

Rāmāñrai Buddhist Complex at District Buner, Pakistan: Architectural and Hydrological Innovations in Gandhāran Buddhist Complexes

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Abstract

Rāmāñrai Buddhist Complex represents one of the most significant and large Buddhist archaeological sites in the Gandhāran region. The site offers exceptional insights into the architectural, hydrological, and cultural sophistication of ancient Buddhist settlements. Recent surveys have revealed a multi-period occupation at Rāmāñrai, with remains ranging from the prehistoric era to the Buddhist period. The complex features a devastated monumental stūpa and a circular structure atop a shared platform, numerous small stūpas, chapels, monastic complexes, rock-shelters, underground chambers, and a corbelled double-storey building. One of the most striking features of Rāmāñrai is its advanced water management system, which includes spring-fed channels and erosion control embankments, which highlights a high degree of environmental awareness and engineering expertise. The site also contained pre-Buddhist rock art, suggesting earlier ritual or domestic use of the area prior to its Buddhist occupation. Architectural parallels with sites like Takhtihāi and Kushan-era monuments in the Swat Valley suggest royal patronage and cultural continuity within the region. Despite ongoing threats from environmental degradation and encroachment, the Rāmāñrai Complex remains a critical testament to the religious, technological, and artistic achievements of ancient Gandhāran civilization.

Keywords: Buner, Buddhist complex, Hydraulic infrastructures.

1. Introduction

Nestled within the mountainous terrain of Khyber Pakhtunkhwa, District Buner occupies a vital place in the broader narrative of NW South Asia's ancient past (Fig. 1). Buner has been historically integrated into prominent cultural and political realms and has long been a crossroads of civilizations and ideas (Samad and Khan 2016: 1). Over the years, archaeological investigations, most notably the 2014-2015 surveys conducted by the Directorate of Archaeology and Museums, Government of Khyber

Pakhtunkhwa, have brought to light a wealth of sites that span a vast chronological spectrum, from the prehistoric period down to the British era (Samad and Khan 2016: 1-74). Among these, the Rāmāñrai Buddhist Complex near Balo Khān village (and Pīr Bābā) emerges as a particularly significant find, shedding new light on the spiritual and architectural traditions that once flourished in the area. Stein (1929, 1930) was among the earliest scholars to document Rāmāñrai, describing extensive habitational ruins with Gandhāran style masonry, including towers, houses, security posts, and numerous stūpas. Later, Rehman et al. (1996) and Khattak (1997) detailed the site's grandeur, highlighting a massive stūpa, small votive stūpas, monasteries, staircases, rock-shelters with lime-plastered and decorated ceilings, watchtowers, and multi-storied structures. Samad and Khan (2016) added that the site exhibits remains from the prehistoric, Buddhist, and Hindu Shāhi periods. Khan, Z.H. (2018) emphasized Rāmāñrai as one of the largest Buddhist settlements in Buner, featuring several stūpas, buildings, and extensive pre-Buddhist rock shelters with rock art vanished long before.

2. Geography

Geographically, the Rāmāñrai Buddhist Complex is situated along a prominent ridge to the east of Alaksar, part of the Mount Ilam range (Fig. 2). The site lies approximately 5.5 kilometers west of the spiritual hub of Pīr Bābā and the village of Balo Khān, and it is also accessible via the ancient site of Bangosar near Bhāi Kalay. Administratively, the site falls within Tehsil Gadaizi and the Malakpur Union Council. Stretching over a linear distance of roughly 1.4 kilometers from east to west and a kilometer from north to south, the complex occupies an elevated position with its geographical coordinates ranging from 34.608075 N, 72.398002 E to 34.611618 N, 72.406013 E. Perched at an altitude varying between 1450 and 1900 meters above sea level, this lofty location not only provided strategic visibility in ancient times but also contributes to the site's remarkable preservation and scenic isolation, making it a commanding presence within the landscape of Buner.

3. Archaeological Remains at Rāmāñrai

The Rāmāñrai Buddhist Complex presents a rich archaeological landscape with evidence spanning from the prehistoric to the Buddhist periods. Early

surveys reported several Pre-Buddhist caves, rock-shelters, and rock paintings, particularly on the steep slopes and under overhangs of Alak Sar/Garhai Sar (Khan, Z.H. 2018: 142). Some of these rock-shelters may have later been re-occupied by Buddhist communities (Khan, Z.H. 2018: 146). One notable rock-shelter in the northern portion of the site, measuring approximately 4 by 2 meters internally, once bore ceiling paintings from Buddhist period (Khattak 1997: 74-77), though these have since been lost (Khan, Z.H. 2018: 142-146). According to Khattak the surviving wall within this shelter features floral, geometric, human, and faunal motifs that appear distinct from typical Buddhist iconography, suggesting a possible pre-Buddhist origin. Unfortunately, the ongoing use of this shelter as a kitchen by a nearby military post has threatened the preservation of this fragile artwork (Figs 3-4). Additional rock-shelters are located on the western side of the site, beneath steep granite cliffs which are provided with walls on its sides and lower portion (Figs 4-6).

Rāmāñrai is among the most significant and large Buddhist sites in Buner District, notable for its extensive layout and massive architecture. The site is largely covered by massive granite boulders (Figs 3, 5-6), which have been integrated into its construction. Architectural remains of the site include a main stūpa, numerous small stūpas, surrounding chapels, isolated monastic cells, wells, a central water tank, a circular watchtower, underground chambers, corbelled double-storey buildings, stairways, bathrooms or tanks adjacent to springs, and massive retaining blockades constructed to prevent erosion. The western portion of the site, with its irregularly arranged structures, resembles a network of ancient streets and residential units (Khan, Z.H. 2018: 162-164).

The stūpas at Rāmāñrai are distributed in three primary areas: the main stūpa complex (Fig. 7), a group of small stūpas nearby (Fig. 8), and scattered individual stūpas across the site (Fig. 10). The main stupa complex, situated on a minor plain in the western sector, consists of two types of buildings standing atop a rectangular platform measuring approximately 24 by 14 meters and elevated two meters above the surrounding ground: a monumental stūpa and a circular structure that may be either a stūpa that has been hollowed out in search for relics in modern times or a circular shrine. Access is provided by staircases on the northern and eastern sides. The main stūpa (Figs 7, 9), now standing with a maximum height of c. 2.7 meters, occupies the western end of the platform, while the other circular structure, mostly destroyed by treasure hunters,

lies on the eastern side. The latter preserves remnants of its base in the form of a double course of dressed stone blocks (Fig. 11).

Surrounding the main stūpa complex, numerous small stūpas are built atop large boulders (Fig. 8), particularly toward the south, east, and northeast. Some of these boulders are naturally accessible, while others are equipped with steps. The small stūpas, typically with a square or round podium, have suffered significant damage due to natural weathering and smugglers' activity. Adjacent to these stūpas are small chapels measuring approximately 2 by 2 meters (Fig. 12), built either directly onto boulders or platforms that correspond to the original elevation of the main monument. Additional stūpas (Figs 10, 13), about six in total, are scattered across the southeastern and eastern portions of the site.

Several monastic complexes have been identified to the southeast, east, and northeast of the main stūpa complex (Figs 12, 14). Although only partial remains of these monasteries survive today, the best-preserved example lies near the northern rock-shelter. However, part of this complex has been lost due to agricultural encroachment. The central and western parts of the site are dotted with rock-shelters, two of which contain built structures and internal steps, possibly used for storage (Fig. 6).

Water management infrastructure at the site includes three active springs (Figs 5, 15) descending from Alak/Garhai Sar, which have been skillfully channeled through masonry conduits (Figs 5, 16-17). In addition, two wells and a large central water tank are present, likely used for rainwater collection or ritual ablution. A small bathroom structure is also located near one of the springs in the central area, featuring a doorway that opens into the spring, a floor paved with square slabs, and a central drainage channel.

Due to the site's steep terrain, steps are strategically placed throughout the area to facilitate movement (Fig. 18), while large masonry blockades have been constructed to mitigate erosion during heavy rainfall (Fig. 19). Other secular structures include houses, streets, underground chambers, and a watchtower. A notable underground chamber in the northeastern sector comprises a double-storey corbelled building (Fig. 20). The lower storey, still intact, features an arched doorway (Fig. 21) and a ventilator, while the upper storey has mostly collapsed. This chamber, adjacent to a spring and rock-shelter (Fig. 5), showcases the advanced engineering skills of the site's builders.

Although Khattak (1997: 74-77) mentioned a watchtower in the western area, no physical remains of this structure have been identified

during recent surveys. Architecturally, the Rāmāñrai complex bears a strong resemblance to other major Buddhist sites such as Takhtthāi and Kushan era complexes in the Swat Valley, suggesting it was developed under royal patronage during a flourishing phase of Buddhist cultural expansion.

4. Hydrological Setup

The ancient Gandhāra region had a complex hydrological system vital to its agriculture, settlements, and trade. Gandhāra region was fed by rivers and tributaries flowing down the mountains on its north. Like other parts of Gandhāra region, Rāmāñrai site also featured advanced water management structures like cisterns, tanks, reservoirs, and channels (Figs 5, 15-17, 19). These reflect the sophisticated engineering of Gandhāran communities and their adaptability to diverse terrain and climate.

One of the most distinctive features of the Rāmāñrai Buddhist Complex is its sophisticated hydrological setup, which reflects a keen understanding of both environmental adaptation and water management in antiquity. The site is flanked by natural streams on either side, a positioning that appears to have been strategically selected to harness spring water for daily use while also mitigating the risk of seasonal flooding. To this end, embankments were constructed to store and control the flow of water, forming an early form of flood management (Fig. 19). Water was then diverted through a system of dedicated channels that distributed it across the complex as needed. Notably, archaeologists have identified remnants of covered and paved water channels (Figs 16-17) throughout the site, which is the evidence of a deliberate and durable engineering effort aimed at sustaining the settlement's needs while preserving the structural integrity of the complex. This integrated water management system underscores the technical acumen and environmental awareness of the site's ancient inhabitants.

5. Conclusions

Rāmāñrai Buddhist Complex stands as a remarkable testament to the architectural ingenuity, hydrological expertise of the ancient Gandhāran civilization. Its unique features, ranging from the monumental stūpas to the intricately designed water management system and pre-Buddhist rock art, underscore the site's cultural and historical richness. The strategic

adaptation to the mountainous terrain through advanced engineering solutions reflects not only environmental intelligence but also the aesthetic sensibilities of its builders. Despite its current threats from environmental degradation and human interference, Rāmāñrai holds immense potential for future archaeological research, systematic excavation, and scientific conservation. Comprehensive preservation strategies and responsible heritage tourism can help unveil its untapped historical layers while ensuring its survival for future generations. This site's uniqueness warrants deeper academic inquiry and international attention, positioning it as a keystone in the broader narrative of South Asian and Buddhist heritage.

References

Ali, I. (2003) Early Settlements, Irrigation and Trade Routes in Peshawar Plain. *Frontier Archaeology*, 1: 177-186.

Ashraf Khan, M. (1993) *Buddhist Shrines in Swat*. Saidu Sharif.

Cunningham, A. (1871) *The Ancient Geography of India*. New Delhi.

Deane, H. A. (1896) Note on Udyana and Gandhāra. *Journal of the Royal Asiatic Society of Great Britain and Ireland*, 18: 655-675.

Giorgio, S. (1967) Discovery of Four Pre-Buddhist Cemeteries near Pacha in Buner (Swat, W. Pakistan). *East and West*, 17, 3/4: 220-232.

Khan, Z.H. (2017) Recent Discovery of Painted Rock Shelters in Buner, Khyber Pakhtunkhwa, Pakistan. *Gandhāran Studies*, 11: 83-102.

Khan, Z.H. (2018) *Archaeological Profile of Buner (Pakistan): Study and Analysis of the Recent Investigations*. A PhD Thesis Submitted to the Department of Archaeology, University of Peshawar.

Khattak, M.H.K. (1997) *Buner, the Forgotten Part of Ancient Uddiyana*. Karachi.

Nasim Khan, M. (2000) *Buddhist Paintings in Gandhāra*. Peshawar.

Olivieri, L.M. (1994) Recent Discoveries of Rock-Carving in Buner and Puran (NWFP, Pakistan). *East and West*, 44, 2/4: 467-480.

Rehman, S., Khattak, H.K., Rehman, F. (1996) The Archaeological Exploration in Buner. In Saeed ur Rehman (ed.) *Archaeological Reconnaissance in Gandhāra*. Pakistan. Department of Archaeology and Museums, pp. 1-79.

Samad, A. and Khan, Z.H. (2016) Archaeological Survey of District Buner: Preliminary Report. *Frontier Archaeology*, 6: 1-74.

Stacul, G. (1967) Discovery of Four Pre-Buddhist Cemeteries near Pacha in Buner (Swat W. Pakistan). *East and West*, 17, 3/4: 220-232.

Stein, A. (1929) *On Alexander's Track to the Indus. Personal Narrative of Explorations on the North-West Frontier of India*. London.

Stein, A. (1930) *An Archaeological Tour in Upper Swat and Adjacent Hill Tracts*. Memoirs of the Archaeological Survey of India, 42. Calcutta.

Tucci, G. (1940) *Travels of Tibetan Pilgrims in the Swat Valley*. Calcutta.

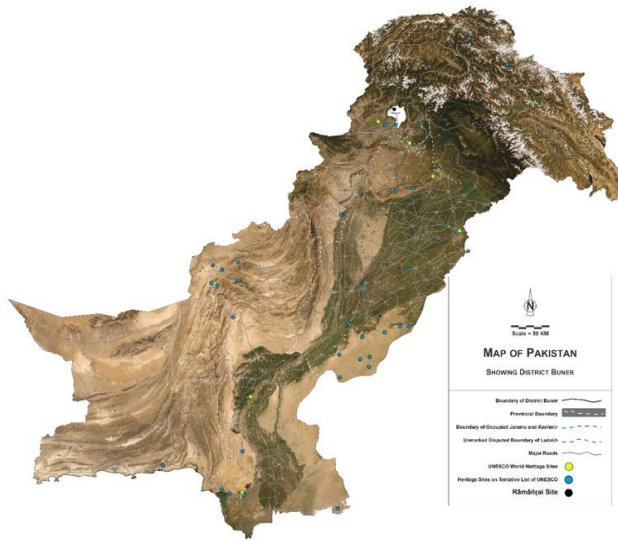


Fig. 1 - Map of Pakistan locating Buner and Rāmāñrai Buddhist Complex.



Fig. 2 - Map of Buner (Locating Rāmāñrai Buddhist Complex).



Fig. 3 - Rock shelter from pre-Buddhist period at Rāmāñrai.



Fig. 4 - Rock shelter from pre-Buddhist period and the Buddhist period settlement in its surroundings.



Fig. 5 - Rock shelter with spring, channel and structures inside.



Fig. 6 - Rock shelter and granite boulders with structures on its sides.



Fig. 7 - Main Stūpa Complex at Rāmāñrai.



Fig. 8 - Small stūpas erected over huge boulders.



Fig. 9 - Robber pit at the drum of the Main Stūpa.



Fig. 10 - One of the scattered individual stūpas at Rāmāñrai.



Fig. 11 - Traces of stūpa at the main stūpa complex.



Fig. 12 - Parts of Monastic complex behind main stūpa.



Fig. 13 - Other stūpas scattered in the eastern parts of the site.



Fig. 14 - Parts of Another Monastic Complex at Rāmāñrai.

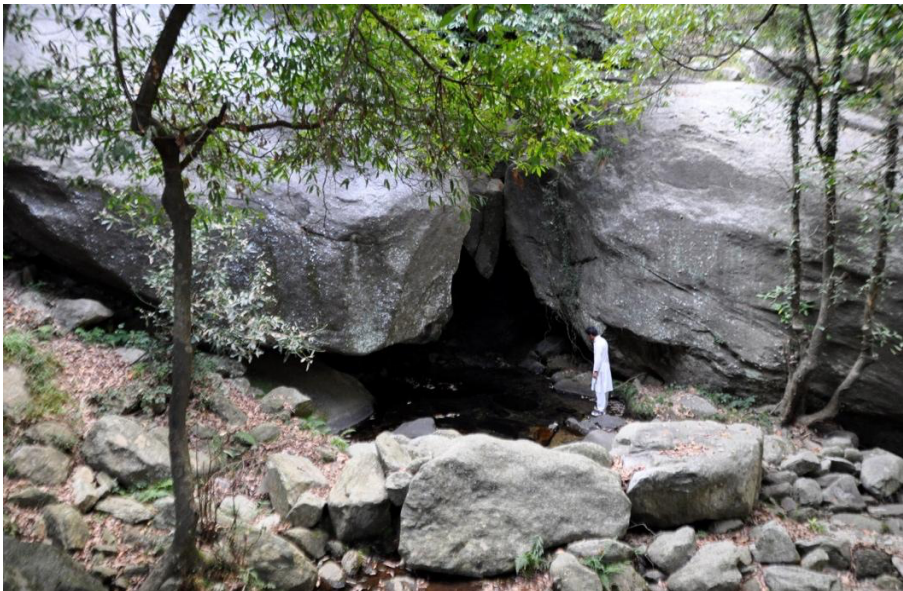


Fig.15 - One of Several Active Springs at Rāmāñrai.



Fig. 16 - Roof of a Channeled Spring at Rāmāñrai.



Fig. 17 - One of the roofed channels of water.



Fig. 18 - One of the damaged stairway at steep places of the site.



Fig. 19 - One of the embankment to support the structures and channel the floods.



Fig. 20 - Corbelled Roof and Double-Storey Structure at Rāmāñrai.



Fig. 21 - Arched doorway to the corbelled roofed double-storey structure.



Fig. 22 - Fragments of a few architectural elements and materials observed at the site (not to scale).