

**ROCK ART RESEARCH AND RECENT TRENDS IN INDIAN CONTEXT****Hemlata Agarwal**

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**ABSTRACT**

*Rock Art is a vital archaeological source to study and analyze the cognitive evaluation of the human intellect across the world. Rock Art has been a focus on academic study in India since 19<sup>th</sup> Century. Most of the rock-art researchers' primary focus in their investigations for rock-art dating at present has been to establish chronologies of different rock-art sites. During the twentieth century a variety of methodological techniques were employed. The earliest researchers' tended to focus on describing the most elaborated and aesthetically pleasing aspects of rock-art, but as studies gradually became increasingly formalized, more systematic approaches were applied. Now a day's digital photography, digital image presentation, digital image processing, geographical information systems and 3D modelling are such kind of tools those are giving new dimensions to rock-art researchers. These new trends of rock art research give means to analyze, conserve and present the rock art heritage of India. In my paper I will focus on these new trends of researches.*

**Keywords:** Cognitive; Methodological; Chronologies; Systematic

**Introduction**

Rock Art is a vital archaeological source to study and analyze the cognitive evaluation of the human intellect across the world. Rock Art has been a focus on academic study in India since 19<sup>th</sup> Century. Most of the rock-art researchers' primary focus in their investigations for rock-art dating at present has been to establish chronologies of different rock-art sites.

During the twentieth century a variety of methodological techniques were employed. The earliest researchers' tended to focus on describing the most elaborated and aesthetically pleasing aspects of rock-art, but as studies gradually became increasingly formalized, more systematic approaches were applied.

Historically, Rock Art has been focused on style and motif, studying rock art symbols as if they were on a page of a book on an art canvas. These studies produce a large amount of valuable data. Researchers recognize the importance of interpreting rock art not only within the context of the rock space but within a holistic context that includes a more accurate view of hunter-gather culture, landscape, information from contemporary native people, style and motif and historical ethnographic and cultural material (Bradley, 1997, Diaz-Granodas & Duncan, 2000; Clottes & Lavis Williams, 1998; Hart, 1992; Lee & Stasack, 1999; Owznan, 1998, Scherfram, 1985; Staffl

*et al., 1997, 2000; Whitley, 1998, Matri Ross...).*

Rock art studies in India have a long history (Chakravarty, 2003). Petroglyphs were first reported in the subcontinent by Henwood in 1856, while pictographs were first "recorded" by Carlylle in 1867-1868 (Chakravarty and Bednarik, 1997), and a number of explorers noted rock art sites in India during the late nineteenth and early twentieth centuries (Ghosh, 1932). Following the discovery of a large complex of painted rock-shelters at Bhimbetka by V.S. Wakankar in the 1950s, rock art research in India became a more deliberate pursuit, and a number of researchers began programs of exploration and documentation, with considerable focus on the central region. As a result, during the second half of the twentieth century, rock art documentation became more formalized, recording the stylistic diversity of sites. The wealth of discoveries made during this period led to a number of syntheses of rock art traditions, permitting the formation of stylistic sequences (Wakankar and Brooks, 1976; Mathpal, 1984; Neumayer, 1993).

**Traditional Trends of Rock Art Research**

During the twentieth century, a variety of methodological techniques were employed. The earliest researchers tended to focus on describing the most elaborate and aesthetically pleasing aspects of rock art, but, as studies gradually became increasingly formalized,

more systematic approaches were applied. Recording techniques have varied considerably between different researchers and due to problems associated with poor replication from photography, high publication costs, and limitations of time, much of the recording that has been undertaken has been in the form of either freehand sketches (eg. Neumayer, 1993) or water colour renditions (Mathpal, 1995, 1998). The work of Mathpal (1984) at Bhimbetka, one of the largest and most widely known rock art complexes in India, is an example of a more systematic and accurate recording system, involving direct tracing of all figures at rock shelters across a single hill-site complex.

Earlier researchers often made uncritical parallels with small-scale hunter-gather or agro-pastoral communities near rock art sites, suggesting that these groups were living in societies that had experienced little change over centuries and even millennia (Ghosh, 1984). Recently, a more nuanced approach relating ethnographic studies to rock art has begun to emerge (Pradhan, 2001; Tribhuvan and Finkenauer, 2003)

Domestic fauna, scenes of hunting, dancing, pastoralism, and food production as well as religious and military imagery, have provided a common means to investigate rock art imagery and undertake regional comparisons, without attempting to understand why the rock art has been produced or what role it played. Although researchers have sometimes attempted to interpret the motivations of the rock art producers, these attempts have rarely been theoretically informed. Mathpal (1984, 1995, 1998) regards much of the Indian imagery as secular, with “no reason to look for esoteric explanations for this art”. Others have indicated that much of the imagery is symbolic, broadly relating to ritual activities. Chandramouli (2002) tentatively suggests that increasing abstraction in style relates to a move away from rock art with an ostensibly straightforward narrative function towards the creation of rock art with more symbolic, ritual purposes.

Current rock art theories and procedures shift in archaeological and anthropological values and the new studies reflecting this shift, have opened the door to a wider scope of

information, giving us the opportunity to access and process new data about rock art.

A number of scholars have focused their research efforts in the meticulous documentation - both of the imagery and the sites themselves, such as V.S. Wakankar, Y. Mathpal and others. While supported by traditional photography, the costs of recording, processing and printing photos in publications are high, limiting the potential to create extensive, public archives. While the history of research has illuminated the wealth of prehistoric imagery India has to offer, contemporary theoretical perspectives demand new methods of recording and analysis are applied. These digital approaches offer keys means, engage wider audiences with India's rock art heritage and adapt to emerging threats to its conservation.

### **Recent Trends of Rock Art Research**

Film photography can still play an important role in the documentation of rock art, digital photography enables researchers to take more photographs of the subject that can easily and cheaply be stored, on a computer and displayed on a computer, over the internet, or printed. Critically, the provision of many cameras with a screen to review photos that have just been taken is a vital tool when recording rock art imagery that may be difficult to access, demanding lengthy travels both on the road and through jungle. Processing a roll of film of rock art imagery at a difficult to access site that is out of focus is fortunately a costly problem that can be easily avoided.

Photographic recording of rock art imagery in infra-red yields a number of benefits, but traditional infrared photography was problematic due to the difficulties in handling the highly sensitive film particularly in the field, and the unpredictable results. Lacking the need for film and offering the ability to instantly review results, digital photography avoids these issues and can be achieved with most easily with a digital SLR camera, a tripod and an infrared filter. It may assist to expose the variability of how paints were produced, what they were made from and how they were used. Depending upon the pigments involved, such methods can also help to reveal rock art imagery from overlying graffiti.

**Fig.1****Fig. 2****Fig.1 Rock Art Panel from KatavaniKunta Valley, Andhra Pradesh****Fig. 2 With Enhanced Contrast**

GNU Image Manipulation Program which can help to adjust the visibility of particular figures. More advanced, but easy to apply, methods for digital image processing that are of particular importance for studying rock art involve transformations of digital images. The most commonly used application for conducting this work is the DStretch plugin for image, developed by Jon Harman. The DStretch plugin conducts this at the press of a button, allowing rock art images to be transformed using a number of colour spaces that are specifically designed to enhance red, white,

black and yellow pigments. The results of these methods of digital image processing are striking and can bring out pigments that are faint to the naked eye and help to differentiate pigments from the rock surfaces they are painted on. Digital image processing offers a critical means to illuminate evidence for prehistoric painting activity beyond that which is directly visible and as a result must now be considered necessary to complement careful recording of imagery at a site, which may otherwise miss out key features of the rock art.

**Fig. 3: Rock art panel from Katavania Kunta Valley, Andhra Pradesh, Digitally Enhanced Using D Stretch**

Geographical Information Systems (GIS) provide tools to manage and explore spatial data, which, for rock art researchers can be employed both at the scale of a single site or panel, or investigating how rock art sites sit

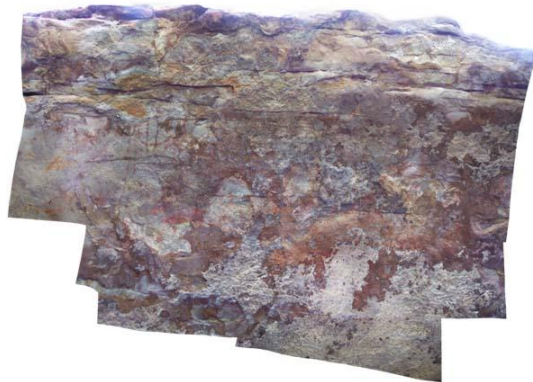
within wider landscapes. An alternate use for GIS analyses of rock art is at the level of the site, exploring how rock art sites are situated within the landscape. Surveys that have been identified through examination of the satellite



imagery. Given the difficulties in conducting exploration of remote areas, or even trying to return to particular sites located in jungle settings, such digital technologies have become an indispensable tool which allows researchers to question and quantify how rock art sites fitted within their physical, social and ecological landscape. More complex analytical procedures include views shed analyses that can identify both inter-and intra-site visibility, and prioritize features of human experience as central in the analyses of rock art.

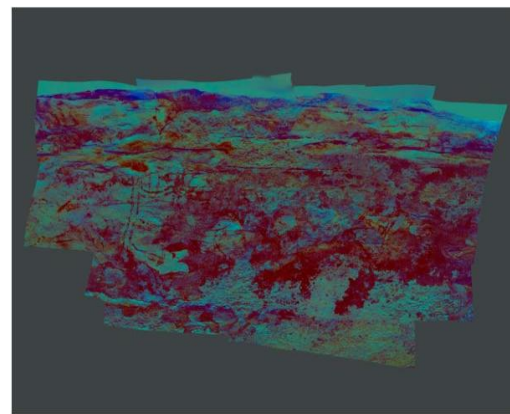
Recent research has also illustrated how GIS studies present vital tool for evaluating the threats that exist to India's rock art heritage, focussed upon Mirzapur and Rewa Districts, located Uttar Pradesh and Madhya Pradesh

respectively. Here, Banerjee and Srivastava (2013) have used freely available satellite data (enhanced thematic mapper ETM+) alongside other materials to classify patterns of land use between 1989 and 2011 and evaluate the impact of these changes upon rock art sites. The authors identify a trend of rapid deforestation up to 2000, followed by extensive mining of sandstone and development of agriculture and forest plantations. Fieldwork to corroborate patterns from analysis of satellite data lead to the discovery of numerous new rock art sites, but also illustrated how mining and deforestation had led to the destruction not only of rock art sites, but also the physical landscape in which they were created.



**Fig. 4**

**Fig. 4: Rock Art Panel from Katavani Kunta Valley, Andhra Pradesh**



**Fig. 5**

**Fig. 5: Rock Art Panel from Katavani Kunta Valley, Andhra Pradesh with DStretch Enhancement**

Producing 3D models of rock art sites offers new means to analyze, conserve and present the rock art heritage of India. Traditionally, the production of 3D models has demanded specialist hardware, such as laser scanners, that were difficult to transport to sites and demanded significant time investment to record a site. The advent of widespread digital photography has promoted new ways of approaching rock art in three dimensions. Photogrammetry software is capable of comparing the location of features between a series of photographs of a rock art panel or site and generating a 3D point cloud. The coloured and textured surface recorded by the digital photographs can then be integrated with the point cloud to generate a 3D model of a rock art site or panel. In the face of destruction of

rock art sites by mining or defacement through the actions of vandals, recording rock art sites to enable photogrammetric reconstructions offers one means to preserve sites for the future. Creating 3D models of rock art panels and sites also allows wider audiences to appreciate the rock art heritage of India in new ways without the need to visit the site directly. Reflectance transformation imaging (RTI) uses photographs from a fixed location combined with a moving light source in known locations. RTI is particularly suitable for recording rock art created in light relief by pecking or bruising the rock surface (petroglyphs). While digital approaches to recording and analyzing rock art will change both how we study it and what we can learn about it, it is the capacity to share digital images that will have the greatest

impact upon collaborative and public efforts to explore India's rock art.

Preservation of India's Rock art sites is a matter of global significance and the digital methodologies outlined here will play a central role in the cultural resource management strategies that will enable for this unique body of artistic work to both inform and inspire future generations. Two notable sites that have a present a diverse array of digital images of Indian rock art are hosted by the Indira Gandhi National Centre for the Arts-Rock Art Unit and the Bradshaw Foundation's Indian Rock Art Archive. An integrated approach to archiving digital rock art data in all its diverse forms is

required to help preserve India's rock art heritage. Specialized open access digital archiving software such as DSpace can play a central role in cultural resource management strategies, which are particularly pertinent due to ongoing pressure from changing patterns of land use and resource exploitation in India.

### Conclusion

Finally, it can be said that such kind of tools are giving new dimensions to rock-art researchers. These new trends of rock art research give means to analyze, conserve and present the rock art heritage of India.

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