

Identifying settlement strategy and land-use continuity of the prehistoric Şorsu Tepe in Nakhichevan, Azerbaijan

Abstract

This study discusses archaeological research on the Late Chalcolithic to Early Bronze Age cultures in the South Caucasus hilly flank belts, focusing on these societies' mobility and settlement strategies. The material record and site selection reflect changes in social structures. Pastoralism has played a significant role in Nakhichevan's history, but detailed records about pastoral activities, mobility patterns, and the evolution of pastoral strategies still need to be included. This study focused on Şorsu Tepe, an archaeological site in the Nakhichevan River Basin. We conducted stratigraphic excavations and sedimentological inquiries to understand the community's settlement tactics and adaptation strategies. The settlement's architectural evidence provides insights into past communities' daily practices, social structures, and organizational patterns. The geographical background of the study area, Nakhichevan, is described, emphasizing its strategic location connecting different regions. The excavation at Şorsu Tepe revealed three stratigraphic levels with distinctive phases, reflecting changing settlement strategies. This research has proposed terms like "Temporary Campsite," "Seasonal/Temporary Campsite," and "Long-term Stay/Seasonal Campsite" to describe the settlement stages. This study highlights the challenges in identifying the distinctions between nomadic and sedentary lifestyles, suggesting that the settlement at Şorsu Tepe could have served as a temporary campsite or summer pasture. In conclusion, this study underscores the significance of mobility and settlement strategies in shaping the cultures of the South Caucasus region during the Late Chalcolithic to Early Bronze Age.

Keywords: late chalcolithic, early bronze age, architecture, mobility, campsite, Nakhichevan, Azerbaijan

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Introduction

Archaeological research on the Late Chalcolithic to Early Bronze Age cultures of the south Caucasus hilly flank belts have been defined by the paradigm of highly mobile groups,^{1,2} mobile pastoralism,³ transhumant pastoralists⁴ or transhumant nomadic pastoralists.⁵ Researchers have focused on the visible changes in the material record, and site selectivity shows changes in social structures. The traditional concept of the early mobility has primarily ignored the considerable variability and adaptability of economic systems across the South Caucasus and North Iranian. Various investigations reveal that organised mobility⁶⁻⁹ within a defined range is prevalent among nomadic communities globally. Unlike animals, humans premeditate their locomotion, drawing from a significant reservoir of ancestral knowledge about the terrain and its characteristics. The crux lies in the spatial diversity of land utilisation and the temporal shifts in climatic conditions and resources like copper^{10,2} or obsidian,¹¹ underscoring the critical nature of selective survival strategies. Pastoralism stands as a persistent motif within the prehistory of southwest Asia, with pastoral communities assuming pivotal roles in narratives that recount the region's economic, cultural, and political progression spanning from the Neolithic Revolution to the emergence of intricate civilisations.¹² Although scholarly curiosity regarding nomadism or pastoralism exists, along with recognition of its significant and impactful role in various aspects of prehistory, comprehensive records about pastoral activities, including mobility and seasonal patterns and the extended evolution of pastoral life strategy, remain scarce.

Among the primary inquiries concerning early mining and metal production in the South Caucasus,¹⁰ this topic holds particular

significance due to the direct correlation between organizational aspects, the extent, and the importance of mining and extractive metallurgy within the social and economic domains. Therefore, the methodologies encompassing the production of salt, copper, and gold production within semi-nomadic pastoralist communities in the Caucasus region and beyond have been meticulously scrutinized. In these studies, settlement strategies and possible routes for raw material acquisition are discussed, evaluating the commitment of Late Prehistoric Caucasian societies to mining and metal production efforts.³ Although this study does not answer all these problems, it aims to discuss the changes in the settlement selection of the mobile groups and the reasons for their preference, starting from an almost wholly excavated settlement named Şorsu Tepe.

The archaeological significance of habitation sites primarily hinges on architectural evidence. Within the architectural context, exploring spatial arrangements is paramount in comprehending past communities' daily practices, social structure, and organizational patterns.¹³ Social order and its structure take form in the dynamic interplay between humans and their environment. Amidst this progression, the physical space is simultaneously a realm of production.¹⁴ In this perspective, structures encapsulate a historical accumulation of experiences and societal preferences, transcending mere three-dimensional geometry.

Identifying all traces of daily or transient individual or collective life within archaeological remnants is a formidable task. This challenge partly arises due to the potential evidence of recurring daily or seasonal movements accumulating over time. Mobility assumes various classifications contingent upon the nature of community

movement.¹⁵ In cases where “mobility” is the fundamental determinant, the duration and nature of this activity hold significance. Communities are categorized as “nomadic,” “semi-nomadic,” “semi-sedentary,” or “sedentary.” Criteria for assessments rooted in settlement models and attributes encompass “settlement continuity” and “settlement size”.¹⁶ However, it is crucial to acknowledge that the inability to discern mobility is insufficient to label a community as “sedentary.” This principle is equally valid in the reverse scenario. While the quantity, quality, and strategic aspects of mobility fluctuate across different societies and epochs, mobility serves as a means to ensure communities’ access to more efficient resources.¹⁷

Material and methods

There exists an extensive body of literature concerning the history and lifestyle of nomads, encompassing historical sources that underscore the significance of nomadic communities for settled civilizations. However, these sources predominantly stem from individuals external to the nomadic societies, thus seldom offering insights into the day-to-day existence of these collectives. They often interpret from select materials like copper, obsidian, and salt.

Our research within the Nakhichevan River Basin centered on the revitalization of stratigraphic excavations coupled with sedimentological inquiries. We mainly focused on Şorsu Tepe, where preliminary excavations in the initial season (2014) revealed the need for a more thorough investigation. This endeavor carried out from 2016 to 2017, sought to comprehend the purpose and settlement arrangement of the designated area and shed light on the settlement tactics employed by the small community utilizing this space. The initial stage of stratigraphic excavations at Şorsu Tepe aimed to unravel the architectural layout of the site and discern alterations in its utilization over time. Concurrently, the paleoenvironment of the settlement locale was ascertained by delving into the cultural sediment layers of the settlement itself and the underlying or surrounding geomorphological and natural deposits. This approach entailed an interdisciplinary methodology to elucidate the functions, adaptations, and transformations of the various groups frequented this locale. The comprehensive dataset was interdependently analyzed to uncover the settlement strategy and divergences in land utilization. Regrettably, ethnoarchaeological data within the study area were scarce. Drawing from numerous ethnoarchaeological studies, particularly those within Upper Mesopotamia, Levant, and Anatolia, we contextualized the interpretation of settlement architecture and land use. Furthermore, we inferred the driving factors behind the mobility of the groups arriving at Şorsu Tepe by referencing resource-rich areas like copper and obsidian.

Submittal of the study area and its geographical background

Şorsu Tepe, initially discovered during the Babek Region archaeological survey conducted by the Nakhichevan Branch of the Azerbaijan National Academy of Sciences, underwent excavation in 2014 (by V. Baxseliye) and in 2016-2017 (by S. Sarialtun). These excavations were part of the Mission Archéologique du Bassin de l’Araxe, Nakhichevan, Azerbaïdjan Project spearheaded by Veli Baxseliye and Catherine Marro. Şorsu Tepe settlement is positioned on the southern slope of the Şorsu Stream in a geographical transition zone between the mountainous area in the northeast and the lowland area in the southwest (Figure 1a). The settlement is located 1050 m west-southwest of Sirab village and 4.400 m northeast of Kültepe settlement (39°17’52”N 45°29’40” E).

Şorsu Tepe was established atop the hill on the western incline of the low hills encircling the east and southeast, at an elevation of 1035 meters (Figure 1b). The rocky formations extending in a Northeast - Southwest direction to the west of Chantier B and C serve as the settlement’s western boundary. These formations exhibit no signs of habitation on their exterior side. The deepest accumulation layer at the site, which encompasses the natural buildup where the pits of Phase S3 were excavated, measures around 117 centimeters in thickness. If the pits are excluded from consideration, the combined thickness of levels S2 and S1, inclusive of tangible construction activities, is approximately 52 centimeters. The sediment found in the settlement is intermittently composed of ash-enriched brown soil and partially yellowish compact soil. The naturally accumulated soil where the pits were exposed is greyish-brown, sandy, and interspersed with random stones. This layer rests upon the firm, bluish- coloured natural soil (Figure 2).

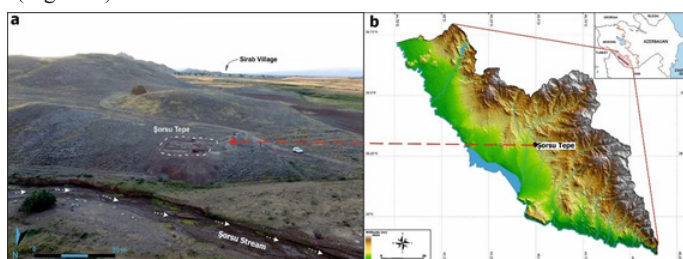


Figure 1 Regional map of Nakhichevan with the prehistoric settlement of Şorsu Tepe in the text.

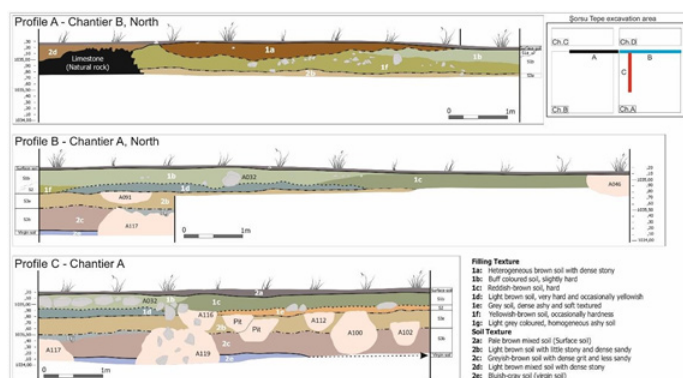


Figure 2 Archaeological remains and sedimentological accumulations at Şorsu Tepe trench profile.

Nakhichevan, positioned between Southern Caucasus, Iran, and Anatolia, exhibits diverse geomorphological features. It is situated to the east of Mount Ararat, on the left bank of the Aras (Araxes) River, and to the south of the Dereleyez and Zangezur ranges of the Lesser Caucasus Mountains.¹⁸ Nakhichevan can essentially be delineated into two distinct morphological structures: lowland regions adjacent to the Aras River and the mountainous expanse encircling the northern and northeastern sectors.¹⁹ The lowest point in Nakhichevan stands at 600 meters, while the summit of Kapıcık Peak reaches an altitude of 3906 meters.²⁰ Given its location at the convergence of east-west and north-south pathways within the southern Caucasus, Nakhichevan enjoys a strategic position that facilitates connections with both the Anatolian region and the Zagros Mountains range, particularly with the Urmia Basin. From Nakhichevan, the most direct and convenient route to Anatolia from the east and/or southeast involves traversing expansive plains through which the Aras River flows. Similarly, access to the Urmia Basin can be attained by following the extensive plains in the northeast-southwest direction.

Şorsu Tepe architectural structure and elements, variations in land use and differentiation of settlement strategy

Şorsu Tepe is one of numerous compact Chalcolithic Kura-Araxes sites amidst the realm, stretching from the lowland plains to the south and extending up to the lower reaches of the elevated mountainous terrain to the north. This area, often referred to as the transition or mid-high mountainous zone, serves as the backdrop for this archaeological gem. Carbon dating using the C14 analysis method places Şorsu Tepe within the 3900-3600 BC.

The years between 2014 and 2017 marked a period of intensive exploration at Şorsu Tepe, ultimately reaching the untouched virgin soil beneath. The archaeological site is divided into three stratigraphic levels, each into five distinct phases. These cultural stages conveniently labelled with the abbreviation “S”, denoting Şorsu Tepe. In broad terms, the earliest phase, Level S3, is marked by various shallow or deep pits scattered across different locations. Within this level, two phases (S3a-S3b) are discerned based on filling characteristics and the spatial arrangement of the pits concerning each other. As we move up to Level S2, only one structure (SB3) comes to light. Notably, remnants of post holes and calcareous surfaces detected in a limited area in the southeast corner of Chantier B hint at a structure fashioned from delicate materials. A unique phenomenon occurs between Levels S2 and S1: a sterile layer, significantly distinct from the other layers, implying a period of abandonment at Şorsu Tepe. The succeeding settlement, belonging to a distinct community with a contrasting architectural tradition, takes root above this sterile layer. Within Level S1, we encounter intriguing features like stone rows or possibly walls (SA1, SB1, and SB2), sherd-paved sections displaying several rounds of renovations, hearths, and partially buried large and small jars (Figure 3).

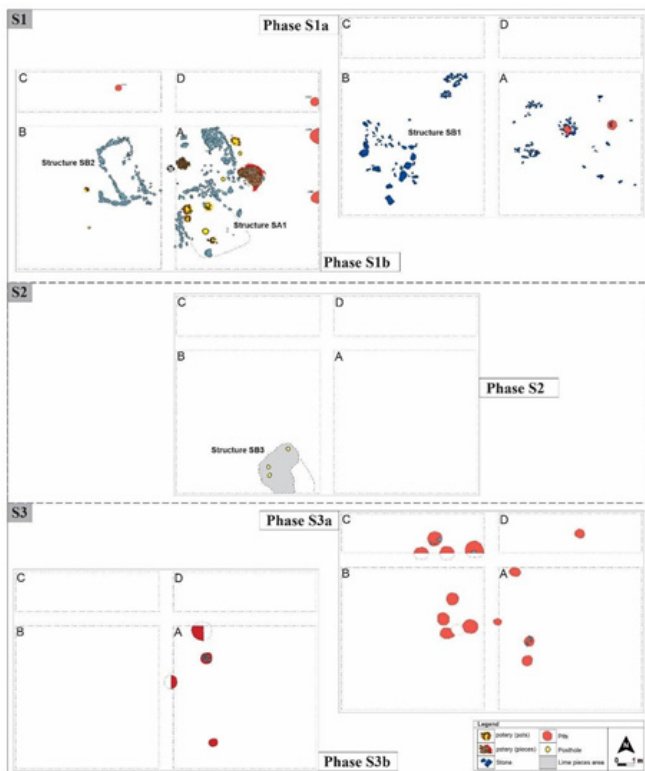


Figure 3 Sequential ordering of the architecture, archaeological remains and pits of Şorsu Tepe according to phases. Scale in drawing is 1 m.

During the earliest stage of this site which is called Level S3, characterized by pits dug into the natural soil (Figure 2), the settlement primarily occupies low hills east and south. Fragmented limestone formations punctuate it to the west. The intermittent Şorsu Stream, which flows along its northern border today, leaves no definite evidence of its presence during the 3900-3600 BC. Nonetheless, the natural boundary formed by the stream’s current location lends credence to the hypothesis of a paleo-stream in the same vicinity. This paleo-stream is believed to have accommodated the first settlement at Şorsu Tepe, nestled within the naturally sheltered area on three sides (Figure 1). Phase S3b features pits of varying sizes dug into a sandy, light brown, and partially yellowish uniform fill. Some Pits delve deeper into the bluish-grey hard virgin soil beneath this fill (Figure 2). Transitioning to Phase S3a, the upper phase of Level S3, reveals the presence of 13 pits scattered throughout the settlement (Figure 3. Figure 4a, Figure 4b). Some of these pits are closely grouped, with an average distance of 1.28 meters between the pits in Chantier B and Chantier C. All these pits have been dug into a yellow clayey fill that has solidified in places. Although devoid of plaster traces, these pits contain ashy deposits or low ash content, alongside some sherds, animal bones, and stones of various sizes. Phase S3b pits contain more sherds than those in the previous phase and are generally larger. Some pits in Chantier B, situated close to each other, hold a wealth of sherds from distinct vessels (Figure 3).

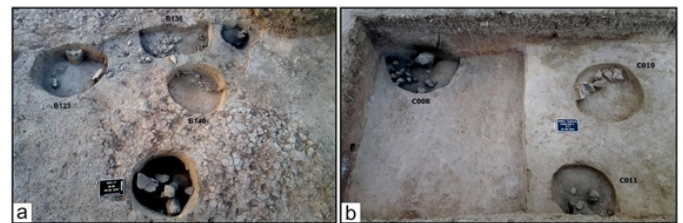


Figure 4 Pits belonging to the Level S3 phase (a- Chantier B pits view from south; b-Chantier C pits view from west), Scale in photo is 30 cm.

The light brown infill of single-stage which is called Level S2 is most pronounced in the southern and southeastern parts of the excavation site. In the southeast corner of Chantier B, structure SB3 is measuring 3.47 x 3.13 meters covers approximately 11 square meters (Figure 3). Noteworthy is the evident calcareous surface and three closely positioned post holes on the western and northern edges of this surface, with diameters ranging from 26 to 29 centimeters. While the exact architectural layout remains uncertain, the structure seems to possess an oval-like form (Figure 5). The absence of plastered or hardened floor surfaces both within and outside the structure leads to the conclusion that the calcareous surface represents the living area of Level S2. Nevertheless, this calcareous surface lacks the characteristics of plaster or a plastered floor. With further investigation needed, the limey surfaces are inferred to be remnants of woven reed mats or organic materials encircling the structure. This interpretation draws support from findings in Jarmo settlement, located on the western slopes of the Zagros Mountain range,²¹ and Sumaki Höyük settlement in the Upper Tigris Basin/Lower.

Garzan Basin,²² where studies show calcified reed/herbaceous plants due to climate change. Hence, it is plausible that Structure SB3 was constructed from perishable materials such as reeds or herbaceous plants.

Level S1 is divided into two phases (Figure 3S1a) (Figure 3S1b), considering the variations in architectural renewal, alterations, and fill attributes. During Phase S1b, representing the initial establishment of this tier, arrays of stones (wall?), structures enclosed by stonework

areas paved with fragments of pottery that either possess single or multiple refurbished foundations, hearths, and four semi-buried large and small jars were uncovered. Although the remnants of S1a are not well-preserved due to its closeness to the surface, indications suggest it needed to be a systematically organized settlement. The sole identified remains consist of Structure SB1 with a rectangular layout in the southwestern part of Excavation Area B (Figure 3S1a). This structure, spanning 3.85 x 2.47 meters, occupies an approximate 10-square-meter area. Structure SB1 encompasses a solitary chamber encircled by a sole row of stones. Given the varying sizes of stones within the rows, either sizable (71x49 - 77x50 cm) or diminutive (11x8 - 13x10 cm), it is inferred that construction lacked meticulous attention. No binding substances, such as mortar, were discovered within the stone enclosure. Furthermore, no traces of posts were identified amid the stone rows or externally from the structure.

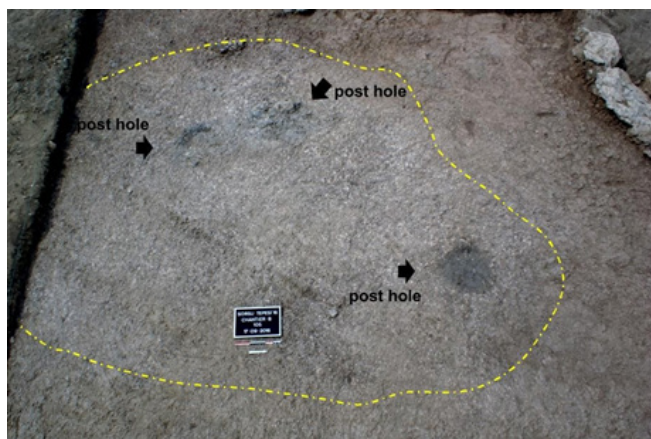


Figure 5 Excavations at Şorsu Tepe showing Structure SB3 in phase S2. Note post-hole on the sides of this structure and traces of lime on the floor. Scale in photo is 30 cm. View from east.

Architectural tradition and settlement layout in Phase S1b, the earliest phase of Level S1, is more intricate and systematic when contrasted with preceding levels S3 and S2 and the subsequent Phase S1a. Phase S1b revealed two architectural formations (SB2 and SA1) oriented in the same direction (Figure 3S1b). The single-chambered, rectangular Structure SB2, measuring 4.53x2.19 meters, covers an area of roughly 10 square meters, excavated in Excavation Area B (Figure 6). The internal space of the room amounts to around 7.80 square meters. A single line of stones of various dimensions encompasses the NE-SW-oriented structure. As in the upper phase, no binding material such as mortar was utilized. It remains uncertain whether the 35-centimetre-wide aperture in the middle of the western wall was due to a doorway or damage. However, the eastern aperture has sustained harm evident from the scattered stones. No indications of post holes accommodating the upper covering were detected, neither amidst the stone rows nor within or outside the structure. In the ethnoarchaeological field surveys in the Upper Tigris Basin, structures encircled by stone rows or surroundings and sheltered with tents were identified in semi-nomadic winter encampments.^{22,23} Ethnoarchaeological research determined that because these temporary structures did not embed posts into the ground, no traces remained when the posts were removed. The field study ascertained that the upper cover of structures with stone surroundings consisted of tents. These tents were secured using a tensioning system, and the posts employed were “movable.” During rainy seasons or when tension adjustments were required for the tent, wooden posts were

relocated from lower areas to achieve the desired tension on the upper covering. Fixing the posts to the ground was unnecessary. In this context, the absence of postholes around the stone rows at the Şorsu Tepe settlement does not signify the non-use of wooden posts in such structures. Notably, the nature of the stone row suggests the possibility of utilizing a lightweight material, such as a tent, for the upper cover.



Figure 6 Showing in phase S1b Structure SB2.

Structure SA1, less well-preserved than Structure SB2, is positioned in the southwestern part of Excavation Area A (Figure 7). The stone rows on the structure's northern, eastern, and western sides are relatively intact, whereas a single stone and a semi-buried jar seem to define its southern boundary. Encompassing nearly 13 square meters, the internal measurements of the single-chambered structure are 4.28x3.14 meters. Its most distinctive aspect is the presence of five semi-buried jars positioned in various areas. Some of these “storage jars” were buried in the ground up to the body, while others were buried up to the neck (Figure 7) (Figure 8).



Figure 7 This photo is showing Phase S1b Structure SA1. Note pots on the west sides of this structure. Scale in photo is 30 cm.

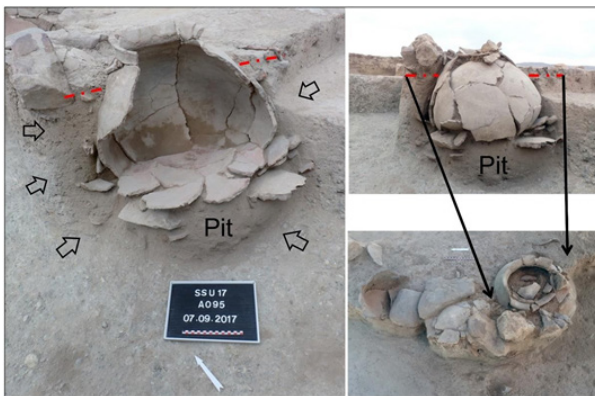


Figure 8 Showing Phase S1b A095 jar which is semi-buried, and it has pit.

Based on the archaeological evidence, particularly the architectural layout and settlement arrangement at the Şorsu Tepe site, it appears that the lifestyle of pastoralist or semi-nomadic groups played a significant role in the Late Chalcolithic-Early Bronze Age mobile communities of the area. However, whether these groups were strictly nomadic herders remains somewhat unclear, given the scarcity of animal bones primarily discovered within pit contexts. The initial habitation during phases S3a and S3b, characterized mainly by pits excavated in virgin soil, might signify a “Temporary Campsite.” The subsequent Level S2, constructed using perishable materials supported by posts, could be termed a “Seasonal/Temporary Campsite.” The latter stages (S1a and S1b), featuring more enduring architectural elements and semi-buried storage containers, could be classified as a “Long-term Stay/Seasonal Campsite” (Table 1).

Table 1 Cultural stages of Şorsu Tepe

Level	Phase	Cultural stage
S1	S1a	Long-term stay/Seasonal Campsite
	S1b	Long-term stay/Permanent settlement with storage jars (?)
S2	S2	Seasonal Campsite/Temporary campsite
S3	S3a	Temporary campsite (Frequently occupied)
	S3b	Temporary campsite

Conclusion

At the onset of the 4th millennium BC, unlike Mesopotamia and Anatolia, urbanization seems to be outside of Nakhichevan. Detecting traces of a connection or interaction between mobile groups’ seasonal pastures and winter encampments and a potential “central settlement” is equally challenging. Nevertheless, drawing from numerous instances of “temporary” or “semi-temporary” settlements that encompass diverse models, such as brief, small-scale camps, daily stations, summer pastures, winter quarters, and more, the cultural landscape of Nakhichevan and its historical context can gain clarity. In this context, it can be affirmed that this lifestyle plays a significant role in shaping the regional culture and elucidating relationships spanning medium to long distances.

Şorsu Tepe does not provide a definitive conclusion regarding nomadic or sedentary lifestyles, and it can be suggested that the pits excavated into the untouched soil notably signify the mobile nature of the earliest settlement. In contrast, sedentary characteristics are more evident in the later phases. Given the topography of the mountainous region and the extent of cultural deposits, including numerous pits, vestiges of transient structures, rectangular formations enclosed by stone rows, and semi-buried jars dispersed across various locations, the settlement situated at an elevation of 1100 meters at Şorsu Tepe

could likely be interpreted as a temporary campsite or a summer pasture.

Indeed, our understanding of the diverse mobile groups utilising Nakhichevan as a transitional zone, or a summer pasture still needs to be improved. Nonetheless, the data emerging from the Şorsu Tepe excavations, encompassing various types of temporary camps, illuminate the semi-nomadic lifestyle during Nakhichevan’s Late Chalcolithic-Early Bronze Age. The presence of sites like Şorsu Tepe and other analogous temporary camp areas in Nakhichevan has prompted a re-evaluation of our perspectives on the cultural landscape during this period.

The settlement strategy in Nakhichevan reveals two distinct hierarchical layers. The first layer consists of “central” larger settlements such as Kültepe and Ovçular, while the second layer involves short-term or seasonal temporary settlements used by “mobile groups.” These groups leverage the natural environmental conditions of the region without possessing a fixed territory and operate autonomously. Based on the initial findings from the Şorsu Tepe excavations, it seems that small settlements, mainly situated around the Nakhichevan Stream, were either temporarily occupied by mobile groups moving in north-south or southwest-northeast directions with their livestock or were solely utilized to reach copper mines or obsidian sources.

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Conflicts of interest

Author declares there are no conflicts of interests.

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