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A Study of Cultural Resource Management of Prehistoric Sites Bantoli in Gumla District and Toyontoli in Ranchi District of Jharkhand

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Abstract: Cultural heritage management is the protection and preservation of heritages which includes both human and natural environments, architectural complexes, archaeological sites, rural heritages and many other things related to the human past. Cultural resource management as a part of heritage management develops and maintains programs designed to investigate the process of site destruction and to preserve and protect them. In Eastern India, many prehistoric sites are under threat due to natural and artificial causes. Two Upper Paleolithic sites of Bantoli and Toyontoli of Gumla and Ranchi districts of Jharkhand state of India are chosen for the present study. The study was done to identify the ways of the destruction of these two sites and to develop some preservation strategies to minimize the destruction of the sites. Both intensive and extensive surveys were done. The nature of the sites, distribution of artefacts and the process of destruction occurring in the two sites were observed. Suitable preservation strategies were then framed based on the types of destruction occurring in the two sites.

Keywords: Cultural Resource, Prehistoric Site, Bantoli, Toyontoli, Jharkhand

Introduction

In the modern world, heritage is the identity of the people. People can connect easily with the help of heritage. The concept of heritage includes both human and natural environments, architectural complexes, archaeological sites, rural heritages, and many other things which denote the legacy of the people. The cultural heritages are the oral signs and symbols, forms of art, languages, myths, beliefs

and traditional knowledge. All these heritages reflect the culture of the ancient people. In the case of prehistoric archaeology, the sites inhabited by the prehistoric people are the heritage. The prehistoric sites bear information on the tools used by the prehistoric people and their making techniques, their subsistence and their economy. The prehistoric sites are viewed as cultural landscapes that are the storehouse of human experience. By studying the site, prehistorians can understand how people have interacted with the local environment to survive. The cultural landscape is the result of the action of human and natural factors (Jokilehto 2005). So, these cultural resources are very important to know about the past people. Gradually the prehistoric sites are under destruction due to both human and natural agents. The effects of erosion, earthquakes, human construction, deforestation, pollution and many other causes are destroying cultural resources (Nickens 1991). Once lost these resources cannot be reproduced and the information about past people would be lost.

According to ICCROM, Cultural heritage consists of the resources of human past activities. These resources have immense importance to understand the bio-cultural evolution of man from the prehistoric period. On the other hand, UNESCO has defined these resources as a result of the human knowledge, skills and creativity for surviving for a long period. They explored the natural environment and natural resources for adaptation in different environmental conditions and geophysical settings. The mechanism of their survivability is always sustainable in nature (Jokilehto 2005). Heritage management is a big umbrella. Cultural Resource Management (CRM) is under this umbrella which preserves the cultural heritage both from the past as well as from the present for better survivability of humans in the future.

Cultural resource management (CRM) does this work of preservation of resources in three stages. In the first stage, a physical survey of the prehistoric site should be done to know the geophysical settings of the sites along with the cultural resources. The previously documented information should be studied to know the history of the site. In the second stage, a report should be prepared that will be helpful for further research on the prehistoric site. This report will help the researcher to take suitable measures for protecting the site. In the last stage, a suitable management plan should be prepared for the protection and preservation of cultural resources (Fagan 1991;493-503).

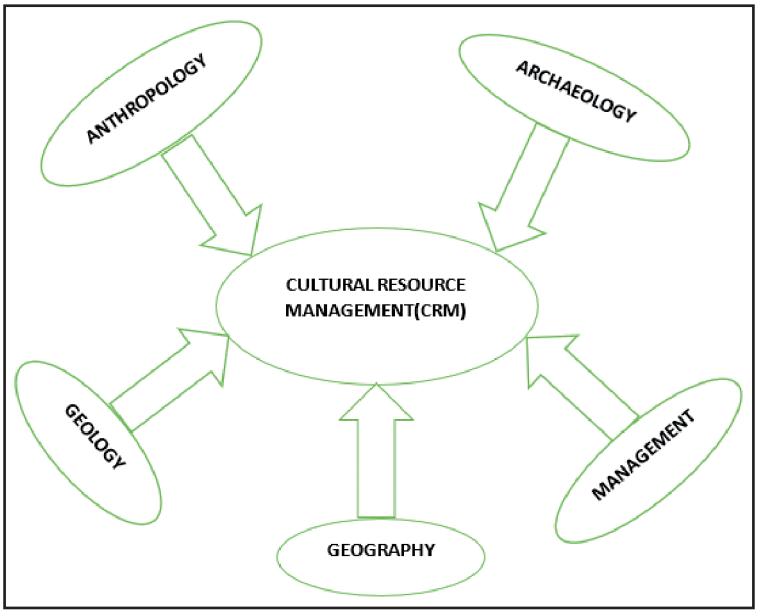


Figure 1: Schematic diagram of multidisciplinary nature of CRM

Cultural resource management is an applied part of archaeological anthropology and is very much multidisciplinary in nature. It takes the help of different disciplines such as anthropology, geography, geology, archaeology and management to understand and protect the cultural heritage. In anthropology, prehistoric sites, rock art, cave art, artefacts, folk life, cultural use of naturally available resources, cultural identity, social institutions and community cultural amenities (Willigen 2002;206). The past landscape is an integral part of the culture. To understand the landscape geography is essential. The landscape is an important storehouse of the past environment. Preserving these will help people to know about the past and to solve any environmental problems in the future (Boyd 1996). In archaeology the preservation of archaeological sites, monuments and buildings under Cultural Resource Management.

In modern times the concept of public archaeology has become important to raise awareness. In public archaeology, the role of people is the protection of the resources are important. This includes the increase in public awareness(Matsuda 2004). Rescue archaeology is also a recent area where the threatened archaeological sites are recorded and excavated before the resources are completely lost due to destruction(Campana 2011). CRM involves these rescue and public archaeology for protecting archaeological resources. In management, the planning of conservation, preservation and sustainable development of the resources for the sake of a better future for human beings has been done(Wai-Yin 2004, Ma Shu-Yun 2004). In geology, the earth's soil stratum preserves cultural resources such as artefacts that contain information about the past life of prehistoric men. These artefacts also indicate the cognitive development of prehistoric men. CRM involves the preservation of these resources.

Heritage Management

Cultural resource management is traced back to its origin in the 1970s. The term "cultural resources" was first used by the National Park Service in 1971-72. The first publication about cultural resource management came at the Cultural Resource Management conference in Denver by Lipe and Lindsay (King 2002). CRM was used as a parallel to Natural Resource Management to preserve tangible cultural heritages such as archaeological sites, museum collections and so on. In 2003 intangible cultural heritage convention took place where the focus was given on improving the formal and informal education on heritage conservation (Jokilehto 2005). In India, after Independence, the Archaeological Survey of India with its various branches and circles, the National Museum at New Delhi, the National Research Laboratory for Conservation at Lucknow and the regional laboratory created at Mysore were set up by the Government as an early initiative for carrying on all the works of preservation and protection of the archaeological sites.

Earlier works on Cultural Resource Management worldwide

There are many factors due to which prehistoric site destruction in America is occurring-surface erosion, bioturbation, construction, agriculture, military maneuvers, wind erosion, gulling and other causes. To protect these documenting proper site boundaries with GIS, GRASS, CAD, revegetation of the destructed surface, site stabilization and regular monitoring of the surface is needed (Macdonald 1990). Protection of soil erosion by wind, water, or lacustrine effect in any Prehistoric sites in North America can be reduced by planting natural vegetation cover in the soil. Plants such as golf course grass, willow and other plants can be used as they can then bind the soil particles tightly with the help of their roots. However, there are a few problems related to this revegetation method. For example, the water content in the soil or the ph in the soil can change and also the artefacts and the biofacts in the

soil can also get damaged due to the roots of the plants. Furthermore, if the plants get uprooted then it will loosen the soil in certain areas leading to damage (Throne 1991). Reburial of Archaeological Sites, Erosion Control and Site Stabilization, Consolidation and Stabilization of Structures, Vegetation Control, Protective Roofing and Shelters are some ways of protecting prehistoric sites (Demas 2013). In Arab, there is a lack of awareness and appreciation to protect archaeological sites. Only a few people are interested. They are responsible for the private museums. These people are taking care of aware the public (Alrawaibah 2014). Protection of underwater archaeological sites can be done by the use of mats of artificial sea grass, which float upright in the water column and entrap passing sediment particles, effectively creating an artificial seabed (Gregory 2015).

Earlier studies on Cultural Resource Management in India

The prehistoric sites of Orissa were explored to know the present status of destruction in those sites. The remedial measures for the preservation of these sites were made based on exploration (Mondal 2014). The growth of museums should also be encouraged, not just for collection, storage and preservation but for the purpose of the education of the masses(Singh 2014). Some remedial measures such as illegal mining, formation of DMC, strict control of graffiti and potential threats, the vigilance of local people on any kind of destruction and awareness creation to stop destruction and awareness creation to stop the destruction of prehistoric sites of Edakkal cave, Tamil Nadu (Shyju 2016). The process of destruction at three prehistoric sites of Bengal- Paruldanga, Mahisdhal and Chandraketugarh was observed. The measures for protecting the sites were suggested in the paper(Mondal 2021).

Objectives of the Study

The prehistoric sites of India are under destruction due to human and natural agents. They need to preserve for further study of the prehistoric people. The objectives of the present study are

- To identify the processes or ways of the destruction of the prehistoric sites of Bantoli and Toyontoli in Jharkhand in Eastern India.
- To develop some preservation strategies to minimize the destruction of the sites under study.

Methodology used in the Study

The present study was done on the Ranchi Plateau which is an extension of the Chotanagpur Plateau. The places covered during the study were Ranchi, Lohardanga, Bantoli, Netarhat, Betla, Palamau, Lodh Falls, Mahuadanr, Khunti and Dasham Falls area. The geomorphology of all the places was carefully observed. The stratigraphy of some places like Mahuadanr, Palamau, Lohardanga, Bantoli and Toyontoli were studied. For fulfilling the objectives two sites-Bantoli and Toyontoli were focused. These two sites of Jharkhand were properly explored and surveyed to know the distribution of artifacts and extension of the sites. The geographical location was taken with the help of GPS. The stratigraphy was studied to understand the nature of the sites. Different agencies responsible for the destruction of the sites have been observed. The research papers, books and journals containing the information of the previous works on cultural resource management were done as far as possible as secondary sources. For the systematic site survey compass, topographic map, camera, notebook, pen, pencil and measuring tape have been used. For developing preservation strategies various articles and journal papers were studied.

Physiography of Ranchi Plateau

Jharkhand is situated in the Eastern part of India. It is the 15th largest state of India. Jharkhand is physiographically divided into Ranchi Plateau, Hazaribagh Plateau, Damodar Valley, Pat Region, Singhbhum Uplands, Rajmahal Hills and Santhal Pargana Uplands. Ranchi plateau is located at an elevation of 700m from the mainstream level (Ekka 2020). The Ranchi plateau is bounded by Damodar, Subarnarekha and Kharkhai rivers from all sides. The plateau is a rugged hilly area filled with forest and small fertile land. The forest areas are mainly present in the lowland areas of this largest plateau of Jharkhand. Swarnarekha, Sankh and Koel are the rivers flowing through this rugged area. Tropic of Cancer passes through the area which indicates the presence of a tropical climate (report of RSI 2008) The rocks of the Ranchi Plateau area are of Archean origin. Quartz, quartzite, mica, chert, hornblende, granite and gneiss are the raw material of the rocks prevailing over the plateau (Ray 2009, Polley 2009).

The composite stratigraphy of this area consists of the bedrock in the lowermost stratum. It is superimposed by boulders in the lateritic matrix. On the top of this layer, there is a secondary lateritic bed mixed with gravel. This gravel bed is topped by yellow-coloured silt, then brown-coloured silt and the blackish clayey layer at the top (Ghosh 1995). Coal, copper, limestone, iron ore bauxite and mica are the minerals contained in the plateau area. The area receives an annual rainfall of 1300mm. The subsistence of the local people is based on agriculture and forestry (Pathak 2012). Tribal groups like Mundas, Birjia, Santhal, Birhor, Gond and Kharwar live in the area (Minj 2010, Hansda 2010;8-10).

Prehistoric Cultural Heritage of Ranchi Plateau

Ranchi plateau is rich in prehistoric assemblages. Sites like Jojadih, Hardag, Bajra, Chasrma, Paras river project, Kamre, Tape, Ghaghra, etc. have been discovered by prehistorians in the Ranchi plateau area (Chattopadhyay 2004, Saha, 2004). The first evidence of Paleolithic tools from this area came from the works of W. H. P. Driver in 1887. Later in the year 1888, J, Wood Mansion explored the discovered site by Driver and discovered many cultural assemblages Stone Age. The whole material was later listed by Coggin Brown (Dani, 1960: 33). Coggin Brown (1915) also examined the chalcolithic copper axes from the Basia Thana in Ranchi and Hanu in the Palamau region. Later Ashok Ghosh explored the lower paleolithic sites of the Jumar, Potpoto and Sapahi areas located in the Subarnarekha valley. The Gumla region also contained rich Paleolithic evidence (cited in Chakraborty, 1993). Upper Paleolithic sites have been discovered by B K Saran in the Kunti region of the Ranchi District (IAR 1968-69). Prehistoric assemblages were later discovered by S Roy and V Jayaswal from the areas of Chainpur, Harra Pahar, Patratu, Borea, Malgo, Salam and Chiraundi (Jayaswal 1981). Megalithic sites containing Menhirs, Dolmen, Stone Slabs and Stone circles have been discovered in the Kunti area near Ranchi (Shekhar 2016, Joglekar 2016). Tajna River Valley also yielded both Paleolithic and Mesolithic tools made of chert and quartzite (Ray 2009, Polley 2009).

The Bantoli site was found on the Ranchi Plateau an extension of the Eastern Plateau region. On the southeastern part of the site lies the reserve forest of the area. The area is dissected by several ancient streams and their dried-up channels. The rock shelter on the hill perhaps was used by the prehistoric people to protect themselves from natural calamities as well as to protect themselves from predators. Different types of physical weathering have been found on the hill. Due to weathering, rocks become cracked and are detached from the hill and deposited at the foothills in and around agricultural land.

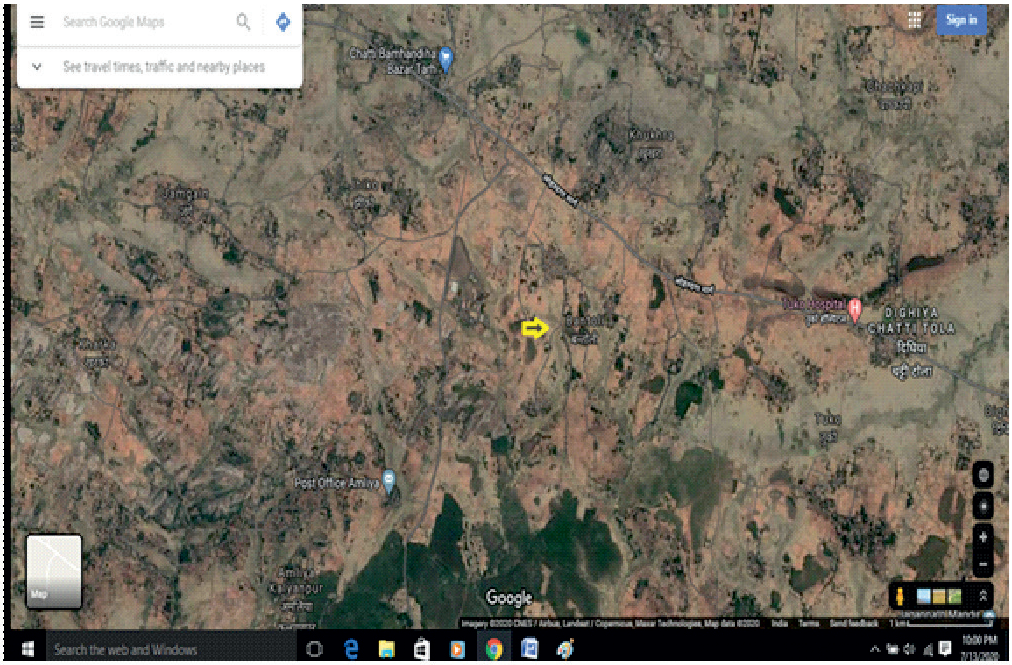


Figure 1: Location of the site Bantoli in Satellite map resent undertaking: Bantoli

District : Gumla
State : Jharkhand
Coordinates : 23^{0}32$^{/}$ N, 84^{0}90$^{/}$ E
Source: https://earth.google.com/web/search/bantoli+hill,+ Bantoli,+ Jharkhand/@23.32630398,84.90917604,791.76597507a,636.89813356d,35y,149.01696225h,44.99794149t,0r/data = C o o B G m A S W g o k M H g z O T h i M m I 3 Y 2 J l Z T B m M D E 3 O j B 4 Z j Q 5 Y z k 3 O D J j N z I 2 Y W U x G T z N E x l n U z d A I T 1 Z 1 q I q O l V A K i B i Y W 5 0 b 2 x p I G h pbGwsIEJhbnRvbGksIEpoYXJraGFuZBg BIAEiJgokCU8n AOf1Hzd AETSZmHRJG DdAGdxFBjo6VFVAIeDZwkFDUlVA

Picture 2: View of the site Bantoli

Picture 3: View of the site from the hill

The colour of the soil varies from reddish to brownish. The topography of the area is undulating in nature and is sloping towards the agricultural field. At present the site is used for agricultural activities. Tools are found lying on the cultivated fields. They became exposed due to the ploughing of land.

Picture 4: Rock shelter at Site Bantoli

Cultural Findings

Stone tools found from the site belong to the flake-blade industry. It consists of cores, flakes, and finished and unfinished tools. Among the tool types, scrapers are predominant. Scrapers family include side scrapers, end scrapers and round scrapers. Tool assemblage includes points, burins, awls, blades, knives and microliths both geometric and non-geometric forms.

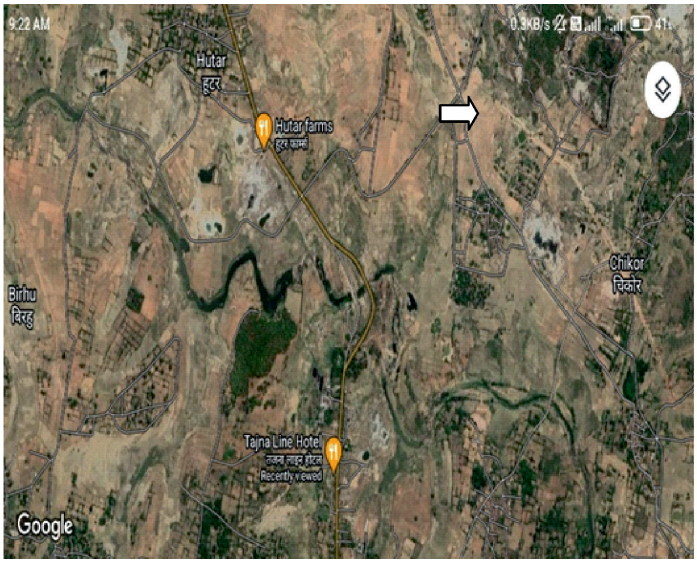
Cultural Period

Tool typology resembles with upper Palaeolithic to Mesolithic period. According to eastern Indian lithostratigraphy, the flake blade industry dated to the later part of the Upper Pleistocene period (Ghosh 1970).

Stratigraphy

The stratigraphy of the site consisted of two layers. The silt layer is reddish brown. It is about 6 ft. in height. The lower part of the silt bed is composed of nodules of quartz and quartzite. The upper part is mostly free of nodules. The silt is reddish and sticky and formed during dry climatic conditions. Tools have been found from this layer. This indicates the dry climatic conditions at the end of the Pleistocene. A gutting layer is found on the top of this silt bed. It indicates the end of the Pleistocene and the start of the Holocene period. The silt layer is topped by a recent alluvium layer of about 4 ft. height. It is dark brown. Grasses and shrubs are found on the topsoil. This is the recent Holocene deposition and is archaeologically sterile.

Toyontoli



District : Ranchi
State : Jharkhand
Coordinates : $23^{0}07'$N, $85^{0}16'$ E

Picture 5: Location of the site Toyontoli in Satellite map

Source: https://earth.google.com/web/search/tajna+river,+jharkhand/@23.1017939,85.3103486,615.34074022a,962.47476728d,35y,0h,45t,0r/data=CoEBGlcSUQolMHgzOWY1MTc0ODEzY2Y2ZWYxOjB4YmVkMTRmOWM0ZWVhZjg5ZRmrbj8qDxo3QCEA11_A3FNVQCoWdGFqbmEgcml2ZXIsIGpoYXJraGFuZBgCIAEiJgok CQK_fmsloTlAEYykSui6ozVAGfx1QROvqFZAIXDydw-4PFRAKAI

The site Toyontoli is located by the site of the River Tajna at the left side of NH 75 (Khunti to Hatia Road) near the Tajna Bridge and canal. Tajna is an ancient tributary of Kanchi, which is the tributary of the Subarnarekha River. The site is 620 m. contour line. The area is agricultural land with outcrops surrounded by open Sal forest. The area is highly undulating and the higher ground is covered with sal (Sorea robusta) trees and the lower ground is swampy and is used as an agricultural field. The water of the stream is preserved for agriculture by the building of a *bandh*. The rocky outcrop is made up of granite, gneiss and schist. There are quartz veins, running through the granites. The granite has decomposed and turned into gneiss and micacious schist. Further decomposition of the bedrock has given rise to the formation of mottled clay. Prehistoric people choose the area because of nearby water sources and the availability of stones from outcrops and veins.

Picture 6: Prehistoric site Toyontoli

Cultural Findings

Cultural findings include flake tools and blade tools mostly made of quartz. The cultural assemblages include finished and unfinished tools with different types of cores and debitage. These prove that the site was a factory site. The flake blade industry dates to the later part of the Upper Pleistocene period (Ghosh 1970).

Stratigraphy

Stratigraphy observed in the area consisted of three layers. The lowermost part is the bedrock made up of granite, gneiss, and micacious schist, the upper part of which has decomposed and formed the mottled clay (1.5 ft.). On the mottled clay, there is a thick deposition of secondary laterite (4.5 ft.) which is compact, and hard mixed with quartz nodules as well as angular gravels made of quartz. This was formed during wet climatic conditions in the lower part of the Upper Pleistocene period. On the top of the layer, there is a silty soil bed (4 ft.). It is red in color and sandy in nature but in rain it becomes sticky. It was formed during the Dry climatic conditions in the later part of the Upper Pleistocene period. Tools have been found from this silt layer. Recent alluvium is blackish and found on the top of this silt bed, but in most cases, it has been eroded and agricultural land is found on the red silty soil.

The Process of Destruction of The Two Sites

The two sites under study have been used for agriculture at present. For agriculture, the natural vegetation cover of the site was removed. There has been regular ploughing of the site. The cultural assemblages get damaged or broken due to this ploughing of land. The removal of the natural vegetation layer has loosened the soil. Rapidly flowing water during the monsoon season and also due to irrigation while

farming has enhanced the erosional activities in the two sites. The drainage system is also contributing to the erosion of the sites. Developmental activities including the construction of roads, bridges, dams, and houses are the major threats to archaeological heritage. Through the prehistoric site of Bantoli, the main road connecting Ranchi with Netarhat has been constructed. Beside the road, small houses have been constructed by the local people for residential as well as for business purposes.

Figure 7: Soil Erosion at Bantoli

Figure 8: Farming at Bantoli

Figure 9: Construction at Bantoli

Figures 10 and 11: Agricultural Activities at Toyontoli

Picture 12: Tunnel at Site Toyontoli

Picture 13: Constructional activities at site Toyontoli

Picture 14: Bridge connecting the National Highway at site Toyontoli

On the other hand, National Highway 75 passes through the site of Toronto. A bridge has been constructed to connect the highway to the Tajna Canal. A small dam has also been constructed on the canal to store the water of the canal for agricultural purposes. All these developmental activities have severely affected the prehistoric sites. The cultural assemblages have been severely damaged. The soil has been uprooted which has increased the erosion of the area. This has increased the problem of proper drainage on the site. The improper drainage and the canal at Tajna dislocated the upper soil as well as the prehistoric tools from the site to other places. Lack of knowledge and awareness of local people has also contributed to the destruction of the site. The presence of broken alcohol bottle pieces in the cave at Bantoli indicates human interference on the site.

Preservation Strategies For The Sites Bantoli And Toyontoli

The two prehistoric sites Bantoli and Toyontoli have immense importance as a part of the prehistoric cultural heritage of India. At first proper identification of the boundaries of the two sites should be done and the cultural assemblages should be identified and collected so that the tools can be preserved in the museum for further study of the sites. For this purpose, the construction of a site museum is recommended. The documentation and proper location of the site boundaries can be done with the help of GIS, GPR, etc. A proper boundary wall should be built around the sites so that the local people cannot enter the sites. The agricultural activities should be stopped immediately and the farmers should be given alternative means of subsistence by the Government. At the same time, the local people should be aware of the importance of the sites and the cultural assemblages. To prevent erosion due to rain, fibre roofing is recommended. The help of the local administration can be taken for awareness of the people and security issues of the sites. At last, proper laws should be formed to protect prehistoric sites. The appropriate penalty has to be taken from the people who are destroying the prehistoric sites deliberately. These remedial measures can help in the management of the resources present in the studied two prehistoric sites.

In most of the cases, there is a communication gap between researchers and Government. The academicians as well as researchers should approach the Government to protect the site. There is also alternative thinking regarding the digital documentation of the site. This is very cost-effective for researchers and academicians. Al the records including geological, geographical and cultural assemblage of the site should be documented before the final disappearance of the sites.

Summary and Conclusion

The present study has been done in two sites Bantoli and Toyontoli in the Ranchi plateau of Jharkhand. The Ranchi plateau region is of Archean origin. Many rivers flow through this plateau. Adequate water sources, forests and food sources have made the region suitable for habitation. This is evident from the prehistoric cultural resources available in the region. The geomorphology of this region is rugged and undulating with less agricultural land and adequate forest area. The two sites of Toyontoli and Bantoli chosen for the present study bear evidence of Upper Paleolithic and Mesolithic tools. Scrapers, burin, awl, points, and geometric and non-geometric microlithic tools are found at the studied sites. The raw material is mainly quartz. However natural and human agents are destroying the sites. Clearing of the plant cover for agriculture, regular ploughing of the soil, and construction of roads, dams and houses are some of the ways by which the sites are getting destroyed. Developmental work is an insentient process for the better livelihood of people. Side by side it is also important to protect the cultural heritage of a country. Here salvage archaeology may play a vital role in protecting this heritage and continuing the development work side by side. It is also important to aware local people about the importance of this heritage. Academicians and researchers also have to inform the Government both state and central about this cultural heritage and recommend measures to stop the threats of this cultural heritage.

References

Boyd, W. E.,1996, The significance of significance in cultural heritage studies: a role for cultural analogues in applied geography teaching, *Journal of Geography in Higher Education*, *20*(3),295-304.

Campana, S.,2011, Total archaeology to reduce the need for rescue archaeology: The BREBEMI Project (Italy), *Remote sensing for archaeological heritage management*,5,33-41.

Chakrabarti, D. K, 1993, *Archaeology of Eastern India: Chotanagpur Plateau and West Bengal*, Delhi: Munshiram Manoharlal.

Chattopadhyay, R. K. & Saha S, 2004, Palaeolithic Jharkhand. In V.K. Srivastava & M.K. Singh (Eds.), *Issues and Themes in Anthropology,* Palika Prakashan,183-221.

Dani, A. H, 1960, *Prehistory and Protohistory of Eastern India*. Calcutta: Firma K L Mukhopadhyay.

Demas, M, 2013, Planning for conservation and management of archaeological sites: a values-based approach, *Archaeological sites: conservation and management*, 653-675. Los Angeles: Getty Publications.

Ekka, M.A., 2020, Physiographic Division of Ranchi. Retrieved from http://www.dspmuranchi.ac.in/pdf/Blog/PHYSIOGRAPHY%20OF%20JHARKHAND.pdf (Accessed on 29/6/23).

Fagan, B. M, 1991, *In The Beginning: An Introduction to Archaeology*.Cambridge: Harper Collins Publishers.

Ghosh, A. K, 1970, The Palaeolithic Cultures of Singhbhu,. *Transactions of American Philosophical Society,* 60(1),3-68.

Gregory, D. J. 2015. Development of tools and techniques to survey, assess, stabilise, monitor and preserve underwater archaeological sites: SASMAP. *The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, *40*(5), 173.

Indian Archaeology-A Review(IAR).Cited volumes.

Jayaswal, V.,1981, Stone Age Man around Ranchi, *Journal of the Oriental Institute Baroda*, *31*(1), 45-63.

Jharkhand Space Application Center, Department of Information Technology, Government of Jharkhand, 2008, *Report On Slope, Aspect and Altitude Of Ranchi District, Jharkhand State*, Prepared by Remote Sensing Instruments.

Jokilehto, J.,2005, Definition of cultural heritage, references to documents in history. Originally for ICCROM, 1990, Revised for CIF: 15 January 2005. Retrieved from http://cif.icomos.org/pdf_docs/Documents%20on%20line/Heritage%20definitions.pdf

King, T. F., 2002, *Thinking about cultural resource management: Essays from the edge* (Vol. 5). Rowman Altamira.

Macdonald, A., 1990, *Surface Erosion And Disturbance At Archaeological Sites: Implications For Site Preservation*. Department Of The Army, Waterways Experimental Station, Corps Of Engineers, Mississippi. https://apps.dtic.mil/sti/citations/ADA219619.

Matsuda, A. 2004. The concept of 'the public ' and the aims of public archaeology. *Papers from the Institute of Archaeology*, *15*(0),66-76.

Minz, D., & Hansda, D. M., 2010,. *Encyclopaedia of Scheduled Tribes in Jharkhand*. Gyan Publishing House.

Mondal, D. K.,2016, A Study of Prehistoric Cultural Heritage and Management in Odisha, India. *Os Prismas Arqueológicos: Gomos de uma mesma Laranja,*15,31-45.

Mondal, D. K., 2021, Problems and Prospect of Management of Archaeological Sites in West Bengal. *Journal of Heritage, Archaeology & Management,* 1(1), 18-29.

Nickens, P. R,1991. The destruction of archaeological sites and data. *Protecting the past*, *73*, 76-77.

Pathak, U. K.,2012, Assessment of Paleogeomorphological Evolution of Ranchi City, Jharkhand, *Indian Streams Research Journal*,2(2).

Ray, R. & Polley K., 2009, Experimental study on the Manufacturing process of the Lower Palaelithic implements from Quartz nodules. *Status of Prehistoric Studies in the Twenty-First Century in India*.49-55.

Shekhar, H., & Joglekar P. P, 2016, Recent Exploration in Ranchi and Khunti District, Jharkhand, *Heritage: Journal of Multidisciplinary Studies in Archaeology*, 4, 261-278.

Singh, G,2014, Heritage and Us Conserve it for the Future, 2(4).

Syju, P. J, 2016, *A Study on Heritage Preservation and Tourism Development at a Prehistoric Site in Kerala Through Community Engagement*. *Available at SSRN 3371388*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3371388.

Thorne, R. M, 1991, Preservation is a Use: Archaeological Site Stabilization and Protection as Primary Means of Reducing Resources Damage or Destruction, *The Public Historian*,13(3), 139-145.

Wai-Yin, C., & Shu-Yun, M.,2004, Heritage preservation and sustainability of China's development. *Sustainable development*, 12(1), 15-31.

Willigen, J. V.,2002, Cultural Resource Management, *Applied anthropology: An Introduction*, 206.London: Bergin and Garvey.