

Conservation Initiatives/Assessments in Rock-Carved Churches Specific to the Göreme Saklı Church

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Abstract

Cappadocia contains historical, documentary, aesthetic, artistic, symbolic, social, economic, religious and spiritual values. Many structures and places produced by the rock carving technique have been destroyed and/or are on the way to extinction because of intense destruction in the historical process. Rock-carved churches, unique in their religious, artistic, and cultural values, are among the most affected. In this study, the current status of the Saklı Church, the examination of its historical development, the architectural documentation studies with the monasteries in its immediate vicinity, the structural deterioration, and the reasons for the preservation of the rock-hewn churches in the Göreme Valley, and the current conservation strategies and practices in the rock churches were evaluated. Preservation proposals have been developed so that the cultural heritage can be safely transferred to the future. As a result, the status and deterioration of the Saklı Church have been documented with various architectural representation methods, and conservation proposals have been developed.

Keywords: Cappadocia, Göreme, Saklı Church, conservation.

Göreme Saklı Kilise Özelinde Kaya Oyma Kiliselerinde Koruma Girişimleri/Değerlendirmeleri

Öz

Kapadokya, tarihsel, belgesel, estetik, sanatsal, simgesel, sosyal, ekonomik, dini ve manevi değerler içermektedir. Kaya oyma tekniği ile üretilen birçok yapı ve mekân tarihsel süreç içerisindeki yoğun tahribatlar neticesinde yok olmuşlar ve/veya yok olma yolunda ilerlemektedirler. Bunlardan dinsel, sanatsal, kültürel değerleri bakımından eşsiz olan kaya oyma kiliseler en çok etkilenenlerdendir. Bu çalışmada, Göreme Vadisi'ndeki kaya oyma kiliselerin korunma durumu ile birlikte Saklı Kilise'nin güncel durumu, tarihsel gelişiminin incelenmesi, yakın çevresinde bulunan manastır mekânları ile birlikte mimari belgeleme çalışmaları, yapısal bozulmaları ve nedenlerinin araştırılarak kaya kiliselerinde mevcut koruma stratejileri ve uygulamaları değerlendirilerek bu kültürel mirasın geleceğe güvenle aktarılabilmesi için korunma önerileri geliştirilmiştir. Sonuç olarak Saklı Kilise'nin güncel durumu, bozulmaları çeşitli mimari gösterim yöntemleriyle belgelenmiş ve geleceğe aktarılabilmesi için koruma önerileri geliştirilmiştir.

Anahtar kelimeler: Kapadokya, Göreme, Saklı Kilise, mimari koruma.

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1. Introduction

Göreme, which is 10 km away from Nevşehir, lies on the borders of Nevşehir province and Ürgüp and Avanos districts in an area surrounded by valleys. The town, located 500 m west of the center of Göreme rock churches, has an area of approximately 5 km². Göreme and its surroundings have the same topographic structure as Cappadocia. Rocks, composed of soft tuffs, have obtained different surface shapes with the erosion effect of harsh climatic conditions (Figure 1).

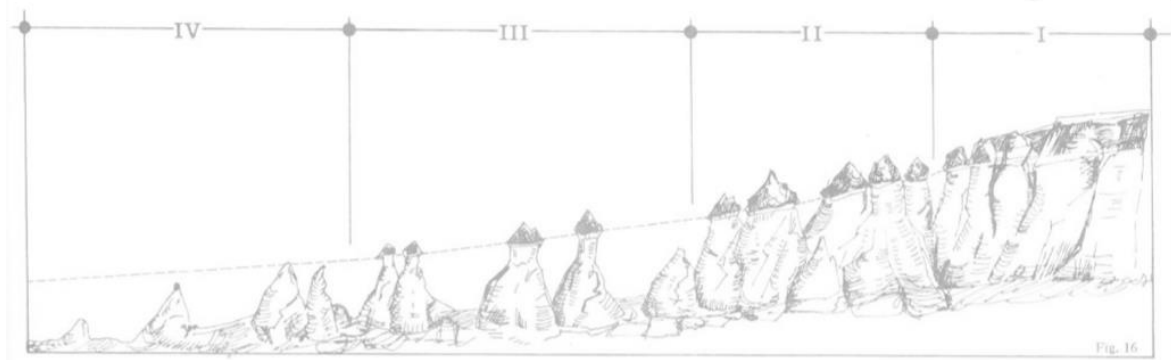


Figure 1. Formation of fairy chimneys in Göreme Valley (Giovannini, 1971, p.61)

Volcanic tremors and erosion formed the general structure of Göreme Valley. The surface shape and narrow valleys form "fairy chimneys," a particular form of erosion of the flood beds (Ötügen, 1987, p.7). They are natural structures that significantly impact the region's architecture. Many rock-carved monasteries, churches, and chapels exist in the Göreme Valley. In the Cappadocia Region, the settlement is usually made by carving into the valley slopes or carving a rock mass in harmony with the terrain.

Today, there are building groups with many religious functions in the "upper valley," called the Göreme Open Air Museum, which contains many important religious buildings for the region, and in the "lower valley" to the east of Göreme Town. The Saklı Church, the present study's subject, is 500 meters from the Göreme Open Air Museum. It is located on the slope of the mountain, which is in the lower valley to the west, overlooking the Zemi Valley.

2. Material and Method

The Göreme Valley is one of the areas where early Christian individuals and communities in Anatolia settled. Mitchell states this is because church fathers, such as St. Basilios, Gregorius of Caesarea, and Gregorios of Nazianzus, were active in the region (Mitchell, 1993). Basil of Caesarea (329-379 AD), known as the father of the church whose writings built the Christian doctrine of Eastern Rome, his brother Gregorius (335-394 AD), and his close friend Gregorius of Nazianzus (330-389 AD) were the most important figures of Cappadocia at that time. They became Christian theologian (Vasiliev, 2017, p.145). In the first years of Christianity, people and clergy fleeing oppression built churches and monasteries in the valley where they could hide easily and worship in seclusion. There are various sections, such as the dining hall, monk rooms, cellar, kitchen, and chapel in the monastery structures carved into the rock. Written document sources such as endowments, inventory or letters related to the rock churches and monasteries are unknown. Therefore, churches in monasteries are dated with the help of architectural elements and stylistic and iconographic features of fresco decorations (Ötügen, 1987, p.13). It is thought that some of the churches in the Göreme Valley have a similar style or iconography to the wall paintings, and they form a group because the paintings contain symbolic scenes. The land structure in and around the Göreme Valley is the same as the Cappadocia region in general and the primary material of the monastic settlement is volcanic ignimbrite tuffs.

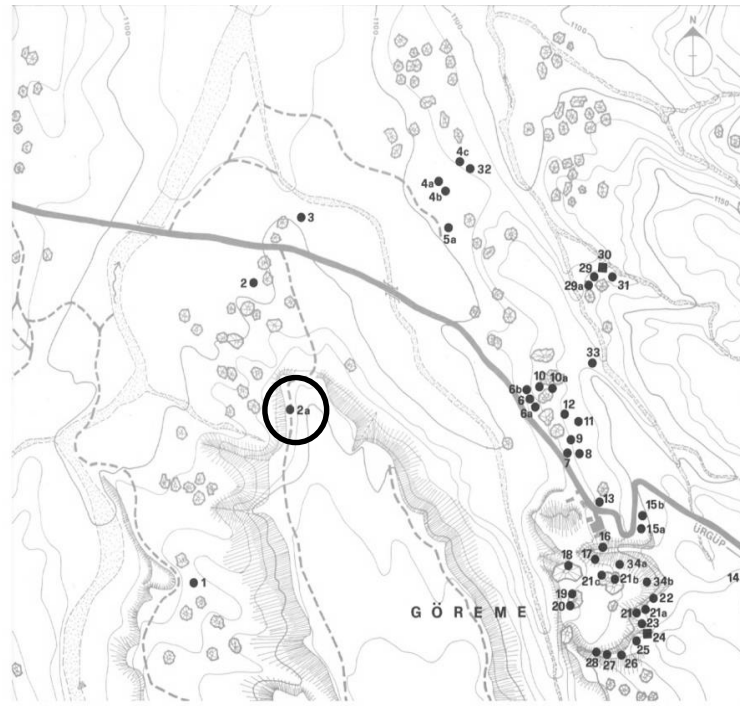


Figure 2. Göreme Valley and Saklı Church (Giovannini, 1971, p.203)

The region with the highest concentration of monastic formations in the Cappadocia Region is the Göreme Valley. None of the rock spaces in the valley can be defined as residences, making the living areas inside the valley structures suitable for monastic life (Figure 2). These monasteries are concentrated in two parts of the Göreme Valley. The structures inside are the Lower Valley, dating from the middle of the 9th and 10th centuries, and the Upper Valley, dating the 11th and 13th centuries (Teteriatnikov, 1997, p.30). The Lower Valley, generally dating from the 10th century, is located to the west of Göreme Open Air Museum. Ten churches, including the Saklı Church, the subject of the present article, are evaluated in the first group (Teteriatnikov, 1997, p.37). Researchers have tried to assess the monastic life and complexes in the region in terms of the history of the monasteries in the region. Cappadocia has been visited by many Western travelers traveling to the East and included in their travel notes, but related scientific research started in the late 19th century. British, German and French travelers and researchers who visited the region examined it according to its different characteristics and made transfers. Jerphanion, a French priest, collected his work, which began in 1912, in his *Les Eglises Rupestres de Cappadoce*. He is the researcher who conducted the first comprehensive study on the Cappadocia region with his archeology and art history research, in which he concentrated on the churches built on tuff rocks (Jerphanion, 1925). Restle, on the other hand, described his work in 1969 in his three-volume *Byzantine Wall Painting in Asia Minor*, consisting of one text, two paintings, plans, and drawings. The first part of the first volume i, included the dating of the researchers who worked on the churches in the region and evaluated the churches from a technical point of view (Restle, 1967). The art historian Rodley, a researcher in Türkiye and Greece, produced *The Cave Monasteries of Byzantine Cappadocia* The book's first part, comprising six chapters, presents the history and geography and features Cappadocia's rock architecture. In the second, third, fourth, and fifth chapters, the author describes the rock monasteries, and in the last chapter, he describes the chronological and typological evaluations of the buildings. The author, who divides the rock monasteries into two monasteries with courtyards and monasteries with refectories, evaluated monasteries and churches separately and compared the cafeterias of monasteries (Rodley, 1985). Many researchers such as Catherine Jolivet-Levy, Mazhar Şevket İpşiroğlu, Sabahattin Eyüboğlu, Ludwig Budde, Sue-Anne Wallace, S. Yıldız Ötüken, Gürsel Korat have examined the Saklı Church and its surroundings (Ertürk, 2020).

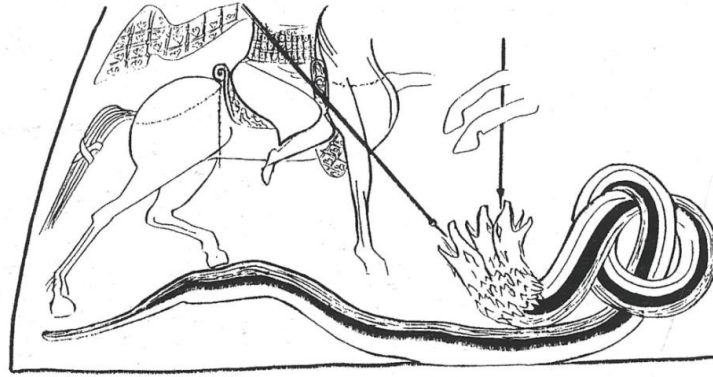


Figure 3. The Saklı Church, (St. George and St. Theodore) Drawing (Thierry, 2002)

Researchers have different ideas about the Göreme Valley and date the churches from various periods. According to Epstein (1975a, p.24-26), dating for the murals of the churches is also controversial since there are no 10th-century inscriptions. Restle introduced the churches in the Cappadocia region with their numbers and names in his book and came up with dates by comparing the wall paintings and manuscripts (Restle, 1967). Byzantine Researcher Thierry, published in 2002 *La Cappadoca De L'antiquite Au Moyen Age IV*. In the volume, he gave information about the churches in Göreme and the Saklı Church (Thierry, 2002). Explaining the location, plan features, and painting programs of the churches in Göreme Valley, the author briefly mentioned the location of the Saklı Church and related publications, included fresco drawings and photographs of the church, and dated the iconographic program of the church to the 11th century from the frescoes (Figure 3).

3. Findings and Discussion

It is seen that the Saklı Church and the monastic settlement around it were built using existing rock layers. The presence of arable land around the monastery shows that the land was specially chosen for the construction of the monastery. Numerous dining halls and their side spaces were built in the rocky texture of the northern wing of the Saklı Church. The Saklı Church, its side space, the dining halls numbered 2E, 2F, 2G, 2H, and its side spaces around it were carved into the slope of the same rock mass. The elevations of the spaces, which are placed in harmony with the natural structure of the topography, also show differences (Figure 4). Other monastic spaces such as churches, chapels, washrooms, and workshops are located within the monoliths as close to each other as the natural texture allows (Ertürk, 2020).

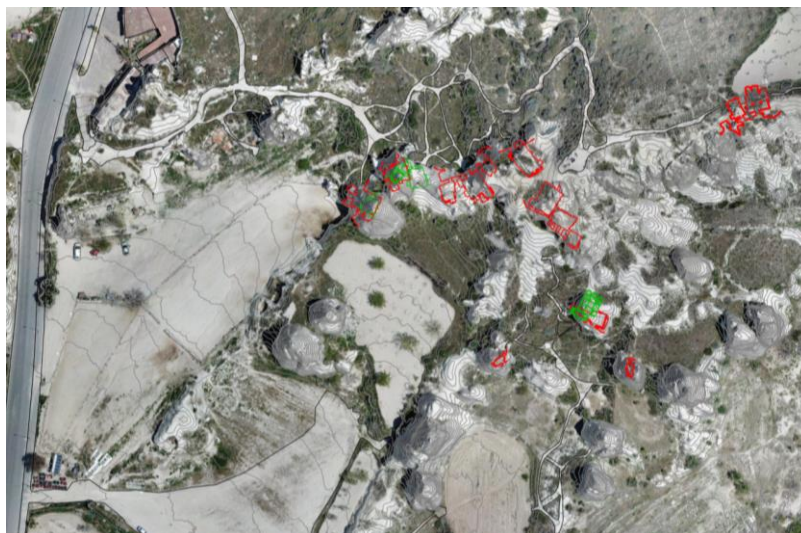


Figure 4. The Saklı Church and monastery structures layout plan (Ertürk, 2020, p.77)

There are no definite rules for the monastic plan type in the region where the Saklı Church is located; the church is centered and other places are around it. Plan schemes were created according to the needs of the region and land characteristics (Koch, 2007, p.96).

Also known as Göreme 2a, St. John the Baptist Church, and Hagios Ioannes Church, the Saklı Church is located to the northeast of El Nazar Church, on the slope of the rock mass between Göreme and Ortahisar, facing Uçhisar. The entrance of the Saklı Church, which took its name when it was discovered in 1957, was closed years ago due to the landslides caused by the flood waters (İpşiroğlu & Eyüboğlu, 1958, p.6). Transportation is by car from Ortahisar using a dirt road. It is 250-300 m upwards from the path between the rocks south of the Göreme - Maçan road. Access is also possible by climbing (Figure 5, 6).

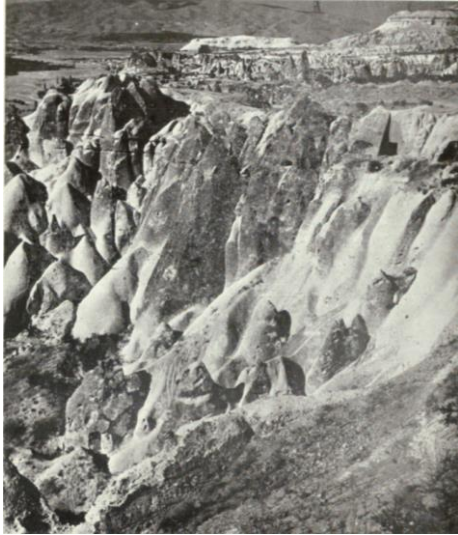


Figure 5. The Saklı Church exterior (İpşiroğlu & Eyüboğlu, 1958, p.8)



Figure 6. The Saklı Church exterior (Ertürk, 2020, p.79)

On the slope view of the rock mass where the Saklı Church, taken in 1958, is located, a tuff ladder made roughly by shaping the rock can be seen. Access to the church is provided by the cut stone steps placed on the top of the tuff block in which the church is located. In addition, there are small pits on the rock surface in front of the terrace of the church and under the northern entrance door of the S1 side room, roughly carved into the rock to provide access to the church from the lower level of the slope (Ertürk, 2020).

Consisting of a narthex and a naos, the rock-carved Saklı Church with a single nave was built as a rectangular lattice plan and three apses, coming from Mesopotamia (İpşiroğlu & Eyüboğlu, 1958: 6). The naos and the narthex are divided into two-by-two columns and three arches. The church is approximately 5 m long and 7 m wide (Figure 7,8). The church's narthex entered through the door on the west wall, is reached by descending three rock-carved steps. The long side of the naos is arranged as an apse. The middle apse is wider than the side apse. (Figure 9, 10). The west of the nave is a flat ceiling, and the east is vaulted. There are crosses and geometric ornaments on the flat ceiling.

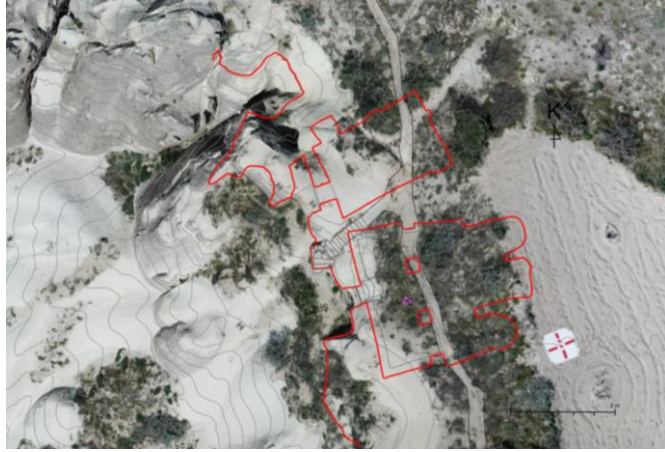


Figure 7. The Saklı Church plan rock settlement (Ertürk, 2020, p.80)



Figure 8. The Saklı Church (Ertürk, 2020, p.81)

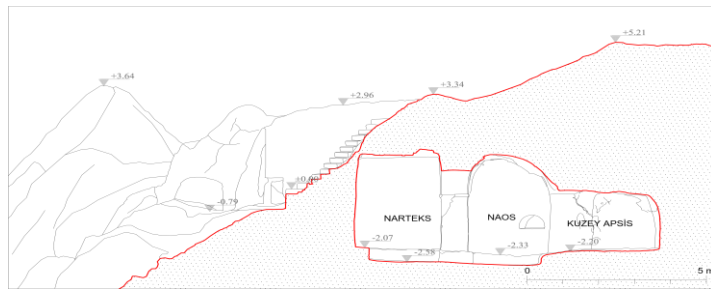


Figure 9. The Saklı Church section A-A (Ertürk, 2020, p.81)



Figure 10. The Saklı Church section perspective A-A (Ertürk, 2020, p.82)

The Saklı Church and other monastic structures are situated in different locations in the rocky area. The volcanic rocks in the area where Saklı Church and other monastic structures are in Göreme are the products of active volcanism in the Upper Miocene. The cone-shaped fairy chimneys on the valley's slope and the spaces placed on the valley slope have been destroyed by falling snow, rain, and water leaks. Damages are increasing gradually due to the inability to drain the water in the area where the buildings are located and the lack of drainage lines. It is seen that the reasons for the deterioration of the Saklı Church and monastery structures are similar when these evaluations are considered. The causes of deterioration of tuffs vary according to their chemical, physical, and biological contents. For example, the color changes observed on the rock tuffs are caused by the reactive components of different metals in the tuffs. In addition, water's freezing and dissolution effect causes the tuff's volcanic glass particles to decompose and turn the tuff into smectite clay (Topal & Doyuran, 1998, p.9-10). The layer thicknesses change and swell due to water and organic liquid entering between the layers that make up the smectite group clays. These clays contain magnesium, calcium, iron, and sodium (Çokça, 2012, p.91-122). Changes and deteriorations are observed in the rock material whose physical and mechanical properties change.

Tuff, the primary material of the buildings, is heavily affected by weather-related deterioration with its soft textured, porous, and granular structure. Factors such as sunlight, temperature and humidity changes, soluble and insoluble salts, water, and wind disrupt the material's texture forming the structure. If the structures, which have been under the effects of nature for many years, are not maintained continuously, irreversible damage occurs. Water, which creates an expansion and contraction effect in the material according to seasonal differences, causes deformation, cracking, crusting on the surface, and color changes. In the lower parts of the fairy chimneys, scours called heel wear are observed with the effect of surface waters. Water entering through cracks on the rock's surface causes blooms, and freezing and thawing events cause larger cracks and fragmentation. Water entering through cracks on the rock surface or rising from the foundation with precipitation causes an increase in humidity in the structure and deterioration caused by the progression of salt and different minerals carried by water in the material. Dust and stone chips moving with the wind's effect also erode the loosely textured rock surface (Ahunbay, 1996, p.45-47; Zakar & Eyüpgiller, 2018, p.47-49).



Figure 11. The Saklı Church appearance (Ertürk, 2020, p.100)

Color changes, ruptures, and cracks in the rock material in the region's rock formations are also seen in other monastic spaces within the rock mass where the Saklı Church is located (Figure 11). There are

abrasions and ruptures on the floor, terrace, and staircase surfaces of the Saklı Church. The water coming from the slope erodes the tuff surface of the structure, and the surface affected by moisture and salt has deteriorated (Figure 12, 13). As a result of the snow falling on the building for a long time in the winter season, ruptures and separations are observed in the ceiling of the building. In addition, when the church was discovered in 1957, there were losses in the wall paintings in the areas touched by the soil heap.

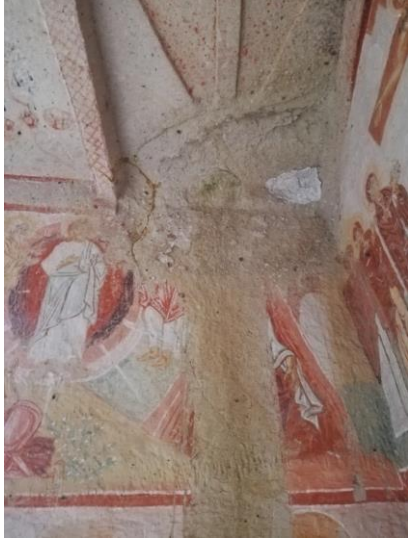


Figure 12. The Saklı Church western murals distortion detail (Ertürk, 2020, p.151)



Figure 13. The Saklı Church, abscess distortion detail (Ertürk, 2020, p.151)



Figure 14. The Saklı Church entry door distortion detail (Ertürk, 2020, p.145)



Figure 15. The Saklı Church, ladder distortion detail (Ertürk, 2020, p.145)

The Saklı Church and the structures in the monastery settlement are of great importance to Christians and are included in the scope of cultural assets that need to be protected today. Other churches and monasteries in the Cappadocia region, such as the Saklı Church, have been abandoned since the Middle Ages. Most churches are subject to natural damage and vandalism (Figure 16, 17).



Figure 16. The Saklı Church northern wall paintings vandalism detail (Ertürk, 2020, p.145)



Figure 17. The Saklı Church, north murals deterioration detail (Ertürk, 2020, p.145)

In the proposed restoration work, it seems more appropriate to deal with an interdisciplinary architectural intervention project with the cooperation of expert teams from construction, geophysics, and geology for material and structural consolidation studies. It is recommended to carry out consolidation works to prevent damage to the structure and surrounding monastic structures. Likewise, it is recommended to examine other rock structures in the region where the repairs were made and to evaluate the processes they underwent after the repair together (Table 1).

Table 1. Causes of destruction in the Saklı Church and suggestions for conservation

Causes of Destruction	Protection Advice
Discontinuities in the rock, distortions due to cracks.	Necessary consolidation works of the building should be carried out, the causes of discontinuity should be determined, and precautions should be taken.
Distortions are caused by the position of the rock in which the place was carved.	Abrasions and soil heaps at the place' entrance should be removed from the building.
Deterioration is caused by the swelling of the material due to precipitation by taking water.	Abrasions and soil heaps at the entrance of the place should be removed from the building
Deterioration of the strength of the rock because of the use of cement.	A material that does not harm the structure should be preferred instead of the material used due to bad repairs.
Disturbances are caused by surface waters flowing over the surface of rock structures.	Protection top covers should be made to prevent abrasions on the surface of the rock.
Deterioration is caused by leaving the church idle.	Necessary interventions to the building should be carried out quickly and periodic controls should be made.
Deterioration vandalism because of the church.	Controlled entrances should be ensured during visits, and destruction should be prevented.

In the churches in the Göreme Valley, processes were carried out to cover the primary material in the conservation interventions. The worn parts were coated and, in the repair, and application projects of El Nazar Church and St. Barbara Church, and imitation plaster was applied to the coating (Figure 18, 19). However, it was determined that the plaster was poured on all surfaces, with gaps under it. The cut stones on which the imitation plaster was poured due to frost during winter revealed an image incompatible with the rock texture. (Figure 20, 21). Cracks and crevices formed in the plaster on the

west, north, and south walls of the Elmalı Church, located in the same rock as the St. Barbara Church. The protection process should be regularly maintained and re-applied every year (Figure 22, 23, 24, and 25).



Figure 18. El Nazar Church entrance (Ertürk, 2019, p.170)



Figure 19. El Nazar Church abscess (Ertürk, 2020, p.170)



Figure 20. St. Barbara's Church (Ertürk, 2019, p.170)



Figure 21. St. Barbara's Church (Ertürk, 2020, p.170)



Figure 22. Elmalı Church North Entrance (Ertürk, 2019, p.171)



Figure 23. Elmalı Church North Entrance (Ertürk, 2020, p.171)



Figure 24. Elmalı Church west entrance (Ertürk, 2019, p.171)

Figure 25. Elmalı Church west entrance (Ertürk, 2020, p.171)

In the Göreme Open Air Museum, visitors are provided with security-controlled entrances to churches and other monasteries, and visits are made under surveillance by cameras and staff. Wooden walking platforms have been placed in the spaces to prevent floor abrasions and to prevent visitors from touching the rock surfaces (Figure 26, 27, 28, and 29). Conservation projects were carried out to stop and repair the damage to the church wall paintings.



Figure 26. Karanlık Church refectory (Ertürk, 2020, p.171)

Figure 27. Karanlık Church refectory (Ertürk, 2019, p.171)



Figure 28. Çarıklı Church refectory (Ertürk, 2020, p.172)

Figure 29. Çarıklı Church refectory (Ertürk, 2019, p.172)

and their surroundings. In addition, with the alternative road passing over the slope where the Saklı Church is located, the damage to the cultural assets in the valley will increase.

However, in recent years, practices regarding the holistic protection of areas such as Göreme Open Air Museum, Paşabağları Ruins, and Zelve Archaeological Sites, measures have been started to be taken to protect them with controlled entrances ensuring their security. However, in the valley where the Saklı Church is located, protection strategies for the refectory, other side spaces, and chapels could not be developed, except for the iron-barred door of the Saklı Church.

When we look at the region in general, short-term solutions are produced with only small-scale emergency protection measures, but they are long-term sustainable. Many cultural heritage sites worldwide are evaluated within the scope of larger-scale archeoparks. Direct access to the protected areas is restricted and controlled from outside the area, public or private; for example, buses and open-air vehicles can provide access to the site.

It is suggested that in areas with dense cultural and historical settlements such as Göreme within the Cappadocia region, an area management unit should be established accordingly, and necessary sustainable policies should be developed.

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Author Contribution and Conflict of Interest Disclosure Information

All authors contributed equally to the article.

References

- Ahunbay, Z. (1996). *Tarihi Çevre Koruma ve Restorasyon*. İstanbul: Yem Yayın.
- Budde, V. L. (1958). *Göreme Höhlenkirchen in Kappadokien*. Duesseldorf: Verlag L. Schwann.
- Çokça, E. (2012). *Zemin Mekaniği ve Temel Mühendisliği 14. Ulusal Kongresi*. Isparta: Süleyman Demirel Üniversitesi.
- Ertürk, S. (2020). *Göreme Saklı Kilise Belgeleme Çalışmaları ve Koruma Önerileri (Yüksek Lisans Tezi)*. Fen Bilimleri Enstitüsü, Kayseri. Access Address (10.10.2021): <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp>
- Epstein, A. W. (1975). *Rock-cut Chapels in Göreme Valley, Cappadocia: The Yılanlı Group and the Column Churches*. Paris: Cahiers Archéologiques.
- Giovannini, L. (1971). *Arts of Cappadocia*. Geneva: Nagel Publishers.
- İpşiroğlu, M. Ş. & Eyuboğlu, S. (1958). *Saklı Kilise*. İstanbul: Yenilik Basımevi.
- Jerphanion, G. (1925-1942). *Une Nouvelle Province de l'art Byzantin, Les Eglises Rupestres de Cappadocia. I-V*, Paris: Librairie Orientaliste Paul Geuthner.
- Jolivet-Levy, C. (1991). *Les Eglises Byzantines de Cappadoce. Le Programme Iconographie de l'apside et de ses Abords*. Paris: CNRS.
- Koch, G. (2007). *Erken Hristiyan Sanatı*, (Ayşe Aydın). İstanbul: Arkeoloji ve Sanat Yayınları.
- Korat, G. (2018). *Taş Kapıdan Taç Kapiya*. İstanbul: Doğan Egmont Yayıncılık ve Yayımcılık Tic. A.Ş.
- Mitchell, S. (1993). *Anatolia, Land, Men, and Gods in Asia Minor, vol. I and II*. Oxford: Clarendon Press.
- Ötügen, Y. (1987). *Göreme*. Ankara: Kültür Bakanlığı Yayınları.

- Restle, M. (1967). *Byzantine Wall Painting Asia Minor, I-III*. Vienna: Recklinghausen.
- Rodley, L. (1985). *Cave Monasteries of Byzantine Cappadocia*. Londra: Cambridge University Press.
- Teteriatnikov, N. (1997). Monastic Settlements in Cappadocia: the Case of the Göreme Valley. M. Mullett ve A. Kirby (Ed.). *Work and Worship at the Theotokos Evergetis 1050 1200* (s. 21-47). Belfast Byzantine Texts and Translations. Access Address (13.11.2019): http://opac.regesta-imperii.de/lang_de/anzeige.php?pk=1347185
- Thierry, N. (2002). *La Cappadoce De L`antiquite au Mayen Age*, Belgium: Brepols Publishers.
- Topal, T. & Doyuran, V. (1998). Analyses of deterioration of the Cappadocian Tuff Türkiye. *Environmental Geology*, Nisan 1998, 34(1):5-20. doi:10.1007/s002540050252. Access Address (12.12.2019):https://www.researchgate.net/publication/225553922_Analyses_of_deterioration_of_the_Cappadocian_tuff_Turkey
- Turizm Günlüğü Turizm ve Seyahat Gazetesi. (2022, 10 Ağustos). Kapadokya Alan Başkanlığı'ndan yol projesi hakkında açıklama. Turizm Günlüğü Turizm ve Seyahat Gazetesi. Access Address (20.12.2022): <https://www.turizmgunlugu.com/2022/08/10/kapadokya-alan-baskanligi-yol-projesi-aciklama/>
- Vasiliev, A.A. (2017). *Bizans İmparatorluğu Tarihi*. (Tevabil Alkaç). İstanbul: Alfa Basım Yayım Dağıtım San. ve Tic. Ltd. Şti.
- Wallace, S. A. (1991). Byzantine Cappadocia: the planning and function of its ecclesiastical structures (*PhD thesis*). Australian National University, Canberra. Access Address (08.02.2020): <https://openresearch-repository.anu.edu.au/handle/1885/110011>
- Zakar, L. & Eyüpgiller, K. K. (2018). *Mimari Restorasyon Koruma Teknik ve Yöntemleri*. İstanbul: Ömür Matbaacılık A.Ş.

