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The Sheikh-Makan Monument in Ilam Province, Western Iran: Fire Temple or Water Mill?

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Abstract

The Sheikh Makan structure in Ilam Province represents one of the most debated architectural remains from the Sasanian period, consistently drawing scholarly attention and controversy. This study employs a systematic methodology to analyze the site's architectural features, construction techniques, and archaeological context in order to determine its primary function. The rectangular complex comprises a central domed chamber, a vaulted iwan, and integrated hydraulic channels elements characteristic of industrial architecture, particularly watermill infrastructure. Notably, the structure lacks key markers typically associated with Sasanian religious architecture, such as circumambulatory corridors, fire temple, and the canonical north-south sacred orientation. In contrast, the building displays unmistakable industrial features, including flour production mechanisms and milling apparatus. A comparative analysis with established Sasanian religious complexes most notably the Negar Fire Temple and the Espakho Temple reveals significant divergences in spatial organization and intended use. Archaeological evidence, supplemented by ethnoarchaeological data, supports the hypothesis of its prolonged use as a hydraulic mill, indicating the functional adaptation of a Sasanian-era construction during later periods. The site's strategic location adjacent to defensive structures and historical trade routes further underscores its economic rather than religious significance. Although some scholars, have proposed a sacred function for the site (suggesting it may have served as a fire temple), the present study definitively identifies the structure's primary role as an industrial facility. It thus offers a paradigmatic example of Sasanian architectural repurposing in the Islamic era. These findings underscore the need for targeted archaeological excavations to resolve existing chronological ambiguities and to trace the developmental trajectory of the building within the broader framework of Iranian architectural history. Ultimately, this research makes a significant contribution to understanding the functional transformation of built environments and the complex interplay between sacred and utilitarian spaces in post-Sasanian Iran.

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1. Introduction

The study of Sasanian architecture presents ongoing interpretive challenges, especially regarding the functional classification of surviving structures. These persistent uncertainties stem from three key issues: (1) inadequate archaeological investigations, (2) discrepancies between traditional typologies and material evidence, and (3) the complex architectural adaptations during the Islamic transition (Tahmasbi, 2012: 1). The Sheikh-Makan monument in Ilam Province exemplifies these scholarly debates, embodying the dynamic relationship between sacred and practical spaces in late antique Iran.

Understanding such transitional structures requires examining the profound spatial changes following the Arab conquests. As Rossi (2023:17-33) demonstrates, the early Islamic period saw significant shifts in settlement patterns, particularly the abandonment of rural religious sites in favor of urban centers. This trend is especially evident in western Iran, where Sasanian rulers had strategically developed Zoroastrian religious infrastructure during their westward expansion (Chen, 2020: 5). Located near the historic city of Seymareh (Darreh Shahr) along important trade routes, the Sheikh-Makan monument offers a valuable case study for analyzing these historical transformations. This study employs a multidisciplinary approach to address the longstanding debate about the monument's original purpose. Through systematic examination of:

- Its rectangular layout with an east-west orientation
- Hydraulic systems including water channels and milling components
- Strategic positioning near Sasanian fortifications
- Architectural similarities to confirmed religious and industrial structures

We aim to develop a more sophisticated understanding of its functional development. The research specifically fills gaps in current scholarship about western Iranian Sasanian architecture and its adaptation during the Islamic period (Hojabri & Karimiān, 2022: 279).

2. Geographical and Historical Contexts of the Sheikh-Makan Structures

Ilam Province is situated in the western part of Iran (Salavarzi and Amouzadeh, 2023: 25), (Fig. 1). The Sheikh-Makan features are located 8 km east of Darreh Shahr (the historical city of Seymareh) within the Sheikh-Makan Gorge (Sheikh-Makho). The Sheikh-Makan Gorge (coordinates: E:47°24'01", N:33°05'51") was formed as a result of a landslide approximately 10,000 years ago (Watson & Wright, 1969). This gorge is near the town of Seymareh (now Darreh Shahr).

However, none of the researchers have mentioned the Sheikh-Makan Gorge and its features. The name of Sheikh-Makan Gorge is derived from the name of the village located 500 meters from the gorge, a shortened form of Sheikh Mohammad Khan in the Lori language (Fig. 2). Within the village, the major monument is the Sheikh-makho Castle, built in 1916 by Mir Seyed Mohammad Khan Ashraf al-Ashayer (Fig. 3).

During Reza Shah Pahlavi's reign (1925-1941 CE), the village was referred to as Sheikh-Makan in administrative documents. The ruins in the Sheikh-Makan Gorge are unique. Approximately 2

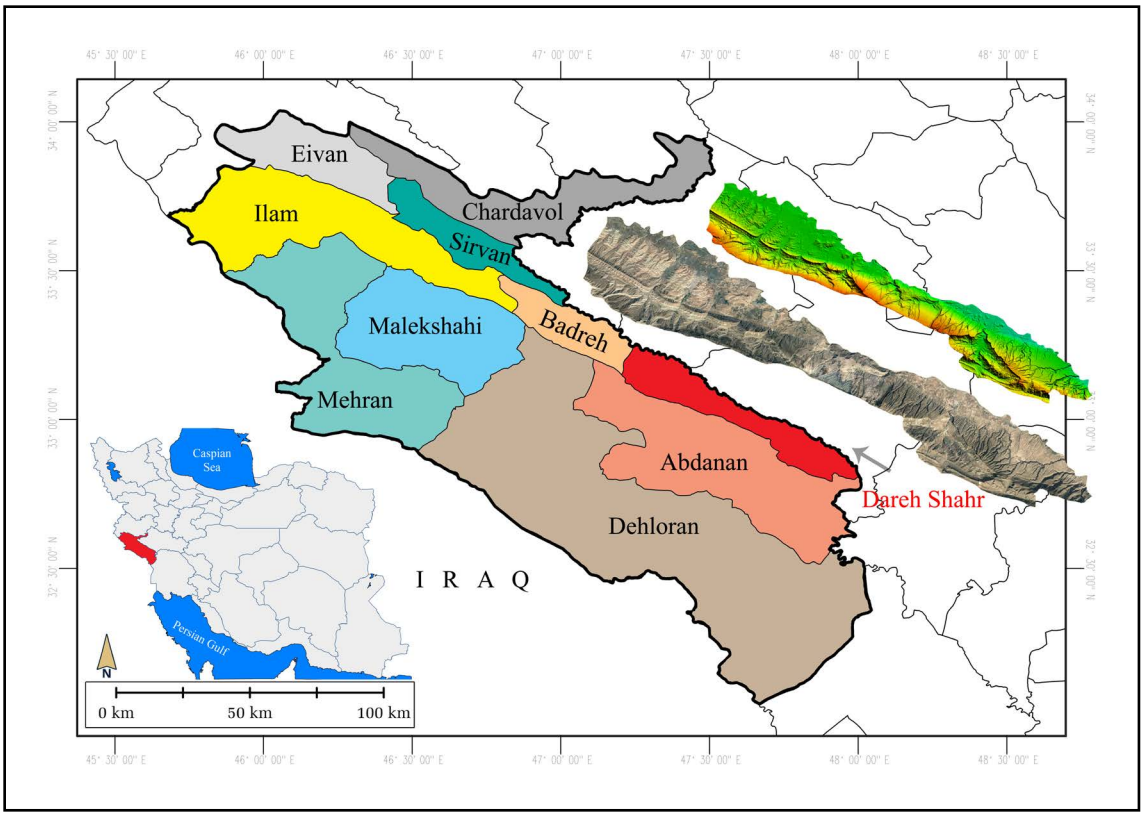

Fig. 1: The Geographical Location of Darreh Shahr County (M. Rokni).

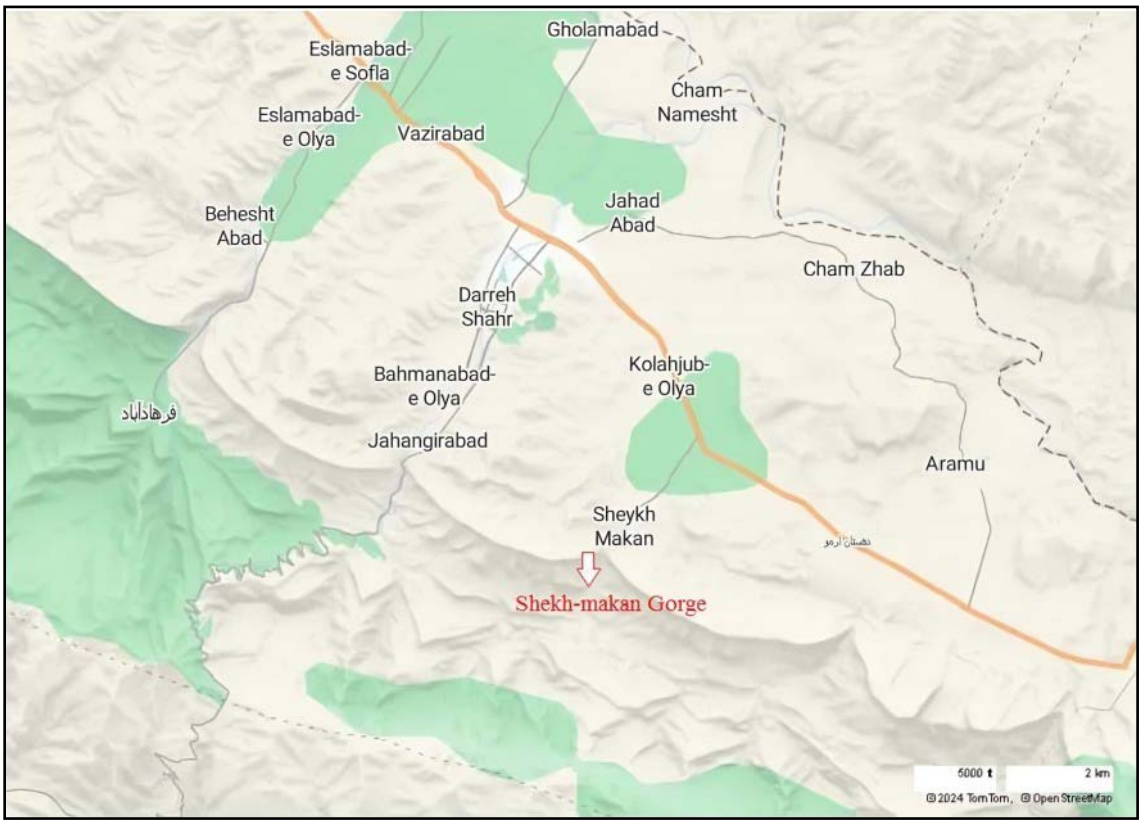

Fig. 2: The Geographical Location of Sheikh Makan (source: Bing Maps, 2024).

Fig. 3: A View of Sheikh Makan Castle in Sheikh Makan Village (https://www.chtn.ir/photo/1402082701496/)

kilometers from the Sheikh-Makan Gorge lies the narrow Bahram Chubin Gorge, located at the foothills of Kabir Kouh. Local legends attribute the ruins found there to Bahram Chubin, a Sasanian general famous for his rebellion against King Khosrow Parviz (Izadpanah, 1977: 421), although some believe the gorge was also a hunting ground. Two historical regions, Mehrjan Qazq (centered in Seymareh) and Masbazan (centered in Sirvan), were situated in the south of Ilam. Iranian and Arab authors such as Ibn Khordadbeh, Ya'qubi, Yaqut al-Hamawi, Mas'udi, Istakhri, Ibn Hawqal, Muqaddasi, Ibn Athir, and Mostowfi indicate that the term "Jebal," meaning "mountainous region," became commonly used to refer to this area and its surroundings after it came under Muslim control. Some sources also refer to it as part of Koust Khurbaran (Marquart, 1994: 37). Blazari attributes its conquest by the Arabs to the year 21 AH, prior to the conquest of Nahavand (Balazari, 1967). Based on these reports, it is clear that the city of Seymareh existed during the Sasanian and subsequent periods.

Rawlinson described Seymareh as a Sasanian city (Rawlinson, 1839), while Morgan identified Darreh Shahrs "Madaktu," the capital of ancient Elam (de Morgan, 1960). Stein suggested the existence of monumental structures from the Parthian and Sasanian periods at the site (Stein, 1940). The oldest aerial photograph of Seymareh, taken in 1935, revealed an area of over 500 hectares (Schmidt, 1940). Izadpanah also examined monumental structures in the region (Izadpanah, 1997). Archaeological surveys began in 1983, with Mo'tamedi initiating excavations in 1995, which continued for nine seasons under Lakpoor's supervision (Lakpoor, 2010). Mazaheri documented water structures, including mills, during his surveys in Darreh Shahr (Mazaheri, 2006), and Sharifinia has recently researched the water mills of modern Seymareh (Sharifinia, 2020).

3. The Sheikh-Makan Gorge Structures

3-1.The Fortress

A Sasanian fortress is constructed on the mountainside, utilizing the mountain wall as its western boundary (Izadpanah, 1977: 420). The fortress overlooks one of the ancient routes leading to Susa. The significance of this fortress lies in its strategic control over the path passing through the gorge (Kambakhsh Fard, 1989; Izadpanah, 1997). The eastern wall, made of rubble stone and partially baked gypsum, reaches a maximum height of 14.5 meters above the fortress roof. The wall is 1.35 cm thick. The exterior surface is finished with plaster. Seventeen steps carved into the mountain lead from the fortress to a roof leading to a circular observation point equipped with battlements, arrow slits, and surveillance openings. Its walls include projections and a lookout fort for effective protection of the gorge. With four rooms and a single entrance on the north side providing a clear view of the passage, the structure is primarily made of rubble and plaster. The nearly impregnable southern remnants of the wall and guard room highlight the fortress's military purpose. The strong enclosure and uniform architectural style indicate that the valley was strategically controlled from both the northern and southern gates (Fig. 4).

Fig. 4: The Sheikh Makan Fortress (Photo by: Ruhollah Gilani).

3-2. The Sheikh-Makan Monument

The Sheikh-Makan monument, located adjacent to the fortress within the gorge, is known today as the water mill by local residents. However, Izadpanah believes that this monument was originally

a fire temple that the local people converted into a mill, making it an important historical structure in the region. The building, made of rubble and plaster, has a simple plan featuring a domed chamber and an eyvan (portico), connected by an entrance. The combination of a dome chamber and eyvan is a common feature in Iranian architecture, utilized in a distinctive manner, with the eastern entrance leading to the eyvan (Shah Mohammad Pour, 2021: 287).

The initial step in understanding the Sheikh-Makan mill involved creating precise documentation to reveal its original geometry. The structure has remnants of a dome in the northern half and has a rectangular plan made of stone and plaster. Identifying its function is challenging, prompting further investigation into its architectural components and spatial elements to clarify uncertainties. To achieve a more accurate understanding than previous studies, modern methods and meticulous analysis are essential. This includes precise documentation of the current architectural state and comparative analyses with water mills and fire temples. However, definitive conclusions can only be reached through scientific excavation. The architectural structure and plan of this mill are quite different from those of other mills in Darreh Shahr County as well as in the rest of Ilam Province (Fig. 5, 6, 7, 8). The building is rectangular, measuring 8.60×4.68 m, and is oriented at an angle along the east-west axis, with the eyvan and main entrance facing east. The structure has not been excavated, so there is no information about the floor. This building includes sections such as the entrance, the miller's room, the furnace, and the water channel, with the area of each part measurable and evaluable separately.

Fig. 5: Sheikh Makan Building, View from the East (Photo by: Ruhollah Gilani).

The building's architectural structure includes the following elements:

- Water Channel: This channel is 11 m long, 2.45 cm wide, and about 1.15 cm thick. As it approaches the furnace opening, its width decreases from 1 m to about 50 cm, apparently to increase the intensity and flow of the water.

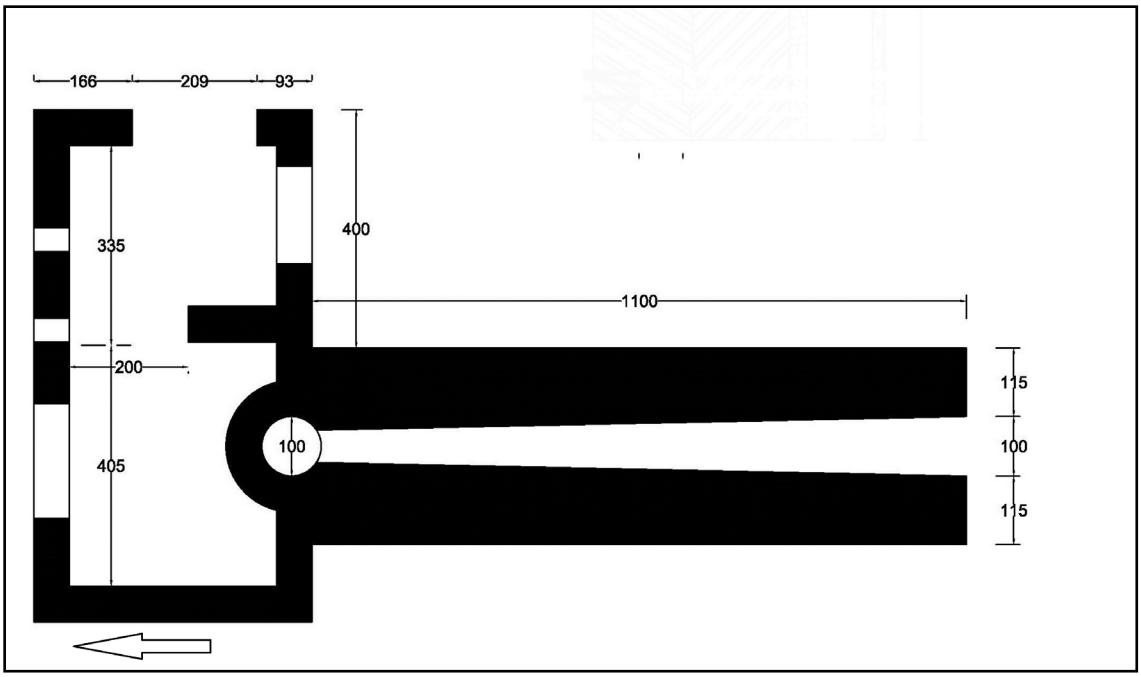

Fig. 6: Plan of Sheikh Makan Building (Author, 2024).

Fig. 7: Sheikh Makan Building, View from Above (Photo by: Ruhollah Gilani).

Fig. 8: A View of the Sheikh Makan Building and Fortress (Photo by: Ruhollah Gilani).

- Furnace: The diameter of its opening is 110 cm, with wall thickness measuring 57 cm.

- Entrance Portal: The entrance portal was intact during Izadpanah's visit and opened to the east. Its dimensions are 2.20×1.10 m.

- Entrance Eyvan (Miller's Room): This space is square-shaped, with an internal area measuring 3.30×3.30 m. In this area, there are two niches with camber arches, measuring 60×80 cm and 47×54 cm. Additionally, on the southern side, there are remnants of a rectangular niche measuring 80 cm in width, with an unspecified height.

- Central Space: This may have been the location of the millstone and features an opening with a pointed arch measuring 2×1.60 m. The internal dimensions of this space are 4.60×3 m. On the northern side, there is a niche measuring 80×90 cm, and on the western side, another niche measuring 80×80 cm. The niches have both arch and flat designs, but there is no complete symmetry among them. The reason for the distribution and duality of the niches in terms of form is unclear.

This structure exhibits three distinguishable architectural phases:

- First Phase: This corresponds to the construction of the western side within the gorge, where remnants of a destroyed furnace can be found at the southeastern end of the water channel.

- Second Phase: The previous furnace was left unused, and a new furnace was constructed to the north, which remained in use until the late Qajar period.

- Third Phase: This may coincide with the restoration and revival of the Pourashraf Castle during the Qajar era, as this mill continued to be utilized until the early Pahlavi period (Mazaheri, 2006: 794).

4. The Sheikh Makan Building as a Fire Temple

Izadpanah (1997) believed that the building was originally a Sasanian fire temple that was converted into an industrial structure after Islam was adopted. He thought that the diversion of water from the river in the gorge toward the structure caused irreparable damage to the original building. The foundation of fire temples during the Sasanian period began with the square structure known as the Sun Temple, featuring a circumambulation corridor in Hatra and the four-arched circumambulation of Kohe Khajeh (Mehrafarin & Ahmadihidayati, 2011: 78). Huff categorizes fire temples with a dome supported by four arches into three groups. The first group consists of a simple dome over a square formed by four arches, having straight, thin walls with three or four entrances. The second group includes four arches with corner columns and arches, with examples featuring a central domed room surrounded by a narrow corridor. The third group, which is less common, is similar to the second group, but instead of a circumambulation, it features an eyvan (Huff, 1987: 245).

One of the most important aspects is the spatial relationship pattern between the eyvan and the dome chamber, which has been widely utilized in the architecture of palaces, tombs, and especially in Iranian mosques. The primary spatial relationship between the dome chamber and the portico has been modified in mosques, transforming this space into a niche. However, the understanding and function of four-arched structures have always faced challenges and ambiguities, with researchers expressing various viewpoints ranging from guiding pathways to ceremonial spaces. In Ilam Province, numerous fire temples and four-arched structures have been

identified, and some have been introduced. However, considering the unique position of this region, which includes the closest routes to Mesopotamia and Ctesiphon, the Sasanian capital, serious studies have not been conducted.

The absence of fire temples along the north-south axis may be attributed to the belief that evil spirits enter from the northern direction, which led to Zoroastrian religious buildings always being oriented away from the north. The most prominent features identifying a building as a Sasanian fire temple, four arches supporting a dome, include a square altar, four internal columns, a covered corridor surrounding the building, and the connection of the fire temple to public ritual sites (Huff & O'Kane, 1990: 634-642). Some pre-Islamic structures were repurposed during the Islamic period into mosques with modifications to their architecture. For instance, the portico of Ctesiphon became one of their first prayer halls (Pope, 2003).

One way to preserve Iranian worship places before Islam was to repurpose them as Islamic places of worship, maintaining their sanctity and allowing these structures to continue serving a new function. This shift primarily involved transforming religious buildings into Islamic sanctuaries, while changes from religious to non-religious functions occurred less frequently. Notably, some transformations were initiated by the Iranians themselves, particularly in the case of sanctuaries like the Imamzadehs, where fire altars from the Sasanian period have been discovered. This topic can be explored alongside other arts and the continuation of Sasanian culture during the Islamic period. Consequently, with the arrival of the Arabs in Iran, the four-arched structure remained the main framework for many mosques and Imamzadehs (Ettinghausen, 2002: 200).

5. The Sheikh Makan Building as a Water Mill

The architecture and components of water mills vary according to climatic conditions, water resource management, and dimensions. The components are generally divided into two categories based on function:

-Technical Spaces: This category includes essential elements for milling operations, such as the "tanooreh" (vertical shaft), "charkhāb" (water wheel), and inlet and outlet channels. All mills, regardless of size, require these components for operation.

-Ancillary Elements: This includes spaces like restrooms, storage areas, bakehouses, and stables. While these do not directly participate in milling, they support milling activities. The mill operates using energy generated by water pressure, which accumulates in the "tanooreh". Water is directed into the tanooreh, exiting with pressure at the bottom, striking the mill's blades to cause rotation. The construction materials include local resources like stone and gypsum mortar.

Water entered the windmill's chamber through a channel from the river within the gorge. This chamber, built with stone and semi-baked crushed gypsum mortar, is durable and resistant to cold, heat, and moisture. The chamber has an external cylindrical shape, with inner walls tapering like a funnel. Water poured from the top into the chamber strikes the wooden turbine, causing the grinding stone to rotate and grind the grains. In the milling system, the speed of the water in the chamber increased due to the reduction in cross-sectional area (Raznik *et al.,* 2003: 82). Currently,

there are no remnants of the grinding stones or the waterwheel (wooden turbine) of this mill.

The entrances to this mill are simple and lack decoration. These entrances were, in fact, the connection points between the various spaces of the mill and the outside world. The presence of multiple niches was a measure to enhance the utility of these spaces and accommodate their various functions. These niches were used for placing tools and household items, as well as reducing the load pressure of the ceiling on the structure, indicating that the primary use was residential. In the past, architects were able to lighten the walls to the desired extent by creating niches at the bottom of the wall, approximately half a meter above the ground, and constructing shelves above them (Pirnia, 1994).

Despite the numerous mills in the region, unfortunately, no intact mill has been identified so far, making it difficult to compare them in terms of layout, components, and architectural structure. However, based on ethnographic studies in the area, the dimensions of the mills were generally around 30 square meters, which somewhat aligns with the dimensions of the Sheikh's building. The city of Darreh Shahr (Seymareh) is called the land of water mills. Wherever there is water in this region, a water mill has been constructed. The grinding stones scattered throughout the ancient city of Seymareh testify to the long history of water mills in this area. The numerous remnants of these mills also indicate the importance of agricultural processing in the region (Sharifinia, 2020). The water mills in Darreh Shahr are of the funnel type, and their distribution pattern, like in other parts of Iran, is directly dependent on the paths of the rivers originating from Kabir Kouh. Most horizontal mills in Iran are fed by rivers flowing down from the mountains (Harverson, 2003: 155).

The structures of mills in the region are generally similar, differing mainly in the materials used. Mills owned by wealthy individuals and local chieftains are constructed with sturdy materials like rubble stone and gypsum mortar, while those belonging to ordinary members of society are made from less durable materials, such as reeds, which have since deteriorated. The funnel section is often the only architectural element remaining from most surviving mills. Management and oversight of these mills were the responsibility of the villagers, with their wages derived from the products processed in the mills; these structures reflect the existing social hierarchy. Unfortunately, many of them have suffered erosion and destruction due to both human and environmental factors (Sharifinia, 2020: 99).

6. Analytical Comparison, Chronology, and Suggested Building Function

In analyzing the architectural patterns used in ancient fire temples, the Sheikh Makan building can be compared to the third type of fire temples, which feature a portico in front of a domed room. It is also comparable to the four-portico structures of Negar in Kerman, Darabagh, Bar Cheshmeh in Farashband, and the Spakho building in North Khorasan, with the distinction that Negar has a narrow corridor surrounding its central domed space (Soleymani, 2015: Fig. 9).

Undoubtedly, similar walls can be found surrounding many of the seemingly isolated four-portico structures and fire temples today. The Spakho prayer building exhibits architectural

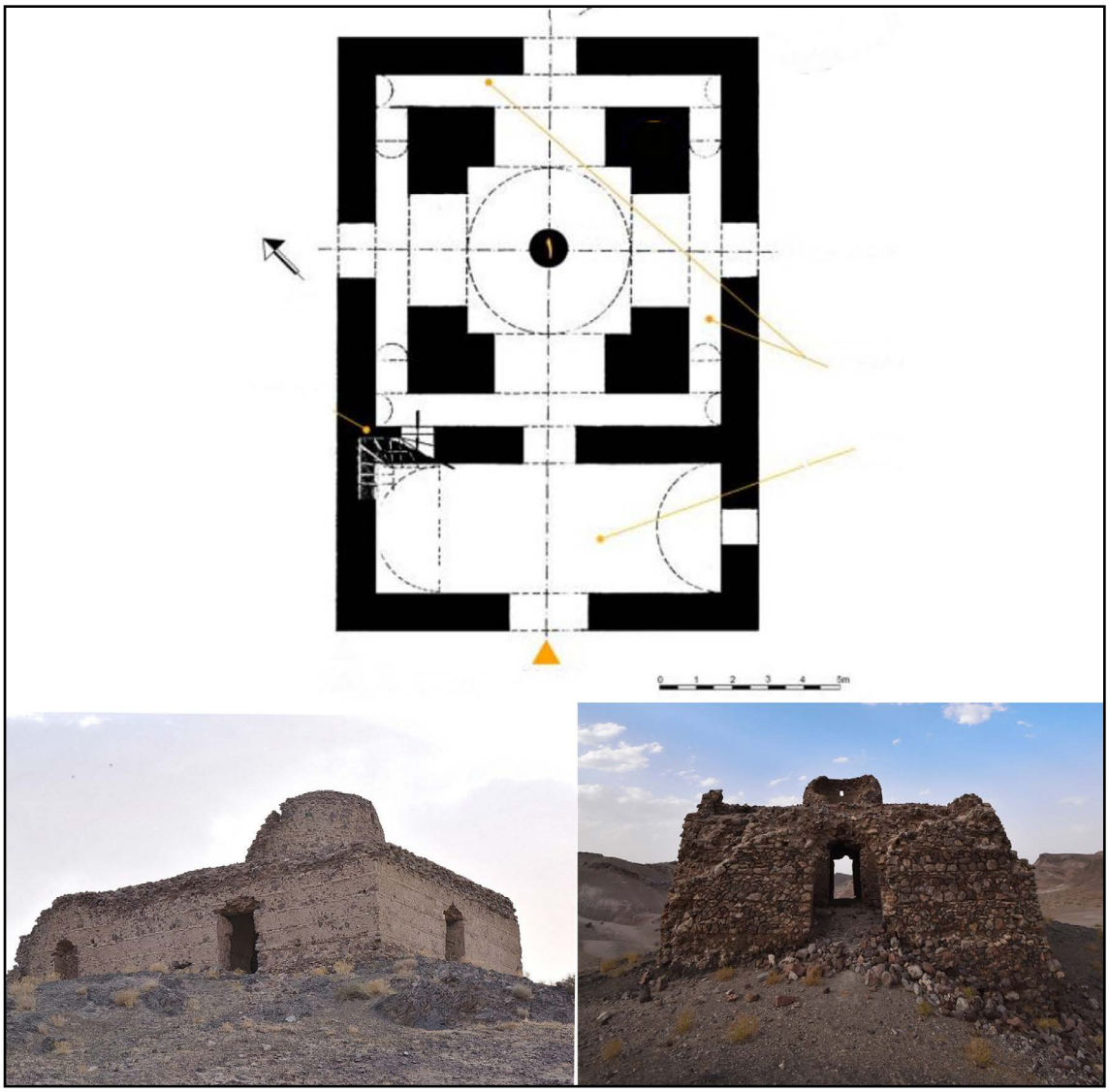

Fig. 9: Negar Fire Temple in Kerman (Soleymani, 2015 & https://iranmonument.com/آتشکدهنگار/).

characteristics of the Sasanian period (Fig. 10), including the main portico of the structure and extensive use of the pointed arch, and its appearance bears a close resemblance to the Sheikh Makan building. By analytically examining all structures known as four-portico buildings and fire temples attributed to the Sasanian-Islamic period, we will conduct a comparative analysis of the Sheikh Makan building alongside the two structures of Negar and Spakho, as presented in the table at the end.

The Sheikh Makan consists of two cubic-shaped rooms, with the front room serving as a porch and built on a natural rocky base. Its plan resembles the third type of fire temples, particularly those with porches. Among various four-arched buildings and fire temples from the Sasanian-Islamic era, it shares similarities with the Negar building in Kerman province and the Spakho building in North Khorasan, though notable differences exist in architectural details. While the exact functions of these buildings remain uncertain, the Negar building appears to possess all the features of a fire temple. In contrast, the Spakho building, with its differing elevations and mihrab-

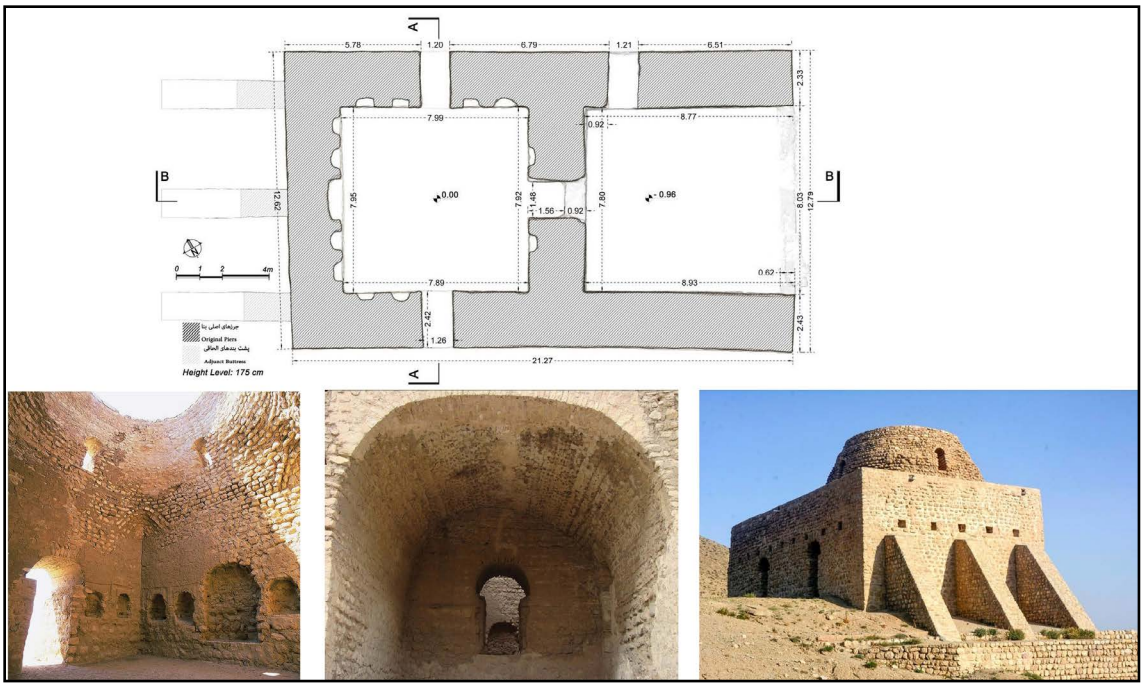

Fig. 10: Spakho Shrine in the Northeast of Iran (Shah Mohammad Pour, 2021).

Table 1: A Comparative Analysis of the Sheikh Makān Structure, Spakho, and the Negār Fire Temple (Author, 2024).

Architectural Elements	Negar	Spakho	Sheikh Makan
Plan	Rectangular	Rectangular	Rectangular
Portico (Eyvan)	✓	✓	✓
Circumambulatory Corridor	✓	-	-
Fire Altar	-	-	-
Platform	-	✓	-
Materials	Rubble stone & semi-baked gypsum mortar	Rubble stone & semi-baked gypsum mortar	Rubble stone & semi-baked gypsum mortar
Building Dimensions (m)	14.16×11.53	21.27×12.79	8.60×4.68
Main Axis of the Building	North-South	East-West	East-West
Entrance Direction	South	East	East
Entrance Arch Covering	camber arch	camber arch	camber arch
Middle Arch Covering	camber arch	Keyhole	Ogee arch
Symmetry	✓	-	-
Niche	-	✓	✓
Dome	Barrel Vault	Barrel Vault	Barrel Vault
Surrounding Elements	-	Cemetery	Military fortress ancient road

shaped recess, suggests it may have served as a place of worship and possibly a burial site (Shah Mohammad Pour, 2021).

7. Comparative Analysis

• **Plan:** The architecture of Negar, like that of other fire temples, is centered around a central point of symmetry determined by the fire altar. In contrast, Spakho and Sheikh Makan emphasize a linear axis that starts from the porch, passes through the middle entrance, and extends to the end wall of the dome room.

• **Circumambulatory Corridor:** All fire temples have a circumambulatory corridor around the dome room, which is visible in the Negar temple. However, there is no such corridor in the Spakho and Sheikh Makan buildings, making it one of the most important architectural elements of fire temples.

• **Fire Altar Base:** In none of the structures has the base of the fire altar been identified.

• **Platform Element:** The platform element is only present at the entrance of the porch in the Spakho building.

• **Construction Materials:** In terms of materials, all three buildings are constructed from local materials in the region, using rubble stone and semi-baked, semi-crushed gypsum mortar.

• **Size Comparison:** The Sheikh Makan building is smaller than the others in terms of dimensions.

• **Arch Design:** The arch covering the entrance in all three buildings is a camber arch; however, the middle entrance in Negar is a camber arch, in Spakho it is keyhole-shaped, and in Sheikh Makan, it is an ogee arch.

• **Symmetry vs. Asymmetry:** The Negar fire temple exhibits symmetry, while the Spakho and Sheikh Makan buildings show asymmetry.

• **Niche Elements:** The niche element is only found in the Spakho and Sheikh Makan buildings, while the Negar fire temple lacks niches.

• **Dome Covering:** The dome covering in all three buildings is a barrel vault.

• **Architectural Decorations:** Architectural decorations are only observed inside the niches of the Spakho building, while the two fire temples, Negar and Sheikh Makan, lack architectural decorations.

By examining the similarities and differences among these three structures, it can be concluded that they share commonalities in their overall plan and elements, including the porch, dome room, materials, camber arch entrance, elevation, and location along routes. However, the Sheikh Makan building lacks the most important architectural element of fire temples: the circumambulatory corridor. Additionally, it is smaller in dimensions compared to the identified fire temples and does not follow the symmetry typically found in fire temple plans. Despite these observations, the Sheikh Makan building, contrary to the proposed hypotheses, resembles the Spakho building more in terms of details, even though it shares a similar plan shape with the rare fire temples that have porches.

The Sheikh Makan building has an east-west orientation, with the entrance of the porch facing east. In contrast, the axis of fire temples is primarily oriented north-south, with notable deviations from the north observed in other fire temples of this period, especially those from the late Sasanian era. Many of the identified four-portico structures by Vanden Bergh also reflect this orientation in Fars, Kerman, and Lorestan, which are oriented according to specific angles, with their entrances facing south. This is also true for the four-portico structures B and X at Takht-e Soleyman (Boucharlat & Lecomte, 1987: 55).

However, some archaeologists believe that the main entrances of certain fire temples, such as the Bandiyan worship building in Darghaz, Shiyan, Mil Milgeh, and Palangerd (Rahbar, 1998:11; Rezvani, 2005; Moradi, 2009; Khosravi *et al.,* 2018: 283), could have faced east. The deviation from north is observed in most fire temples and four-portico structures dating from the early, middle, and late Sasanian periods. After the arrival of Islam, many places of worship from the previous era, such as churches (Creswell, 1969: 157), were also affected. However, in all the cases examined, no structure was found that had a religious or ritual function and was repurposed for non-religious and service-related uses after the advent of Islam. Regarding the Sheikh Makan building, it is noteworthy to consider how a religious structure could have been transformed into a non-religious function. The existence of a mill next to the fortress in the gorge throughout different periods seems logical for facilitating access, supply, and preparation of food for the inhabitants of the fortress.

The Sheikh Makan building in Ilam likely dates from the late Sasanian to early Islamic period, based on its materials, architectural style, and the context of nearby Sasanian structures. Despite the presence of pointed arches suggesting Islamic construction, these arches originated in the late Sasanian era, indicating a gradual transition rather than an abrupt shift in culture. Evidence supports the hypothesis that the Sheikh Makan building functioned as a water mill rather than a fire temple, as it features a rectangular plan, dome chamber, portico, irrigation channels, and flue elements indicative of industrial use. The absence of key fire temple features, such as a circumambulatory corridor and fire altar base, further supports this conclusion. Its preservation is vital, serving as a symbol of traditional knowledge and a potential cultural tourism attraction. Further archaeological research could clarify its history and role in regional social and economic changes, showcasing sustainable resource use.

8. Conclusion

This investigation of the Sheikh-Makan Monument in Ilam Province has provided significant insights into its architectural and functional identity, challenging traditional classifications as either a Sasanian fire temple or a water mill. Through meticulous analysis of its structural characteristics and historical context, this study concludes that the Sheikh-Makan building primarily functioned as a water mill, despite its architectural features suggesting a connection to Sasanian religious practices. Key findings indicate that while the monument exhibits a rectangular plan typical of Sasanian architecture, the absence of essential elements characteristic of fire temples such as a circumambulatory corridor and a fire altar reinforces its identification as a water mill. The architectural layout, including the presence of a water channel and furnace, aligns with known configurations of milling structures in the region, highlighting its practical utility in agricultural processing. Moreover, the historical context of the Sheikh-Makan site emphasizes the adaptive reuse of structures in post-Islamic Iran, reflecting broader socio-economic transformations. This research underscores the importance of further archaeological exploration to uncover additional layers of history and clarify the monument's role within the local community. In summary,

the Sheikh-Makan Monument serves as a vital case study in understanding the complexities of architectural evolution and function in ancient Iran, illustrating how structures can embody multiple identities over time. Future research should focus on systematic excavations and comparative analyses with other regional sites to enhance our comprehension of the interplay between architecture, culture, and economy in historical contexts.

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Authors' Contribution Statement

I am the sole author of this article and was responsible for all aspects of the research and writing process, including: Conceptualization and design of the study, Data collection and analysis, Original draft preparation, Critical revision and editing, Final approval of the manuscript.

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چکیده

بنای شیخ مکان در استان ایلام، به‌عنوان یکی از آثار بحث‌برانگیز معماری دورهٔ ساسانی، همواره محل اختلاف‌نظر پژوهشگران بوده است. این پژوهش به روشی نظام‌مند به بررسی ویژگی‌های معماری، شیوهٔ ساخت و یافته‌های باستان‌شناختی می‌پردازد تا کارکرد اولیهٔ بنا را روشن سازد. ساختار مستطیل‌شکل بنا شامل: تالار گنبدی مرکزی، ایوان طاق‌دار و کانال‌های آبی یکپارچه است که همگی از شاخصه‌های معماری مرتبط با سازه‌های صنعتی، به‌ویژه آسیاب‌های آبی محسوب می‌شوند. نکتهٔ قابل‌تأمل، فقدان عناصر تشخیصی معماری مذهبی ساسانی مانند: راهروی طواف، آتشدان و محور مقدس شمال-جنوب در این بناست. در مقابل، مؤلفه‌های صنعتی مشخصی ازجمله مکانیسم تولید آرد و اجزای آسیاب در آن شناسایی شده است. تحلیل تطبیقی با نمونه‌های شناخته‌شدهٔ معماری مذهبی ساسانی، مانند: آتشکدهٔ نگار و معبد اسپاخو (به‌عنوان یکی از معابد شاخص این دوره) تفاوت‌های بنیادین را در هر دو سطح کالبدی و عملکردی آشکار می‌سازد. شواهد باستان‌شناختی و داده‌های قوم‌باستان‌شناسی حاکی از استفاده طولانی‌مدت از این بنا به‌عنوان آسیاب آبی است که احتمالاً نشانگر بازکاربری عملکردی یک سازهٔ ساسانی در دوره‌های پسین است. موقعیت راهبردی بنا در مجاورت دژ و مسیرهای تجاری نیز بیشتر بر نقش اقتصادی آن تأکید دارد تا کارکرد مذهبی. اگرچه فرضیهٔ کارکرد مذهبی (آتشکده) توسط برخی پژوهشگران مطرح شده، اما این پژوهش با استناد به مدارک موجود، کارکرد اصلی بنا را به‌عنوان یک سازهٔ صنعتی تأیید می‌کند که نمونه‌ای ارزشمند از بازکاربری معماری ساسانی در دوران اسلامی محسوب می‌شود. یافته‌ها بر ضرورت انجام کاوش‌های هدفمند برای روشن‌سازی زوایای تاریک گاهنگاری مطلق و سیر تحول این اثر در تاریخ معماری ایران تأکید می‌ورزد. این پژوهش سهمی مهم در درک فرآیندهای تحول عملکردی فضاهای تاریخی و رابطهٔ پیچیده بین سبک معماری مذهبی و صنعتی در ایران پس از ساسانی دارد.

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