Rock Art Research **2026** - *Volume 43, Number 1, pp. 90-99. L. KYAB*

KEYWORDS: ***Petroglyph – Pictogram – Pre-History – Relative dating – Mustang – Nepal***

PETROGLYPHS AND PASTORALISM: ARCHAEOLOGICAL EVIDENCE FOR HUMAN ADAPTATION IN THE MUSTANG REGION OF THE HIMALAYAS

Lhamo Kyab

Abstract. This study examines the pre-Historic rock art of the Mustang region, Nepal, focusing on petroglyphs and pictograms as crucial indicators of early human activity and expression. The research synthesises data from archaeological excavations, carbon dating analyses and extensive fieldwork across both upper and lower Mustang, with key sites including Kagbeni (སྐག), Samar (མ་དམར), Chuggsang (ཆུག་ས་བཟང་) and Kya (སྐྱ) rock art, serving as a precursor to written language, offers valuable insights into pre-Historic worldviews through various depictions including labyrinths, hunting yaks, geometric patterns, footprints and symbols. Archaeological findings from multiple sites, including Chokhopani, Dzong (རྫོང་ཁུག) and Mebrek (མེ་བྲག) reveal a flourishing pre-Historic culture dating to approximately 2500–2000 BP, corresponding to the late Bronze Age. The prevalence of yak and horse-riding pictograms and petroglyphs witnesses early animal domestication in this high-altitude environment, while the absence of Buddhist symbols supports the artwork's pre-Historic origins. The rock art demonstrates cultural connections across the broader Tibetan Plateau, with similar themes found in western Tibet, Ladakh and Spiti regions. Evidence suggests a gradual transition from wild yak hunting to domestication, alongside the cultivation of buckwheat, indicating complex mixed pastoral-agricultural economies. The paper contextualises Mustang's rock art within the broader archaeological landscape of the Tibetan Plateau, highlighting complex cultural connections and societal developments. The findings underscore the significance of Mustang in understanding pre-Historic human adaptation and artistic expression in challenging high-altitude environments, emphasising the need for further interdisciplinary research to determine the chronological and cultural context of these works, thereby enriching our understanding of the region's pre-Historic narrative and its place in the wider archaeological record of Asia.

1. Introduction

The Himalayan range stands as a formidable natural wall, stretching from western to southeastern Tibet and forming borderlands with several South Asian countries, including Pakistan, India, Nepal, Bhutan and Tibet. This majestic mountain chain, the result of a dramatic continental collision, represents not only the world's highest but also its youngest mountain system. The Tibetan Plateau and surrounding Himalayan regions, situated at elevations between 3000–5000 m above sea level, have witnessed human adaptation to cold, arid and hypoxic conditions for millennia. Archaeological explorations in these regions have yielded significant insights into human activities at high altitudes. Evidence suggests that pre-Historic humans successfully adapted to these extreme environments long ago, leaving behind a rich cultural legacy that continues to be unearthed across Tibet and the Himalayan regions. Among the most fascinating remains of this legacy are the numerous rock art sites scattered throughout the area, offering vivid glimpses into the lives and expressions of ancient inhabitants. The historical tapestry of Mustang is rich and complex, reflecting a region that has witnessed numerous political and cultural shifts. Initially believed to be under the Zhangzhung kingdom, Mustang became part of the Tibetan empire around the 8th–9th centuries ('Bri gong 2015). Subsequently, it fell under the influence of the Ngari kingdoms before establishing itself as an independent principality. Today, Mustang stands as a prominent tourist destination in Nepal, captivating visitors with its ancient, arid landscapes and crumbling structures.

Rock art emerges as a crucial element in tracing pre-Historic cultural distributions and connections across the region. Similar as well as different rock art traditions are found in the Tibetan Ngari area and Himalayan regions, with significant finds in Ladakh, Baltistan, Gilgit, Spiti, Lahaul, Mustang (སྨོན་ཐང་), Ru Thog (རུ་ཐོག), rZa 'Da (རྩ་མདའ), Changthang (བྱང་ཐང་) and

beyond (Sheng and Zhang 2001; Hefner III 2010; Singh and Bhatt 2020: 175–187; Man et al. 2022: 143–154; Bellezza 2024, 2025). These artistic expressions provide a deeper understanding of pre-Historic cultures on the Tibetan Plateau and surrounding areas.

Western explorers first noted pre-Historic artefacts and ancient caves in regions such as Ru thog, sGar, rTsa mda and 'Brongpa in western Tibet, Ladakh, Spiti, Kunu and Zangskar from India, Mustang and Dolpo from Nepal (Tucci 1935: 105–116). Subsequently, scientific excavations have revealed intricate pre-Historic networks linking these areas. For instance, similarities in Neolithic materials suggest connections between western Tibet and the Himalayas with Central Asia, while eastern Tibet shows links to the Hexi corridor and Loess Plateau. Additionally, the discovery of golden masks in Mustang, Guge, Xinjiang and Uttarakhand probably shows historical connections across these mountainous regions. The similarities identified by Devkota suggest a shared artistic tradition or cultural exchange between Mustang and western Tibet during pre-Historic times (Devkota 2017), but there is also a different petroglyphic tradition in those regions as well. The mountainous terrain of Mustang bears a striking resemblance to Tibet's contemporary Ngari region, reflecting shared geographical and environmental characteristics across this trans-Himalayan landscape. This physical similarity extends to cultural practices as well, as demonstrated by recent archaeological research. Modern scholarly investigations have revealed significant parallels between mortuary traditions practised at two distinct sites: Samdzong (བསམ་རྫོང་) in Nepal and Gurugyam (གུ་རུ་གྱམ།) in the ancient kingdom of Guge. These funeral and burial customs, despite being separated at considerable geographical distance, exhibit remarkable cultural continuities that suggest common ancestral practices or sustained cultural exchange across the region (Aldenderfer and Eng 2016).

Focused archaeological explorations in Mustang, particularly regarding cave systems and artefacts, have provided crucial insights into the region's pastoral and agricultural history (Benerjee 1969; Kurt et al. 2003). Archaeological research in the Mustang region shed some light on its pre-Historic culture through carbon dating of burial materials at several key sites. The findings reveal a chronological range spanning approximately 2500–2000 BP, with Chokhopani dating to about 2575 BP, Dzong to 2615 BP, Phudze Ling to 2222 BP and Mebrek to 2565 BP (Mishra 1994: 147–161; Simons et al 1994: 51–75; Tripathee 1994: 76–79). This data collectively points to a flourishing pre-Historic culture in Mustang during a period corresponding to the late Bronze Age.

To comprehensively connect these regions, an interdisciplinary approach is essential. This approach should integrate archaeology, rock art studies, genetic research and geological investigations. While modern administrative boundaries divide these areas into different countries, research perspectives must transcend national borders to capture the full scope of cultural diffusion and interaction. This study focuses on the rock art of Mustang, contextualising it within the wide framework of Himalayan petroglyph and pictogram traditions. Despite some existing publications (Pohle 2003: 1–14; Bellezza and Devkota 2017), the rock art of Mustang remains limited in its research, necessitating more in-depth research to contribute to a holistic understanding of Himalayan pre-History.

This investigation undertakes a systematic analysis of Mustang's rock art through original fieldwork, utilising typological comparison with petroglyph and pictogram traditions documented across other Himalayan regions. Through this comparative methodology, the study seeks to elucidate the intricate web of pre-Historic cultural expression spanning the Trans-Himalayan landscape, thereby advancing scholarly understanding of human adaptation and artistic evolution in one of the world's most challenging high-altitude environments. Furthermore, through the application of interdisciplinary methodologies, this research provides evidence suggesting that pastoral and agricultural economies may have been established within the Mustang region and contiguous areas by the late Bronze Age. This integrative analytical framework enables a more comprehensive understanding of subsistence adaptations and settlement organisation during this critical period of sociocultural transformation in the Tibetan Plateau borderlands.

2. Study area

Mustang, a small Himalayan kingdom with its capital in Upper Mustang, is now an integral part of Nepal. This high-altitude region, ranging from 2000 to 8000 m above sea level, is bordered between 'Brongpa rDzong from Tibet to the north, Dolpo to the west, Myagdi to the south and Manang to the east (Fig 1: 1). Geographically, Mustang is an extension of the Tibetan Plateau, with its name derived from the Tibetan term sMon Thang, meaning 'plain of aspiration'. The Kali Gandaki River serves as the region's primary water source, carving through the barren landscape.

Reminiscent of Ngari Guge in western Tibet, Mustang is an arid terrain with thousands of ancient caves, offering a glimpse into its rich historical past. The region's deep-rooted connections with Tibet are evident in its geographical, cultural and historical aspects (Thapa 2020). Linguistically, the local population communicates in the sTod dialect, while the predominant religious influence comes mainly from the Tibetan Ngor Sakya sect, which is relatively close through the mountain pass. These ties to Tibet are not merely contemporary but are witnessed by archaeological findings throughout the Himalayan regions. The Mustang region keeps a number of archaeological and rock art sites, yet our understanding of its pre-Historic culture remains limited. To address this knowledge gap, my fieldwork concentrated on

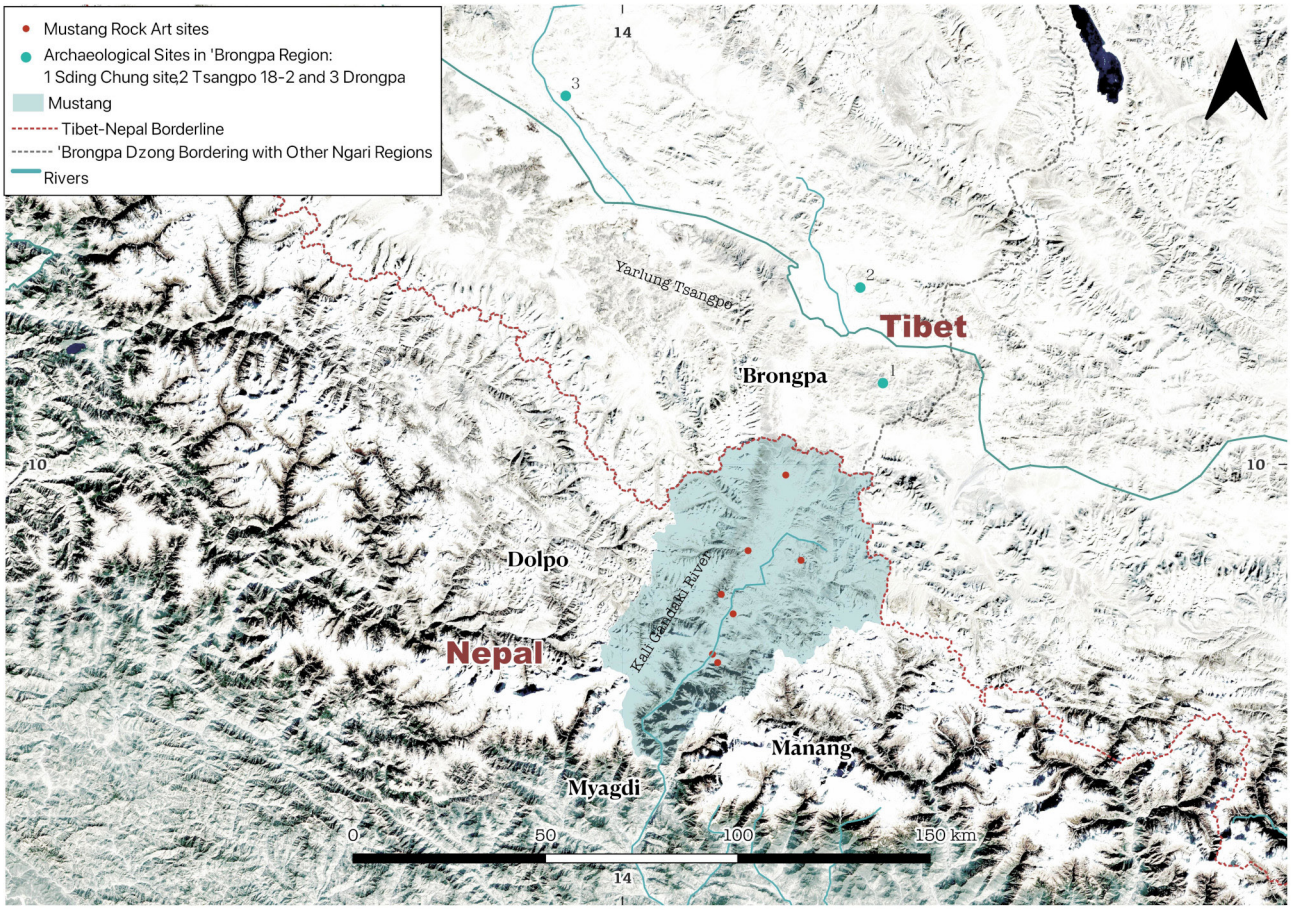

Figure 1. *Map indicating Mustang region with the Tibet-Nepal borderline, the main rock art sites in Mustang and archaeological sites in 'Brongpa dzong. All images by the author.*

Mustang and its rock art, with the primary objective of illuminating aspects of the region's pre-Historic inhabitation, particularly focusing on early pastoralism and agricultural practices. This work is crucial for constructing a more comprehensive narrative of human settlement and development in this unique Himalayan landscape, potentially offering an important contribution to our broader understanding of pre-Historic mountain cultures.

Kagbeni

The Kagbeni petroglyph site represents the most extensive rock art assemblage documented within the region, situated along with the Kali Gandaki River within Kagbeni village, Lower Mustang district, at an elevation of 2700 m above sea level. The surrounding landscape is distinguished by extensive cave networks distributed throughout the Kali Gandaki River valley system, indicating prolonged human occupation of this geographical corridor. While the cultural attribution of these petroglyph traditions remains undetermined, the site constitutes a significant repository for understanding pre-Historic cultural practices within the region.

The site encompasses an extensive corpus of approximately one thousand individual petroglyphs, exhibiting considerable thematic diversity including anthropomorphs, 'wild yaks' (*Bos mutus*), 'bharal' figures (*Pseudois nayaur*), hoofprints, 'yak-riding' compositions, ungulate track impressions, 'solar disc' motifs and various geometric configurations displaying distinctive stylistic characteristics (Fig. 2, Fig. 3: 1–10). These petroglyphic compositions are executed upon sandstone substrates of considerable geological antiquity, indicating sustained traditions of artistic expression within this area. Technical analysis reveals employment of multiple production methodologies, with groove formations likely produced through incision techniques utilising lithic implements, while additional elements demonstrate clear evidence of percussion methods.

The preservation status of the site presents critical concerns, as the petroglyphic assemblage faces imminent deterioration from multiple anthropogenic and environmental factors. Numerous engraved elements have experienced inadvertent burial beneath sediment accumulation, while additional petroglyphs have been deliberately obscured through sand application by construction. Furthermore, proximate industrial development activities pose substantial risks to the archaeological integrity of this cultural resource. The preservation crisis at the Kagbeni site represents an urgent threat to this millennial cultural heritage, with irreversible deterioration processes currently observ-

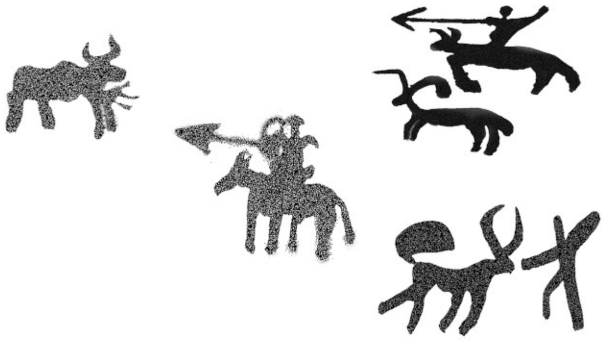

Figure 2. *'Hunting scene' from Kagneni petroglyphs.*

able (Fig. 3: 11–12). The contemporary juxtaposition of ancient artistic traditions with modern developmental pressures underscores the critical necessity for immediate conservation intervention to safeguard this irreplaceable archaeological record for future scholarly investigation and cultural heritage preservation.

Chuggsang

Chuggsang (ཚུགས་བཟང་།) village is positioned within the Mustang fluvial basin at an altitude of 2270 m above sea level. The petroglyph site maintains considerable spatial separation from the settlement, necessitating river traverse and subsequent ascent of an adjacent elevation for site access. Approach to the location requires a demanding 40-minute traverse across geologically unstable terrain characterised by unconsolidated lithic debris and alluvial deposits. The site comprises a singular horizontal rock formation positioned precariously along a precipitous cliff edge, demonstrating structural instability and detachment vulnerability. This lithic surface contains approximately 80 petroglyphic elements, encompassing pedal impressions, geometric configurations, swastika symbols and indeterminate anthropomorphous figures (Fig. 3: 15–16). Distinguished from the Kagbeni assemblage, these petroglyphs were executed utilising percussion-based production methods.

Precise enumeration of petroglyphic elements remains problematic due to extensive superimposition phenomena within the petroglyphic assemblage. Preliminary archaeological assessment indicates potential temporal posteriority of these engravings relative to those documented at Kagbeni and additional Mustang petroglyph localities. The precarious geological positioning of the rock formation presents critical preservation challenges (Fig. 3: 15). Absent immediate protective intervention by regional administrative authorities, geological assessment predicts probable cliff detachment within a three-to-four-year time frame, resulting in irreversible loss of this cultural heritage. While petroglyphic elements remain visually discernible, comprehensive photographic documentation encounters significant impediments due to topographical constraints and positioning. This circumstance emphasises the critical necessity for professional archaeological recording and conservation implementation to preserve this invaluable archaeological resource for subsequent scholarly investigation. The Chuggsang site, distinguished by its unique geographical context, constitutes a significant component within Mustang's broader petroglyphic heritage framework. Preservation and systematic documentation remain essential for a comprehensive understanding of pre-Historic cultural and artistic developmental trajectories across temporal sequences.

Samar rock art

The Samar (ས་དམར།) rock art site, named after the Tibetan term for 'red soil,' is a significant archaeological and cultural landmark in Mustang. Located just 3 km from the main road from Samar, it stands out among Mustang's rock art sites as the only one protected by a metal sheet enclosure. This unique protection appears to stem not from its archaeological value, but rather its perceived religious significance, evidenced by the presence of monetary offerings and ritual remnants. The site features a variety of petroglyphs engraved into numerous boulders, depicting anthropomorphs, geometric patterns, grooves, snakes, labyrinths and hoofprints (Fig. 3: 13–14). Those petroglyphs were created by engraving.

However, many of these motifs have become difficult to discern due to weathering and age. While precise dating remains elusive, the Samar rock art can be set to predate the Chuggsang site, probably originating in the Bronze Age. Despite the lack of absolute dating methods applied to this site, its antiquity and cultural importance make it a valuable subject for further archaeological study and preservation efforts.

Kya

The Kya petroglyphic site, situated within the remote Kya valley adjacent to the historical settlement of old Dhe village (སྦྲེ་ཏྲིང་པ), constitutes a distinctive archaeological manifestation within the broader Mustang petroglyphic corpus. Site accessibility requires extensive logistical coordination, encompassing a three-hour vehicular traverse from Tsarang to the former Dhe, followed by prolonged pedestrian navigation across challenging terrain. The region maintains contemporary occupation by transhumant pastoral communities engaged in seasonal migration patterns, contributing additional ethnographic significance to the archaeological landscape.

The Kya assemblage exhibits distinctive characteristics that differentiate it from contemporaneous Mustang petroglyphic sites. The pictographs were executed utilising red pigment application techniques, depicting complex hunting narratives, 'wild yaks' (*Bos mutus*), 'blue sheep' (*Pseudois nayaur*) figures, canine subjects, stick anthropomorphs and pre-Historic weapons including bow and arrow configurations (Fig. 4). The notable absence of identifiable Historical

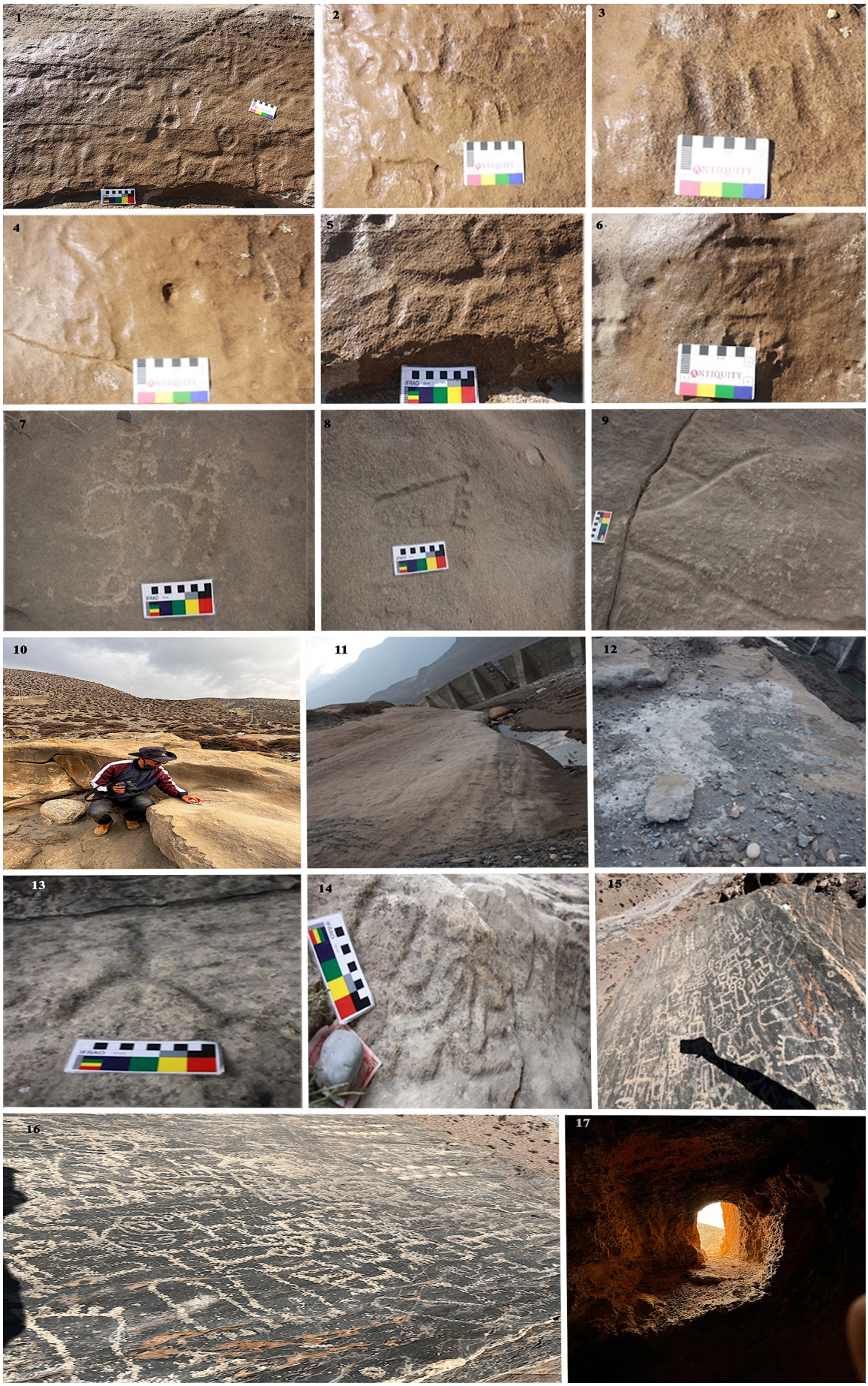

Figure 3. *1–12 petroglyphs from Kagbeni rock art site, 13–14 from Samar rock art site, 15–16 from Chuggsang site, and 17 Nub Pug Cave at Tsoshar.*

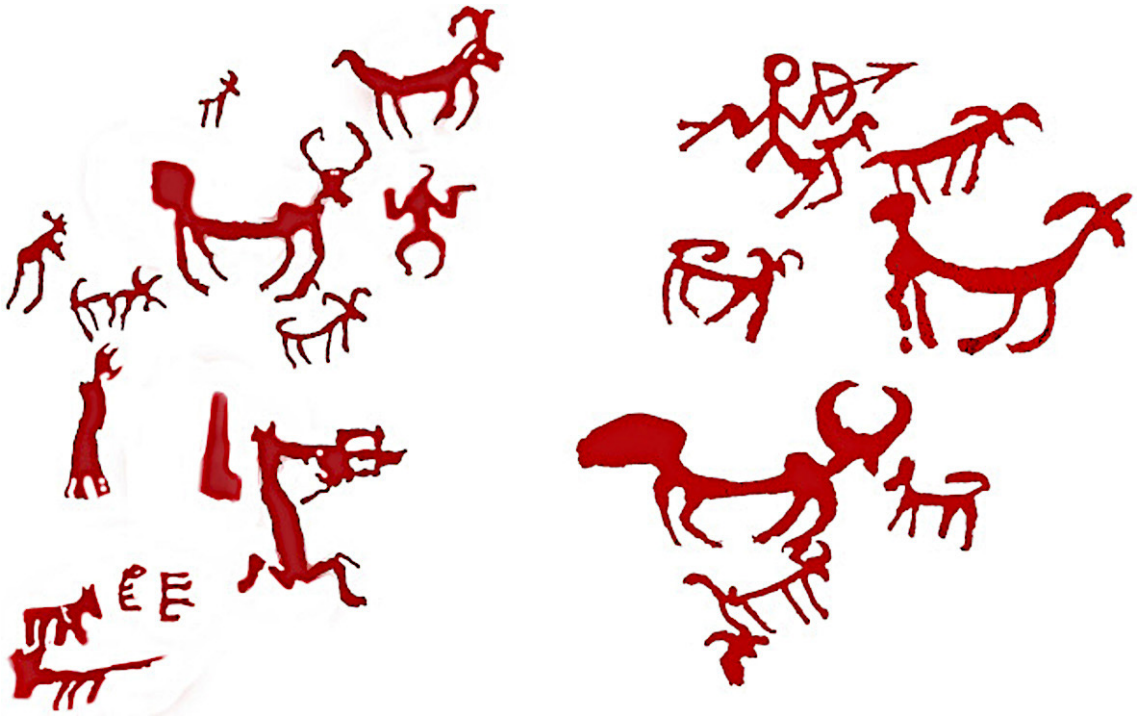

Figure 4. *'Hunting' pictograms from Kya rock art site.*

period markers suggests pre-Historic temporal attribution, providing valuable insights into the subsistence strategies and environmental relationships of ancient high-altitude populations.

The Kya valley preserves exceptional examples of regional rock art traditions, featuring distinctive pictogram compositions that illuminate pre-Historic lifeways within the study area. These visual narratives encompass dynamic hunting sequences depicting stick anthropomorphs utilising archery technology in pursuit of 'wild sheep', alongside representations of 'wild yaks', domesticated canines and presumed solar disc motifs. While absolute chronometric dating remains absent from current documentation, a preliminary study by Devkota (2017) has established foundational archaeological recording. The absence of later-period technological indicators or metallurgical implements within the artistic corpus suggests pre-Metal Age cultural attribution, though definitive chronological determination requires additional investigation. Temporal contemporaneity with cultural manifestations documented at Kagbeni and Samar sites remains plausible.

3. Discussion

The consistency and spread of these dates suggest a time of significant cultural development and increasing societal complexity in this high-altitude Tibet and Himalayan region, offering a glimpse into the rich archaeological heritage of Mustang and its importance in understanding the pre-History of the broader Himalayan area. Archaeological findings comparable to those in western Tibet, along with the discovery of domesticated buckwheat, offer glimpses into the region's pre-Historic economy and cultural connections. While much of Mustang's pre-History remains obscure, ongoing archaeological excavations and rock art studies continue to shed light on the early permanent settlements and cultural links with neighbouring mountainous regions. Some scholars suggest that certain rock art sites in Mustang may date back to the Neolithic period, further emphasising the deep historical roots of human habitation in this fascinating Himalayan landscape (Bellezza 2017).

During my fieldwork in the region, a notable discovery was made among the abundant rock art sites: a recurring motif of a metal axe petroglyph at Kagbeni site (Fig. 3: 1, 5). This particular image stands out for its consistency across various locations, suggesting a metal technological significance among the pre-Historic inhabitants of the area. However, it is important to note that interpretation of this finding is not without complexity. Archaeological findings from absolute dating methods indicate that pre-Historic occupation of the region had domesticated buckwheat by the Bronze Age. Some bronze objects were discovered with mummies in the cave of Mebrek site as well (Kurt et al. 2003: 1529). While the metal axe motif could potentially indicate Metal Age origins, the majority of other themes depicted in the rock art may predate this period. This juxtaposition raises intriguing questions about the chronological development of the rock art and the cultural evolution of the area's inhabitants. Just on the other side of the border area known as the 'Brongpa region, Chinese archaeologists discovered a multi-burial cist at 5000 m asl. They unearthed some artefacts, including a wooden cup, a bronze goblet, ceramic sherds etc. (Lu et al 2022: 750).

4. Yak motifs in the rock art

The Tibetan Plateau, despite lacking definitive archaeological evidence for yak domestication during the Neolithic period, has produced substantive proof of this practice throughout the Bronze Age at archaeological localities including Bangga, Nomuhong, and Chu Gong (Dong et al. 2016: 5; Lu et al. 2021: 955; Chen 2023: 1–13). Within Mustang, archaeological evidence of anthropogenic occupation dating to the Bronze Age has been documented at Dzong cave and Mebrek site, both positioned at considerable geographic distance from the Kagbeni and Chuggsang petroglyphic localities. The more land becomes lower, the less yak-relating petroglyph appear. Comprehensive investigation remains imperative to establish proper contextualisation of these archaeological findings within the broader regional framework of material culture and historical development. The representation of horse and yak riders is particularly significant, as it suggests that the domestication of these animals had already occurred during the period of the petroglyph creation.

The prevalence of yak (*Bos grunniens*) as a dominant petroglyph element within the rock art corpus of the Tibetan Plateau has been extensively documented in archaeological literature. Petroglyphic compositions depicting both the hunting of wild yak populations and anthropomorphic figures mounted on domesticated yaks or horses demonstrate consistent thematic representation across western Tibet regions, including Ru Thog, sGar, Shan sTsa and dGe rGyas counties (Sonam Wangdui 1993: 61–84; DASU and CRBTAR 2001: 32–37). Scholars have debated what these rock art images really mean. Pohle questioned whether the yak hunting scenes actually show real hunting practices or are just symbolic representations (Pohle 2003: 5). However, similar rock art showing wild yak hunting is found throughout the Tibetan Plateau (Bellezza 2023), which suggests these images do represent real hunting activities by people living in high mountain areas. The artwork likely shows how these communities gradually changed from hunting wild animals to domesticating them for herding in these harsh mountain environments.

Traditional hunting methodologies within Tibetan cultural systems encompass specialised techniques targeting specific fauna, including wild yaks, cervids and blue sheep. These practices, developed across generational transmission, demonstrate sophisticated understanding of local faunal behaviour and habitat utilisation. Wild yak hunting has maintained widespread distribution across the Tibetan Plateau (Sonam and Wanggyal 1983: 40), with persistence documented through historical accounts, archaeological evidence and ethnographic research. The economic and cultural significance of these practices within high-altitude communities reflects their integral role in subsistence strategies. Pohle's demographic hypothesis proposes initial habitation of Tibetan-speaking territories by non-Tibetan populations utilising Tibeto-Burman linguistic systems, subsequently undergoing cultural and linguistic shift processes resulting in 'Tibetanisation' or 'Buddhicisation' (Pohle 2003).

In addition, the frequent depiction of wild yaks and sheep in the rock art corpus underscores their central role in pre-Historic regional economies, reflecting broader subsistence and cultural patterns observed across the Tibetan Plateau. The hunting wild yaks and yak-riding depictions from Kagbeni and Kya sites may indicate established pastoral traditions within Mustang (Devkota 2017), correlating with archaeological evidence supporting wild yak (*'brong*) domestication processes (Fig. 4). This domestication narrative finds expression in a traditional Tibetan proverb: "The yak descended from taming the *'brong*, the horse evolved from taming the *rkyang*, the sheep stemmed from taming the *gna'*, and the dog was derived from taming the *spyang*". The rock art of the Tibetan Plateau frequently depicts domesticated animals, including yaks, sheep, horses and dogs, alongside their wild ancestors such as wild yak, wild ass, wild sheep and wolves that continue to inhabit the Ngari and Himalayan regions today. This artistic corpus serves as archaeological evidence documenting the pre-Historic domestication processes that transformed these wild species into the domestic animals central to high-altitude pastoral life. While this traditional knowledge encapsulates pastoral domestication principles, precise chronological parameters remain indeterminate. Based on available material culture evidence and petroglyphic analysis, these developmental processes likely occurred during the Neolithic to Bronze Age transitional period, though comprehensive chronometric investigation remains essential for definitive temporal attribution.

5. Geographic and ethnographic connections

Comparative analysis reveals that analogous thematic compositions depicting yak hunting and yak domestication are prominently featured within the petroglyphic tradition of Ladakh and Spiti regions. These territories have sustained enduring geographical contiguity and ethnographic interconnectedness with the Tibetan Plateau cultural sphere across multiple millennia, constituting a coherent trans-Himalayan civilisational zone.

The historical designation of these territories as Zhangzhung or Ngari within ancient Tibetan textual sources provides documentary evidence of their integrated cultural identity and shared civilisational heritage within the trans-Himalayan cultural complex. This nomenclatural convergence demonstrates the existence of shared socio-cultural systems and pastoral lifestyles that transcended contemporary geopolitical boundaries, thereby establishing these territories as constituent elements of an expansive trans-Himalayan cultural complex characterised by sustained intercultural exchange networks and common civilisational trajectories. The petroglyphic traditions documented in the region may be attributed to populations be-

longing to the branch of Tibeto-Burman linguistic and cultural complex, potentially including groups historically designated by scholars as the Chang ethnic classification. This cultural affiliation suggests a deep temporal continuity in the archaeological record of the trans-Himalayan region.

Archaeological evidence supports the hypothesis that pre-Historic humans utilised established trans-Himalayan corridors as migration routes. These mountain passes, which functioned as vital trade routes connecting the Tibetan plateau with southern regions, likely facilitated not only commercial exchange but also demographic movements and cultural transmission across high-altitude landscapes throughout antiquity. Chinese archaeologists uncovered important pre-Historic artefacts in the cave burials that Tucci had already predicted, such as Dongkar cave, Pyang cave and Gurugyam burial site (Tucci 1973: 14; Lu 2016). Still, some burials he mentioned are yet to be explored. Archaeological research by Mark Aldenderfer has revealed striking similarities between the contents of shaft tombs from western Tibet, dating to approximately 500 BCE to 100 CE, and those discovered in upper Mustang. These parallels in burial goods and tomb construction suggest shared mortuary traditions and cultural practices across this trans-Himalayan region during the late pre-Historic period, indicating sustained cultural connections between communities in western Tibet and the Mustang area (Aldenderfer 2013, 1985: 306, 47–66). Mustang has also thousands of such caves, which were used as pre-Historic and historical dwellings in the region. Some caves were studied, but many are yet to be investigated throughout the Himalayas (Seeber 1994; Tripathee 1994).

Conversely, the observed cultural similarities across these regions may also result from processes of cultural diffusion rather than solely shared ancestry. Archaeological evidence from mortuary practices indicates potential influence from Zoroastrian traditions, suggesting that religious and cultural ideas spread along trade routes and through inter-regional contact, contributing to the convergent burial customs observed in western Tibet, Mustang and surrounding areas. This Zoroastrian influence points to the complex networks of cultural exchange that operated across Central Asia, where religious practices and beliefs transcended geographical boundaries and became incorporated into local traditions (Aldenderfer and Eng 2016).

The Mustang region maintains not only geographical contiguity with the adjacent 'Brongpa territory of western Tibet but also sustained kinship networks that transcend contemporary national boundaries. Historical Tibetan sources document these territories as constituent parts of the Zhangzhung and late Tibetan kingdoms, respectively. Consequently, scholarly analysis of these regions necessitates a transnational framework that transcends modern state-centric approaches to understand their interconnected cultural and historical trajectories (Fig. 1). This transnational cultural landscape demonstrates historical continuity that transcends modern geopolitical divisions. Recent archaeological investigations in the 'Brongpa region have yielded dating evidence from multiple sites, revealing microlithic assemblages and ceramic fragments that provide absolute dating (Hudson et al. 2013: 11, Fig. 1). These radiometric dates establish a comparative temporal framework that may be effectively correlated with settlement patterns and material culture sequences documented in the Mustang archaeological record, thereby contributing to a more comprehensive understanding of regional pre-Historic occupation.

Utilising typological methodologies, the petroglyphic assemblage at the Kagbeni site may be provisionally attributed from the beginning of the Bronze Age to the Iron Age, employing relative chronological techniques. The absence of Buddhist elements at both Kagbeni and Kya petroglyphic sites provides additional corroborative evidence supporting the pre-Historic temporal attribution of these artistic manifestations. The petroglyphic sites of Mustang present a complex cultural and archaeological framework, with Samar site petroglyphs demonstrating morphological similarities to those documented at Kagbeni. The Samar assemblage encompasses recognisable anthropomorphous figures, cupule formations and linear geometric configurations. Analogous cupule motifs have been documented within sectors of the Spiti valley (Ekta et al. 2017). The hoofprint motif demonstrates broader geographical distribution, extending to Lubra locality, where these elements maintain religious significance within local cultural practices. Scholarly analysis indicates that hoofprint and labyrinthine motifs demonstrate widespread distribution across Central Asian petroglyphic traditions (Pohle 2003). According to indigenous informants, comparable petroglyphic manifestations occur extensively throughout Gammey village, predominantly featuring yak hoofprints that appear fossilised within the lithic substrate. While these petroglyphic examples are hypothesised to demonstrate temporal precedence relative to Chuggsang site manifestations, precise chronometric determination remains problematic.

In contrast, the rock art at Chuggsang appears to be of more recent origin than that of the Kag site, potentially spanning the Iron Age through the seventh century CE chronological framework. Conversely, the petroglyphic assemblage at Chuggsang demonstrates apparent temporal posteriority relative to the Kagbeni site, potentially spanning the Iron Age. This assessment derives from the relatively pristine preservation state of the petroglyphs, including the presence of swastika symbolic elements. The Chuggsang site exhibits superimposed compositional designs, complicating individual element identification, though footprints, geometric symbols, concave configurations and 'solar disc' motifs remain discernible (Fig. 3:

15–16). Footprint motifs demonstrate particular prevalence throughout the Mustang region, with specific examples at Lubra monastery attributed to historical personages, including the Bonpo Lama Yangton Tashi Gyaltsen. From an analytical perspective, footprint petroglyphs represent culturally appropriated symbolic systems requiring comprehensive research and analysis to fully comprehend their significance within Mustang's broader archaeological heritage framework. These manifestations potentially represent pre-Historic ritual practices within the regional cultural complex.

The petroglyph assemblage at the Kagbeni site provides visual documentation of pre-Historic pastoral lifeways within the Mustang region. Archaeological discoveries from Bronze Age contexts confirm concurrent buckwheat cultivation practices. Perhaps, the petroglyph corpus depicts yak and horse domestication processes, illustrating the region's traditional mixed economic system incorporating both pastoralism and agricultural production. Buckwheat maintains contemporary cultural significance within Ngari regions, utilised in traditional culinary preparations including *zankong* (ཟན་ཀོང་) and *chang* (ཆང་) beverages. These findings collectively present evidence of complex, well-established pre-Historic societies within Mustang, demonstrating proficiency in both animal husbandry and agricultural cultivation, establishing foundational elements for enduring regional cultural practices.

6. Conclusion

This systematic documentation and analysis of Mustang's pre-Historic rock art establishes a critical framework for understanding early human adaptation in the trans-Himalayan region during the late Bronze Age. Fieldwork conducted at Kagbeni, Samar, Chuggsang and Kya reveals sophisticated pastoral-agricultural economies characterised by yak and horse domestication alongside buckwheat cultivation, with the consistent absence of Buddhist iconography providing compelling evidence for pre-Historic temporal attribution. The recurring motifs of wild yak hunting and mounted riders document an evolutionary transition from hunter-gatherer subsistence to established pastoralism in extreme high-altitude environments, while comparative analysis demonstrates Mustang's integration within extensive cultural networks spanning western Tibet, Ladakh and Spiti through morphological parallels in rock art traditions and mortuary practices, indicating sustained intercultural exchange through trans-Himalayan corridors. Critical research imperatives emerge from this investigation, including the urgent need for direct chronometric techniques—particularly optically stimulated luminescence (OSL) and uranium-series dating—to establish absolute temporal frameworks beyond current typological methodologies, and immediate conservation intervention to address documented threats of geological instability at Chuggsang and anthropogenic deterioration at Kagbeni. Future research trajectories must encompass systematic regional survey to locate undocumented sites, integration of paleoenvironmental reconstructions, genetic analysis of contemporary populations, and expanded comparative studies incorporating recent archaeological discoveries from adjacent territories to fully contextualise Mustang's archaeological record within the broader narrative of pre-Historic highland adaptation and the complex sociocultural transformations that characterised human occupation of one of the most challenging environments.

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