk factories, including the *Fabrika-i Hümayun* (Imperial Factory), Turgut Yılmazipek (Romangal), and the Duraner family's silk factories, were reused for cultural, touristic, and educational purposes.
2. The Alacahurka Sports and Recreation Area Land Use Project was led by Osmangazi Municipality and concerned with repairing two canals feeding into Cilimboz Creek in 2003. Due to flood risk, green spaces were redesigned for playgrounds and sports facilities, while the traditional texture, including historic bridges, silk factories, fountains, and trees, was conserved through the restoration implementations (Figure 7)
3. The Cilimboz Valley Landscape Design Project was launched after a major flood in 2010 and was approved by the cooperation between RCCB and the Metropolitan Municipality of Bursa in 2012 (7). It is

Figure 6. The sub-project areas of the environmental regulation and stream rehabilitation initiatives along Cilimboz Creek (Photos from archive of Bursa Metropolitan Municipality; Maps re-designed by S. Çakıcı Alp).





**Figure 7.** The sport center and children's playground applications within the concept of The Alacahırka Sports and Recreation Area Land Use Project (Photos by S. Çakıcı Alp).

aimed to uncover sections of the streambed previously sealed in concrete as a part of the rehabilitation process in the area between Cilimboz Creek and *Fabrika-i Humayun*.

Despite these regulations at this scale, the HUL along this watercourse was not included in any official conservation area or sustainable buffer zone designation, despite encompassing diverse forms of cultural heritage. Consequently, there is still a lack in providing holistic conservation within the HUL of the Cilimboz Valley, although the collective efforts behind these rehabilitation and environmental planning initiatives are significant for the continuity of cultural and natural heritage in the study area.

## RESEARCH METHOD

Understanding and managing the dynamic changes affecting the study area requires a comprehensive methodological framework grounded in the principles of the HUL approach, as defined by UNESCO (2011). This framework recognizes the area along Cilimboz Creek as a multi-layered urban landscape, where natural, cultural, and socio-economic processes have shaped the spatial identity of Bursa. The research method of the study, therefore, would integrate historical, spatial, and interpretive analyses to assess the changes and threats to provide sustainability of the multi-layered historic character of the study area. For the purpose of the study, it is required to address four main research questions (RQs):

RQ1: What are the attributes qualifying the Cilimboz Valley as a HUL in Bursa? Which heritage assets contribute to its authentic urban identity?

RQ2: What are the impacts of stream rehabilitation and environmental regulations on the conservation of cultural landscape around the Cilimboz Valley?

RQ3: What sustainability challenges affect the preservation of traditional texture, identifying the multi-layered character of the study area?

RQ4: What strategies can support a comprehensive and holistic conservation plan responding to the pressures from sustainable urban development actions in the surrounding neighbourhoods of Bursa?

To answer these questions, the study employs a multi-method qualitative research design combining interpretive-historical and case-study approaches. As exemplified by the scholars concerning similar researches

8. The related decisions were approved by RCCB: (1) 5995 / 06.08.1997; (2) 8872 / 07.12.2001; (3) 9701 / 22.03.2003; (4) 9735 / 04.04.2003; (5) 10343 / 04.03.2004; (6) 239 / 01.12.2011.

(Martini, 2012; Çağaptay, 2014; Verdini et al., 2016; Su et al., 2024), the methodological framework progresses through four interrelated phases (Figure 8), which illustrate the process from data gathering to the strategic outcomes:

Phase 1: Historical–Archival Documentation

The first phase focuses on identifying the defining characteristics of the area as a HUL. Primary and secondary sources—such as historical maps, cadastral plans, old photographs, and conservation reports—were collected from local and national archives (8). These materials were analysed to trace the evolution of the built environment and water systems, providing the basis for identifying key architectural and landscape typologies that illustrate the area’s authenticity and integrity.

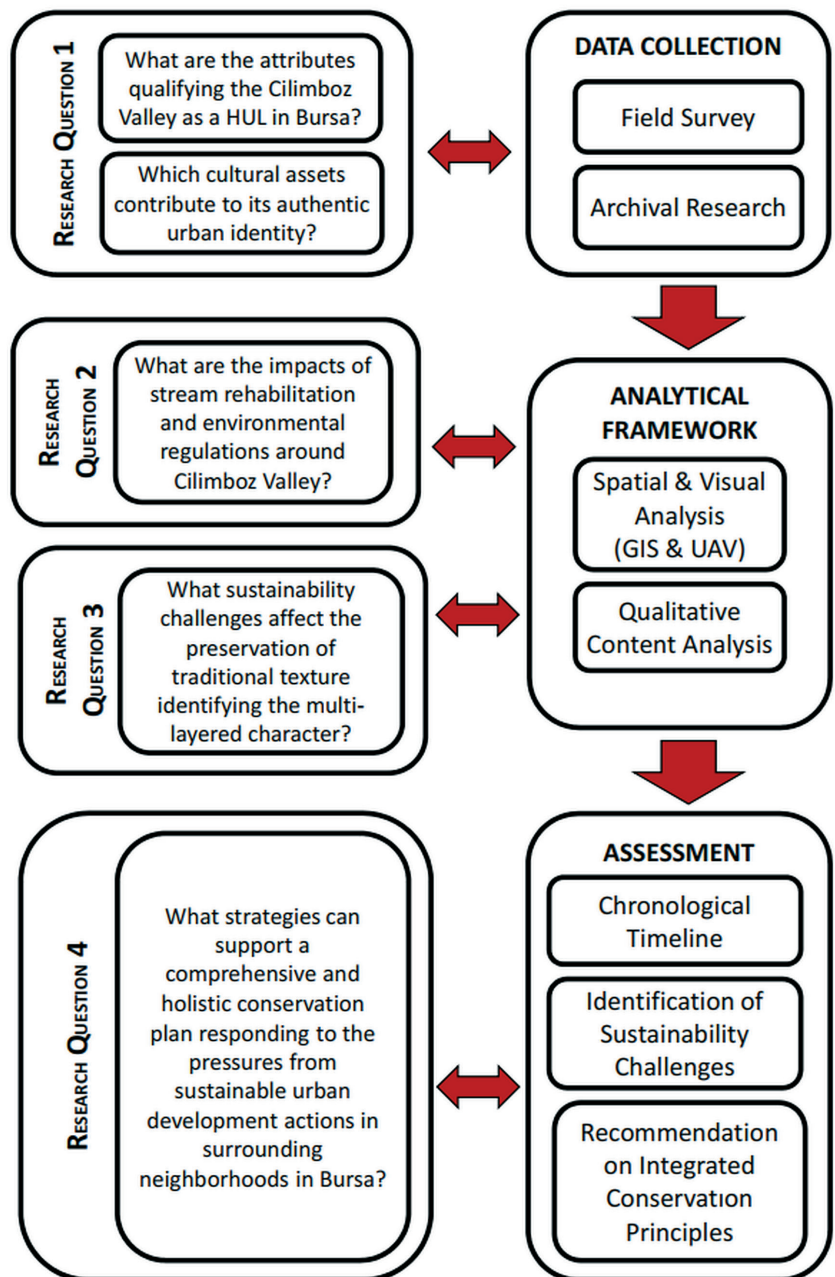


Figure 8. The flowchart revealing the methodological framework in relation to phases of the research.

### Phase 2: Field Survey and Data Collection

On-site surveys were conducted to document the current state of heritage assets, land use patterns, and environmental characteristics such as topography, drainage, and circulation systems. Field observations were systematically recorded through photographs, mapping, and structured checklists. These findings were cross-verified with archival sources to ensure data consistency and reliability.

### Phase 3: Spatial and Visual Analysis (GIS and UAV)

Using Geographic Information Systems (GIS), spatial data from the field and archives were integrated to visualize patterns of transformation and conservation across time (Çakıcı Alp and Şahin Güçhan, 2017; Morandotti and Doria, 2023). Conservation decisions issued by the Regional Conservation Council of Bursa (RCCB) were digitized and layered over spatial datasets to analyse the relationship between regulatory actions and heritage transformations. Complementary low-altitude imagery obtained through unmanned aerial vehicles (UAVs) provided up-to-date visual data to assess physical integrity and recent alterations. By means of this process, it was expected to construct a coherent timeline revealing the interaction between stream rehabilitation, urban development, and conservation attempts.

### Phase 4: Assessment and Strategy Development

The evaluative phase involved a qualitative content analysis of all spatial, archival, and visual materials. Patterns of change, conservation interventions, and urban pressures were synthesized into a chronological timeline. Researchers emphasized the need for strategic approaches to address sustainability challenges, calling for comprehensive conservation and renovation initiatives that would shape the historic urban identity of a landscape (Ahern, 2013; Bandarin and Van Oers, 2014; Zhou et al., 2019; Bohnet et al., 2022). Hence, key sustainability challenges were identified and mapped against heritage values to determine risk zones and areas of opportunity. The findings were then interpreted through the lens of HUL principles—contextual integrity, layering, and continuity—to formulate integrated conservation strategies and planning recommendations for sustaining the historic urban character of the Cilimboz Valley.

In summary, the inclusion of both analytical and interpretive dimensions ensures that the research moves beyond descriptive documentation to provide a critical understanding of how the HUL along Cilimboz Valley can be sustained through informed, evidence-based conservation strategies.

## DIAGNOSIS OF VALUES AND PROBLEMS











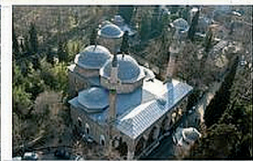

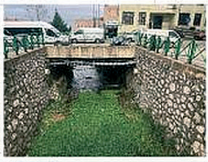












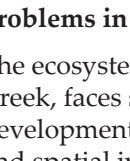
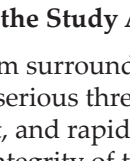
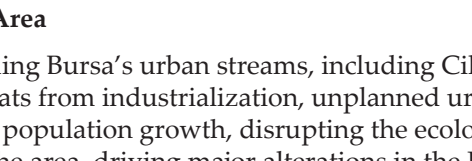
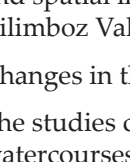
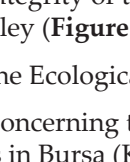
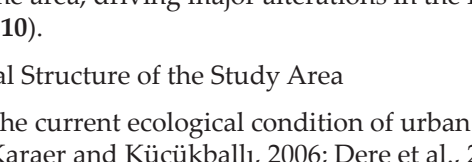
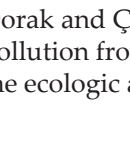
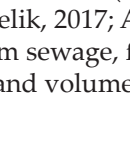
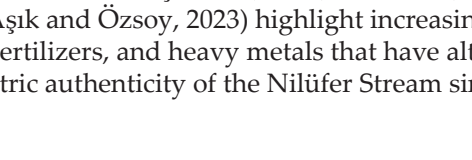



The UNESCO Recommendation on HUL (2011) endorses the use of value assessment methods as a tool for comprehensive data analysis to guide sustainable development in a multi-layered HUL, like the study area, including archaeological, industrial, and natural heritage. Within the framework of the study, it is necessary to interpret the layered characteristics of the Cilimboz Valley and to enhance sustainable land management strategies for the continuity of its surrounding cultural landscape, by reflecting its historic urban identity (values) and the threats to its sustainability (problems).

### Values of the Study Area

Cultural landscapes within historic city cores are inherently subjective, situational, and interpretative, which makes them relative, pluralistic, flexible, and often contested concepts (Buckley, 2019). The diversity and relativity of the values complicate the development of objective, holistic, and sustainable conservation strategies for HULs composed of both natural and man-made cultural properties. As the primary water source within the study area, the Pınarbaşı spring and the channels extending along Cilimboz Creek support naturally occurring greenery and large trees that grow spontaneously near the streambed. This natural element serves as a significant driver of environmental, economic, social, and cultural vitality. Artificial green spaces, such as playgrounds and cemeteries, contribute to the expansion of the green texture alongside small agricultural land found in residential gardens on this site. In addition to the archaeological remains along the Citadel walls, the historic residential, commercial, and religious buildings sustained by this watercourse reflect the continuity of social and cultural lifestyles. Besides, Ottoman and Early Republican-era buildings that were constructed within the distinctive topography of its valley also contribute to the multi-layered spatial character of the HUL surrounding the Cilimboz Creek (**Table 1**).

Cilimboz Creek has witnessed social, technological, and economic transformations in the urban history of Bursa, particularly through its role in the expansion of the sericulture industry during the 19<sup>th</sup>-century modernization efforts. The silk trade, located in the historic trade center, experienced significant social, spatial, and physical changes in response to the growing need for a new type of industrial zone. Taking advantage of the region's geography and the fast-flowing waters of the Cilimboz, silk and leather manufacturing concentrated along the western side of the streambed, an area well-suited for the establishment of new silk factories and the development of industrial infrastructure in the surrounding landscape (**Figure 9**). By the 1860s, visitors reported the presence of numerous industrial buildings, mostly filatures, engaged in silk-wrapping processes to produce raw silk for export, much of which was shipped to France (Erder, 1975: 89, 96). Notable examples of historical industrial buildings; *Fabrika-i Hümayun* Factory, the Romangal Factory, the David Saban Brothers' Factory, the Savul Brothers' Factory, and the Ishak Iskender Factory, were active between the end of the 19<sup>th</sup> century and the 1990s (Oral and Ahunbay, 2005, 39-41). These factories played a significant role in shaping both the tangible and intangible heritage that defines the cultural landscape in this region of Bursa. The availability of abundant and fast-flowing water made hand-spinning silk techniques impractical without steam-powered machinery. Additionally, wastewater had to be rapidly discharged from the manufacturing area after each batch of cocoons was boiled.

In addition to its industrial use, the flow of the Cilimboz Creek powered watermills and a 100-volt coal-fired steam dynamo that once lit the city of Bursa. Proximity to its streambed was also essential for operating spinning mills overlooking the valley (Akkuş, 2011). These historic industrial structures contributed to both regional and national economic development. Today, they offer educational, recreational, and touristic value, while enhancing local property markets and raising public awareness of architectural heritage. The multi-layered spatial character of the HUL has supported the coexistence of industrial and prehistoric water-

Physical Structure of the Cultural Landscape	Historic Built Environment	Archaeological Remains	Citadel Walls and Dungeon cells				
		Houses					
			Historic Buildings	Factories and other Industrial Buildings			
		Religious Buildings (Mosques and Tombs)					
		Other Structures	Fountains				
			Bridges				
		Natural Environment	Pınarbaşı Springwater				
			Vegetation in and around Cilimboz Streambed				
			Monumental Trees				
			Cilimboz Stream (Antique Canal)				
Gardens and Green Public Areas							
Alacahırka Graveyard (since Ottoman period)							

**Table 1.** Heritage assets and associated values along the Cilimboz Creek.

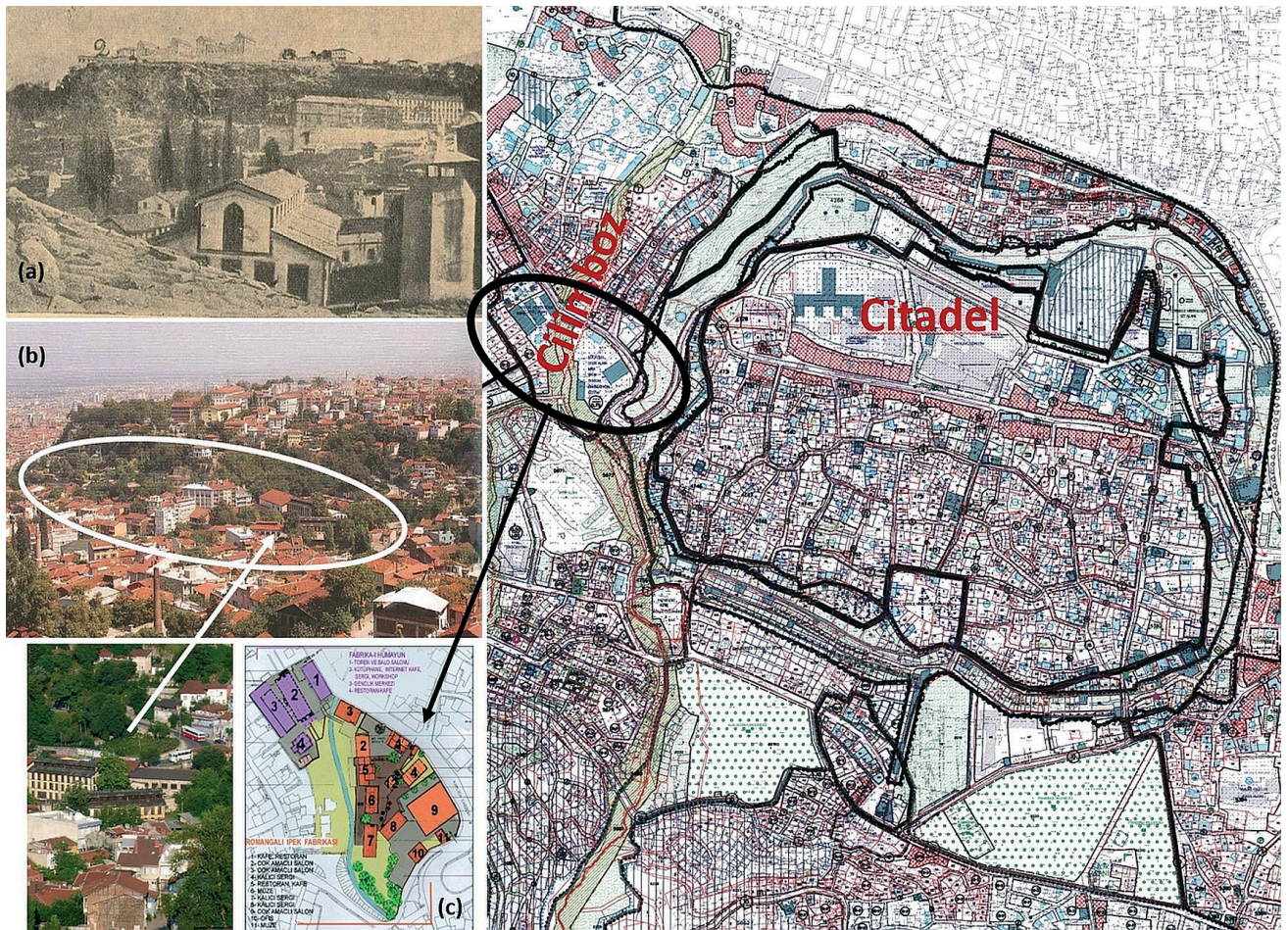
related structures as the key values that shape the HUL through nature-human collaboration.

### Problems in the Study Area

The ecosystem surrounding Bursa's urban streams, including Cilimboz Creek, faces serious threats from industrialization, unplanned urban development, and rapid population growth, disrupting the ecological and spatial integrity of the area, driving major alterations in the HUL of Cilimboz Valley (**Figure 10**).

### Changes in the Ecological Structure of the Study Area

The studies concerning the current ecological condition of urban watercourses in Bursa (Karaer and Küçükballı, 2006; Dere et al., 2006; Dorak and Çelik, 2017; Aşık and Özsoy, 2023) highlight increasing pollution from sewage, fertilizers, and heavy metals that have altered the ecologic and volumetric authenticity of the Nilüfer Stream since the



**Figure 9.** Historical (a) and current (b) views of the industrial area within the Cilimboz Valley. (c) The location of silk factories on the current map of Bursa (Photos and maps from the archive of Bursa Metropolitan Municipality).

1980s. According to Çalışkan and Akbulak (2010), its water quality has further declined due to a mass migration and rising housing demand, mostly resulting in the explosion of potentially hazardous construction and squatting around this watercourse. In response, a 1993 sewage project proposed to separate rainwater from wastewater and transfer them into the tributaries of this stream through distinct systems (Figure 11a). Nevertheless, as one of these tributaries, the streambed of Cilimboz could not be prevented from solid waste pollution due to the lack of risk management measures in urban design and rehabilitation efforts. Sewage from historic silk factories caused overflows, leading to environmental waste and foul odours. Untreated wastewater flowed between houses and factories, prompting complaints from residents. Between 1982 and 1984, the Bank of Provinces (*İller Bankası*) developed two wastewater treatment plants along the Valley’s east-west axis. However, poor infrastructure continued to pose a public health risk. As pollution worsened, the municipality and the State Hydraulic Works (*DSİ*) paved the streambed with cement and stone, permanently altering the surrounding ecosystem (Figures 11b and 11c). Thus, natural riverbeds were replaced by narrow river corridors and tunnels of artificial materials, rendering the original boundaries of this watercourse no longer discernible.

#### Changes in the Spatial Structure of the Study Area

Since the mid-nineteenth century, the factory region around the Cilimboz Creek has provided income to inhabitants and facilitated immigration from

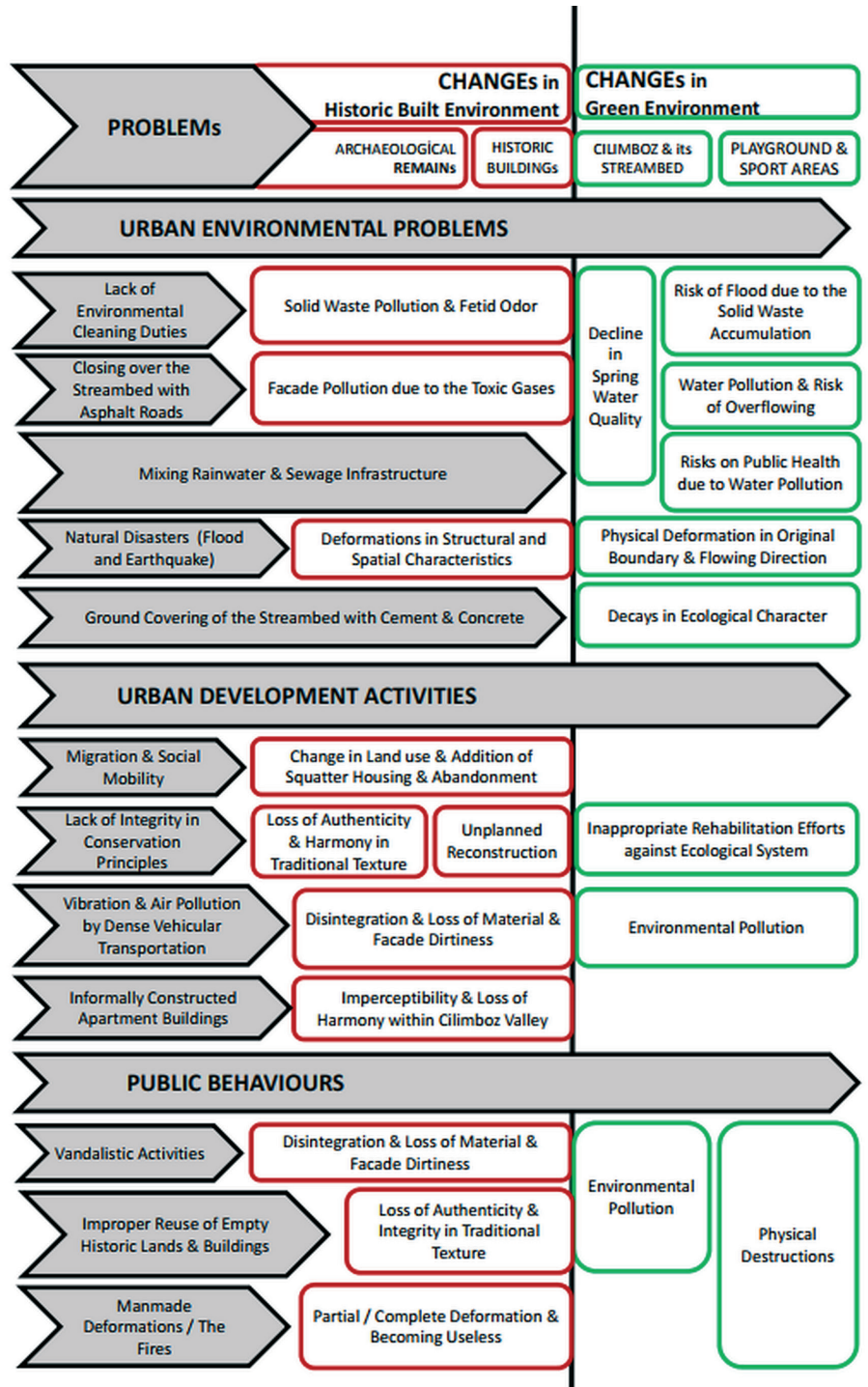


Figure 10. The relation between problems and changes as the results in both the green and historic built environment within the study area.

rural areas to Bursa’s ancient city core (Önge, 2019; Aslan, 2020; Çetin et al., 2025). Labour demand of the silk factories led to population movement, particularly due to the large-scale migration leading to the squatter housing (Yeke et al., 2016). Urban growth brought permanent changes to the HUL, as human activities, including vehicle vibrations, vandalism, abandonments, and solid waste pollution, weakened the structural stability of historic buildings (Figure 12). In addition to the renovations made in infrastructure and transportation along the Cilimboz Stream, social



**Figure 11.** (a) Solid waste and water pollution within the Cilimboz streambed (b) Vehicular transportation along Cilimboz Creek, (Photos of (a) and (b) by S. Çakıcı Alp) (c) Process of ground covering with concrete and stone masonry (Photos of (c) from the archive of the State Hydraulic Works (DSİ) and Bursa City Museum).



**Figure 12.** (a) Facade deterioration and structural cracks on the citadel walls and travertine cliffs in the study area; (b) Abandoned and vandalized industrial buildings (Photos by S. Çakıcı Alp).



**Figure 13.** Irregular urbanization and squatter housing units within the Cilimboz Valley (Photos by S. Çakıcı Alp).

mobility has emerged in the study area due to the uncontrolled increase of illegal and irregular construction towards the slopes of Uludağ (**Figure 13**).

There is a clear gap between legal frameworks and conservation decisions concerning both ecological habitat sustainability and the preservation of the historic built environment (Çakıcı Alp, 2022a). Restoration efforts after multiple fires in the silk factories have failed to prevent structural damage and collapses, altering the historic urban identity along this watercourse. The lack of a comprehensive conservation approach has made it more difficult to identify the distinctive architectural features of the study area. For example, the Conservation Development Plan (CDP) for Muradiye District (1991) did not include measures for the sustainability of cultural heritage around the HUL along the creek. According to the revision decisions approved by the RCCB since 1990s, flood zones of its streambed were extended by five meters, and new construction was permitted two meters above the highest watermark (9).

The first expropriation efforts by the order of Municipality of Bursa, in 1959, aimed to clear Cilimboz Valley of newly constructed squatter housing. As reported in the local newspaper, *Hakimiyet*, Bursa Municipality decided to demolish eight houses after classifying the northern side as a landslide zone (Sarı, 2020). However, the streambed remained polluted due to the accumulated trash, causing floods and water contamination in the following decades. After severe flooding in October 2010, the municipality demolished most of the multi-story buildings following the expropriation of 45 zoning parcels along the streambed as part of a stream rehabilitation project to renew and restore its deformed streambed (**Figure 14**). According to urban design projects prepared by the municipality, it was recommended to demolish the houses that were located within 7,700 square meters along the streambed of Cilimboz. However, it could not be possible to confirm how many of the demolished structures were listed as cultural heritages.

The municipal archaeologist committee reported that the remains of the Citadel walls, partially destroyed by natural disasters and vandalism, pose a public safety risk and require urgent repair in 2007 (12). It is particularly emphasized that the consolidation of partially collapsed citadel walls should be preferred instead of reconstruction. However, the southwest corner of the Citadel's walls, between the Zindankapı and Yerkapı gates, was reconstructed by using modern building materials. While such a reconstruction approach remains debated in both national and international conservation contexts, it raises a serious concern, in which rebuilding without adequate scientific evidence has the potential to

9. The related decision is approved by RCCB: 2613 / 29.05.2007.



Figure 14. Before (a) and after (b) the rehabilitation process along the Cilimboz Valley due to the flood in 2010 (Bursa Metropolitan Municipality, 2024).

create various problems in the future (Figure 15). Moreover, contradictions between ancient and modern structures create replicas that conflict with the authenticity and sense of belonging. In brief, both the natural disasters



Figure 15. The reconstruction process of the historic Citadel walls (Photos by S. Çakıcı Alp).

and human interventions have caused permanent changes in the physical and social structure of the study area's traditional texture (**Figure 10**). The absence of risk management and integrated maintenance plans has further exacerbated the transformation of the architectural and urban character of the study area (Çahantimur and Öztürk, 2021).

For the final assessment, a chronological timeline map was produced to establish the sustainability challenges in the study area (**Figure 16**). While conservation decisions and implementations within Cilimboz Valley began in the 1980s, urban development and stream rehabilitation actions have involved expropriation and alteration in its traditional texture since the 1950s. The archaeological remains and historic silk factories have been listed to be conserved since 1990s, although the surrounding HUL was not mentioned to be sustained. Since the early 2000s, the municipality and the RCCB have prioritized stream rehabilitation and environmental regulation projects, as well as the excavation and reconstruction actions around the Citadel walls, over developing a comprehensive conservation development plan for the continuity of multi-layered historic urban identity of the HUL along Cilimboz Creek as a water-related heritage in Bursa. Hence, this chronology demonstrates how fragmented planning methods and infrastructure-oriented rehabilitation initiatives have created sustainability challenges for the continuity of the multi-layered HUL.

## DISCUSSION AND RECOMMENDATIONS

This study illustrates how the HUL approach can be contextualized within a multi-layered urban fabric shaped by natural, industrial, and residential heritage. While the early twentieth-century conservation practices focused on preserving monumental integrity, contemporary frameworks advocate for the integration of social, environmental, and economic dimensions (UNESCO, 2011). In addition to the international declarations (UNESCO 2011, UNESCO 2016), recent researches (O'Donnell, 2008; Ahern, 2013; Bandarin and Van Oers, 2014; Rössler and Chih-Hung, 2018; Zhou et al., 2019; Colavitti et al., 2020; Tafahomi, 2022; Moazzeni Khorasgani and Asadi Eskandar, 2024; Cai and Nasu, 2025) discuss and emphasize

- the significance of a holistic HUL approach in sustainability of both tangible and intangible heritage
- the importance of ongoing community involvement and value-based preservation,
- the need for specialized administration and public engagement to build consensus on conservation values,
- the application of interdisciplinary methodologies such as stakeholder mapping, and multi-criteria decision-making in adaptive reuse strategies,
- the contribution of 'cultural mapping' in maintaining the social character as fostering a sense of place,
- the use of advanced digital technologies in documenting, analysing, and overcoming the problems without demolition.

In the case of HUL along Cilimboz Creek, this integrated view becomes essential for addressing the tensions between urban development pressures, industrial reuse, and ecological rehabilitation. The results of the analysis indicate that the cultural environment in the area has been

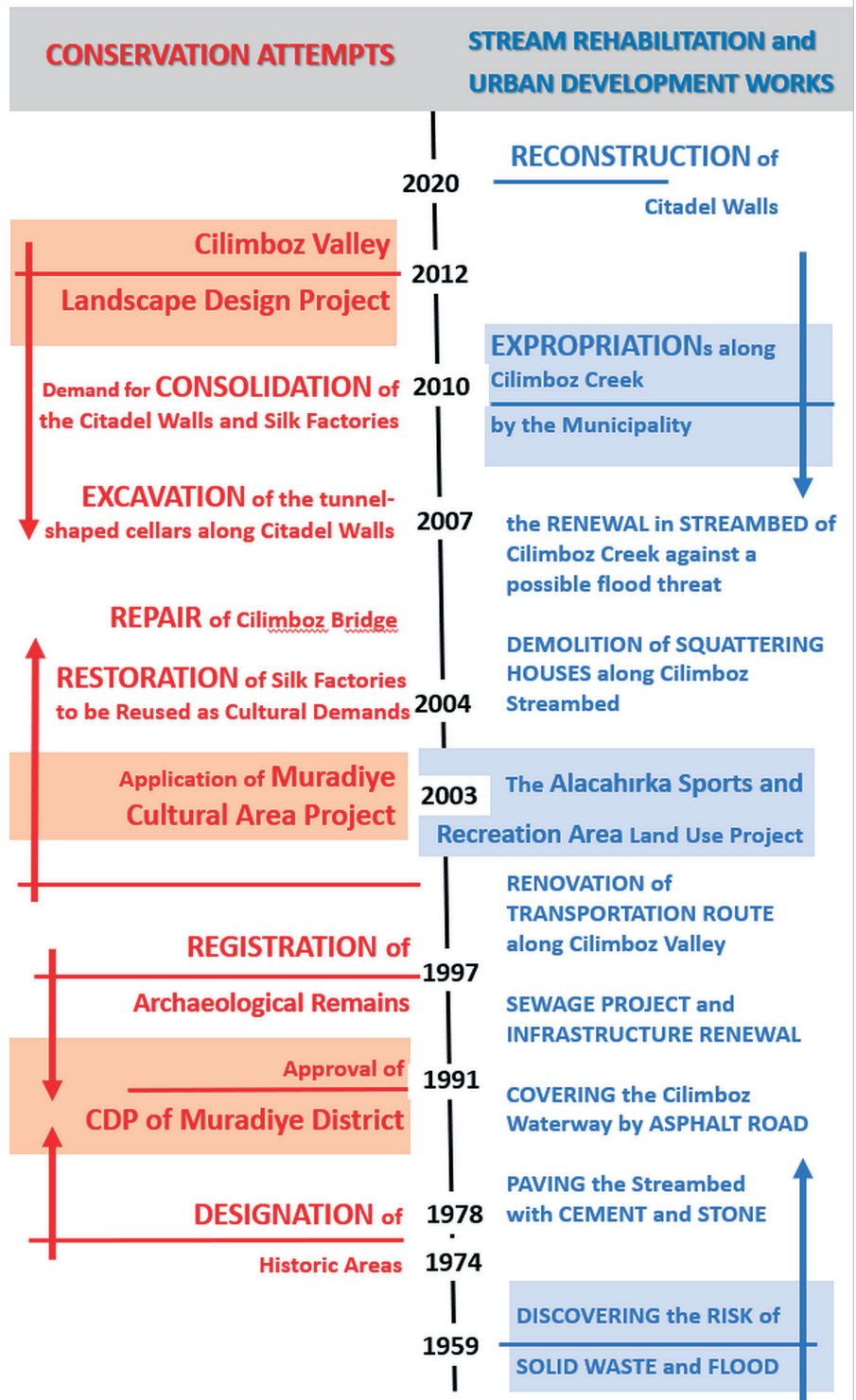


Figure 16. the chronological timeline illustrating conservation decisions and implementations together with stream rehabilitation projects, and urban development interventions along the Cilimboz Valley.

influenced by factors such as water, production, and settlement dynamics although, integrity and authenticity issues are not restricted to specific monuments. Accordingly, rapid urbanization and industrial transformation have destroyed the values describing the historical and multi-layered identity of Bursa. This loss of integrity and authenticity highlights the limits of traditional site-based conservation and reinforces the need for a holistic management model consistent with HUL principles. Thus, the case

of HUL along this watercourse enriches current debates on urban stream rehabilitation by demonstrating how the continuity of industrial and natural environments can be handled simultaneously through value-based planning.

The study highlights the need for community involvement and collaboration across disciplines when it comes to setting conservation priorities. Locals and others who worked along the stream in the past have vivid memories of the area and its industrial background, according to the interviews and surveys done for the evaluation. Social cohesiveness and cultural preservation are both enhanced when these intangibles are considered when making decisions. This is in line with the United Nations Sustainable Development Goals (11th and 15th SDGs), which advocate for a worldwide movement away from preservation efforts focused on monuments and toward more inclusive and environmentally friendly city planning. Besides, the fact that Cilimboz Creek has maintained its historic industrial character throughout the years is evidence to describe cultural heritage management aiming to reach the useful component of environmental and social policy frameworks.

There is an immediate need for consistent planning and legal tools due to the discrepancies between the preservation of archaeological sites and the adjacent urban development. Several spots along the Citadel walls have had the material integrity of their original structures that were undermined by modern renovations. Promising techniques for visualizing these consequences and guiding preventative conservation initiatives are the aims of digital documentation technologies, such as GIS-based spatial analysis and 3D modelling. The use of GIS and UAV-based data, along with the archival mapping approaches revealed the fragmentation of Cilimboz Creek's historical path and its separation from the surrounding industrial fabric. Moreover, there are advantages and disadvantages to renovating and adaptively reusing silk factories by the help of multi-criteria decision-making. These restoration applications can generate revenue and attract tourists, but in case of not following the standards established by the HUL approach, the authentic architectural character of the heritage assets in the study area might be lost.

In response to RQ4, the strategic recommendations proposed in this study are directly derived from the analytical layers identified using the HUL framework. The assessment of cultural and natural values (Section 4.1), as well as the diagnosis of ecological and spatial concerns (Section 4.2), provides the analytical basis for linking observed transformations to specific sustainability challenges. Rather than suggesting generic conservation measures, the strategies developed in this study are guided by the interaction between natural systems, industrial heritage, residential patterns, and regulatory interventions that collectively shape its multi-layered historic character. In this regard, the recommendations outlined below are structured to respond to the pressures highlighted in the analytical phases, emphasizing integrated conservation, risk-sensitive planning, and the role of water-related heritage as a structural element of the HUL. This way, these suggestions could contribute to achieving holistic and sustainable conservation in the HUL within Cilimboz Valley.

1. Integrated Management and Co-responsibility:

Governmental bodies should support cooperative management of archaeological, industrial, and natural heritage resources, as well as community participation in the urban stream rehabilitation.

2. Comprehensive Heritage Inventory:

A standardized and open-access documentation system should be built to document water-related urban heritage and landscapes, ensuring systematic data management and monitoring.

3. Sustainability in Adaptive Reuse Principles:

Reusing the historic industrial sites reduces new construction and environmental effects, supporting the SDGs. Integrating nature-based solutions can improve sustainability and public appeal, emphasizing the balance between functional improvement and heritage conservation. Creating a long-term preventive management strategy would also help to preserve the material, structural, and social assets of the industrial heritage, which reduces the need for reactive measures.

4. Public Awareness and Education:

Training modules, workshops, and media activities should increase public understanding of the HUL's significance while also reinforcing the collaborative role of local institutions and residents.

5. Ecological Restoration and Sustainable Design:

The rehabilitation programs should focus on natural streambed recovery, water quality improvement, and biodiversity conservation. Integrating nature-based solutions into urban architecture would reduce flooding risks while improving ecosystem services.

In brief, this study emphasizes the importance of maintaining a HUL through a holistic approach that considers cultural preservation, ecological sustainability, and socio-economic vitality, as well as the need for a realistic model for balancing urbanization with environmental and cultural preservation by integrating analytical results with global heritage frameworks.

## CONCLUSION

Sustainable urban practices and conservation strategies in industrialized historic cities depend on the dynamic relationship between geographical context and architectural heritage. Continuous urban growth must respect the principles of the HUL, preserving the integrity of natural systems and historic built environments. Effective governance, innovative policy frameworks, and public awareness are critical to ensuring the continuity of heritage values within this framework.

This study examined the sustainability challenges of the Cilimboz Creek and its surrounding HUL in Bursa through the archival research, field surveys, GIS-based mapping, and UAV documentation. Although the available archival information did not allow for a fully comprehensive chronological timeline, a preliminary sequence of conservation and transformation phases was developed. This timeline provided the foundation for identifying gaps in policy continuity and spatial integrity within the HUL.

The key contributions of the study can be summarized as follows:

- Identifying the natural urban watercourse and surrounding industrial, archaeological, and architectural heritage as the integral components of a defined HUL in Bursa;
- Assessing the effectiveness and integrity of current conservation efforts aimed at sustaining the area's cultural and natural assets;

- Revealing the sustainability challenges posed by traffic circulation and urban development pressures;
- Emphasizing the necessity of preserving the multi-layered urban identity and the values that define the HUL's unique character;
- Proposing a holistic conservation approach that informs future risk management and sustainability planning in similar heritage contexts where ecological and cultural values intersect;
- Guiding stakeholders and policymakers toward integrated conservation strategies that align with sustainable trade, tourism, and community development goals in Bursa.

These contributions provide a basis for the integration of conservation and sustainability strategies into historic urban settings. Looking ahead, it is recommended that future study broaden the quantitative assessment of heritage vulnerability and investigate the possibility of participatory digital tools to improve monitoring and management within the HUL framework. The findings from this study thus represent not only an analytical account of the Cilimboz Valley but also a transferable model for other HULs facing similar environmental and socio-economic challenges.

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**Anahtar Sözcükler:** Suyolu; tarihi kentsel peyzaj; çok katmanlılık; bütüncül koruma; dere ıslahı.

## ÇOK KATMANLI TARİHİ BİR KENT PEYZAJINDAKİ KORUMA SORUNLARI: CİLİMBOZ VADİSİ, BURSA

Kent içi suyolları, tarihi kent kimliğini şekillendiren yapılı çevrenin gelişimini ve dönüşümünü yansıtan önemli doğal öğelerdir. Bitinya döneminden bugüne Bursa'nın tarihi kent merkezindeki sur duvarlarının batı çeperi boyunca akan bir su yolu olarak bilinen Cilimboz (Phillippos) Deresi'nin güney kısmındaki alanda arkeolojik kalıntılar, geleneksel konutlar ve endüstriyel miras anıtlarından oluşan bir tarihi kentsel peyzaj yer alır. Çalışma alanı olarak seçilen bu doğal ve yapılı çevrede gözlenen yangın ve sel gibi felaketler ile birlikte gerçekleşen kentsel gelişim faaliyetleri, buradaki çok katmanlı dokuyu kalıcı olarak değiştirmiştir. Buna rağmen, bir zamanlar çeşitli etnik gruplara ev sahipliği yapan bu kültürel peyzajda özgün bir mekân algısı da mevcuttur. Çalışma

kapsamında, bu alanı şekillendiren geleneksel dokunun mevcut durumunu tespit etmek için öncelikle alan çalışmasına dayalı yorumlayıcı-tarihsel araştırma yöntemleri kullanılmıştır. Sonrasında, Cilimboz Deresi'ni çevreleyen kültürel peyzajın devamlılığını tehdit eden zorlukları tanımlamak için çalışma alanındaki kentsel dönüşüm ve dere ıslah çalışmaları da değerlendirilmiştir. Böylece benzer kültürel peyzaja sahip tarihi alanların sürdürülebilirliği için bütüncül koruma yaklaşımının önemi vurgulanırken, çalışma alanındaki çok katmanlı kültürel miras yapısının korunmasına yönelik öneriler sıralanmıştır.

### **CONSERVATION ISSUES IN A MULTI-LAYERED HISTORIC URBAN LANDSCAPE: CİLİMBOZ VALLEY, BURSA**

Urban watercourses are crucial natural elements that reflect the development and transformation of the built environment, shaping historic urban identity. The Cilimboz (Phillippos) Creek, a watercourse at the historic city core of Bursa, has flowed along the west side of citadel walls since the Bithynian era. Its southern valley, the study area, contains archaeological ruins, natural textures, traditional dwellings, and industrial heritage monuments. Over time, urban development activities and disasters, such as fires and floods, have permanently altered this multi-layered texture. Yet this cultural landscape maintains its unique sense of place once home to diverse ethnic groups within its historic urban landscape (HUL). To explore the current status of its traditional texture, the spatial features of the study area shaped by culture and natural assets were initially identified through interpretive-historical and case-study research methods. Afterward, the outcomes of urban transformation and stream rehabilitation attempts were evaluated to highlight challenges threatening the continuity and integrity of the HUL surrounding Cilimboz Creek. Finally, the urgent need for a holistic conservation approach was emphasized to address spatial, social, and ecological problems impacting the sustainability of such a multi-layered HUL in Bursa.

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