Exploring the forest and mapping its archaeology: Bandhavgarh National Park and Tiger Reserve, India

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The archaeology of historical India has usually been perceived through the lens of cities and states, leaving forest tracts to a large extent unexamined. This article considers the historical signature in a segment of the Bandhavgarh National Park and Tiger Reserve, Madhya Pradesh, India, in order to understand how histories of occupation in jungles and wilderness where no settlements presently exist can be studied. Our survey involved a combination of ground-level investigations using GPS devices along with an analysis of satellite images to explore whether such images can be used for locating structures and sites. The earliest archaeological markers in Bandhavgarh are cave shelters of the 2nd century CE, which form the subject of this article.

Keywords: Bandhavgarh Tiger Reserve, caves, forests, Indian archaeology, satellite imagery.

FORESTS and wilderness occupied a far larger space in historic India as compared to settled domesticated land. And yet, we write about those centuries (*c.* 6th century BCE–5th century CE) primarily from the perspective of cities and states. Part of the reason is an academic preoccupation with the creation and consolidation of urban life and culture. Equally, monumental remains are most visible around contemporary cities, towns and villages – from mounds and fortifications to sculptural and architectural relics, often with dateable epigraphs – are also the most carefully explored. Jungles, in contrast, are remote and usually explored by those interested in wildlife and biodiversity. Thus, the range of monuments and relict remains there are little known. That permission for investigations in reserve forests is mandatory might be another reason why field work is uncommon in forests. Additionally, as this paper on Bandhavgarh underlines, even where the forested terrain has figured, there is a hesitation in exploring the interface between jungles and the material relics there.

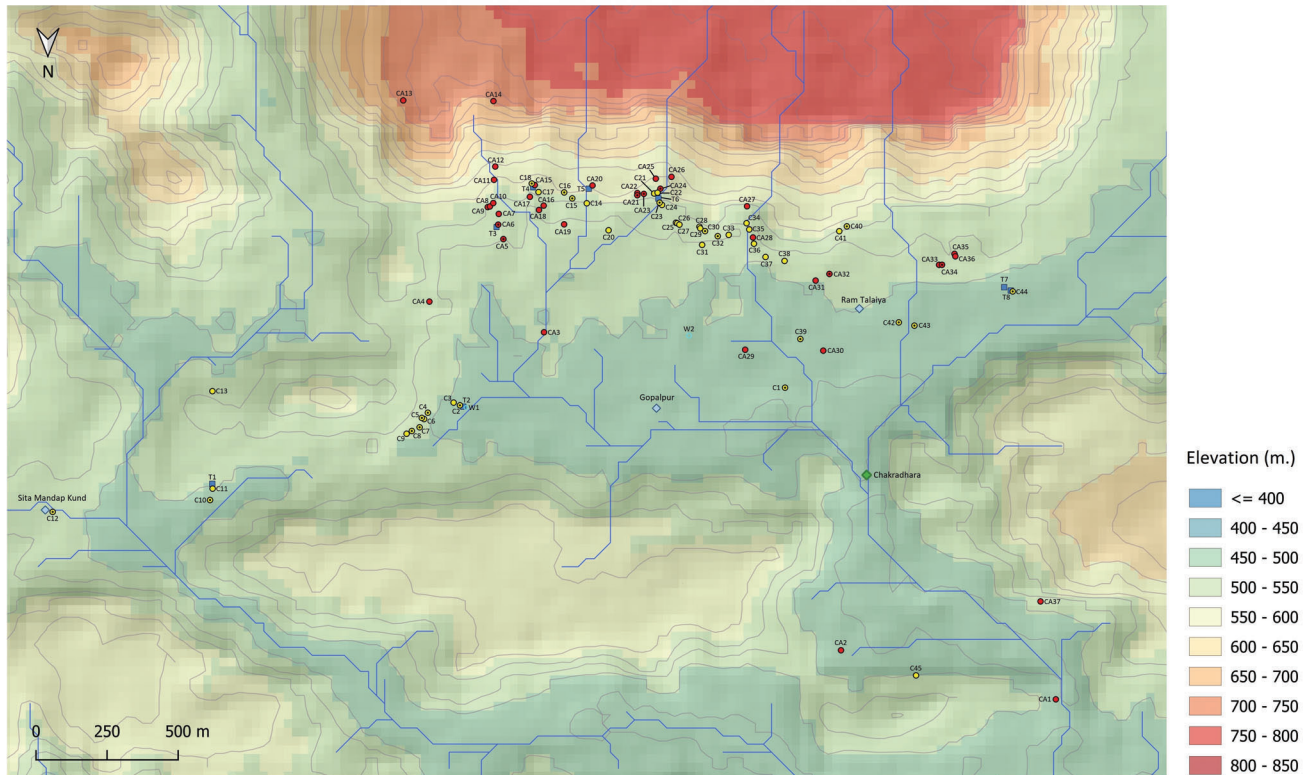The Bandhavgarh National Park and Tiger Reserve is located on the flanks of Satpura hills of northeastern Madhya Pradesh (Figure 1). Some 716 sq. km constitute the core zone of the tiger reserve. The purpose of this exploration was to take up a segment of the reserve in order to understand how histories of settlements in jungles and wilderness, where no habitations presently exist, can be studied. Our work was focused on the 109 sq. km of the Tala range and a small part of Magdhi in the reserve. Done in four phases, from March 2021 till June 2022, the survey involved a combination of ground-level investigations using GPS devices along with an analysis of satellite images, as has been done in relation to past human activities elsewhere in India[1]. Cave shelters are the earliest historical markers in Bandhavgarh, and are examined here. Their cartographic locations and elevations have been provided for the first time in this paper (Figures 2 and 3) which help in understanding their spatial patterning and character. Alongside, cave epigraphs have been juxtaposed, wherever possible, with what the archaeological survey revealed to consider in case some of their details could be verified on the ground.

Colonial foresters in the nineteenth century first remarked on these caves. One early notice was penned by a British officer, identified as 'J.M.'. He had visited this area
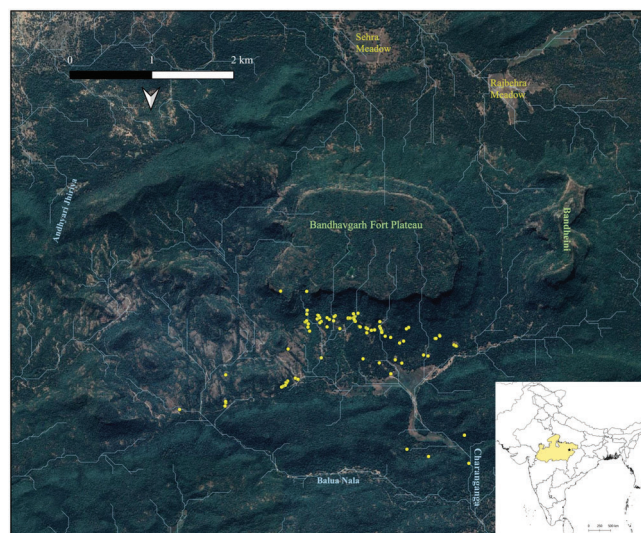
Figure 1. Study area in relation to Madhya Pradesh, India.

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Figure 2. Elevations of sites and features.

as part of a traverse in the forests of the princely state of Rewa, Madhya Pradesh, intending to harvest the best trees. After visiting the fortified hilltop, on the way down, he and the group who accompanied him were shown 'several very roomy caves, partly natural and partly excavated', which local lore regarded as having been occupied by an eighteenth-century ruler of South India, Tipu Sultan[2].

The caves are much older and their date was established decades later when in 1938, 2nd century CE epigraphic markers were discovered there by Chakravarti[3]. The reigns of the kings of Kausambi, especially those of the Magha dynasty, helped provide a secure chronology. There were 26 inscriptions in the Brahmi script, mainly in the Prakrit language, with three in Sanskrit. The most elaborate rock-cut dwellings were described by him as having seven, eight or nine cells while the average caves were plain rock excavated structures. These were located within around 3 miles (or 4.82 km) of Gopalpur village which was not far from the Chakradhara meadow.

Chakravarti was a specialist in ancient writing, having served for many years as Government Epigraphist for India, and he was not specifically interested in the relationship of these caves with the topography. The natural terrain figured in his work only in a negative way in the sense

that he described the forests in the vicinity of the caves as being 'infested' with animals. The first report in *The Times of India* newspaper that drew attention to Chakravarti's discoveries failed to even mention that the caves were located in a forested tract[4]. The absence of forests and the hilly terrain was also a feature of Ranabir Chakravarti's epigraphic exploration of ancient Bandhavgarh[5]. Dilip Chakrabarti's[6] monograph, based on fieldwork relating to the archaeology of the Deccan routes, is bereft of the forests as well, and when describing Bandhavgarh, it largely summarized Chakravarti's work.

This is somewhat surprising since this terrain intrudes into the caves in different ways, from the forest foliage to its wildlife. The high-pitched sounds of flying bats and the pug marks of the best-known big cat of Bandhavgarh – the tiger – in the silted-up interiors of the caves are an integral part of their ambience today. Many caves are only accessible by foot, as they are situated in the midst of jungles and waist-high undergrowth. Their accessibility is seasonal. The underscrub in early winter, a consequence of the monsoon rains, made several locations that were visited in spring impossible to reach. Today, fire lines help in clearing access paths. In the 2nd century CE, there must have also been a system for ensuring that shelters could be

Figure 3. Location of cave sites and features.

reached at different times of the year. The epigraphs reveal that the caves were endowed and excavated in summer (*grishma*) during the rainy season (*vasa*), and frequently in winter (*hemanta*), which underline their accessibility[7].

The physical landscape

The Tala range forms a variegated landscape of great beauty made up of high and low hills along with grassy meadows in the flat lands around them[8]. There are two massive hills here. One is Bandhavgarh which gives its name to the reserve forest, dramatically looming over smaller ranges and meadows around it. Around 811 m high, there is a large rectangular plateau on its summit with remnants of a medieval fort, temples, images and reservoirs[9,10]. The plateau edge is a series of precipitous and perpendicular-looking cliffs, and then, some distance down, a more gentle and steady alignment sweeps down to the hill base. The other high hill is Bandheini, almost the same height as Bandhavgarh, to its west. The forest in this part of the reserve is a moist tropical deciduous one, dominated by Sal trees (*Shorea robusta*) and bamboo clumps (*Dendrocalamus strictus*), as also other varieties ranging from woody ficus trees to the gnarly Indian frankincense (*Boswellia serrata*). Pol-

len records have revealed a fluctuating history of Sal trees in Madhya Pradesh, but by the early first millennium CE, the growth of Sal forests was indicated across northeastern and southeastern Madhya Pradesh[11]. The other feature of Bandhavgarh is the presence of large stretches of grasslands in its low-lying areas. These are marked by as many as 130 grass species, from short and medium grasses along with coarse, tall varieties which support a variety of wildlife, especially deer and other herbivores[12].

Several streams make their way across this landscape, eventually reaching the Son River, a tributary of the Ganga. The important streams in the Tala range are the Charanganga, Damnar, Janar, Banbai, Amba Nala and Andhyari Jhiriya. Numerous unnamed water channels course through the jungles and flow into the meadows. The Charanganga rivulet is a major lifeline of the Tala area and flows out of the Chakradhara meadow. Over time, its course has been deliberately altered. Earlier, it used to flow from the 10th century CE image of Sheshashayi Vishnu (the preserver God of Hinduism, sleeping on a serpent) – the name Charanganga being derived from its waters washing the feet of this sleeping God ('Charan' being feet). It then went down the hill, eventually reaching the Gopalpur–Chakradhara meadow area. Now, that channel has dried up since

the water was diverted by the Forest Department to its colony. Presently, it is the seepage from the Bandhavgarh hill that comes down to the marshlands of the Chakradhara meadow which provides much water for the Charanganga stream.

The jungles and meadows have significantly changed in the last couple of hundred years. There were thick forests in the nineteenth century, evocatively delineated by the very same officer – 'J.M.' – who first mentioned the caves. He described a dense forest of Sarai (same as Sal), bamboo and wild mango along with a thick carpet of ferns on the way up to the Bandhavgarh hill. By the middle of the last century, though, the forests of the Tala zone were significantly denuded. The naturalist Satyendra Tiwari remembers that in 1979, there were hardly any big trees here and as he put it, even 'bamboo was very poor only because till 1968, a nearby paper mill did bamboo extraction from Bandhavgarh' (personal communication). These had been leased out to the Orient Paper Mills at Amlai[13]. Since then, the forest has regenerated, resembling what 'J.M.' had captured in his description. Large parts of the grasslands, over time, were cleared by village populations in the lowland area, with agricultural fields coming up in those clearings. After Bandhavgarh became a national park, villages were relocated, and thus, the village sites disappeared.

On the ground and in satellite imagery, though, field boundaries can still be identified as, for instance around the former village areas of Bathan and Magdhi. The Rajbehra meadow also had paddy fields till 1968.

Evidently, Bandhavgarh's grasslands and forests are not pristine habitats and like the Charanganga river, carry traces of human intervention across time.

Spatial distribution of cave shelters

Our survey located 81 rock-cut shelters and of these, 44 bore numbers of the Forest Department (mentioned with the prefix 'C' in the maps and text) while 37 were unnumbered (bearing the prefix 'CA' here) (Figures 2 and 4). Two unnumbered shelters (CA2 and 10) appeared natural, while the rest were artificially created. Each site's specific location and elevation were noted and subsequently, an attempt was made to see whether their entrances and front clearances could be spotted in satellite images. This was done in the hope that more cave shelters could be located by studying the pattern of the documented sites in the first phase of work. The cave locations were also interwoven with water channels, reservoirs and wells on the ground as also those observed in satellite imagery and Geological Survey of India maps. Chakravarti[7] had noted 50 caves and described most as being artificial. But the lack of either a map or cave photographs in his work made it difficult to ascertain whether all those explored by us were also seen by him. The caves with epigraphs that he described could be more easily identified. Twenty six such shelters were documented by us, but in some instances, the inscriptions had become excessively faint.

The cave shelters and water tanks contemporary to them spread over an area of about 5 sq. km. They were created on the north side of the Bandhavgarh hill and along several smaller hills facing the same direction. The south side of the fort plateau was not inhabited. The northernmost cave shelter is at 23°42.337′N, 81°01.426′E and is today known as Jamuniya (CA1). This small rock-cut structure stands at 479 m (Figure 3). Marking the southernmost limit is an unnumbered cave (CA13) in the form of a long roofed space, entirely open in the front. Located on the plateau at 23°41.197′N, 81°02.780′E, it is the highest shelter at 724 m. The easternmost dwelling is Cave 12, locally called Sita Mandap, and based on its inscription, it appears to be the oldest shelter (Figure 5). Made up of two rooms with stone beds and a covered verandah common to them, it is located at 23°41.981′N, 81°03.505′E at an elevation of 497 m. To the extreme west is a long and narrow shelter, Cave 44, with five entrances leading to the hall. At an elevation of 484 m, it is located at 23°41.561′N, 81°01.519′E. This cave is just north of Ghirniya tank, a rectangular waterbody. A similarly constructed reservoir was created adjacent to Cave 2. These tanks date back to the 2nd century CE as their locations immediately in the vicinity of caves suggest, quite apart from the fact that medieval reservoirs in Bandhavgarh are architecturally different. The ruins of a third tank, oval in form, lie below CA20. Two old wells, now filled up, were also located, including one in the vicinity of Cave 2. These relics make the epigraphic allusions to the donation and creation of tanks (vapi) and wells (kupi), along with cave dwellings, alive and visible[14].

How does one explain the concentration of caves entirely towards the north? There can be no geological reason for this choice since the same soft sandstone makes up the hills and hillocks here. An important reason could be the

Figure 4. CA1 shelter at Jamuniya.

combination of perennial water with shady jungles. Because the slope of the plateau is towards the north, there are many more streams that flow down into the flatlands there. Moreover, in the hot months, the porous rocks release a large amount of water which then, as now, would have fed the streams and also ensured that the Chakradhara meadow area remained marshy, attracting large groups of ungulates and other animals – ready food for people living there (personal information from the artist and Tala resident, Kay Hassall). The rock shelters are largely north-facing, with some facing the east, and an occasional shelter that looks towards the west. In comparison, the area that falls south of the Bandhavgarh plateau has a low to medium hill shade; if shelters were created there, they would be exposed to a great deal of sun. With the exception of the winter season, this would not make them favoured habitational spaces[15].

Another reason was that the high road of commerce and travel was used, as the epigraphs revealed, by people moving from the northern regions, for instance, Kausambi and Mathura. The invocation of the Kausambi kings in the epigraphs emphasizes this connection. The route traversed by travellers would have moved towards Rewa and Sutna and on reaching Bandhavgarh, the northern face would first be encountered with its abundant water and food resources. That area would, thus, be the most logical place to halt. Beyond Bandhavgarh, the high road led towards Shahdol on the one hand and Tripuri on the other before moving towards Chattisgarh and the Deccan[16]. Finally, what is worth considering is that the only access to the large plateau that crowns the Bandhavgarh hill is from the north. As Figure 4 reveals, there are two shelters on the northern edge of the plateau (CA13 and CA14), very close to the plateau. Surely, ancient folk who created those shelters would have explored the large plateau, and taken in the panoramic views of the forests and meadows visible from its various faces.

Many caves appear clustered together. Eight (Caves 2 to 9) are within a short distance of each other. Cave 2, facing the north, is at the lowest elevation and is the roomiest. A large and low-hanging flat rock face was dug deep, allowing multiple rooms to be created, covering about 252 sq. m (Figure 6). On the other hand, above this cave, on the side of the same outcrop, a long shallow cave (Cave 3) was created, facing north-east. Its interior was a mere 28.5 sq. m, its size being a consequence of the nature of the outcrop there.

Further east lies another interrelated group – Caves 10, 11 and 13. Initially, we approached Cave 13 from the west after traversing a dry water channel and a steep hillside. Later, when the area above the cave was examined on Google Earth, it became evident that this could be reached by walking across the hilltop and jungle that separated it from Caves 10 and 11. A mere 350 m or less separated Cave 13 from those two caves, as our subsequent walk across revealed, and this was likely to have been the ancient route connecting them (Figure 7). Such features of interest were revealed because satellite imagery was combined with a ground investigation. Incidentally, as Cave 13 was shallow and west facing, it would have been largely used in the cold season.

Caves 30, 31 and 32 were also positioned close to each other, facing north. CA33 and CA34 were created within 50 m of each other and, in much the same way, Cave 39 and CA30 were close to each other. A small strip of ground separated them, with a difference in height of 4 m or so, with Cave 39 being at a lower elevation. There were though, some caves that appeared to be solitary dwellings for instance, Caves 12 and 44.

If paths connecting caves were discovered during fieldwork, was it possible to see the imprint of caves in satellite photographs? The geospatial analysis of remote sensing profiles revealed a faint occupational signature. Whether we were looking at caves close to present vehicular pathways or a large number of caves tucked away in the hilly areas, there were no clear features that made it possible to identify them in aerial images. We were able to mark the sites because of GPS readings. After the first

Figure 5. Inscribed interior verandah of Cave 12 (courtesy Satyendra Tiwari).

Figure 6. Interior of Cave 2.

Figure 7. The route connecting Caves 10 and 11 to Cave 13.

Figure 8. Cave 6 in the forest.

phase of work in March, a sustained poring over the satellite data suggested the possibility that a combination of small forest clearances and flat rocky surfaces could be the marker of possible sites. Potential sites were explored in the second phase, but did not turn out to be cave shelters. Satellite imagery was used in another study, for instance, in the Sanchi survey project of Shaw[17], had also proved to be deficient as an aid for site detection. Rather than aerial images, most of the shelters were located by us with the assistance of local people, naturalists and forest guards who knew the terrain.

There are at least three reasons for the absence of a visible settlement signature in relation to the cave shelters. Firstly, these old places are enveloped in the wild spaces surrounding them (Figure 8), and equally, there is a frequent silt build-up around them which obscures their frontal faces. CA4, for instance, lies in a thick shroud of bamboo with a large accumulation of leaves on the silt outside. Those who explore its inside area need to crawl into its silted interior. Secondly, Bandhavgarh shelters do not have large open verandah-like spaces in front with double-height entrances that can be seen in caves elsewhere. Moreover, the entrance can sometimes, as in the case of Cave 11, be a small aperture into the rock face which leads into a chamber. Usually, the cave façades are made up of a line of rectangular openings, as also an occasional arched entrance, separated by pillars at regular intervals but these are only distinguishable in the midst of forests within ~50 m from them. In several instances, the cave facade on both sides – e.g. Caves 1, 39 and 45 – is flanked by deliberately created sloping rock faces. But even these are not discernible in satellite imagery. Thirdly, while the caves are concentrated on the northern face of Bandhavgarh, their locations are diverse. Habitation places here, in fact, sometimes cannot be spotted even from places in their immediate vicinity. Cave 12, for instance, is not visible from the low channel area in its immediate vicinity because a large outcrop stands in front of the cave. In much the same way, Cave 16 was carved out in a secluded spot, one that was concealed from Cave 15 and that happened to be less than 100 m or so from it.

Exploring the jungles to locate historic caves is undoubtedly best done by walking with forest guards because these form part of their regular beat and their interiors are intimately

known to them. The caves often shelter tigers whose movements they regularly track and these men helped us track the hollowed-out shelters that were once human habitations.

Forms and functions of the caves

How were the caves used in antiquity and what does their architecture reveal about their possible functions? Is there a way in which the outer surroundings were integrated with their interiors?

The green, sunlight-dappled, forested terrain contrasts strikingly with the dark cave recesses. Notwithstanding their inky interiors, the caves appear to be like domesticated spaces in a landscape marked by wilderness. They are not marked by paintings or carvings that capture the character of the surrounding area. One exceptional shelter is Cave 4, with a variety of carved decorations and animal reliefs in the interior as also on one exterior pillar. Monkeys and tigers can be spotted here among the throng of creatures, as also an armed person in the main relief, with separate reliefs of an elephant and horses with humans riding them (Figure 9). There is an epigraph in this cave which mentions a hunting ground, and while it may be an allusion to the carving, it could also be a pointer to the surrounding terrain where animals were hunted. Cave 7 was another shelter where the exterior intruded into the cave interior since the small room attached to the long cave had a skylight on one side. One can imagine that this helped in air circulation, but along with occasional rain, birds and small animals would also have shown up through it. Such skylights, however, were rare. Perhaps the experience of unwanted guests like beasts and birds in Cave 7 ensured that hardly any caves were made with partially open rooftops.

There is much architectural variety here. The smallest caves are single chambers with enough space for one person to sit. The uninscribed cave at Jamuniya is an example of this, as seen in Figure 3, as is Cave 11, which is a small single square room on a high rocky outcrop with an artificial pool to its left (T1 on the map). Another similar shelter that had rounded entry points –entirely different from the usual apertures – was CA37, marked by footholds to go up to one of the entrances (Figure 10).

Some caves like Cave 1 and Cave 6 were single halls. There were others with stone benches along walls, which had an adjacent cell with beds of stone as in Cave 8 and CA34. On the other hand, Cave 13 had two small rooms with separate entrances and open verandahs on either side. Cave 2 was singular in that it had a single small entrance which led into a large interior space marked by *in situ* pillars and nine rooms (Figure 6). It is called 'Badi Gufa' ('big cave'). A unique shelter was Cave 16, locally called 'Rani ki Jhiriya' ('Queen's water stream'). This name probably got attached to it because of the central pool inside the cave (Figure 11). On three sides of the pool were pillars cut out of the rock, some inscribed, while the pool was drained out through an opening towards the entrance. The cave was made up of six small, oppressively dark rooms around the pool area and corridor.

Depending upon the architecture of the caves, the pattern of usage varied. In caves with a central space flanked by a smaller room/rooms – which in several instances, had beds and pillows carved out of the stone – there was a demarcation between the common area and the chambers around
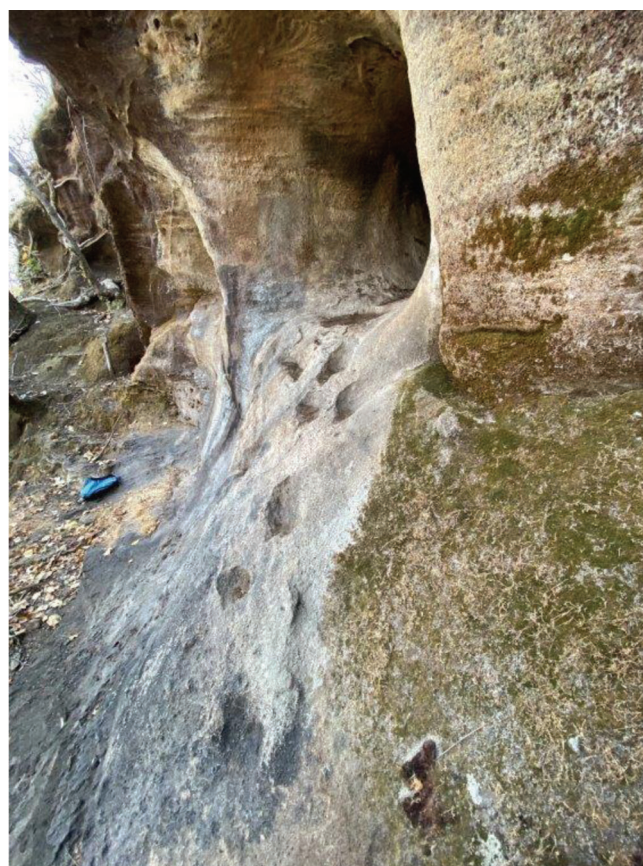

Figure 9. Carvings of animals and humans in Cave 4.

Figure 10. CA37 shelter at Dudwa.

them. The common areas were accessible to the chambers that were used for sleeping and resting. The smaller rooms were secluded and not immediately visible, while the central common space is what visitors today, as in ancient times, step into when they enter the cave.

Were the caves used for religious purposes? Cave 18 had multiple niches on two of its walls which looked like images were placed there, perhaps when the cave was re-purposed as a shrine in medieval times (Figure 12). This possibility was further strengthened by the large standing figure with folded hands etched next to one of the niches. We do not know who this was, but the pose was a religious one. Similarly, the Srivatsa symbol on the exterior face of one of the pillars of Cave 4 evoked similar symbols at Buddhist sites. The symbol, though, was deployed in Jainism and Hinduism too.

Who used the caves can partly be surmized based on the epigraphs. These were wayfarers from the northern plains, travelling to central India and the Deccan. The donors in the earliest dated inscription here in Cave 12 (constructed around c. 129 CE) were a large group of patrons, described as a 'goshthi' (committee). This had several merchants belonging to a guild-like organization ('negamas'), small traders ('vanijakas'), and two crafts people[18]. One was a goldsmith ('suvanakaro') while the other was a wood-worker-blacksmith ('kathikarika-kammara'). Other epigra-

phs mentioned patrons, including a minister and a king (Vaisravana of Kausambi), but the most common donors in Bandhavgarh were men of commerce. One especially worth mentioning was a merchant called Pusa, who, along with a tank and cave, got a gymnasium ('vayama-sala') created[19]. A place to exercise in the midst of the forest is rare in ancient India and suggests that travellers may well have taken long breaks in Bandhavgarh before continuing with their journeys. Since these travellers often moved in caravans, it is not fortuitous that one cave was described as a 'sarthika lata', i.e. a cave for caravan people.

What the epigraphs did not throw any direct light on, is a resident populace in the forest to ensure maintenance, access and availability of fresh food from the forest for the wayfarers. The archaeology of the caves occasionally helps in understanding their presence. Round artificial hollows on the floors of the cave interiors and occasionally outside must have been used for pounding grain, while in some shelters, small drain channels facilitated the flow of waste-water outside. What the parallel lines of cupule marks in a couple of caves were used for is less clear (Figure 13). They may well be part of an ancient game.

The elevations are also worth considering. While caves in the lower hills and on the meadow edges would have been used by travellers, it is unlikely that traders and merchants would have huffed and puffed up to stay in the shelters located high on the Bandhavgarh hill. After all, the hill slopes do not lead anywhere except to the top of the plateau. So, possibly the more permanent residents of the forest preferred to stay in high shelters, especially during the monsoon season, because the water was less likely to accumulate there. The rainy season was a lean time for journeys if ancient Indian texts were to be believed, and if there was an occasional travel group, they could have been spotted from the areas around the high shelters that provided a clear view of the Chakradhara meadow from where the caves were approached.
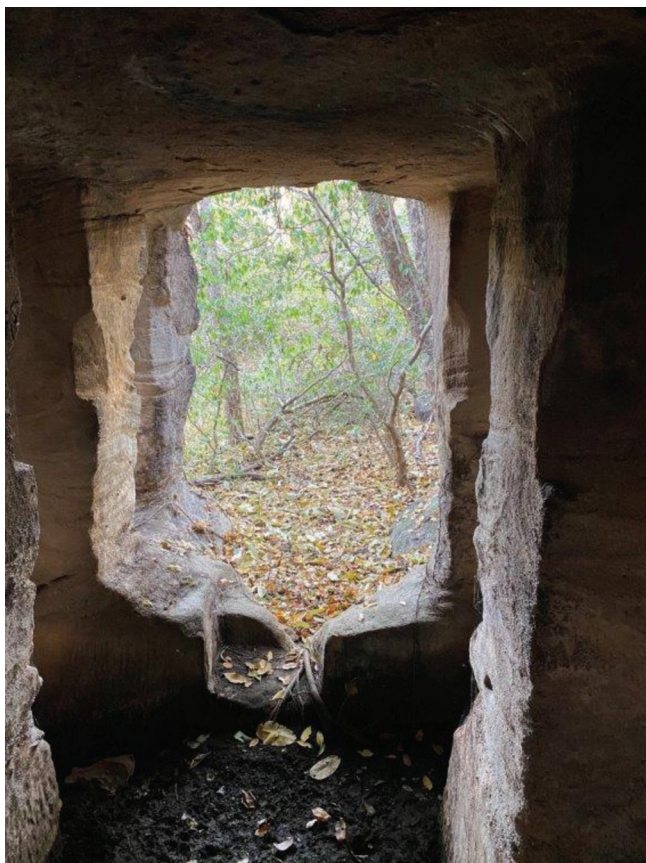

Figure 11. View of the small pool (dried up) inside Cave 16.

Figure 12. Cave 18 with a standing figure carved into the rock and niches.

Figure 13. Parallel lines made up of hollows in the floor of a room in Cave 13.

Conclusions and the way forward

(1) The early historical archaeology of the forests of Bandhavgarh is best studied by integrating various techniques for exploration and analysis. If the ground surveys and GPS readings helped us locate and document caves, streams and water reservoirs, a close analysis of satellite imagery enriched our understanding of the hilly topography as also the sources and alignment of the streams. Incidentally, our analysis of medieval Kalachuri remains (*c*. 8th–10th centuries CE) in this area revealed the role of satellite images in locating water reservoirs and features of that time (as will be evident in a publication relating to them being prepared).

(2) The epigraphs and features of architecture in caves have contributed to our understanding of the people who created and used them. However, the donors whose names we know while the men and women who provided sustenance remain anonymous. The lack of a historically recognizable resident population with names and voices is a lacunae worth considering, but remains unresolved within the parameters of the present research.

(3) Several caves in Bandhavgarh are heavily silted. The character of activities undertaken in the caves can be reconstructed if the Forest Department undertakes a careful desilting in collaboration with archaeologists.

(4) Finally, a study of how the forest has changed over the centuries should be attempted. An exploration of past vegetational changes can begin by analysing soil cores from some of the old reservoirs in the area.

Note: The channels on the maps (Figures 1, 2 and 4) are generated artificially using stream order analysis on QGIS with a threshold of 4. Dataset for the DEM is from SRTM n23_e081_1arc_v3 with 30 m × 30 m resolution (accessed on 6 December 2021).

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