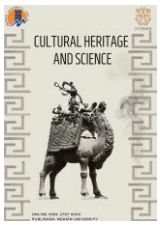
Volume 3 Issue 2
December 2022

CUHES

CULTURAL HERITAGE AND SCIENCE

ONLINE ISSN: 2757-9050
PUBLISHER: MERSİN UNIVERSITY



Cultural Heritage and Science (CUHES) is an interdisciplinary academic, refereed journal for scholars and practitioners with a common interest in heritage.

Aims and scope

Provide a multidisciplinary scientific overview of existing resources and modern technologies useful for the study and repair of cultural heritage and other structures. The journal will include information on history, methodology, materials, survey, inspection, non-destructive testing, analysis, diagnosis, remedial measures, and strengthening techniques.

Preservation of the architectural heritage is considered a fundamental issue in the life of modern societies. In addition to their historical interest, cultural heritage buildings are valuable because they contribute significantly to the economy by providing key attractions in a context where tourism and leisure are major industries in the 3rd millennium. The need for preserving historical constructions is thus not only a cultural requirement, but also an economic and developmental demand.

Therefore, Cultural Heritage and Science (CUHES) cover the main aspects related to the study and repair of an existing historical artifact, including:

- ✓ Issues on the history of construction and architectural technology
- ✓ General criteria and methodology for study and intervention
- ✓ Historical and traditional building techniques
- ✓ Survey techniques
- ✓ Non-destructive testing, inspection, and monitoring
- ✓ Experimental results and laboratory testing
- ✓ Analytical and numerical approaches
- ✓ Innovative and traditional materials for repair and restoration
- ✓ Innovative strategies and techniques for repair and restoration
- ✓ General remedial measures
- ✓ Repair and strengthening of structures
- ✓ Seismic behavior and retrofitting
- ✓ Detailed and state-of-the-art case studies, including truly novel developments
- ✓ Cultural Heritage and Tourism
- ✓ Close-range photogrammetry applications for cultural heritage,
- ✓ Laser scanning applications for cultural heritage,
- ✓ 3D modeling applications for cultural heritage,
- ✓ UAV photogrammetry applications for cultural heritage
- ✓ Underwater photogrammetry applications for cultural heritage
- ✓ Virtual Reality and Augmented Reality applications for cultural heritage
- ✓ Remote Sensing applications for cultural heritage
- ✓ Archeologic studies
- ✓ Architecture studies
- ✓ History of Art studies
- ✓ Description of novel technologies that can assist in the understanding of cultural heritage.
- ✓ Development and application of statistical methods and algorithms for data analysis to further understanding of culturally significant objects.
- ✓ Computer sciences in cultural heritage

The main objective is to provide an overview of existing resources useful for the rigorous and scientifically based study of the state of ancient structures and to present state-of-the-art novel research in the field. The journal will publish review papers, research papers, and detailed case studies. Interdisciplinary contributions will be highly appreciated.

Cultural Heritage and Science (CUHES)

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Volume 3
Issue 2 *December, 2022*

Contents

Articles

Cultural Heritage and Science
https://dergipark.org.tr/en/pub/cuhes
e-ISSN 2757-9050

Conservation status of intangible cultural heritage after restoration: Case study of Mardin Spice Bazaar

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Keywords
Cultural Heritage
Sustainability
Historical Bazaars
Intangible Cultural Heritage
Mardin

Research Article
Received:12.08.2022
Revised: 16.11.2022
Accepted:17.11.2022
Published: 20.12.2022

Abstract

When the bazaars lose their traditional functions, characters, and identities through urban development, they also lose their importance as the element of intangible cultural heritage defining the behaviors and life styles of the local people traditionally, and as the channel of human interaction. Within this context, this article aims to research what the sustainable architectural elements of historical bazaars are after restoration and their relationship with the social and cultural components critically by addressing the historical Mardin Spice Bazaar as a case study. Qualitative research method was used in the study. The primary data was collected through the observations in Mardin Bazaar and in-depth interviews with the shop owners and customers. In the results of the study, it is seen that the restoration applications carried out in Mardin Spice Bazaar were intended for improving only the physical conditions of the bazaar, and has focused on the spatial statuses and have not considered the human activities. The study is significant for investigating the pros and cons of the restoration projects, which were applied to make the traditional bazaars more attractive as the touristic attraction centers, over the intangible cultural heritage values.

1. Introduction

It is necessary to consider the sustainability also within the context of increasing the life quality and developing the social sustainability, considering it not only in the concepts such as energy, environment, ecology, and recycling, but also paying attention to human behaviors and body interaction, in order to develop a sustainable city. In a sustainable city, the sense of belonging to that place must be established and increased (Sobouti & Alavi, 2016). Within this context, the bazaars, particularly in Islamıc countries, are efficient in the generation of the sense of belonging in a venue, due to their characteristics of being a life style and a symbol of the life itself (Jayyusi et. al, 2008). Today, such kind of a sense of belonging does not exist in modern passages (Samadi et. al, 2020). These areas had an important place in the collective memory of the cities also in terms of cultural heritage and social life (Arslan, 2015), as well as their commercial importance (Soltanzadeh, 1987). When the tourists visit a traditional bazaar in a country, they can also experience the cultural characteristics, social and behavioral interactions completely, in addition to the odours, tastes, voices, and images, due to the cultural activity and social behavior (Zandieh & Seifpour, 2019).

The bazaars are the places, where the human behaviours and body interactions are the most intense in a city, the details such as the rhythmic sound of the hammer used by the coppersmith, the odour of spice, the combination of the bodies of the craftsmen and the rhythm of light creates an admirable symphony of various senses, which cannot be compared with the modern passages, and recall the life in these places (Samadi et. al, 2020). The traditional bazaars are the windows opening to the life culture of the populations and places and the permanent exhibitions of the tangible and intangible cultural heritage of a community (Pirnia, 2007; Edgu et. al, 2012). A traditional bazaar may have many values as a part of the intangible assets of a region, even without the historical buildings, because the daily lives of the inhabitants of a region are depicted there lively (Lai et. al, 2013; Zandieh & Seifpour, 2019). Since the conservation of the cultural heritage requires sustaining the intangible values as well as the tangible values, it is necessary to ensure also the sustainability of

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Cite this article (APA);
Karataş, L. (2022). Conservation status of intangible cultural heritage after restoration: Case study of Mardin Spice Bazaar. Cultural Heritage and Science, 3(2), 30-36

the values such as the intangible human behaviors, within the context of transmitting the bazaars to the future generations (Pereira Roders & Van Oers, 2011; Timothy, 2011). Therefore, the bazaars must be conserved also as a value of intangible heritage, as well as their social and economic importance (Assari et. al, 2011; Arslan, 2015; Sobouti & Alavi, 2016).

Within the context of conservation of the traditional bazaars, since the traditional bazaars function as the "museums" of touristic attraction elements, human interaction, and cultural expressions, it is the duty of the conservators and government to pay attention particularly to any physical change that may affect the social behavior intended for the bazaars (Taheri & Khatibi, 2016). When the bazaars lose their traditional functions, characters, and identities within the scope of various renewal projects, they also lose their importance as the element of intangible cultural heritage, which defines the behaviors and life styles of the local people traditionally, and as the channel of human interaction, and one of the primary touristic attraction centers of the city shall disappear (George et. al, 2009). Therefore, the behavioral regulations of the local people, particularly those working in the traditional bazaars, and the links between the behavioral regulations of the local people and the value of the bazaar are important (Zandieh & Seifpour, 2019).

As what attracts the tourists to a place is the identity and uniqueness of that place, the great challenge before and after the restoration process of the bazaars is the loss of the identity during the urban renewal and urban planning. If the urban modernization occurs only according to the modern aesthetic criteria, the tourists visiting the traditional bazaars may be surprised or disappointed for how the locality is different from the imagine. They may see a modern and "beatified" bazaar instead of a unique traditional bazaar that represents the local cultural customs (Zandieh & Seifpour, 2019). Since the bazaar has an enormous potential in the study subject as an important element for increasing the sense of belonging and tourism development, an integrative approach is needed, which respects to the local communities, contributes into its welfare, and undertakes a socially responsible future (Kalan & Oliveira, 2016).

As stated before, the spatial characteristic of a place also affects the feelings of the individuals about a place and their evaluations on that place, and the loss of the place identity causes the loss of sense of belonging and loyalty to a place (Michelson, 1976). Within this context, the studies in the literature explain that studies determining which spatial elements are considered by the members of the society as the parts forming the identity of place are needed, and emphasize that more favorable urban venues may be established by realizing and strengthening these elements (Salah Ouf, 2001). Within this context, the study is based on the suggestion regarding the determination of the spatial elements forming the sense of place of the bazaars, which is overemphasized by Zandieh & Seifpour (2019) and Salah (2001) in their study results to investigate in future studies.

Within this context, this article aims to research what the sustainable architectural elements of historical bazaars are and their relationship with the social and cultural components critically, by addressing the historical Mardin Spice Bazaar as a case study. The study is significant for investigating the pros and cons of the restoration projects, which were applied to make the traditional bazaars more attractive as the touristic attraction centers, over the intangible cultural heritage values.

The question of how the behaviors of humans at a place may change with the need of conservation projects due to various factors and making changes and how these changes shall affect the intangible cultural heritage emerges (Zandieh & Seifpour, 2019). The behaviors of a seller in a bazaar are specific to the place and formed by the venue. The behaviours reflected by the seller are imprinted into the memory of the visitors within that area, and form the collective memory specific to that place. Any spatial and physical change, which shall cause the behaviors of the sellers within the bazaar to change via the urban renewal projects, shall affect the behaviors of the Merchant using that environment, and may cause them to be unable to behave traditionally (Lang, 1987). In summary, the sustainability of the historical bazaars becomes meaningful, only if it can reflect the busyness of the daily life on their physical structures. The fact that how the renewal process affects the daily life of the community is also very important. However, in many cases, the urban planners have made spatial changes in order to improve the functionality of the bazaars, and this has caused the current behavioral regulations to be changed or eliminated. When the workplaces of the sellers are removed or changed significantly, also the working methods, physical presences of the sellers, and the sounds and smells they produce within the bazaar change. All of them are the parts of the bazaar environment, which creates the individual memories and collective identity of a place (Connell & Gibson, 2003).

Many studies in the literature state that the architectural order, which forms the behaviors within the venue, provides opportunity for traditional behaviors (Soleimani et. al, 2017; Barati & Kakavand, 2013; Lotfi & Zamani, 2015; Samadi et. al, 2020; Ujang & Zakariya, 2015). However, the studies, which investigate the effect of the urban changes and restorations on the bazaars, are limited in the literature. In the research conducted by Kermani and Luiten (2009) on the historical bazaar of Kerman City, Iran, which is a significant example, it is stated that the urban changes have weakened the main transportation connections from the entrance gates of the city to the historical bazaar and this caused the bazaars to lose their privileged socio-economic roles (Aminzadeh & Afshar, 2004). Shamsuddin and Ujang (2008) explain in their study, which they have investigated the traditional bazaars in Kuala Lumpur, that creating a sense of place develops the loyalty of the inhabitants to that place and thus increases the desirability of that place, and emphasize that the importance of creating a sense of place in the urban renewal projects within the historical sites of the cities must be considered.

2. Study Area

Mardin Spice Bazaar is located on the north side in Şar district and on the South side in Ulucami district within the urban archaeological site of Mardin Province, Artuklu County (Figure 1).

Two periods – original and current status – are seen on the building, from the traces from the building and characteristics of the similar period, based on the written and visual resources. The stores of the bazaar have been built from smooth cut and pitch-faced limestone, in single storey in the first period, in which it bears the original texture, and the entrances, which are next to and face each other on the North and South wing of the bazaar, with lancet and half-round arch, have wood door wings. It has a plan structure with a rectangular plan and cross or cradle vault from inside and with a flat roof from outside, and it continued its function within this layout. The Spice Bazaar having the typical characteristic of Mardin Bazaar, which creates the starting point of a new bazaar following the end point of each bazaar, also opens to Smugglers Bazaar on the west end, and to the Clothing Sellers' Bazaar on the east end (Figure 2 and Figure 3).

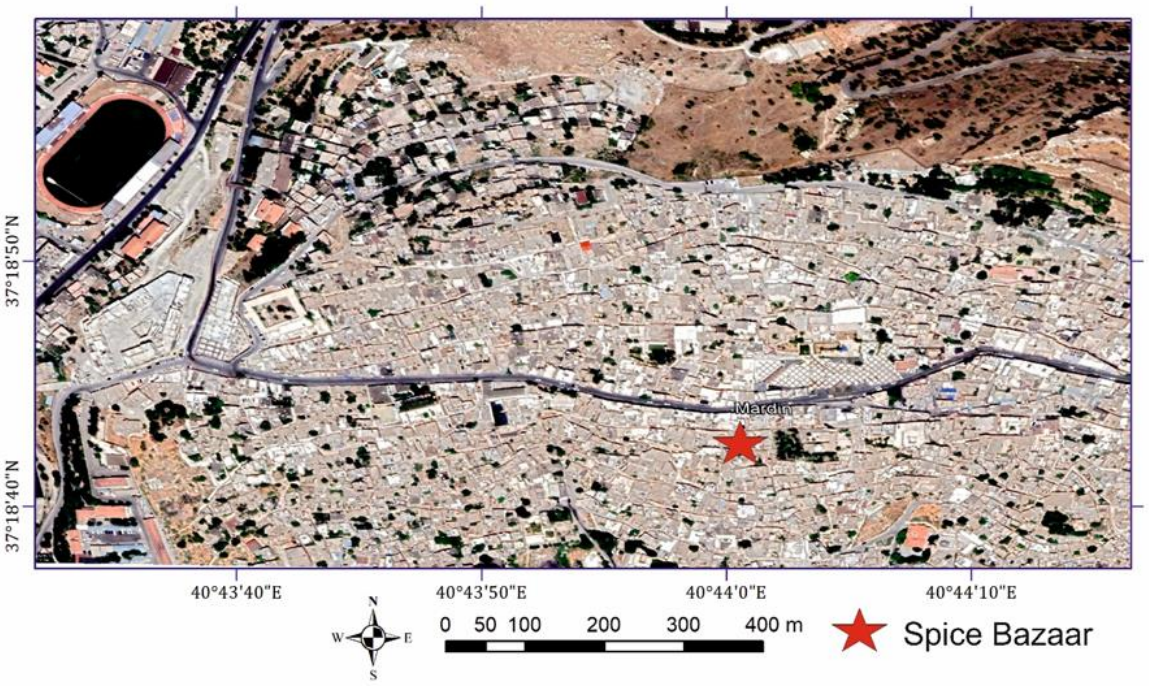

Figure 1. Location of the Spice Bazaar

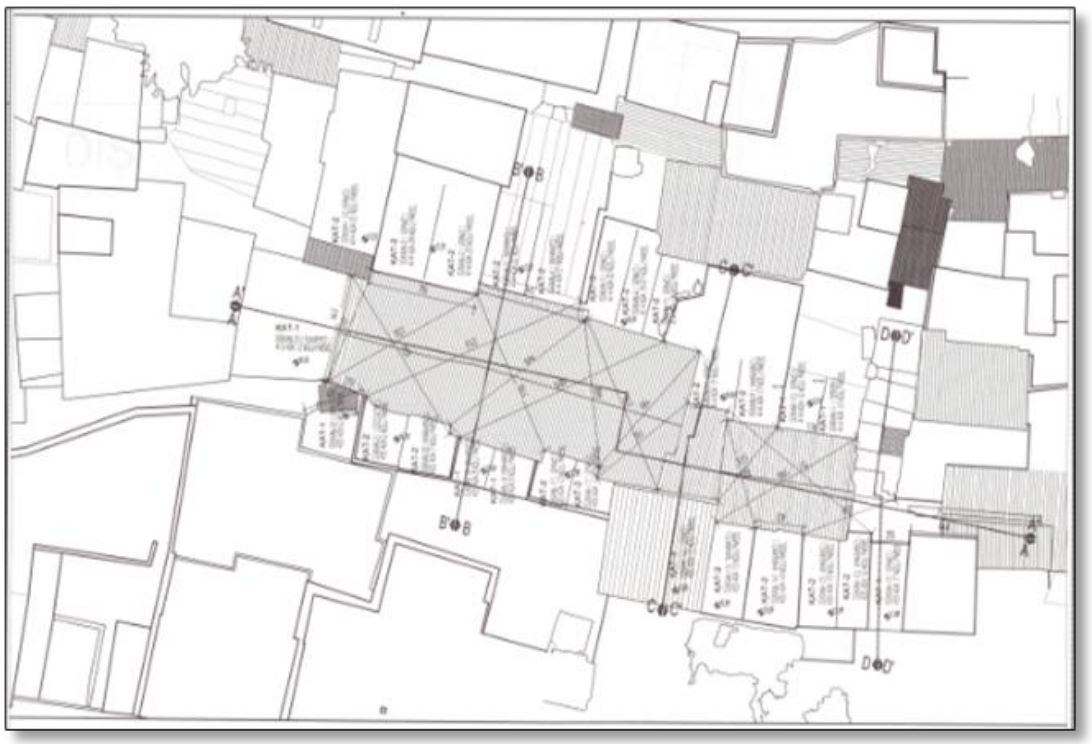

Figure 2. The layout plan of the bazaar

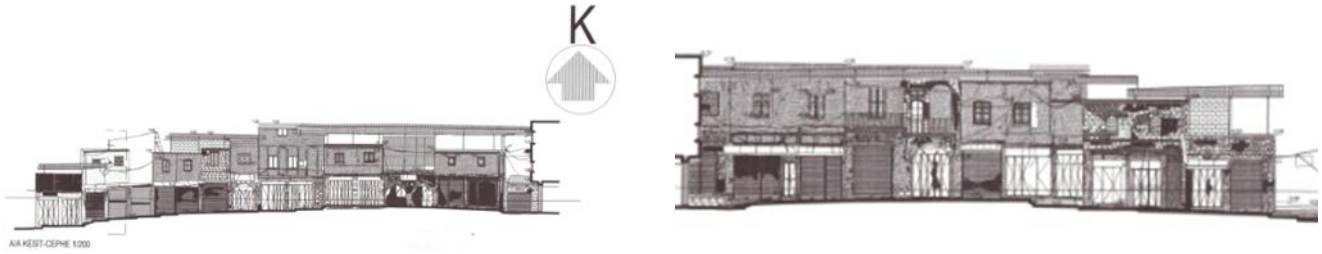

Figure 3. Sections regarding the bazaar

The Spice Bazaar has confronted with losing its original purpose in recent years. It is seen that the bazaar, in which the spices brought from outside and made within the city are sold, is rather replaced with the clothing stores today. However, the symbolic meaning of bazaar's original purpose always exists in the memory of the city population. Today, individuals from every section of the community prefer to visit the bazaar to purchase spices and in brief to breathe the historical features of the venue.

3. Method

Qualitative research method was used in the study. The primary data was collected through the observations in Mardin Bazaar and in-depth interviews with the shop owners and customers. In-depth interviews were used to collect information regarding the perception of those who interacts with the bazaar daily. The selection of the participants started with the convenience sampling process (Neuman, 2011) and continued as snowball sampling. Interviews and observations were carried out by the author in July 2022 at the Spice Bazaar.

3.1. Architecture of the bazaar and its social and cultural components

The historical Mardin Spice Bazaar is located on the point, where various architectural building groups (mosque, church, monkery, delubrum, public bath) are present within the urban archaeological site. Furthermore, primary public services such as the banks, government agencies, post office and other institutions and activities are within this scope. Various activities around the bazaar and the hordes of tourists make these points busier. Within the scope of the accessibility of the bazaars, pedestrian access is available. It is important to specify that the perfect accessibility and the opportunity to access the bazaar by using the public service vehicles are among the main reasons for the users in choosing the bazaar for shopping. The architectural elements such as the "abbaras (a kind of passage specific to Mardin)", "elevation differences" surrounding the bazaar contribute into the sustainability of the bazaar by creating an appropriate social and economic interaction. The religious buildings and their green elements of them and fountains surrounding it create a social area in order to increase the welfare of the society and create an ambience and spirit.

Also, the memories recalled by the bazaar are among the primary reasons of why the visitors visit here many times. The bazaar brings the memories from past to present like childhood memories such as going to school and play games in the backyard of the mosques and medreses. These memories are also important for the shop owners, as well as the visitors, and develop the sense of place within Mardin bazaars.

3.2. Faults seen in the restoration

When the status of Spice Bazaar after the restoration is reviewed, it is seen that many applications, which damage the historical spirit, have been made. It is seen that the shutters that are specific to the modern passages and sunshades to protect the spices from the sun were placed on the facades. Furthermore, doors made of wooden-like PVC-based material have been placed as the entrance doors that are exactly the same of each other to all stores within the bazaar. The gold-colored signboards on the facades of the stores, which are the exact copies of each other, damage the historical appearance of the bazaar (Figure 4). In addition, air conditioners have been placed on the facades to keep the stores cool (Figure 5).

Figure 4. Stores before and after the restoration in spice bazaar

Figure 5. Shutters specific to the modern passages on the facades of the bazaar, air conditioners placed on the facades, and sun shades placed in order to protect the spices from the sun

3.3. Opinions of the shop owners and satisfaction assessment

The results of the interviews show that 30% of the shop owners is satisfied with the bazaar restorations, and 70% of them is not satisfied. Within this scope, the most important point that the shop owners are uncomfortable with is the incompatibility between the microclimatic features and the function of the monuments. It is seen that spotlights and air conditioners had to be used in the stores located in the Spice Bazaar. This is related with the facts that the building is about to lose its primary function currently and shop windows are being placed to the stores to exhibit some other functions. However, some architectural details such as the facts that the building has preserved its original height, stone has been used as the construction material, and wall thickness, are the elements that are sufficient to protect the spices easily without using air conditioners.

3.4. Opinions of the tourists and satisfaction assessment

When the status of the bazaars after the restoration is reviewed, it is seen that the facades of the stores made exactly same of each other. Restoration applications have been carried out only according to the modern aesthetic criteria, and the tourists visiting the traditional bazaars emphasized that the locality is different from the imagine and they are surprised. They stated that they have seen a modern and "beatified" bazaar, instead of a unique traditional bazaar representing the local cultural customs. For instance, a European tourist has stated that he/she had a mental image regarding the traditional bazaars of Middle East, which are pretty different from the concept in Europe; however, he/she could not see that here. The facts that the facades and signboards are exactly the same, music and the intense light reflected from the store windows and the use of air conditioners give the tourists the sense of being in modern passages (Figure 6).

In summary, it is seen that even a few basic changes to be made on the buildings and environments of the bazaar in order to improve the performance of the bazaars and modernize them, change the characteristic and personality of the bazaar radically; this has made it a copy of its equivalents in other geographies and thus damaged the place concept and sense of belonging of a bazaar.

Figure 6. Placing shop windows and spotlights to exhibit the spices

4. Discussion

This study aims to research what the sustainable architectural elements of historical bazaars are after restoration and their relationship with the social and cultural components critically, by addressing the historical Mardin Spice Bazaar as a case study. Within this context, the findings of the study match up with the findings of the previous studies (Soleimani et al., 2017; Barati & Kakavand, 2013; Lotfi & Zamani, 2015; Samadi et. al., 2020, Ujang & Zakariya, 2015). The common point of these findings is that the architectural layout forming the behaviors within a venue is efficient directly on the perception of the bazaars and provides opportunity for the traditional behaviors. It is seen that the restoration applications carried out in Mardin Spice Bazaar were intended to improve the physical conditions of the bazaars, focused only on the spatial situations, and did not consider the human activities. Yet, the studies in the literature emphasizes that the importance of creating a

sense of place must be considered in the urban renewal projects in the historical sites of the cities (Shamsuddin & Ujang, 2008).

Another finding that has to be emphasized is that paying attention only to the visual value, instead of the "Place" concept in the renewals carried out in the Spice Bazaar caused the bazaars to lose place identity fact. The renewals carried out in the bazaars have changed the sellers' exhibition and protection methods of spice, which they have exhibited and protected through the traditional methods. It is seen that the spices are being exhibited through the shop windows under the spotlights today instead of the traditional methods and they are tried to be protected from spoiling by using air conditioners instead of natural ventilation methods. These results obtained from the study support the finding of "any spatial and physical change, which may cause the sellers of the bazaar to change their behaviors with the urban renewal projects, shall affect the behaviors of the merchant using that environment and cause them not to behave traditionally", which is emphasized in the literature (Lang, 1987; Connell & Gibson, 2003).

Creating a three-dimensional model of the building before starting the restoration work will be of great benefit (Karataş et al. 2022). Unmanned aerial vehicles and laser scanners, which are remote sensing techniques, have been frequently used in the modeling of historical buildings in recent years (Alptekin et al.2019; Alptekin & Yakar 2021; Kanun et al.2021; Mirdan & Yakar 2017). The most important advantage of remote sensing technology is to model the historical artifact without touching it (Yılmaz et al.2000; Doğan Yakar 2018; Korumaz et al. 2011; Yakar & Doğan 2017).

5. Conclusion

It was investigated that how the applications made on the bazaars for conservation and renewal may affect the habitants and visitors. It is seen that the bazaar has failed to preserve its original design and general architectural characteristics until today. Yet, the cultural and social sustainability of the bazaars must be considered with the restoration projects. Attention must be paid not to change the original structure and features and not to change the external facade extremely during the modification / repair works of the bazaars. The original structural system of the building must be preserved intact in order the bazaars reflect the characteristics of the period, in which they have been built. Therefore, it is expected that the repairs be in conformity with the original structure and form of the buildings and the buildings preserve their original functions as far as possible. The sense of place and collective memory can be strengthened only by conserving the heritage of the places that assist to create the social identity of a community. Therefore, any planned change**s** must remain in compliance with the conservation of the connection of the local identity with the place. Furthermore, including the local habitants into the decision-making process shall assist to protect the sense of local place and identity.

The physical planning must reflect the basic behavioral principles to decide on the way of change within the context of traditional value of a bazaar in order to conserve its intangible cultural heritage. The activities having significant effects on the identity of the bazaar must be recognized by assessing the long-term field studies and their effects on the place identity. The most important step for the correct development is to research and discover new strategies for urban planning interventions within the urban environments and to analyze how modernization shall affect them. The plans intended for the importance and value of the bazaar in daily life and the sustainability of the bazaar must be prepared in this direction. Transformation of Mardin Bazaars into ordinary shopping venue may only be prevented through a management emphasizing that it is the oldest and unique bazaar of Mardin.

Acknowledgement

We would like to thank to the tradesmen of Mardin Bazaar.

Conflicts of interest

The authors declare no conflicts of interest.

Statement of Research and Publication Ethics

Research and publication ethics were complied with in the study.

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Cultural Heritage and Science
https://dergipark.org.tr/en/pub/cuhes
e-ISSN 2757-9050

Ram-head Tombstones in and around Iğdır and their place in art history

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Keywords
Ram-head Tombstones
History of Art
History
Iğdır

Research Article
Received:07.10.2022
Revised: 15.11.2022
Accepted:21.11.2022
Published: 20.12.2022

Abstract

In this research, a total of 16 ram tombstones, including 6 ram headstones in the open-air museum of the Karakoyunlu district municipality, which is 15 km away from Iğdır, and 10 ram-head tombstones in the Kadim Çaybaşı Cemetery in Melekli town, 6 km away from the city center of Iğdır, has been studied. Since many of the tombstones have suffered various destructions over time, only those that have survived to the present day and are in readable condition have been identified and studies have been carried out on them. A total of 37 tombstones were identified during the field survey. Only 16 of these tombstones have been studied. The research started with a literature review in order to create a source for the study, then the ram-head tombstones in Iğdır and its surroundings were seen in person, the photographs of these tombstones were taken and their measurements were taken. In line with the available data, the tombstones were marked and read. As a result, the materials used in the construction of the ram headstones seen in and around Iğdır, the stamps, depictions and embroideries on the shaping techniques are documents that clearly show that they were created by the Turkish communities who settled in Anatolia and dominated these regions.

1. Introduction

The concept of death, which directs human life, has been questioned in all beliefs and human beings have been busy answering whether there is another life after death (Arslan, 2018). In Turkish belief, death is not the end, on the contrary, it is an inevitable fact and a phenomenon that is accepted as a natural process. Turks, who believe that everything in nature has a soul and that they will die (Eroğlu, 2017), have given great importance to graves and tombstones since history (Bodakçı, 2017). The fact that Turks bury them with their valuables and believe that there will be another life after death shows the belief in death and burial traditions (Aslan, 2019).

Tombstones, which are an important part of cultural history, are documents that provide information about the traditions, customs and beliefs of that nation in the cultural relations that a nation has made on the geography of its area (Sili, 1996). Gravestones can be considered as a language that reflects the belief, state of mind and perspective of the person they are in, as well as the economic, cultural and social situation of the environment in which that person is located (Kuru, 2014). In this respect, tombstones appear as the primary source of information about the cultural and social structure of the region (Çaylar, 2016).

In the Turks, the tradition of burial and erecting stones for the dead, which continues for thousands of years with the belief that life continues after death and that the dead person will be resurrected, began to emerge primarily in their homeland, Central Asia. This practice continued in various ways under the influence of different ethnic groups during the temporary or permanent settlement of Turks in many parts of the world (Karamürsel, 2002). In this sense, the Balbals, which have the tradition of erecting stones on the graves, are both important works of Turkish sculpture art and the beginning of the tombstone tradition (Aslanapa, 2019). Although "balbals" continue as tombstones in the Göktürks, there are also large stone erection practices called Bengütaş, which has an inscription on it and means eternal life (Tunçel, 1996).

In Turkish states such as Hun, Göktürk, Uygur, stone sculpture and balbal practices, which are the tradition of pre-Islamic tombstones, have changed with the acceptance of Islam, the understanding of burial, grave and tombstone has changed, and this situation has transformed into different forms. Especially common in Central Asia, 'balbals' and 'stones with tamga' started to be replaced by new forms with Islam (Çetin, 2019), but the old forms were not abandoned after Islam and continued by adapting to Islamic culture (Kaya, 2021).

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Cite this article (APA);
Kaya, A. (2022). Ram-head Tombstones in and around Iğdır and their place in art history. Cultural Heritage and Science, 3(2), 37-48

The presence of tombstones such as rams, sheep, and horses are an indicator of Turkish nomadic culture and belief in the sky god, as well as the presence of balbals in regions under Turkish domination (Borisenko & Khudyakov, 1998). Turkish communities, who lived in tribes in various periods of history, have integrated animals such as rams with themselves due to their lifestyle and have frequently included this subject in many literary genres, besides, they have made ram-head tombstones for the grave of the deceased (Alyılmaz, & Alyılmaz 2017). It is known that among the ancient Turks, people sacrificed mountain sheep or rams to protect themselves from evil spirits, as well as drawing ram horns or making ram statues (Diyarbekirli, 1972).

The tradition of making ram-sheep sculptures in Central Asian Turkish culture has continued to be used as tombstones, especially with Akkoyunlu and Karakoyunlu people who settled in the Eastern Anatolia region, and has survived to the present day (Yaşa, 1992). These works provide important documents in the field of history, art, literature and culture of Turkish communities in regions where Turkish communities live, such as Central Asia and Anatolia (Berkli, 2007).

The fact that ram and sheep tombstones in Anatolia are seen in the Eastern Anatolia region, where Akkoyunlu and Karakoyunlu states lived in the region since the 13th century, establishes the belief that these works belong to the Akkoyunlu or Karakoyunlu tradition (Küçükahmet, 2009).

Gravestones with ram, ram head and horse figures, which were revealed by integrating with local characteristics in various regions of Anatolia, are important in terms of revealing the Central Asian traditions of the Turks (Danık, 2004). The works with ram, sheep and horse figures are listed on the roads where Turks migrated from Central Asia to Anatolia (Esin, 1972). Nomand Turkish tribes carried the Central Asian burial tradition to Anatolia. The Turks who immigrated to Anatolia preserved and continued their old traditions here for a long time. With the acceptance of Islam, they adapted these traditions to Islam. It can be said that the gravestones of horses, rams and sheep, which are still available in Anatolia, are frequently used by immigrant Turks during their conversion to Islam (Kahya, 2022).

Among the tombstones with horse, sheep and ram figures seen in different parts of Anatolia today, it is a common belief that especially ram-head tombstones were made during the Akkoyunlu and Karakoyunlu period. The fact that the inscriptions and dates on many tombstones found in and around Iğdır province belong to the recent period raises some questions about the period and date of these tombstones.

Coruhlu uses the following expressions on the subject:

"In the studies we have mentioned, it has been accepted that the tombstones (for Anatolia) belong to the Akkoyunlu and Karakoyunlu people…..When the tombstones in general are considered, we believe that these views may be partially correct. As a matter of fact, there are very few examples whose dates coincide with the Akkoyunlu and Karakoyunlu periods. Many horse, ram/sheep tombstones could not be dated. We also know that these stones have not been identified and cataloged throughout Turkey. Existing artifacts are samples discovered by chance or during another study or obtained by scanning a region. On the other hand, the presence of examples of these statues in places such as the Caucasus, Azerbaijan, Iran, Kazakhstan, Siberia, and Mongolia shows that they are widely used because of their meanings related to death (Çoruhlu, 2019)."

Again, according to Çoruhlu: Another source thought to be based on ram-shaped statues is "deer stones": "These deer stones are probably the source of ram/sheep shaped stones. Because ram, sheep and horse are symbols of the dead in Turkish art and culture as symbols of many things. The Aries animal is also a symbol of protection from evil. For this reason, it is quite normal to make a ram/sheep or horse shaped tombstone.

When we look at the stylistic technical materials and forms in the sculpture of ram and sheep, their continuation until today depends on belief (Nergis, 2019).

In the cities located in the eastern regions of Turkey, there are hundreds of tombstones made in the shape of a ram, varying in size and type. Some of these tombstones can be in the form of lambs, some in the form of sheep and some in the form of rams. The tombstones in the form of lambs may have been made for a child, the tombstones in the form of sheep for women, and the tombstones in the form of a ram for men. The ram-shaped tombstones are mostly depicted with war tools such as swords, daggers or arrows, as well as motifs related to ancient beliefs such as hunting scenes with figures and amulets (Buğrul, 2016).

Iğdır and Tunceli are among the provinces where ram-head tombstones are commonly seen in Turkey, especially in the Eastern and Southeastern Anatolia regions (Aksoy, 2019). Apart from these provinces, it is possible to come across ram head tombstones in provinces such as Erzurum, Erzincan, Kars, Ardahan, Van, Rize Tokat, Hakkari, Elazig, Amasya, Bitlis.

Due to its strategic location, Iğdır province, which is the border city of Eastern Anatolia, which has hosted many civilizations, contains many different artistic, historical and cultural artifacts with the cultural interaction that took place in the historical process. Undoubtedly, ram-headed tombstones are at the forefront of these works that have witnessed from the past to the present. The artifacts that are the subject of our study among the tombstones spread over different points of Iğdır province today are the tombstones found in Karakoyunlu district and Melekli town.

2. Method

It is aimed to determine the historical ram-head tombstones in and around Iğdır province, on which much research has not been done until today, and to reveal their importance in the history of art. For this purpose, the tombstones that are the subject of our research consist of 6 ram headstones in the open-air museum of the municipality of Karakoyunlu district, which is 15 km away from Iğdır, and 10 ram-head tombstones in the Kadim Çaybaşı Cemetery in Melekli town, 6 km away from the city center of Iğdır.

In the field research, ram-head tombstones in and around Iğdır province were examined on site. Since many of these tombstones have been deformed over time for various reasons, only tombstones that have survived to the present day and whose writings and motifs can be examined were selected and the studies focused on these tombstones. A total of 37 tombstones were identified during the field survey. Only 16 of these tombstones have been studied.

The research was started with a literature review in order to create a source for the study, then the ram-head tombstones in and around Iğdır were personally seen on site, photographs of these tombstones were taken and their measurements were taken. In line with the data obtained, the tombstones were marked and read.

3. Results

In this section, ram-head tombstones found in the field are mentioned.

3.1. Ram-head Tombstones in Melekli Town of Iğdır Province

Melekli town ram-head tombstones, which is 6 km away from the city center of Iğdır, are located in the Kadim Çaybaşı Cemetery belonging to the town. We visited Melekli town of Iğdır province on 05/11/2021. We took pictures in the area and chatted with the local people. According to the data we have obtained, the following information is presented.

3.1.1. Number 1 Ram-head Tombstone

The properties of Number 1 ram-head tombstone are given in Table 1.

Table 1. Properties of Ram-Head Tombstone-1

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not available
Situation	Head-trunk solid, no pedestal
Material	Red stone
Width	75 cm
Length	53 cm
Base	No

The ram-head tombstone number 1, which is approximately 75 cm in width and 53 cm in length, is located in the cemetery of the municipality of Melekli, 6 km away from the city center of Iğdır. This tombstone has no pedestal and was carved from red hard stone, and its head and body have survived intact (Figure 1).

It is seen that the feet of the ram-head tombstone were not chipped, and the body and foot part were left as one piece. The ram-head tombstone, standing upright and without a pedestal, is made quite simply, and the horns on the head are made up of two intertwined folds. By giving the nose structure on the front of the ram-head tombstone, the general headlines of the ram animal were tried to be given.

The neck part, which is approximately 77 cm in diameter, is separated from the body by a contour and highlighted. The ram-head tombstone was made in a very simple way, without any ornaments or writings on it. The head of ram headstone number 1 was shaped as a single piece in a round form. There is no clear information about the construction date of the tombstone, which is located in an unprotected open area and has no inscription or date on it.

3.1.2. Number 2 Ram-head Tombstone

The properties of Number 2 ram-head tombstone are given in Table 2.

Table 2. Properties of Ram-Head Tombstone-2

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not available
Situation	Head-trunk solid, no pedestal
Material	Red stone
Width	75 cm
Length	53 cm
Base	No

The number 2 ram-head tombstone is approximately 75 cm wide and 53 cm high. No ornamentation or date was found on the tombstone, which seems to have worn out over time (Figure 2).

Number 2 ram-head tombstone, which is carved from red hard stone and without a pedestal, which is not known exactly as a result of human destruction or natural causes, is in a broken state from the neck to the head. Since the head is detached from the neck, it is not possible to distinguish between a sheep or a ram-head tombstone. However, the fact that it is big like other ram-head tombstones in Melekli town stands out as a great similarity with the others. It is seen that the feet of the tombstone were carved, and the body and foot part were left as one piece without separating. This tombstone, which has a detached head and does not have any motifs or writings on it, was made in a very simple way. The ram-head tombstone number 2 is shaped in a round form, unlike the tombstones shaped in rectangular forms.

3.1.3. Number 3 Ram-head Tombstone

The properties of Number 3 Ram-head tombstone are given in Table 3.

Table 3. Properties of Ram-Head Tombstone-3

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tomstone
Inscription and/or History	Not available
Situation	Head and trunk intact
Material	Andesite stone
Width	99 cm
Length	51 cm
Base	No

The ram-head tombstone number 3, which is in an unprotected condition, has no pedestal and was carved from andesite hard stone, and the head and body have survived to the present day. In the examination carried

out on the tombstone, which is 99 cm wide and 51 cm long, it is seen that the feet of the form were not carved, and the body and foot part were left as one piece (Figure 3).

The ram-head tombstone was divided into two between the body and the neck, and the neck of the tombstone was highlighted by contouring from the body. The ram-head tombstone, standing upright and without a pedestal, was made quite simply. The horns on the head, which is located on the neck, which is approximately 95 cm in diameter, consist of two folds inside each other. On the tombstone, which is shaped in a rectangular form, there is a depiction of the the BUĞDAYIK bird figure, which is a mythical bird species mentioned in Turkish and Altai mythology and is considered to be the ancestor of all birds, in low relief technique on the front of the neck (Karakurt, 2012). Since there is no inscription or date on it, clear information about the date of the tombstone is not available.

3.1.4. Number 4 Ram-head Tombstone

The properties of Number 4 Ram-head tombstone are given in Table 4.

Table 4. Properties of Ram-Head Tombstone-4

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tomstone
Inscription and/or History	Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	83 cm
Length	61 cm
Base	No

The ram-head tombstone number 4 is located in the Kadim Çaybaşı cemetery. The tombstone, which is in an unprotected condition, has no pedestal and was carved from andesite hard stone. The tombstone, which is approximately 83 cm wide and 61 cm long, was shaped by dividing the body and head into two. The body, which is shaped in a rectangular form, is separated by a contour with the neck (Figure 4).

The ram-head tombstone, standing without a pedestal, was made quite simply, and the horn of the right side of its head was broken. Another horn of the left side of its head is intact indicates that the tombstone belongs to a ram headstone. number 4 ram-head tombstone was carved in one piece without making any separation of the foot and body, without chipping the feet. While there is no embroidery or writing on the left side of the ram-head tombstone, there is a date and writing written in Arabic letters on the right side. It is estimated that the date (1361 in the Hijri calender) and (Hüseyin Ferac) were written in this manuscript, which is not fully read due to the destruction that occurred over time.

3.1.5. Number 5 Ram-head Tombstone

The properties of Number 5 ram-head tombstone are given in Table 5.

Table 5. Properties of Ram-Head Tombstone-5

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Red stone
Width	170 cm
Length	80 cm
Base	No

The ram-head tombstone number 5, which is approximately 170 cm in width and 80 cm in length, is located in the Kadim Çaybaşı cemetery. The tombstone has no pedestal and was carved from red hard stone, and the head and body have survived to the present day. It is seen that the feet of the tombstone, which was shaped in a round form, were not chipped, and the body and foot part were left as one piece (Figure 5).

The neck, which is approximately 99 cm in diameter, is highlighted by contouring from the body. It is seen that the head is tried to be kept above the body. The horns on the head consist of two folds inside each other. By giving the nose structure on the front of the tombstone, the general headlines of the ram animal were tried to be given. Standing and without a pedestal, the ram-head tombstone is made in a very simple way and there is no ornament or writing on it. Since the ram-headed tombstone number 5 was found on a newly built tomb, it is understood that the actual location of this tombstone was changed and moved to another tomb. It is seen that the head of the tombstone was separated from the body by treasure hunters and then the head of the tombstone was fixed to the body with iron rods by the local people.

3.1.6. Number 6 Ram-head Tombstone

The properties of Number 6 ram-head tombstone are given in Table 6.

Table 6. Properties of Ram-Head Tombstone-6

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	94 cm
Length	70 cm
Base	No

The ram-head tombstone number 6 is located in the Kadim Çaybaşı cemetery. The tombstone, which is approximately 94 cm in width and 70 cm in length, has no base and was carved from andesite hard stone, and its head and body have survived intact (Figure 6).

The horns on the head of the ram-headed tombstone, which is standing and without a pedestal, consist of two intertwined folds. The neck, 86 cm in diameter, is separated from the body by a contour and the body is carved in a rectangular form. It is seen that the feet of the tombstone were not carved, and the body and foot part were left as one piece.

There are 6 medallion reliefs, 3 on the upper part of the body and 3 on the left, on the ram-headed tombstone numbered 6. It is seen that the middle one of these reliefs located on the same horizontal axis is larger. We consider that these relief figures, the meaning of which is not fully known, may have been made to show that the deceased was an important person.

3.1.7. Number 7 Ram-head Tombstone

The properties of Number 7 ram-head tombstone are given in Table 7.

Table 7. Properties of Ram-Head Tombstone-7

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Red stone
Width	103 cm
Length	50 cm
Base	No

The ram-head tombstone, which is approximately 103 cm in width and 50 cm in length, has no base and was carved from red hard stone, and the head and body have survived to the present day. It is shaped into a round form. The neck with a diameter of 88 cm is outlined from the body and highlighted (Figure 7).

It is seen that the feet of the ram-head tombstone were carved, and the body and foot part were made separately. In this respect, it differs from another ram-head tombstone in the town. The horns on the head of the ram-head tombstone, which is standing and without a pedestal, consist of two intertwined folds. Since there are no ornaments or writings on it, clear information about its age and the period it was made is not available. Since the ram-headed tombstone number 7 was found on a newly built tomb, it is understood that this tombstone was moved to another tomb by changing its original location like the tombstones numbered 5 and 8 in the area.

On the right and left sides of the ram-head tombstone number 7, there is a relief made in low relief technique, which brings the body to the fore. similarly, on the right and left sides of the tombstone, a medallion-like carving, centered on the body, draws attention.

3.1.8. Number 8 Ram-head Tombstone

The properties of Number 8 ram-head tombstone are given in Table 8.

Table 8. Properties of Ram-Head Tombstone-8

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	90 cm
Length	70 cm
Base	No

The tombstone, which is approximately 90 cm in width and 70 cm in length, has no base and was carved from andesite hard stone, and the head and body have survived to the present day. The neck, which is 80 cm in diameter, is highlighted by contouring from the body. The head part of the tombstone is tried to be held higher than the body, it is made in a very simple way, there is no ornament or writing on it. It is seen that the feet of the tombstone were not carved on the body, which was shaped in a rectangular form, and the body and foot part were left as one piece (Figure 8). The horns on the head of the ram-head tombstone, which is standing and without a pedestal, consist of two intertwined folds. On the upper part of the neck, there are sharp-lined lines that cannot be fully understood due to the destruction that has occurred over time. The ram-headed tombstone number 8 is located on a newly made tombstone. For this reason, it is not known to whom the tombstone belongs, since there is no inscription of the tombstone, which is understood to have changed its original location later on.

3.1.9. Number 9 Ram-head Tombstone

The properties of Number 9 ram-head tombstone are given in Table 9.

Table 9. Properties of Ram-Head Tombstone-9

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	89 cm
Length	70 cm
Base	No

The ram-head tombstone number 9 is located on the roadside in Melekli town of Iğdır province. The tombstone, which is in an unprotected condition, has no base and was carved from andesite hard stone, and the head and body have survived to the present day. In the examination carried out on the tombstone, which is approximately 89 cm wide and 70 cm tall, it is seen that the feet of the tombstone were not carved, and the body and foot part were left as one piece. The ram-head tombstone was evaluated by dividing it into two between the body and the neck, and the neck of the tombstone was highlighted by contouring from the body (Figure 9).

The standing ram-head tombstone, which is without a pedestal, is made quite simply, its neck is approximately 85 cm in diameter, and the horns on the head consist of two folds intertwined. On the tombstone, which is shaped in a rectangular form, there is a depiction of the BUĞDAYIK bird figure in low relief technique on the front of the neck. Since there is no inscription or date on it, clear information about the date of the tombstone is not available. Kadim Çaybaşı cemetery is similar to other ram-head tombstones found in the cemetery.

3.1.10. Number 10 Ram-head Tombstone

The properties of Number 10 ram-head tombstone are given in Table 10.

Table 10. Properties of Ram-Head Tombstone-10

Property	Value
Location	Melekli town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Red stone
Width	65 cm
Length	55 cm
Base	No

The ram-head tombstone number 10 is located on the roadside in Melekli town of Iğdır province. The tombstone, which is in an unprotected condition, has no pedestal and was carved from red stone, and the head and body have survived to the present day. The tombstone, which is approximately 65 cm in width and 55 cm in length, differs from other ram-head tombstones in terms of size. During the Karakoyunlu period, they gave a special value to the sheep they took their name from, and they made sheep tombstones for women and rams for men (Sümer, 1992).

Since the tombstone number 10 is smaller in volume than the other tombstones, it brings to mind the thought that it may have been built for a child's grave (Figure 10). In the examination, it is seen that the feet of the tombstone were not chipped, and the body and foot part were left as one piece. The ram, standing upright and without a pedestal, is made quite simply. The horns on the head, which is located in the upper part of the neck, which is approximately 35 cm in diameter, consist of two folds inside each other.

3.2. Ram-head Tombstones in Karakoyunlu District of Iğdır Province:

Ram-head tombstones of Karakoyunlu district, which is 15 km away from Iğdır province, are in the open-air museum of the municipality.

3.2.1. Number 11 Ram-head Tombstone

The properties of Number 11 ram-head tombstone are given in Table 11.

Table 11. Properties of Ram-Head Tombstone-11

Property	Value
Location	Karakoyunlu town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	103 cm
Length	59 cm
Base	No

The tombstone, which is approximately 103 cm in width and 59 cm in length, has no base and was carved from andesite hard stone, and the head and body have survived to the present day. The ram-head tombstone was divided into two between the body and the neck, and the neck of the tombstone was highlighted by contouring from the body. Standing upright and without a pedestal, the ram-head tombstone is made quite simply (Figure 11 and Figure 12).

The horns on the head, which is located on the neck, which is approximately 95 cm in diameter, consist of two folds inside each other. On the tombstone, which is shaped in a rectangular form, there is a depiction of the BUĞDAYIK bird figure in low relief technique on the front of the neck. Since there is no inscription or date on it, clear information about the date of the tombstone is not available.

3.2.2. Number 12 Ram-head Tombstone

The properties of Number 12 ram-head tombstone are given in Table 12.

Table 12. Properties of Ram-Head Tombstone-12

Property	Value
Location	Karakoyunlu town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	96 cm
Length	60 cm
Base	No

The ram-head tombstone, measuring approximately 96 cm in width and 60 cm, it has no pedestal and was carved from andesite hard stone, and the head and body have survived intact. The ram-head tombstone number 12 was evaluated in two parts between the neck and the body, and the neck of approximately 106 cm in diameter was highlighted with sharp contours. In this tombstone, in which the body was shaped in a rectangular form, the head was tried to be kept up. It is seen that the feet of the tombstone were not carved, but the body and foot part were left as one piece (Figure 13).

Standing upright and without a pedestal, the ram-head tombstone is made quite simply, the horns on the head consist of two intertwined folds. On the front of the neck, there is a depiction in low relief technique, which is estimated to be the BUĞDAYIK bird figure, which is a legendary bird in Turkish and Altai mythology. A sun motif, which symbolizes the universe, is also embroidered on the upper side of the neck. It has been known since ancient times that there were sun and moon cults in Turkish communities from Central Asia (Ersürel, 2019). In fact, depictions of the sun, trees, birds, etc., many of which are based on mythological sources, appear as frequently used elements in Turkish Art and culture.

3.2.3. Number 13 Ram-head Tombstone

The properties of Number 13 ram-head tombstone are given in Table 13.

The tombstone, which is approximately 110 cm in width and 61 cm in length, has no base and was carved from andesite hard stone, and the head and body have survived to the present day. Standing upright and without a pedestal, the ram-head tomstone is made quite simply, the horns on the head consist of two intertwined

folds. The neck part, which is approximately 127 cm in diameter, was separated from the body with a contour and tried to be kept up. On the left side of the body, which is shaped in a rectangular form, there is an inscription in Arabic script (1318, *Haza Merkad El-Merhumpenah İbn Kerbalai İbrahim*) in Turkish *Bu Kerbelai İbrahim Oğlu Merhum Penah'ın Mezarıdır*, in English (1318 in the Hijri calender) (This is the Grave of the Deceased Penah, Son of Karbalai İbrahim) (Figure 14).

Table 13. Properties of Ram-Head Tombstone-13

Property	Value
Location	Karakoyunlu town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	110 cm
Length	61 cm
Base	No

It is seen that the feet of the ram-head tombstone were not carved, but the body and foot part were left as one piece. On the front of the neck, there is a depiction in low relief technique, which is estimated to be the BUĞDAYIK.

3.2.4. Number 14 Ram-head Tombstone

The properties of Number 14 ram-head tombstone are given in Table 14.

Table 14. Properties of Ram-Head Tombstone-14

Property	Value
Location	Karakoyunlu town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	116 cm
Length	62 cm
Base	No

The tombstone, which is approximately 116 cm in width and 62 cm in length, has no base and was carved from andesite hard stone, and the head and body have survived to the present day. The neck part, which is 132 cm in diameter, was separated from the body with a contour and tried to be kept above. The horns on the upper part of the head consist of three intertwined folds (Figure 15).

It is seen that the feet of the tombstone, which was shaped in a rectangular form, were not carved, and the body and foot part were left as one piece. On the front of the neck, there is a depiction in low relief technique, which is estimated to be the BUĞDAYIK bird figure.

3.2.5. Number 15 Ram-head Tombstone

The properties of Number 15 ram-head tombstone are given in Table 15.

Table 15. Properties of Ram-Head Tombstone-15

Property	Value
Location	Karakoyunlu town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Not Available
Situation	Head-trunk solid, no pedestal
Material	Red stone
Width	105 cm
Length	61 cm
Base	No

The ram-head tombstone number 15 is located in the cemetery area belonging to the municipality of Karakoyunlu district of Iğdır province. The tombstone, which is approximately 105 cm in width and 61 cm in length, has no pedestal and was carved from red hard stone, and the head and body have survived to the present day. The neck part, which is 80 cm in diameter, was separated from the body with a contour and tried to be kept higher. The horns on the upper part of the head consist of three intertwined folds (Figure 16). It is seen that the feet of the tombstone, which was shaped in a rectangular form, were not chipped, and the body and foot part were left as one piece.

Two crescents carved inwards on a rectangular structure on the upper part of the tombstone body and three crescents made in low relief technique; that is, there are five crescents in total. In addition, there are 2 crescents made in low relief technique on the right and left sides of the tombstone. Standing upright and without a pedestal, the horns on the head of the ram-head tombstone consist of two intertwined folds. The ram-head tombstone number 15 differs from the other ram headstones found in Karakoyunlu district, both in terms of the material used and the carving technique. Since there is no inscription or date on it, there is no clear information about the construction date of the tombstone.

3.2.6. Number 16 Ram-head Tombstone

The properties of Number 16 ram-head tombstone are given in Table 16.

Table 16. Properties of Ram-Head Tombstone-16

Property	Value
Location	Karakoyunlu town of Iğdır province
Type	Ram-head Tombstone
Inscription and/or History	Available
Situation	Head-trunk solid, no pedestal
Material	Andesite stone
Width	105 cm
Length	60 cm
Base	No

The tombstone, which is approximately 105 cm in width and 60 cm in length, has no base and was carved from andesite hard stone, and the head and body have survived to the present day. Standing upright and without a pedestal, the ram-head tombstone is made quite simply, the horns on the head are composed of two intertwined folds (Figure 17).

The neck part, which is approximately 135 cm in diameter, was separated from the body with a contour and tried to be kept up. On the front left side of the body, which is shaped in a rectangular form, there is an inscription written in Arabic (*Haza Merkad El-Merhum Kurban*) in Turkish (*Bu Merhum Kurban'ın Mezarıdır)* in English (This is the Grave of the Deceased Kurban). It is seen that the feet of the tombstone were not carved, but the body and foot part were left as one piece. On the front of the neck, there is a depiction in low relief technique, which is estimated to be the BUĞDAYIK.

Figure 1. Number 1 ram-head tombstone

Figure 2. Number 2 ram-head tombstone

Figure 3. Number 3 ram-head tombstone

Figure 4. Number 4 ram-head tombstone

Figure 5. Number 5 ram-head tombstone

Figure 6. Number 6 ram-head tombstone

Figure 7. Number 7 ram-head tombstone

Figure 8. Number 8 ram-head tombstone

Figure 9. Number 9 ram-head tombstone

Figure 10. Number 10 ram-head tombstone

Figure 11. Number 11 ram-head tombstone

Figure 12. Number 11 ram-head tombstone

Figure 13. Number 12 ram-head tombstone

Figure 14. Number 13 ram-head tombstone

Figure 15. Number 14 ram-head tombstone

Figure 16. Number 15 ram-head tombstone

Figure 17. Number 16 ram-head tombstone

4. Conclusion

As a result of the concept of death, burial culture and the tradition of erecting stones on these graves appear as an important concept in Turkish culture both in the pre-Islamic and post-Islamic periods. These stones, which are especially the witnesses of history and erected on the graves, are not only important works of the period, but also appear as a very important primary source that shows the belief structure, literary life, social and cultural relations of that period.

The ram-head tombstones in and around Iğdır, which are the subject of our research, and the motifs and decorations on them reveal the social, cultural, religious

and artistic understanding of our ancestors living in this region, both historically and plastically. Today, there are hundreds of inscribed and unwritten ram-head tombstones in and around Iğdır. When we look at the embroideries, stamps or depictions, which are both epigraphic elements and construction techniques, on these tombstones, we come across as important evidence that these tombstones reflect the Turkish belief and lifestyle and belong to Turkish communities.

The Turks, who came to Anatolia in tribes, continued their beliefs and lifestyles in this new geography. Ram-head tombstones found in and around Iğdır are generally associated with the Akkoyunlu and Karakoyunlu periods who settled in this region. Most of the ram headstones found in Karakoyunlu district of Iğdır province and the ram-head tombstones found in Melekli town (1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15 numbered ram-head tombstones) no inscription and date can be found. This situation makes it difficult for us to reach a clear knowledge about the history of the tombstones in question. On the tombstones on which there are inscriptions or dates, information about the deceased person is given in the inscriptions (4, 13, 16 numbered ram headstones), and the dates used belong to the recent period. This situation raises the suspicion that the writings on the tombstones were made later.

As a material, red tuff stones and andesite type stones, which are frequently preferred as many building materials, were used in the construction of ram-head tombstones in the province of Iğdır and its surroundings.

It is possible to consider two groups as the materials used in the ram-head tombstones in Iğdır and its surroundings, which are the subject of our research, and the chipping techniques. The first group of ram-head tombstones are tombstones carved from andesite stone. These (1, 4, 6, 8, 9, 11, 12, 13, 14, 16) ram headstones were shaped in a rectangular form and the neck and body were evaluated in two parts. The neck parts were highlighted with a contour and the head part was tried to be kept up. The sun motif is embroidered on the upper part of the neck of the tombstone number 12. The common feature of the tombstones in this group is the presence of a BUĞDAYIK bird figure carved in low relief technique on the front of the necks. The other group of ram headstones are tombstones carved from red tuff stones. These (2, 3, 5, 7, 10, 15) ram headstones were shaped in a round form. Another remarkable feature is that they were made quite simply way. Only on the ram-head tombstone number 15, a crescent moon pattern was engraved. The tombstones in both groups are standing without a pedestal and standing upright. The horns on the head of the tombstones are clearly carved in inward folds.

It has been determined that an inventory record has been made of the ram-head tombstones found in and around the province of Iğdır. In this sense, all ram-head tombstones in and around Iğdır should be identified and documented by making an inventory record.

In our research, it is seen that no protection measures have been taken especially for the tombstones in Melekli town. These tombstones, which were almost abandoned to their fate, have also been invaded by treasure hunters many times. Therefore, these gravestones, which are seriously damaged, should be taken under immediate protection.

It has been determined that the ram-head tombstones found in the cemetery and other areas in and around Iğdır were removed from their original places for various reasons. Gravestones should be accepted as a deed of the areas where they are located and these gravestones should be kept in their original places.

Acknowledgement

My dear colleagues who supported me in the field work, Dr. I would like to thank Fatih TOPRAK and Kurbanali AKDAŞ.

Conflicts of interest

The authors declare no conflicts of interest.

Statement of Research and Publication Ethics

Research and publication ethics were complied with in the study.

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Cultural Heritage and Science
https://dergipark.org.tr/en/pub/cuhes
e-ISSN 2757-9050

Negotiating the urban space: Unlocking the development of the historic center in the modern city

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Keywords
Heritage Preservation
Urban Development
Neighborhood Approach
Masterplan Negotiation

Research Article
Received: 18.10.2022
Revised: 26.11.2022
Accepted: 28.11.2022
Published: 20.12.2022

Abstract

The paper introduces a brief analysis of the historical processes that have contributed to the paralysis and degradation of downtown Phnom Penh (capital of Cambodia). It shows the impossibility of implementing stringent regulation in favor of negotiating practices among various urban actors based on relationships established by social and economic subordination and culturally embedded in the population. It seems that these unavoidable mechanisms should be explored to devise strategies aimed instead at the redevelopment of green space and the consequent valorization of historic real estate, creating a stimulus for the emergence of public-private cooperation capable of supporting the necessary investments. The paper discusses the actual situation in the city of Phnom Penh and tries to indicate possible solution in order to make a compromise between the conservation of the historical centers, or what is left of it, and a socially useful rehabilitation of the districts. A more pragmatic and sustainable operation will mitigate the risk of fragmentation or worse the disappearance of the historic fabric, focusing on the once-recognized identity of the city, considered a "green garden" and the "pearl of Asia." To support the analysis carried out in the paper some reference from other similar experiences in other city in the world are presented.

1. Introduction

This paper draws on literature that focuses on the period of the last 25 years. It compares existing research on urban development in Phnom Penh city and suggests possible interpretations of the underlying socio-economic mechanisms. The paper traces the introduction of urban planning tools imported with the help of international agencies and adopted by local governments, considering their subsequent failed implementations. Proceeds to analyze current legislation on urban land management, taking into account its interpretations through current planning practice in the Country. It proposes possible scenarios by investigating emerging phenomena in light of urban redevelopment theories the identify the essential role of public space. It proceeds in the analysis of the territory through survey campaigns, (conducted within the Urban Design Studio of the American University of Phnom Penh) and aimed at producing maps and photos of the current state, suggesting intervention areas aimed at heritage revitalization.

2. Historical overview

At the beginning of the 19th century, Phnom Penh belongs to a group of merchant cities and can be considered no more than a transit port located at the intersection of the Mekong River with the Tonle Sap and Bassac Rivers, in an area known as the “Four Arms” (Stetten, 1997).

The most important transformations occur after 1884, when the management of the territory comes under the total control of the French protectorate. Thus, in the early 20th century, the redevelopment of the original settlement begins with the addition of new administrative buildings in the area surrounding the Post Office, the extension of the Chinese commercial district towards the Central Market, and the organization of a green boulevard between the Royal Railway Station and the Riverside (Igout, 1993).

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Cite this article (APA);
Santoro, C. (2022). Negotiating the urban space: Unlocking the development of the historic center in the modern city. *Cultural Heritage and Science, 3(2), 49-59*

Figure 1. Urban Design Studio Research: Current Development of Phnom Penh City, American University of Phnom Penh

Figure 2. Central Districts, Phnom Penh

Figure 3. Former French Protectorate District, Phnom Penh

Figure 4. Wat Phnom historical site - View from the Development Council of Cambodia (former Palais du Commissariat de France), Phnom Penh.

As Cambodia gains independence in 1953, the city undergoes large-scale urban interventions along the south and west directions expanding from the central zone (Molyvann, 2006).

Sadly, the sad history of the 1970s is marked by the outbreak of the devastating civil war, which begins with General Lon Nol's coup and follows with the Khmer Rouges regime until 1979 (Chandler, 1991).

After liberation in the 1980s, a land management model is imposed, borrowing principles from the Vietnamese legal framework. Land in the city center is mostly granted to government and military officials or for collective use. (Carrier, 2019)

Even with new elections in the 1990s, no real political stability is achieved (Strangio, 2014).

Under these conditions, the 1992 Land Law seeks to put heritage, cultural and historical properties, monasteries, and ancient public buildings under protection, granting government authorities the discretion to expel occupants for public interests. Many areas and properties classified for collective use are cleared in exchange for compensation. (Törhönen, 2001).

The current district configuration of the central area divided into 5 areas takes shape. Daun Penh district emerges as the administrative center of the Capital. At the same time, real towns within the city take shape under the control of ministerial offices and with quasi-independent management. (Carrier, 2019).

3. Urban inertia of the city center

The effect of this process is becoming increasingly evident today. The financial resources allocated are so limited that they cannot even cover "basic urban services." (World Bank Group, 2016). The development of the historic city, therefore, must necessarily respond to planning logic that foster private investments, and often involve capitals from abroad. As is the case with suburban areas of the city (Percival & Waley 2012), the main objective becomes the maximization of corporate profits achieved by increasing the density of the built-up area while leaving the urban structure and infrastructure unchanged (Blancot, 1997). In the specific, the urban fabric still largely consists of blocks of residential buildings 3 to 6 stories high, with commercial activities located on the ground floor and facing the streets. The model keeps borrowing from the concept of the French urban block and combines it with that of the Chinese merchant's house (Hetreau-Pottier, 1997), but at the same time is increasingly dotted with the inclusion of tower buildings.

This recent phenomenon of high-rise development is indeed fragmented and concentrated in a few areas, but it represents basically the only significant breakthrough in a 60-year real estate stagnation.

In general, local people instead tend to occupy low-rise buildings by adapting them to mixed functions according to their needs, especially with temporary and informal activities.

The trend toward informality is also driven by the difficulty of ensuring an adequate degree of security of tenure (Thiel, 2010), given the low penetration of cadastral registration (Anttonen, 2012).

Obviously, this extends to public spaces, invaded especially near arteries of intense vehicular traffic and walkways. (Decant et al., 2009).

Finally, in the historic city, development "continues to take place in an ad hoc manner," (World Bank Group 2016) and proceeds slowly through urban projects that find wide acceptance (Blancot, 2006).

The only interventions to infrastructure and utilities are planned with external technical assistance and financed with loans and international cooperation funds. (World Bank Group, 2016).

The lack of regular maintenance is especially deteriorating heritage buildings (Blancot, 2003), which will then inevitably have to be demolished and replaced, contributing even more to the processes described above.

The second revision of the Land Low in 2001, enacted now 20 years ago, attempts unsuccessfully to protect sidewalks, gardens, parks, and public services, such as schools, hospitals, administrative offices; in general, archaeological, cultural, and historical heritage, as well as all properties being used by the royal family.

In practice, this instrument proves to be inadequate, the population receives it with difficulty, and the informal dynamics of land management, as mentioned,

remain prevalent. This shows the evident limitation of standardized reforms, (Carrier, 2019) which fail to eradicate the parallel system of exchange of inherited land and real estate by right of use in favor of the Roman territorial property right attested by cadastral registration (Fauveaud, 2015).

Moreover, a significant advantage is held by those who can maneuver the imported regulatory apparatus through the help of international experts (Pierdet, 2011).

The result then is the gradual depopulation of Phnom Penh's central districts. In the past 10 years, a quarter of the population has left the area heading to the periphery and supplementing migration flows from the rest of the country. Nowadays the population growth rate is 5 percent annually, and the city already concentrates 15 percent of the national population on its territory, reaching a density ten times higher than any other city in Cambodia (National Institute of Statistic, 2020).

Figure 5. Central Market and Shop Houses Neighborhood, Phnom Penh.

4. Failure of current master planning approach

It may be unfruitful to persist only with one-sided discussions centered on the absence of regulatory frameworks aimed at urban space management, e.g., the lack of detailed land use or phasing plans (World Bank Group, 2016). Through the analysis briefly introduced here, we understand, indeed, how management is highly subject to negotiation practices fueled by economic, social and historical mechanisms of spatial production, especially during the implementation phase (Fauveaud, 2014).

As a matter of fact, the transformations of the urban fabric have not been coordinated by the implementation of a long-term strategic plan, despite the copious production of guidelines at various administrative levels. They are the result of habits, very often transmitted verbally and mainly referring to established customary practices. Administrative regulatory instruments are adopted as very broad guidelines, are often left in draft status, reaching approval status when by then they are clearly not effective and need to be redrafted. For example, Phnom Penh's current Land Use Master Plan was only approved in late 2015, following Sub-Decree No. 181, but it contains only a time projection up to the year 2020. It turns out to be a very general policy document on considerations following the directions of the "White Book" prepared by the French Bureau of Urbanism in 2009 (World Bank Group, 2016). Urban planning and land management instruments promoted by international consultants and agencies have so far taken a slow drafting process and have failed to address the complex conditions of the city.

There is certainly a need to continue to rethink the long-term vision of the current Master Plan, consider the integration and formulation of new regulations and codes, promote viable urban planning processes, and strengthen their technical capacity for implementation (World Bank Group, 2016).

The risk, however, is to replicate the same mistake made by the administration of the French Protectorate if we fail to think that pre-existing practices (Carrier, 2019) are the result of a social and territorial process rooted over the course of time. It may be misleading to consider their simplistic exemplification in the terms of a system that is corrupt or bent only to the desire to increase its economic capital (Fauveaud, 2015).

After all, the fallacy of the master planning process has been largely proven especially if one frames it in its modern meaning introduced by the rationalist current (e.g., that of CIAM) and now embraced in its new globalizing form in the former colonies of Southeast Asia and beyond (Un-Habitat, 2009).

Could we instead proceed through a system of desirable scenarios, not necessarily prescriptive, that would allow the urban development model to be constantly adjusted to the dynamics of the relationships among various urban actors and the inevitable rapid change in their socio-economic conditions?

We are most likely not far from the era of a " Smart, Sustainable and Inclusive Urban Development" (United Nation Cambodia, 2019), when we will be able to test, optimize and validate proposed interventions in real time, thanks to the perspectives introduced by a new digital twinning software (Mccluskey et al., 2012).

Figure 6. Old Chinese Shop Houses Front, Phnom Penh.

Figure 7. Royal Place Front Gardens, Phnom Penh.

Figure 8. Dilapidated Colonial Building- Former Gendarmerie, Phnom Penh.

Figure 9. High-rise buildings emerging in the Central BKK1 Neighborhood, Phnom Penh.

5. Toward a green infrastructure for the preservation of the historic center

The management logic of the central district could then follow up on what has already been suggested by theories such as Landscape Urbanism (Waldheim, 2016) in areas without population growth. There should be a focus on the redevelopment and valorization of the existing urban fabric through the reconsideration of empty space as a potential green infrastructure to support the rehabilitation of historic properties, improving the living conditions of resident inhabitants and mitigating the heavy anthropogenic impact on the environment. The unbuilt could thus take on a fundamental importance in guiding evolutionary directives of the city and land governance, facilitating the coexistence of the green network with that of fundamental services such as drainage works, flood control systems, sewers, and pipelines. The identification of such areas could foster, among other things, the emergence of a true urban ecosystem (Downton, 2009) by encouraging biodiversity. As highlighted in the Phnom Penh Green City Strategic Plan prepared by the Global Green Growth Institute, the bountiful gardens of some schools, vacant land, abandoned buildings, pagodas, and even private stores and hotels willing to engage more with the public could be converted into an interconnected collective space used as an urban park, compensating for the exploitation of the increasingly densified urban fabric (GGGI, 2019).

Figure 10. The Independent Monument Park continued by the Royal Palace Park and the tree-lined avenue of Norodom, Phnom Penh.

In this regard, the study conducted by Urban Design Studio at the American University of Phnom Penh intends to identify areas dedicated to possible interventions insisting on a potential green network within the city's historic center (Fig. 14 and Fig. 13).

It would be geared not only to the establishment of "third places" (often reduced by theory into bars and small restaurants) (Oldenburg, 1989), but also to places of community services and aggregating spaces for sports, youth activities or children's games.

Spaces could be arranged for community events such as large public events, concerts, art exhibitions, and even the inclusion of community gardens and urban orchards, following French and German examples, in cities such as Lyon and Berilno (Clergeau, 2020).

In the specific, we might mention the "urban pockets" among the residential blocks in Lyon's Confluence district or the Princess Gardens in Berlin, but also the green community courtyards in Tübingen or the primary school of science and biodiversity in Boulogne, the International Campus Ecocity in Wünsdorf and the Center for culture and Scienze, Cité Nature, in Arras.

We might think, therefore, of extending these opportunities by assuming a concept of semi-public spaces in which the management of the public area is entrusted to the private sector because it is functional in encouraging emerging entrepreneurship. as implemented, for example, in the Ile Seguın cultural hub in the Trapèze eco-quartier of Boulogne.

As anticipated since more than a decade by the proponents of Tactical Urbanism (Lydon & Garcia, 2015) and recalled by Ottone and Cocci Grifoni (2017), opportunities can be drawn from bottom-up micro-transformation actions on even small lots lacking any organizational form (Clement, 2004) or even abandoned (Viganò, 2018).

Forms of “urban acupuncture” capable of structuring a map of actions and reactions well known when looking at the examples implemented in the city of Curitiba in Brazil (Lerner, 2014), in Comuna 13 of Medeiln or in Sant Antoni Superblock of Barcellona.

6. Conclusion

In conclusion, it is necessary to create negotiating mechanisms capable of triggering public-private agreements that can overcome the lack of funds allocated for the management of the city and in particular the historic center.

With this perspective in mind, it is advisable to look at urban planning tools that are more adaptive than those typically associated with a rigid master planning process and to date still proposed by various consultants outside the local government.

Tools such as framework planning, already as proposed by Carta 2014 in his "Reimagining Urbanism", but also the simpler project financing can be repurposed (Montani, 2013), reorganizing the historic center through the introduction of pilot projects or “urban fractals” (Downton, 2009), transforming it into a real laboratory of experimental urban redevelopment

Often in Southeast Asia, unfortunately, lack of interest is among the main causes of abandonment for those historic buildings that are simply classified by the administration as "dilapidated," with the obvious exception of monumental buildings. As pointed out earlier in the article, they are of little or no value to local urban actors, primarily because there is no perceived economic benefit from their renovation. Moreover, in the case of Phnom Penh's historic center, the preserved fabric belongs to a time when completely new characters were introduced. Given the distance with the pre-existing local tradition, it has remained associated with the cultural identity of the former colonizers instead of reflecting that of its current inhabitants. As we argued above, in the absence of maintenance, buildings are doomed to collapse and simply be replaced.

A change in perspective could be assumed by adopting a pragmatic approach. In general, city development occurs through necessarily profit-driven operations that follow dynamics based on local negotiation practices. Although organized parks and gardens seem to be scarce in the city, studies conducted on central districts note the existence of construction-free areas. These very spaces could be the catalysts for a full-scale socio-spatial regeneration effort, which could begin by pointing to areas of intervention capable of activating a pre-existing and still potentially present green network. Finally, the value of historic buildings in the vicinity of these areas would obviously gain a significant economic premium, and at the same time the entire urban fabric would regain a characteristic closer to the local cultural identity. This would stimulate in its inhabitants a fundamental sense of belonging and most likely motivate them to undertake the necessary maintenance, preservation and restoration work.

Figure 11. Former De Verneville water canal reclaimed in the ’30. A formal linear park, currently under renovation, bordering the south side of the former French Protectorate District, the Wat Phnom historical site and the Embassy of the United States of America (former Sport Club), Phnom Penh.

Figure 12. Preah Sihamoniraja Buddhist University continued by the former Russian Federation Diplomatic Compound and the Sofitel Phnom Penh Phokeethra Garden, Phnom Penh.

Figure 13. Urban Design Studio Research: Potential green network in the central historic districts of Phnom Penh (North Zone), American University of Phnom Penh.

Figure 14. Urban Design Studio Research: Potential green network in the central historic districts of Phnom Penh (South Zone), American University of Phnom Penh.

Figure 15. School complex Lycée Sisowath, Chaktomuk Secondary School and Royal University of Fine Arts, further continued by the Royal Place and National Museum Gardens, Phnom Penh.

Figure 16. Renovated Art Deco Royal Train Station building and garden, Phnom Penh.

Figure 17. Kiosks in the gardens surrounding the National Museum of Cambodia, Phnom Penh.

Figure 18. Former Residence of Princess Sisowath Pindara reconverted in Bar and Restaurant at Hyatt Regency located in the proxhimity of the National Museum of Cambodia and Royal Palace, Phnom Penh.

Figure 19. Friend Future Factory, renovation of the nineteenth-century industrial pavilions and courtyard, Phnom Penh.

Figure 20. Temporary bar and garden organized on a vacant lot along road No. 21 (former historic residential villas neighborhood), Phnom Penh.

Acknowledgement

I express my thanks to prof. Donato Abruzzese (University of Rome Tor Vergata) for his guidance in the preparation of this article. Additional thanks go to my students, Ouk Mutita and Thoeurn Sreymean (Urban Design Studio, American University of Phnom Penh), for their assistance in preparing the maps included in this article.

Conflicts of interest

The authors declare no conflicts of interest.

Statement of Research and Publication Ethics

Research and publication ethics were complied with in the study.

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Cultural Heritage and Science
https://dergipark.org.tr/en/pub/cuhes
e-ISSN 2757-9050

Tracing the cultural heritage values of a traditional Antakya house

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Keywords
Cultural Heritage
Heritage Values
Traditional House
Architectural Analysis
Antakya

Research Article
Received:18.10.2022
Revised: 20.10.2022
Accepted: 21.11.2022
Published:20.12.2022

Abstract

Defining the cultural heritage values of the houses in the historical urban fabric of Antakya, which has traditional houses with courtyards and culs-de-sac, is important for the conservation of the buildings. Traditional Antakya houses have reached the present day by undergoing changes in the historical process. The traces of the change are crucial important to understand and appreciate the original physical formations of the buildings. Houses have special heritage values that need to be protected. In order to determine the heritage values, it is important to determine the original features of the buildings. In this study, Gali Mansion, located in the north of Antakya's historical urban fabric, is examined. Within the scope of the study, the physical characteristic of the mansion is defined, historical and comparative analysis are presented, and cultural heritage values determined in the light of the restitution study.

1. Introduction

The traditional Antakya house, known as Gali Mansion, is located in the north of the historical urban fabric, on the plot lot no: 2056 in the 4th Circumscription (Figure 1). The mansion is accessible through three entrances from different culs-de-sac. The main entrance of the mansion is from the cul-de-sac located on the plot number 2068. The other two entrances are from the culs-de-sac on the plot numbers 2070 and 2071. There are other residential units located adjacent to the mansion on neighbouring plots. Except for the entrance located on the cul-de-sac on the plot 2068, the entrances of the house are hidden from sight. The study which was conducted to determine the cultural heritage values of Antakya Gali Mansion includes historical research, comparative study and restitution analyses regarding the building and its type. In this context, in the first part of this paper, the methodological framework of research is presented. In the second part the physical features of the building will be briefly mentioned. Third part concentrates on the details of the historical and comparative study. In the fourth part, restitution analyses are evaluated with respect to the traces from the building. In the last part evaluations and comments regarding the cultural heritage values of Gali Mansion are presented.

2. Method

For the architectural analysis phase of the building written sources, old photographs, old drawings, traces from the building, legal documents, building inscriptions and comparative studies made on the buildings from the same period in the surrounding building lots were used.

The main method followed in the formation of the architectural analysis is composed of a comparative study related the building category on the surrounding buildings from the same period specific to the functional requirements, architectural requirements and traces from the buildings as well as diachronic and historical-contextual research methods for determining periods in order to determine the construction and architectural elements of the building that have changed, partially and/or completely destroyed or added in the historical process; and to determine their reliability.

In studies for determining the periods of the building; written and cartographic documents (Cadastral plans, Land Registry records, and Building Inscriptions), old drawings and old photographs were used as the primarily reliable sources (Bakırer, 1982); while scientific publications on the region and the housing samples in the region were used to support the studies for determining the building periods.

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Cite this article (APA);
Rifaioğlu, M. N. (2022). Tracing the cultural heritage values of a traditional Antakya house. Cultural Heritage and Science, 3(2), 60-72

In this respect, all visual, oral and written materials related to the building category were obtained from libraries, virtual databases and related institutions. The data obtained are associated with the traces from the building. Particularly for the buildings in the similar building category in the historical urban texture of Antakya, architectural elements, structural system, mass-facade properties were investigated, and 1929 French Cadastral Maps were utilized in order to understand the parcel-building relationship (Figure 1).

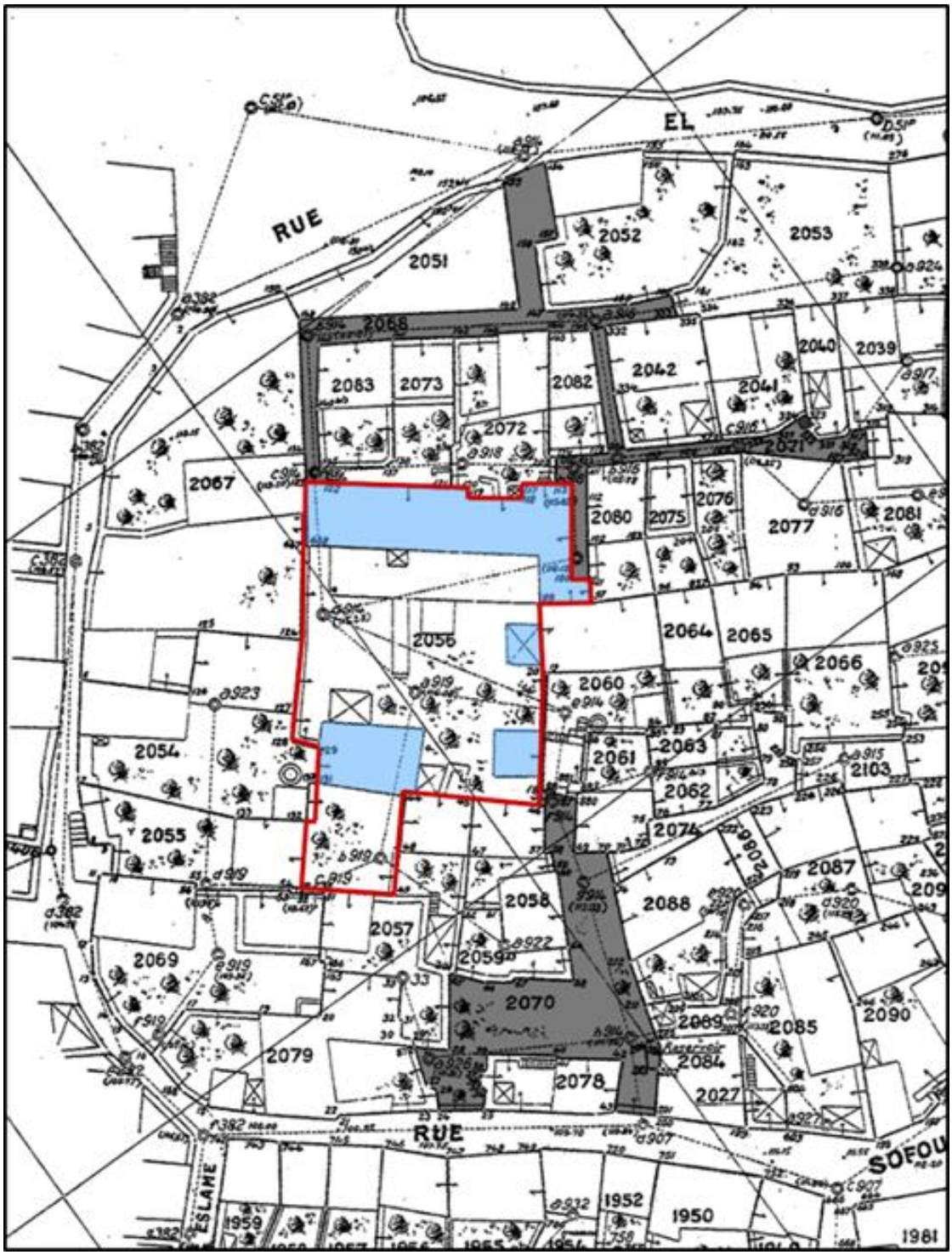

Figure 1. Building-plot relations created on the basis of the 1929 French Cadastral plan

3. The physical features of the building

The building complex, which sits on a roughly rectangular area, consists of a high, two-storey main building constructed by masonry ground floor and timber frame first floor and a single-storey annexes (Figure 1). The masses on the periphery of the long and short sides of the courtyard generate the "L" shaped closed area. There are also two ruined buildings, which are composed of single space, in the courtyard. The courtyard façade of two-storey main building displays the characteristics of the traditional Antakya courtyard façade. There are cut stone, arched openings, crowns and rosettes on the courtyard facade. In the single-storey annex, there are high rectangular openings and stone-like plasters. There are periodic differences between the

two masses in terms of construction technique and architectural style.

The exterior façade features are visible on the entrance facade of Gali Mansion, which is surrounded by adjacent buildings. There is no opening on the ground floor of the entrance facade, where there is an arched door that is accessible from below the ground level due to the level difference in the site. On the upper floor, there are rectangular windows. Because of the level difference on the site, the façade of the building adjacent to the plot no: 2067 is also visible. At the upper floor level of the façade, there are two rectangular windows with timber shutters and one neo-classical style, arched window opening with timber shutter existed.

There are two building masses on the courtyard facade of the building. The main building is rectangular in shape with two floors. The outbuildings are single storey and rectangular in shape. The façade configuration of the main mass consists of three axes. There is a pointed arched *eyvan* (iwan) with a high entrance between the first two axes. On the third axis, there are two rooms that open directly to the courtyard. On the ground floor of the mass, there are arched windows and door systems and stone carved rosettes and *takas*, which are found commonly as a façade feature in traditional Antakya houses (Rifaioğlu, 2021; Demir 2016). The neo-classical façade of the corridor façade, which projected into the courtyard dominates the configuration of the upper floor façade. Cut stone was used on the ground floor façade, and metal cladding over timber framing was used on the upper floor.

The façade of the annex building differs from the traditional mass in terms of window and door openings and its construction technique. There are rectangular window and door openings on the high, single storey façade of the outbuilding. The facade of the mass is coated with stone-like plaster. Similar to in the *eyvan* of the main mass, there is an arched neo-classical style entrance door on the façade of the annex building.

The main building mass is 2.5 m higher from the entrance located on the cul-de-sac on the plot no: 2068. At the entrance, at the level -2.5 m, there is a corridor space and a cross-vaulted, stone-paved space with an upper window. There is an *eyvan* and two other spaces that can be reached from the *eyvan* at the entrance of the main mass, which is accessible from the courtyard. Cupboards, niches, shutters, timber frame ceilings, which are common in traditional Antakya houses, are also present in these spaces. The floors of the spaces are covered with cement mosaic tiles. The other two spaces that can be accessed directly from the courtyard are configured in a similar manner with the areas that can be reached from the *eyvan*.

There are service spaces, kitchen and two more spaces in the annex building. The spaces in the annex building are configured with neo-classical and modern architectural elements. The floor is covered with geometric pattern cement tiles.

On the upper level of the building, there are spaces accessed from the corridor formed by the projection from the main mass. In these places, the floor is timber flooring. There are niches in the rooms. There are traditional decorated timber ceilings in a room on the upper floor and in the place where the stairs reach.

4. Historical and comparative analysis

Information about the construction date of the building cannot be obtained from primary reliable sources. The oldest document is the cadastral plan prepared in 1929. In the cadastral plan, the building is shown in its present borders. Both the construction technique and the architectural elements of the building, as well as the facade and the mass formation suggest that the building was built in the 18th century.

The location of the building in the city confirms the proposal that the building was built in the 18th century. The building, which is located in the north of the historical urban fabric, was located at the periphery of the city in the 18th century where the agricultural lands started to appear. There are small-scale residences in the close vicinity. It is known that the building which diverges from the houses around it in terms of architectural program and status was constructed as the mansion of a wealthy family of the period which was affiliated with agricultural activity. For this reason, the mansion has features that periodically differ from the traditional houses in its close vicinity.

The spatial and formal features of the building with its close vicinity were tried to be analysed in terms of plot-building mass relationship, building mass-space relationship, spatial organization-architectural element relations.

4.1. Plot-Building mass relationship

There are residences having building plot sizes ranging from 50 m^2 to 150 m^2 in the north-south and east of the Gali Mansion. With its 691 m^2 size, the mansion structure, located on the largest lot of the building block that it is located in, differs in scale from the surrounding residences (Figure 2).

When the building mass-courtyard relationship is examined in the plots, it is seen that for the houses in the close vicinity the main mass is usually located in the north of the building lot while the courtyard is located in the south of the building lot. In Gali Mansion, the main mass is located in the north of the plot in terms of the lot-building mass relationship.

In the analysis of the street-built environment relationship, it is seen that the main masses are located on the street axis in the building lots located in the north of the building block, and the courtyards are predominantly located on the street axis in the southern plots. Since Gali Mansion is accessible via culs-de-sac and it is surrounded by residences, the main building mass and/or courtyard do not have a direct contact with the street. Due to the fact that, the mansion is large scale building located in a physical environment that was formed before the 18th century, the plot-built environment relationship features differ from the main mass or the courtyard-street relationship of the historical urban texture of Antakya before the 18th century (Figure 3).

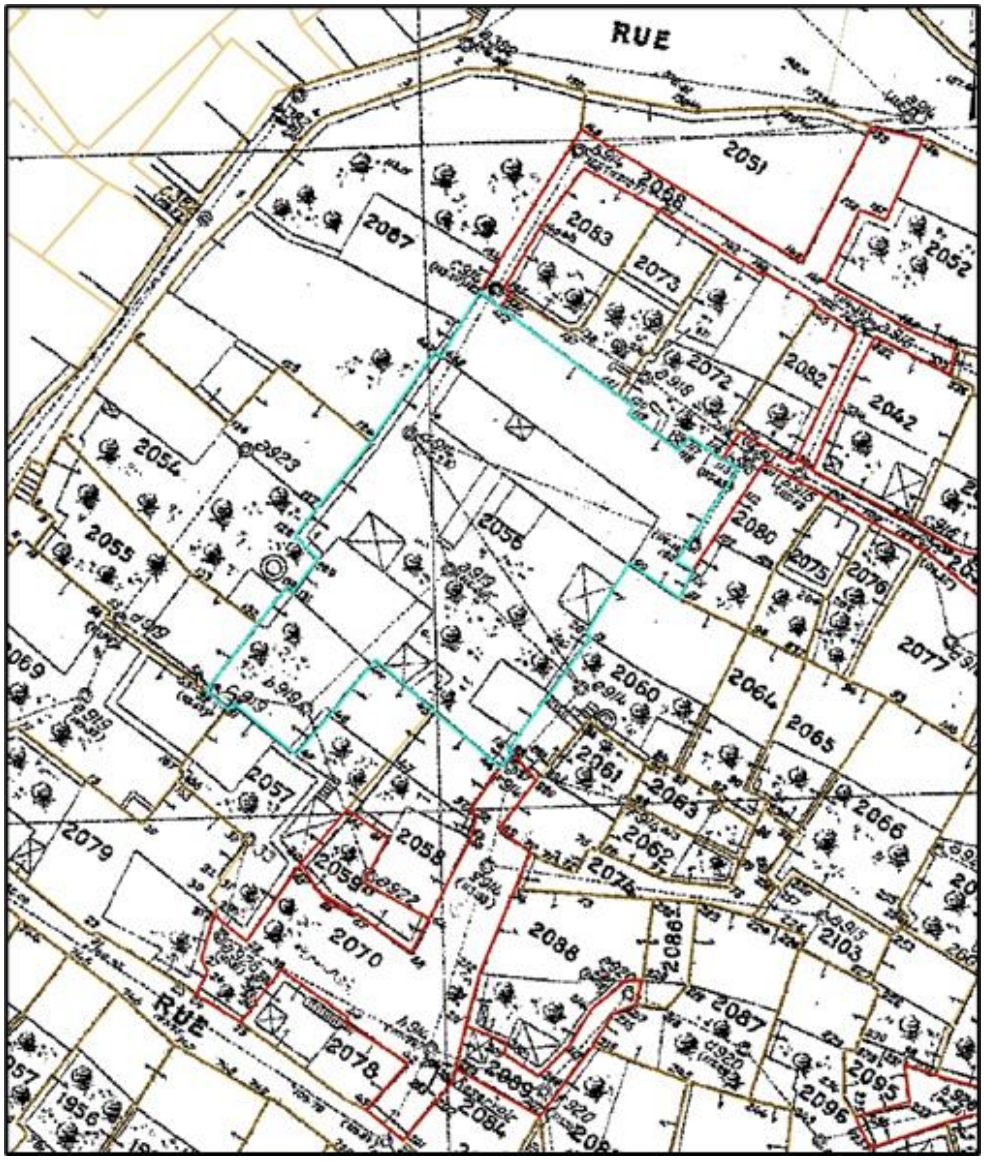

Figure 2. The plot-building mass relationship of Gali Mansion with building lot number 2056 and its near surroundings

Figure 3. The view of the near vicinity of Gali Mansion from the cul-de-sac located on the plot no: 2070. The door of Gali Mansion that opens to the cul-de-sac is located in the left corner to the left of the green painted door

4.2. Building mass-space relationship

In the analysis of the building mass-space relationship of the close vicinity of Gali Mansion, the analysis of the courtyard-main mass and annex system was investigated. In the plots where the traditional houses are located in the building block, the main mass-courtyard relationship is provided directly. Access to the spaces in the main mass was provided via the courtyard. The courtyard has an active functional role in providing access to the spaces of the main mass. There are at least two spaces in the main mass of residences located in the close vicinity. Both spaces are directly accessible via courtyard. In general, an area is reserved for annex building in the courtyard. There are wells in the courtyards of some residences.

Most of the residences on the building block consist of the main mass built as a single-story stone masonry. There are also examples of the attic of the main mass used as warehouse.

On the other hand, in Gali Mansion, the relationship between the main mass and the courtyard differs from that of the houses in the near vicinity. Two spaces in the main mass which occupy the largest area among the spaces on the ground floor level reach the courtyard via an *eyvan*. There are two directly related spaces between the courtyard and the main mass. These two spaces are the spaces with the smallest area on the ground floor. Regarding the annex building, it is directly related to the courtyard and has a more intense architectural program and spatial setup compared to other annex buildings located in the close vicinity. In terms of building scale, the annex building is equivalent to the main masses of the houses in the near surrounding (Figure 4 and Figure 5).

Figure 4. The main mass-courtyard relationship in the close vicinity. The high mass in the rear belongs to Gali Mansion

Figure 5. The courtyard-main mass-annex building relationship in the close vicinity

4.3. Spatial organization-architectural elements relationship

When the spatial organization and architectural element relationship of the building is examined, it is seen that features of different periods and styles are found throughout the building. In particular, the relationship between the two spaces, located in the eastern corner of the main mass, directly with the courtyard, the façade openings and architectural elements are similar to the surrounding structures. The rooms with narrow-span arches and stepped entrances called as *eşik* overlap with typical traditional Antakya houses. There are wooden cupboards and niches in the rooms. The rooms located in the continuation of the main mass are accessed through a pointed arched *eyvan* which was built in the neo-classical style. In the interior spaces which are accessible from both sides of the *eyvan,* window jambs placed later in the neo-classical style can be seen. There is no stylistic difference on the courtyard facade of the ground floor of the main mass. The traditional arched window-*taka*-door scheme was applied on the exterior façade.

On the upper floor of the building, a corridor was formed by the projection of the longer side of the main mass. The courtyard façade of the corridor has a neo-classical window arrangement. The facades of the rooms on the upper floor facing the corridor have rectangular window and door openings. The traditional architectural elements are not observed in the spaces. There is a traditional decorated timber ceiling in the place where the stairs to the upper floor reach and the place that connects to it. The rest of the upper floor has timber flooring.

The *mabeyn* which is frequently observed in the traditional houses of Antakya (Rifaioğlu, 2021) and in the near vicinity of the building, is not seen in this building. However, there are traces suggesting the existence of the *mabeyn*. There are stone engravings on some of the *takas* on the courtyard façade of the main mass.

The annex building differs from the main mass in terms of the level of the architectural program, construction technique and architectural elements. There are high rectangular windows on the courtyard facade of the annex building which is composed of high ceilings and four spaces. Similar to the main mass on the *eyvan* façade, the two spaces in the annex building are entered through a neo-classical opening. The façade of the annex building is plastered with stone-like plaster.

The main mass and annex building are located above the courtyard level. It is observed that masses located at the same level with the courtyard level are common in traditional Antakya houses and in the close vicinity of the building.

5. Restitution analysis

According to the data obtained during the restitution research, four periods including major interventions related to the structure were determined. Period intervals are classified by analysing the physical changes of the building regarding its construction, observing the traces and the evaluating written and visual sources.

Accordingly, the first period covers the time span between the 18th and the 19th centuries. It starts with the first construction date of the building. It was determined that the first form of the long mass located on the northwest-southeast axis, which has survived to the present day, was shaped in this period, and the three masses, which are indicated on the French Cadastral Plans of 1929 but could not reach the present day, were also included in this period. Although the first construction date of the building is not known precisely, so that the settlement in this region started around the 18th century, it is also seen in the construction system, architectural elements and the characteristics of the surrounding structures. Although the fact that the size of the building lot of the building is larger in comparison to the surrounding buildings and the four blocks in its courtyard and the entrance from three different culs-de-sac indicate that there may be a building lot merger in this parcel, sufficient traces to support this argument could not be found in the building.

It was determined that the three blocks, which it can be called annex buildings, that are smaller than the long mass located on the northwest-southeast axis during the period where the location of the buildings on the building lot are considered match with the position and form in the French Cadastral Plans, could be single-storeyed. It was also determined that a part of the long mass that has survived to the present day was single storeyed (Bora, 2008), and the remaining part had a second floor having timber flooring and accessed by the *mabeyn* (Figure 6).

Figure 6. View from the *mabeyn* space

The next period, which can be considered as the second period, covers the time span between the 19th

century and 1917. It begins with the changing of the function of the upper floor that is reached by the *mabeyn* in the building, which is used as a warehouse in traditional Antakya houses. Access to the upper floor was provided by the arched staircase that was integrated into the vault through which the first period entrance to the building was provided, and this place was converted to a two-room living space. The traditional decorated timber ceilings in the building were integrated into the building in this period. It was determined that the *eyvan* and the mass above it, located right next to the arched staircase because of the level differences on the ground, were added to the structure in a later period. With respect to the fact that the guillotine windows open to the *sofa* (hall) on the upper floor, lack of possibility any door opening on the floor where the stairs reach up, and the curvilinear elements on both sides of the traditional decorated timber ceiling of the *sofa* area it was determined that this space was configured as semi-open area on its facade, like an *eyvan* (Figure 7).

Figure 7. The curvilinear support that forms the border between the windows in the *sofa* and the decorated timber ceiling of this area and the covering under eaves that was added in the later periods

The third period covers the time span between 1917 and the second half of the 20th century, when the building went through important interventions. The inscriptions facing the courtyard facade were added to the facade during this period. Since the French Cadastral Plans of 1929 were prepared in this period, it was used as a cartographic document about the period. Three more steps were added to the arched stone staircase on the upper floor, which is located at two different levels in the building, and thus the elevation was raised. The two upper floors were connected to each other by an 80 cm projecting corridor (Figure 8). A room on a barrel vault was added right next to the arched stone staircase on the southeast side of the courtyard. An *eyvan* like use was created in the lower part of this vault.

The fourth period is the period covering the time span from the second half of the 20th century to the present day. It starts with the construction of the mass located on the northeast-southwest axis that has survived to the present day on the site of the three masses, which could have been the annex building and service spaces in the previous periods.

Figure 8. The 3 steps added to the arched stone staircase that provides access to the upper floor and the vault-stair level relationship

5.1. First period: 18th Century–19th century

The building outlay of the four blocks located on the building lot in this period was prepared as a result of the comparative study between the masses and traces that have reached to the present day and building lot-mass relationship on the French cadastral maps. In this respect, the building outlay was created by making comparative studies between the building and other buildings from the same period (Figure 9).

In this period, there are two entrances to the building lot from which access is provided through culs-de-sac. Entrance doors to the culs-de-sac on the building lots no: 2071 and 2068 opened to barrel vaults through which access to the building lot was provided. While the entrance vault reached through the cul-de-sac on the building lot no: 2068 in the building was the entrance gate through which the main entrance is also provided today, the vault opening to the cul-de-sac on the building lot no: 2071 converted to a staircase that provided access to the upper floor. These entrance vaults provided access to the courtyard with steps. The courtyard floor was located at a lower elevation compared to today (Figure 10). From this courtyard, access was provided to the five rooms in the long mass located on the northwest-southeast axis, the two masses located in the southeast of the courtyard and the mass located in the south of the courtyard, which could not have reached the present day.

Figure 9. Ground Floor Plan of the First Period

The first of the spaces accessed from the courtyard on the ground floor is the space reached from the vestibule with two steps on the stone courtyard floor in front of the long mass. This place provides access to three rooms. As a result of a comparative study of the traces from the building in this period and other buildings from the period it was determined that there was a room located in the area in this period, which has reached today with a windshield.

Among the three rooms on the ground floor, which can be accessed from the above-mentioned area, the timber door jambs rising up to the *taka* windows can be seen in the room located in the northern corner of the parcel. It is understood that these glamorous curvilinear jambs did not exist in the first period of the building since they covered the opening of the *taka* windows but were added to the building in a later period with the geometric and plant motifs on the ceiling (Figure 11).

Since the decorations in the other rooms on the ground floor are the same as the decorations of the room in the northern corner of the building, it was determined that they were added to the building in later periods.

Access to the two rooms located in the eastern corner of the building is provided from the courtyard. Their doors open to a threshold bordered by cut stones. It was determined that there was once a *mabeyn* connecting the two rooms, which appear to be two separate rooms because they are reached by separate doors from the courtyard and providing access to the upper floor, on the wall that forms the border of these spaces.

Figure 10. The photo shows that the ground level of the First Period was lower and there was an access to the stone floor of the courtyard by steps after the cut stone finish

The *mabeyn* staircase, which provides access to the upper floor of the building, was analysed by making a comparative study on the dimensions and heights in the building lot 62 in the 4th circumscription. It is understood from the traces of joint between the wall and the timber flooring observed from the inside of the building that the *mabeyn* staircase was large enough to cover the two rooms to which it gives access on the upper floor ground. In this part of the building, while the timber flooring boundaries end at the wall line in the remaining parts, cement surfaces showing the intervention on the wall line are seen.

Of the façades that have reached to the present day, only the north-western façade of the building is unplastered, and cement-based plaster is seen throughout the remaining façades. Among the traces seen on the northwest façade, the traces of two arched openings measuring 75x225cm show that there were two openings facing the city panorama here. In the same way, we can say that the rectangular wall niches in approximate dimensions, which are the closets of the annex building today, were openings in the same manner in this period, since they are located on the transport line of the polygon points on the French cadastral sheets. On the courtyard façades of the building, we can say that the symmetrical façade, centred on the wide two centre arch-shaped entrance, on the north side of the main mass, has not been damaged except for the additions and interventions in the windows. On the east side of the building, with the introduction of the vault in the later periods, it was determined that the building had a serious intervention in the floor height and facade formation, especially after the +1.45 m elevations, and after this intervention, inscriptions were placed on the facade in this part of the building. This part of the building, which is two-storey was shaped with reference to the neighbouring buildings on the plots no: 2054 and 2055 (Figure 12).

Figure 11. Timber window shutter decoration blocking the *kus takasi* windows

Figure 12. Façade configuration of the building on the plot no: 2054

5.2. Second period: 19th century -1917

The most serious change occurred in this period of the building is the interventions which resulted in the use of the upper floor as a living space. While no change was observed in the quarters in the northern corner of the building, the *mabeyn* staircase providing access to the upper floor in the two-storey building located in the eastern corner was removed. In the room located in the eastern corner of the building lot, timber cupboard covering the walls were added with this intervention and the space was transformed into a square like form. The upper floor, which was converted into a living space, was separated into rooms by separator walls, and the entrance has been changed by adding an arch and a masonry staircase to the entrance vault, which provides access to the cul-de-sac on the building lot no: 2071. The door in the vault providing the entrance was closed and the opening that has survived to the present day was

added under the newly added stair arch. As a result of the comparison of the traces on the façade in this section with those on the adjacent building lot no: 2060, the presence of a platform in this area was determined (Figure 13). The staircase, which started with the opening on the wall in the part that was the entrance vault of the previous period, extends to the main wall of the main mass with the missing three steps that were found to be added later (Figure 14). Here, through the opening on the façade, the space consisting of an inner balcony/eyvan is reached. The decorated traditional timber ceiling in this section is bordered by curvilinear support elements on both sides at the ceiling façade. Apart from this space, in the space divided into two rooms, the two guillotine windows of the room with a decorated traditional timber ceiling, which have survived to the present day, open to this space.

In this period, with the transformation of the upper floor, which was used as a warehouse in the previous period and was reached by the *mabeyn*, into a living space, the upper floor consisting of the three rooms in the northern corner of the building was added in order to meet this need. It was determined that this floor can be reached via a timber ladder leaning against the wall from the niche, as in the neighbouring building lot no: 2060 (Figure 15).

Figure 13. With respect to the comparative study on the trace on the wall and the one on the adjacent building lot no: 2060, and the statement of the inhabitant in the adjacent building in the current situation, the presence of a platform can be proposed.

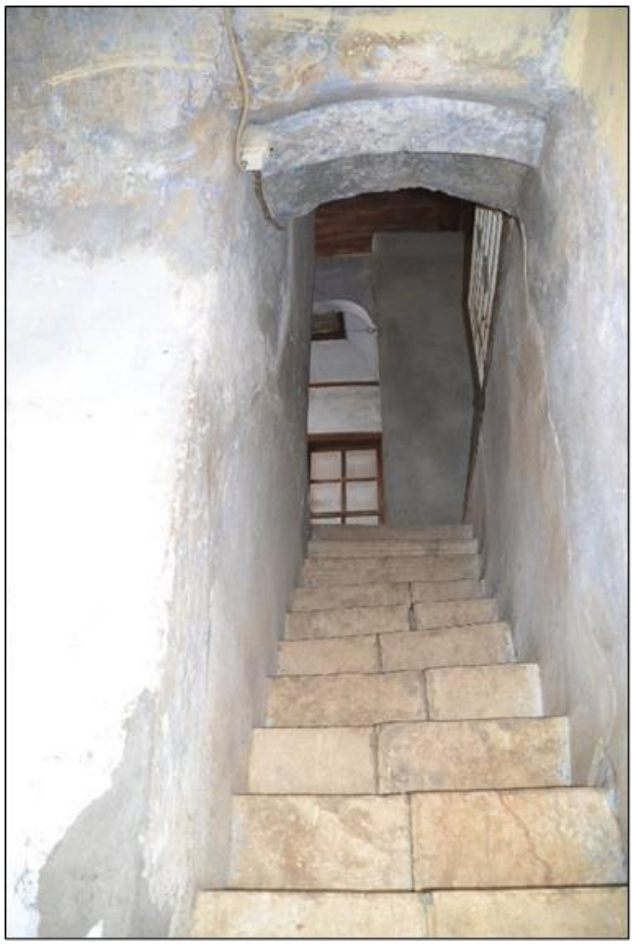

Figure 14. The opening which was opened on the entrance vault in a later period

Figure 15. The ladder providing access to the upper floor in the building on the building lot no: 2060 in the 4th circumscription

The only difference on the exterior of the building compared to the previous period is the construction of the upper floor of the part of the main mass located in the northern corner of the building lot. In this regard, it was determined that two skylights on the north-eastern façade of the building, which cannot be seen because they are plastered today, but perceivable from the interior due to the traces of filling, existed in this period with the construction of this floor. Regarding the courtyard facades of the building, on the courtyard facade of the main mass facing the northeast, as a result of the construction of the upper floor, the timber covered facade formation that continues throughout the floor was repeated on the facade in the similar size and quality with the surrounding building lots. In the eastern corner of the building, which turned into a living space, two timber covers were removed and the balcony part which was reached by the newly added staircase was created.

5.3. Third period: 1917–2nd half of the 20th century

In this period, which also covers the period when cement mosaic tile floors started to become widespread in Antakya (Nakip, 2012), the existing floors in the two areas located in the northern corner of the building lot on the ground floor were replaced with cement mosaic tiles. The wall of the room, which started right in front of the entrance with two central arches, was removed, and instead, a timber windshield, which is seen on the French cadastral maps and has survived to the present day, was added. With this feature, we can say that the room wall was removed after the windshield was added and the room was somewhat expanded. In this period, no changes were detected in the ground floor plan.

The upper floor spaces, which were reached in two different ways in the previous period and at different levels, were brought to the same level by adding three more steps to the arched stone staircase in this period. Thus, the entire upper floor is connected to each other by the corridor area that has survived to the present day. In addition to the previous period, a space with three guillotine windows and a decorated traditional timber ceiling which is supported by the vault that was built next to the stairs was added to the beginning of the corridor. With the addition of this mass, the space, which was a balcony in the previous period, turned into a hall connected to the corridor. Since the guillotine windows opening to this hall could not fulfil their function anymore, two windows were opened to the exterior in the room located in the eastern corner. The differences in the dimensions of these windows with cut stone jambs also show that these windows did not exist in the first period. In this case, the upper floor is divided into six rooms in total. Three of these rooms can only be reached from the corridor in front of them, and two of them from the hall in front of the stairs, while one room can be reached from both the corridor and the hall. At the end of this corridor, there is a window with two wings and wooden shutters, while the part of the corridor facing the courtyard is open. The top of the corridor, which was added to the building later, was covered in the manner of an eaves by extending the roof (Figure 16). At certain intervals, wooden posts support the eaves covering the corridor. Between these posts, there are two centred curvilinear arches.

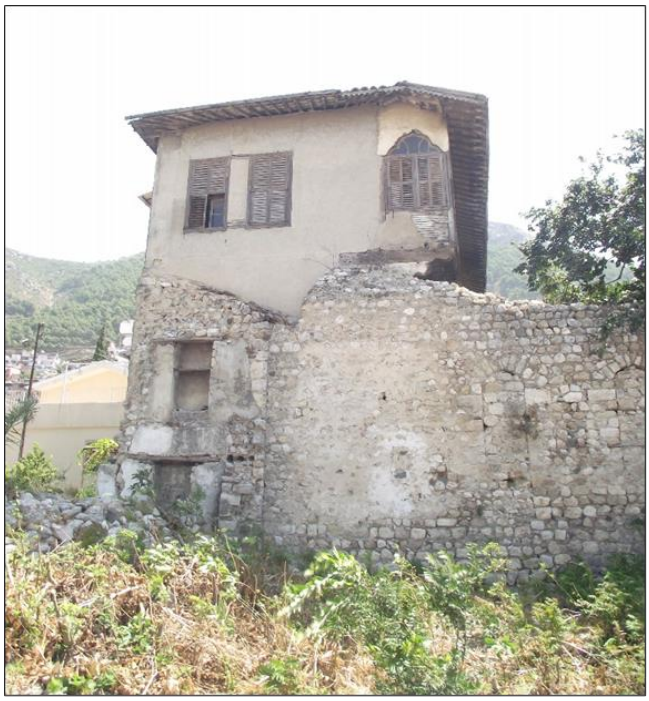

Figure 16. The corridor and the eaves added to the north-eastern façade of the building in a later period

From this period, which also covers the preparation date of the French cadastral maps, there are traces of the mass among other masses seen in the French cadastral maps in the southwest of the building lot located on the northwest-southeast axis (Figure 17). In this regard, the door and window openings facing towards the small courtyard located in the western corner of the mass constitute the façade openings of this mass. It is understood from the polygon transport lines on the French cadastral maps that there were two doors that provide the access between this courtyard and the large courtyard in the mass whose window openings face the small courtyard.

Figure 17. Traces confirming the existence of the door-window opening of the mass, which could not reach the present day, in the southwest of the building lot.

In this period there were serious interventions in the building such as the connection of the upper floors with a corridor and the addition of the vault forming the *eyvan*. A façade integrity was created with the floor elevation on

the southwestern façade of the building, which faces the courtyard. As a result of these interventions, inscriptions were added on the two *fanus takası* on the façade. It was revealed that there were no windows in this period in the corridor line, which is closed with arched windows today.

5.4. Fourth period: Second half of the 20th century-present time

Main intervention to the building lot in this period was the positioning of a single mass on the northeast-southwest on the site of the three annex building masses that existed in the previous periods. Considering the construction technique and materials of this mass, which is reached through a corridor line covered with tiles and extending from the stone courtyard in front of the main mass, it was probably built during the Republican Era. Window dimensions of the building, window jambs, cut stone cladding up to the starting level of the window and stone imitation plaster coating in the rest are the period features seen in the mass. The corridor in front of the mass continues until the end of the building and with six steps turns towards the cul-de-sac on the building lot no: 2070 and finally reaches the door opened in this period. A plan mass was formed on both sides of the glass room that is located in the centre of the mass reached from this corridor. While the kitchen and service areas are located on the northeast side of the room, there is another room on the southwest side of the mass. In the mass, which was separated with brick masonry separator walls, the reinforced concrete slab sitting on the brick wall in the service areas of the mass, lowered the ceiling level in this section and paved the way for an attic space above it. In the rest of the mass, the walls continuing up to the roof, and the high ceilings show that there were living spaces here.

Although there is no mass change in the main mass of the building, concrete-screed flooring can be seen on the floors of the three rooms located in the east corner of the ground floor. On the upper floor, a service corridor was created by adding an exit to the east of the staircase reaching here, and the upper part of the vaulted WC area on the ground floor was started to be used. In this period, the room above the *eyvan* vault was repaired with brick walls, a single wing opening window was installed instead of the guillotine window facing southwest, and the door providing access to this room was relocated. On the upper floor of the building, the skylights opening to the northeast façade were closed and single winged windows were added.

On the exterior of the building, single-wing timber windows replaced the skylights on the northeast façade. On the southeast façade, no difference was observed except for the door that opens to the cul-de-sac on the building lot no: 2071 and the service corridor that extends into the facade as timber projection. On the courtyard facades of the building, windows were added to the upper floor corridors on the southwest courtyard facade of the main mass. The annex mass on the northeast-southwest axis, which was added in this period, is one of the façades on the courtyard façade that differs from the previous period.

6. Conclusion

There are small-scale traditional houses in the close vicinity of Gali Mansion, which is located in the north of the historical urban fabric of Antakya. The building differs from the neighbouring buildings in terms of scale and architectural program level. The building complex, in its main mass, has spatial features and neo-classical and modern architectural elements that are not observed in the buildings in its close vicinity.

As a result of the examinations made on the building, on the scale of the location of the building and on the similar building groups in its surroundings, it was determined that the building was built after the 18th century and has the additions belonging to the neo-classical style, which is observed in the historical urban texture, especially by the post-*Tanzimat* period, and the modern period.

The Gali mansion has an important cultural value as it is a traditional building and reflects the lifestyle and accommodation needs of the period in which it was built. It was the subject of a social life because it meets the accommodation needs of a family. It has a unique scientific and cultural value because of the fact that it has changed slightly, that its original planimetric features can be seen and its original façade formation has been preserved. Since it was built using the construction technique and materials specific to the traditional buildings in the region, it has technical values with its material usage and technical features. It has artistic value with the arrangement of its facades with a neo-classical approach. The traditional building design of the region has a local characteristic because it is one of the typical examples of material use and construction technology. With its rich architectural level and scale, it continues its existence as a valuable cultural asset that needs to be preserved in the building block it is located.

Conflicts of interest

There is no conflict of interest between the authors.

Statement of Research and Publication Ethics

Research and publication ethics were complied with in the study.

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Cultural Heritage and Science
https://dergipark.org.tr/en/pub/cuhes
e-ISSN 2757-9050

A GIS-based method for researching the historical and architectural heritage of the mountainscapes: The case of Uludağ / Olympus Monasteries

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Keywords
Cultural Landscape
Cultural Heritage
Architectural Conservation
GIS
Uludağ / Olympus
Byzantine Monasteries

Research Article
Received:24.10.2022
Revised: 30.11.2022
Accepted:04.12.2022
Published:20.12.2022

Abstract

Uludağ / Mount Olympus is a mountainscape where natural and cultural values coexist. One of the under-researched cultural layers of Uludağ is the remains of the Byzantine Period monasteries, which are considered to compose one of the unique cultural landscapes of the Byzantine world. The site surveys realized by the Bursa Metropolitan Municipality Research Team proved that some remains still exist in the current Uludağ mountainscape. This study aims to understand the monasteries' cultural landscape by integrating qualitative, quantitative, historical, and current data on the Uludağ monasteries in a Geographical Information Systems (GIS) model. Various analysis tools that GIS provides are utilized in order to estimate the approximate locations of the monasteries' remains. In addition, the relationships of the monasteries with topography, city, and landscape are discussed through relevant GIS maps. As a result, it is observed that the Uludağ monasteries were located in hard-to-access locations and were well-integrated into nature. The cultural heritage of monasteries requires a multidisciplinary approach that can be managed by the utilization of GIS.

1. Introduction

1.1. Problem definition

Uludağ / Keşiş Dağı / Olympus *(the Mysian / Bythinian Olympus*) is a 2,543-meter-high mountain located south of the city of Bursa in northwestern Turkey. The earliest known beginning of the built structures in Uludağ is the monasteries located on the mountain between 600 meters and 1500 meters altitude since the 8th century AD. It is considered that these monasteries gradually lost their function in the 14th century with the transition of the administration of the historical city center of Bursa to the Ottoman authorities. According to Menthon (1935), who studied the remains of the monasteries at the beginning of the 20th century, there were about 150 monasteries on Mount Olympus during the Byzantine period. Additionally, Uludağ (1928), who researched the architectural remains on the mountain approximately 30 years after Menthon, points out that dervish lodges and dervishes replaced the monasteries and monks in the Ottoman period and supports this idea with some Ottoman legends and notes of foreign travelers. It is believed that during this period, the dervishes repaired the structures that used to be monasteries or stayed in caves to live in seclusion (Uludağ, 1928).

The fact that the rapidly-flourishing nature of the mountain quickly covers the architectural remains and makes accessibility very difficult has caused the Byzantine and Ottoman cultural fabric of the mountain to be almost completely forgotten today. As a result, there are a limited number of studies about the monastic period and the "dervishes' period," in other words, the Byzantine and Ottoman periods of Uludağ.

Within the scope of this study, it is argued that the cultural heritage values of the monasteries cannot be considered separately from their relationship with the landscape. Therefore, this study aims at analyzing and understanding the cultural values of the remains of the Uludağ Monasteries within their natural context.

This article aims to document the current cultural and natural qualities of Uludağ and to determine the cultural heritage values. As a methodology, the modeling of the multi-layered structure of Uludağ in Geographical

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Cite this article (APA);
Çorakbaş, F. K. & Bektöre, E. M. (2022). A GIS-based method for researching the historical and architectural heritage of the mountainscapes: The case of Uludağ / Olympus Monasteries. Cultural Heritage and Science, 3(2), 73-85

Information Systems (GIS) is realized, and the GIS data model was created in order to obtain relevant maps from the GIS database. The determined study area covered the Menthon Map (Figure 1-2). The maps and legends were prepared according to the place's tangible and intangible characteristics. Finally, the outputs of the analysis maps were evaluated, and the qualitative and quantitative data on natural, cultural, and historical values were discussed.

Four of the forty-three monasteries within the study area boundary are located in the current city settlement of Bursa Province. Thirty-nine of them are located in rural areas. As a part of the study, the historical data obtained from the previous studies on monasteries and monastic groups were examined, and historical information on the monasteries was entered into the GIS model. For instance, the construction dates or periods and the historical narratives about the locations and views of monasteries are included in the database as textual information. A key map showing the estimated locations of the monasteries, topography map, inclination analysis map, water streams map, and current transportation map were prepared by utilizing the GIS model, and results are compared and interpreted in order to draw conclusions on the past and present conditions of the monasteries' cultural landscape.

As a result, this study contributes to the enlightenment of a new layer in Bursa's urban identity by shedding light on the unique monk life on the periphery of the city of Bursa, which stands out as an Ottoman city. This research's originality stems from the methodology based on the use of the GIS model to relate qualitative and quantitative, past and current data on the Uludağ monateries' cultural landscape.

1.2. Studying mountainscapes by GIS modeling

Although the current scholarship on the study of the cultural and natural characteristics of the mountainscapes using GIS modeling is not rich in the number of studies, some studies analyze various cultural and natural phenomena utilizing various GIS tools. According to Cillis, et al. (2021), who claim to apply historical GIS for the diachronic analysis of a Mediterranean forest scape, landscapes represent a changing element of the territory. However, in some cases, their historical, cultural, and ecological importance requires a specific and detailed approach to avoid landscape loss or excessive transformation. Therefore, it is necessary to deal with the issues in multidisciplinary and multitemporal ways (Cillis, et al., 2021). Cillis, et al. (2021) underline that GIS, although with errors, is the only way to have a spatial reference of the historical structure of the area. In addition, they emphasize that the historical GIS implementation can be a valuable tool for those involved in landscape and forest ecology because it can become the basis of a decision support system (Cillis, et al., 2021).

Considering the change in a monastic area and a settlement in a mountainscape context, Caiji *et al.* (2015) find out that a Tibetian monastery's change in land use type and landscape pattern is more stable than the change in settlement. According to their study that is based on GIS analysis of a vast area in a Tibetian mountainscape, the fragmentation index of monasteries is significantly lower than that of the settlement within the study area from 1987 to 2007. In addition, the landscape pattern of the surrounding river and lake is better than that of the surrounding settlement (Caiji *et al.*, 2015).

In their attempt to bring to light the relationship between the ancient Wari structure's locations and the mountainscape, Williams and Nash (2006) utilized GIS-based viewshed analysis to assess which points on the landscape are likely to be recognized by a large number of communities. Their methodology combined ethnohistoric and ethnographic data with topographical and spatial data, which they think can be a powerful tool for investigating the "cognitive landscapes of the past."

Concerning the development of relevant archaeological research methods in mountainscapes in Sicily, Fitzjohn (2007) emphasizes the importance of systematic field walking in landscape archeology. He states that absolute landscape archeology is possible not only by evaluating the region's physical features in the analysis but also by developing our analytical and interpretive approaches to the material. For this, he proposes unconventional humanistic uses of GIS. These uses include parameters such as interviews, and daily experiences in the region, in addition to GIS data inputs (Fitzjohn, 2007).

Investigating the tangible and the intangible aspects of the sacred landscapes in Colorado's Rocky Mountain National Park, Diggs and Brunswig (2013) applied a four-stages method, including GIS modeling, which is composed of the following steps:

1. "mining" of the ethnographic and historical records related to religious practices, belief systems, and physical manifestations of those practices and beliefs;
2. field visits of elders and members of tribes that are known to have historically occupied the region;
3. an archeological field program designed to identify sites with religious elements, including modified natural features that are associated with past ceremonial activities; and
4. using GIS software to generate and test landscape patterning and site models using the above sources.

As exemplified in the case of the Rocky Mountain National Park, cultural landscape studies necessitate combining qualitative and quantitative research methods tailored to the specificities of the case studies.

To conclude, GIS provides a convenient data model that combines spatial, historical, ethnographical, and geographical data types, making it a unique environment to analyze mountainscapes' cultural and natural characteristics integrally.

1.3. The cultural layers of Mount Uludağ / Olympus

Written resources claim the existence of 150 monasteries in this area, but Menthon (1935), who studied this area in detail in the early 1900s, confirmed the existence of the remains of about 50 monasteries. Moreover, Menthon (1935) determined the names of these monasteries from historical written sources.

However, the Uludağ Cave and Monastery Research Team, established by the Bursa Metropolitan Municipality (2012), has reached the remains of only 5 or 6 of these monasteries. The site survey of the municipal team was not well integrated with the historical research, so all the names of the monastery remain were not determined.

The monastery remains are located at altitudes between 600 and 1500 meters (Figure 9). Being located in one of the highest mountains in Turkey, the area is a scene of harsh climatic conditions, and it is very much inclined (Figure 10). As mentioned above, the regional and architectural scales should be analyzed and evaluated to study the monasteries' cultural heritage.

The selected study area covers nearly 1000 square kilometers on the mountain surface (Figure 1). In order to comprehend the scale of the study area, the study area can be compared with Bursa's İnegöl District, which also extends around 1000 square kilometers. The remains of circa 50 monasteries reached by Menthon (1935) and 5 or 6 monastery remains researched by the municipal team are distributed to an area as large as the Inegol District, where 230.000 people live today. This comparison highlights that the area in question is enormous and forested.

Monastic life in a mountainous area was undoubtedly influenced by the climate cycles. One of the reasons why the monks and dervishes chose the mountain landscape for seclusion both in the Byzantine and Ottoman periods is the weather phenomena, the climate, and their reflections on nature. For instance, Lâmiî Çelebi, who wrote about the Bursa city in the 16th century, emphasizes that the valley known as Sarıalan, where important monasteries were established in the Byzantine Period, "blooms a thousand and one flowers, especially the beauty that emerges with the melting of the snow in the spring season is unique" (Uçak, 2019).

In the years following the establishment of the Republic of Turkey in 1923, Uludağ became the host of new hotels and winter tourism as the modern winter sports center of the new nation-state. As Bozdoğan (2015) pointed out, modern public spaces, especially the recreational parks and gardens in the cities, played an important role in the construction of the modern Turkish nation. Similarly, Uludağ hotels region was planned as a modern facility both for the city of Bursa and the whole country. Accordingly, in the first decades of the Republic, the mountain began to attract more attention and turned into a more accessible place than it was in the past. Mountaineers, skiers, tourism planners, bureaucrats, and other civic actors were influential in this transformation. In 1925, with the suggestion of Osman Şevki, who visited the mountain and climbed to its peak, the name "Keşiş Dağı" was changed to Uludağ. With organized trips, youth and scouting camps, and picnic activities, Uludağ became a significant source of tourism for the region in the early 1930s. Thanks to Uludağ and foreign educators who migrated to Turkey in the 1930s, skiing was promoted as a leisure activity. With the establishment of the Bursa Mountaineering Club, skiing sport began to develop in Uludağ. In 1935, Turkey's first ski house was established in Uludağ, and the accommodation facilities in the mountain were developed (İnal, 2019). Today, the ski center hosts activities such as snowboarding, bigfoot, snowmobile safari, sledding, and winter mountain climbing in addition to skiing (Adamış ve Özçoban, 2020).

Kirazlıyayla Sanatorium, designed by Leman Tomsu and Emin Onat, was opened in 1946 as the first modern accommodation and health facility in Uludağ. The building complex was designed as a lung and chest disease hospital. Accordingly, balconies were designed for each patient room to ensure that patients had fresh air. Moreover, a courtyard for sports activities was included in the design of the building. The building has architectural value due to its plan organization, natural materials used in a modern sense, and remarkable structural details. The sanatorium complex is a successful product of the period called the Second National Architecture (Türkün Dostoğlu and Erdoğdu Erkaslan, 2013). Having been used as a hotel for a while, the building changed dramatically after several renovations. In addition to the sanatorium, many hotels were built in Uludağ, and with the snow removal vehicles imported from abroad in 1949, Uludağ was made easily accessible in winter. In the 1960s, Uludağ became an alternative holiday destination for the middle and upper-income groups.

After the Second World War, new tourism opportunities were investigated in Turkey, and, as a result, leisure activities have become an important industry since the 1950s. The infrastructure investments for skiing have increased in Uludağ with the construction of new hotels and pensions and the installation of chairlifts; thus, significant changes have occurred in the mountainscape (İnal, 2019).

At the same time, since the nature of the mountain is an ecosystem famous for its biodiversity, a National Park area was created, and the plants and animals in this area were taken under protection in 1961 (Ersoy, 2012). Within the borders of the National Park, which has rich flora and fauna, there are more than 8500 endemic plants and animals, such as bears, wolves, jackals, wild pigs, partridges, and deer.

The tourism center, which has been developing and growing since the 1930s, is a limited area within the borders of the Uludağ National Park (Atasoy et al., 2008).

A significant development in 1963 was the cable car, one of the transportation methods established between Bursa and Uludağ (Figure 1). Having a horizontal length of 9 km as the longest cable car line in Turkey and being Turkey's first cable car line, it has become one of the city symbols of Bursa. This important cable car line has four stations: Teferrüç, Kadıyayla, Sarıalan, and “Oteller Bölgesi” (Hotels’ Region) respectively. Kadıyayla Station, one of these stations, constitutes an important area with much potential for Uludağ monasteries’ research. The monasteries of Saccudion, Mesolympe, Cathares, and Libiana were located in this region.

Access to the mountain became more practical by the cable car, it increased the region's attractiveness in terms of mountain and winter tourism and facilitated low-income individuals' daily visits to Uludağ (Atasoy et al., 2008).

While the number of hotels in Uludağ was five in 1961, the bed capacity increased to 1000 in 1971. Newly

opened hotels tried to attract customers to Uludağ with services such as hot water, central heating, and more comfortable spaces (İnal, 2019). For local and foreign tourists, in addition to staying at hotels and camping, there is a potential for nature tourism activities such as nature walks, mountaineering, climbing, and mountain bike tours in the plateaus (Erken et al., 2019).

On the north side of the mountain, there are Sarıalan, Kirazlı, Kadıyayla, Sobra plateaus. Kadıyayla hosts a cable car station around which important monasteries were located in the past.

Eight glacial lakes, such as Aynalı Lake, Kilimli Lake, Kara Lake, are among the main attractions of the mountain.

The modern Uludağ cultural landscape, with its hotels, provided a popular environment for the leisure activities of the Republican urban upper-middle class. In the news and columns in the local press of Bursa, especially in the 1950s, the renovation of the Uludağ road, the construction of a cable car, and various opinions on Uludağ becoming a national park were discussed. Films, literary products, news and advertisements in the local press, and postcards are essential resources for a better understanding of the importance of the modern image of Uludağ in popular culture during the Republican period. These resources have the potential to shed light on the development of the Uludağ landscape in the last century and the determination of its socio-cultural and natural values. On the other hand, the lack of monasteries or other historical constructions in the modern image of Uludağ constitutes one of the highlights in the problem definition of this study.

Similarly, it is remarkable that the mountain villages surrounding Uludağ, like a net, have not become a part of winter tourism. The examples of traditional residential architecture, monuments, and natural products in these mountain villages have significant potential for rural tourism. In contrast, the villages are not connected to tourist routes in the mountain; therefore, the villages are not a part of the recent future vision and development scenarios.

The only exception is Cumalkızık Village, which is a component of the "Bursa and Cumalıkızık: the Birth of the Ottoman Empire" UNESCO World Heritage Site (2022). Concerning this study's aims and scope, Cumalıkızık is significant since it can serve as the starting point of the monastery's cultural routes leading to the numerous monasteries in the east of the study area (Figure 1 and 2).

This study aims to exemplify a system for the integrated documentation and conservation of the cultural and natural values of the mountain based on Geographic Information Systems (GIS). The multi-layered GIS structure consists of cultural and natural layers on the mountain, such as flora, fauna, water system, paths, and architectural remains from the Byzantine Period. Additionally, villages, roads, viewpoints, and some of the natural and cultural routes are modeled in GIS. This model is an example of a dynamic decision-making system, which can be updated, shared, and developed with the designated stakeholders. It can be a tool for conservation and site management. A wide range of qualitative and quantitative data can be entered into the system, and all data types can be analyzed and evaluated integrally.

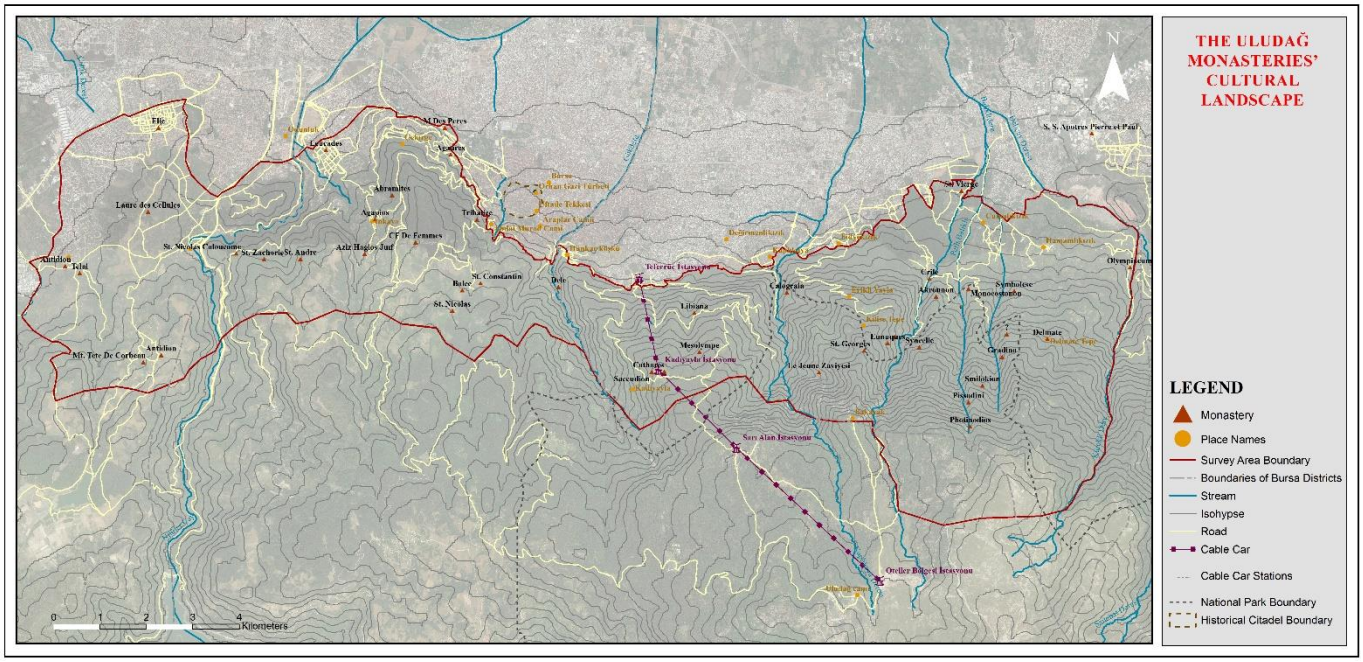

Figure 1. The key map shows the monastery's estimated locations in Mount Uludağ / Olympus

1.4. The previous studies on the monasteries of Uludağ / Olympus cultural landscape

Two of the most important studies on the Uludağ Monasteries were Bernardin Menthon, the Priest of the French Church of Bursa, in the first half of the 20th century. Menthon (1935), in his work titled "L'Olympe de Bithynie- Ses Saint, Ses Couvents, Ses Sites," evaluated the historical written resources about the monasteries in Uludağ, combined them with the results of his fieldwork

and created a sketch-map (scale: approximately 1/83.333) showing the locations of the monastery ruins (Figure 2).

In addition, Uludağ 1928, a doctor and an intellectual from Bursa, published a work titled "Bursa and Uludağ: Guide to the Travelers" and a work called "Uludağ Temples, Monks, Dervishes" in 1936. In these works, the author mentioned Uludağ / Keşiş Dağı Monasteries referring to Menthon's work and his own field studies. Like Menthon, Osman Şevki Uludağ included sketches and maps in his works (Figure 3).

After the 1930s, studies on the Uludağ Monasteries were suspended for a long time, and in 2006 and 2007, a French research team conducted church and monastic research in an area outside the area where Menthon worked, that is, on the slopes of the mountain facing west and north and in Kurşunlu (Auzépy et al., 2007 and Auzépy et al., 2009). These archaeological surveys focus on documenting the architectural fragments identified (Auzépy et al., 2006) and is shown in Figure 4. As a result, this study's originality stems from its unique approach in terms of using cultural landscape data while aiming to reveal the tangible and intangible cultural qualities of the monastery ruins. At the same time, questioning the relationship of the cultural landscape and its component monastic ruins with historical data is one of this work's original aspects.

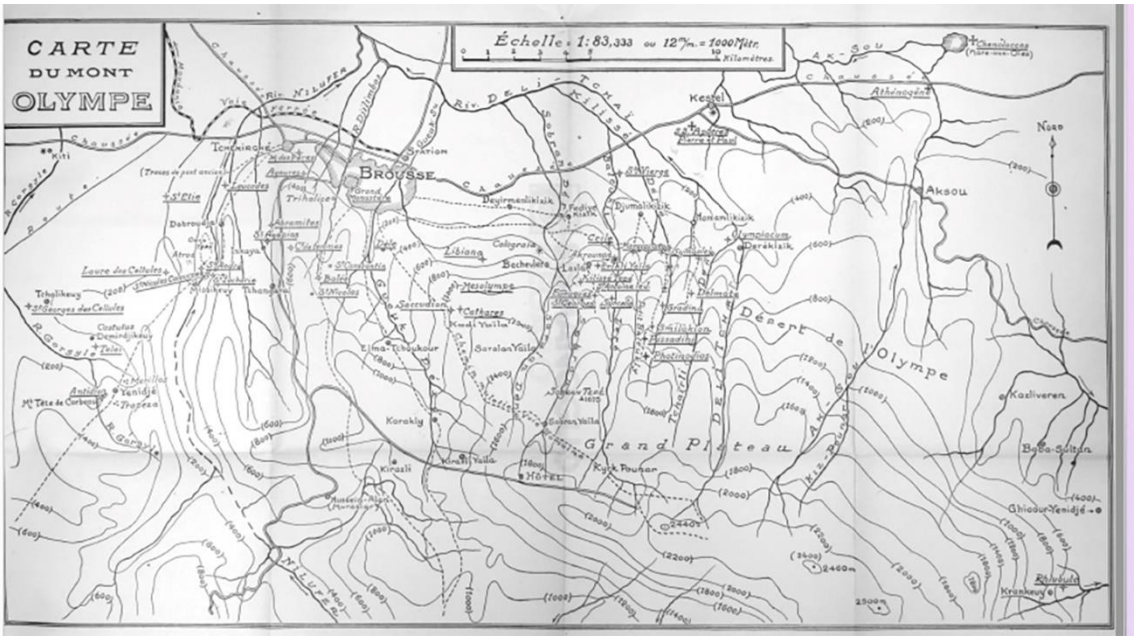

Figure 2. The Menthon Map showing the Uludağ monasteries (Menthon, 1935)

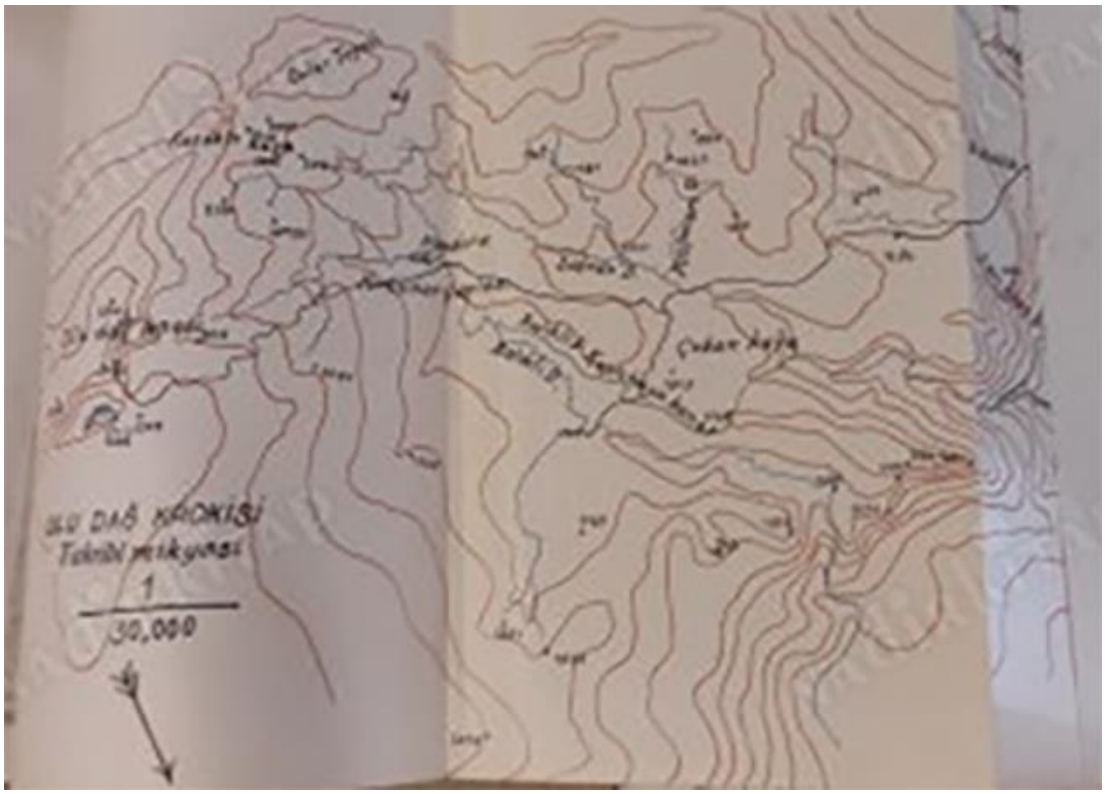

Figure 3. Uludağ sketch published by Uludağ (1928)

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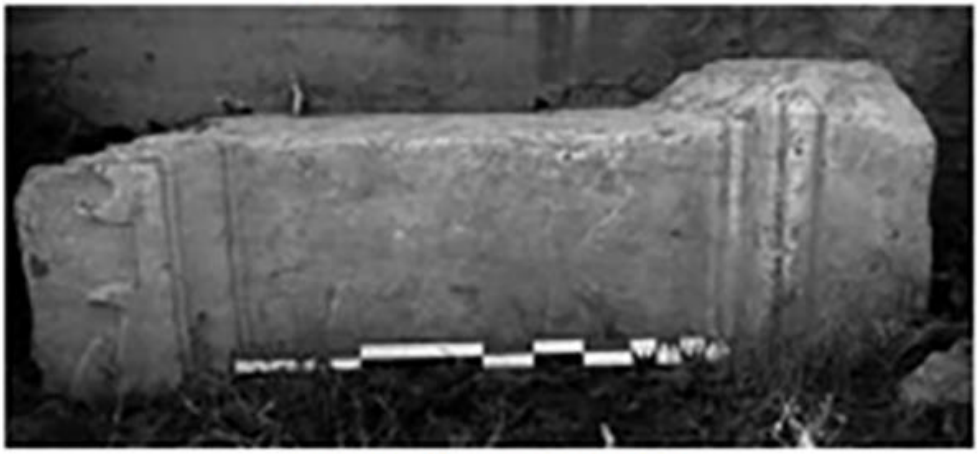

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Figure 4. An example of the ancient finds in the 2006 report (Auzépy et al.,2006).

The primary textual sources for the Olympus monasteries are the monastic saints' lives and the foundation documents. They contain information about religious subjects (e.g., organization of monastic communities) and daily life. Any monastery of Olympus does not have a complete foundation document, but the foundation document of the monastery of Stoudios in Constantinople, founded by monks from the monastery of Sakkoudion in Olympus, is indirect evidence of the monastic organization in Olympus. The document is in Greek and was translated into English (Thomas and Hero, 2000). The Life of St. Plato of Sakkoudion, written by Theodore of Stoudios, is an essential source of life in Bithynia's monasteries. The lives of St. John and St. Peter of Aatro are likewise important sources in Greek.

As a result, in this study, the original texts about monasteries and the reports and publications of the few field studies on the Uludağ monasteries are interpreted together. This study is a presurvey to discuss the advantages of utilizing GIS to understand the tangible and intangible qualities of the monastic cultural landscape. The inter-scale approach, supported by the use of GIS as a tool for analysis, proves to be an efficient and unique method to understand the cultural texture of mountains.

2. Method

The study aims to draw attention to the highly diverse and qualified cultural texture arising from the human-nature interaction of the mountain landscapes, which stand out with their natural qualities and the cultural heritage values inherent in this texture. In other words, this study aims to develop GIS-based conservation and management methods for conserving and managing complex rural systems.

Concerning the questions of determining the locations of the monasteries and the investigation of the relations they established within the cultural landscape; it should be stated that it was impossible to locate most of them. When the data obtained from the field studies carried out by Bursa Metropolitan Municipality (2012) in the recent past are evaluated, it is foreseen that the locations of at least five monasteries can be determined precisely. As a result of the interpretation of the archive documents and architectural remains related to them, important new data about these monasteries and their immediate surroundings can be reached.

The main stages of the method were as follows:

1. Preliminary site survey

2. Archival work: Compilation and examination of archival documents, historical and current maps, past and current climate data.
3. GIS database design: Creation of database structure, design of outputs.
4. Creation of GIS database: Entering land and archive data into the GIS database.
5. Analysis: Comparative analysis of all data with the opportunities offered by GIS.
6. Evaluation: Determination of natural and cultural heritage values.
7. Recommendations: Development of the GIS database as a model for site management. Proposals for the integrated conservation of natural and cultural values.

2.1. The use of GIS databases for the conservation of heritage sites

GIS is a spatial database that contains and analyzes georeferenced information. Within its broad range of applications, GIS is often used for urban management purposes, including urban and rural conservation and management. The fact that GIS has numerous spatial analysis tools that can analyze and update large amounts of data makes it a valuable tool that is well-suited for monitoring and analyzing the changing nature of the urban environment (Çabuk, et al. 2016).

GIS allows researchers working on the "cultural landscape" to analyze and evaluate physical, socio-cultural, and historical information by relating it to each other. Interactive maps based on GIS databases provide an effective environment to present the relationships between the cultural landscape and meanings. As a result, various applications carried out through GIS can be used to analyze, evaluate and present both tangible and intangible characteristics of the place. Moreover, GIS allows for the continuity of different scales; in other words, it enables "navigation" between scales. In this respect, GIS provides an ideal environment for storing and analyzing data on the historical, cultural, and physical characteristics of cultural landscapes that can be associated with specific locations, adding them to decision-making processes and monitoring the transformation of landscapes. Thus, it is possible to bring together spatial data related to different scales according to a common geographical/spatial reference system, to be monitored and queried in the same environment (Çabuk, et al. 2016).

As a result, GIS is selected to deal with the existing diversity of resources, which is one of the problems of cultural landscape studies.

2.2. Data model in documenting cultural heritage

At the beginning of the study, the data needed for the analyses to be made in line with the aims and objectives are determined. Then, a process is started for creating thematic layers and designing the database. This process consists of logical and physical design stages.

In the logical design process, the data to be used in the study are planned, accessibility is determined, and it is decided which thematic maps will be reached as a result of which analysis with the obtained data. Planning is the stage where it is determined which data will be used and under what constraints or conditions will be stored in the database (Zeiler, 1999). At the end of this stage, a data model is put forward. This model shows all kinds of data to be used in the project, the relational structure, and storage conditions. Moreover, the thematic processes are exhibited as a whole in a single document. This model aims to ensure data consistency by preventing data repetition and ensuring that the whole project team acts in a common structure during the project process.

The physical design process consists of data generation and processing stages after the creation of the locational database in line with the data model created.

A locational database is a data model that supports storing and managing locational information in a standard relational database system.

In a locational database, data is stored in locational object tables, also defined as vector data (Figure 5). Locational object tables are components created with different geometry types to store vector data, which constitutes a layer in GIS software (Uyguçgil et al., 2017). Verbal data can be contained both in a locational database and a standard relational database. At the same time, raster data with visual content can be stored in the locational database as an attribute of an object. These features of GIS make it possible to represent and analyze the qualitative and quantitative data to be obtained in the study in the same database.

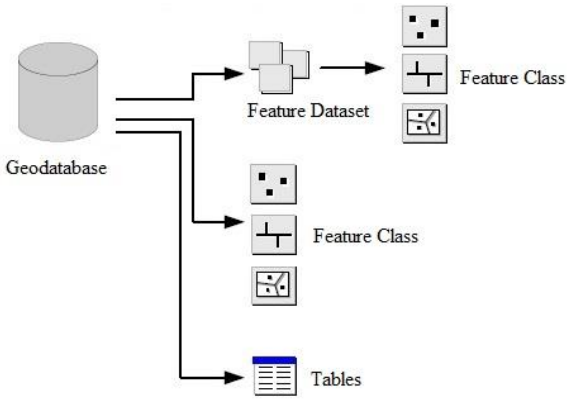

Figure 5. Locational database general data structure (Levent, 2009)

Various data sets within the database constitute conceptual models (Figure 5). These data sets form the components of a network structure that may need to be evaluated together in terms of topology relationships (Levent, 2009).

When creating a database in the documentation work, stone structures and all material cultural assets in the historical area must be documented and recorded. The sensitivity of the work to be done at this stage is of utmost significance. Performing a restoration precision study for a specific structure in the area and making an inventory of the stone structures in the area requires the formation of different data sets from each other. According to the study, geometry can be created on the database by mapping with spatial measurement, and geometries of stone structures can be created as a result of a measurement (Koçyiğit, 2020) is shown in Table 1.

Table 1. An example of data sets used in archaeological sites (Koçyiğit, 2020)

Data Sets Created for Archaeological Sites	
Administrative Boundaries (Layer usually has the largest area and contains other details like provincial border, district boundary, country boundary, etc.)	**Social Infrastructure** (The layer hosts all kinds of social infrastructure data like population density, area per capita by year, etc.)
Hydrology (The layer contains information about the water in the area, like stream flow direction, basin boundaries use, etc.)	**Land Use/Land Cover** (The layer contains information on land use in the area, such as land use purposes by year, etc.)
Weather (The layer contains the weather information in the region temporally, like minimum annual precipitation, average precipitation amounts etc.)	**Project General Information** (The layer covers general information about the project, compiled from academic articles and news about the field.)
Land Measurements (The layer contains information about measurements made by various methods in the field, such as points taken by GPS, measurement results made by photogrammetric methods, etc.)	**Geophysics and Geology** (The layer contains information about the soil structure, such as areas with earthquake risk etc.)

2.3. A GIS database prepared for the conservation of Uludağ / Olympus cultural landscape and monasteries

As mentioned above, one of the main visual resources in determining the historical and cultural texture of Uludağ is the map of Menthon. However, the lack of exact coordinates causes the map to deviate from accuracy. It is usual for a historical map to show deviations when it is overlapped with today's satellite images.

In this study, since the Menthon's Map has no accurate coordinate information that can be utilized for overlapping it with the georeferenced satellite image; villages, urban focal points, and localities whose locations can be clearly matched were used as reference points for overlapping. Since some settlements, which were small when the Menthon Map was prepared, have reached the size of neighborhoods and even districts today, the oldest buildings and squares of the settlements were selected as the reference points in the georeferencing process.

The facts that accuracy is significant in the georeferencing process and that there are many (more than 10) reference points, as well as numerous checkpoints, made the "spline" transformation in the georeferencing method work better than other methodologies. The spline function is a piecewise polynomial function that maintains continuity and uniformity between adjacent polynomials. The conversion matches the source reference points exactly to the target points, and the error rate of the pixels increases as one moves away from the reference points. This conversion is proper when reference points are accurate, and increasing the number of reference points increases the overall accuracy of the conversion (Kramer et al., 2011). In this method, at least ten reference points should be used.

In this study, in addition to historical map and written source data, the following data is used in GIS environment:

1. up-to-date stream data
2. up-to-date road data
3. DEM (Digital Elevation Model)
4. *Google Earth* maps
5. current maps (such as a map showing the National Park Area border)
6. high-resolution satellite imagery

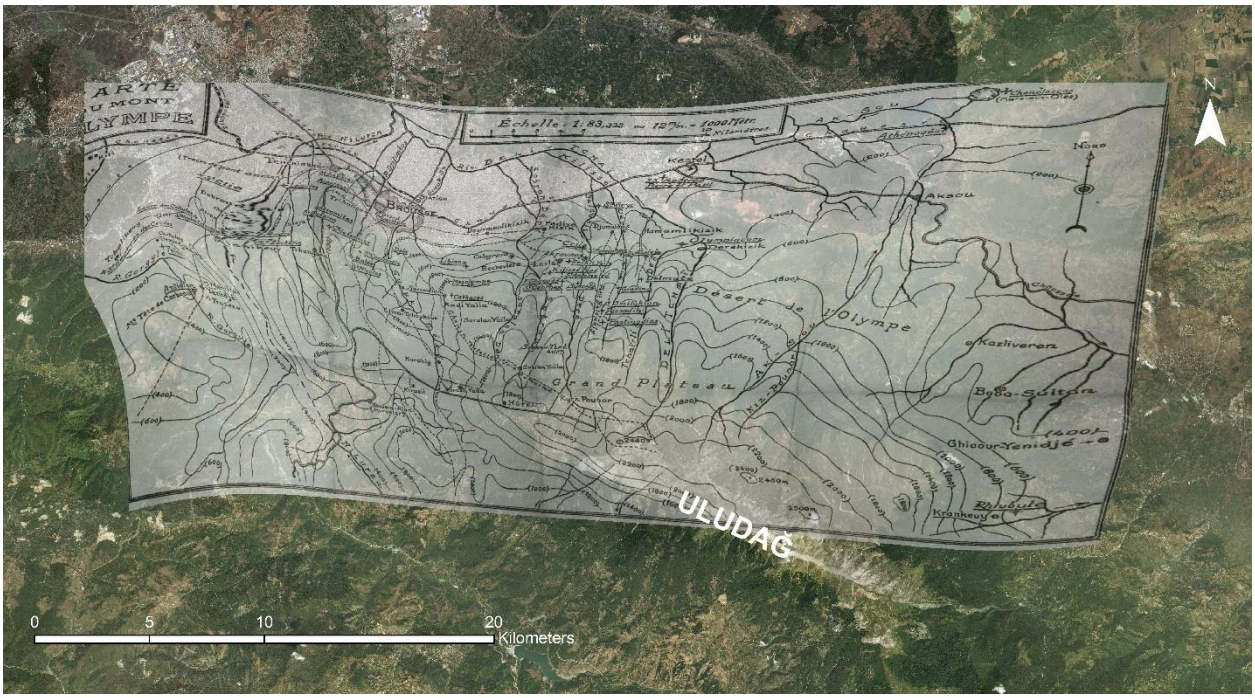

Figure 6. The georeferencing of the Menthon Map according to the reference points and the determination of the study area

3. Results

Since the Menthon Map covers a vast area of about 1000 square kilometers, the georeferencing was carried out on a relatively small-scale (10 m/pixel) RGB satellite image. As a result of the georeferencing process, the probable locations of the monasteries were estimated, and large-scale (high-resolution 1.2 m/pixel) RGB images, multiple spectral images, and hyper-spectral images of those regions were obtained, and the anomalies under dense vegetation were visualized for the analysis of exact locations of the monasteries. In the scope of this study, no fieldwork was carried out in places where the remains of the monasteries are thought to be present. Instead, the results of the Bursa Municipal Research Team's field surveys were compared with the probable monastery localities obtained from the georeferencing process.

As a result of obtaining the Digital Elevation Model (DEM) data of the study area and comparing the monasteries with their approximate location according to the Menthon Map, it was confirmed in Figure 9 that the monasteries in the central and right zones were generally located between 600 meters and 1500 meters (Figure 9). Similarly, when the approximate positions of the monasteries in the study area are examined according to the inclination analysis, it can be concluded that the monasteries on the east of the mountain are located on extremely inclined grounds and at difficult-to-reach points of the topography (Figure 7). The fact that the cable car line passes near one of the areas where monasteries are grouped has important potential for the research process and the development of cultural route proposals.

In the analysis of transportation and roads, it is understood that most of the monasteries are located at points that are very difficult – even impossible – to reach by motor vehicle today (Figures 8-11).

When the walking routes followed by the Bursa Metropolitan Municipality to document the ruins of the monastery are examined (Figure 12), it is observed that:

1. It is possible to create monastic routes from Cumalıkızık Village, near the Hotels District, or from the Teferrüç or Kadıyayla stations of the cable car line.
2. So far, the Bursa Municipal Research Team has reached the monastery remains at five different locations.
3. There is a considerable difference between the coordinates of the points where the remains were reached and the approximate locations of monasteries found by rectifying the Menthon Map (1935) in this study. It is calculated that the error margin is approximately 500 meters. The huge error margin leads to the conclusion that the rectification (georeferencing) of the Menthon Map for the localization of the monasteries confirms that additional methods like site surveys and remote sensing methods should be used to achieve more precise results and to discover more monastery remains at Uludağ.

As a result, the analysis and evaluation of the monasteries as part of the cultural landscape in an integrated and comparative manner with historical research, fieldwork, and geographical data reveal crucial and new information about the forgotten monastic cultural heritage of Uludag and set an important example for the preservation and presentation of mountain landscapes with their natural and cultural values.

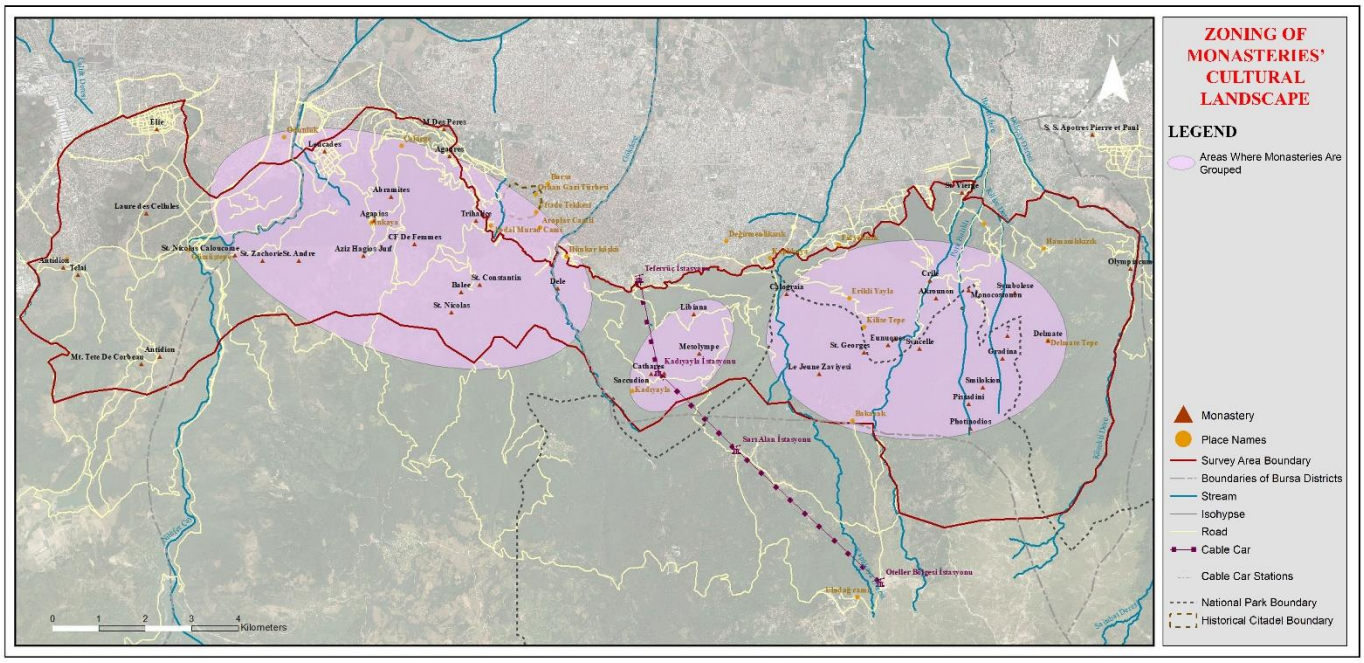

Figure 7. Identification of three areas grouped with monasteries approximately located according to the Menthon Map (1935) in the study area. The first of these areas is located in the west, the second is near the cable car line, and the third is located in the east, at the top of Cumalıkızık Village, one of the components of the World Heritage Area.

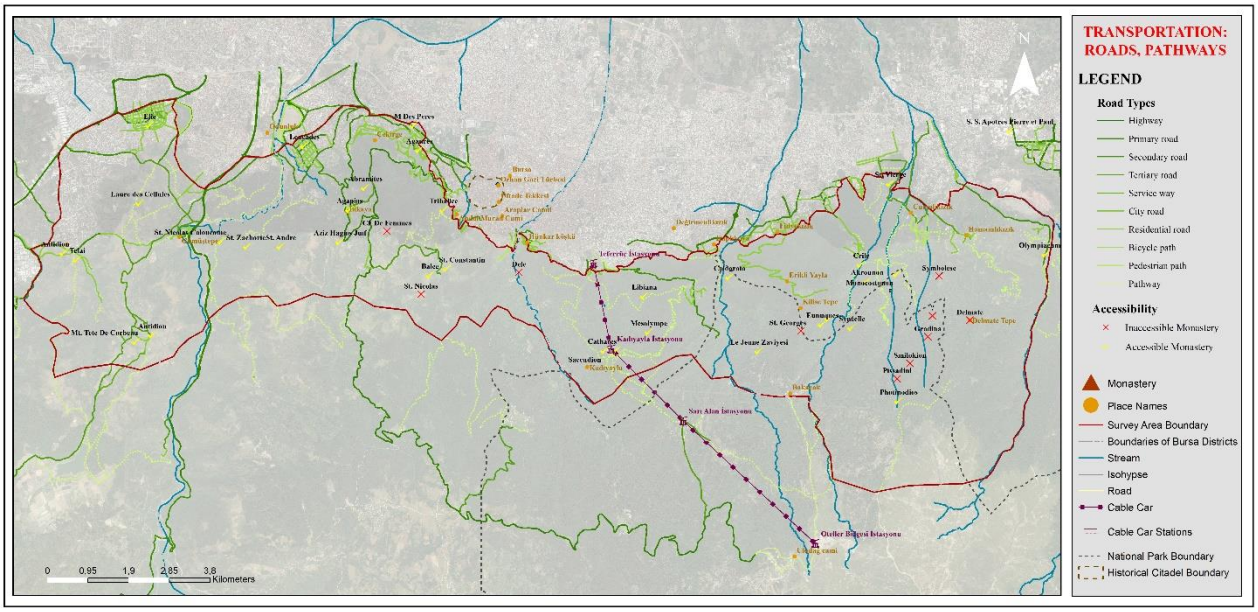

Figure 8. The current state of transportation and accessibility

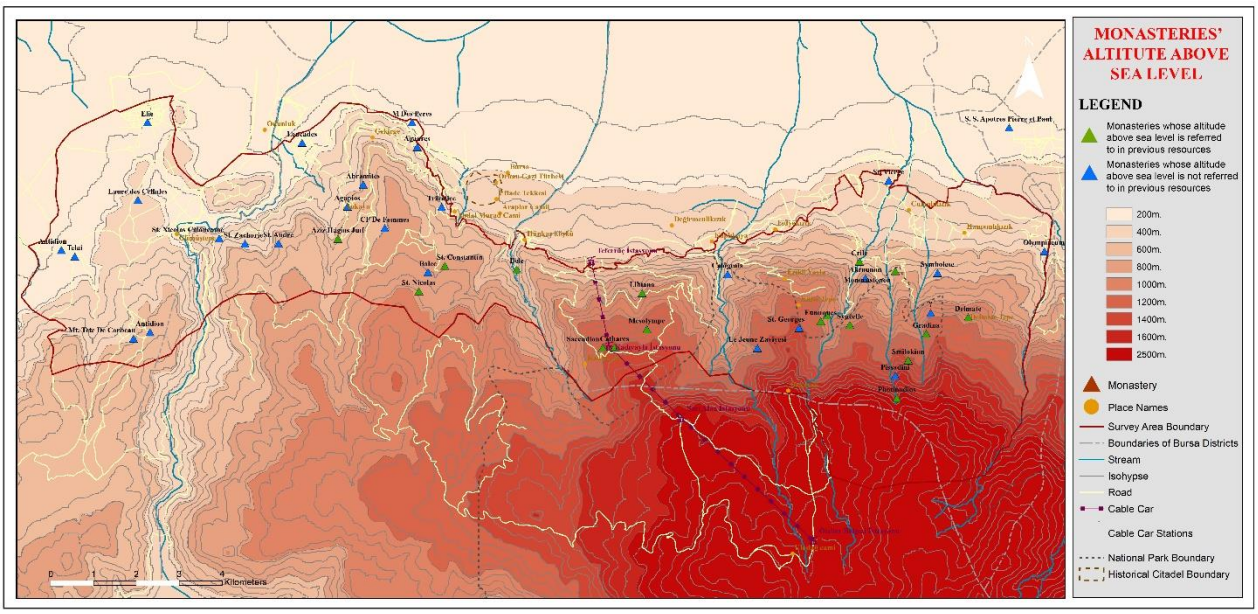

Figure 9. The analysis of the monasteries' altitude above sea level

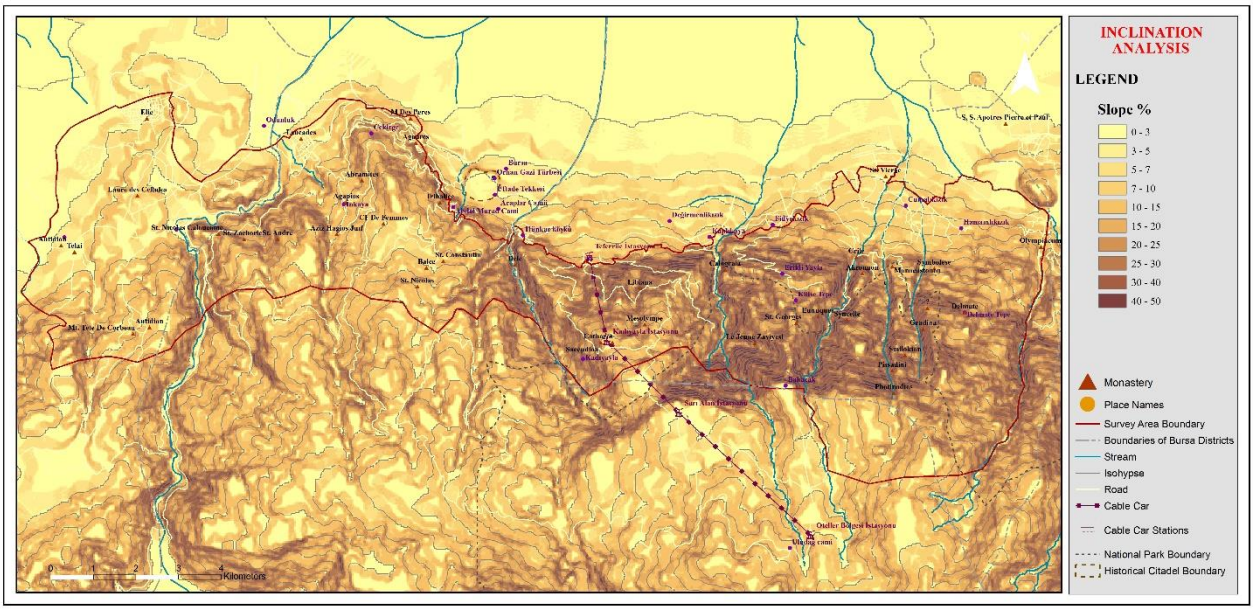

Figure 10. Inclination Analysis

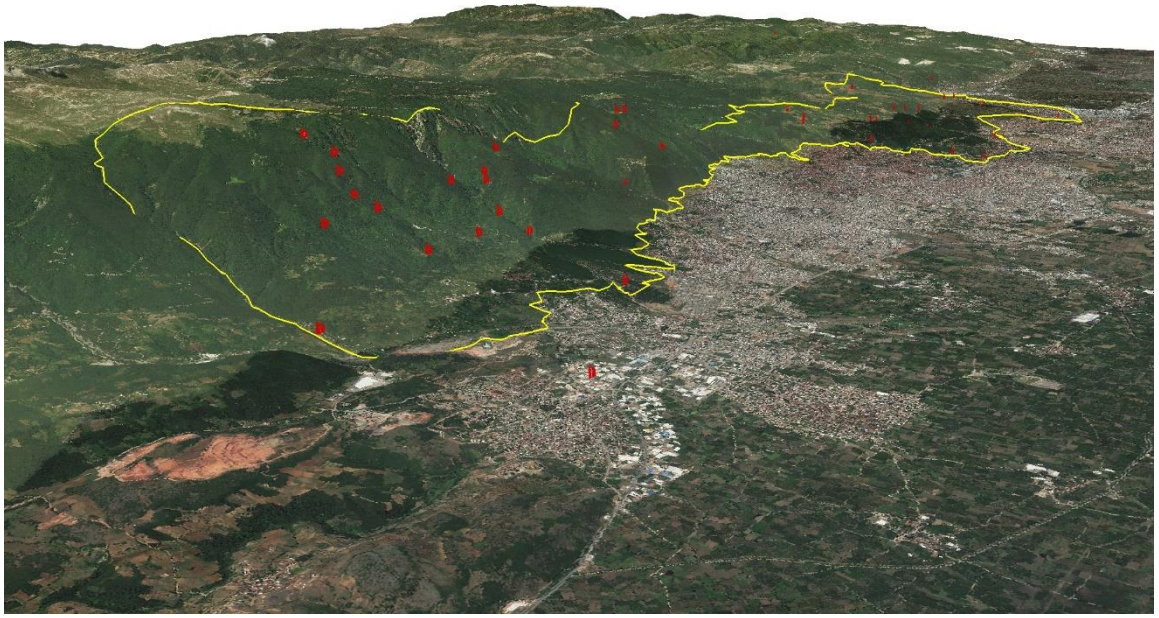

Figure 11. A 3D model showing the massive mountain and the estimated locations of the monasteries

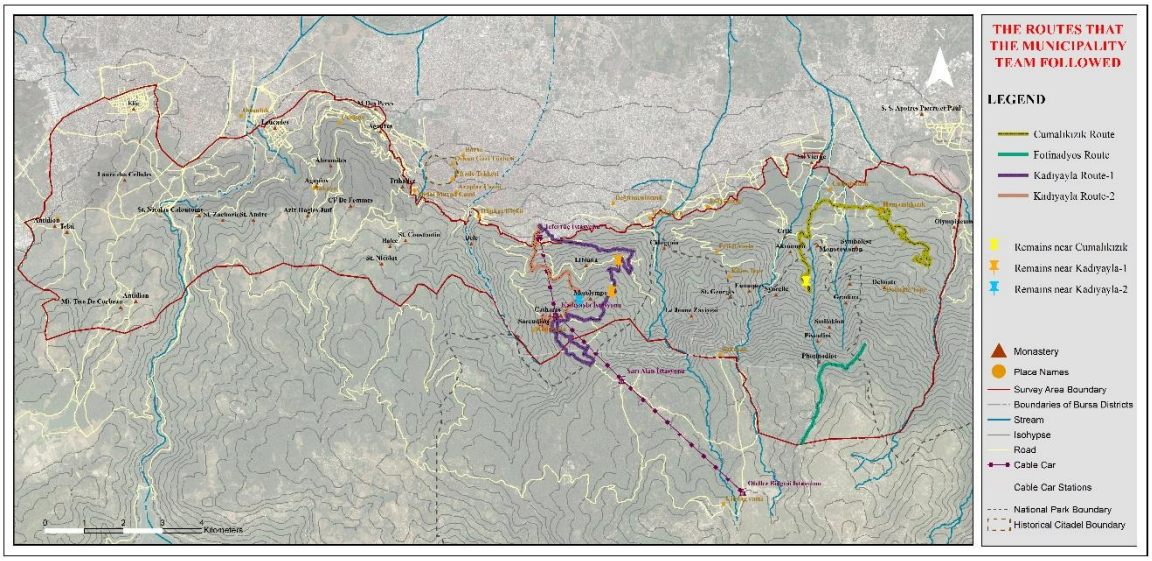

Figure 12. The discovery walks carried out by the Bursa Metropolitan Municipality (2012) in the middle and east of the study area and the approximate locations of the remains they have reached

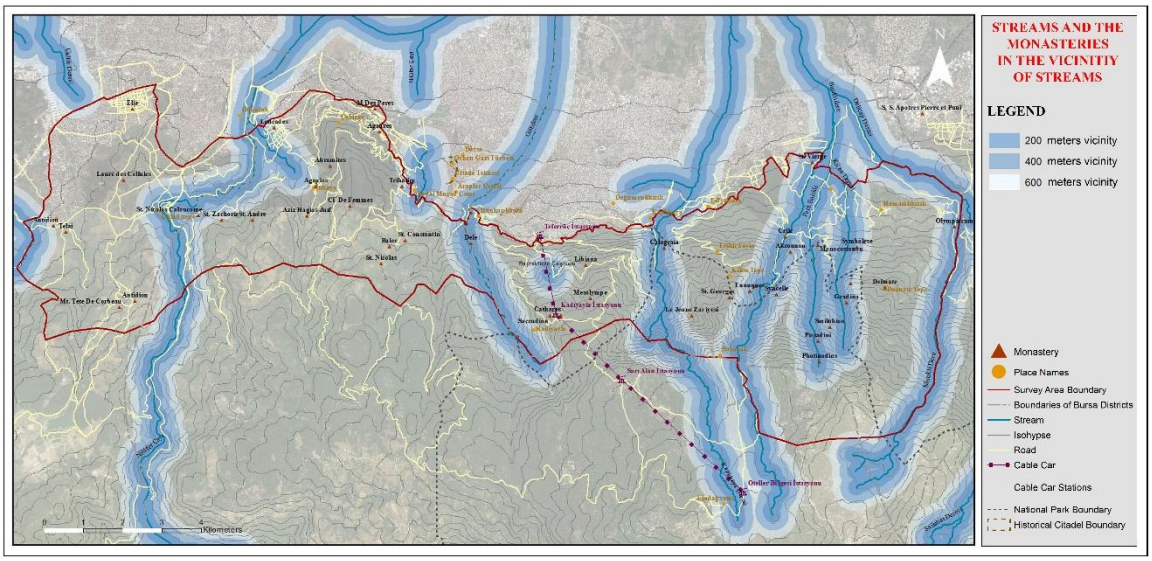

Figure 13. The water streams and the monasteries located near them

4. Conclusion

Uludağ has diversity and density in its natural and cultural resources, such as its unique mountainscape, forest, plateaus, lakes, flora, fauna, and cultural heritage. With these features, it is seen as a geographical area with nature and rural tourism potential (Erken et al., 2019). The fact that Uludağ is a destination center with a reputation increases the potential of rural tourism (Ölmez, 2021; Karadamar et al., 2018). Uludağ is a region suitable for various types of tourism thanks to its favorable climatic and geomorphological conditions. Among them are alpinism; winter tourism as a result of prolonged snowfall; ecotourism due to rich flora and fauna, and finally, rural and cultural tourism as a result of historical villages and the cultural landscape including the remains of monasteries and dervish lodges (Adamış and Özçoban, 2020).

While proposing routes to introduce the monasteries' cultural landscape, the historical and cultural attraction points in the vicinity can be entered into the GIS system in order to propose routes that enrich the identity of Uludağ by establishing relationships between the different cultural and natural layers of Uludağ and experiencing the various cultural layers and values of Uludağ. Thus, the results obtained from this study will contribute to achieving a holistic and multifaceted Uludağ identity.

To remember the monasteries in Uludağ, the monastic layer, which has been almost completely erased from the collective memory and the mountainscape, can be studied in the scope of new scientific studies by the institutions like universities and municipalities. Since it is a cultural landscape, which is characterized by both natural and built structures, GIS proves to be a compatible analysis tool for researching the values of Uludağ monasteries.

The current scholarship investigates the mountainscapes by integrating quantitative and qualitative research methods and modeling and analyzing the collected data in the GIS. Various methodologies were developed to analyze the mountainscapes' cultural and natural characteristics. In the case of Uludağ, field survey, archival research, and GIS modeling should be used in combination in order to achieve the discovery, documentation, and evaluation of the Uludağ monasteries.

With the help of GIS, it is possible to analyze and evaluate archival resources, the data obtained from site surveys, aerial photographs, maps, and DEM images. Producing a GIS-based dynamic updatable tool can also serve in site management of the monasteries' cultural landscape. The GIS database can also be a tool to support decision-making processes for the conservation and management of the area.

Acknowledgement

This study was first conducted in the scope of the graduate course entitled "Conservation Project 2," which was coordinated by Figen Kıvılcım Çorakbaş and Emre Bektöre at Eskişehir Technical University in the spring semester of 2020-21. We are grateful to Zeynep Çoban, Zuhal Kara, and Feyza Çelik, the students of the above-mentioned course, for contributing to GIS database preparation. We thank the Bursa Metropolitan Municipality for sharing their archive. Finally, we thank very much to İmran Satış Atar, Muhammed Gazihan Çelik, and İlayda Maşat for their help in proofreading and formatting.

Author contributions

Figen Kıvılcım Çorakbaş: Defined the problem and proposed the structure of the study. **Emre Mustafa Bektöre:** Managed the GIS database design and GIS analysis stages.

Conflicts of interest

The authors declare no conflicts of interest.

Statement of Research and Publication Ethics

Research and publication ethics were complied with in the study.

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