
STUDIES / ESTUDIOS

Exploration and Digitalization of Historical Heritage: Tur Abdin Region and Mor Loozor Monastery

Exploración y digitalización del patrimonio histórico: la región de Tur Abdin y el monasterio de Mor Loozor

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ABSTRACT

The study focused on the historically and architecturally significant Mor Loozor Monastery in the Tur Abdin Region of Turkey. It aimed to emphasize the current deteriorated and dilapidated state of the monastery. The study was conducted in four stages. The monastery's location was identified, and a conceptual basis was established. In the second stage, fieldwork was organized in 2024. In the third stage, a three-dimensional (3D) model of the recently demolished portico section of the monastery was generated. Finally, the current state of the monastery was evaluated, and methods were discussed regarding the benefits of the 3D model. These stages facilitated the comparison of the original and current state of the monastery, leading to the conclusion that the building requires urgent conservation decisions. The study provides a valuable resource for understanding the cultural and religious significance of the Monastery of Mor Loozor and its region.

Keywords: cultural heritage; digitalization; preservation; documentation and historical buildings.

RESUMEN

Este estudio se centra en el monasterio de Mor Loozor, un complejo de gran importancia histórica y arquitectónica, situado en la región turca de Tur Abdin, y tiene el objetivo de poner de relieve su actual estado de deterioro y ruina. El estudio se llevó a cabo en cuatro etapas. En primer lugar, se identificó la ubicación del monasterio y se estableció una base conceptual. En segundo lugar, se organizó el trabajo de campo en 2024. Después, se generó un modelo tridimensional (3D) de la sección porticada del monasterio, parte recientemente demolida. Por último, se evaluó el estado actual del monasterio y se debatió sobre las ventajas del modelo 3D. Este proceso facilitó la comparación del estado original y actual del monasterio, lo que llevó a la conclusión de que el edificio necesita actuaciones de conservación urgentes. El estudio proporciona un valioso recurso para comprender la importancia cultural y religiosa del monasterio de Mor Loozor y su región.

Palabras clave: patrimonio cultural; digitalización; conservación; documentación y edificios históricos.

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1. INTRODUCTION

Mor Loozor Monastery, known for its historical richness and cultural importance, is a significant religious building in Anatolia. This sacred place has experienced the interaction of many civilizations and cultures over time and has preserved traces to the present day. The foundation of this monastery complex was related through two distinct historical narratives (Altan 2022). Firstly, it was claimed that the monastery was founded by Mor Loozor,¹ the bishop of Harran (Bell and Mundell Mango 1982: 110; Hollerweger 1999: 38-51). The second narrative was based on Mor Shem'un d-Zaite constructing a monastery and stylite tower dedicated to Mor Loozor. According to this, Shem'un put the sacred relics of Mor Loozor, which were transported from Harran, within this monastery complex (Doran and Johnson 1992 20; Keser Kayaalp 2018: 180; Hoyland *et al.* 2021). Dolabani (1971) mentioned that Mor Shem'un d-Zaite was born in the village of Mercimekli² but that he lived his religious life in the Mor Gabriel (*Deyr-el-Umur*) Monastery and stayed for a long time. This raises the possibility that Shem'un d-Zaite built a monastery with a tower for the village of Mercimekli. The monastery was built on a hill to the southwest of this village, located in the Midyat District of Mardin Province, in the southeast of Turkey, within the region historically known as Tur Abdin (Palmer 1990; Keser Kayaalp 2016). Bell and Mundell Mango (1982) define Tur Abdin as the region lying east of the triangular area formed by the cities of Amida-Diyarbakır, Edessa-Urfa, and Nisibis-Nusaybin. While the etymology of the name "Tur Abdin" is subject to various interpretations, it is commonly considered to derive from Syriac, signifying "the mountain of (God's) servants" (Yaşar 2021). Due to the number of monasteries and churches built in the region starting from the early Christian period, this region is of great importance for the Syriac community (Çelik 1987; Mundell Mango 1982). Yaşar (2010)

argued that 107 churches and monasteries still stood in this geography. Such a large number of religious structures in a relatively small geographical area makes this region particularly worthy of examination.

The historical presence of the Tur Abdin region in written records can be traced back to the 13th century BC (Gabriel 2014). The inhabitants of this region shared common cultural values during the emergence and diffusion of Christianity in the Near East. Christianity was embraced as the primary religion in the area, and these people were identified to be called "Syriacs" (Özcoşar 2006; Melki 2013). Following the adopting of religious principles, monastery activities were rapidly observed in the region at the beginning of the 4th century. Notably, this region witnessed frequent visits from figures such as the Bishop of Nusaybin, St. Jacob, and St. Ephrem in the 4th century (Comfort 2017; Dolabani 1971). By the late 4th century, the number of monasteries in the region increased, with prominent examples including Mor Gabriel in Qartmin (Yayvantepe) and Mor Shmuel Church in Hah (Anıtlı). During the 5th and 6th centuries, many monasteries were constructed, some of which remain today and some still active (Fig. 1).³ The increase in the Muslim settlers in the region spurred the growth and consolidation of the Christian community, united by a shared Christian ethos. In the 7th century, many religious buildings were constructed that continued the architectural form, decorative elements, and style of the 6th century. However, towards the end of the 7th century, there was a significant decrease in the number of religious constructions. In the 10th and 11th centuries, the Tur Abdin region experienced a period of stability, but it was not a productive period in terms of new religious building constructions (Demirkent and Korkmaz 2007).

Mor Loozor Monastery, one of the most important monastery complexes in the Tur Abdin region, is the main subject of this study. In accordance with the common features of monastic architecture, it was built isolated from its surroundings with its solid walls. The monasteries were built to provide an isolated environment for priests, monks, safe, and students to pray and study safely and seclusionally. The monastery also has a seclusion tower in the courtyard, dating back to 792 (Palmer 1990). It was commonly assumed that worshippers spent years as ascetic "stylites" on this tower. The first representative of these seclusion towers in Eastern

1 Vööbus (1978) noted that the accuracy of the name "Mor Loozor (Mor Lo'oor)", also referred to as Mar Lazarus, remained uncertain. The spelling "Mor Lo'oor" can sometimes be seen in the literature, but is most often found as "Mor Loozor".

2 Biner (2019) referred to the name of the village as Hbûşyo Nêşe (Syriac), Habsus (Kurdish), Mercimekli (Turkish). Keser Kayaalp (2021) mentioned the village as Habsenas on the map of Tur Abdin. Altan (2022) stated the name of the village as Habsenus. Mostly known by the names Hapisnas, Hapsus, Habsenus, or Habsnas in the region. It will be referred to by its current name Mercimekli in this study.

3 The Syriac names of the villages in Biner (2019) are indicated on the map.

Christianity was based on St Simeon, who was born in the village of Sisa near Nicopolis, on the border between Euphratensis and Cilicia (Atiya 2005). This ascetic lifestyle of St. Simeon influenced numerous monks. The Syriac life was also an apology for Simeon's novel

asceticism of standing on a pillar. Doran and Johnson (1992) presented three main motivations for Simeon's unique way of life. Firstly, it was considered fitting for the Lord to send his servants to preach and teach in a way appropriate to each historical era. Secondly,

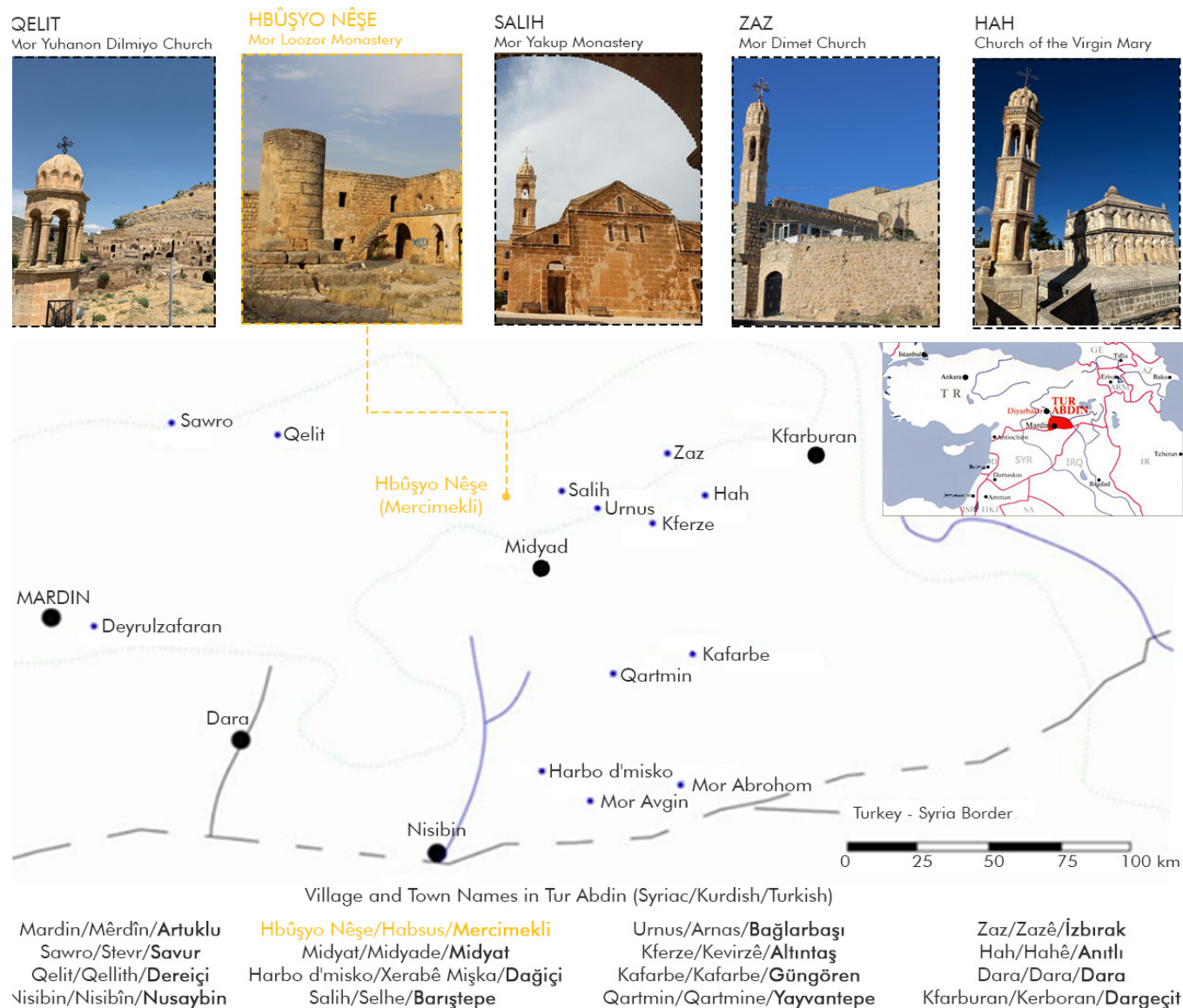


Figure 1. The Turabdin Region and the numerous examples of churches and monasteries in the region provide knowledge about Syriac life (created by the author).

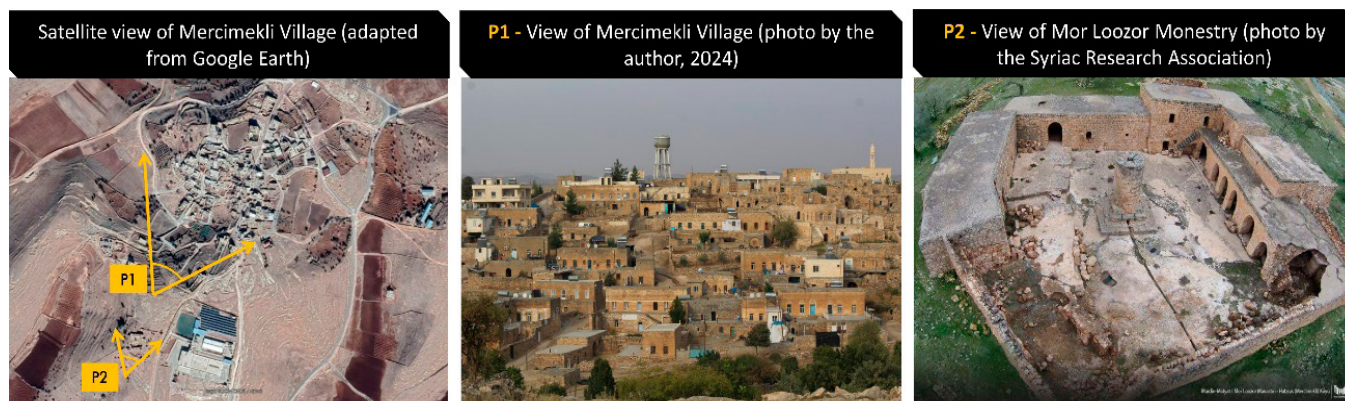


Figure 2. Views of Mercimekli Village and Mor Loozor Monastery (created by the author).

Simeon receives a vision in which an angel shows him the proper way to pray. Finally, another vision shared by Simeon is the proper design and construction of the final pillar.⁴ Stylites, also known as Pillar Saints, were ascetic individuals in the early Byzantine Empire who inhabited pillars, dedicating themselves to worship, prayer, fasting, and preaching. The belief was that enduring physical hardships would purify their souls, granting salvation and absolution from sins (Aykit 2012). Due to the declining Christian population in the region, the Mor Loozor Monastery lost its function as a center for religious education, and the building was abandoned and fell into a dilapidated condition. Today, the building is still vandalized due to inadequate security measures and its exposure to illegal treasure digging by trespassers. Throughout the site and especially in the indoor areas, rubble, soil, straw, and rubbish piles are formed due to rangeland and treasure digging. As an extension of this study, a 3D photogrammetric model of the parts of the building damaged over time is generated. The model provides important data for future restoration and conservation studies and can be easily archived in digital media. The study combines architectural analysis and contemporary modeling approaches to understand the

Mor Loozor Monastery's history, preserve its values, and analyze its original religious spaces. These approaches aim not only to ensure the passing on to future generations of the Monastery's history but also to offer insights into its original condition and current state.

2. MATERIAL AND METHOD

Mor Loozor Monastery was built 500 meters from Mercimekli Village for privacy required by the monastic function (Fig. 2). Its general organization is square in plan with building blocks around a courtyard. According to information gathered from the local Christian community, the monastery includes the surrounding lands and hill slopes owned by the monastery. In their original period, these lands were used as fruit and vegetable gardens to supply the needs of those living in the monastery. Today, these lands are owned by the village administration or by individuals. The current boundaries of the monastery can be defined as an area surrounded by simple and mortarless rubble stone walls.

There are two inscriptions in the monastery. The first is on the external wall above the entrance door (Fig. 3). It is a text inscribed vertically with an incised rect-

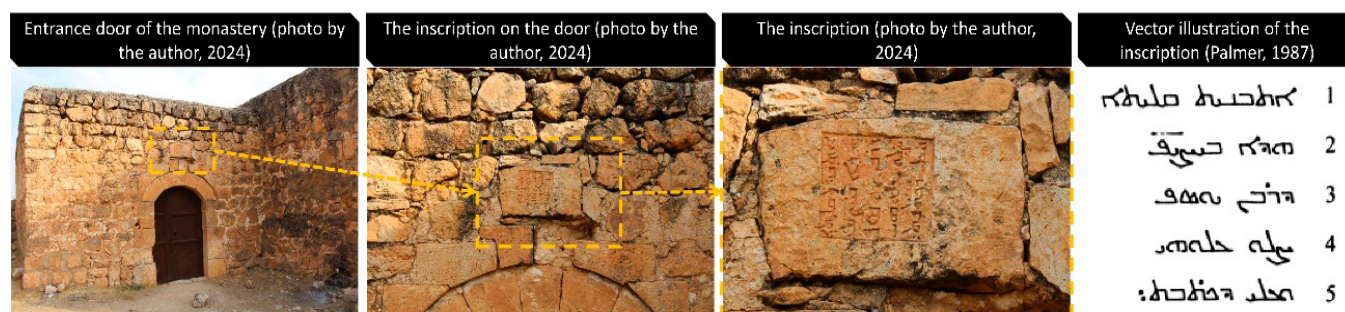


Figure 3. Views of the inscription on the entrance door (created by the author).

⁴ See for further information Doran and Johnson (1992: 51-54).

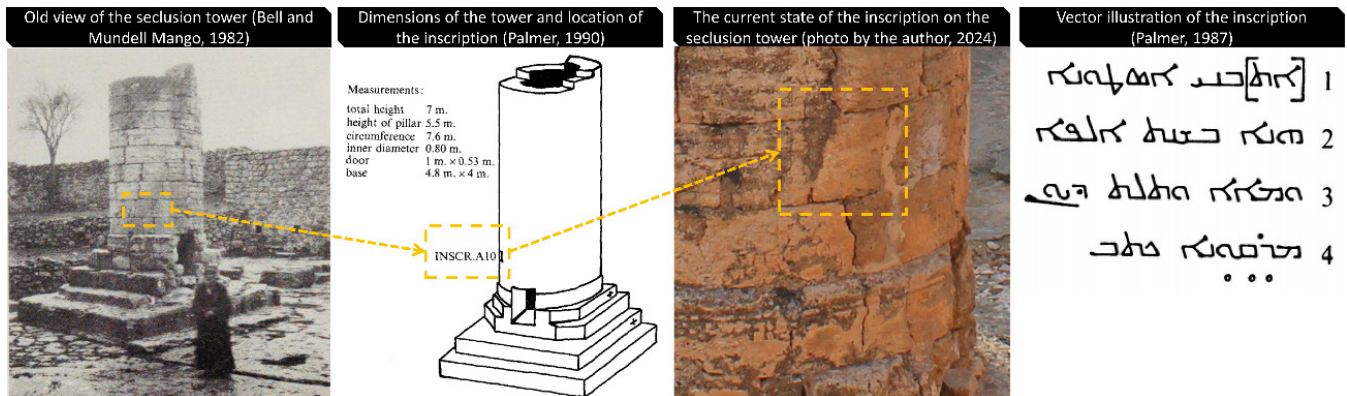


Figure 4. Features of the inscription on the seclusion tower (created by the author).

angular frame 20×18 cm in block 55×21 cm. This inscription is carefully executed and well preserved. The inscription means “This chamber was built by the care of Rabban Joseph; pray for him and for me, who wrote (this)” (Palmer 1987). Palmer (1987) referred to “the careful layout, the distinctive *ṢODHE*,⁵ and the differentiated chisel-work, which attempts to imitate the thick-and-thin of quill-script, show that this inscription belongs to the period of calligraphic revival in Tūr 'Abdīn between the 11th and 14th centuries” regarding the inscription style.

The second inscription is located on the seclusion tower. Today, this inscription has become quite invisible and has not been preserved well (Fig. 4). Text inscribed vertically is weather-worn. This study benefited Palmer's (1987: 71) work in which he drew atten-

tion to the location of the inscription and showed the inscribed stone, in the second course, counting upwards from the top of the entrance to the tower, a short block between two long ones just to the left of that entrance. The incised frame that contains the text inscribed is 41×37 cm. The inscription means, “This column was built in the year one thousand one hundred and three of Greece; Marquino wrote (this)”. However, the inscription has unreadable letters, so the meaning is unclear. In the Greek calendar, the year 1103 corresponds to the Gregorian calendar year of 791/792. The year mentioned in the inscription did not match the year the monastery was built. The date on the tower does not match the Life, according to which Simeon, who, according to the Life, built the tower, died in 734 (Hoyland *et al.* 2021: 146; Palmer 1987; Keser Kayaalp 2018). This has

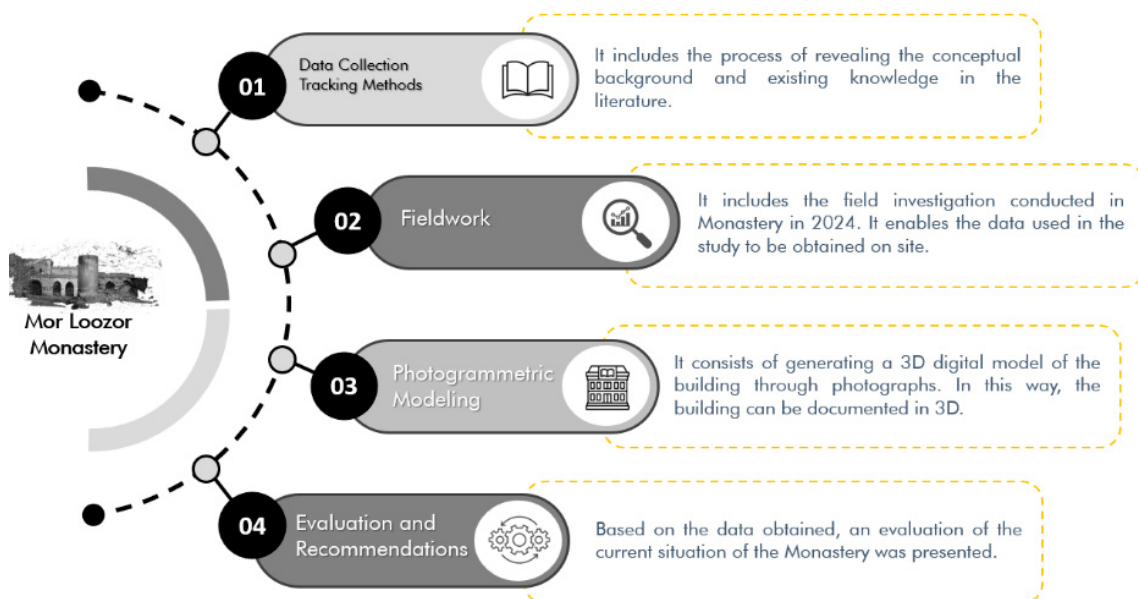


Figure 5. Representation of the stages of the study (created by the author).

⁵ A ligature in the Syriac alphabet.

raised the possibility that the column was built after the monastery. However, there was no document to confirm this except the inscription.

This study, which aimed to document and reveal the process of the monastery's development to the present day, is organized into four stages (Fig. 5):

- The first stage is to explore the existing conceptual knowledge about the Monastery. At this stage, two qualitative research methods, data collection and tracing, are applied. The tracing or process tracing method is a qualitative research method in which the causal conditions of a situation are examined by including the process.
- During the second stage of the study, field studies were conducted. The village of Mercimekli was visited in

2024, and the condition of the building was examined on-site. Photographs taken at this time are compared with the old photographs of the building, and the parts that had been damaged over time were identified.

- In the third stage of the study, a 3D photogrammetric model is developed for the eastern part of the building, where the porticoes were determined to have been damaged and demolished in the last 15 years. Photogrammetry is measuring objects through photographs and metric interpretation of image data (Van Den Heuvel 1998; Grussenmeyer *et al.* 2002; Benavides and Barrera 2020; Şimşek and Kutlu 2023). Models can be generated by measuring two or three-dimensional objects from photographs. Using this method, the current condition of

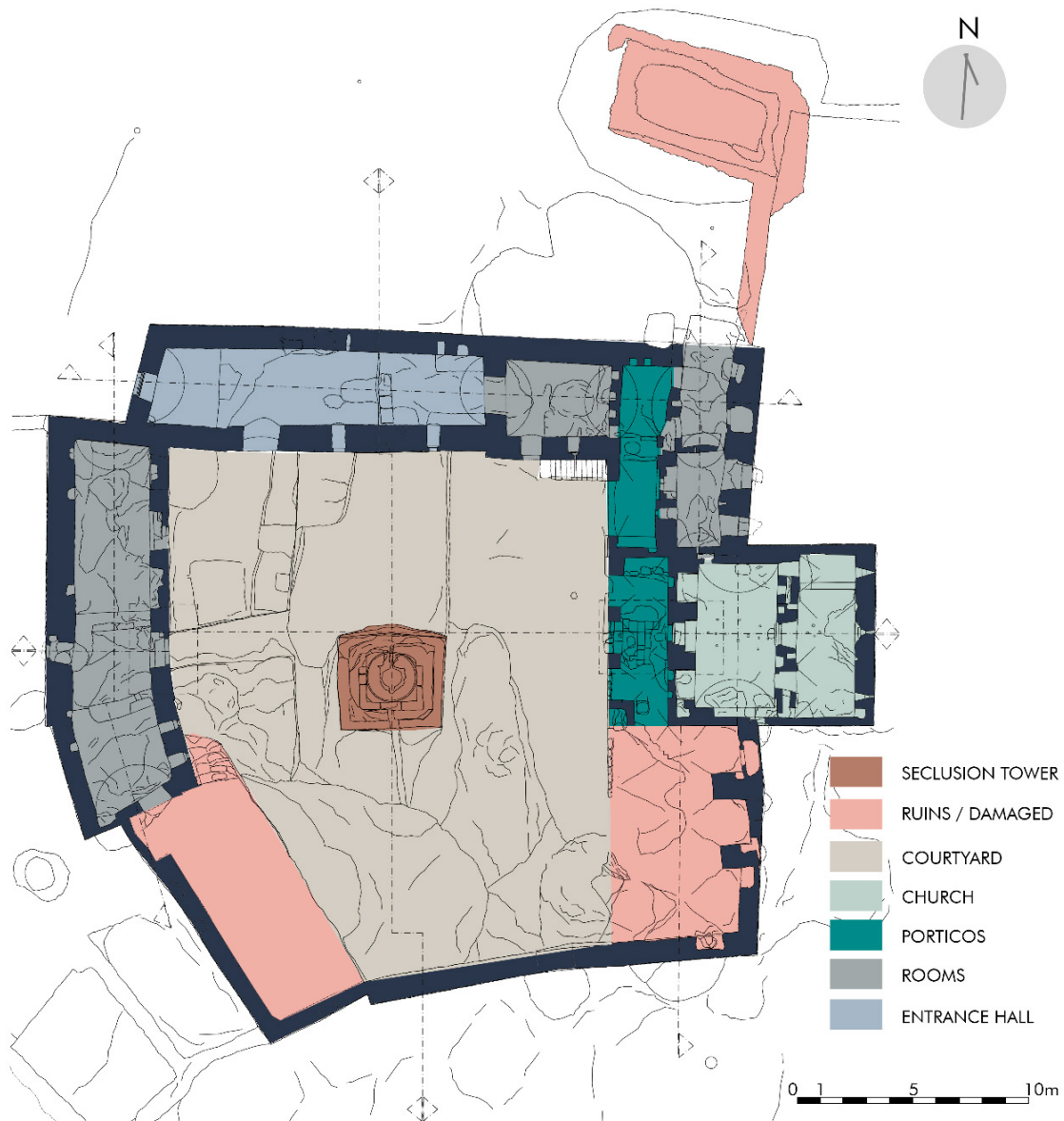


Figure 6. Mor Loozor Monastery ground floor spatial plan features (adapted from Şanlıurfa Cultural Heritage Conservation Regional Board).

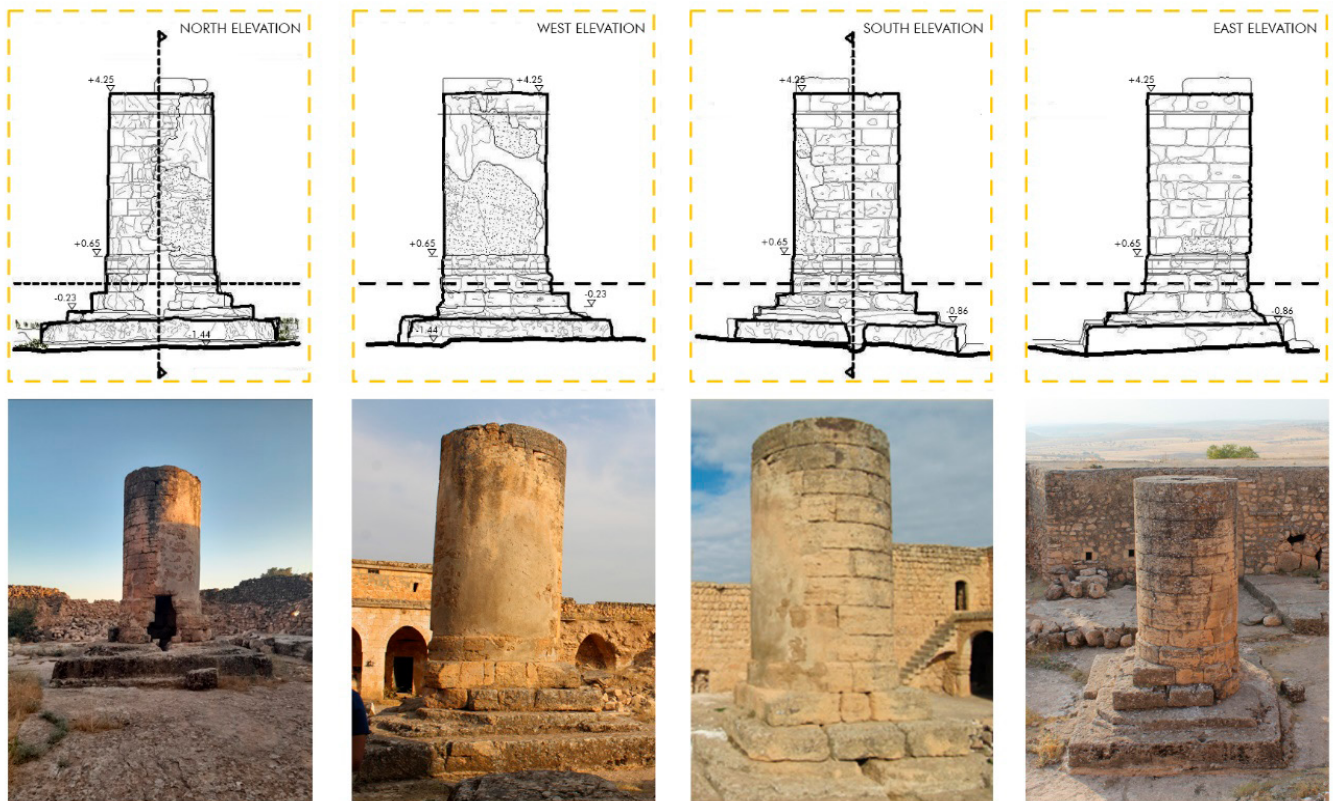


Figure 7. Survey drawings and views of the seclusion tower (elevations adapted from Şanlıurfa Cultural Heritage Conservation Regional Board and photos by the author).

the monastery is digitally documented. Furthermore, the beneficial usage of this model for conservation studies is presented.

- In the last stage of the study, the current condition of the monastery is evaluated, damage conditions are discussed, and alternative suggestions are presented for conservation works that can be implemented for the building.

The literature includes architectural analyses and documentation studies on the monastery using traditional methods (Gernot 1982: 87-93; Altan 2022: 65-69). In addition, a digitalization study of the Syriac cultural heritage was carried out recently by the Heritage Management Organisation. A raw digital model of the Mor Loozor Monastery was created through fieldwork between 17 and 29 September 2018.⁶ In this context, periodic modeling studies of the monastery are crucial to documenting the changes in the building and determining its structural condition. Notwithstanding, analyzing, and documenting the current situation of the monastery and the advantages of the digital model are also significant. For this reason, this methodological framework has been developed in order to

convey the architectural features and historical values of Mor Loozor Monastery to future generations and studies as well as to emphasize the necessity of its conservation.

3. FINDINGS

3.1. Spatial Features of Mor Loozor Monastery

The building has a single entrance in accordance with the general design principles of monastery buildings. This entrance was located to the west and provides access to the complex. Today, it is very difficult to determine the exact original functions of all the building spaces. For this reason, the spaces are named using general concepts in the survey drawings (Fig. 6).

To start with, when the spatial features of Mor Loozor Monastery are examined, as a general observation, it is obvious that illegal excavations were made on the interior walls, floor, and courtyard. The local people also confirmed this observation. Over time, the building collapsed due to irreversible interventions by trespassers. In addition to the deterioration due to time, the building is also vandalized and heavily damaged over the years.

⁶ Heritage Management Organization, 2022: <https://intangiblesyriac.org/tangible.php>, accessed date: June 28, 2024.

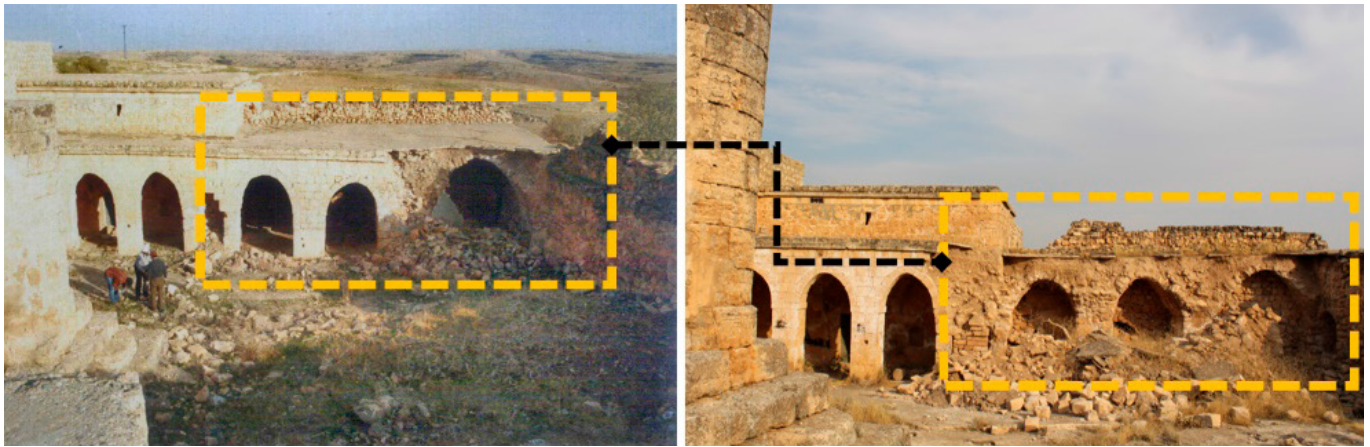


Figure 8. Mor Loozor Monastery - 2010 view of the porticoed section (photo by Şanlıurfa Cultural Heritage Conservation Regional Board archive) and 2024 view indicating its collapse in the last 15 years (photo by the author).



Figure 9. Mor Loozor Monastery. 1: Old view of the sanctuary (Hollerwerger 1999). 2 and 3: 2024 view indicating its destruction in the last 15 years (photo by the author).

The entrance hall extends in the east-west direction and has a rectangular plan. At the western side of the entrance hall was the entrance door to the monastery complex, and at the eastern side was an arched gateway leading to the adjacent room. The entrance hall was covered with a rubble stone barrel vault that was formed. This structure is a common form of covering in the Syriac Orthodox religious architecture of Tur Abdin.

The courtyard, the largest area of the building, can be accessed from the south of the entrance hall. The courtyard is usually located in the center of the monastery buildings. Monastery complexes partially surrounded the northern and eastern sides and the western side of the courtyard. In contrast, exterior walls bordered the southern and western sides. At the northeast corner of the courtyard, there is a stone staircase leading to the upper floor of the monastery. The monastery was built on a natural rock plateau, and the natural rocks formed the pavement of the monastery courtyard. These natural rocks are also

noticeable outside the building in the northeast towards the village. The most remarkable part of the building, the seclusion tower, is located in the center of the courtyard (Fig. 7). The seclusion tower was built of cut stone with a circular plan. Yet, the tower's base had a square plan and was hollow inside. The tower was used by monks and priests as a place of seclusion to live an ascetic lifestyle. Nowadays, there is an approximately 80 cm hole on the north side of the tower. This hole was formed as a result of material damage over time. Additionally, some channels can be observed in the south of the tower, which has a hollow in the center. These channels can also be seen around the cisterns. Therefore, it was probably related to the cistern. The monastery building was included in the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Tentative Heritage List on 15 April 2021. It was stated that the tower of the building and the drainage system of the channels around it were unique (UNESCO 2021).



Figure 10. Mor Loozor Monastery first floor spatial plan features (adapted from Şanlıurfa Cultural Heritage Conservation Regional Board).

Some monastery rooms were located at the western and northeastern ends of the courtyard. These rooms have a rectangular floor plan. However, their original function remains uncertain. Şanlıurfa Cultural Heritage Conservation Regional Board suggests that they may have served as dining halls or stables.⁷ The rooms were covered with a rubble stone barrel vault. There are many niches in these rooms, and some of these niches were destroyed or hollowed out due to interventions over time. Today, the rooms are largely filled with rubble stones and piles of soil. As mentioned before, this situation results from illegal excavations in the rooms and results from illegal excavations in the rooms and throughout the monastery.

⁷ An unpublished survey report on the monastery was prepared by the Şanlıurfa Cultural Heritage Conservation Regional Board in 2010.

On the eastern side of the courtyard, there is a semi-open porticoed space. These areas provide access from the courtyard to the rooms and the church. Cistern holes were on the ground of the porticoes in the north direction. Cistern holes in a circular form were observed embedded in the ground at various points within the monastery, and they were used to meet the water demand during the original period of the monastery.

Upon examining old photographs of the ruins in the southeast direction of the monastery, it was determined that there used to be a space with a portico before 2010, which was subsequently destroyed due to lack of preservation (Fig. 8).

Therefore, it can be concluded that the porticoed space in the monastery was originally of an L-plan type.

The church has a planned orientation of a transverse hall in accordance with the typology proposed by

Bell and Mundell Mango (1982). Inside the church are arched niches and horseshoe arches on both sides of the entrance door on the west wall. The church interior was divided into two main spaces- the nave and the sanctuary.⁸ The sanctuary, located in the eastern direction, was the sacred area reserved for religious rituals and ceremonies. In the upper levels of the church, there were small windows for ventilation and niche-shaped openings, though these did not directly connect to the exterior. The height of the sanctuary space exceeded that of the other areas within the monastery complex, likely indicating its specialized liturgical function. Three cistern holes were found in various sections of the church. Currently, these cistern features are partially filled with rubble and soil. Access to the sanctuary from the nave was through a pointed arched portal, typical of Syriac church architecture. The sanctuary was only accessible to the clergy and high-ranking religious personnel in accordance with liturgical conventions. Hollerwerger (1999) documented the presence of an element referred to as a “throne” or “table of life” situated in front of the cut stone window on the east wall of the naos. However, this area is now obscured by piles of rubble and soil (Fig. 9).

Stone stairs can access the second floor on the northeast side of the courtyard. On the second floor, there are open spaces in the form of a flat terrace roof and two rooms (Fig. 10). These rooms on the upper floor appear to have been originally used as dormitories. The rectangular room in the north, extending east-west, is accessed through a door with cut stones. Part of the upper cover of this room was reconstructed in reinforced concrete. On the east side of the same room, a cross vault built of original rubble stone can be observed. It can be assumed that the wall between the cross-vaulted section and the section with the reinforced concrete roof was demolished over time. This assumption is supported by the presence of many piles of stones and soil in this area and the differentiation of the roof structure.

The room with a square plan extending in the north-south direction can be accessed by a cut stone door to the terrace from the west wall. There are two symmetrical windows on the east side of the room, and a hearth is located in the center. A hearth in the room suggests that

it was originally used as a kitchen or cooking area, etc. The room, covered with a barrel vault, has a party wall with the church on the south side due to the high elevation level of the church.

The porticoes in the monastery were used as terraces at the second-floor level and provided access to the rooms. The roof of the recently demolished porticoes to the southeast collapsed. These terrace roofs were covered with a layer of cement screed, which was added later. This intervention was intended to insulate the roof; however, it appears to have been an inappropriate and inadequate solution.

No documentation has been obtained regarding the original function of the rubble stone masonry ruin in the northeast direction of the monastery. However, it is considered that it may have been used as a “hermitage house (cilehane)” within the monastic complex, a place separate from the main building where monks and priests voluntarily isolated themselves. The rectangular structure extends in the east-west direction, and very little of its original structure has remained to the present day. Today, the general condition of this ruined building is in the form of rubble stone blocks and a pile of soil.

3.2. Structural and Facade Features of Mor Loozor Monastery

The monastery was constructed on a hill situated on a natural rocky plateau. Limestone, a common local material in the region, was used in the construction, with no trace of any other material in its original state. Mud or lime mortar was generally used as a binder, and a masonry structure was built from rubble stones. Walls and vaults are predominantly made of rubble limestone, while cut limestone was utilized in some architectural elements such as doors and windows. The porticoes and arches on the courtyard facade are also constructed of cut limestone. The church was built with cut stone blocks. It is concluded that the monastery spaces were generally covered with barrel vaults, and partially cross vaults or vaults without a distinct shape were used as covering elements.

The facades of the monastery buildings are generally solid and nearly devoid of large openings. The most prominent opening in the Mor Loozor Monastery is the entrance door on the west facade. The windows in the interiors on the upper levels appear as small stone holes on the exterior facade. It was observed that the facades of the interior spaces facing the courtyard contained more openings, with doors and windows positioned

⁸ Wiessner (1982) referred to the space of the church as “hagia-sterion” and “naos”. These expressions are usually used for Greek temples. It may have been associated with the year written on the seclusion tower according to the Greek calendar. Considering the usage of the people of the region and Syriac community, nave, and sanctuary reflect clearly that function.

in this direction. However, the number and size of the openings on these facades facing the inner courtyard are minimized. The interior spaces are generally dark and inward-looking. The porticoes on the eastern side of the courtyard provide an open space to the courtyard with their arched structure. However, since these spaces open to the courtyard within the monastery, they adhere to the general design principle of inwardness. The rectangular cut stone cornices on the upper levels are almost the only decorative element on the facades. There are two inscriptions on the building, one on the west facade above the entrance door and the other on the west facade of the porticoes on the courtyard side, facing the seclusion tower.

4. EVALUATION

4.1. Assessment of the Current Damage Status of the Building

The long neglect, inappropriate interventions, and illegal excavations in search of treasure have caused serious damage to the Mor Lozoor Monastery. Many damages were visible during the observations conducted during the fieldwork. These damage types and the effects on the building were summarised below:

- There are numerous structural and capillary cracks in various locations within the monastery. These cracks can lead to water seepage, dampness issues, structural

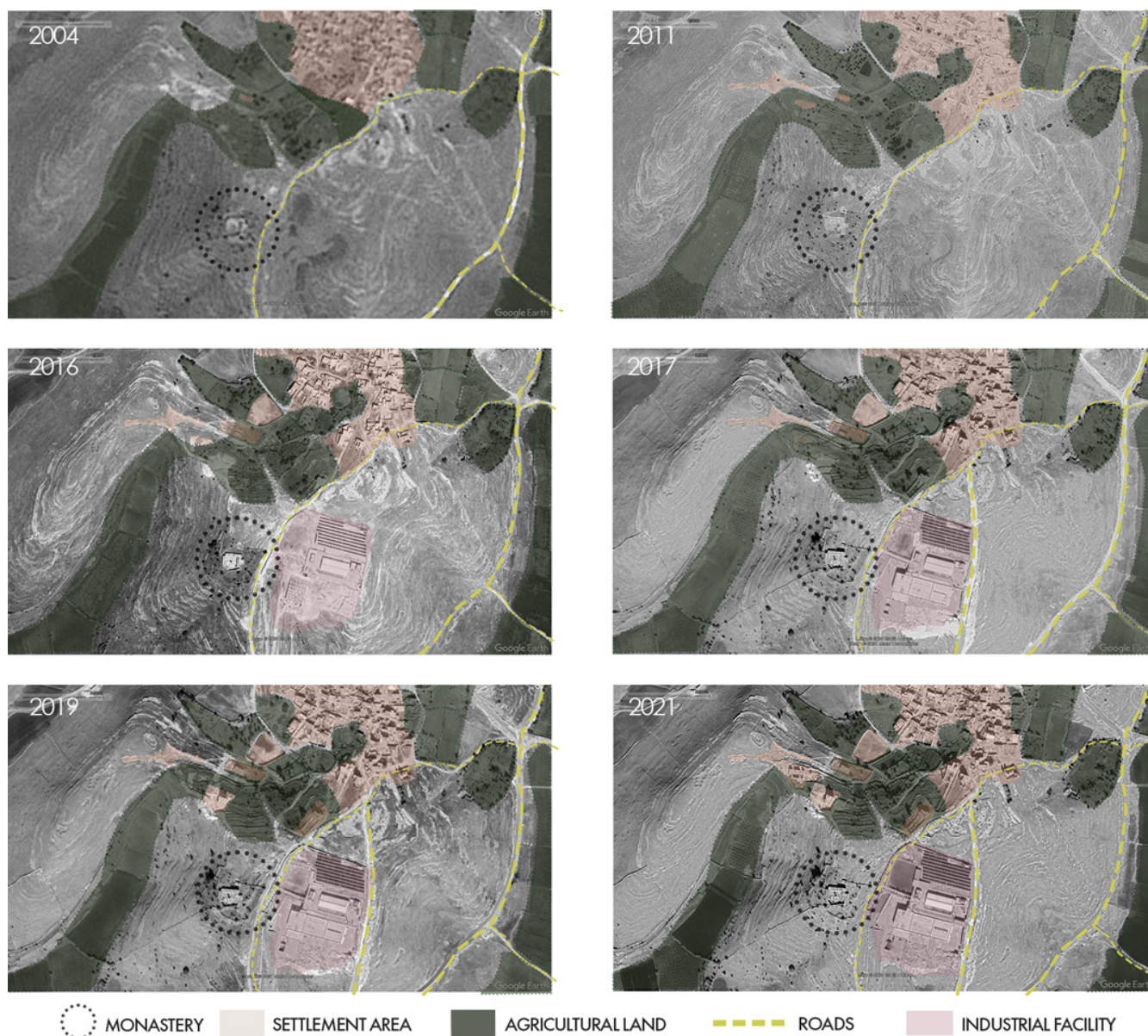


Figure 11. Satellite images showing the change of the site according to years (adapted from Google Earth).

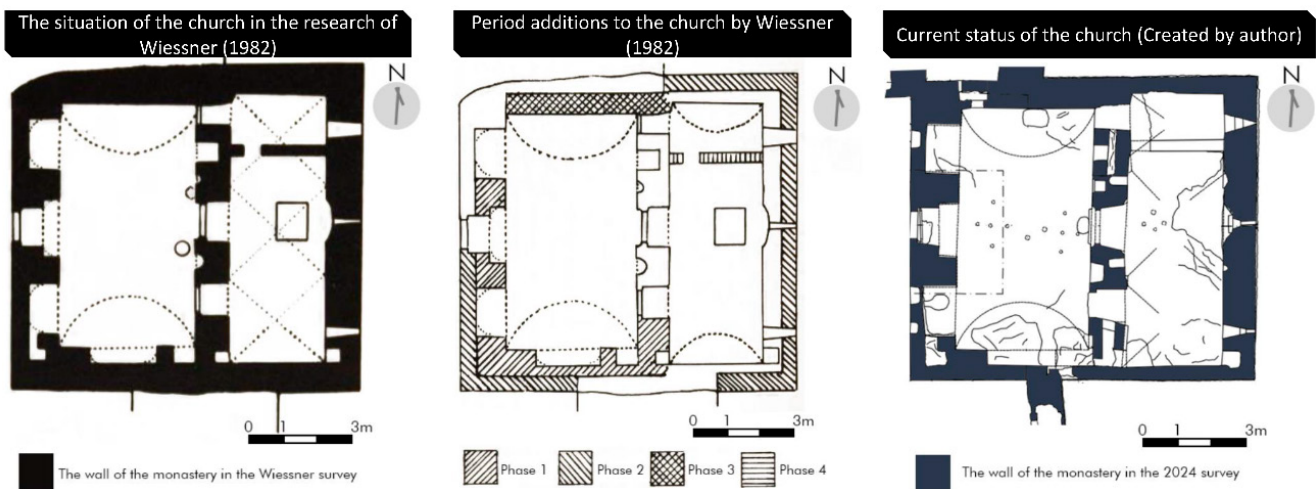


Figure 12. Period comparison of the church and Wiessner's (1982) restitution project (created by the author).

failure, aesthetic deterioration, insulation problems, and safety hazards. Water infiltration and moisture accumulation resulting from these cracks can cause deterioration of building materials. Moreover, large and deep cracks can weaken the structure and pose a risk of collapse. Additionally, insulation problems and safety risks may arise. Therefore, it is essential to analyze these cracks promptly and carry out necessary rehabilitation and strengthening work.

- The walls and vaults on the facades and interiors of the building were restored using lime or cement mortar. Restorations that are not properly analyzed and incompatible with the original material in a historical building can cause cracks and damage by affecting the natural elasticity of the structures. This situation can lead to severe damage to the structure over time.
- The mortars were damaged in some parts of the monastery facades and interior surfaces. Damaged mortars can cause water seepage and moisture problems. These damaged areas may lead to stone loss, decay of building materials, and structural weakening over time.
- The roofs of the monastery complex were covered with an additional layer of cement screed. Furthermore, the vault was demolished in a part of the room on the second floor, and a reinforced concrete slab with beams was built in its place. First, the cement screed layer may damage the original design and infill materials of the roofs and may not provide an optimal solution. This can cause historical damage as well as aesthetic damage. Additionally, the cement screed layer does not provide adequate water insulation, as intended, as evidenced by the moisture in the interior

ceilings of the Mor Loozor Monastery. The construction of a reinforced concrete slab in place of the vault may have added extra weight and load to the structure, resulting in additional stresses. This intervention carried out without the necessary structural analysis calculations, is considered to have endangered the structural integrity of the monastery.

- The stone or plastered surfaces of the interiors were contaminated and degraded, especially due to the fires lit inside. This could have caused damage to the stones and structural integrity.
- Some niches and windows have been intervened inappropriately and filled with rubble stone over time. Such interventions led to the deterioration of the historical texture of the building and removed the building from its original architectural features. Besides, with the filling of niches and windows, the monastery building has lost important functions such as light and ventilation, and the usability of the interior spaces has decreased.
- Natural collapses and illegal diggings over the years have caused holes and material losses in the structure of the building. This has caused significant deterioration in the structural integrity and risk of collapse.
- Due to exposure to natural weather conditions and other environmental factors, corrosion has occurred on some building surfaces. These abrasions may have reduced the building materials' durability and could lead to greater damage over time.
- The interiors and the stone floor of the seclusion tower have become mossy due to rain and humidity. Additionally, small trees have grown around the building, and shallow-rooted plants have appeared on some walls.

The failure to preserve and reuse the building has resulted in a growing amount of damage to the building over time. Especially illegal digging activities have inflicted crucial heavy damage to the building. The demolition of a portion of the porticoed section of the building after 2010 can be attributed to the absence of proper conservation and restoration procedures.

When a general evaluation of the monastery site is conducted, there is no information available about any recent archaeological excavations and surveys. The surrounding area was used as agricultural lands belonging to the monastery for an extended period. Although the site still requires archaeological investigation, irregular and uncontrolled changes can be observed in the satellite imagery (Fig. 11). In the 2004 satellite image, there is no construction in the surrounding area of the site. In 2011, several concrete structures were developed on the northern side. In 2016, the most significant change was the construction of a meat-integrated industrial facility approximately 50 meters to the east. Moreover, it can be observed that settlements on the northern side are encroaching closer to the site and new reinforced concrete houses were built in the surrounding area. In 2021, the number of agricultural lands decreased while the number of settlements increased. Uncontrolled development in the vicinity of the site may have led to the destruction of important archaeological values.

4.2. Comparison according to Wiessner's work (1982)

Wiessner (1982: 87-93) conducted a field study of this monastery. Forty years later, it is obvious that the monastery is currently more damaged.

- He discussed that the certain uniformity of a large part of the masonry enclosing the courtyard should not lead to the conclusion that all the wall sections and wall courses built from this material can be assigned to a uniform construction period; the material used for these parts of the outer casing is a material that is in a certain sense timeless in the building history of the Tur Abdin from more recent construction periods, which could be used again and again for alterations and extensions. This situation can be currently observed from the differences in the form of the building materials used.
- He affirmed that the large blocks and the foundations cut to support them belonged to the oldest construc-

tion period of the church and that the west facade of the oldest period was largely preserved. It can now be observed that the church has undergone several interventions and changes since then. For instance, the additional wall on the north side and the inside of the sanctuary are demolished, and niches are highly deteriorated (Fig. 12).

- He reported that one of the most important inventories in the sanctuary was a brick altar with a floor area of 1.17 m × 0.87 m and a height of 1.18 m. This altar is today completely demolished.
- He reported that a 1.64 m high, 0.30 m deep, plastered extension wall constructed of rocks and rough rubble stones, separated by a distance of about 1.37m, was built later. This wall is today also completely demolished.
- He determined that the sanctuary was covered by a barrel vault extending north to south, which rests on the inner masonry without a cornice. There were three small rectangular windows for ventilation on the south side, partially closed from the outside. These windows still retain the same features.
- He stated that columns were on both sides of the central entrance from the nave to the sanctuary. One of these columns had an octagonal section in the north, another was round and with, and another was round and had a simple cap on the top in the south. There is currently no trace of these columns.
- He determined that the portico's pillars and arches, which extend almost the entire width of the courtyard to the east- alternating semicircular arches and stylized round arches with a tendency towards flattened pointed arches- were neatly constructed of medium-sized, carefully smoothed stones. The porticoes were not damaged during Weismann's site visit between 1977 and 1980. The southeastern part of the porticoes is demolished, but the part in front of the church is still standing.

As stated by Wiessner (1982), the building was renovated and intervened in many times. Since the documentation is very inadequate and the same materials are generally used, it is impossible to determine in which periods the additions were made. However, it is thought that the concrete slabs of the building and the roof pavement of the room on the upper floor were built in the 1950s. Wiessner (1982) has already recorded that the local people, in the 1950s, had also reported the first use of reinforced concrete in the region. Therefore, it is thought that the last intervention took place in the 1950s.

Digital model type of Mor Loozor Monastery	View of the digital model
Camera angles and point cloud model	
Dense point cloud model	
Mesh model	

Table 1. Mor Loozor Monastery - Digital Model Stages

4.3. Digital 3D Model of Mor Loozor Monastery

Given its historical significance, the Mor Loozor Monastery urgently requires preservation and restoration. Upon examination, it became evident that the porticoed section of the building had recently been demolished, highlighting that need. Consequently, thanks to the fieldwork, the demolished portico section was documented and archived in 2024. During this process, the photogrammetric modeling technique was used (Tab. 1), and by utilizing terrestrial photogrammetry and photographs captured with human-scale cameras, a three-dimensional model of the building was generated. The resulting model serves as a crucial tool for guiding conservation and restoration efforts to mitigate potential future collapses. Had such a modeling study been conducted previously, it could have facilitated the preserva-

tion of the original condition of the demolished portico and guided conservation works effectively.

The model-building process involves capturing identifiable photographs during the fieldwork and importing them into the photogrammetry program (Metashape - produced by Agisoft). In the case of the units on the east side of the Mor Loozor Monastery, where the demolished portico section is situated, 19 photographs were taken using a smartphone camera. The program identified the photographs and generated the photogrammetric model. Metashape provides the capability to export the three-dimensional mesh model in different formats. In this study, following the generation of the mesh model, the model was exported as an object (.obj format), and the original state of the building's porticoed area was modeled. The intention was to underscore the potential for creating a representation of the demolished portico area. This process demonstrates that highly detailed data can be obtained from the photogrammetric model for



Figure 13. Processability of the photogrammetric model before restoration decisions using different 3D visualization programs (created by the author).

use in conservation-restoration studies and before interventions on the building (Bekar and Kutlu, 2024). The advantages of the photogrammetric model data obtained in the study are summarized below:

- The model can be exported to computer-aided design (CAD) programs in two dimensions, allowing for the creation of current survey drawings of the building. Traditional techniques may be inadequate, particularly for heavily damaged or partially demolished buildings such as the Mor Loozor Monastery. While laser scanning has been utilized for numerous years, acquiring a three-dimensional measured digital model, achievable via smartphones, significantly accelerates and facilitates the process.
- In addition to obtaining two-dimensional drawings for the restoration works, interventions can be visualized and rendered in 3D on the model. Consequently, the balance of harmony between the building's original condition and the planned interventions can be assessed before implementation. The planned interventions, aligned with the building's requirements, can be organized within the three-dimensional model, allowing for an interactive process in a digital platform to reach a final decision that aligns with the building's character. The creation of a solid mass model of the demolished porticoes of the Mor Loozor Monastery serves as an illustrative model for this process (Fig. 13). The white area within the model was generated

based on the dimensions of the demolished portico area and serves as a representation where the planned interventions can be modeled. This representation can also be refined to reflect implementation details according to the intervention decisions, providing a realistic preview before the intervention.

- It is possible to experience the building in a virtual reality (VR) environment with augmented reality (AR) applications by incorporating the planned interventions into the photogrammetric model. This approach enables the preliminary exploration of the building's potential usage post-restoration, offering insights before physical interventions are undertaken in the virtual environment.
- Archiving the photogrammetric model generated in digital platforms is also quite feasible. As a result, a 3D digital model can contribute to intergenerational interaction and can be provided in studies utilizing this method, as in the case of the Mor Loozor Monastery. Furthermore, the periodic application of photogrammetric modeling processes will enable the documentation of the transformations that buildings have undergone over time, allowing for the experience of their past states in virtual environments.

5. CONCLUSION

The Mor Loozor Monastery is a crucial building representing the region's rich social and religious heritage. With its features, such as the seclusion tower and cisterns, it is one of the unique monasteries in the region. Particularly, the seclusion tower dating back to 792 provides significant information about the religious life of that period. However, there is evidence that this monastery's historical and cultural values were lost and destroyed over time. The demolition of many porticoed areas in the last 15 years was an important sign of structural deterioration and destruction. Based on previous studies, it was observed that the entire porticoed section was still standing around 40 years ago. Over time, the structure, which was vandalized and even graffitied, has been neglected and abandoned for many years. The monastery, which is on the UNESCO World Heritage Tentative List, urgently needs conservation and restoration strategies as of 2024.

This study emphasizes the importance of strategic planning and effective interventions for the conservation and restoration of the Mor Loozor Monastery. It reveals the current architectural condition of the monastery and provides an understanding of the historical and cul-

tural context of the building. The foundation date of the monastery was detailed by associating it with the religious events of the period. The seclusion tower of the monastery provided information about how the monastery was used and transformed over time. The history of the monastery was addressed in the context of the region's cultural heritage regions cultural heritage, and the destruction's dimensions and causes were examined in this context.

The proposed digital methods for preserving the monastery offer new perspectives on how historical buildings can be preserved using modern technology. Photogrammetry and 3D modeling techniques facilitate the detailed documentation of damaged areas and the planning of necessary interventions during restoration. These methods provide time and cost advantages and allow for a more precise and effective execution of the conservation and restoration process. Furthermore, digital archiving and modeling ensure the documentation of the current condition of the monastery for future studies and serve as a reference.

As a result, the examinations reveal that the Mor Loozor Monastery urgently needs conservation and restoration. The existing structural deteriorations demonstrate the necessity of quick and effective interventions to prevent further damage to the structure. The emergency actions include priority interventions such as retrofitting the load-bearing elements, addressing water insulation issues, and repairing the damaged areas. These emergency actions will prevent the monastery from further deterioration. This study provides a comprehensive foundation for the conservation and restoration of the Mor Loozor Monastery. The data obtained is a valuable resource for the preservation of historical heritage and its passing on to future generations. A deeper understanding of the historical and cultural context of the monastery will assist in the more effective planning and implementation of conservation efforts. Digital preservation techniques offer innovative and effective solutions in the restoration process. Accordingly, the development and implementation of comprehensive analyses and strategic plans are of great importance for the conservation and restoration of the Mor Loozor Monastery. The current condition of the monastery and the new perspectives proposed for future conservation efforts are considered an important step in preserving and sustaining historical structures.

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DECLARATION OF COMPETING INTEREST

The author of this article declare that they have no financial, professional or personal conflicts of interest that could have inappropriately influenced this work.

AUTHORSHIP CONTRIBUTION STATEMENT

İzzettin Kutlu: conceptualization, data curation, formal analysis, investigation, methodology, resources, software, visualization, writing – original draft, writing – review & editing.

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