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Prehistoric Floats of Cham Qule, Evidence of Human Responses to Natural Occurrences in the Seimarreh Valley, Central Zagros

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Abstract

The narrow valleys of Seimarreh, with their high ecological potential and strategic location between the lowlands and the Zagros highlands, hold particular significance for archaeological research. Nevertheless, despite the earlier efforts of foreign researchers, the region has rarely been subjected to systematic and focused investigation, with the exception of the Huleilan Valley. The salvage project in the reservoir area of the Seimarreh Dam, initiated in 2009, provided a valuable opportunity to expand our knowledge of the prehistoric and even historic societies of the region. The identification and investigation of important areas such as East Chia Sabz demonstrates the potential for the earliest settlers to have occupied these valleys. Cham Qule is another prehistoric settlement in this area that has yielded evidence dating to the sixth and fifth millennia BCE and was excavated over two seasons. Archaeological evidence points to a notable pattern linking the abandonment of Chia Sabz with the formation of Cham Qule, a transition that extended for about a thousand years. This discontinuity in settlement may have been caused by the massive landslides of Kabir Kouh and Pusht e Bil, which occurred around the end of the eighth or the beginning of the seventh millennium BCE. Given that the lake formed by the damming of the Seimarreh and Kashkan Rivers persisted for about a thousand years, it appears that even after this period, the lake waters had not fully drained. For a further two or three thousand years, river depths and water levels remained higher than at present. Accordingly, the inhabitants of a settlement such as Cham Qule, which is enclosed by canyons with only two narrow gorges providing access to surrounding areas, probably travelled by boat. Evidence recovered from the excavations at Cham Qule should help clarify this hypothesis.

Keywords: Central Zagros, Human Ecology, Village Period, Cham Qule, Boat.

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Introduction

The archaeological salvage project in the catchment basin of the Seimarreh Dam, covering parts of Luristan and Ilam provinces in western Iran, was conducted from the mid 2000s to the early 2010s. This project led to the identification of over 100 archaeological sites (Boroujeni, 2008) and provided the basis for the subsequent reconstruction of chronological sequences (Moghaddam *et al.,* 2008), thereby establishing the groundwork for long term, targeted research in these ecologically favourable habitats. However, these research efforts were ended by the formation of the dam's reservoir.

The significance of the Seimarreh Dam salvage project lies in its potential to provide a coherent cultural sequence for the Central Zagros, particularly given that our current understanding largely derives from excavations undertaken by foreign archaeologists in the northern and western plains, such as Kangavar and Mahidasht. Except for Danish archaeological investigations in the Huleilan Valley, there has been a conspicuous absence of systematically researched settlement sites in Luristan proper. The findings from the early Neolithic settlement of East Chia Sabz (Darabi *et al.,* 2011; Riehl *et al.,* 2012; Darabi, 2015), which formed part of the Seimarreh Dam salvage project, demonstrate the environmental capacity of these prehistoric communities. Furthermore, several settlements dating from the Initial through Late Village periods were excavated within the framework of this project, revealing remarkable environmental features and providing clear evidence of regional and trans regional connections. Among them, the small site of Cham Qule was particularly significant, being located near East Chia Sabz.

Excavations at Cham Qule were carried out over two seasons in 2009 and 2010. The investigations produced cultural evidence spanning the Initial to Late Village periods (corresponding to the late Neolithic and Chalcolithic of the Central Zagros). A rich assemblage of findings was uncovered, including pottery, lithic tools, animal bones, human burials, and plant remain. Additionally, the site yielded a unique and internally consistent architectural complex from Area A, dating to the Late Village period. In this paper, we present clear and tangible evidence of the ecosystem's impact on the lives of prehistoric communities in the Central Zagros highlands, drawing on the discoveries from Cham Qule.

Physiography of the Central Zagros during the Early Holocene

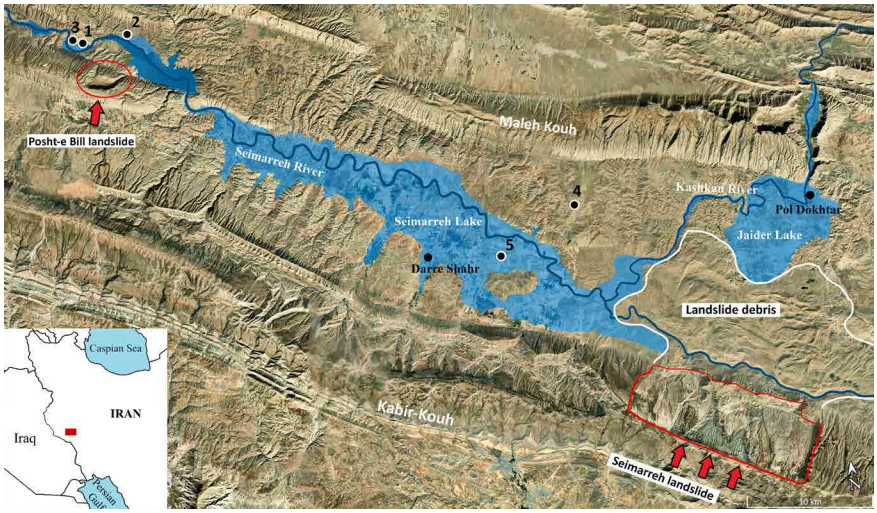
The Central Zagros region, characterised by rugged but orderly highlands interspersed with narrow, water rich valleys that open onto small fertile

plains, represents a key structural feature of the central Zagros. The mountainous area under study, encompassing parts of present day Luristan and Ilam provinces in western Iran, is dominated by the Seimarreh and Kashkan rivers. The Kabirkouh mountain ridge, which historically marked the border between Pishkouh and Poshtkouh, stands as the region's most prominent mountain. This area is a significant reserve of oak, wild pistachio, and hawthorn species within the Zagros mountain range.

Palynological studies conducted at Lake Mirabad indicate that during the early Holocene (8000 to 4500 BCE), there was a high abundance of pistachio pollen. In contrast, the amount of oak pollen was about 30% lower than at present. Additionally, the prevalence of salt tolerant vegetation suggests a drier climate than that of today (Stevens *et al.,* 2006; Van Zeist & Bottema, 1977). However, toward the end of this period there was a sudden increase in oak pollen, signalling a shift to a more humid climate and an improvement over the previously drier conditions.

The climate of the Seimarreh Valley during the Early Holocene was profoundly influenced by the colossal Seimarreh landslide. This landslide, situated on the northern flank of the Kabirkouh ridge overlooking the Seimarreh Valley, is regarded as one of the largest landslides in the world (Harrison, 1946: 62; Oberlander, 1965; Roberts, 2008: 6). It was first identified and described by Harrison and Falcon during their oil exploration project (Harrison *et al.,* 1935; Harrison & Falcon, 1937; Harrison & Falcon, 1938). This complex geological phenomenon involved the slippage of limestone masses from the Asmari formation, resulting in a massive failure extending 16 km in length, 6 km in width, with an average thickness of 400 m from the edge of Kabirkouh at an elevation of about 2,640 m (Shoaei, 2014).

The debris from this natural event, covering an area of approximately 200 square kilometres, led to the obstruction of the confluence of the Seimarreh and Kashkan rivers. This blockage subsequently facilitated the formation of three lakes, namely Seimarreh, Jaider, and Mirabad/Balmak, behind the natural dam (Sharafi, 2015; Delchiaro *et al.,* 2020; Shoaei, 2014; Watson & Wright, 1969), (Fig. 1). The resulting lacustrine deposits, now visible as clay and silty mounds up to 40 m thick (Fig. 2), lie above the deep riverbed of the Seimarreh River. These deposits, situated at an approximate elevation of 630 to 640 m, correspond to the upper terrace of the Seimarreh River (Zeynivand *et al.,* 2018). Taking into account the height of the natural dam, the lake's water level likely exceeded 700 m at its peak, which suggests that the lake may have reached a depth of over 100 m at full capacity.



◄ **Fig. 1: Location of the Seimarreh and Posht-e Bil landslides and distribution of sites mentioned in the text: 1. Cham Qule; 2. East Chia Sabz; 3. Kapargah; 4. Kelek Asad Morad; 5. Kozehgaran (base image from: Google Earth; edit by M. Zeynivand).**

◄ **Fig. 2: Overview of the Kabirkouh rock avalanche (Seimarreh landslide), showing the source area and the landslide debris within the former lake basin (photograph by: Mohsen Zeynivand photograph by: Mohsen Zeynivand).**

The timing of this event has been the subject of investigation by numerous researchers. The most reliable 14C dates for the deposits associated with this event have been obtained by Watson & Wright (1969) and Roberts (2008), who estimate that the landslide occurred approximately 10,000 years ago. Berberian (1994) has reported an earthquake of this age on the Kabirkouh anticline, which could have been the primary cause of the Seimarreh landslide (Shoaei, 2014). This date appears to be consistent with the archaeological evidence, since there is a gap of nearly a thousand years between the early Neolithic and late Neolithic settlements in this area, which may have been influenced by this event. Shoaei (2014) estimated that it took 935 years to breach the dam wall and drain the lake, based on the size and volume of the lake and the hardness of the natural bedrock. As will be discussed later, it is possible that the lake water was not completely drained even after a millennium, and that the water level and depth of

the Seimarreh River remained much higher than at present during the late Holocene/early Middle Holocene.

While researchers have concentrated on the Seimarreh landslide, a similar phenomenon, albeit on a smaller scale, occurred 40 km to the northwest on a distinct fault line north of Kabirkouh and parallel to it. Known locally as Posht e Bil, this landslide overlooks the Seimarreh River and is situated in the vicinity of the contemporary Seimarreh Dam, where its movement altered the course of the river (Fig. 3). The deposits extended to the opposite bank and partially covered the Pre Pottery Neolithic site of East Chia Sabz. The dimensions of this landslide are observable, with a length of 2,500 m, width of 2,100 m, and an approximate thickness of 500 m. Because no laboratory analysis has been undertaken, the exact date of the event is unknown. However, it may coincide with the Seimarreh landslide or may have occurred before 9000 BCE. Archaeological evidence indicates that the East Chia Sabz settlement (Darabi *et al.*, 2011) was established around the ninth millennium BCE, or possibly somewhat earlier, after which the Kapargah settlement (Akbari, 2018) came into existence, with habitation persisting for another thousand years. After a period of abandonment caused by the Seimarreh landslide and the subsequent formation of the lake, human groups returned and resettled in the region by the late seventh millennium. Examples of such reoccupation include the Cham Qule and Cheshme Rajab settlements. Further evidence is provided by the burial of both older settlements (East Chia Sabz and Kapargah) beneath lacustrine sediments, with no subsequent settlements reported in these areas during the later Neolithic period and beyond.

Fig. 3: View of the Posht-e Bil landslide and the reservoir of the Seimarreh Dam (photograph by: Ali Azizi). ▶

Cham Qule

Cham Qule is situated within the catchment area of the Seimarreh Dam, straddling the border between Luristan and Ilam provinces (Central Zagros), and became submerged approximately a decade ago following the filling of the reservoir. The site lies roughly 8 km from the dam's construction site and is located 2,100 m west of the Neolithic site of East Chia Sabz. The extent of the settlement slightly exceeds half a hectare, at an elevation of 667 m asl. Cham Qule developed on a small alluvial fan within an isolated plain. The Seimarreh River flows in a horseshoe shape around the southern extremity of the plain, passing through two gorges on the western and eastern sides, approximately 750 m from Cham Qule (Fig. 4).

◀ **Fig. 4: General view of Cham Qule and its surrounding landscape (photograph by: Abbas Moghaddam).**

Cham Qule was first identified in 2006 by Rasoul Seyedin Boroujeni as part of a salvage archaeological survey project and was designated "Tappeh Dol Keikha" in his report (Boroujeni, 2007). Subsequently, a dedicated and long term salvage project was developed for Cham Qule by one of the authors (A. Moghaddam). However, excavations were conducted in only two seasons, in 2009 and 2010, owing to a lack of funding and the filling of the dam's reservoir, which permanently halted further research at this valuable archaeological site. The excavations focused on three trenches (A, B, and C), (see: Fig. 5). Trench A (initially 4×4 m, later expanded to 14×27 m) was extensively dug in the northern part of the site. Trench B (2×2 m), also located in the north of the site and initially dug by looters, was incorporated into Trench A during the second season. Finally, Trench C (2×2 m), positioned in the southern part of the site, was established for stratigraphic purposes. The surface elevation between Trench A and Trench C was approximately 4 m. The excavations revealed deposits associated with the Initial Village period (Late Neolithic) in Trench C and deposits

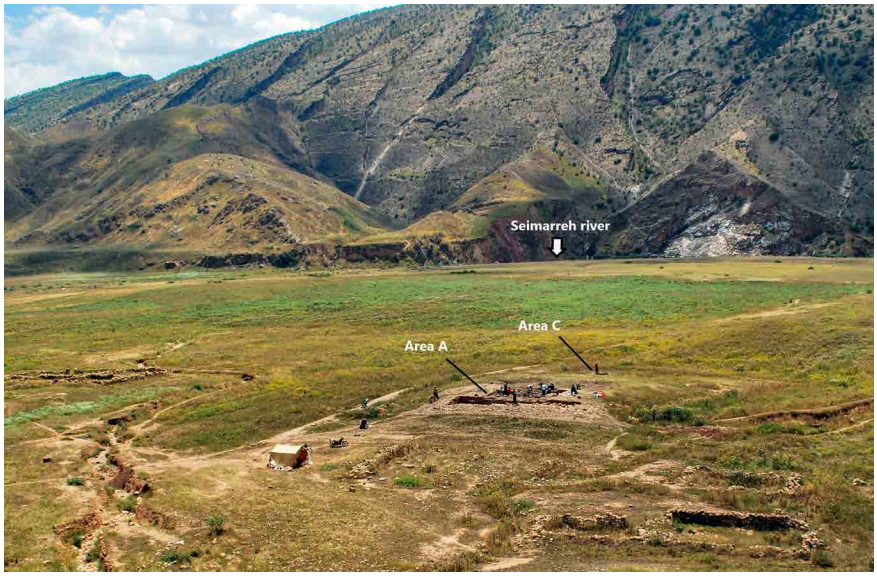


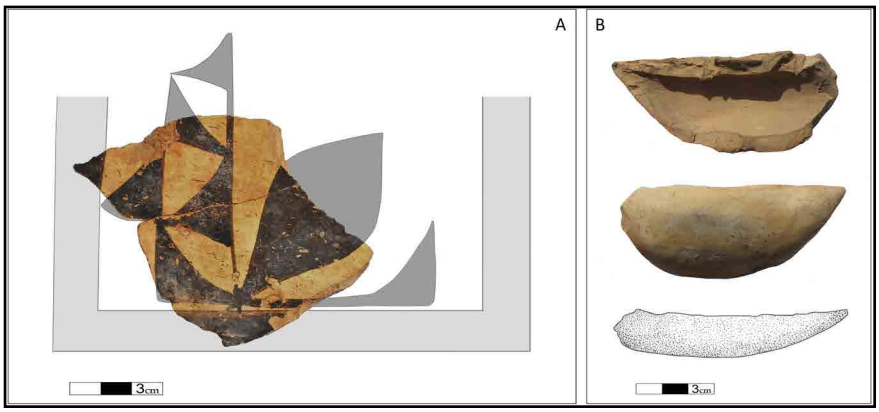
Fig. 5: View of the site showing the locations of Trenches A and C (photograph by: Abbas Moghaddam). ▶

dating to the Middle to Late Village periods (Central Zagros Chalcolithic) in Trench A, including the settlement's upper layers. Comprehensive excavations in Trench A, conducted across five areas and extending into what appears to be an extension of Area 5, uncovered 12 archaeological strata. The five uppermost layers, revealed through extensive excavation, included evidence of two settlement phases. The architecture of the second phase exposed an exceptional stone construction (Fig. 6), remarkably similar to that found at Bahra 1 in Kuwait (Rutkowski, 2011: 33), dating to approximately the 5th millennium BCE. Chronologically, this phase aligns with that same timeframe.

Fig. 6: The second architectural phase identified at Cham Qule (photograph by: Abbas Moghaddam). ▶

Artifacts Associated with Boats from Cham Qule

During two excavation seasons in Trench A at Cham Qule, among other finds, two specific artifacts were unearthed: a pottery fragment with a distinctive motif and a ceramic object, both seemingly related to boats or rafts. The first artifact is a painted pottery sherd bearing black motifs on a buff to brownish background, identified as part of a vessel (Fig. 7a). The depicted motifs are geometric, suggesting the image of a sailing boat. Despite the partial preservation of these motifs, the symmetry in the geometric patterns allows for a speculative reconstruction of their complete forms. The principal motif appears within a frame, delimited by a broad black band visible at the motif's lower section. Above this band is a narrow strip terminating in a filled triangle, forming the primary subject from which the other motifs derive; mirroring this arrangement suggests a form akin to a cockleshell. Completing the vertical motifs on the background, one of which is diagonal and converging at the base, is straightforward using mirroring logic (as demonstrated in: Fig. 7a). Remarkably, this composition evokes the image of a sailboat. The diagonal motif resembles a unified leaf shape, and the vertical motifs include several triangles resembling flags, connected near the scene's base to two poles. The junction of the poles, extending through the boat's body to the base where they are entwined, is clearly observable.



◀ **Fig. 7: Boat-related finds from Cham Qule: (a) painted pottery sherd of Black-on-Buff type; (b) ceramic boat model (?), slightly damaged (Drawing by: Mohsen Zeynivand; photograph by: Abbas Moghaddam).**

This piece was recovered from the third layer of Trench A at Cham Qule. This layer yielded three main types of pottery: Black on Buff, incised and pressure flaked styles associated with the Dalma tradition, and a plain type with a thick red slip (Fig. 8). Dalma style artifacts are rare at Cham Qule, suggesting they were imported from northern regions via the Seimarreh Valley. Apart from a few specimens found at Farrukhabad (Wright 1981: Fig. 10), Cham Qule is the southernmost site in the Seimarreh Valley where this style has been identified. A modest collection of this style was

Fig. 8: Selected ceramics from Phase 3, Trench A (photograph by: Abbas Moghaddam).▶

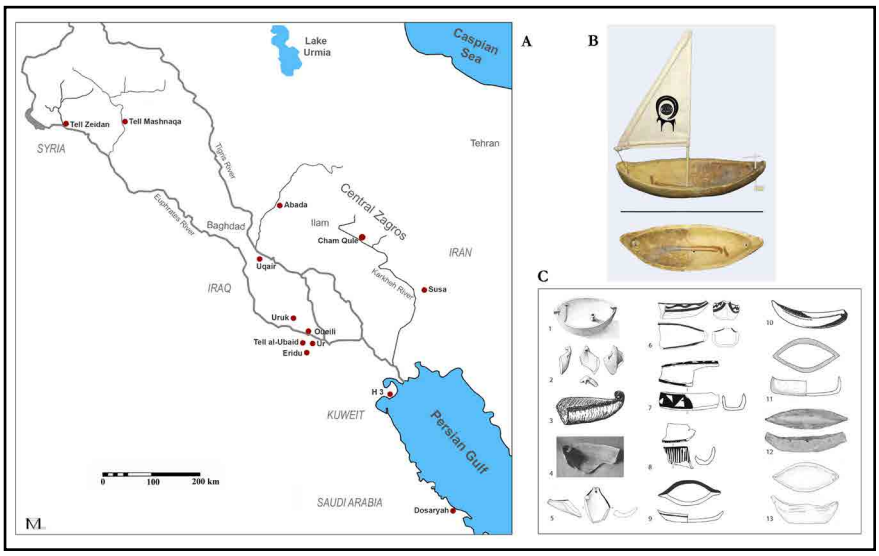
also discovered at the Cheshmeh Rajab settlement to the east of Cham Qule. This style, albeit infrequently, has been found in the Hamrin region and northern Mesopotamia, alongside Ubaid style pottery (for details on the pressure flaked and incised Dalma style, see: Renette 2022). Notably, it appears at Tall e Abada, where this style coexists with Ubaid 3 pottery (Jasim, 2021). The prevalent Black on Buff style is recognizable across the Central Zagros and was popular during the Middle Chalcolithic period of the region. The most significant and nearest comparable examples come from the cemeteries of Hakalan and Parchineh, located respectively 23 km and 38.7 km southwest of Cham Qule. A few instances of the plain Red Slip style, similar to the Plain Red style of Bayat, were also unearthed in this and even some earlier layers, albeit with some stylistic variations. The pottery assemblage from this layer dates to the first half of the 5th millennium BCE.

The second artifact is a ceramic model that was damaged and possibly deformed by physical pressure either before or during firing, as evidenced by one of its altered sides (Fig. 7b). This object is made of a light buff coloured clay and has a somewhat polished exterior. It measures 9 cm in length and 3 cm in height and is devoid of any detailed embellishments. What leads us to consider it a model of a boat is the precisely crafted curve on its underside and the sharp point at the prow. Additionally, the discovery of a pottery sherd with a similar motif supports this interpretation. Compared with similar artifacts found in Mesopotamia, along the southern shores of the Persian Gulf, and a recently discovered object from earlier excavations at Susa, this piece is markedly simpler and more rudimentary.

This simplicity may be attributable either to the potter's unsuccessful attempts at crafting this model or to damage it sustained after manufacture. This ceramic model was retrieved from Layer V of Trench A and is chronologically older than the pottery sherd bearing the "boat" motif. The ceramic assemblage from this layer includes regional and local styles such as black on buff, local plain red, and painted red on buff.

Similar Samples

Given that the boat model and the pottery sherd were recovered from layers dating to the late 6th millennium BCE and the first half of the 5th millennium BCE, and that the pottery sherd corresponds to the black on buff (BOB) style similar to Ubaid pottery, it is appropriate to review comparable examples from this period. Our understanding of the oldest known clay boat models derives from their contexts within significant Ubaid period settlements (see: Carter, 2018). These settlements were typically situated along rivers with abundant flow and at lower elevations throughout Mesopotamia (from modern day southern Iraq to Syria) and along the southern coast of the Persian Gulf (Fig. 9a). Additionally, a previously unreported boat model (Fig. 9b) was identified in the pottery collections stored at the French Castle in Susa by Abbas Alizadeh (Alizadeh, 2020). He compared it with the as Sabiyah (H3) sample and dated it to approximately 4200 BCE, coinciding with the formation of the Acropole settlement at Susa. However, the as Sabiyah sample is notably older.



◄ **Fig. 9: Prehistoric ceramic boat models from southwestern Asia: (a) location of sites from which boat models have been recovered; (b) ceramic boat model from Susa (Alizadeh 2020: fig. 8); (c) boat models from various sites: 1. Eridu; 2. Tell el-Oueili; 3. Al-Ubaid; 4. Tell Zeidan; 5. Dosariyah; 6. Mashnaqa; 7. Tell el-Oueili; 8. Tell el-Oueili; 9. Tell Abada; 10. Uqair; 11. Tell Abada; 12. Uruk; 13. H3/ As-Sabiyah (Carter 2018: fig. 2.7).**

The earliest examples of boat models date to the Ubaid I period, having been discovered at Tell Oueili (Breniquet, 1996: Pl. XXVIII 2 & 3) and Eridu (Safar *et al.,* 1981: 230). Most of the remaining models are attributed

to the Ubaid III and IV periods (see: Fig. 9c). Only three models from Northern Mesopotamia, namely those found at Tell Abada (Jasim, 1985: fig. 63a), Tell Zeidan (Stein, 2010: fig. 5), and Mashanqa (Thuesen, 2000: fig. 5), all date to the Ubaid III period. These sites are located at elevations of 100 m, 300 m, and 300 m above sea level, respectively, making them the highest locations where boat models dating to the Ubaid Period have been found. The boat model from Cham Qule closely resembles the one from Tell Abada in form, except that the Abada model features a horizontal black band painted just under the rim. The Mashanqa model also bears a strong resemblance to the Abada model, being distinguished by the addition of a wavy line. This decorative feature became popular during the Ubaid I period, as both models from Tell Oueili are adorned with paint.

Fig. 10: Bitumen spring near Cham Qule and the use of bitumen to repair a ceramic vessel from the site (photograph by: Abbas Moghaddam). ▶

Aside from the boat motifs on seals that became prevalent during the 4th millennium BCE in Mesopotamia and southwestern Iran, the only older related motif found painted on pottery was identified on a clay disc from the H3 settlement at as Sabiyah on the Persian Gulf coast (Carter 2006: fig. 4). This motif is rendered in a simple and abstract style, depicting a boat with two sails. It appears that the H3 settlement at as Sabiyah is the only prehistoric site where a comprehensive set of archaeological evidence related to boats has been found. Thus, Cham Qule represents the second known site where similar artifacts have been identified, dating to the first half of the 5th millennium BCE.

Conclusion

The discoveries at Cham Qule provide concrete evidence concerning

the lives of inhabitants during the Initial to Late Village periods in the Central Zagros and their interactions with the river. For the first time, boat related artifacts have been identified in the highlands, raising questions about why boats were used in the Zagros highlands in a manner like that of the neighbouring lowlands. Was the turbulent Seimarreh River navigable, or were these items purely symbolic or related to ritual offerings? Furthermore, we must consider whether this technology was adopted from Ubaid settlements.

As discussed previously, a significant landslide occurred in the Seimarreh Valley and had a considerable impact on archaeological interpretations. This event likely influenced both settled societies and communication routes between the lowlands and highlands. The earliest villages in the Seimarreh Valley, East Chia Sabz (Darabi *et al.,* 2011) and Kelek Asad Morad (Moradi *et al.,* 2016), emerged in the 9th millennium BCE but were abruptly abandoned by the 8th millennium BCE, with no further evidence of settlement until the resurgence of activity at Cham Qule and Cheshme Rajab in the late 7th millennium BCE during the Late Neolithic Period. This sequence suggests a gap of nearly a thousand years, which may be attributed to the Seimarreh landslide. Acceptance of Shoaei's (2014) hypothesis of a millennium long lake formed by natural dams on the Seimarreh and Kashkan rivers is consistent with the archaeological evidence. We might further speculate that it took a further one to two thousand years for this lake to fully drain following the dam's rupture. The establishment of several terraces (Sharafi & Bahrololoomi, 2017) overlooking the Seimarreh River supports this view.

Our aim in raising these points is to develop a clearer understanding of the natural environment in which Cham Qule developed. This natural setting likely sustained elevated water levels in the Seimarreh River well into the fifth millennium BCE, before the river eventually incised through the landslide deposits and established its present course. The strategic location of Cham Qule on a natural embankment beside a dynamic river, along with the availability of natural resources such as bitumen, wood, and reeds, would have facilitated technological advancements that improved connectivity and ease of access to surrounding habitats. Even if these innovations were not indigenous and were instead adopted through interactions with western Zagros regions such as Hamrin (Tell Abada) and Greater Susiana (Susa), the environmental capacity and the presence of elites within the communities of the Seimarreh Valley should not be overlooked.

Acknowledgments

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Observation Contribution

This research presents part of the findings from the first author's doctoral dissertation, titled "The Village period settlements of the Seimarreh River Basin on the basis of Cham Quleh", which was defended at the University of Tehran in 2024. The second and third authors supervised this thesis.

Mohsen Zeynivand: Writingoriginal draft; Methodology. Abbas Moghaddam: Investigation-Lead; Project administration; Writing - review & editing; Supervision. Kamal-Aldin Niknami: Writing - review & editing; Supervision.

Conflict of Interest

The Authors, while observing publication ethics in referencing, declare the absence of conflict of interest.

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شناورهای پیش‌ازتاریخی چم‌قوله؛ شاهدی از واکنش انسان به رخ‌دادهای طبیعی در درهٔ سیمره، زاگرس‌مرکزی

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چکیده

دره‌های کم‌عرض سیمره با ظرفیت بالای زیست‌محیطی و موقعیت راهبردی بین سرزمین‌های پست و بلندی‌های زاگرس اهمیت بسیاری در پژوهش‌های باستان‌شناختی دارند. با این‌حال، به‌رغم فعالیت‌های جسته‌وگریختهٔ برخی از پژوهشگران خارجی، جز در درهٔ هلیلان، هیچگاه مورد پژوهش جدی و هدفمند قرار نگرفته‌اند. پروژهٔ نجات‌بخشی حوضهٔ آبگیر سد سیمره که از نیمهٔ دوم دههٔ ۸۰هـ.ش. آغاز شد، فرصت مناسبی بود تا آگاهی ما نسبت به جوامع پیش‌ازتاریخ و حتی تاریخی منطقه فزونی یابد. شناسایی و کاوش در محوطه‌های ارزشمندی همچون چیاسبز شرقی نشان از قابلیت شکل‌گیری روستاهای نخستین در این دره‌ها دارد. چم‌قوله یکی دیگر از زیستگاه‌های پیش‌ازتاریخ این محدوده به‌واسطهٔ وجود نهشته‌های هزاره‌های ششم و پنجم پیش‌ازمیلاد است که طی دو فصل مورد کاوش قرار گرفت. شواهد باستان‌شناختی نشان می‌دهد بین متروک شدن چیاسبز تا شکل‌گیری چم‌قوله که حدود یک‌هزار سال به‌طول انجامیده، الگوی معناداری وجود دارد. این وقفهٔ استقراری می‌تواند ناشی از زمین‌لغزش‌های بزرگ سیمره و پشته‌بیل بوده باشد که تقریباً در اواخر هزارهٔ هشتم/اوایل هزارهٔ هفتم پیش‌ازمیلاد رخ‌داده بودند. یافته‌های مرتبط با قایق (ماکت قایق) از چم‌قوله برای نخستین‌بار از مناطق مرتفع شناسایی شده‌اند و این پرسش مطرح می‌شود؛ چرا در ارتفاعات زاگرس هم‌سو با سرزمین‌های پست از قایق استفاده شده است؟ و اساساً رودخانهٔ خروشان سیمره قابل قایق‌رانی بوده است یا اشیای فوق، نمادین یا در رابطه با نذری هستند؟ وجود حجم عظیمی از رسوبات مارنی برروی محوطه‌های نوسنگیِ بدونِ سفال چیاسبز شرقی و کپرگاه، شکل‌گیری زیستگاه چم‌قوله بر روی رسوبات دریاچه‌ای نشان می‌دهد که در هزارهٔ هفتم پیش‌ازمیلاد درهٔ سیمره و حوضهٔ آبگیر امروزین سد سیمره در سیطرهٔ دریاچه‌ای کهن بوده است. براساس شواهدی که از رخ‌داد زمین‌لغزش دوگانهٔ سیمره ارائه می‌شود، استفاده از قایق توسط جوامع ساکن در چم‌قوله واکنشی است روشن به شرایطی که طبیعت بر زندگی انسانِ پیش‌ازتاریخ تحمیل کرده است.

کلیدواژگان: زاگرس‌مرکزی، زیست‌بوم، دورهٔ روستانشینی، چم‌قوله، قایق.

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