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Contents

Theme: *Art / Architecture/ Iconography*

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Theme: *Geography / Geo-morphology/ Geo Archaeology/ Hydrology*

Editorial

During this global pandemic situation, all of us are passing through a very critical phase. It seems like the world has come to a stand still. Yet, we need to continue with our journey and keep the flame of knowledge burning. Thus, in this quest for wisdom and learning, **"Society for Heritage, Archaeology and Management"** has been supported and guided by the esteemed members of our Executive Committee, Executive Secretaries of academic wings and scholars from various disciplines and Institutions**,** which has made it possible to publish its very first e-Journal named ***Journal of Heritage, Archaeology and Management (JHAM)***. This volume presents a series of articles on different aspects of Art, Archaeology, Conservation and Management. It contains 16 articles altogether. The articles have been categorized under various themes such as Heritage, Heritage management, Archaeology, Art / Architecture / Iconography, Conservation and Geo-archaeology.

Our Heritage section starts with a valuable article on "Archaeological Surveys in India and Archaeological Survey of India" by Prof. Alok Tripathi, Additional Director General, ASI, which has given us an insight on the origin and history of Archaeological Survey of India and Archaeological Surveys in India. There are few more articles on the theme of Heritage and Heritage Management contributed by Mr. Tamal Dutta, Dr. Debasis Mondal and Ms. Asmita Basu Chatterjee which discuss about the local, national and world heritage sites.

The theme Archaeology consists of researches related to recent excavations and explorations. The archaeological materials are being revealed day by day which not only provide us significant information about human past but also serve as evidences leading to new arenas for future research. In this category, there are two articles, contributed by Dr. Banani Bhattacharya, Mr. Arabinda Singha Roy and his co-authors. In any archaeological mission, scientific equipment is required for better interpretation. Under this theme, we also have an interesting article focusing on a newly innovation of one such equipment which seems to be very useful in archaeological work, contributed by young scholars along with their mentor Mr. Anustup Chatterjee.

In Art, Architecture and Iconography section there are seven articles highlighting metal sculpture, terracotta figurines, ivory objects, temple and its decorations, of Bengal as well as stone sculptures and painting of other regions. This part of the volume starts with a very interesting article on "Commonality of Indian Tradition and Art" by Dr. Shanti Swarup Sinha, Asstt. Professor, History of Visual Arts & Design, Faculty of Visual Arts, Banaras Hindu University, Varanasi. Other articles have been contributed by Prof. Durga Basu, Dr. Kallol Dasgupta, Dr. Sumita Guha Sarkar, Mr. Balak Nath Bhattacharya and Mr. Niladri Gunin.

Conservation work is also an integral part of archaeological activities and built heritage. This volume offers two important articles on the theme Conservation authored by Dr. Surajit Maiti and Mr. Tapan Bhattacharya.

The last theme covered in this volume is Geo-Archaeology which consists of an informative article on a newly discovered site in West Bengal, authored by Dr. Biswajit Roy. The different research articles presented under the purview of the themes of this volume will undoubtedly provide a wide spectrum of knowledge to all the academicians, research scholars, students and heritage enthusiasts.

Our Society deeply mourns the sad demise of Prof. Samir Mukherjee, former Emeritus Professor, Dept. of Museology, Calcutta University. He had carved a distinct space for himself in the field of Archaeology, training and teaching. His contributions to the field of Art History are well known.

The journal has included only those articles which have been peer reviewed and accepted by a board of scholarly reviewers. We have kept dia-critical marks in some articles as given by the authors. Any part of this publication in any form cannot be reproduced without prior written permission of the society.

We are immensely thankful to the scholars who have contributed their articles on several aspects of national and international heritage and culture. Last but not the least, we also acknowledge the help and active participation received from our Society's Secretary Mr. Anustup Chatterjee in all technical aspects for composing and designing the entire volume.

Prof. Durga Basu (Editor)

Ms. Asmita Basu Chatterjee (Associate-editor)

Archaeological Surveys in India and Archaeological Survey of India

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Abstract

Archaeological Surveys in India and Archaeological Survey of India are not one and the same. The former started by the government in the first half of the nineteenth century, whereas the latter was established in 1871.

Officers of Colonial government, baffled by the rich cultural heritage of great antiquity strewn all around, knew its great value and started collecting them. Their searches associated with documentation and study form an important phase in the development of archaeology in India. History of this phase, falling under the period termed as modern history, perhaps did not engage most archaeologists and heritage enthusiasts. What was written and printed by some early writers was more or less accepted and faithfully reproduced by others. Some differing views also surfaced time to time but no consensus based on facts and records is seen. This paper attempts to look into the past through available records on the matter and try to find out the probable cause for the confusion about the establishment of the Archaeological Survey of India, a 150 year old central organization with a long and eventful history.

Key Words: Archaeological surveys in India, Archaeological Survey of India, History of archaeology in India

India's splendor is not confined only to her physical extent, from snow covered peaks of the Himalayas to shores of the Indian Ocean, but also in its long and eventful history and rich heritage. The 'Mistress of the Eastern Seas' is extremely rich in cultural heritage and every area is strewn with archaeological remains of great antiquity. These treasures of the past, in diverse forms, attracted several British officers who explored the length and breadth of the country in search and collection of them. Of course, their documentation and study also formed a part of the scheme. These antiquaries and their works form an important phase in the development of archaeology in India.

One thing must be understood clearly that history of archaeological surveys in India is not the history of Archaeological Survey of India. Archaeological surveys were conducted time to time by different officers long before establishment of this grand old institution in the year 1871. One

such archaeological survey, which started from December 1861, was often erroneously interpreted as the beginning of the organisation.

This erroneous narrative started building up almost at the same time when the organisation was being set up. Published in 1871, *A Memoir on the Indian Surveys* tracing the history of archaeological surveys in India take its foundation back to 1860. Markham records that "it was not until 1860 that the Government of India instituted an archaeological survey, with the object of preserving ancient monuments, rendering them easy of access, obtaining correct copies of inscriptions and pieces of sculpture, and thus facilitating the studies of future antiquaries and historians"(Markham, 1871:196; 1876:263). Western style of history, which is taught in India, somehow promoted copying more than analysing facts or implementation of knowledge gained for understanding causes and effects. Those trained in such traditions readily, more or less, accepted whatever was written, printed rather, and the same was frequently repeated by several other authors. Some others tried to do something different and tried to establish with other events which took place at a later date (Ghosh, 1953: 1).

Different Dates

Most archaeologists in India are mainly fascinated with digging of archaeological sites and remains, study and documentation of material evidence of past and their interpretation or reinterpretation, most of the time. Like many historians, history of archaeology hardly interests them. As a result, very few serious researches are seen on these aspects of history. A glance on some related works in the past would suggest that there was no consensus on the issue.

Markham (1871: 196) in his Memoir on the Indian Surveys set 1860 as the beginning of archaeological surveys in India. At the same time, Alexander Cunningham (1871) published his previous reports in a series which he started as the Director-General of Archaeology. Inclusion of report for the year 1861-62 in the first volume seemed to authenticate the date given by Markham which created a false impression. He undoubtedly explored several important places and thoroughly documented them, for about fifteen years. The remaining period of the nineteenth century, after Alexander Cunningham relinquished his office in 1885, was not very eventful.

In the beginning of the twentieth century, when the Archaeological Survey of India was put on firm footing, John Marshall started a new series of publications. In his introduction, in the first volume for the year 1902-03, he too traced the brief history. He also adhered to the established timeline and wrote "The history of the Archaeological Department may be said to open with the appointment in 1862 of Major General Sir Alexander Cunningham to be "Director of Archaeology" (Marshall, 1904: 3). What established by Marshall, continued unaltered and no attempt was made thereafter to research on this aspect in British India.

Fifty years later, in 1952, the Archaeological Survey of India celebrated "fifty years" of its "continued existence". In the Bulletin of the Archaeological Survey of India, A. Ghosh (1953: 1) writes "The Archaeological Survey of India as a Central organization completed fifty years of its continued existence in 1952, to be precise on the 21st February". In a way, the (firm) foundation

of organization was thus considered from the joining of John Marshall as the Director-General of the Archaeological Survey of India.

Only after nine years, in 1961, the Archaeological Survey of India celebrated the centenary of her foundation. On this occasion, in the same bulletin of the organization, it was recorded that "In December this year (1961) we are celebrating the Centenary of the Survey" (Ghosh, 1961: 1). Celebration of the centenary within a decade from celebrating fifty-years was definitely going to create some confusion. Organizers, therefore, further clarified by mentioning "That an organization only fifty years old in 1952 should now become a centennial may seem to be a jugglery to many . . . ". Here the date was reverted to earlier one mentioning clearly that "the origin of the Survey dates back to 1861, which, in turn, would explain its Centenary Celebration in 1961" (Ghosh, 1961: 1). Once accepted by the organization, in Independent India, no further analysis was considered necessary and in 2011, the Archaeological Survey of India celebrated 150 years of its foundation on a grand scale (Senguptaand Lambah,2012).

What is discussed above were official decisions based on official records. But actually, what date should be considered foundation of the organization still remains a question for archaeologists, historians and researchers as different dates kept cropping up time to time in different publications now and then.

A booklet published on the Institute of Archaeology records "the Archaeological Survey of India as a central organization was established on 21st February, 1902". Very recently, in 2013, Guidelines for ASI Museums (2013: 2)prepared jointly by Archaeological Survey of India, J Paul Getty Trust, U.S.A., British Museum U.K. and National Culture Fund, also mention John Marshall as the "first Director General of ASI".

Thus it is clear that still there is no unanimity on the date of establishment of the Archaeological Survey of India, and hence it is necessary to re-examine and analyse available documents afresh to arrive on some logical and acceptable conclusion.

Many Archaeological Surveys

Whenever there are discussions on systematic or state funded surveys for archaeological purposes, generally one goes back to the 1860's when Alexander Cunningham carried out explorations in northern part of the country. But neither was Cunningham the only British officer to get appointed by the government for conducting archaeological survey nor was such appointment made for the first time. Several such appointments were made in the past where British Officers, generally army officers who were good at preparing sketches, drawings and carrying out documentation accurately, were appointed on such special duties.

Active interest of State in Indian monuments can be traced back to 1844 when Court of Directors recommended to the Government of India to employ some of the talented officers (Roy, 1953: 9). Lord Hardinge recommended entrusting such works to the "officers possessing habit of

research and knowledge of Indian antiquities".Captain Markham Kittoe was appointed as 'Archaeological Enquirer' in the North-West Provinces to conduct operations in Bihar and Banaras (Roy, 1953: 9-10).While on archaeological duty he conducted excavations at Sarnath near Benares (Markham, 1871:186).

Another such officer who was appointed for archaeology related work was Captain Gill. Hewas appointed "to copy the paintings in Ajantaand the Ghat caves and the setting up of the Bombay cave-temple commission" (Roy, 1953: 10).On the recommendation of Bombay Cave-temple Commission, "Lt. Brett was commissioned in 1851 to take impressions of the cave-inscriptions" (Roy, 1953: 10).

A young officer who contributed significantly was F.C. Maisey. On the orders of Lieutenant-Governor of the North-West Provinces he "prepared an illustrated account of Hindu antiquities of Kalinjar in Bundelkhand" (Maisey, 1892: 1).

In 1849 he was "employed under the Government of India, in archaeological work in Upper Betwa Districts of Central India." He was selected for this "special duty" on the recommendation of Lieutenant-Governor of the North-West Provinces (Maisey, 1892: 1).He meticulously measured the monuments and prepared drawings and copies of sculptures. Detailed account of his work was finally published in 1892. It is therefore evident that several British officers were appointed in different parts of the country, on various archaeological duties, time to time.

Generalisation has broad applications in many disciplines. But when it is done unmindfully, over generalisation creates serious confusion in history. As mentioned above it is necessary to understand difference in 'archaeological surveys in India' and 'Archaeological Survey of India'. There cannot be any doubt that both are two different things, and hence should not be mixed together. With this clear understanding let us now examine the available records and find out where the mistake could have been made.

Cunningham as Archaeological Surveyor

A careful study of records make it clear that Colonel A. Cunningham had submitted a proposal to the Governor General in November 1861 at Allahabad, "regarding an investigation of the archaeological remains of Upper India" (Cunningham, 1871: i). Although, developments immediately after submitting the proposal and the beginning of the work are not that clear but, a scrutiny of available records suggests that Lord Canning approved the proposal immediately and asked him to start his survey. Cunningham in his own report gives two different dates for beginning his survey (Cunningham, 1871: i, XLI).

This matter was minute din the Council on 22 January and the order was issued on 31 Jan 1862 appointing him as the Archaeological Surveyor from last month. There is no doubt that the proposal was submitted in November 1861 at Allahabad and work started soon after that. According to the order issued on 31 Jan 1862 he was appointed from December 1861. Due to his appointment from retrospective date, different dates are often referred by different scholars in

their writings. It is beyond doubt that Colonel Alexander Cunningham was appointed as the Archaeological Surveyor from December 1861 and hence beginning of his project of archaeological survey of upper India officially started from 1st Dec 1861. "The year 1861-62 was the first of General Cunningham" operations as archaeological surveyor (Markham, 1871: 196).

With his proposal, he had also submitted a plan of work, and he more or less followed it. The survey was initially approved for two years (Cunningham, 1871: iii).The Journal of Asiatic Society also clearly mentioned that "The President informed the meeting of the appointment by Government of Colonel A. Cunningham on an Archaeological Mission which might be expected to occupy him for the next two years and in the course of which the Colonel intended to explore the interesting district of Behar" (Dutt, 1862: 422).

"Cunningham was given a salary of Rs. 450 with a field-allowance of Rs. 250 and a share in the antiquities to be discovered by him" (Roy, 1953: 10). During his appointment as Archaeological Surveyor, it was also clearly minuted that there is going to be no expenditure in the future thus it is clear that the Government had no plans to continue it (Cunningham, 1871: ii).

This surveycontinued for four seasons, i.e. from 1861-62 to 1864-65. Field surveys were carried out in winter season followed by preparation of reports during summer and rainy season. The reports which he submitted to the Government were communicated to the Asiatic Society, which published them in their journal also."Lord Lawrence abolished the appointment of Archaeological Surveyor" (Markham, 1878:265). Roy (1953: 11) records that Cunningham conducted his surveys from November 1861 to January 1865.

In 1868 Lieutenant H.H. Cole was appointed to conduct archaeological survey in the North-West Province (Markham, 1871: 199; 1878: 266).

Archaeological Survey of India

In 1870 July it was decided "that a central establishment should be formed to collect the records of former researches, to train a school of archaeologists capable of conducting local enquiries and to direct, assist, and systemize the various efforts and enquiries made by local bodies, persons as well as by the Government" (Markham, 1871:201). Since A. Cunningham was known for his previous works he was appointed as the Director General of Archaeology in India. "In 1871 General Cunningham commenced work with the aid of two assistants" (Markham, 1878: 269). He worked as Director General of the ASI from 1871 to 1885 (Bhattacharya, 2014:63).

Why This Confusion?

From the above discussions it is clear that Colonel Alexander Cunningham was appointed as the Archaeological Surveyor for a very short period for "investigation of the archaeological remains of Upper India" (Cunningham, 1871: i).The question which then arises is – Why is his short-term appointment taken as the foundation of the Archaeological Survey of India?

There can be two possible explanations. One probable reason to give an early date may be to push the date of foundation of the organisation backwards. Roy (1953: 10), in his official history projected the survey done by Cunningham as "the first archaeological survey of India". Furthermore, a false narrative was built as "Cunningham came back to resume his interrupted task". Another reason, which appears more probable, may be due tothe annual reports published by Cunningham. We are aware that at the time of his appointment it was clearly defined that he would be submitting his reports on his works. He not only followed the plan but also submitted detailed reports on the areas he explored, monuments and sites he documented, antiquities he collected and traditions recorded. These reports were submitted annually to the government as per the condition of the appointment. Government shared them with the Asiatic Society and it published them in their Journal.

When the Archaeological Survey of India was established and Cunningham joined as the Director-General in 1871, he published these ten years old reports as volume 1 and 2 in the series which he initiated as the Director-General. Clubbing these two separate works in a single series gave a false impression to its readers that these works were also conducted by the Director-General of the Archaeological Survey of India. This appears to be the major cause of confusion and misunderstanding. Here it is noteworthy that the publication of this series was started in 1871, the year when Memoir on the Indian Surveys was also published.

Conclusion

When archaeological surveys started in India and when Archaeological Survey of India started, are two different questions having different answers.But a careful examination would suggest that both had been mixed up somewhere which created serious confusion. Study of different records and writings would give different dates at different time.

Authentic history should only be based on evidence and verifiable records. Conducting archaeological surveys by officers appointed by the government of India for this purpose cannot be considered as the beginning of the Archaeological Survey of India. It is clear that archaeological studies were conducted in India since long. British government also appointed various officers on special duty for conducting archaeological surveys or documentation of ancient and historical monuments of interest. Some such appointments include Captain Markham Kittoe, Captain Gill, Lieutenant Brett, Lieutenant F.C. Maisey, Colonel Alexander Cunningham, Lieutenant H.H. Cole, to name a few. After these several local or regional unconnected surveys, finallythe British Government decided to establish a department for archaeology in the year 1870 and Major General Alexander Cunningham was appointed as the first DirectorGeneral of the newly created department. He joined in February 1871 marking the beginning of the Archaeological Survey of India. The organisation continued since then and has now completed 150 years.

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BALLAL DHIPI IN NADIA DISTRICT OF WEST BENGAL: *AN ARCHAEOLOGICAL OVERVIEW*

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Abstract

Ballal Dhipi(mound) is a historical as well as an archaeological site of 13,000 sq.m area, located at Bamanpukur Bazar on way to Mayapur at a distance of about 25 k.m from Krishnanagar which is believed to be the part of Raja *Ballal Sena*'s kingdom, who was the third ruler of the *Sena* dynasty in Bengal, in 12th century. At about 1979 AD a preliminary survey was conducted by the Archaeology Department of Calcutta University, under the supervision of Dr. Ashok Datta. Later on, in 1980 the site was taken over by the Archaeological Survey of India, Kolkata circle. After a series of extensive survey of the site and analysis of the findings the experts concluded that the site was a *Stupa* (Buddhist religious edifice) having certain features of temple complex of 8th /9th century, and was perhaps a seat of learning and pilgrimage up to the 11th century. The site is now protected by the ASI and enlisted as the *Monuments of National Importance*.

Key Words: Heritage, Stupa, Style & motifs

Introduction

Remnants of cultural heritage of ancient Bengal may exhibit its huge affinity in throughout West Bengal. The present study is to highlight the Ballal Sena's Dhipi (BallalSena's mound), which reposesstrong connection with the Great *BallalSena* (1158-1179 C.E.), the fourth independent ruler of *Sena dynasty* (1070-1230 C.E.) of ancient Bengal. The study was done on a fortified monument which is located in Bamanpukur area (on way to Mayapur, at a distance of 25 KM. from the Krishnanagar railway station) in Nadia district of West Bengal. The complexhas occupied about a 13,000 sq.mt. area surrounding a mound having a height of 9 m. After Raja *Ballal Sena,* local people call the entire complex as '*Ballal Sen*'s Dhipi'.

In 1979, primary exploration activities were conducted and some test pits were dug by the post graduate students of Department of Archaeology of University of Calcutta, which was led by Late Dr. Ashok Datta of the said academic department. Later on, in 1980 ASI took over the charge of the complex and a number of excavations were carried out successively from 1982 to 1989. (IAR, 1982-83; 1983-84; 1984-85; 1985-86; 1986-87; 1987-88; 1988-89). Later on, ASI partitioned the site into two parts – the mound and the fortified remains of the fort. For now, both the parts are protected by ASI and enlisted as the *Monuments of National Importance*.

Fig.1 An overview of the site from the north-east boundary

Historical background

During the mid of 11th Century Bengal experienced a distinguished political mess after the fall of *Pala Empire* (900-1050 C.E.). Many *Samanta Rajas* (territorial vassals) who were subordinates tothe*Pala Empire* claimed themselves as the individual rulers of their territory. It is believed that, one of them named *Samanta Sena* and his son *Hemanta Sena* took the opportunity to reunite the mutineers. In 1080 CE. the *Sena* dynasty was established under the reign of *Hemanta Sena* (1080-1096 CE). He became the first Raja of *Sena* Empire with the honorary epithet of the *Mahārājādhirāja* (King of kings) and the *Rājarakshāsudaksha* (competent savior of the kings)of the *Rarh* Bengal (lies between the Chotanagpur plateau in the west and the Ganges delta in the east) (Jarret &Sarkar, 1949; Vasu, 1987; Rahman, 2018).

Somehow, the *Samanta Sena* hada genealogical connection with a remote ancestor of *Sena* dynasty named *Bir Sena* or *Vira Sena* (Jarret, Sarkar, 1949; Rahman, 2018) who belonged to the *Chandravanshi* (Lunar dynasty)*Brahma-Kshatriya* (Brahmins turned to warrior clans) clan of *Karnat* (Karnataka, South India) (Jour. of Asi. Soc. ,1838; Majumdar, 1945; Vasu, 1987).

On the contrary, the rulers of *Suket* and *Mandi* estate of Punjab claimed themselves to be the ancestors of the *Sena*'s of Bengal. They believed that they belonged to the '*Atri gotra'* of the *Chandravanshi* line of Rajputs and consequently claimed as descendants of the *Pandava* family of *Mahabharata*. The progenitors of this line are believed to have ruled for 1700 years in *Indraprastha* (now in Delhi), until one *Khemraj*, the last ruler of the early dynasty was dispelled by his *Wazir* (vizier) *Bisarp*, who then controlled the throne. (Punj. Gaze. 1920; Beotra,1927; Vasu, 1987)

*Khemraj*losinghis kingdom of *Indraprastha*, fled awayeastward and settled in Bengal, where thirteen of his successors were said to have ruled for 350 years. Their capital was at *Lakshmanapuri* on the banks of the river Ganges. The most distinguished ruler of this dynasty was *Lakshmana Sena*, who was said to have extended his conquests to Kanauj, Nepal and Orissa and founded *Gaur city* in Malda district and renamed it as Lakshanauti or *Lakshmanabati* after himself. One of his successors *Ballal Sena* chose *Nuddia* (Nadia) as his capital near the confluence of the river Bhagirathi and Jalangi (Punj. Gaze. 1920; Beotra, 1927; Vasu, 1987).

A number of incised copperplates were discovered from various parts of Bengal in last two centuries. Notably among those were **a)***Kesava Sena*'s (Ballal's grandson) plate from zilla Bakherganj pargana; **b**)Edilpur (now in Bangladesh) (Jour. of Asi. Soc., 1838); **c)***VijaySena*'s (Ballal's father) plate from Barrackpore, district North 24 Parganas(1910); **d)***BallalSena*'s plate from Naihati, district North 24 Parganas (1911); **e)***Lakshman Sen*a's (Ballal's son) plates from Tarpandighi, district Dinajpur (1875);**f)**Dighirpar-Bakultala, Sundarban, South 24 Parganas (1886); **g)**Anulia, district Nadia (1898); **h)**Govindapur, South 24 Parganas (1919); **i)**Saktipur, district Murshidabad (1984) (Sen, 1942; Sanyal,2010), which are illustrious glorification of the royal line of *Sena* dynasty. The plates are mostly of grants of *Bardhan bhukti* and *Gram bhukti* to the Brahmins and for sacred and other religious purposes. The ten armed *Sadashiva* incised copperplate of *Ballal Sena* from Naihati (Jour. of Asi. Soc., 1838; Sen, 1942; Sanyal, 2010)and mention of having golden *Shiva* emblem on his throne in *Deo-para Prasasti*(Sen,1942) arealso noteworthy. Alongside, Tarpan dighi copperplate exhibits the grant of *avadhapa*, a rent-free plain land belonging to the deity of Buddhist monastery during the second reign of *Lakshmana Sena* (Sen, 1942; Sanyal, 2010).

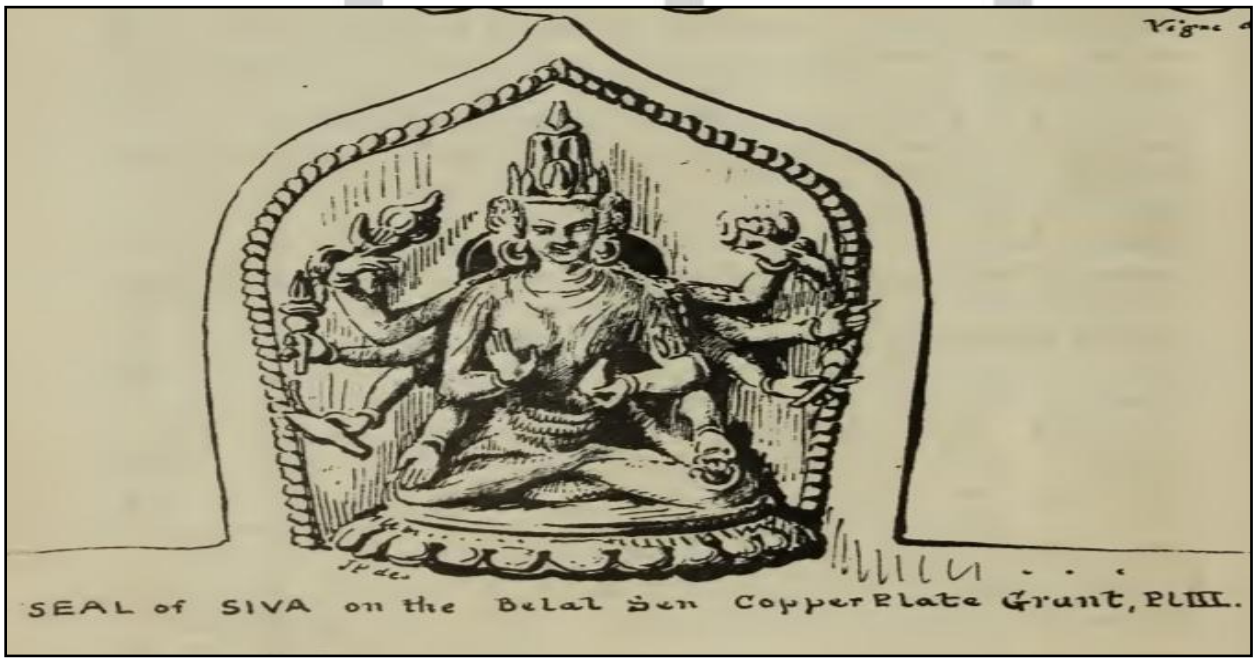

Fig.2 Seal of Sadashiva on the BallalSena copper plate grant, from Naihati(Jour. of Asi. Soc., 1838).

On the support of the above, Abul Fazl Allami's (Grand *Wazir* of Emperor *Akbar* and author of *Akbar-nama*)*Ain-i-Akbari* (third volume of *Akbar-nama*) provides corresponding feedback. The descriptions and the genealogical evidences for the *Sena*'s are given in *Ain-i-Akbari*often resembles with those found in copper plate inscriptions (Jour. of Asi. Soc., 1838; Jarret & Sarkar,1949; Rahman, 2018).

Archaeological significance

Presently, the mound is covered an area of 128 x 100 m. The series of excavationshave revealed a massive brick wall measuring 4.10 m. in width and 3.48 m. in height from the original ground level. From the study it can be assumed that the wall was repaired at least twice after its initial construction. The bricks from the initial phase measured 16 x 10 x 4 cm whereas in the later phases the bricksof different dimensions were introduced along with the bricks of the earlier construction. In the later phases of construction, bricks of 21 x 18 x 4 cm size becamecommon.The defenses were manifestedthrough a fortified wall of length of 22.70 m. on the eastern boundary of the mound and it is 50 m.long in the southern periphery. At a later stage duringperiod of second phase renovation an outer wall of 1.68 m. thick was additionally constructed. The wall continues parallelly to the earlier wall at least on the southern side. The nature of the defenses points out that they were designedfor safety and security of the settlement. In the midst of the settlement, remains of extensive brick-built flooring were observed.

Anotherbrick structure measuring 8 m. of extant height has been observed in one of the trenches.The approach of the structure was relieved with offset projections at regular intervals. The diminishing dimensions producing a pyramidical elevation was another notable feature of this structure. The extensive ground plan was of cruciformpattern as has been observed from the exposed portion of the mound.

This form was retained in all of the stages of repair.In the top most level a brick edging was provided in an identical mode to the rammed lime-surkhi (terracotta brick dust) flooring. On the south-eastern corner a terracotta brick made fire-place was observed in circular form having 70 cm diameter at top and 50 cm at the bottom perhaps used as a *yagna kunda* (sacrificial fire place).

From the entire observations four phases of floorings have been encountered. The upper most was featured by a rammed lime-surkhi floor with brick edging. Remains of a brick flooring which appeared beneath were more extensive than the upper one; howeverits plan could not be fully understood. The next two consecutive floor levels were more elevatedwhich might be for protection from inundation. Contextually, earlier the river Ganga was flowing close to the complex, which has now shifted about 4 km away.

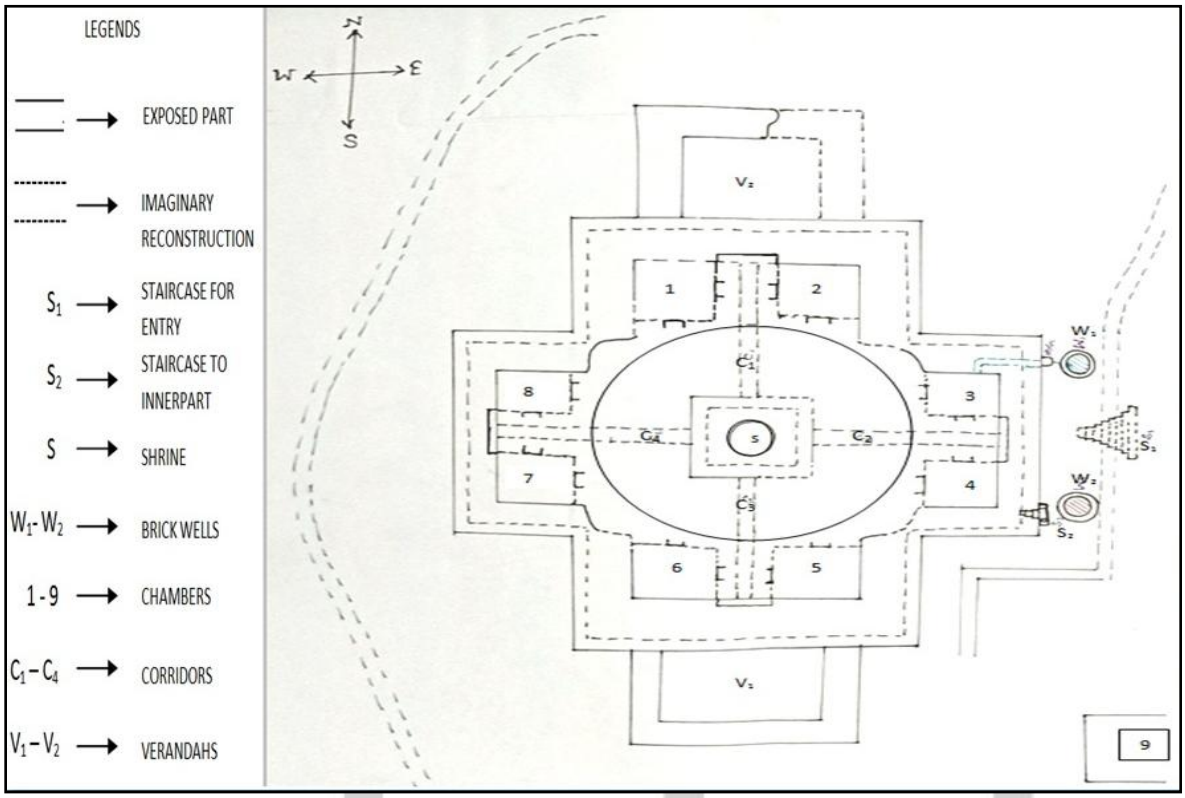

Fig .3 Schematic diagram of the ground plan of the site (not to scale)

Style and motifs

It is observed that the exposed structure which represents a religious edifice was in all likelihood a temple of '*pancharatha*' style, the width of which was 1.90 m, built of brick, the size of which varies but mostly it is 20×16×4 cm. The arms of the *ratha* projections which were designed with offsets were having a length of 5.50 m north-south and 3.15 m. east-west and the central projection being 14 m. long. This stupendous structure of 7 m. long from the foundation was laid on a brick platform which was also 1 m. high from the ground. The same is evidenced in the south-western corner. The medial space between the outer wall of the structure and the inner wall was 1.76 m. from surface. The inward structure was also in compatibility with its replication and similarly of '*pancharatha*' style. The length of its projected arms was 5.50 m.in north-south direction and 3.15 m. in east-west respectively. The central projection was 9.40 m. of length. The nature of this massive structure, which through its exposed parts illustrates a cruciform plan inside a bigger cross, was ambiguous as the projected walls did not have a superstructure over them.

It was further to be noted that the use of the intermediate space between the inner and the outer parts of the structure which apparently served the purpose of circumambulation is not distinct. As yet no working plan has been found to prove its use. The structure underwent several

renovations and repairs in its upper level. At least two floor levels were observed. On the topmost level a brick edged pathway was built towards the last stage of assignment for circumambulation. In the upper part of the structure in its reconstructed portions as revealed in corners five-fold projections, slightly outward cornices were formed by molded bricks. The monotony of walls was broken by the provision of niches. It appeared that at a later phase the upper part of the structure was renovated as a shrine. There were traces of lime plaster of water channels used for disposing of the logged rain water. On the eastern side of inner structure, basalt made crocodile faced gargoyle, which is ended above a narrow circular well (*kunda*), is still in working condition.

Findings

On the lime-surkhi floor in a trench from the inner structure, a good number of copper objects were encountered. The objects included spouted lotas (small ritualistic water vessels), lamps, ladles and a number of cylindrical cases, the use of which in all probability was for preserving valuable records.

A good number of stucco figurines with human and demonic heads (*Gana*) and decorative motifs were recovered from the top level.

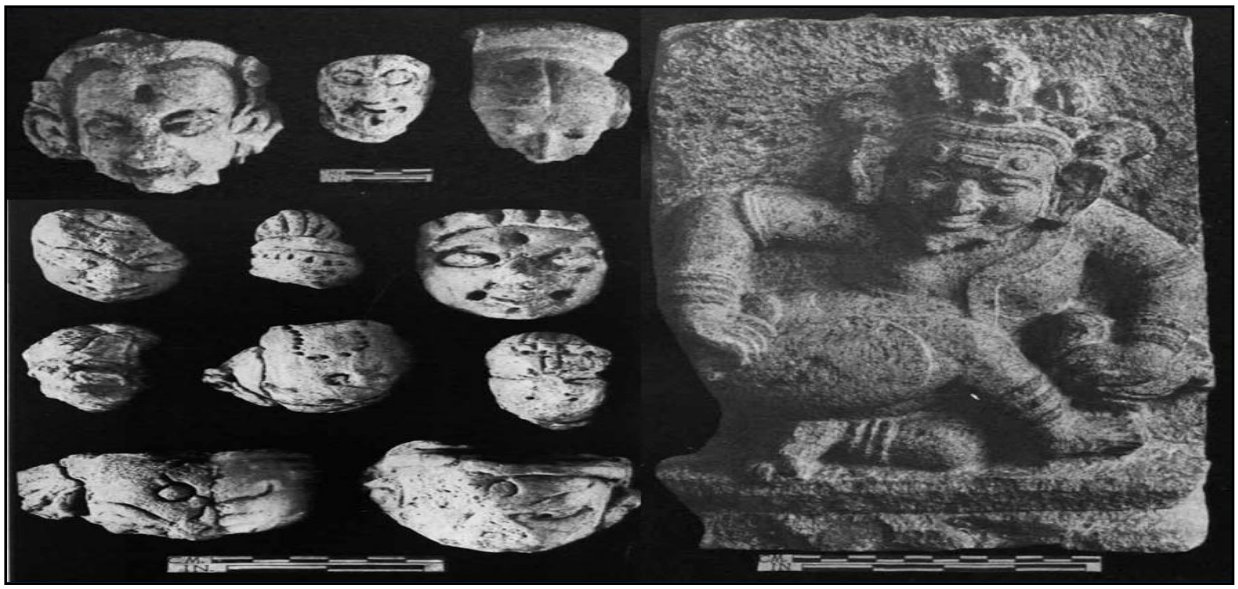

Fig.4 stucco figurines from the site (IAR.1985-87)

The discovered stucco figurines exhibit prominent human features. Most of the female head sare found with well combed hair with a prominent parting in between along with circular dots on their forehead, which may be the indication of applying vermillion or alike. Some of them are with topknot and bun.

Among the *gana*s elliptical depression is seen on the forehead, demonstrative of a third eye. Also, their round protruding eyes and grinning faces elucidate their demonic outlook. A complete stucco figure of a *gana* has been found. He is seated on his left leg with right leg on top, having a thread like form hanging from his left shoulder (perhaps *yagnapavita*; sacred thread) and continued to the waist region. Also, a good number of bangles are observed on the upper arms and on the wrists, and anklets in the ankle regions. A crown like appearance can be observed on its head though not so prominent.

A large number of architectural and pottery remains have been recovered from the same level. The ceramic artifacts comprised of hand is, jars, bowls, dishes in red ware are mostly unslipped and a few are slipped with dull grey material having impression of leaves, flowers and blocks of miniature squares on the outer surface.

Conclusion

It is very apparent that the present site was once a popular habitation for the people of the contemporary period. From the literature reviews and the findings, it is observed that the present site was once used as religious shrine though it does not specify the actual religious beliefs of the settlers. Taking into account of the context ofusing of ritualistic sacrificial fire (*yagna*) and presence of *ganas* it is observed that both appeared in the belief system of Hindusim as well as Buddhism. Similarly, the ritualistic utensils which have been unearthed were used in the religious practices of both the religions. Cylindrical cases may be used for the protection of the important documents perhaps manuscripts. The female figurines may demonstrate the *nartakees* (dancers) or perhaps the *devdasis* (women dedicated to the service of the deity-often temple dancers) existed during the period.

From the inscriptions of *Deopara-prasasti* and *Balla lSena*'s copperplate from Naihati, it can be assumed that the *BallalSena* was *shaiva* by his beliefs. From the Tarpandighi copperplate inscription it is known that grant was given to the Buddhist monastery by *Lakshmana Sena* which may reflect the patronage view on Buddhism. However, comparing the identical features from the remains of *Vikramshila Vihar*experts consider this site as a religious complex of 8th century which might be transformed later into a seat of learning and pilgrimage till 11th century. Thus, further detailed study may enlighten with many hidden facts regarding the Ballal Dhipi of Nadia district as a part of cultural heritage of West Bengal and may contribute to the future research on Bengal heritage.

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Problems and Prospect of Management of Archaeological Sites in West Bengal

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Abstract

Heritage Management is a global issue of the Twenty-first Century. It plays an important role in protection of archaeological remains and sites. There are number of legislations for protection of archaeological sites as well as artifacts in India. But most of the cases these legislations have been applied in historical sites and monuments. Few steps have been taken to protect the prehistoric sites and artifacts used or made by early human. Present study is an approach to explore the problems related to the protection of archaeological sites, prehistoric, proto historic as well as historic with a specific focus on West Bengal and India in general.

Key Words: heritage, management, legislations, public archaeology.

Introduction

In the course of Human evolution culture appeared as new kind of adaptation with non-genetic mode of inheritance. It is a unique possession of human kind and primarily restricted to the Genus Homo. It includes all of the capabilities and habits of man including norms and values, language, religious beliefs, laws, food procurement, raring of children and other behaviour that are shared by a group. Culture is an adaptation in a specific environment. It is dynamic in nature and changes through time. The history of culture goes back to 2 million years ago and continued through generations. Anthropology deals with this cultural continuity from prehistoric to contemporary period to know the evolution and variation of culture through time and space. Archeological anthropology is a sub discipline of anthropology which is dealt with the both tangible aspects of prehistoric past when there is no written records and associated intangible aspects which are reconstructed through the analysis of prehistoric artifacts. Prehistoric culture gradually continued to proto-historic and historic period as well in contemporary period.

Sites preserve the relics of past human activities. It preserves both cultural remnants and fossil remains of early man. So it is very important to preserve the archeological sites as part of our cultural heritage, which has immense importance to know the past human behaviour and

important aspects of human bio-cultural evolution i.e. migration, cultural contact and socio-economic activities.

For the present study three sites have been taken into consideration one prehistoric site, one proto-historic site and an historical site in West Bengal to identify the problems of protection of the archaeological sites of West Bengal and alternative policies for preservation and protection of these cultural heritages.

A glimpse of heritage management

The word heritage includes urban centers, archaeological sites, industrial heritage, cultural landscape and heritage routes. The heritage of a country is its tradition that has been continued for many years and has been passed down from one generation to another.

As per the UNESCO declaration, the World Cultural and Natural Heritage have become an urgent issue globally since 1972. The concept of Cultural Resource Management was started with the beginning of the environment/conservational movement in the 1960s and 1970s. In 1970 the term "cultural resource management" was introduced by archaeologists as a parallel to Natural Resource Management. The primary objective was to preserve the tangible cultural heritage including Historic properties, older properties, museum collections, sites etc.

The Convention for Safeguarding of the Intangible Cultural Heritage was adopted in the UNESCO Convention, 2003. The intangible heritage is consisted of traditional or indigenous knowledge, skills, oral history etc. (Jokilehto, 2005).

The literal evidences show that the Cultural Heritage Management was in action in India before the Colonial period. But there is no such terminology. The concept of preservation of heritage in India started since 1873, when Central Government issued a circular assigned to local Government regarding the preservation and caring of monuments which have historical and architectural value by Cunningman.

Interest in India's archaeological heritage was started by Sir William Jones since the foundation of the Asiatic Society in 1784. Alexander Cunningham, who is known as father of Indian archaeology also became interested in Indian archaeology and history during the colonial period. He started systematic investigation of archaeological heritage of India as early as 1848. He was pioneer in the countrywide survey of archaeological remains and was the first director of Archaeological Survey of India, which was started in 1861 (Roy, 1961).

Agents of destruction of archaeological sites

The heritage of prehistoric sites is very rich in India and has been destroyed day by day due to some unavoidable circumstances. The agents of destruction of categorized into two-natural agents and human agents. There are two types of human agents- incidental, which includes agriculture, land clearing, grazing, and construction of road, water management etc.

whereas intentional causes includes archaeological exploration and excavation, looting, vandalism. Natural agents are erosion of soil, deforestation and flood (Nickens, 1991)

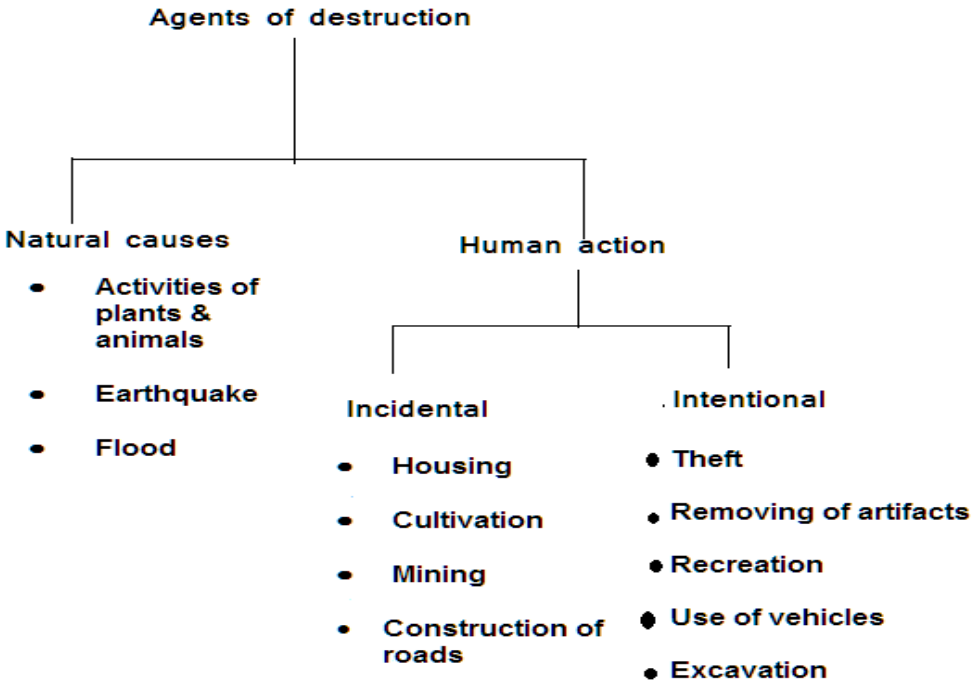

Figure 1 Agents of destruction of archeological sites

Objectives

Archaeological sites have been destructed day by day due to number of reasons. Objectives of the present study are to explore the causes of destruction of these sites and finding out the alternative ways to protect these rich cultural heritages.

Methodology

Data have been taken both from the primary and secondary sources. The secondary sources are existing literatures, books and reports whereas the primary data have been collected from the field. The methods which have been applied in the present field are survey and observation. Observation is an important tool to identify the nature of the sites, distribution of artifacts and the process of destruction.

An observation has been made on the different agencies responsible for destruction of the sites, such as deforestation, soil erosion, and displacement of the layer and riverine activities.

Local people were interviewed to gather information about the history of the site, present activities, their opinion and suggestion for protection of the site.

Studied sites

1. Site: Paruldanga in Birbhum district of West Bengal

Paruldanga (23°42' N and 87°43' E) is a Mesolithic site which was discovered in August 1979 and intensively explored by Prof. Subrata Chakrabarti during 1979 and 1994 (Chakrabarti 1998-1999).

Paruldanga is a village under the jurisdiction of Bolpur Police Station, Community Development Block Bolpur Sriniketan in Birbhum district of West Bengal. It is about 4 km from Santiniketan near the railway station Prantik. The soil is red lateritic and sandy in nature. Quartz nodules are also scattered on the site. The upper yellowish brown to reddish brown silt and yellowish silt deposition yielded Mesolithic tools.

Figure 2 Location of the site Paruladanga

(Source: https://www.google.com/maps/search/paruldanga+/@23.6860649,87.6997616,718m/data)

Present observation

A number of changes have been observed during the field work from 2009 to 2016. It was a bare land and highly erosion in nature. Due to soil erosion a number of tools have been dislocated from its original deposition due to rainfall. For expansion of habitation the trees were cut and soil became loosened which is one of the reasons of dislocating of archeological

materials. In recent years a number of mud houses built up in and around the site. They used to collect soil from the site to build their houses. Major destruction is done during the building of engineering college on the site and later construction of a helipad few years ago. The site is used as shortcut way and people crossed the site with two wheelers and van. Trucks also load clay from the site. So, the site is in danger due to both natural and manmade activities.

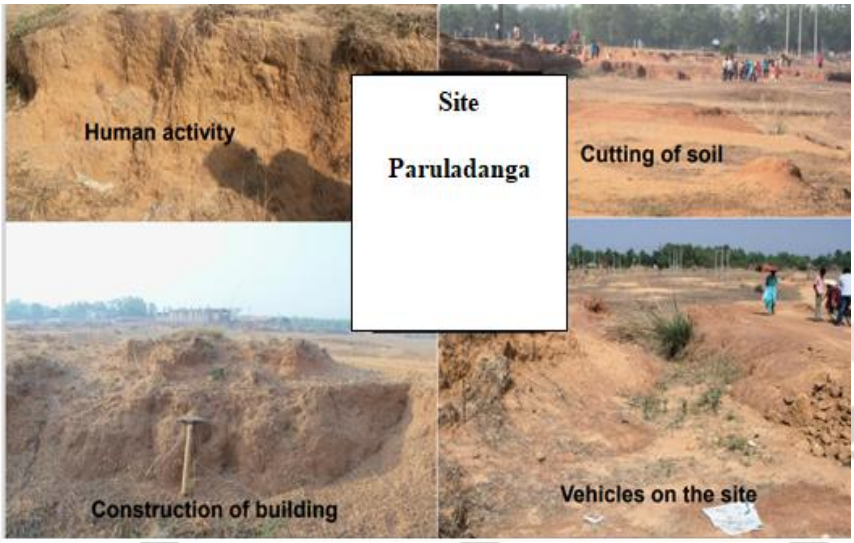

Figure 3 Threats observed in the site Paruladanga

2. Site: Mahisdal in Birbhum district of West Bengal

Mahisdal (23°42' N and 87°42' E) is an excavated chalcolithic site in west Bengal. It is also located under the jurisdiction of Bolpur Police Station, Community Development Block Bolpur Sriniketan in Birbhum district of West Bengal. It is situated in the northern bank of Kopai river and about 5 km. from Santiniketan. Shri R.P Das of the Eastern Circle of Archaeological Survey of India explored the area (IAR, 1962- 63) and later excavated the site in 1964 (IAR, 1963-64). The earliest C14 date of Mahisdal is 1380 BCE. The C-14 date of "Early Iron Age' period is Mahisdal is 690 CE (Chakrabarti *et.* al, 1993).

The site is in alluvium soil which is very fertile for agriculture. Present Mahisdal village is near to the site and the villagers primarily depend on agricultural produces from nearby fields of the ancient mound. The fertile soil and nearby water sources attracted the Chalcolithic people to live for a long periods of time.

The mound extends 230m. X 135 m. This yielded two phases of cultural deposits. Phase I is the chalcolithic which yielded ceramics of different types like red ware, brown ware, black and red ware, grey ware, black polished ware with fine texture. Different incised and pin holes

decorations are found in pot shards and white paintings have been noticed. These are parallel bonds, dots, triangle and geometric motifs. There is evidence of chalcolithic habitation with comprising floors of beaten earth with a soiling of rammed terracotta nodules and burnt husk impressed clay structure. Findings are also comprised of very small microliths mostly made on white chert, a flat copper celt with a convex cutting-edge, terracotta objects, bone tools, fragments of a decorated comb, bangles and a number of beads of semiprecious stones and steatite. A large quantity of charred rice has been found from the floor levels. Evidence of charred rice and burnt clay prove that the site perhaps was destroyed due to firing.

Period II yielded a large quantity of microliths, terracotta figurines and iron objects such as arrow-heads, spearheads, chisels and nails. The site was also used for procurement of iron as large quantity of iron ore and slags have been found. Clay sealing with two symbols and fragmentary terracotta figurines of an elephant in motion are interesting findings from the site. The faunal remains of include the jungle cat, pig, antlered deer, wolf and cattle (IAR, 1963-64).

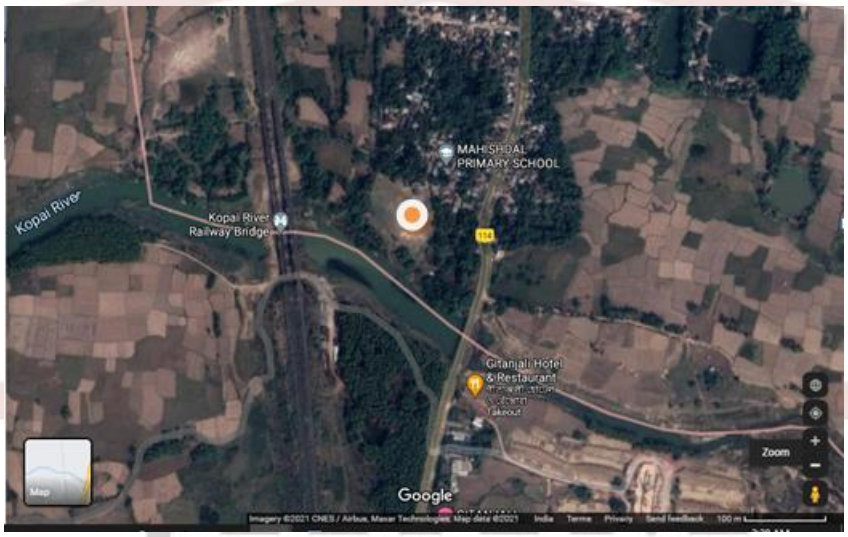

Figure 4 location of the site Mahisdal

(Source: https://www.google.com/maps/place/Mahishdal,+West+Bengal+731204/@23.7123337,87.6914912,718m/data)

Present observation

The mound is almost in destruction. One part of the mound is cut for agricultural purpose by the local villagers. The flat top of the northern part of the mound is used for play ground. The site is highly affected by the construction of Railway Bridge towards the eastern part of the

mound. The western part is steep in nature and erosion of soil has been noticed towards the agricultural field. The river Kopai is flowing from southern part of the mound and in rainy season a portion of the mound became water logged with the overflow of river. The Southern part the mound is used as cremation ground and gradually slopes towards the river. These activities both natural and manmade are the causes of destruction of archeological materials as well as the site Mahisdal.

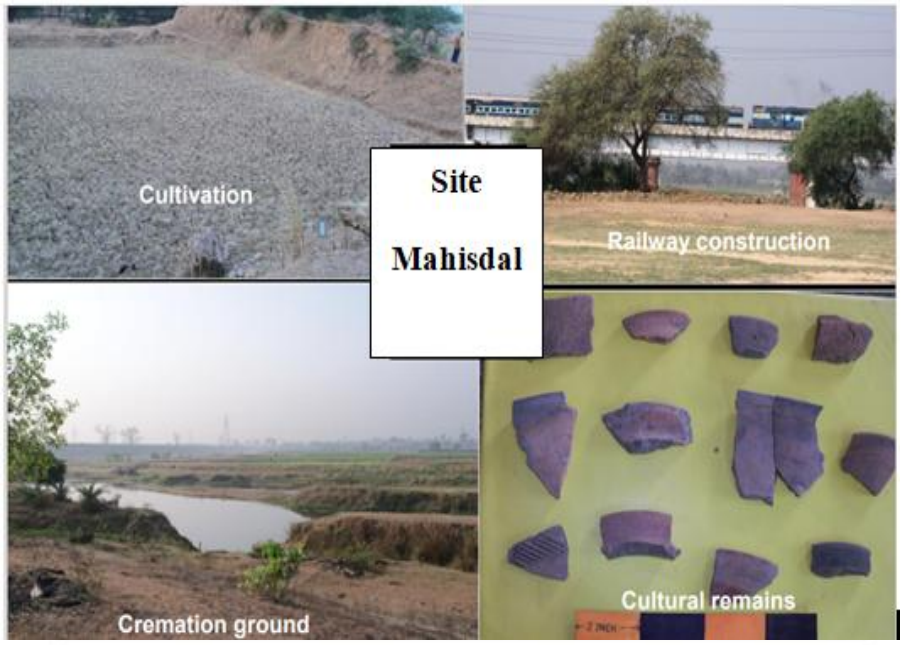

Figure 5 Threats observed in the site Mahisdal

3. Site: Chandraketugarh in North twenty Four Parganas district of West Bengal

The site Chandraketugarh (Latitude $22^0$41'N and Longitude $88^0$42'E) is located near the township of Berachampa in Basirhat in North Twenty Four District of West Bengal. It is situated near Berachampa bus stoppage on the road to Haroa. It was an ancient port city by the side of the river Vidyadhari, which was connected with the river Ganga.

The site was first identified by a local doctor Tarak Nath Ghosh and brought to the attention of the then chief of Eastern circle of ASI, A. H. Longhurst in 1907. Later archaeologist Rakhaldas Banerji visited the site and made some publications on terracotta artifacts collected from the site. Asutosh Museum of Indian Art, University of Calcutta conducted a decade-long excavation on the site since 1956.

Chandraketugarh was the centre of civilization in coastal Bengal from 4th century BCE and the site was continuously occupied from pre- Mauryan times to the Sunga-Kushana period, Gupta and Pala dynasties in 12th century CE (Haque, 2001).

The site yielded huge terracotta objects including pottery, seals, rattles, toys, figurines and plaques. Period I (600 to 300 BCE) yielded NBPW, grey ware, punch marked coins, Period II (300 - 200 BCE) marked by the presence of terracotta objects, copper coins and stone beads. The Period III (200 BCE – 50 A.D.) yielded roulette wares and ceramic vases. Structural remains of temple were found during the Gupta period. Period IV belongs to the Kushan period (50 – 300 CE). Period V (300 - 500 CE) and VI (500 – 750 CE) belong to the post-Gupta age accompanied with huge terracotta object and habitation or temple structure known as Khana Mihirer Dhipi. It is located near the Berachampa bus stand. A fortification was found few km, away from the bus stand. These two places are of interest to the visitors. The site is protected by ASI.

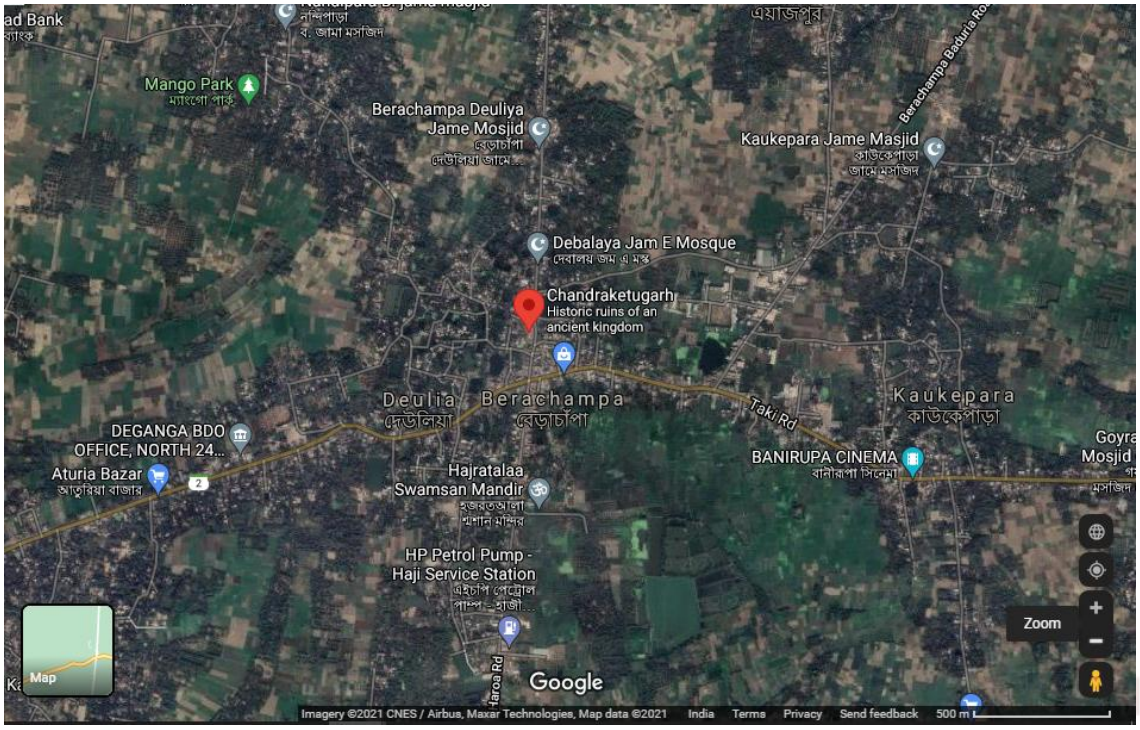

Figure 6 Location of the site Chandraketugarh

(Source: https://www.google.com/maps/place/Chandraketugarh/@22.6975936,88.6809904,2892m/data)

Present observation

Though the site is protected by ASI, a number of activities have been noticed related to the process of destruction of sites. The first site Khana Mihirer Dhipi is a gathering place of local

people. They gossip here on the ancient brick structure. Boys are climbing and jumping from the trees. The ancient water tank made of brick became a garbage dump. People make littering, throw polythene, burnt tobacco and broken wine bottles. Beside these human activities a number of natural destructions have been noticed like the deeply rooted trees and grasses on the brick structure.

In fortification area local people use the site for grazing of animals, drying of jute. People come here with two wheelers on the fortification and due to these activities ancient brick, terracotta and pot shards have been breaking into pieces. Sometimes the site is also used as picnic spot in winter. Firing, cooking and throwing of garbage are also destroying the site day by day. Some prohibitions regarding the protection of the site are in the signboards of ASI, but due to lack of awareness people do not obey these.

Beside these problems, a number of archeological materials yielded in different parts of the area are kept in personal collection. Sometimes the villagers also sell the objects which have archeological values. Recently a museum has been set up by the initiatives of the West Bengal Government.

Figure 7 Threats observed in the site Chandraketugarh

Summing up the problems

In India the archaeological sites which have been preserved by Archaeological Survey of India are mostly historic sites and monument, but the preservation of prehistoric sites is negligible. Most of the legislations are for preservation of monuments and antiquities. The prehistoric sites which provide valuable information about our past, have not been taken into consideration except a few cases.

A number of excavated sites are almost destroyed in West Bengal due to human agents including agriculture, cutting of soil, use of the land for playground and other development projects. Local people also are disobeyed the rules and regulation of the Government and sometimes engaged in different destruction activities. Most of the protected sites are now of an easy access to all, both men and animals. The sites sometimes were used for recreational activities.

The observation in the fieldwork in different parts of West Bengal reveals that local environment played an important role of the protection of archaeological sites. Vegetation cover and soil protect the sites and also artifacts. In humid condition taller plants prevent the direct rain splash on the soil by breaking the rain drops as in case of fortification in Chandraketugarh. The fortification is full of tall trees. The vegetations which cover the top soil have been removed due to number of reasons like deforestation, field clearance, cutting of soil, animal grazing and agriculture. The shrubs covering most of the areas are burnt by local people for clearing the lands for agriculture and also for fuel consumption which results in loosening of the soil. Agriculture involves digging, hoeing and ploughing of soil which degenerates the archaeological materials and grazing of animals also loosen the top soil. These were noticed mostly in case of the site Mahisdal in Birbhum district of West Bengal.

The erosional activities dislocate and transport the artifacts. The archaeological remains are further redeposited in secondary location and lost its original identity in a particular geophysical condition. Gullies are formed along the edges of the boundary of a site due to cutting down the underlying soil at different depths due to the flow of water. Small gullies are sometimes close together joined and form a larger one. The direction of flow is towards the lower area from the higher elevated region. These types of destruction have been noticed in the sites Paruldanga and Mahisdal in Birbhum district of West Bengal.

Protective measures

Due to limitations of fund for protection of the sites, there is an alternative way i.e. increasing awareness programme, which is known as public archaeology. It deals with the role of the people for protection of archaeological sites. Increasing of awareness is an important tool of this approach. The people should be informed about the importance of the site and the artifacts found from the sites. Local people can play a vital role in the protection of the sites. They can be act as security and stop different intentional activities like exporting of archaeological materials, looting etc. the awareness camp should be arranged to aware local people about the importance of the site and values of the artifacts so that they can be act as a preserver of their own culture.

The artifacts collected from the different prehistoric sites are preserved and displays in the museums far away from the site. These artifacts should be preserved in site museum. Natural erosion can be minimized by proper planning and long-term management programme by putting a boundary around the site, fiber roofing. Above all a site Museum should be established to study the culture in proper landscape.

There are three stages of management of archaeological sites have been recommended (Fagan, 1991):

1. At first an overview of the cultural resources in an area with surroundings geophysical setting has to be planned. An ethnographic account also has to be prepared. Previous researches and culture history of the area also is an important aspect of the stage of research. On the basis of these potentialities of the sites an assessment of management procedures are recommended.

2. Then an archaeological assessment report should to be prepared including further assessment and re-exploration of known sites and surveying of new sites. This report is important for further developmental projects such as construction of building etc. This document is very useful for further research and to determine their eligibility for the National Register of Pre-historic and Historic sites and to establish suitable measures to protect them.

3. At final stage a management plan is proposed for protecting, preserving, interpreting and using cultural resources.

Conclusion

The discussions reveal that attention has not been given to the protection of the archeological sites. Both the state Government and the central Government should come forward to undertake different projects to protect our cultural heritage. There are number of constraints such as limitations of fund, politics and policies. In the present socio-political scenario, awareness programme has immense importance in the protection of archeological sites, artefacts and also minimization of intentional activities in an around the sites. So, the practice of public archaeology has an important role in protecting the rich cultural heritage of West Bengal as well as India and planned collaborative research would enhance the archeological tourism in future.

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Challenges for Cultural Tourism & Sustainability of the World Heritage Site of Angkor, Cambodia

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Abstract

Cambodia, a culturally significant country in South-East Asia draws the attention of several tourists for its ancient culture and heritage. It is well-known for the ancient civilization of Khmer centered in Angkor. As a result, Angkor has become a one-of-a-kind symbol of this ancient civilisation and the Cambodian country as a whole. In the year 1992 Angkor Archaeological Park, in Siem Reap, Cambodia, became a World Heritage Site. It was included on the List of World Heritage in Danger. The APSARA National Authority, monitored by the ICC-Angkor, took great initiatives in conserving the sites. These efforts finally lead to the removal of the property from the World Heritage List in danger in 2004. Since then, Angkor and Siem reap have become a prime focus for cultural tourism. The location attracts a large number of tourists from all around the world. This has resulted in more visitor traffic than the region's cultural and physical infrastructure can sustain. Thus, Angkor is seeing some economic and social progress, as well as a slew of serious challenges that have cropped up as a consequence of the development process. Cultural tourism has on one hand given a thrust for financial, social and economic development while on the other has brought about a threat for sustainability and heritage management in the region. This paper aims to highlight the boons of cultural tourism and the major threats it poses for sustainable development and heritage management principles of the ancient sites of Angkor. The study encompasses the positive effects and possible threats of cultural tourism in Angkor.

Key Words: Cultural tourism, World heritage, Angkor

Introduction

Cultural tourism is regarded as a branch of Tourism. This branch of tourism deals with leisure travel usually motivated by one or more aspects of the culture of a particular region or country. Various aspects of human culture and built heritages form the basis of cultural tourism. A number of tourists across the world are attracted due to the culture & heritage of a country. However, cultural tourism can be regarded as a multidimensional segment of the 'tourism sector,' with a diversified and dynamic supply (Csapó, 2012).

There are different definitions of Cultural tourism. One of the most diverse and specific definitions are given by ICOMOS (International Scientific Committee on Cultural Tourism): "Cultural tourism can be defined as that activity which enables people to experience the

different ways of life of other people, thereby gaining at first hand, an understanding of their customs, traditions, the physical environment, the intellectual ideas and those places of architectural, historic, archaeological or other cultural significance which remain from earlier times. Cultural tourism differs from recreational tourism in that it seeks to gain an understanding or appreciation of the nature of the place being visited" (ICOMOS, 1997)

Another definition given by Stebbins (1996) states that "Cultural tourism is a genre of special interest tourism based on the search for and participation in new and deep cultural experiences, whether aesthetic, or intellectual".

Cultural tourism portrays the different aspects of human culture, heritage, natural resources of a certain area or nation. Tourists are more interested in visiting different heritage and archaeological sites & monuments. It has been observed that the heritage travellers stay longer at their destinations and spend more money there than other types of travellers.

Cultural tourists can be classified into five categories (Fig.1) as suggested by Mckercher, on the basis of centrality and intensity of experience (Mckercher, 2002).

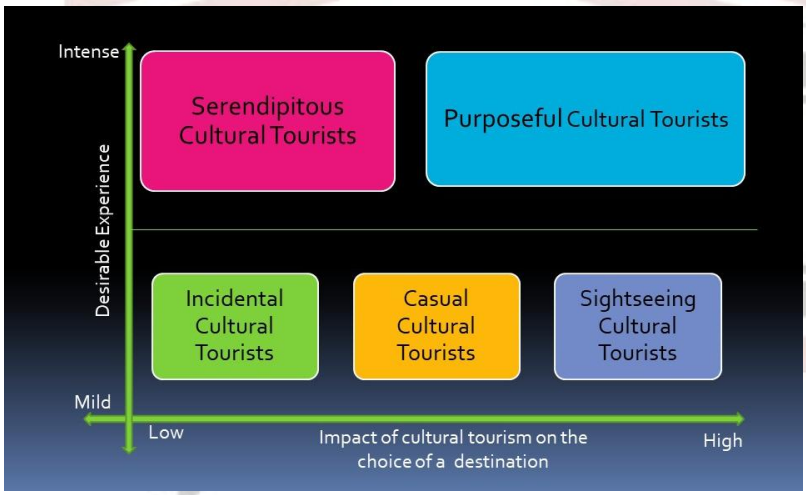


Figure 1: Classification of cultural tourists

The purposeful cultural tourists – represent the group of individuals with high motivation and enjoy a very rich and intricate cultural experience since cultural tourism is the major driving factor for visiting a destination.

The sightseeing cultural tourists – Although cultural tourism is a key motivation for travelling to a certain location, the experience is less in-depth and detailed for this type of tourists.

The serendipitous cultural tourists – Tourists who do not visit for cultural purposes but appear to be having a rich cultural tourism experience as a result of their participation are regarded as serendipitous cultural tourists.

The casual cultural tourists – For such tourists, cultural tourism is not a major reason to travel, so the experience that results is superficial.

The incidental cultural tourists –This category of tourists does not seem to be motivated by cultural purposes, although he or she does engage in certain events and has a limited amount of experience.

The varied definitions of cultural tourism can be thus classified into four group such as- tourism derived, motivational, experiential and operational (McKercher & Du Cros, 2002).

However, the growing interest leading to a huge influx of visitors requires a well- developed infrastructure which can put a major strain on the very resources that attract the visitors in the first place. The natural, cultural resources have a high chance of damage as the number of visitors and local tourism industry increases. It is imperative to protect those cultural heritage resources while attracting the tourists.

Cultural Tourism & Sustainability

A growing concern of the present generation of human beings is the preservation and management of the resources and the heritages. In the attempt to solve this problem, the concept of Sustainable development has emerged in recent times. Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations. The term was first used by the Brundtland Commission., 1987. According to this concept a nation or a society should be able to satisfy its need--- social, economic and others without jeopardizing the interest of the future generations. Sustainability requires that human activity only uses nature's resources at a rate at which they can be replenished naturally. This concept of Sustainability backed by biological, economic and more rarely, cultural and social arguments, made its appearance in the mid-80s, with a marked emphasis on environmental protection. It involves both the factors --safeguarding and development. With the changing scenario sustainability now has a much wider aspect and is holistic in nature. Now a days sustainability is being associated to other important elements apart from environment such as the social, cultural and economic dimensions.

Thus, the idea considers long term social solidarity, enhancement of cultural diversity, protection of the environment and economic growth as essential components of the sustainable framework as a whole. Since the Johannesburg summit the cultural dimension has become an integral part of sustainability thereby changing the notion of sustainable development into a more holistic concept.

One of the principal objectives of cultural heritage tourism is collaboration with local organizations and the public to develop sustainable economies. Tourism creates jobs, new business opportunities, and strengthens local economies. Apart from sustainable economies cultural tourism leads to the sustainability of natural & cultural resources. It protects natural and cultural resources, which improve the quality of life for residents and travellers who participate in the services and attractions. Heritage tourism also promotes community pride by allowing people to work together to enhance economic and cultural development through distinct community engagements. Studies show that travellers are keener to visit places with a strong community identity. Thus, cultural tourism not only provides economic development but also social, environmental & cultural sustainability of a nation.

Angkor Wat- The World Heritage Site

Cambodia, a culturally significant country in South-East Asia draws the attention of several tourists for its ancient culture and heritage. It is well-known for the ancient civilization of Khmer centred in Angkor (Fig.2&3). Angkor has thus been a unique icon of this ancient civilization and the Cambodian nation as a whole. The Angkor Archaeological Park, in Siem Reap, Cambodia, was designated as a World Heritage Site in 1992. It was added to the List of Endangered World Heritage Sites. The APSARA National Authority, which was overseen by the ICC-Angkor, took significant steps to preserve the sites. These efforts eventually resulted in the site being removed off the endangered World Heritage List in 2004. Since then, Angkor and Siem reap have become popular tourist destinations.

Angkor Wat, a UNESCO World Heritage Site, is going through one of its most critical and tumultuous times in its 1200-year existence. Over 20 nations have given millions of dollars to assist protect and repair its temples since the early 1990s. In just over a decade, Angkor has experienced a 10,000 percent increase in foreign visitor visits, making it one of Southeast Asia's most popular attractions. The difficulties posed by the intense confluence of these two contradictory and insecure agendas—heritage protection and tourism development—are amplified by Cambodia's desire to recover from conflict and upheaval. At this juncture, it is important to investigate the patterns of tourism that have emerged at Angkor, as well as why the difficulties brought by rising tourism have been inadequately addressed.

Given recent developments in Cambodia, it contends that Angkor's prominent role within the country's post-conflict cultural and tourist sectors deserves closer, more critical scrutiny.

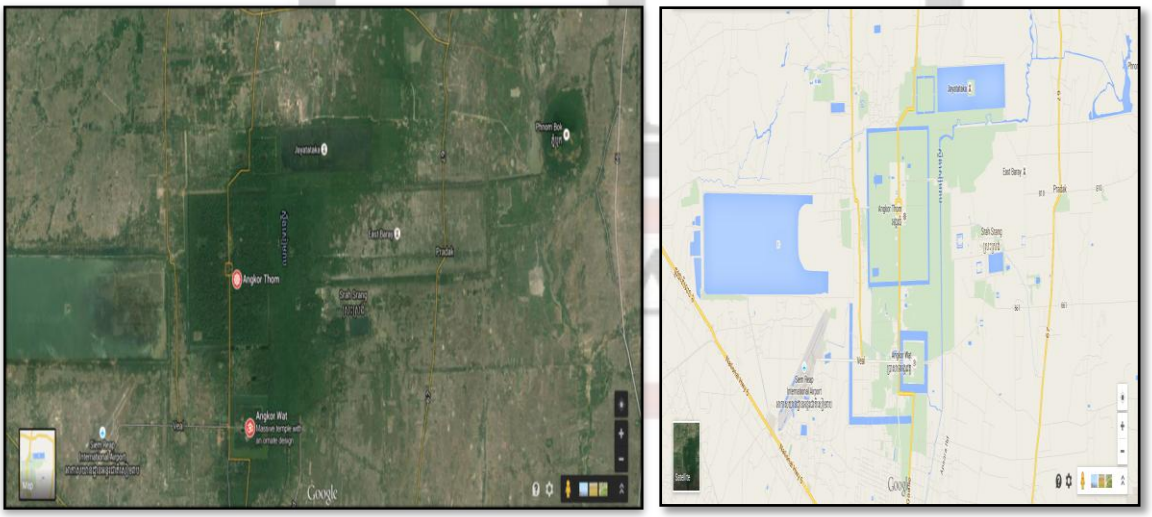


Figure 2 : Satellite view of Angkor

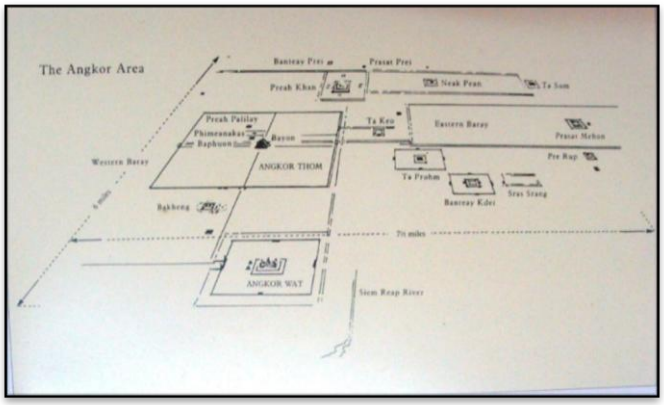


Figure 3: Map of World Heritage Site of Angkor

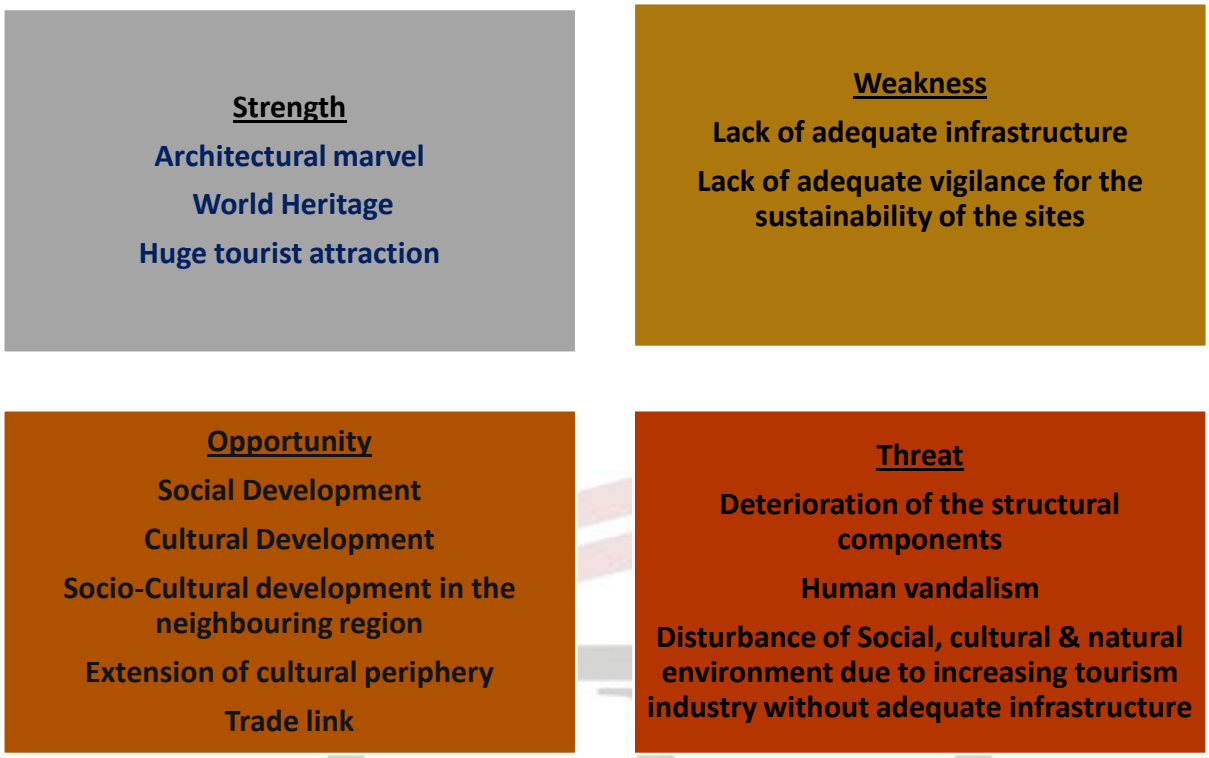
Figure 4: Visitor traffic at Angkor Wat

Figure 5: Tourism infrastructure within the Heritage site of Angkor

Along with Cambodians, numerous tourists visiting Cambodia from different parts of the world have increasingly added to the tourist count which may be projected to be more than a third of a million now(Fig. 4).Due to the overcrowding at Angkor, both visitors and the general public have been subjected to limitations. Access to the most important items of heritage significance has been restricted (Miura,2006). Figure 5 represents the infrastructure inside Angkor Wat which needs to be strengthened to support the visitor traffic. Angkor has grown in popularity as a destination for various festivities such as the annual Khmer New Year celebrations, social functions, weddings (Fig. 6) and so on. The visits to Angkor are generally characterised by an interweaving of leisure, tourism and religion (Winter, 2004).

Figure 6: Wedding celebrations hosted in the premises of Angkor Wat

SWOT Analysis of the World Heritage site of Angkor



We can readily determine the strengths and weaknesses of the research area by analysing the SWOT matrix. This will assist us in developing effective plans and policies to maximise the strengths while minimising the limitations. The last two parts of the matrix depict the expanding opportunities and potential dangers that stand in the way of long-term growth. We must take steps to turn possibilities into regional strengths and to limit any dangers that may obstruct our progress. Thus, a number of challenges lie in the path of cultural tourism in Angkor. It requires more meticulous vigilance for the sustainability of the sites. The increasing tourism activities, social and cultural events within the heritage site leads to the disturbance of heritage values, cultural & natural environments of the site.

Conclusion

Cultural tourism indeed is a boon for the economic development of a region. To reap the actual benefits of this, proper measures and subsequent infrastructural support is required. Growing tourism industry backed by cultural tourism requires a proper framework which has to be prepared considering different aspects. A holistic approach is needed for the sustainability of the archaeological sites & heritages which will not only consider the structural preservation and conservation but also consider effective strategic planning for providing a sustainable framework for the economy, society, culture & natural environment of that region as well as the neighbouring regions. Thus, the vital question at this juncture remains –Is Cultural Tourism a boon or a threat particularly in case of Angkor? As a matter

of fact, tourism has the potential to be a tremendously positive force, yet there are basic conflicts at its core. Tourism, in the case of Angkor, both simplifies and erases its host environment while reinvigorating and re-creating it. In order to address the difficulties that global tourism poses to places like Angkor Wat, it is important to have the theoretical ability to examine these inconsistencies and formulate adequate strategies.

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Depiction of Art as Reflected on Kunal Ceramics

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Abstract

An important feature of Kunal, a pre Harappan site in Haryana, was the use of different ceramics on which various aspects of the culture are depicted. A large variety of patterns can be seen on the pot sherds. The present paper is an attempt to analyze the painted decorative styles on ceramics recovered from Kunal. The paintings demonstrate a remarkable blend of geometrical as well as natural motifs, rendering natural harmony to the subject. The paper is focused upon an overview of the different kinds of patterns or art practices on ceramics recovered from Kunal.

Key Words: Pre Harappan, Ceramics, geometric motif, non-geometric motif, floral or foliage motif

Kunal (29°30′N 75°41′E) is one of the earliest pre-Harappan sites in Haryana, located in the Ratia Tehsil of Fatehabad district in Haryana lies in the flood plain of now dried river bed of mythical Saraswati. The modern town is a part of and lies next to the ancient settlement. The site of Kunal is important since it has provided the evidence of not only the existence of the Pre-harappan culture as it was in its prime time, but also of preceding and succeeding cultures as well. Kunal is the only site included in this category. The old path of the River runs to the north of the site. The study may enable a probe into the various facets of receptiveness of art in a society through the paintings on pottery, a tradition that spans over time and space. Although these constitute a very small proportion of the vast material assemblages, it is of extreme significance in providing a source of information. The paper is based on field data recovered during excavation at the site from 2017-20.

Figure 1 General view of the site

Figure 2 General view of excavated trenches at Kunal

Painted ceramic means beautifying vessel by applying paint on the surface of the ceramic where the expression of the potter/painter's aesthetic sensibilities, and also a reflection of the natural surroundings can be noticed. The aesthetic quality of painted pot is apparently related to the artistic beauty of the patterns executed. These designs and patterns are constituted of motifs and elements, can be classified as geometric, non-geometric, human, floral or foliage motif etc (Rao 1963; Manchanda 1972; Joshi 1972). The presence or absence of certain motifs, its frequency, or continuity and change over time may be used to formulate typological history and chronological framework. The complexity of the painting style is incurred when one looks into their internal variations in patterning the decorations. The cultural and social life of the society can be imagined through the study of the paintings on pottery Basically use of space on any vessel by the potter, as it improves the external appearance making it visually appealing.

The actual habitation deposit exposed so far belongs to the earliest phase of the occupation at the site with pit- or subterranean dwellings of the pre-Harappan people. The ceramic assemblage at the site of Kunal constitutes of a Red ware industry with varied surface treatments ranging from appliqué to incised decorations and a chocolate/black slip on the body. The ceramic industry as a whole closely related to the pre-Harappan Hakra wares to mature Harappa and PGW. The vessels are made of medium fine fabric without any gritty inclusions, though the presence of tempering in the form of fine sand is clearly visible. The clay is mostly well-levigated as it gives a compact feel to the surface and the core of the pots. Most of the vessels are made on medium to first wheel. Some vessels are made on a slow wheel with uneven striation marks in different parts and the use of luting techniques is visible in manufacturing the complete vessel. Handmade vessels are also recovered. In some cases, the rims are wheel-made with perfect striations luted to an uneven body with the finger impressions. The vessels are light-weight, medium to thin bodied, except for storage jars which are heavy and have a thick body. In most cases the pottery has a self-slip with smooth surface, while instances of a light to bright red slip have also been noticed independent of the type of surface treatment being used. Evidence of firing suggests a degree of advanced technique, the undulating surface and limited shapes of the vessels suggest that the industry has not fully evolved when compared to the Mature Harappan period.

One of the most important criteria has been noticed on ceramics i.e., paintings. These paintings are of variety of patterns, constituting of motifs and elements like geometric, non-geometric, human, floral motif etc. Regularity of forms and outstanding symmetry between various component motifs, supplemented by the best rhythmic effect are clearly established by pre-Harappan potters. The paintings demonstrate a remarkable blend of geometrical as well as natural motifs, rendering natural harmony to the subject. The vessels were generally painted before firing, so that in the process of firing the paint adhered to the surface and attained durability. The colour of the paint sometimes varied due to varying temperatures during firing. Some unique forms of art have been noticed in the ceramic assemblages of Kunal. The artists of that time surely had fine artistic sensibilities and a vivid imagination. Their delineation of foliage and animal figures was highly realistic in nature. Aesthetic senses are also visible in ornamental motives. A large quantity of pottery excavated from the site, enable us to understand the gradual evolution of various design motifs as employed in different shapes, and styles.

The painted designs on pottery show various motifs, which may be classified as follows:

- Geometric - Geometric motifs like straight lines, wavy and zigzag lines loops, triangles, squares, circles and dots, diamonds or lozenge pattern, chevron pattern, etc.

- Naturalistic- Flora, Fauna, Human - Naturalistic motifs are the representations of the living world in graphic forms. They include vegetation (floral), birds and animals (faunal), and human motifs.

- Others- Sun symbol, swastika or pipal leaf might be a religious symbol.

Depiction of some sherds and vessel given below- (Courtesy Department of Archaeology & Museums, Haryana)

1.Sherd, Red ware , Biochrome, Hexagon with Circle (Geometric Pattern)
2. Sherd, Red Ware, Biochrome, Loops as fish-scales with Dots (Geometric Pattern)
3. Sherd, Red Ware, Geometric Floral Patterns (Blend of Geometric and Naturalistic pattern)
4. Red Ware- Leafy designs and loops(Blend of Geometric and Naturalistic pattern)
5. Red Ware- Loops as fish-scales with Dots (Geometric Pattern)

1. Broken Pot, Red Ware- Alternatively filled with crisscross or net within triangle in between thick lines (Geometric Pattern) 2. Rim of Handi, Red Ware- Loops with low curve with thick lines and bands on rim (Geometric Pattern) 3. Rim of Handi, Red Ware- Thick horizontal line (Geometric Pattern) 4. Broken Miniature pot, Red Ware- Vertical lines from horizontal thick line. (Geometric Pattern)	
Broken painted pot. Red Ware, Esthetic sense of artist highly noticeable. Depiction of a pipal leaf with human eyes, upper portion of the leaf is filled with crisscross or net designs. It is an impeccably beautiful design. The neck portion also painted with thick black band. It might be a religious symbol.	 

1. Rim of Handi, Red Ware- Diamond pattern filled with criss-cross or net design with two horizontal lines (Geometric Pattern) 2. Rim of bowl, Red Ware, Biochrome, horizontal and wavy lines (Geometric Pattern) 3. Sherd of Bowl, Red Ware, Biochrome, Geometric Floral Patterns with horizontal lines (Blend of Geometric and Naturalistic pattern) 4. Sherd, Red Ware- Diamond pattern filled with criss-cross or net design with two horizontal lines as borders drawn horizontally. (Geometric Pattern) 5. Rim of pot, Red Ware- Diamond pattern filled with criss-cross or net design with a horizontal line as borders drawn horizontally. Above this there are two more horizontal lines (Geometric Pattern) 6. Rim, Red Ware- Loops with low curve radiating from with horizontal line below another row (three) of horizontal lines lines. (Geometric Pattern)	
1. Sherd of a vase, Red slipped red ware with black painted foliage motives on body (Naturalistic pattern) 2. Broken lid, red ware with horizontal lines and loops with low curve (Geometric Pattern)	

Broken pot, Red ware, Biochrome, horizontal lines (Geometric Pattern)	
1. Sherd of vessel, Red slipped red ware, fish-scale designs within horizontal lines. A thick band covering neck and rim (Blend of Geometric and Naturalistic pattern) 2. Sherd of a vase, Micasious red ware. Horizontal lines on body (Geometric pattern) 3. Part of a handled jar, Red ware, made on slow wheel, incised rows of wavy lines (chevron pattern) but in crude form. Horizontal lines on handle and thick band on neck (Geometric pattern) 4. Part of a jar, Bichrome red ware, multiple rows of chevron patterns in between black lines, a thick white band on shoulder and thick lines on neck and rim (Geometric pattern)	

1. Broken Miniature Bowl, Red Ware. Rows of vertical lines and Cross radiating from thick lines. (Geometric pattern) 2. Broken Miniature Bowl, Red Ware. Rows of vertical lines. Below there is a thick band(Geometric pattern) 3. Sherd of a bowl, Red ware. Oblique lines above black band(Geometric pattern) 4. Broken miniature pot, Chocolate slipped red ware. Loops with low curve radiating from edge of the rim (Geometric pattern) 5. Broken Miniature Bowl, Red Ware. Rows of vertical lines from black band rest on a thick line. (Geometric pattern)	
Broken bowl, Red Ware. Decorated with a Horizontal Band of Circular Motifs in between two thick bands (Geometric pattern)	
Sherd, Red slipped red ware, Depiction of wild Bore (Naturalistic pattern- fauna)	

Sherd, Red ware, Depiction of buffalo. (Naturalistic pattern- fauna)	
Two different Sherds, Red ware, Depiction of cattle (Naturalistic pattern- funa)	 

Broken pot, Red ware, Black painting on red surface. Diamond motif filled with crisscross or net in between multiple horizontal lines. (Geometric Pattern)	
1. Rim of Handi, Red Ware, Loops with low curve with multiple horizontal lines and bands on neck (Geometric Pattern) 2. Sherd, Red ware, Biochrome, Depiction of a pipal leaf below thick horizontal band (Blend of Geometric and Naturalistic- flora)	
Sherd, Red ware, Depiction of snail (Naturalistic pattern- fauna)	

1. Sherd, Red slipped red ware, fish-scale designs within horizontal lines. (Geometric pattern) 2. Sherd, Red ware, Bichrome, wavy line on thick band. (Geometric pattern) 3. Sherd, Red ware, Bichrome, crisscross oblique lines with thick bands. (Geometric pattern) 4. Sherd, Red ware, Bichrome, Horn motif (Religious symbol) 5. Sherd, Chocolate slipped Red ware, Graffiti with sun motif. (Religious symbol) 6. Sherd, Red ware, linear composition (Geometric pattern) 7. Sherd, Red ware, Bichrome, linear composition (Geometric pattern) 8. Sherd, Red ware, Bichrome, Horn motif (Religious symbol)	

The painted decorations are a reflection of the excellent artistic skill of the artisans, their acceptance, and involvement in the social and cultural life of the society. The artists depicting the designs had a very clear sense of utilizing the available space; sometimes restricting himself by drawing panels or registers, and sometimes depended on the shape and size of the vessel. The paintings demonstrate a remarkable blend of geometrical as well as natural motifs, rendering natural harmony to the subject.

In the above discussion it is attempted to classify the diverse patterns seen on ceramics recovered from Kunal. They often used only a fix set of patterns. It is suggested that some of these creations are not random scribbles but involve a certain understanding of the culture itself. Above examples show their craftsmanship was remarkable and practically demonstrate the imaginary limit of human capabilities in creating such designs.

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Settlements in the Late Medieval Ramgarh, Jharkhand

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Abstract

This work is based on the archaeological remains found from the different places in the Ramgarh distict of Jharkhand. It is noted that late medieval period for some unknown reasons the king Dalel Singh shifted his capital from Badam to Ramgarh and probably named it after his father Ram Singh. Acceding to a local legend king Dalel Singh excavated a tank beside the double storied *pancharatna* siva temple which was also probably built by him and donated for the *bona-fide* of his draught affected tenants. An exploration has been done by the present authors to find out the residence of the king mentioned in the literature and the temple and tank. After a scientific and systemic survey, two ruined forts and a broken two storied *pancharatna* temple have found. Both the evidences clearly indicate that in the Late Medieval Period for some unknown reasons the king Dalel Singh shifted his capital from Badam to Ramgarh in around 1670s CE and probably named it after his father Ram Singh. Throughout the article, an effort, has been made to reconstruct a comprehensive view on the Late Medieval history and archaeology of the district of Ramgarh.

Key Words: Ramgarh, Kaitha, Fort, Temple, Structure, Chota Nagpur

Introduction

Ramgarh district is one of the 24 districts in the Indian state of Jharkhand, was made on 12 September 2007. It was carved out of erstwhile Hazaribagh District. Ramgarh lies at the heart of the Jharkhand State. The district covers an area of 1,360.08 square kilometres (525.13 sq mi) with a population of 949,159, and a population density of 684 inhabitants per square kilometre . The present boundary of Ramgarh district is in North – Hazaribagh district , South – Rāṇchidistrict, East – Bokaro and Purulia district of West Bengal and West - Ranchi district. The district headquarter is at Ramgarh town. It is situated on the National Highway 33, 46 km awayfrom state's capital, Ranchion Northern side and 52 km away from Hazaribagh on southern side. Out of the total area, 487.93 Sq. km is covered by forest. Ramgarh district has 315 revenue villages of which 305 is Chiragi and 10 is be-Chiragi.

The district is a part of Chota Nagpur plateau. Important physiographic region of the district is Damodar Trough or Upper Damodar basin or simply Damodar Valley. Major area of the district comes under Damodar Valley. Damodar Valley is bounded by Hazaribagh Plateau in north and Ranchi Plateau in south. Ranchi and Hazaribagh plateau is separated by east–west running Damodar Valley. Barka Pahar (Marang Buru)1,049 m (3,442 ft) high above sea level located along the Ramgarh- Ranchi border is probably the highest peak, and it also separates the districts. Damodar is the main river of the district and it also forms a major river basin, comprising a number of tributaries amongst them are: Naikari, Bhervi or Bhera and Bokaro river.

Lack of the archaeological exploration, ancient and medieval history of this region is still unknown. Though, from this district, by the effort of A. Ghosh of the University of Calcutta, a few Lower Palaeolithic tools have come to light beside the river Damodar (Sinha and Singha Roy 2018, 28). Some specimens were also found in situ in a thick secondary laterite deposit in the vicinity of Ramgarh town. The district is also rich in the occurrence of the Megalithic tombs in the form of Dolmen and Menhir. Among the places from where megalithic tombs have been reported mentioned may be made of Dulmi; Gola; Kujjukala; Rajrappa; Bhalugram; Jaynagar; Godatu; Huhuwa; Honhe; Bhenpur; Chitarpur; and Bankheta (Sinha and Sinha Roy 2018, 76). The written history of this district is unknown, and no such attempt has been taken to uncover this part of the history, some of the legends are well known which will be discussed later. Same as early history, the late History and the history of the early and late medieval period of this district is vague and quite unclear. E. Lister had given a list of names of the rulers with a short description of their regime before the advance of the British. But, no such attempt has been done by the Archaeology Department to expose material evidences supporting late medieval literature.

According to the District Census Report the word "Ram" is derived from Murram and "Gaḍh " is derived from Beluagadha but there is no certain evidence to support the view. The report again (Census of India 2011, 5) mentions that Chota Nagpur was the jurisdiction of gigantic king Jarasandha and probably the region was also under subordination of Mahapadmananda of Magadha and Nanda Ugrasena(Census of India 2011, 5). It is also said that entire Chota Nagpur

was under sub-ordination of Asoka the Great, but no such evidence has found to specify this postulation.

The written history of this place is known from the late medieval period, when certain evidence is found about the residence of the Chief of Ramgarh for a hundred years, after Badam was abandoned in 1670s. Ramgarh was attacked and captured by the Muhammadans under Hidayat Ali Khan in 1740, but the complete subjugation of the district was cut short by necessity of moving away to meet a Maratha invasion of Bihar. It was again captured in 1772 by a British expedition under the command of Lieutenant Goddard, who replaced Makund Singh by Tej Singh as the chief of Ramgarh. Makund Singh fled, and shortly after died, as did his infant son. Tej Singh established himself at Ichak, and the former capital quickly fell into decay.

Therefore, the literature evidence is strongly support that the place, Ramgarh, was ruled directly by a few independent chiefs of the Ramgarh Family in the late medieval period. They are;

I. Dalel Singh with a *fauzdar* (Thakur) Golal Singh (1667-1724 CE)

II. Maharudar Singh with a *fauzdar* Manir Singh (Probably a few months in 1724 CE)

III. Bishan Singh (1724-63)

IV. Puratan Singh (Probably a few months in 1763)

V. Makund Singh with a *fauzdar* Tej Singh (1763-72)

Actually, the family was started with the hand of Bagdeo Singh (1368-1402) and his elder brother Singdoo probably the Rajputs of Bundelkhand (Lister 1917, 55). Bagdeo Singh was more auspicious than his elder brother and quarrelled with the King of Nagpur Raj. He defeated Kapper Deo, the Raja of the Karanpura area under the Maharaja of Nagvnshi King, and captured 22 parganas. Therefore, he declared himself as an independent ruler and settled his capital at Urda. He positioned his elder brother, Singdoo, in the rank of the height officer, i.e., fauzdar or Thakur. The tradition had been continuing since that time. The descendants of Bagdeo Singh were always taking the charge as a chief with a fauzdar or Thakur from the descendants of Singdoo. The Family shifted their capital at Ramgarh in around 1660s under the chieftain of Dalel Singh (1667-1724 CE). Ramgarh was served as a capital upto the year of 1772 when fauzdar or Thakur Tej Singh revolted against his Chieftain Makund Singh. He, with the help of British Army overthrow Makund Singh and declared himself as a chief of the Ramgarh Family. Therefore, he shifted his capital from Ramgarh to Ichak.

Remains of Late Medieval Archaeology

Literary evidences indicate that in between 1670 to 1772 the place Ramgarh was probably used as the capital of a few provincial chiefs of Ramgarh family and it was deserted when the provincial capital was established at the Ichak. Now, if the place was used as the provincial capital than there might have a place for the residence of the local chief and other structure in their daily life that must be existed in form of materials remains or intact in present days.

An archaeological exploration has been conducted to find out if any such remains have been existed. And after exploration three places have been identified, i.e., Kila Mandir in the heart of the present city of the Ramgarh, Raja Garh/Garh Bandh, on a hill at the northern end of the present town, and Kaitha, a superb of the Ramgarh town, with ruined forts and a brick built temple respectively (Figure 1).

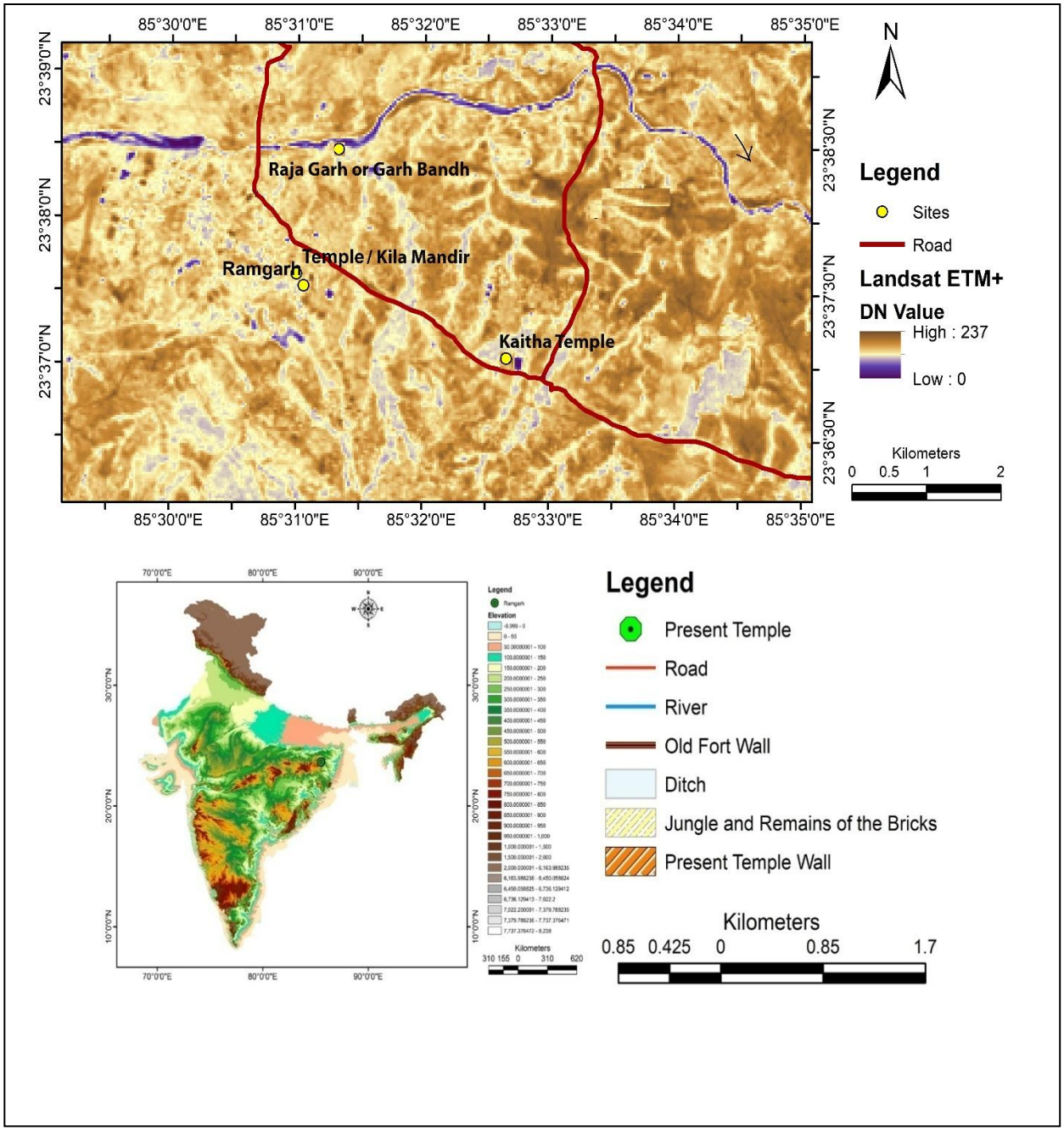


Figure 1 Showing the location of the Kila Mandir (Temple Complex at Ramgarh town), Raja Garh, and the Kaitha Brick Temple

Kila Mandir (230 37/ 37// N; 850 30/ 59// E)

Located at the heart of the town 1.56 km south of the river of the Damodar (Figure 1) with a height of approximately 8-10 m from the surrounding surface. The area which has now existed in the form of a mound extends from south-east to north-west is 109 m and from north-east to south-west is 115 m. In the middle of the mound a complex of three modern temples is constructed with a huge boundary wall. Local people known the place as the fort of the king but nothing is left, except a few remains. Outside of the present temple's boundary wall remains of brick structures and stone wall are found. And the surface of the mound except the temple area covers with bricks butts and block of stones. To the east and the south-east of the present temple a wall made of small square stone blocks jointed each other's by clay and plastered with thick mortar is seemed (Figure 2A and B). The thickness of the wall is not known as the present temple wall is constructed over the ancient wall. The wall is broken and now 130 cm from the surface is standing. The wall can be seen on the east-south-east- and south of the present temple complex. The stone wall is oriented from north-south and takes a turn after 45 m from the north towards west. After running 25 m towards west the wall is finished and did not found in any other side. To the south, and south-west of the present temple a few parts of the brick structure have been noted with the brick size of the 23x 21x7.5 cm (Figure 3). 35m east of the long stone wall and around the high mound a deep ditch with approximately a depth of 7-8 feet have been noted (Figure 4) except the norther portion of the mound where the ditch was filled with the modern people to make a road for approaching the present temple complex. To the south-western corner beside the ditch below the surface from 3 feet a few pieces of iron slags have been discovered (Figure 3).

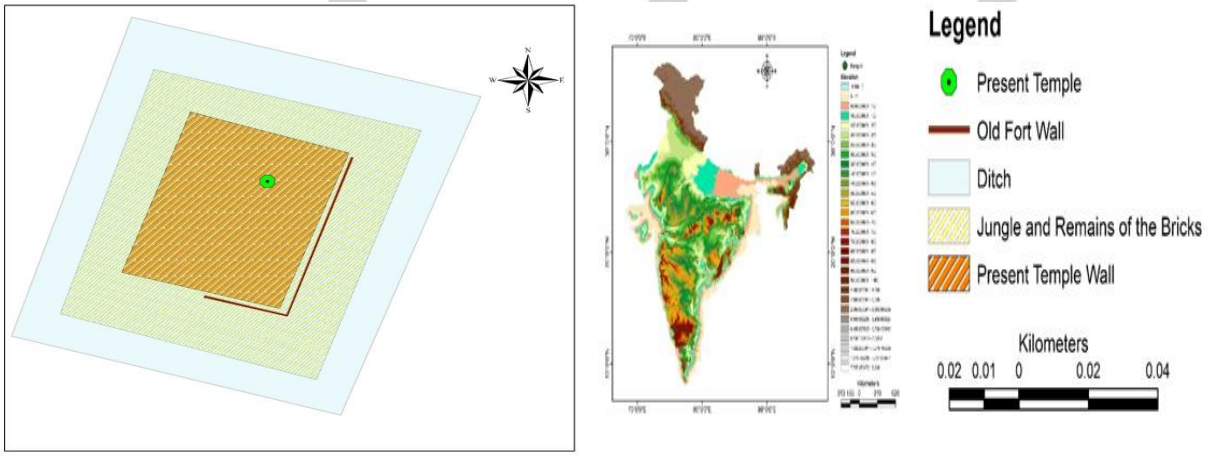


Figure 2A: A complete Layout of the ancient fort based on the materials remains

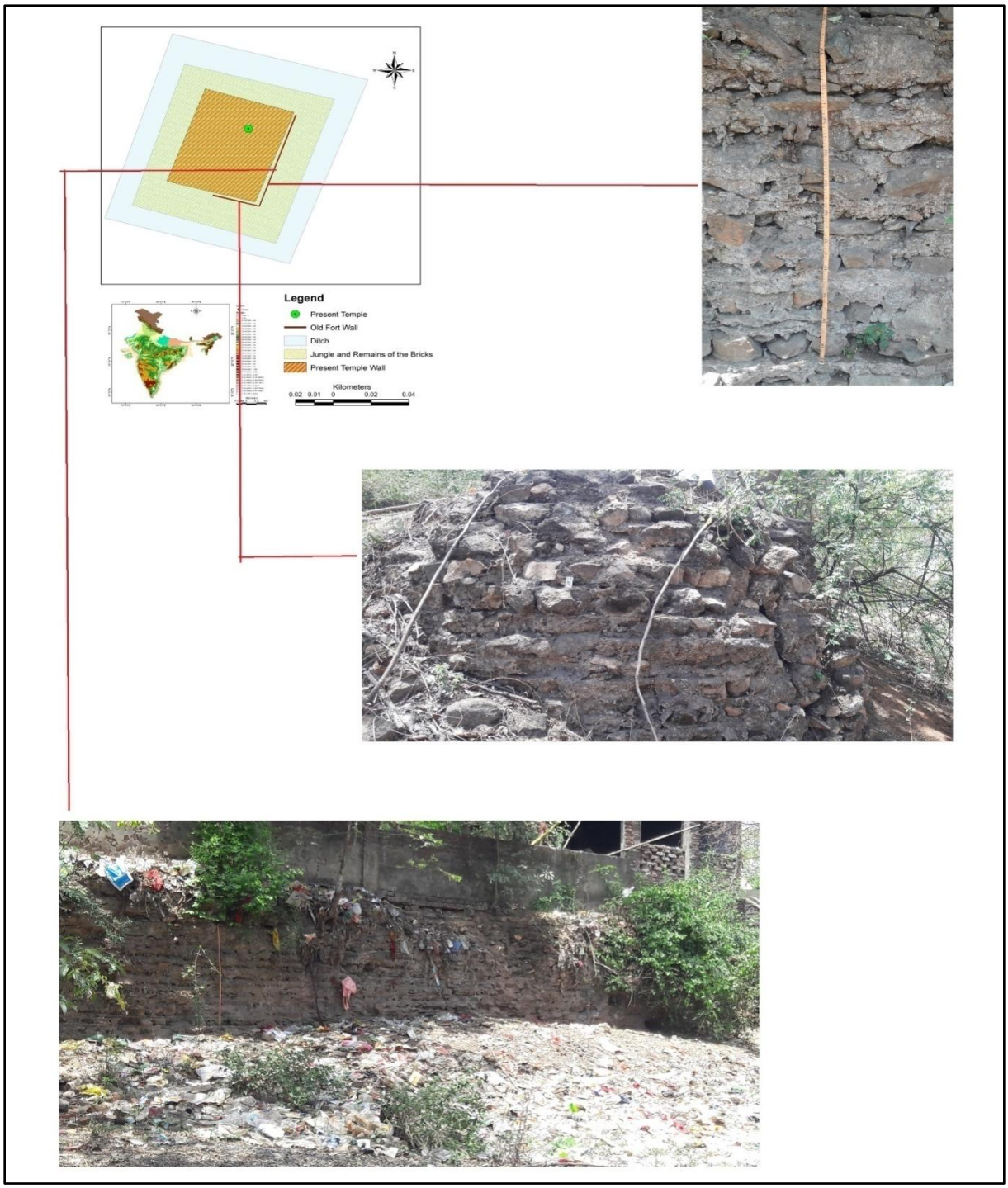


Figure 2B: Remains of the ancient stone walls which has been discovered during the time

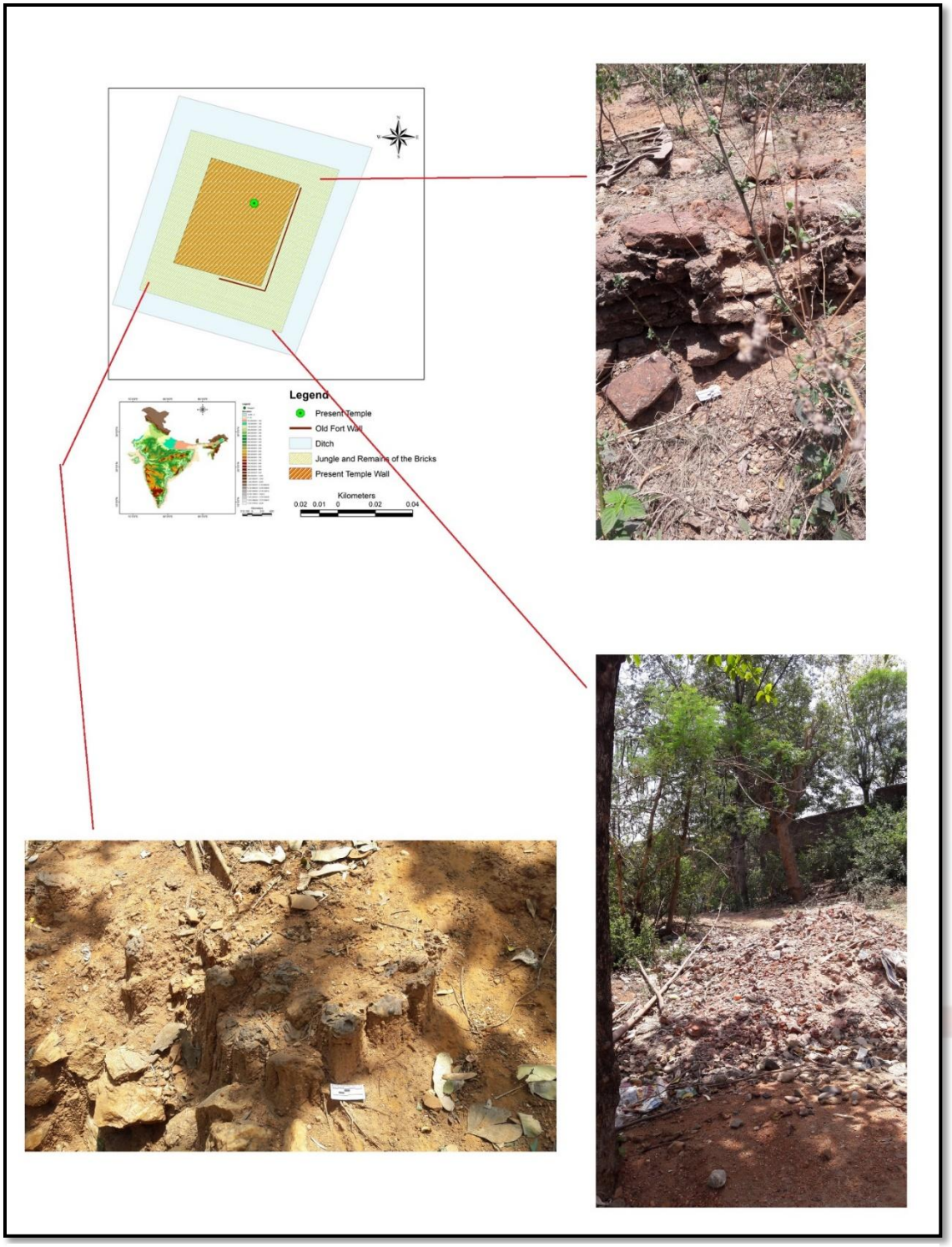


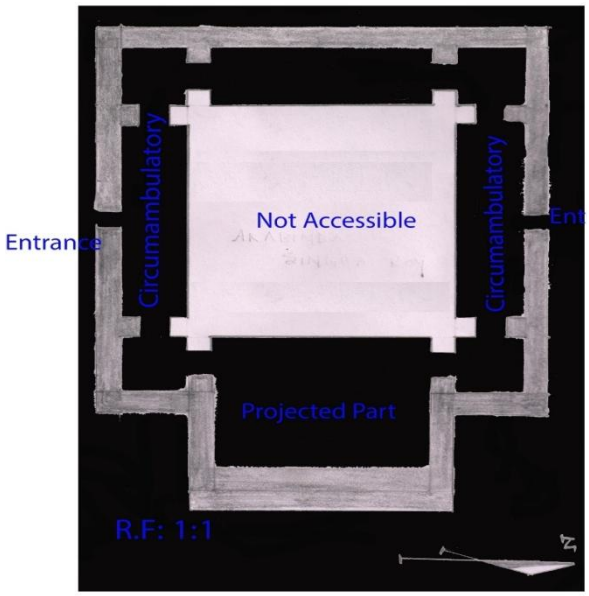
Figure 3 Remains of two circular brick structure on the north-eastern and southern corner and evidence of iron slag on the south-west corner of the mound

Brick Temple at Kaitha (23^0 $38^/$ $11^{//}$ N; 85^0 $33^/$ $21^{//}$ E):

Beside the ruined fort other two remains of the late medieval period has been traced out from this district. One is from Kaithā , a small village in the fringe of the Ramgarh town, approximately 3.66 km east from the town and 1.82 km west from the river Damodar and 450 m east from the NH 23.The temple is unique in its nature. It has a two storied building. The ground floor is square in plan with two entrances on the north and south directions respectively. The outer wall is thick in nature and made of bricks with a mortar plaster. After the entrance a circumambulatory path is seen around a square but solid structure (Figure 8). The solid square structure is also made of the same bricks used to build the outer wall with a thick lime plaster. It will not be possible to know why the square chamber would have been built as there is no such way to access into the chamber. Probably it has served as a support on which the upper storey is standing in balance. The circumambulatory path is also square in nature with a square chamber attached two doors at each corner of the structure (Figure 5). On the eastern side of the structure a hall is seemed projected towards the east with a thick wall. This part was projected in a purpose to build the staircase for approaching into the first floor . The plan of the first floor is totally different from the ground floor . On the first floor , at the centre , a rectangular sanctum is seen with an Śiva Liṅga in the middle and an entrance to the east . After the entrance of the sanctum a four pillared small hall is seen (Figure 6) which is still used a *Ghogamandapa (*Figure 8). A porch is seen attached with the pillared hall which is open. And toward the eastern end of the porch the entrance of the temple is made which can be approached after passed through nineteen high staircases. The porch is used as a place where dances and songs are performed during the time of worship. Around the sanctum and the pillared hall, a square circumambulatory path is made - exactly over the circumambulatory path on the ground floor (Figure 8). At each corner of the circumambulatory path a four arched doors canopy is seen with a conical shaped dome on the top (Figure 6).

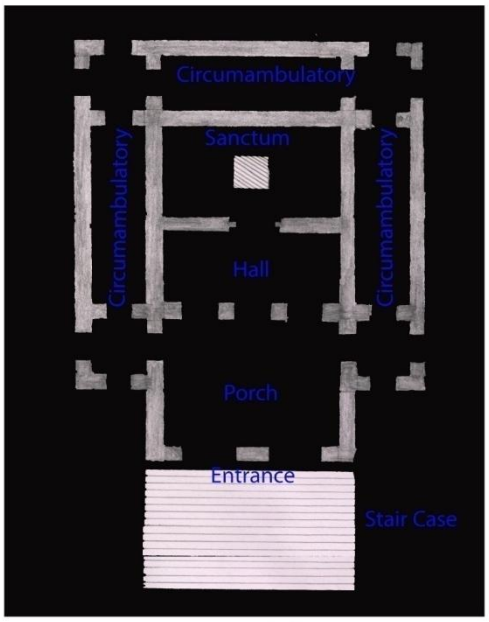
Over the sanctum of the temple a cone shaped tower (*ekaratna*) made of bricks with a lime plaster is seen (Figure 8). The tower is *saptaratha* in nature and the top of the structure is like a dome. Over each of the canopy which is described above a conical shaped tower is also noted, and same like the big tower in the centre these small towers are also domal in shape at the top (Figure 7).

The entrance to the first floor of the temple is also interesting. It contains two arched doors. And over each of the doors a conical shaped tower is placed with the same domal top (Figure 8).



Ground Plan (Ground Floor)

Figure 5 Ground plan of the Ground Floor on the Temple at Kaithā



R.F.: 1:1 Ground Plan (First Floor)

Figure 6 Ground Plan of the First Floor of the Temple at Kaithā

Figure 7 The Brick temple at Kaitha

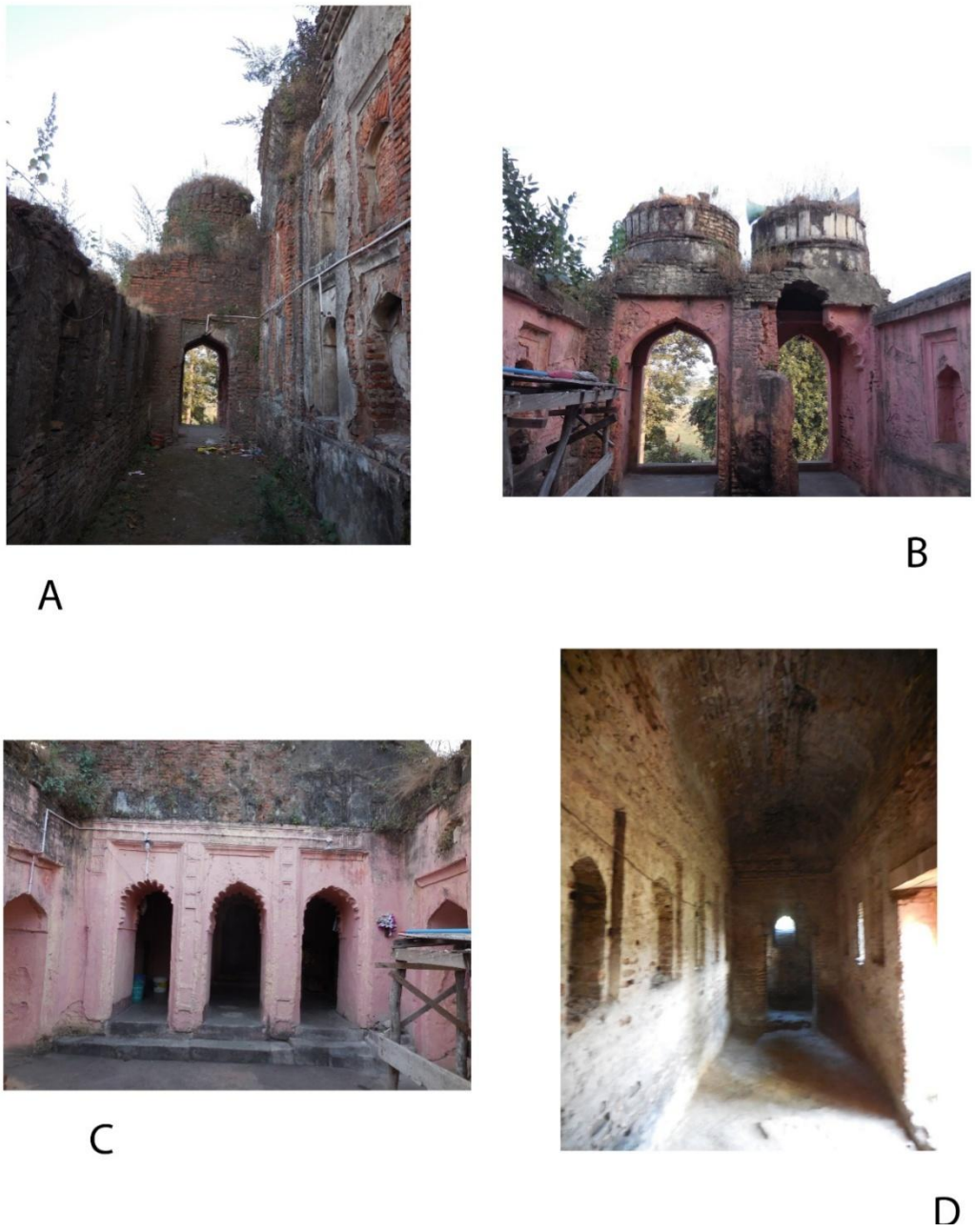


Figure 8 A. Circumambulatory path around the sanctum of the First Floor; B. Entrance into the First Floor; C. A general view of the Porch and Small Hall; D. Circumambulatory path around the solid square chamber in the ground floor

Raja Garh/ Garh Bandh

Locally known as Raja Garh or Garh Bandh, situated on a small upland (tilla) at the northern end of the modern town of Ramgarh beside the river Damador (Figure 9). The hill is oval in size with a size of 322 m long and 174 m wide. On the eastern side of the hill remain of a fort is found. Outer wall which is square in nature with a size of 111 x 100 m made of block of stones and plastered with a thick layer mortar (Figure 10). Inside this square outer stone wall foundation of three blocks of square big rooms have been traced out (Figure 11). The three square rooms are big and more or less same less in nature. Outer walls of these rooms are made of block of stones, but inner walls of these rooms made of small bricks with a size of 15 x 18x 4 cm. except the three rooms, foundation of a wall is also found to the northern end of the outer stone wall. To the western side of the fort complex the land is plain and also square in nature. Probably, this part of the *tilla* was designed for a big ground. The Ground plan of the fort is not determined properly due to thick forest which covered the hill completely and also served as a den of wild animals. But scattered brick butts over the surface indicate that a few super structures were once built within the square stone wall. Same as the Kila Mandir local people considered this place as the fort of the King of the Ramgarh Family.

Figure 8 Location of the Raja Garh or Garh Bandh

Figure 9 Remains of the fort; Green outline showing the outer stone wall of the fort; red lines indicates square chambers with their respective walls

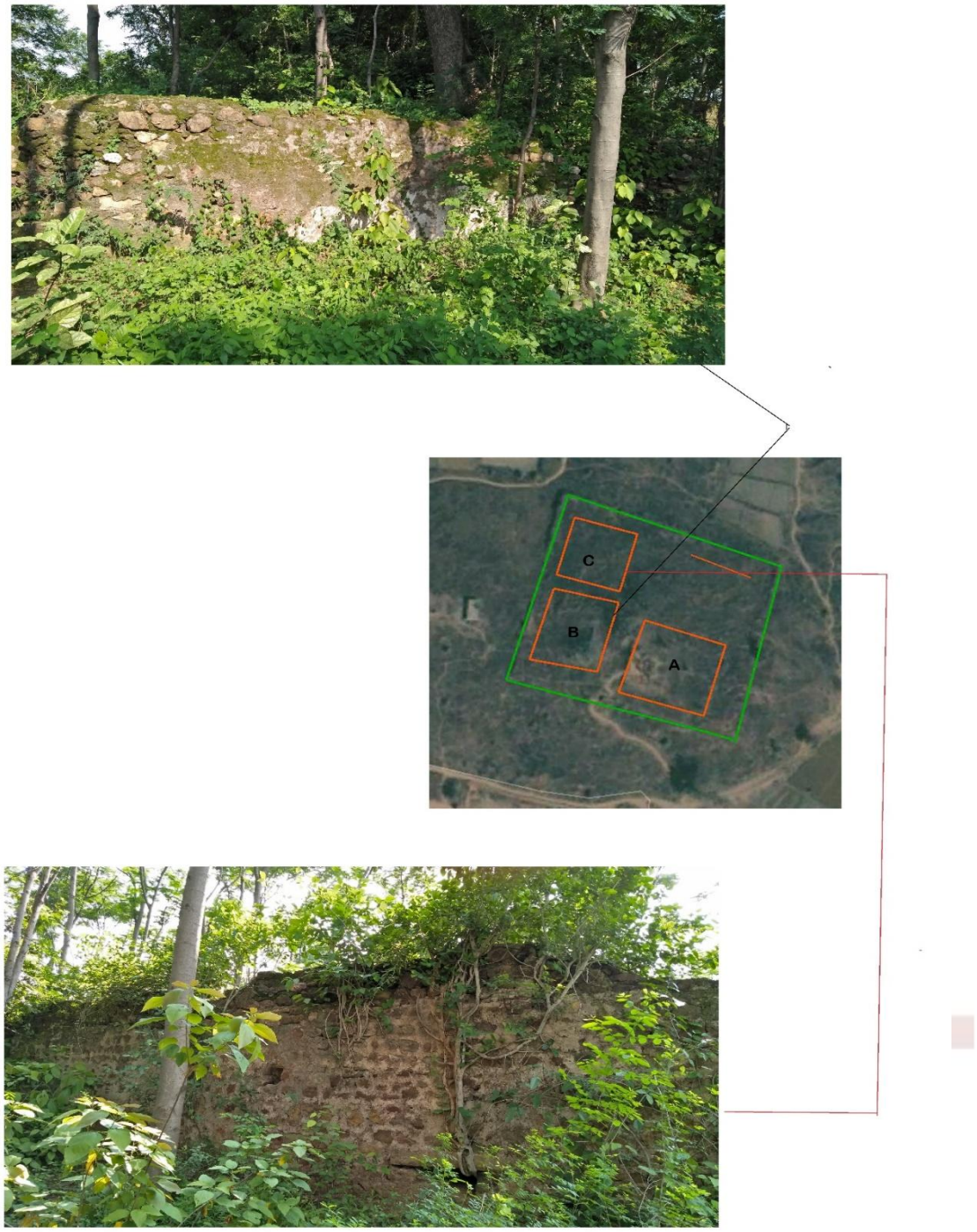


Figure 10 Remains of the fort; Green outline showing the outer stone wall of the fort; red lines indicates square chambers with their respective walls

General Observation

The aforementioned details on the literature and archaeological remains gave an impetus in the field of the late medieval archaeology and history of the district Ramgarh. Now, some facts are still not being clear and need to deal with care. A systematic excavation of the forts areas can unveil certain evidences. Therefore, all the present commands are tentative and we hope precise facts will be exposed by the hand of future generation. However, it would be safe to postulate an observation rather than any certain conclusion on the history and archaeology of the Late Medieval Ramgarh:

I. It is now more or less confirmed that the place, for the first time, ruled directly or more to say served as a capital in the Late Medieval Period by the hand of the Ramgarh family.

II. Two forts, rather called “A Fort Complex”, were constructed by the independent King Dalel Singh in around 1670s and probably named as "“Ramgarh” before the name of his father and former King Ram Singh. This postulation is only based on the assumption that the name "Ramgarh”is not found in any literature in the Early Historic Period or Early Medieval Period and it could be possible that the King who founded the fort complex was named it after his father to commemorate him.

III. Distance between the two forts is 1.3 km and their purpose of use is still vague. In between the two forts present Ramgarh town is situated and find out any archaeological remains in between these two forts areas is quite unbearable. It should be mentioned here that both of the forts are situated on a *Tilla* or natural uplands as well as the temple is two storied, but only the upper storey is used as secret place. It would also not be clear why a raised platform was needed. It was probably due to the river Damodar but present nature of the river in this area is quite undisturbed and gentle. However, in this regards, more important to reveal why two forts were constructed instated a big one? The fort found on the Kila Mandir is well planned with a moat and strong outer wall. Another fort beside the river is only strengthened by a stone outer wall. Based on the plans of both of the forts, it can be said that the fort on the Kila Mandir was more important than the fort beside the river. It could be possible that the well planned fort, i.e., Kila Mandir, might have been served as a residence of an important person, probably used as the residence of the King and on the other hand the fort beside the river could have been used as the residence of the higher officers or *fauzdar* of Thakur. It also can be said that forts are built only for the royal persons or officers and common people probably inhabited in between the two forts areas. These assumptions only inveterate after systematic excavations in the two forts areas and a few places in between the two forts.

IV. The unique brick temple at Kaitha with the combination of *pancharatna* and *ekbanla* architectural style, though not sophisticated like which are found in the present geographical area in West Bengal, is no doubt built sometime in the late medieval period. Probably due to the lack of experience the local artist could have not been successful to shape it in the form of typical *pancharatna* temple style and gave it a shape of double storied building with a big *ratna* combined with other four small cylindrical *ratnas*. Construction materials and architectural style clearly indicate that

this temple was built sometime in the Late Medieval period. However, no such indicators are available which could help us to ascertain this temple in a certain period and in the name of a ruler. But a legend is quite popular among the local people that this temple is made by the king Dalel Sing after a famine with a big Tank. We found a big tank attached to this temple, but no archaeological remains are also there to correlate this tank with the temple.

After all, we have done nothing except carefully noted the late medieval history of the region which is found from the literature and systematically analysis the scatters archaeological remains in an around the present Ramgarh town. Both the evidences clearly indicate that in the Late Medieval Period for some unknown reasons the king Dalel Singh shifted his capital from Badam to Ramgarh in around 1670s CE and probably named it after his father Ram Singh. He also excavated a tank beside the double storied *pancharatna* siva temple which was probably built by him and donated for the *bona-fide* of his draught affected tenants.

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Design, Development and Application of Robotic Arm in the Field of Archaeological Excavations

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Abstract

This paper focuses on the application of the electromechanical design concept of a lead screw actuated, robotic arm gripper in the field of Archaeology. Robotic applications are known to be catering to many industries from a range of tasks namely pick & place, material handling, as fixtures, tool & instrument holders etc. In this application specific robots are equipped with end effectors customized with design, appropriate for the application. In this paper, the details are presented for the design of an end effector also known as the robotic arms which works on a lead screw linear mechanism actuated by a dc motor. The mechanical construction for this unique robotic arm gripper mechanism is observed to be robust and can be used as an end effector to a suitable robotic application. There are numerous archaeological fields on earth, in which the majority of the civilizations, the ancient physical remnants have been buried with time. Therefore, reaching all points of any archaeological site becomes quite difficult. Sometimes areas are not accessible in this condition and it becomes dangerous for people to reach without any instruments at all. Thus some device is needed to address the problem that will help in discovering the unknown and unreachable areas. The robotic arm will serve the purpose of such archaeological endeavours.

Key Words: Robotic Arm, Robotic Grippers, Lead Screw, Archaeological excavation

Introduction

Due to increasing demand in archeological research, innovation in this area is expanding rapidly. As there are many archaeological research areas present on earth, in which most of the civilizations, antiquities, old physical remains have got buried under the earth and water levels, with the passing of time. So, it becomes very challenging to reach to every point of any archeological site. In this condition sometime places are not reachable and it becomes risky for the archaeologists to reach there without any tools. To resolve the problem some instrument is required which can reach to those spots or provide a glimpse to know more about those places. The present study aims at introducing a machine which can solve those problems to give an extra edge in archeological research. This machine has potential of going deep down under water surface and also capable of going deep under the surface to capture the evidences of ancient civilizations, and to collect samples, specimens or any other object from the site.

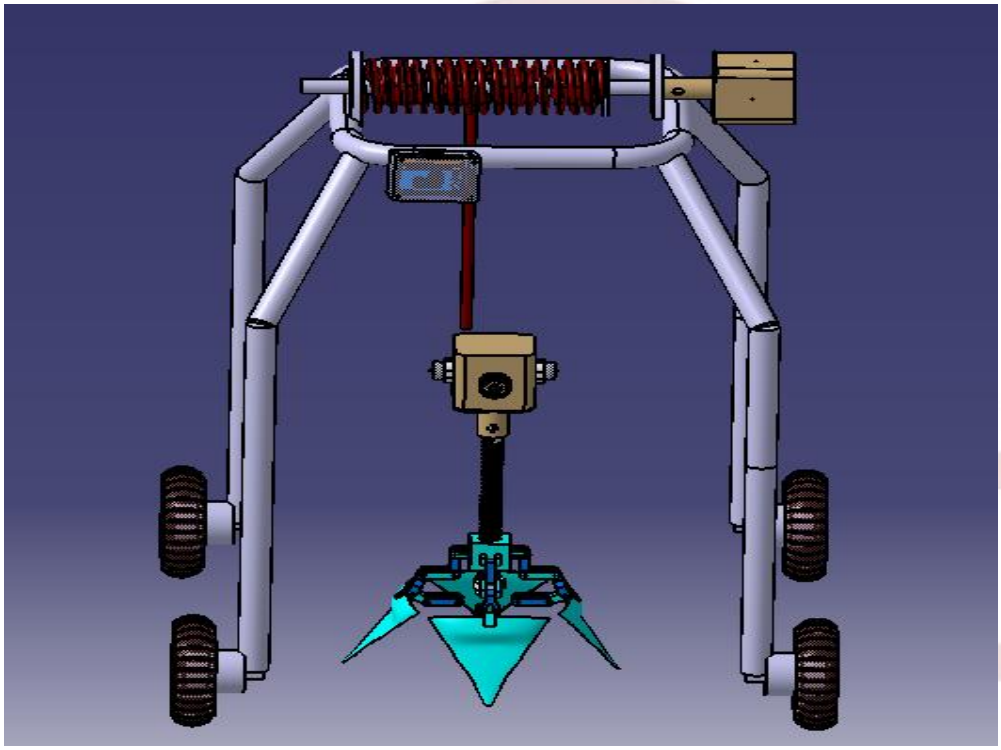


Figure 1 CAD assembly model Robotic Arm Gripper

Figure 1 gives an initial overview of this Robotic arm gripper which will be used in archeological survey and excavations (Krishnaraju, et.al. 2015).

It is having a movable arm with gripping jaw which could be sent to the underground via bore-well or could be sent to the deep water directly. It consists of a set of cameras which can constantly monitor the surrounding area and take pictures or videos which might reveal what is

in there underwater or underground. It is completely battery operated and rechargeable, which allows this machine to be taken anywhere for use without any hesitation in power source (Aparisii Escriva, 2016).

Objective of the Study

In archaeology, excavation is the exposure, processing and recording of archaeological remains. An excavation site or "dig" is the area being studied. These locations range from one to several areas at a time during an excavation and can be conducted over a few weeks to several years.

Before excavating, the presence or absence of archaeological remains can often be suggested by, non-intrusive remote sensing, such as ground-penetrating radar and explorations of the site. Basic information about the development of the site may be drawn from this work, but to understand finer details of a site, excavation via auguring can be used & for understanding more finer details the machine which has been developed will investigate in deep down through bore-well before the actual excavation.

This machine is an automatic specimen collecting & investigating machine which can telecast live video in the panel & images from the bore-well underground or it could be sent to the deep water directly as it is water proof. As this machine has a robotic arm with Robotic Gripper Mechanism, it is capable of collecting the soil sample or antiques from underground.

Area of Study

In this particular paper the different applications of robotic arm in the archeological operation have been discussed.

Basically, this machine can investigate the area before the excavation in archeological operation. Its robotic arm goes down the bore-well for collecting soil sample & giving a clear view under the ground of the excavation site. By this machine a better idea about the time period of the layers of earth or soil can be obtained as well as the data related to the antiques.

Sothe basic area of study is the robo-gripper mechanism with some modification for better investigation & to understand the finer details in deep down.

Structural Component of Robotic Arm

The robotic arm gripper is an assembly of several parts as follows: -

1. 4 jaws- dimensions: (120-118mm in overall length
   30/20/10mm base
   Two 4mm diameter hole)
2. 20 plane metallic strips- dimensions: (40/10mm with 4mm diameter hole at each end)
3. 4 two planner metallic strips-dimensions: (40/20mm)
4. 1 cubic metallic block with internal threading (40/30mm
   20mm hole
   6mm pitch)
5. 1 lead screw of 200mm in length/ 20mm in cross section.

6. 2 DC motors of 12v,24v.236 rpm
7. 1 conveyor pulley with anti-rust metallic rope
8. 5 waterproof cameras: 12 MP

Motors are used to power the pulley and also to rotate the lead screw. The rotation of the pulley helps the robotic arm to reciprocate up and down. The 2nd motor rotates the lead screw. Then the lead screw triggers the cubic block which is connected with it by internal threading. This makes the metallic strips to reciprocate and ultimately the force is transmitted to the jaws and then the desired output is availed **(**Eitel, 2010).

Methodology

This research paper will also facilitate Heritage management and helps to preserve the antiquities during the excavation processes. The research was started keeping in view lowering the expense and costing while doing excavation or digging at any archeological site. The key aim of this paper is to promote the use of technology and innovation in any archeological survey or excavation.

Methodology involves the following the steps of Fig 2 with collecting theoretical, conceptual and technical information about the excavation processes and then analyzed the difficulties faced in any excavation process with a step-by-step flow chart.

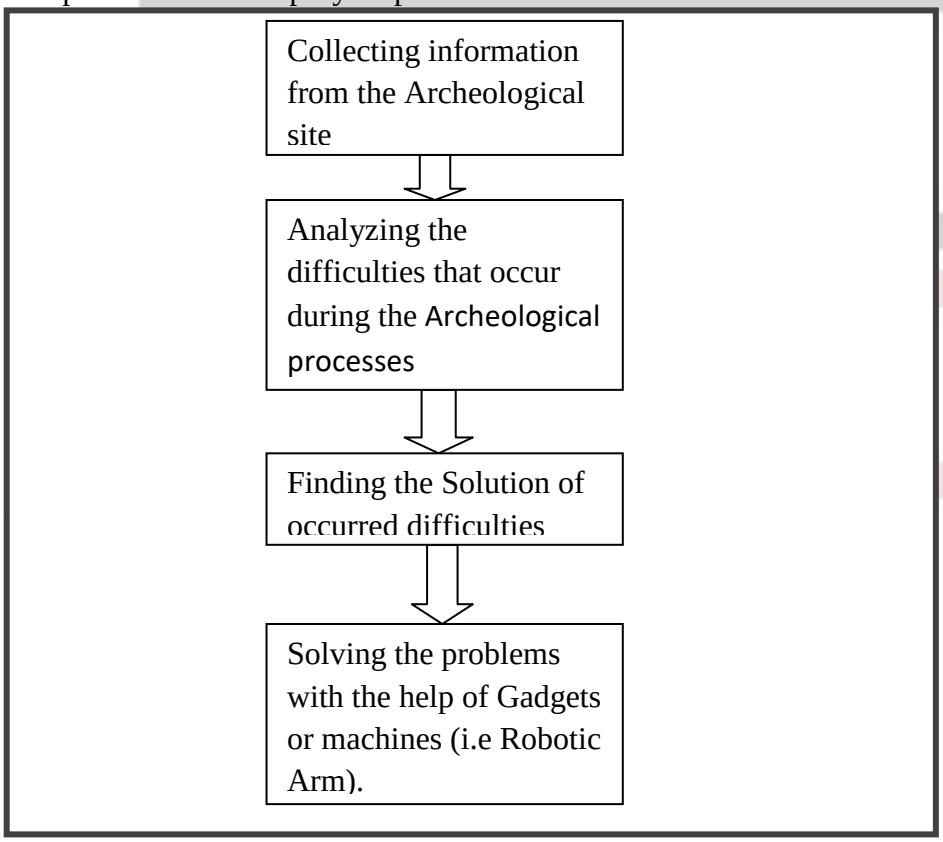


Figure 2 Methodology

Different suitability parameters and other relevant data required to develop the robotic arm are collected from an archeological site during survey and excavation process. These are considered from the point of the difficulties faced during excavation process, identifying the soil layers or testing of soil. As we know that, the technology and technological resources in archeological processes is very limited, so one has to follow the conventional process of site surveying or excavation. While doing the surveys and research on the problems of archeological operations like excavation processes and water body surveys, the main issues are raised when the sub-soil water prevents to go further below or the challenges faced in underwater excavation. Water bodies refer to river, pond, lakes, sea or any watery area where the presence of antiquities is suspected.

The main difficulty in any water body is, searching for any antiquities, artifacts and other physical remain beneath the water surface for a long time. According to conventional procedure for surveying under the water surface, divers are sent for collecting the information from there. Now from here, a problem arises that the diver needs many gadgets and equipment and also most importantly the oxygen cylinder to dive under the water. Because of this oxygen limitation divers are not capable to explore the region for long time and along with this it can be also observed that general divers do not possesses much knowledge in archeological aspects.

Figure 3 Divers exploring the city of Dwarka

The Archeological Survey of India (ASI) has its eye on underwater exploration since the mid of -1970s. Figure 3 shows the exploration of man-made structures off the coast of Dwarka by scuba divers, where a handful of explorers have always borne a disproportionate workload. In 1990, S.R. Rao, named the father of marine archaeology in India, who supervised the Dwarka dives, observed that 'five diving archeologists is too small a number for a country of the size of India. (Sudarshan Aditya, THE HINDU, 2017)

So, due to lack of resources and technology in marine archeology it gets difficult to explore any water body for archeological purpose. Due to this lack of technology and resources in India excavating or surveying any place on land for archeological purpose also has certain limitations. At the time of excavation in any archeological site, after digging several layers of earth the groundwater surfaces and excavation gets restricted and from there it gets difficult to go beyond the ground water. Thus, by means of conventional process only up to a certain level of earth surface can be explored or excavated.

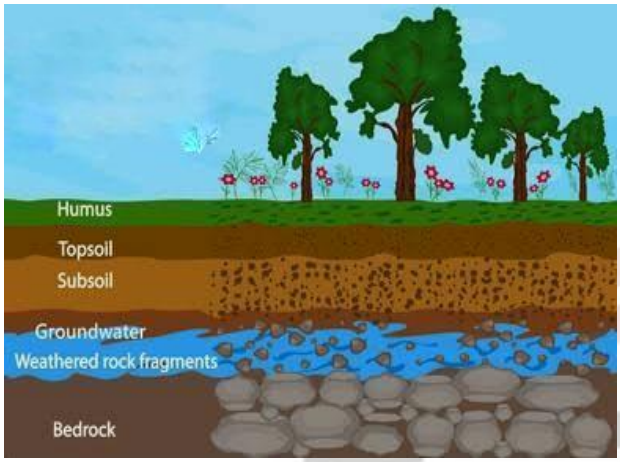


Figure 4Soil Layers

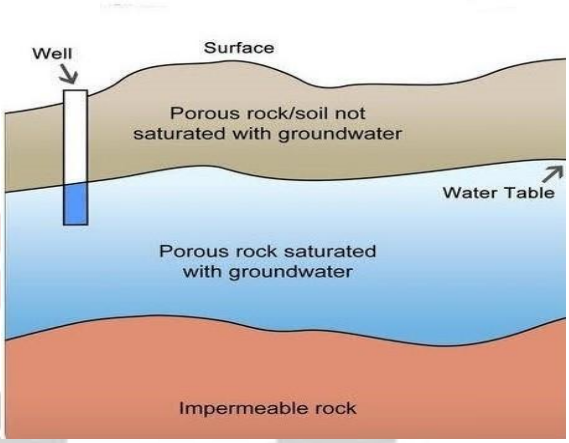


Figure 5 Ground Water and Water table

From Figure 4 and Figure 5 it is clearly understandable that after digging several layers of earth in the form of well, groundwater comes in the way and after the level of groundwater a rocky layer occurs.

Thus, considering all facts and figures, the design of the Robotic arm has been modified in such a way that it can be sent directly to the remote area under the earth surface where human beings cannot reach easily for further archaeological research work. The Robotic arm is supported by a solid structure through a metallic chain and a conveyor pulley. This metallic structure acts as a base from earth surface, which consists of control panel for the operator to operate arm in remote area while standing above the earth surface. In addition to these, it is also equipped with five waterproof cameras, an underwater LED light and a direction mapping module. Mechanisms of each equipped gadgets in Robotic arm are described below.

Camera

There are five cameras mounted on the ‘Robotic Arm’ which will specifically capture the images and videos of remote area under water surface and each camera will be able to capture the images and scenes in different angle.

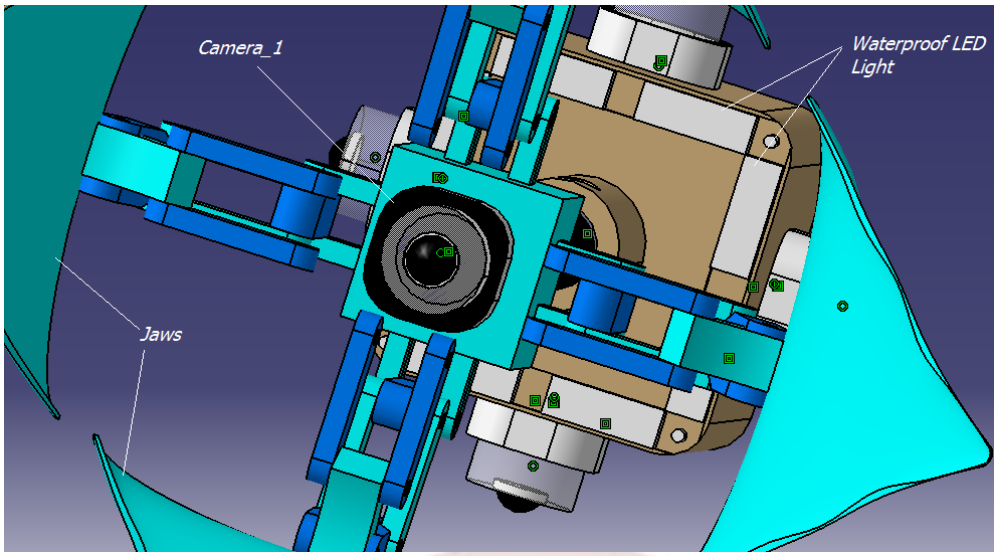


Figure 6 Camera 1mounted in the middle of jaw

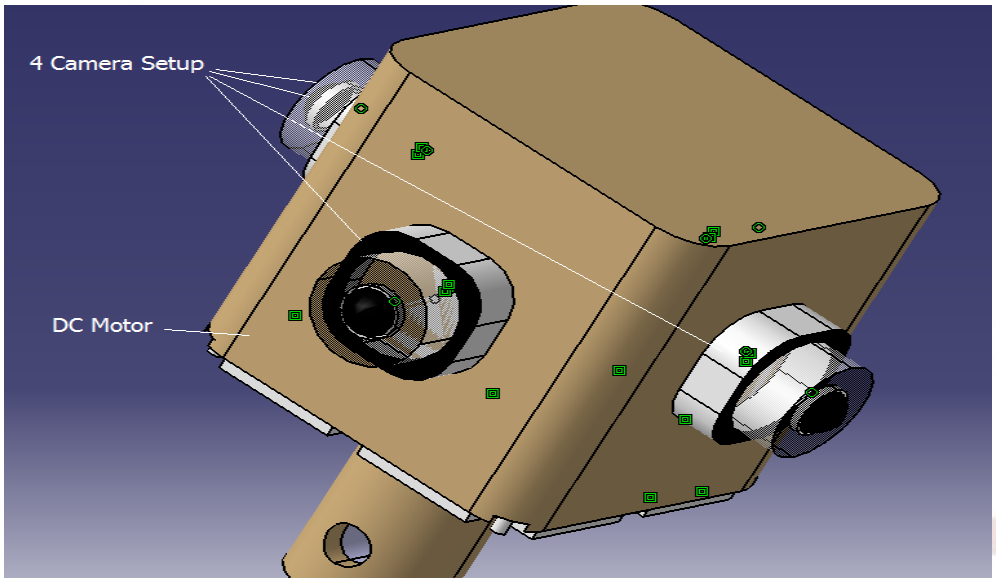


Figure 7 4 Cameras mounted on motor casing

In Figure 6 and Figure 7 each camera is shown where it is mounted on motor casing, which will monitor the surroundings in different direction.

These cameras could be operated by operator according to their use while staying on the earth surface. These are totally waterproof and can work in any surroundings. Main task of the cameras is to monitor the scenes when the robotic gripper will be in remote area to grab the objects. Cameras are powered by 5V power supply and operated using Wi-Fi technology with a range of (700-800) m from earth surface.

Lights

In Figure 6, four pairs of waterproof LED lights are mounted below the geared motor casing. The CAD model design of LED lights is done on CAD software. These lights are mounted on motor casing for better image capturing of surroundings of robotic gripper jaw. This light will illuminate the surrounding and operator will get better quality of images when Robotic Arm will be in working mode in remote area.

Scientific analysis

As this "Robotic Arm" has several parts and each part works on different theories and principle so we will see the working analysis of each part.

Mechanical Function of Robotic Arm Gripper

The design of robotic arm gripper mechanism is progressed to a high level. This involves construction of complex mechanical system as demanded by level of dexterity required by the end application. This paper describes a simple construction of a robotic arm gripper which will grip antiquities and ancient remains under water surface efficiently.CAD assembly model of robotic arm gripper is attached for better understanding of mechanism.

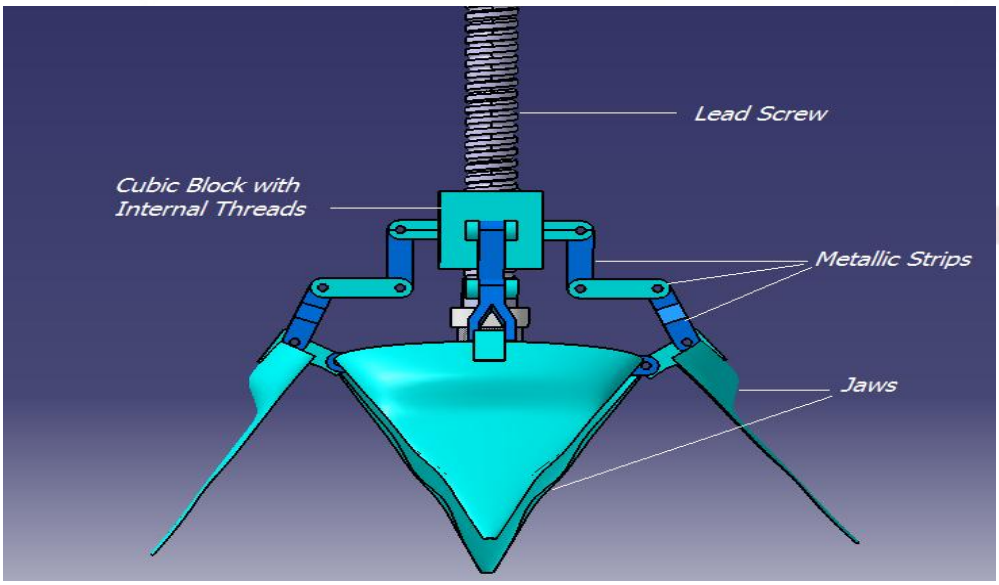


Figure 8 CAD model of Robotic Gripper

An overview of mechanical design of the robotic arm gripper is shown in the CAD assembly model picture in Figure 8.The gripper plate is designed to hold the object against the jaw with force exerted by the metallic strip moving on the lead screw. The lead screw is driven by a geared motor coupled with flexible coupling. The lead screw rotates in the bearing housed in the fixture. There is a guide metallic cube having internal threads attached with lead screw moves linearly. The condition for effective grip for the jaw grippers during normal object pick & movement is mathematically given by,

$$\text{Gripping force, } F(\text{grip}) > (m \times g/\mu(\text{grip})) \times F.O.S \times N$$

Where,
m = weight of the object being gripped, kg
μ(grip) = coefficient of friction between the object and gripping surface
F.O.S = factor of safety recommended based on motion
g= acceleration due to gravity, m/s^2

Mathematical formulations of the gripping are made in earlier studies for the intended compliance and dexterity of the end effector. However, the scope and simplicity of the robotic jaw gripper allows us to make use of straight forward engineering calculations. Objects of various shapes are often handled by modular robotic grippers. Robotic jaw works on Screw principle. Screw principle is simple mechanism that converts rotational motion to linear motion and a torque (Rotational force) to linear force. **(**Krishnamoorthy, 2019).

Mechanical function of conveyor pulley

Conveyor pulley is one of the essential parts of this machine (robotic arm) in which metallic ropes are wraps around it. One end of this metallic rope is coupled with pulley and on another end “Robotic Jaw” is connected. Rotation of conveyor pulley in its fixed horizontal axis help to fold and unfold the metallic rope and also help to calculate the distance travelled by Robotic arm under the water surface. The metallic ropes are anti-rust galvanized coated made of stainless steel. Conveyor pulley is operated using 24Vpower supply. When the motor will be powered up it will start to rotate and along with it, and the coupled conveyor pulley will also start to rotate in its fixed axis. Both this motor and conveyor pulley are mounted on a metallic rigid structure which has four legs to support these parts on it.

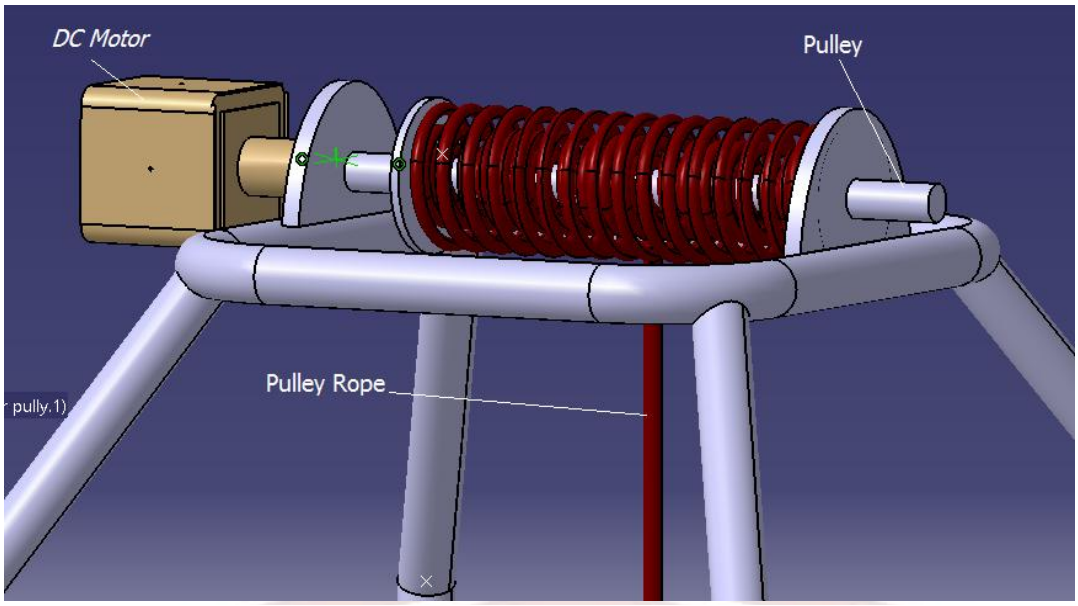


Figure 9 CAD model of Conveyor pulley and metallic rope

Figure 9 shows the mechanical design of conveyor pulley and metallic rope as CAD assembly picture. This design is made for better understanding of pulley and rope mechanism in robotic arm operation. Conveyor pulley is one of the essential parts of this machine (robotic arm) in which metallic ropes are wrapped around it. One end of this metallic rope is coupled with pulley and on another end "Robotic Jaw" is connected. Rotation of conveyor pulley in its fixed horizontal axis help to fold and unfold the metallic rope and also help to calculate the distance travelled by Robotic arm under the water surface. The metallic ropes are anti-rust galvanized coated made of stainless steel.

Distance or length of depth travelled by arm is computed as:

$$d = 2\pi R \times \text{no. of rotation of conveyor pulley}$$

Where, d= Travelled distance
r = Radius of conveyor pulley.

Component Selection

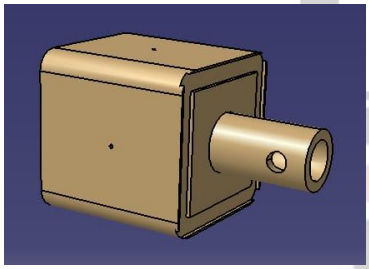
Based on theoretical calculation and also keeping in mind the sourcing & cost criteria, components are selected for this prototype CAD model assembly. The DC motor is suitable for the voltage range of 12V, 24V and maximum output torque of 20N-cm. The gear box can be customized with different revolutions and torque. To meet the application requirements, with output torque, high performance, high precision, high starting torque, low speed, easy to dissemble.

Motor:

Description
DC 12V,24V 236rpm high torque, low rpm geared motor

Specification:

Motor Type	DC geared motor
Operating voltage(VDC)	12, 24
Rated current(A)	0.8 to 1
Rated Speed(RPM)	236
Operating Temperature(°C)	-40 to 100



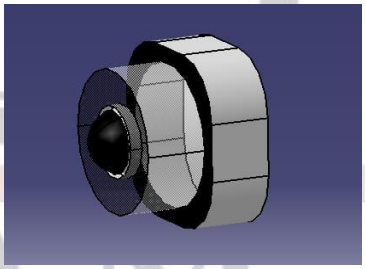
DC motor 12V,24V 236rpm

Camera:

Description
12MP, 5V Waterproof Camera

Specification:

Effective still resolution	12MP
Optical sensor resolution	12MP
Operating voltage	5V
Operating Temperature	-10°c to 80°C
Aspect ratio	16:9



12MP WATERPROOF CAMERA

Camera is selected for a minimum weight of 126gm, which have features like improved HDR and super photo with 4k 60 wide and 1080P 240 wide and having connected feature of wifi+Bluetooth, GPS enabled so that it can be used in specific application when it is operated. It is waterproof and can work in any surroundings. This camera is having special feature of more durable and not easy to wear. Special Application is video recording under water surface for a long time.

Mechatronics System Concept

The mechatronic approach gives a blend of sensing, actuation and control to the mechanical design. The level of intelligence needed by the system is limited by the degree of sophistication required and cost of development for the intended application. Figure 10 gives an overview of the mechatronic concept for the Robotic Arm Gripper Design.

Along with the objective to design & develop a robust mechanical construction for the Robotic Arm gripper, the performance of the conveyor pulley, motors and gripper jaw by means of on/off signal given to the motor actuator has to be understood. As mentioned earlier the lead screw actuator is powered by the 12V or 24V dc motor. Also shown in earlier figures, a dc motor driver is employed which is based on the Arduino and motor driver integrated chip, is capable of bidirectional control of dc and stepper motors.

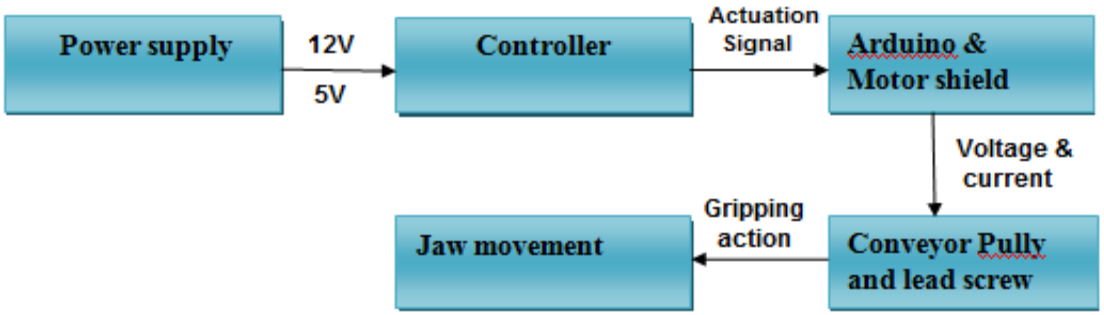


Figure 10 Mechatronic system concept for Robotic Arm Gripper

All the components and parts of this Robotic Arm Gripper are controlled by Arduino and Motor shield which take input signal from operator via controller and gives the output voltage to the actuators. The controller part of the system is not investigated in the system prototype development. This could be an embedded controller which should take the feedback signal from the Force Sensing Resistor (F.S.R) for further processing and control. In Figure 11a CAD model of Arduino is shown for better understanding.

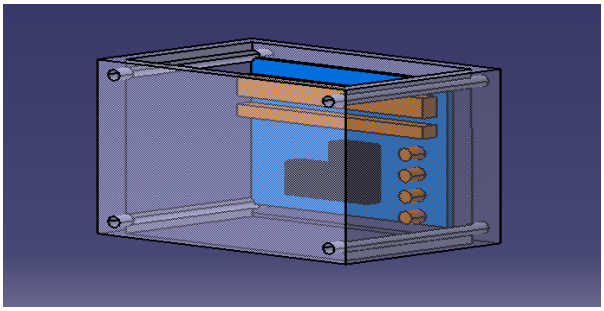


Figure 11 CAD model of Arduino Circuit Board

System Development & Testing Overview

Engineering manufacturing drawings are developed for metal fabrication process through which the strippers& gripper plates are developed. Again, the manufacturing drawings are created with the help of the CAD tool. 'Design for manufacturing' principle is employed in designing these metal parts wherein standard bend features, standard uniform hole sizes and addition of slots for weight reduction are considered in the design. Finger-like features are added to the parts to give them look typical to a hand shaped robotic end effector.

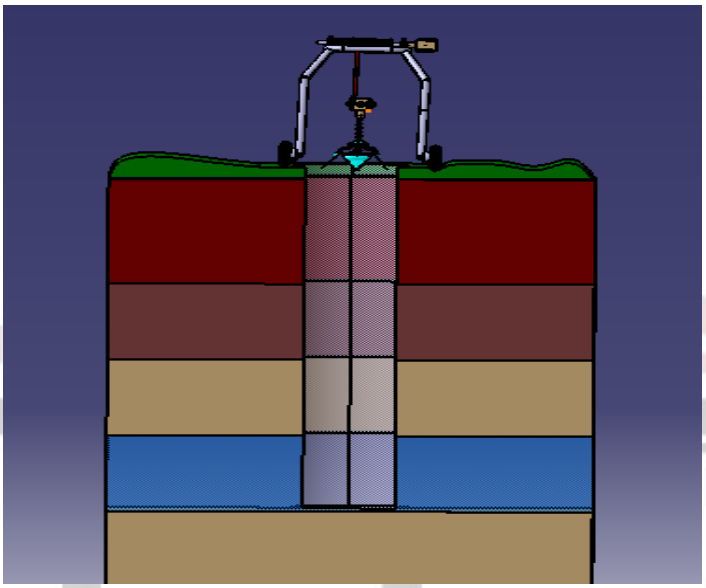


Figure 12 Testing overview of the system

The designing and assembly of the Robotic Arm Gripper is done in CAD software. An operational and functional overview of the system is shown in figure 12 where the robotic arm is shown to operate in bore well to collect the specimen from deep down the earth surface. The robotic arm will go down with the help of rotating of conveyor pulley and unfolding of metallic rope and then after going down, jaw will start its mechanism to grab the specimen below. The grabbing mechanism will process after lead screw movement. An operating voltage of 12V is required in geared motor to rotate the lead screw. After the grabbing of specimen, the pulley motor rotates in reverse direction to fold the metallic rope so that the robotic arm could climb up to earth surface while holding the specimen. Later the specimen will be collected very carefully from the robotic jaw for archeological research purpose.

Conclusion

The operating and performance of the Robotic Arm Gripper yields favorable results in gathering specimens, soil samples, artifacts, or any ancient materials from deep beneath the earth's surface and under the water's surface for archaeological study. The robustness of the mechanical design involving the conveyor pulley, anti-rust metallic chain, metallic strips & gripper plates and its

application are well understood. Performance of the motor actuated lead screw results on gripping action, since the lead screw is known have negligible backlash. Functional overview of the Robotic Arm gripper by gripping the objects gives satisfactory results on the gripping performance. Using the PLC (programmable logic controller i.e. Arduino) to control the machine is a matter of further research from a control engineering standpoint. The mechanical design is made keeping in view of attaching this standalone end effector to a robotic arm. This could be a standard pick & place robotic application in any Archeological excavation and also in any other industry.

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Commonality of Indian Tradition and Art
(with special reference to the story of Shibi and Megharatha)

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Abstract

The present paper aims at discussing a rare episode, which is commonly found in all the three traditions (Vaidik-Puranic, Buddhism and Jainism) and which originated from the **Mahabharata** (*Vana-parva,* 131. 1-31).

The main objectives of the present study are:-

1. How the traditional story makes a trend for other traditions and becomes core of Indian culture.

2. What message is transmitted through art depictions? Usually such core spirits of non-violence and truth become the Pan-Indian and Pan-Religious concept.

3. Through the study we shall try to underline how a concept or trend, shared by all cults, becomes model of social-ethical ideals and values?

Key Words: Commonality, Indian Culture, Shibi Jataka, Megharatha story

Introduction

The commonality of the story of the Shibi lies in the core spirit of Indian culture in which *Ahimsa* (non-violence) becomes tool to save the life of someone, seeking shelter (refuge - *Sharana*) [*1]. In the story of Shibi or Megharatha(in Jaina context) the ruler in all the traditions is*Cakravartin* and assured to save the life of a pigeon (dove, some god in disguise) from the threat of falcon. The narration of this story is first found in the **Mahabharata** and then in the Buddhist *Jataka* (**Shibi-Jataka**) in early centuries of Common Era.

Note: [*1]The*Sharanagata-bhava*, is eloquently mentioned in *Sundarakanda*, of the**Ramacaritmanasa** of Tulasidas (early 17th century CE), when Vibhisana younger brother of Ravana takes refuge to Rama.

Thereafter the story was assimilated in Jaina tradition as early as 11th-12th century CE. Although the narrative depiction in Vaidik-Puranic context is rarely found (perhaps to be seen on Hoyasala temples) yet Buddhist tradition takes lead in its visual renderings, which are early, found from Shunga period (first-second century BCE onwards) at Bharhut.

However in Buddhist tradition also we have the identical story of Shibi mentioned in**Shibi-Jataka** with two different stories. The first story exactly follows the story of **Mahabharata**, while the second story does not refer to saving life of pigeon from falcon but mentions about the liberal donation made by Shibi, who also donated his eyes (*netra-dana*), highlighting his *Dana-vritti*(Cowel, 1999). The depiction of the Buddhist story is found as early as second century BCE at Bharhut (M.P.) followed by Amaravati, Nagarjunikonda (Andhra-Pradesh), Gandhara (first-second century CE, fig. 04) and Ajanta (5thcentury CE, Maharashtra). Interestingly its representation in Buddhist context is found also on Buddhist *stupa* of Borobudur (Java, Indonesia, 9th century CE, fig. 04), which is important since it shows the extension of the common story of Shibi outside India.

On the other hand, in Jaina tradition the textual referencesand the visual depictions are found from 11th-12th century CE onwards, mainly at ShvetambaraJaina sites of Western India. Now we take up detailed study of story of *Cakravartin* Megharatha in Jaina tradition, who was destined to take birth as 16thJinaShantinatha. The name and the cognizance deer of JinaShantinatha are suggestive of *Shanti* (Peace) which is the ultimate objective of human life and which could be experienced through *Ahimsa* and *Sharanagata-bhava*. Its comparison with earlier tradition of **Mahabharata** and also the tradition of Buddhist **Jatakas** (**Shibi-Jataka**) hint at the element of commonality in all the traditions.

The 16th Tirthankara Shantinatha in his previous existence as *Cakravartin* ruler Megharatha became the epitome of compassion and non-violence by offering his own flesh to save the life of a pigeon (*kapota*). This episode is mentioned at length in the Jaina works namely the **Trishashtishalakapurusacaritra** (5.4.253-322) of Hemacandra Suri (12th century CE), **ShriShantinathaCaritra** of Bhavacandra Suri (14th century CE) and **ShriShantinathaCaritra** of AcaryaAjitaprabha Suri (in form of manuscript, latter half of 14th century CE)[*2] and which was represented in the narrative art found at the important Jaina sites of 11th – 12th century CE namely Kumbhariya (Shantinatha temple, Banaskantha, Gujarat, 11th century CE, fig. 01) and Delvada (Vimala-Vasahi, Mt. Abu, Rajasthan, mid 12th century CE, fig. 02)(Tiwari, 1981). The present study aims at probing into how and with what socio-religious objectives this particular episode of the life 16thJinaShantinatha was assimilated in Jainism from the **Mahabharata** (1000 BCE) in 11th – 12th century CE.

Note: [*2]**Shri ShantinathaCaritra** of Acharya Ajitaprabha Suri, manuscript, latter half of 14th century CE, UNESCO declared in 2013 as world heritage property.

The name of the ruler in **Mahabharata** was Shibi, who stood for the cause of saving the life of pigeon from the threat of falcon by way of offering his body to pacify its hunger. The falcon did specifically ask for the flesh from the body of the *Maharaja*Shibi (Shastri, samvat 2051), while in Jaina texts the falcon said that it eats only the meat (*Mansa*), therefore in place of pigeon it should be provided with human flesh equal to weight of pigeon [***3**].

The detailed story of king Megharatha is given in the **Trishashtishalakapurusacaritra**. It shows that as Megharatha*Cakravartin* he earned merit by way of following the highest ideals of *Ahimsa* (*sharanagata-bhava*) [***4**]. The text says that once Indra in his *deva-sabha* was praising the religious practices (*Dharmacarana*) of Megharatha. On this the god Surupa wanted to test the religious merit of Megharatha and entered the body of a pigeon, who was fleeing from a falcon to save his life. The pigeon came to the lap of king Megharatha and requested for saving his life from the falcon, which was chasing the pigeon. Naturally the falcon also came after a while and asked to give him the pigeon, because he was hungry. On this what Megharatha said was very important that to save the life of someone taking refuge was the *Kshatriya-Dharma*. Megharatha further asked the falcon to take milk and something else in place of pigeon. Megharatha also preached the falcon to follow the path of *Ahimsa* (non-violence) and keep himself away from the killing [***5**]. But since falcon and pigeon were part of test to the *Dharmacaraṇa* of Megharatha, falcon said 'I am in the habit of eating the meat of birds and animals' [***6**]. Then Megharatha offered to give the flesh of his body equal to the weight of the pigeon to pacify his hunger [***7**]. The king immediately ordered for a balance and started taking out his own flesh and putting it on the scale against the weight of the pigeon. But the god Surupa in pigeon's body went on to increase its weight till Megharatha decided to offer whole of his body by putting himself in the scale. Then the god in the pigeon appeared and blessed Megharatha who was born as Shantinatha in his next birth. [***8**] (Tiwari, 1989:367). Almost the same story is mentioned in other two Jaina texts (the **ShriShantinathaCaritra** of Bhavacandra Suri and the **ShriShantinathaCaritra** of Acarya Ajitaprabha Suri).

In art depictions, the verbal story is represented in brief and capsule form in which the suggestion of the story is given which helps in identifying the entire narrative depictions in the ceilings showing the *Panchakalyanakas* of the Tirthankara.

Note [*3] **Trishashtishalakapurusacaritra** of Hemacandra Suri (12th century CE), 5.4.282-283.- A 12th C.E.
Sanskrit epic poem written by Hemacandra Suri.
[*4]**Trishashtishalakapurusacaritra** (abbreviation – **TSP**)-5.4.253-322
[*5]**TSP** – 5.4.253-267.
[*6]**TSP** – 5.4.273.
[*7]**TSP** – 5.4.274.
[*8]**TSP** – 5.4.282-283

The *Panchakalyanakas* include the descend of the soul of the Jinas from the heaven into the wombs of their respective mothers (*cyavana*), birth (*janma*), initiation into ascetic life (*diksha*), attainment of omniscience (*kevala-jnana*) and the emancipation (*nirvana*). These five auspicious events occurred in the life of each of the 24 Jinas and hence find invariable representations in all the instances of the narrative scenes in the Western Indian Jaina temples (Tiwari, 1989:362). On the basis of the figures of balance (*tula*) in the examples from Kumbhariya (Shantinatha temple, fig. 01) and Delvada (Vimala-Vasahi, fig. 02) and on its one side the figure of pigeon while on other side human figure of Megharatha, the same could be identified with the episode of Megharatha and hence with previous life of Shantinatha.

Figure 1: Narratives from the life of Shantinatha showing also the episode of Megharatha saving life of a pigeon, aisle ceiling, Shantinatha temple, Kumbharia (Banaskantha, Gujarat), 11th century CE.

Figure 2: Narratives of Shantinatha, devakulika no. 12, aisle ceiling, Vimala-Vasahi (Delvada), Mt. Abu (Rajasthan), mid 12th century CE.

Figure 3: The story of Shibi-Jataka, on a slab, from Gandhara, first-second century CE, now in British Museum, London

The scenes pertaining to *Shantinatha-carita* is carved in the western bay ceilings of the Shantinatha and Mahavira temples of Kumbhariya. Besides the usual auspicious events, the episode from his previous existence as king Megharatha is also carved in Shantinatha temple. According to the Shvetambara tradition, king Megharatha weighed his body against a pigeon to save the latter's life. The scene in the Shantinatha temple (fig. 01) as usual is divided into three rectangular boxes. The outermost *pattika* on west shows Shantinatha in his previous existence as king Megharatha, sitting in a pavilion in the midst of dancers, musicians and warriors. Further ahead is shown a *tula* showing the figure of Megharatha on one side and the pigeon on the other [In one of the panels, presently in British Museum, London, showing **Shibi-Jataka** found from Gandhara (fig. 03) and datable to first-second century CE, who balance is shown and on its right side a pigeon appears while on left side Bodhisattva is standing in spirit of weighing his whole body. Another interesting example of **Shibi-Jataka** is carved on Buddhist *stupa* of Borobudur (Java, Indonesia, 9th century CE, fig 04), in which balance is shown and on left side pigeon sits while on its rightside Bodhisattva is preparing himself to weigh his body as demanded by falcon]. Thus, it represents the moments when Megharatha offered the whole of his flesh to save the life of a pigeon from a falcon. The story narrates that god Surupa entered the body of a pigeon who was fleeing from a falcon to test the steadfastness of kind hearted Megharatha. The scenes in the ceilings of Mahavira temple, Kumbhariya are also divided into crucified boxes; but here the episode of Megharatha is not shown. The scenes are being labelled (Tiwari, 1989:366-68). A subsequent example of mid 12th century CE showing identical scene, though not so detailed, is found in the ceiling of Vimala-Vasahi (cell no. 12, Delvada, fig. 02) (Shah,1954).

Figure 4.The story of Shibi-Jataka, Buddhist stupa, Borobudur, (Java, Indonesia), 9th century CE.

Thus, in conclusion we should note that the stories of king Shibi in Brahmanical and Buddhist traditions and that of Megharatha in Jaina tradition are identical. There are several other such stories and episodes, which reveal the commonality and assimilation having some distinctive features as we find in case of present story in respect of its literary references and visual renderings. The story undoubtedly first appears in the **Mahabharata,** which was subsequently followed in other traditions. The story has three main characters the king who was kind hearted, the pigeon (god in disguise) and falcon. Through the entire story the core spirit of non-violence and saving the life of the *Sharanagata* are boldly projected. However, the earliest depiction of this story is found in Buddhist art. In Jaina literature and art it appears only during 11th -12th century CE and onwards.

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Hayagriva - Madhava Temple at Hajo
A study of the late medieval temple style of Koch Ruler, Assam

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Abstract

From the Gupta period onwards, Assam has a distinct history of temple construction, however most of the early temples have either collapsed or are in a damaged state. The Ahom period, when the Ahom kings showed tremendous effort in erecting many temples, is remembered as the most prosperous period of temple construction in Assam. During the late medieval period, a great number of temples were constructed in this region. Following the Ahom dynasty, the Koch kings ruled Assam for a while and were responsible for the construction of a number of temples in the Brahmaputra valley. The Koch rulers' construction works were limited to the districts of Goalpara, Kamrup, and Darrang. The two most important Koch temples that have survived are the Kamakhya temple and the Hayagriva- Mahadeva temple. The main objective of this paper is to examine the architectural characteristics of the Hayagriva- Mahadeva temple in Hajo, Kamrup district.

Key Words: Temple architecture, Late medieval, Koch ruler, Hayagriva- Mahadeva temple, Assam

Introduction

Assam has a unique history of temple buildings from Gupta period onwards though most of the early temples have either completely disappeared or they are in a dilapidated condition. The fragmented structural parts of these ruined temples are still seen to exist in form of door- jambs *amalakas* lintels, door sills and others which help us to know the architectural pattern of the early temples. Among these ruined structures, the door frame of Da- parvatiya, in the vicinity of the modern town of Tezpur is note-worthy (Choudhury, 1985:170).It is from these structural parts that one can easily understand the contemporary architectural style of early period. The most flourishing phase of temple construction in Assam is marked by the Ahom period when the Ahom rulers took great initiative for building different temples. A large number of temples were built during the late medieval period. This period witnessed the growth of a new architectural style which has been termed as "Nilachala type" representing Assam's own regional temple style. Following the Ahom dynasty, the Koch rulers reigned Assam for a while and contributed to the erection of a few temples in the land of Brahmaputra valley. The building activities of the

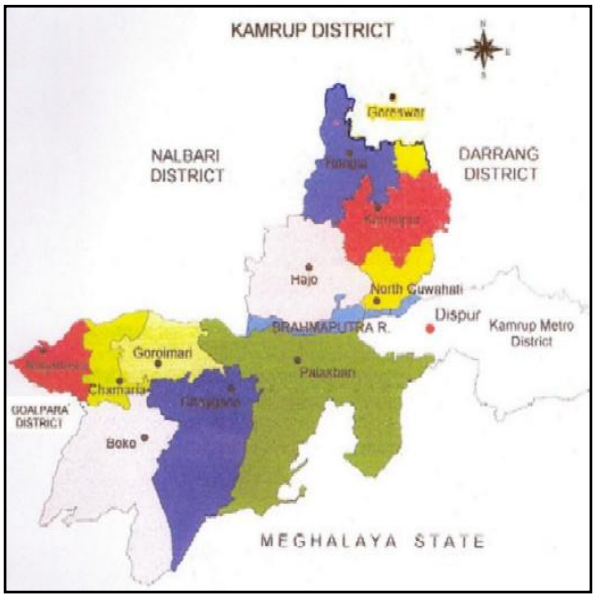

Figure 1 Map of Assam

Koch rulers were confined to the districts of Goalpara, Kamrup and Darrang. The Kamakhya temple and the Hayagriva-Mahadeva temple are the two very significant Koch temples which have survived the test of time. The present paper aims to highlight the architectural features of the Hayagriva-Mahadeva temple at Hajo in Kamrup district (Fig.1).

In Assam, temples or shrines have different names like *dol*, *debaloy* or *than.* Assam temples can be classified into three categories from the ruined but intact structures seen today. The first group resembles the Nagara style of Orissa. The second group characterizes Assam own vernacular style- the "Nilachala type",which has been recognized as the major architectural pattern of Assam and is very popular in this valley. The third group reflects an unusualstyle having a special merit of its own. It is a combined architecture of temple and Mughal mausoleum (Sarma, 1988: 119).It is a rare architectural feature.

Temple of Hayagriva- Madhava

The Hayagriva – Madhava temple (Fig.2) is located at Hajo, a small town about thirty kilometers north-west of Gauhati. It is believed that the present temple was not built by any Koch king. It was only renovated by the Koch king Raghudeva. Probably, there was an old temple over which the present temple was built. A stone inscription attached to the temple mentions that Raghudeva reconstructed the temple in 1583 (Neog, 1974:17).This inscription also mentions that Shidhara, the architect of this temple supervised the renovation work.

Figure 2 Hayagriva – Madhava Temple

Architecturally, the temple consists of three component parts, namely sanctum cella, pillared assembly hall and a small passage (*antarala*) whichconnects the other two component parts (Fig.3). The Hayagriva- Madhava temple belongs to the *nagara* style but in many instances, it exhibits its regional attributes. The tower resembles the shape of a rekha deul with a disproportionately tapered upper part and a *bada* region which also takes an unusual taller shape. Unlike the typical Orissan temple, the vertical lines or *rekha* are very irregular in this temple structure. The main temple is *pancha ratha* in plan but the vertical lines are not so pronounced and the regions between the *anuratha* and *kanika pagas* have been corrugated into three projections in diagonal plan(Sarma,1988:126).This is a very unusual feature, not commonly seen in the Assamese temples. Hayagriva Bishnu is worshipped as the main deity. On the left of the main deity, the images of Jagannatha and Garuda while on the right image of Basudeva are seen.

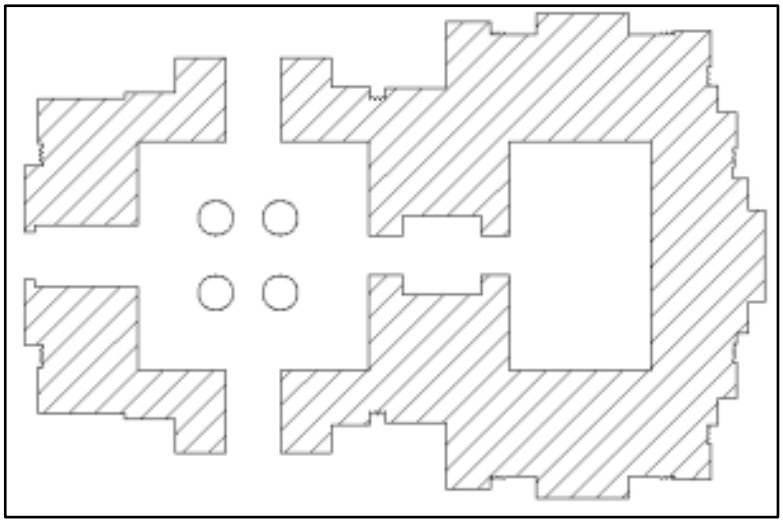

Figure 3 Plan of Hayagriva – Madhava Temple

The outer wall of the temple or *bada* region is segmented into five divisions namely- *pabhaga, upara jangha, bandhana and tala jangha.* Both the*janghas* are adorned with stone sculptures of varied shapes. Since these sculptures are not enshrined improper *devakoshtha* or nicheon the outer wall, it seems that *sthapati* failed to relocate the original space for keeping these sculptures and maintaining the original sequences. The *baranda* region comprises of a number of horizontal bands of lotus petal motifs along with diamond and beaded design. The tower or *shikhara* shows a sharp bend at the top giving a complete conical shape which alsoreflects the regional characteristic. This type of tower is quite different from the typical Orissan temple. The local builder-artist simplified the structure perhaps due to the lack of knowledge of construction of such magnificent tower (*gandi*) like that of the Orissan temple. The irregularity in the arrangement of recesses is prominent. The frontal door of the sanctum seems to have belonged to the original temple. In the lower part (*adhisthana*) of the present temple, a series of elephant frieze (*gajathara*) are visible indicating that the elephants may be supporting the entire structure's weight (Fig.4). This feature is unique in its own character. It may be presumed that these elephant friezes were originally attached to the old temple (Fig.4).

Figure 4 Elephant frieze at the base

Mandapa or Assembly Hall

The *mandapa* or assembly hall (Fig.5) of this temple is much larger than sanctum. It is built with blocks of stones. Inside the hall, there are four massive octagonal stone pillars(Fig. 6)with pointed arches which not only support the flat roof of the *mandapa* but bridge the span in between walls and pillars. These arches were probably innovated by the Koch ruler under the Islamic influence (Sarma, 1988:127).A beautiful *amalaka* design is seen at the base of the pillar (Fig.7). At the centre of the hall a square alter is placed for performing temple rituals and offerings. The inner part of the hall is decorated with graceful stone sculptures of devotees (Fig.8).Another notable feature on the interior wall of the *mandapa,* is the eloquent depiction of the auspicious symbol of Srivatsa and lotus which symbolizes Vishnu and Lakshmi (Fig. 6).The elevation of *mandapa* is simply the vertical extension of the outer wall without any sculptural depiction or design. The masonry of *mandapa* is ashlar without any plastering.

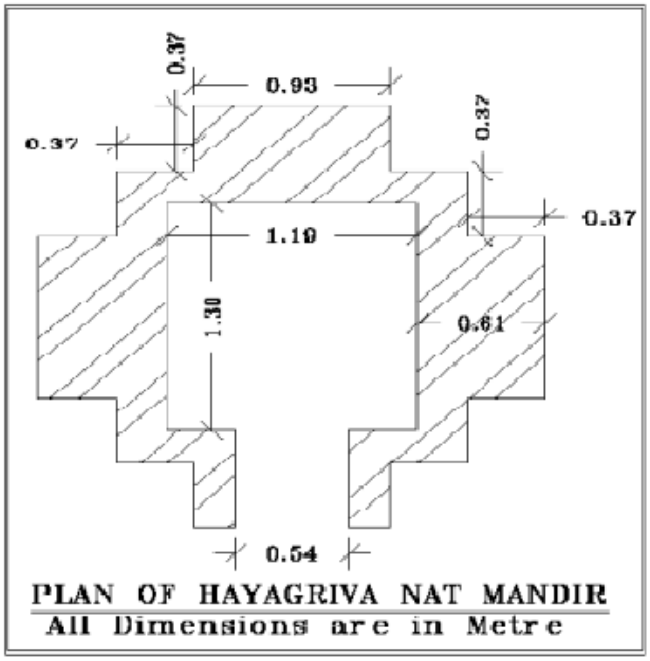

Figure 5 Plan of Hayagriva Nat Mandir

Figure 6 Octagonalpillar

Figure 7 Amalaka Pillar base

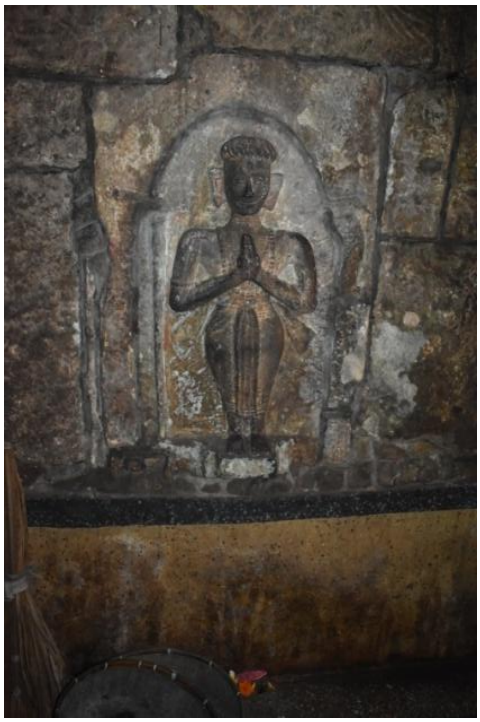

Figure 8 Sculpture of Devotee

Figure 9 Srivatsaand lotus symbol

Sculptures

A number of stone sculptures and decorations adorn the exterior walls of the temple. Both *upara jangha* and *tala jangha* are replete with images of Brahmanical gods and goddess. The deities are Hayagriva Vishnu, Vishnu mounted on Garuda, Kaliand others. The four handed Hayagriva image holds a mace in his upper right hand while a disc like *chakra* is held in his upper left hand. The lower right hand is evidently clutching the lotus stem, while the lower left hand is in varada mudra (Fig.10). Another image of Vishnu mounted on his *vahana* Garuda and accompanied by goddess Lakshmi is noteworthy (Fig.11). A four handed image of goddess kali holding *kharga* and shield in her two upper hands is ornately sculpted on the outer wall of the temple (Fig.12). Among the many sculptures, we also come across one portraying a horse rider with his right hand grasping a branch of foliage and his left hand holding a banner. Yet another sculpture depicts two masculine figures seated on a makara being pulled by three horses(Fig. 13).There are other male and female deities, beautifully carved on the walls. Admittedly, these images express different stylistic idioms and artistic skills of the then sculptors.

Figure 10 Image of Hayagriva Vishnu.

Figure 11 Vishnu on Garuda

Figure 12 Image of Kali

Figure13 Two male figures on Makara

Conclusion

According to the inscription, this temple was dedicated to Hayagriva- Madhava (Neog, 1974) who happens to be one of the *Avatara* forms of lord Vishnu. Vishnudarmottara Purana mentions Hayagriva – Vishnu as an incarnated form of half man and half animal (Varadpande, 2009:16).The shrine was offered by Raghudeva Narayana in 1583 who reconstructed the temple during his reign. The inscription also mentions that the temple was destroyed by the Muslim attack. According to the Devi Purana, a demon named Hayagriva was granted the blessing of not being slain by any man or animal. So, at the request of the other gods, Vishnu took on the appearance of a half-man, half-horse and vanquished the demon. Vishnu was given the name Hayagriva-Vishnu as a result of this incident. Hayagriva has been considered as a minor *avatara* form of Vishnu. (Rao, 1993:260)

In Gauhati region only two temples of Kochs have survived. These are the famous Kamakhya temple built by Koch king Naranarayan and the Hayagriva Madhava temple by Raghudeva. In fact, both of these temples were reconstructed in sixteenth century by the Koch rulers. The Koch emperors added several unique architectural elements to the Hayagriva temple. Unfortunately, the new characteristics of the temple did not attract the builders in the subsequent periods which resulted in a complete discontinuation of this architectural style.

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A Survey of Buddhist Sculptural Art from Coastal West Bengal

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Abstract

This paper highlights the extension, chronology and sculptural art of Buddhism from coastal West Bengal. This article also focuses on the classical foreign sources mainly the Chinese traveller accounts which reflect the continuation of the Buddhism in this area. The recent discoveries of sculptural art of Buddhist religion create a coherent picture of this area. A vast remote forest land which is geographically known as Sundarban area and central part of coastal West Bengal where considerable number of Buddhist image recovered has been discussed in this paper.

Key Words: Buddhism, Coastal West Bengal, Sundarban, Chinese account, Buddhist Sculpture.

Introduction

This paper has delineated a preliminary survey on Buddhist sculptural art from coastal west Bengal. Archaeological explorations and excavations during last decades in some early historic/early medieval sites in West Bengal have brought forth abundant and varied antiquities belonging to different eras. Among these rich assemblages of antiquities, some terracotta, stone, metal and bone objects earn particular consideration as these have got some association with Buddhism. The Bengal coast is stretch over widespreadregion lying roughly between East Medinipur in the west and Noakhali in the east. In the present paper our study area of 'coast' is limited to districts of East Medinipur(21º38'N to 22º30' N latitudes and 87º27E' to 88º11'E longitude),North Twenty FourParganas (22º11'6" N to 23º15'2" N latitudes and 88º20'E to 89º5' Elongitude)and South Twenty Four Parganas(21º26'N to 21º38'N latitudes 87º57'E to 89º09' E longitude)in the present Indian state of West Bengal. The major archaeological sites where the Buddhist sculptural remains have been recovered are Tamluk, Panna, Tilda, Chandraketugarh, Barrackpur, Boral, Atagraha, Harinarayanpur, Baishata, Tilpi, Kankandighi, Nalgora, Sajenekhali, Bhangar-Dhara, Khalisadya, Maheshpur, Maipit and Patharpratima. This may be indicated that the unearthing of antiquities with Buddhist connection is nothing new in coastal Bengal as we have got some indications to prove that Buddhism had previously a stronghold in Bengal during the early centuries of the Christian era. The literary evidences show the missionary activities of Buddhism as recorded in *the Mahavaṃsa* (Sarkar, 1972: 74) and the travel accounts of eminent Chinese pilgrim scholars highlight the activities of the Buddhism in this region. The Buddhist *Jātaka*stories mentioned the archaeological site Tamralipta (Sarkar, 1972: 74-75).The epigraphic records highlight the names of twodonors in the railing of *stupa* in *Sanchi* (Bühler,1984:108 & 308),Madhya Pradesh, hailing from Pundravardhana (North Bengal) is important in this perspective. An epigraphical record from Nagarjunakonda (3rd Century A.D) (Vogel, 1983: P.23) comprisedof a long list of well –known countries.

During the first decade of fifth century A.D the Chinese traveller Fa-hien visited India and he gave description of Tamralipti, a sea port of coastal Bengal. In his account he described a thriving condition of this Sea-port. According to Fa-hien that time about twenty-four *Sanghārāmas*were present in this area. Fa-hiendwelt for two years in this area for the purpose of studying Buddhism.He stayedin one of these *Sanghārāms*copied the scared book and portrayed images (Beal,1966:Ixxi). This ancient sea port Tamralipta now identified as modern Tamluk, is located in east Medinipur district of West Bengal. Hiuen Tsang, another Buddhist traveller came in India during the seventh century A.D and visited this area. In this period time about ten *Sanghārāms* and fifty temples existed in the coastal land. According to Hiuen Tsang, thousands of priests and several sectaries lived in this area. In his account he mentioned about a *stūpa* in this area which was built by Aśoka, situated by the side of the city(Beal, 1966:200-201).

According to I-tsing (A.D. 671)another Chinese traveller described a comprehensive picture of Buddhism in Tamralipti in his account. During his journey, he met another Chinese person and *mahayan Pandit* Ta-Cheng-teng. I-tsing stayed in Tamraliptifor one year and he studied Brahmi-language (Sanskrit) and practiced the science of the words (grammar, *sabdavidya*) (Takakusu, 1896:XXXiii).In this period he described monastic organisation in this area. According to him "I also observed that every morning the managing priest (of that monastery) examined water on the side of a well; that if there was no insect in it, that water was used, and if there was a life in it, it was filtered, that whenever anything, even a stalk of vegetable, was given (to the priests)by others persons, they made use it through the assent of the assembly; that no principal office was appointed in that monastery; that when any business happened, it was settled by the assembly; and that, if any priest decided anything by himself alone, or treated the priest decided anything himself alone, or treated the priests favourably or unfavourably at his own pleasure, without regarding the will of the assembly, he was expelled (from the monastery) being called a *Kulapati* (i.ehe behaved like householder)"(Takakusu, 1896:62-63).According to I-tisng "...on the four *upavasatha*-days of every month a great multitude of priests, all having assembled there late in the after moon from several monasteries, listened to reading of the monastic rites, which they obeyed and carried out with increasing reverence(Takakusu, 1896:63)".

During this time there was Bhikshu named A-ra-hu(not 'shi) la Mitra (Rahula Mitra) in that monastery. He is same person Rahulaka, whose verses are mentioned in the Subhāsitāvali of Vallabhadeva. According to I-tsing "He was then about thirty years old; his conducted was very excellent and his fame was exceedingly great. Every day he read over the Rantnakūtasūtra. Which contains 700 verses. He was not only versed in the three collections of the scriptures, but also thoroughly conversant with secular literature on the four sciences. He was honoured as the head of the priests in the eastern districts of India" (Takakusu, 1896:63-64).

I-tisng mentioned about teaching, learning and ritual rites of a monastery in Tamralipti whose name wasBha-ra-ha (Barahat or Varāha)(Takakusu, 1896:65).

M.M. HaraprasadSastri says that about 1000 years ago, there were numerous Buddhist *viharas* in the tract now known as Coastal Bengal, where Buddhist monks wrote their books and preached their faith. He exemplified two important places Hatiagarh and Balanda where there were *Vihāras*and the monks studied the *prajñāpāramitā*(Chaudhuri *et al*,2001:244). Nalini Nath Dasgupta (Dasgupta, 1355(BS): 217)and Devaprasad Ghosh (Ghosh,1968:48 &

50) acceptedthe view of Pandit Sastriregarding the existence of *Vihāra* at Balanda. Pandit Sastri refers to a manuscript of *Aṣtasahasrikāprajñāpāramitā* preserved in the Royal library of Nepal (Now Bir Library) as the ground of his argument.

Khasaparna Lokānthwas an important deity at Khāḍi (South Twenty Four parganas). In the Sādhanamālā there is a story regarding the installation of this image. A pious merchant named Śubhaṅkara was on the commercial expedition to Potalok a port of Western India. During this voyage he passed a night at Khasaparna, a village at Khāḍī-mandala. Avalokiteśvara appeared to him in his dream and asked him not to proceed further and to establish the deity according to the rule of the *Vairocanatantra*. Through this he would attain prosperity and merit. The merchant accordingly installed the image of Avalokiteśvara(Sen,1985:P.162).

This area as a centre of Buddhism was first mentioned in *Dākrnava Tantra* where it mentioned about *pithas (Khadi)* like *Radha ,Dhikkara, Vangala* and *Harikela* (Sastri,1917:P.92). The Rakshaskalicopper plate inscription of *Madanapaladeva* mentioned a Buddhist *Vihāra*which was situated outside of the village of *Vahamitā*and was called *Ratnatraya Mahāvihāra.* Several Buddhist images in different periods highlight this region as one of the important Buddhist centres during early historic and early medieval periods (Sen &.Ghosh, 1934:321-33; Ghosal,1947-8:119—24; Sircar,1953-4:42-46).

DHYANI BUDDHA AKSOBHYA

The earliest Buddhists considered the timeless existence of five *Skandhas* or cosmic elements–*rupa* (form), *Vedāna* (sensation), *Samjna* (name), *Samsakara* (conformation) and *Vijnana* (Consciousness). These components are consecrated in the *Vajrayana* as the five Dhyani Buddhas, originating from the highest mortal Vajradhara, often recognized with *Sunya*and Adi Buddha. The five Dhyani Buddhas are Amitabha, Aksobhya, Vairocana, Amoghasiddhi and Ratnasambhava. They are the progenitor of the five families of deities (*Kulas*) representing the entireBuddhist family. Each Dhyani Buddhahas a *Sakti,* a *Bodhisattva,* a number of secretions, a male and female, and an identification emblem. They are seated on a full –blown lotus and in *dhyansana*. The hands resting on the lap is sometimes pouring, but in most of the cases it bears a bowl. The head bears thick clustering curling of hair. The half-closed eyes are another feature of the images. The proper narratives of the Dhyani Buddha are mentioned in *Adayavajrasamgraha.* Their icons are broadly illustrated in miniature forms on the head of their emanations. They are sculpted on the four side of the *Stupas*- Amitabha facing the west, Aksobhya the east, Amoghasiddhithe north and Ratnasambhava the south. Vairocana's place is in the sanctum of the *Stupas* and for this reason he is not visualised on its body. Individual iconographic form of the *Dhyani Buddha* is not exceptional but it is very familiar in Nepal and Tibet.

An image of Dhyani Buddha Aksobhyahas been found from Kankandighi, now preserved in a private collection. The god seated on a full blossom lotus in *dhyāna*posture. The important features of this image are his half-closed eyes, divine smile and well built body. His right hand shows *bhumisparsha-mudrā*and left hand holds *Śakti* his consort Mamaki. The well decorated hallo is another feature of this image. The lower portion of his body is covered by dhoti like garments and the upper portion shows a folded *sanghati*, the ends of which is placed on the left Shoulder. On the basis of stylistic consideration this image can be dated c. 7th century A.D.

BODHISATTVA

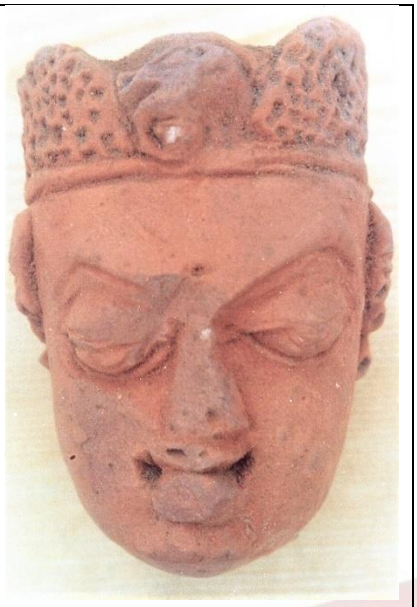

PLATE-I

PLATE- II

Photo Courtesy:

Archaeological Survey of India

A head of *Bodhisattva* datable to c. 6th century A.D has been found from Atghara (PLATE-I). It is now preserved in a private collection. The half-closed eyes, sharp nose and a divine smile are notable features of this terracotta specimen.

Another head of *Bodhisattva* hasbeen recovered from Tamluk area can be dated to c.5th century A.D. It is now preserved in Archaeological Survey of India Museum at Tamluk. The oval face of the figure with flaccid eyelids, sensuous lips, divine smile and the mind fascinated within expresses an appearance of spirituality. The accurate curls of the hair turning to the sight another important feature of the image(PLATE II). Similar type of Bodhisattva image recovered from Tamluk area can be dated to c.5th century A.D now preserved in Archaeological Survey of India Museum at Tamluk.

BUDDHA IMAGE

The numerous Buddha images have been recovered from all the parts of India. The eastern Indian Buddhism played a crucial role in India. The coastal Bengal is ntan exception in this regard. A considerable number of Buddha images has been recovered from this remote forest land which reflects the well-founded Buddhist establishment in this region. Large number of Buddha images of terracotta, stone, metal and bronze have been discovered in this area. The majority of images are in seating posture. Two standing images of Buddha have also been recovered from this area.

The earliest Buddha image, so far recovered in coastal Bengal, has been collected from Khana-MihirerDhipi, at Berachapa in the vicinity of Chandraketugarh. The image belongs to second century A.D. According to S.K Saraswati (Saraswati,1962:12): “The head and bust of Buddha-Bodhisattva from Chandraketugarh have all the characteristic traits of the colossal Kūshan Buddha-Boddhisattva images found in such sites as Saranath, Sahet-Mahet, Kousambi, Mathuraetc.and though in miniature form, has the same stolid dignity in its physical form and bearing. Both hands are broken away, the right completely. The left, of which the upper portion now remains, seems from its positions, to have been held

to waist. A drapery covers the left shoulder and the upper torso, the folds being indicated by prominent ridges on the left upper arm. Here we find a sturdy bust with a heavy neck, all distinctive of the physical type of Kushan Buddha-Bodhisattva images. On the upper torso the drapery is to a certain extent, diaphanously treated revealing the modelling underneath. An attempt towards a thin and transparent treatment of the drapery may assign the fragment to a period not earlier than the second century A.D."

PLATE-III

A low relief sculpture of Buddha is depicted on a brick in meditation posture have been recovered from Chandraketugarh(PLATE III), now preserved in Dr.G.S De's private collection. This image of Buddha seated on a thrown in *mahārājālīlāsana* posture. Three lions are depicted below the throne. His right hand rests on thigh and left hand is in*abhaya-mudrā*. The halo has been depicted behind his head. Two flying*vidyādharas*are found on both sides of the halos. Two male attendants are there on both sides of the Buddha. They hold fly whisk. Theimportant features of this imageare divine smile, bared face, ameliorated chest and magnanimous shoulder. This image of Buddha closely resembles with Katra image of Buddha from Mathura. On the basis of stylistic consideration this image can be dated 2nd/3rd century A.D.

PLATE IV

A terracotta image of Buddha has been recovered from Haroa, a close vicinity of Chandraketugarh, now preserved in DilipMaiti's private collection highlights Buddha engaged in preaching his first sermon *(dharmacakrapravartanmudrā*). The highly decorated halo with flying *Vidhyādaras* on the upper corner and the *makara* and similar figures on the sides,a reminiscent of Gupta images in stone from Saranath. The face though mutilated shows his eyes absorbed within. Elongated earlobes, hairtied in a top knot have been magnificently delineated by the artist. The Buddha wears *Sanghati*covering both the shoulders. Below the Buddha's seat a wheel is shown diagonally, indicating the Deer park at Sarnath where Buddha delivered the first Sermon. This specimen of art can be dated 7th century A.D. Another same type of image has been recovered from same area now preserved in Khas Balanda Pratna Gabeshnakendra (PLATE IV).

Another image of Buddha has been recovered from Haroa, now preserved in DilipMaiti's private collection. In this image, Buddha is seated in *Yogasana* posture on a raised seat. The god is bare-bodied and wearing a lion-cloth, the fold

of which sling in the centre and rest on the seat. His right hand is raised to his chest in the gesticulation of assertion and left hand is placed on his left thigh. The round face, open-eyed expression and callous built body with shorter neck deserve attention. The curls of the hair have been delivering somewhat imprecisely as if twisted. The cranial bump over the head is very distinct. Thus, the diminutive coiled hair, the obtrude *Usnisha* and the extended earlobes symbolize the extraordinary virtues (*mahapurusalaksmana*). The whole figure is set off adjacent to a semi-circular nimbus having notched markings at the both limits and a*stupika* in the centre of the arch on the top. The image can be dated c.8th /9th century A.D.

A *dhyānamurti* of Buddha has been found from Kankandighi, now preserved in Chattrabhog-Khari sangrahasala and is dated to c.7th c A.D. Buddha is seated on a two-tiered pedestal. His two hands are placed on his lap. His curling hair, elongated ear, closed eyes, and *Urna* on his forehead are important features of this image.

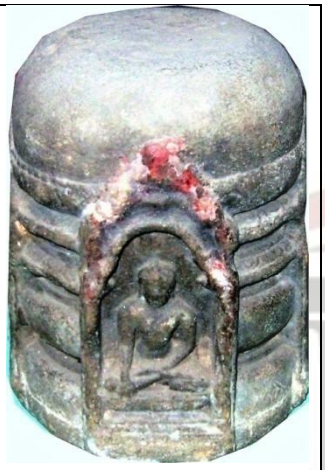

PLATE- V

A votive *Stupa* from Baishata(PLATE V) shows four major incidents of Buddha's life. Four images of the Buddha are carved in the four different niches of the *stupa* in *vitarkamudra, dharmachakrapravartanamudra, bhumisparshamudra,* and *padmāsana* with a mango in his hand. This art object is dated between the last part of the 7th century and first half of the 8th century AD. It is now preserved in Pratnatattvik Kalidas Dutta Sangrahasala (Jaynagar)

Another terracotta plaque of Buddha has been recovered from Panna, now preserved in Ashutosh Museum of Indian Art University of Calcutta. God is seated on*padmasana* on one tier pedestal. He possesses*dharmachakrapravartanmudra*. The early guptabrahmi creed is engraved on the stella(*Indian Archaeology 1957-58 A Review P.72 Pate LXXXVII*).

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An image of Vajrasana Buddha c. twelfth century A.D. has been recovered from Barrackpore(*Indian Archaeology 1957-58 A Review P.72 Plate XCI A*) area of North Twenty-Four Parganas district. The god is seated on a visvapadma. His left hand is situated on his lap and right hand shows *bhumisparshamudra*. Five, dhyani Buddha engraved on the stella. Two female companions are standing on both sides of the god.

PLATE VI

PLATE VII

Another image of Buddha in meditation has been found from Kankandighi. It shows the Lord seated on *dhyāna* posture inside a temple. Some elongated *stupikā* encircled this image (c. 8th century A.D) (PLATE VI). This image is situated in Sundarbanpratna-GabeshanaKendra,Kasinagar.

A magnificent–sealing has been recovered from Kankandighi,now preserved inPratnatattvik Kalidas Dutta Sangrahasala (Jaynagar). Lord Buddha is seated in *bhumisparsamudra*under a pillared decked arch with leaves. This type of sealing closely resembles clay lumps found from *Sañchi* with similar motifs dated to c. 7th c. A.D.(PLATE VII)

The image from Birinchibari(Mukhopadhyay,2005:2)shows the god is seated on a full blossomed lotus, placed on a rectangular pedestal. The right hand shows *vitarkamudra* and left-hand rests on lap. The god wears a *dhoti* type garment in the lower part of the body and the upper portion is covered with a folded *sangati*, the end of which runs down from the front of the left arm. This image has curling hair, half-closed eyes and a halo in the back of the head consisting of lotuses. This image of the *Buddha* closely resembles some aspects of the *Buddha* of the Mathura School of sculptures. This image can be dated to c. 6th c AD.

PLATE VIII

PLATE-IX

Another image of *Buddha* which is made of black basalt was recovered from Kankandighi. *Buddha* is here seated on a throne. He is displaying *dharmachakrapravartanamudra*. He wears a long tight fitting garment. He wears a *mukuta, kanthahara* and *karnakundala*. This image is dated to c. 7th- 8th century A.Dand preserved in SundarbanpratnaGabeshanaKendra, Kasinagar (PLATE VIII).

An image of Buddha, found from Sajnekhali (preserved in a local temple) shows the god seated on a two-tiered pedestal, in *dhyāna* posture. His two hands are in *dharmachakramudra*. The curling hairs are carved very distinctly. Two elongated votive stupas are placed on both sides of the upper part of the stella. This image is dated to c. 10th c AD.(PLATE IX)

Another image of Buddha was found from Atghara(Satyajug 18th June 1980 p.5). It shows the Lord seated in *dhyāna* posture. His left hand is in *bhumisparshamūdra*. But the important thing is that its pedestal shows an 11th –12th century proto-Bengali inscription (*Ratnatraya-Buddhavihara-Vikshu-Sanghasa*). This specimen displays some sort of Tibetan or Burmese art idioms in its physiognomical representation.

A broken image of Buddha from Kankandighi, which is now preserved in Dutta's house shows the god seated on a *viśvapadma*, showing *dhāyanamūdra*. The central figure is encircled by many small images of *Buddha*. This specimen is dated to c. 10th c. AD.

A headless *pralambapad*image of *Buddha* has been found from Salika – Maheshpur and can be dated to c. 8th/9th century A.D. Buddha is here seated on a throne. He is displaying *dharmachakrapravartanamūdra*. He wears a long tight-fitting garment. This image now preserved in a local temple.

An image of Buddha is recovered from Krishnachandrapur, now preserved in a private museum. The image is seated on a one tied pedestal in padmasana posture. The right hand of the god rests on lap and left hand possesses *abhyay- mudra*. A round shaped halo is situated back of the head. The oval shaped face, sharp nose, half closed eyes, carling hair and long ears are the physionomical feature of the image. The lower portion of his body is covered by a *dhoti* like garment and the upper portion shows a folded *shangati* the ends of which is placed on the left shoulder. Another similar type of image has been recovered from Krishnachandrapur preserved in a private collection. These images can be dated 7th century A.D, on the stylistic consideration.

Anumberof small votive images of Buddha have been recovered from adjacent area of Jatar Deul. The god is seated on arch like architectural motif in dhyanamudra. There right hand shows *bhumisparshamudrā* and the left hand rests on the lap. These specimens display some sort of Tibetan art idioms in its physiognomical representation. On the basis of stylistic consideration these images can be c.11th century A.D.

Six images of Buddha in *bhumispasha-mudra* posture have been recovered from adjacent area of Jatar Deul[40], now preserved in a private museum in Sundarban. The first image shows the god seated on a two-tier pedestal in dhyana posture under an arch type motif. This image is made by black basalt. His left hand shows *bhumisparsha-mudra* and right hand rest on lap. The round face, long ears, half-closed eyes, carling hairs, thick lips, snub-nose are the physical feature of the image. A prominent Urna is visible on his forehead. This art specimen closely resemble with Burmese art idion, can be dated 9^{th} /10^{th} century A.D. The second specimen of art which is recovered from same area highlights the god seated on a lotus based one tier pedestal. The lower portion of his body is covered by a *dhoti* like garment and the upper portion shows a folded *shangati* the ends of which is placed on the left shoulder. The closed eyes, tranquil face, blooming smile, and divine physiogonomical form are the important character of this image. The physical anatomy of the third and fourth specimens of the image of Buddha of this group bears close similar with second art idioms. These specimens of art can be date 9^{th} /10^{th} century A.D. Two specimens of the images of Buddha have been recovered from same vicinity highlights the god seated on lotus based one tier pedestal. The lower portion of his body is covered by a *dhoti* like garment and the upper portion shows a folded *shangati* the ends of which is placed on the left shoulder. The left hand of the god shows *bhumisparsha-mudra* and right one rests on lap. The half closed eyes, tranquil oval shaped face, elongated ears, carling hairs with knot, prominent eyebrows and smiley lips are the basic features of the images. On the basis of stylistic consideration these art specimens go to 9^{th} /10^{th} century A.D.

An excellent basalt stone image of Buddha discovered from Raidighi now preserved in local police station is a noteworthy addition to the Buddhist sculptural repertoire of Bengal. Standing on a lotus placed on a decorated *pancharatha* pedestal, the Master is presented in strict frontality or *Samapadasthanaka* posture. His transparent monastic robe covers the broad shoulders and coming down much below the knee. Both the fore arms of the image are broken from the elbows.But the position of the upper arms it appear that the right hand was orignially raised in *abhyay-mudra*, while the left one was slightly lowered balancing the right one. The image is standing under a magnificent architectural motif. Two flying *Vidhyadhara* bears garland is situated both side Buddha. A stupa motif is situated upper part of the architectural motif. The round face, closed eyes, bare legs, thick lips, sharp nose, coiled hair with knot are the basic feature of the images. This image can be dated 11^{th} century A.D. (PLATE X)

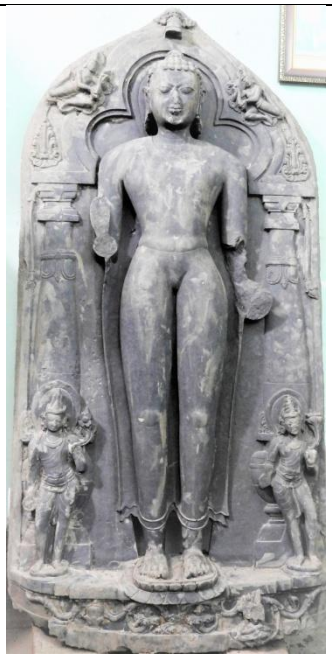

PLATE-X

PLATE-XI

PHOTO COURTSY –DIRECTORATE OF ARCHAEOLOGY AND MUSEUM GOVERNMENT OF WEST BENGAL

One of the significant collections of the Asutosh Museum of Indian Art University of Calcutta is a black stone sculpture depicts *Mahaparinirvana* seen of *Buddha* found from Khalisady. This piece of sculpture is important both from the iconographic and artistic point of view. The row of five *Dhyānī Buddhas* on the top, *Indra* or *Sakra* in regal costume holding a parasol beside the rising *stupa* in the background, the kneeling figure of *Brahma* and with *Jatamukuta,* the feet of the dying *Buddha* with both hands, are unusual the traditional pair of *sāla* trees of Kusinagara between which the couch of the *Buddha* is usually placed, the mourning monks including the mediating figure of *Subhadra,* the last disciple of the departed master seated under the couch according to the idiom of the Eastern School are conspicuous by their absence.

An image of Buddha has been recovered from Deganga (North Twenty FourParaganas), now preserved in Directorate of Archaeological Museum Govt. of West Bengal. The god seated on a *visvapadma*placed on a three-tiered pedestal. His right handpossesses*bhumisparshamudra* and left hand rest on lap. The Dhyani Buddhas is situated top of the stella. Two female attending figure is situated both side of the god. Two devoteesarekneeling below the pedestal. This image can be dated c. 11^{th} /12^{th} century A.D.(PLATE XI)

An image of Buddha has been recovered from North Twenty Four Parganas now preserved in Directorate of Archaeology and Museum Govt. of west Bengal. The god seated on a *visva-padma in dhyana* posture. Buddha is in the *bhumisparsa-mudra* with his right palm touching the pericarp of the *visva-padma.* The left palm is placed on the soles of the feet. The rigid pose, the sculpt of the upper body and the outline of the arms close influence with late Gupta example of art. The surrounding stella closely resemble with the Buddha from Salban Vihara, Mainamaticomilla. This image can be dated early seventh century A.D on the stylistic consideration.

PLATE-XII

A metal image of Buddha has been recovered from Chandraketugarh(PLATE XII)now preserved in Dr.Gourisanakar De private collection. Buddha, seated on an oval shaped full blossomed lotus pedestal. He is in *dhyanamudra* posture. A decorated round shaped halo has been situated behind this image. The robust body, royal physiognomical attributes, sullen face and conventional garb reflects an ascetic feature of this image. The reverse of the image is very magnificent for its artistic skillness. The *Garuḍa* hold a wheel by his hand. *Garuda is* flapping his both wings. The vigorous motion this *Garuda* image creates an astonishing manifestation of this art specimen. A small corroded inscription of late Gupta *brahmi* has been situated back of the image. On the basis of epigraphical records this image can be dated 7th century A.D.

Another image of Buddha has been recovered from Chandraketugarh area, now preserved in Dr. Gourisankar De private collection. The god seated on lotus like oval shaped pedestal. He is in *dhyan*posture. His right hand in *Vyakhana-mudra* and left hand lies on the soles of feet. A round shaped halo is situated back of the god. The closed eyes, celestial smile and divine physiognomical feature imperative attributions of this image. The lower portion of his body is covered by dhoti like garments and the upper portion shows a folded *Sangati*the ends of which is placed on the left Shoulder. On the basis of the Stylistic ground this image can be date 9th /10th century A.D.

An image of Buddha has been found from Maipit area of Sundarban, now preserved in a private collection. The God seated on an oval shaped pedestal in dhyana posture. His right hand shows *bhumisparsha-mudra* and left hand lies on the soles of feet. His elongated ears, half closed eyes, curling hair and well-arranged monastic drapery reflects this image closely resemble with Nalanda Buddha images. A prominent *urna* has been situated forehead of the Buddha. This image can be dated 10th century A.D on stylistic consideration.

A bronze image of headless Buddha has been recovered from Patpukur, in Baishata area and it can be dated to c.10th century A.D. The god is seated in *vajraparjankasana* posture and his two hands possess *dharmachakrapravartan-mudra*. This image is now preserved inin Directorate of Archaeology and Museum Govt. of west Bengal

PLATE-XIII

PHOTO COURTSY –DIRECTORATE OF ARCHAEOLOGY AND MUSEUM GOVERNMENT OF WEST BENGAL

A metal *Buddha*, standing on a three tiered rectengular pedestal, in *sthanaka* posture has been found from Kankandighi area and preserved in the Directorate of Archaeology and Museum Government of West Bengal.The right hand of *Buddha* shows *abhayamudra* and holds the hem of the robe. The *Buddha* wears a folded *Shangati* which covers both the arms and shoulders. He is accopained by a couple of miniature images of Boddhisattvas having same hand position as in the evident form the central figure. This image is dated to c.10th century A.D(PLATE-XIII).

Another bronze image of *Buddha* has been found from Patharpratima (c.10th century A.D). It can be compared with the Jhewari group of bronzes on the basis of stylistic consideration. In this image Buddha is seated on a rectangular pedestal in *dhyana* posture. His right hand shows *bhumisparsha-mudra* and left hand rests on his lap. The lower portion of his body is covered by a *dhoti* like garment and the upper portion shows a folded*shangati* the ends of which is placed on the left shoulder. This image now preserved in private collection.

Another metal image of Buddha has been recovered from Bhangar (c.11th century A.D). This image is seated on a two-tiered lotus like rectangular pedestal in *dhyanasana*posture. His right hand shows *abhaya-mudra* and the left hand rests on the lap. The lower portion of his body is covered by a *dhoti* like garmentand the upper portion shows a folded *shangati* the end of which is placed on the left shoulder. It is now preserved in local police station.

A metal image of Buddha has been recovered from Maipit area and it can be dated 11th century A.D. This image now worshiped in a local villager's house. The Buddha seated on a rectangular pedestal in dhyana posture. His right hand shows *bhumisparsha-mudra* and left hand rests on lap. An*uran* has been situated on his forehead.

PLATE-XIV

A magnificent image of Buddha has been recovered from Kankandighi,(Plate-XIV) now preserved in the local museum of sundarban. His right hand rests on lap and left possesses*abhaya-mudra* posture. He is seated on an oval shaped pedestal. He wears royal type of garment on his body. His prominent eyebrows, elongated ears, cylinder tapering eyes, sharp nose and thick lips. The important feature of the image is the life of Buddha depicting on the back side of the pedestal. This image can be dated 11th century A.D.

An image of Buddha has been recovered from Maipit, now preserved in a private collection.The god is seated on a three-tier pedestal. His right hand possesses *abhaya-mudra* and left hand *shows varada-mudra*. He wears *dhoti* and *sangati* like garments. His half-closed eyes, elongated ears, sharp nose, prominent eyebrows, thick lips and carling hair with top knot important features of the images. The pedestal of the image is very interesting. It is divided into two parts. The below parts engraved lotus petals. The second row divided into three rows. The second row depicted two elephants both side and an auspicious symbol is situated middle register of the pedestal. This image can be dated 10^{th} /11^{th} century A.D.

Another image of Buddha has been recovered from Chandanpiri, a core forest area Sundarban. The right hand of the god possesses *Varada-mudra* and and left hand shows rest on lap. The lord Buddha seated on lotus based oval shaped pedestal. The God wears *Sangati* and dhoti like garments. His half closed eyes, elongated ears, sharp nose, prominent eyebrows, thick lips and carling hair with top knot important features of the images. This image is belongs to 10^{th} century A.D.

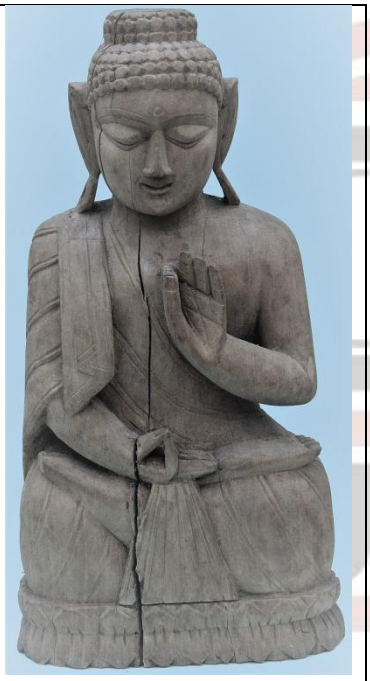

PLATE-XV

Few years ago an image of Buddha an excellent piece of wood carving, was discovered from kankandighi. This image of the Lord in meditation is seated crossed-legged in *Padmasana* on a *Visvapadma*. His round face, half closed eyes, spiral coils of hair rolling down to the ears and the top knot (*Ushinisha*)are all curved out meticulously. The left hand of the image shows *abhyay-mudra* and the right one rests on the lap exhibiting*vitarka*. The lower portion of the body is covered by a *dhoti* and the left part of the upper portion shos a folded *shangati*, the end of which runs down in front of the left arm. Stylistically, this image of Buddha has close resembles with some of the similar images from Nepal and may be dated c.9^{th} -10^{th} century A.D(PLATE XV). This image now preserved in SundarbanPratna-Gabeshana Kendra Kasinagar.

BUDDHIST DEITIES

A number of Buddhist deities have been noticed in this area. The most important image in this regard is a *Manjuśrī* image which has been found from Bhangor and is now preserved in the Asutosh Museum of Indian Art, University of Calcutta. The image is in *sthānaka* posture on a pedestal. He wears different types of ornaments. His left hand holds an *utpala* and right hand exhibits *varadamūdrā*. Two attendants are standing on both sides of the Lord. Five *dhyānī Buddhas* are visible around his head. According to the description of *Sādhanamālā* the image is an example *SiddhaikavīraManjuśrī* of the *Manjuśrī* group. This image is dated to c. 11^{th} c. A.D.

An eight handed, three headed *Mārichī*have been found from Kankandighi and now preserved in Chatrabhog-khari Museum. She wears *Karandamukuta* on her heads. She wears a sari like garment and stands in *ālīdha* posture. The weapons of the deity are not very

distinct. Few of them can be identified as the *dhanusha, bāna, ankuśa and aśakapuspa.* The image stands under a *chityagriha*. The *pādapītha* is like a *ratha*. This *ratha* divided some rooms. The chambers depict some small animals carrying the chariot. The animals are most probably boars. The charioteer is seated in the middle of the chariot. This image can be dated to c. 10th century A.D

PLATE- XVI

Some images of *Tārā*, another important Buddhist goddess, were found from this region. Such images have been found from Boral, Atghara, Kankandighi. The image from Boral which is dated to 11-12th c. A.D is now in the *Tripurasundari* temple. In this image the *Devī* is standing in *Pratyālidha* posture on pedestal. She wears a long *mala*, which is formed by human skulls. Another *Tārā* image of c. 11th c. A.D was found from Kankandigi and is now preserved in the State Archaeology Museum, Calcutta. The *Devī* holds an *utpala* stalk in the right hand, while a *stupikā* is carved on the stella[60]. Another image of *Tārā* found from Haroya (PLATE XV) is now preserved in a local museum of Baruipur and is dated to c. 10th - 11th c. AD. Here the *Devī* is seated on a lotus pedestal. Her left hand holds a *padma* and right hand rests on her lap. She wears a *karandamukta* on her head and she is decked by different types of ornaments[61].

PLATE-XVII

A magnificent image of *Padmapani* recovered from Kankandighi (PLATE-XVII) has close affinity with Nepalese sculpture preserved in Museum of Fine Arts, Boston. The God stands on *samapadasthanaka* posture on a two-tiered lotus pedestal. His left hand holds a lotus stalk and right hand possess *Varada-mudra*. The god is bejewelled by several types of ornaments. On the stylistic grounds this image can be dated late Gupta or pre-Pala. This image is situated in Dr. Tulsicharan Bhattacharya Smriti Sangrahasala (South Vishnupur).

Another *Boddhisattva* image has been recovered from Ghosherchak, Baishata, now preserved in Dr Ramtaran Chakraborti Archaeological Heritage Museum. The God seated on an oval shaped pedestal in *lalitasana* posture. His left hand shows *abhyaya-mudra* and right hand holds a jar with *Kalpavrksa*. A prominent *urna* has been situated on his forehead. His elongated ears, half closed eyes, charming face, curling hair and well arranged monastic drapery reflects this image closely resemble with Nepalese art. Some wheel symbol has been situated on his back. This image

identified as *Boddhisattva Ksitigarbha* on the basis of *Sadhanamala*. On the basis of the stylistic consideration this image can be dated first half of the 8th century A.D.

Aksayamati another form of *Boddhisattva* has been recovered from Maipitarea and it can be dated c.11th century A.D. The God seated on an oval shaped pedestal. According to *Nispannayayogabali* his two hands hold the bowl containing the nectar of knowledge. This specimen of art closely resembles with Tibetan school of art.Another similar type of *Boddhisattva Akyasamati* image has been recovered from Maipit area and it can be dated c.11th century A.D. The god seated on an oval shaped pedestal. He is in *lilasasana* posture. According to *Nispannayayogabali* his two hands hold the bowl containing the nectar of knowledge The important features of this image are round shaped, half closed eyes, well arrange dress and divine smile. This image now preserved in Dr. Tulsicharan Bhattacharya Smriti Sangrahasala (South Vishnupur).

Sadaksari Lokesvara is regarded has another form of *Bodhisattva Avalokitesvara* according to *Sadhanamala*. A metal image *Sadaksari Lokesvara* from Kankandighi is dated to c.9th /10th century A.D. The image shows the divinities on a four tiered pedestal on *vajnkasanraparyaa* posture. His front hands are in anjalimudra and the back right hand holds a rosary and the back left hand is broken. He wears a*karandamukuta* and there are different types of ornaments on his body.This image now preserved in Dr.Tulsicharan Bhattacharya Smriti Sangrahasala(South Vishnupur).

The *Jambhala* is regarded as an emanation of *Aksobhya*as well as that of *Ratnasambhaba.* He is regarded as the God of wealth. A metal image of *Jambhala* (c.9th century A.D) found from Kankandighi, now preserved in Bhuvan Museum, shows the god seated on two-tiered oval shaped pedestal in *ardhaparyankasana*posture. The upper part of the body of the divinity is bear. His head is decorated by a trident in the middle of which a *Boddhisattva* image is visible. *Jambhala* wears different type of ornament and his right hand hold a purse and left hand holds a mongoose vomiting jewel.

PLATE-XVIII

The goddess *Nairatma* emanating the dhyani Buddha Akshobhya is well delineated in a bronze image found from Katandighi. The goddess is dancing on a round three decked lotus pedestal in *ardhaparyanka* posture. She is standing on corpse. Her right hand holds *Vajrakarti*and left hand bears *Kapāla*. She is adorned with five ornaments such as *kanthika, rucaka, ratna, mekhala* and *sutra* and according to sadhanamala these are five auspicious ornaments of the goddess. The*dhyānī* Buddha Akshabhay is visible in her crown. This image is dated to c.9th -10th century A.D.(PLATE-XVIII)

A metal Buddhist image of Tārāhas been recovered from Kankandighi and is dated to c. 8th century A.D on the basis of stylistic considerations. In this image Tara is seated on the three tiered lotus pedestal in *lalitāsana* posture. Her right hand is broken and her left hand holds a fruit. She does not wear any ornament except a *karanda-mukuta* which is seen on her head. It isnow preserved in Directorate of Archaeology and Museum Government of West Bengal.

PLATE-XIX

PHOTO COURTSY –DIRECTORATE OF ARCHAEOLOGY AND MUSEUM GOVERNMENT OF WEST BENGAL

A Buddhist tantric goddess has been recovered from Baruipur area and it can be dated on 10th century A.D, now preserved in Directorate of Archaeology and Museum Government of West Bengal. The god is standing in the *Pratyālīdha* posture on a mule. Her right hand has been situated on the head of being and left leg rest on the waist of the animal. The left hand of the goddess bears *kartarī*and the right hand holds *Vajra*. She adorned by several types of ornaments like *kantha-hāra, sarpa-nupura, udara-bandha, sarpa-valaya, sarpa-angadas* and *karna-kundala.* The execution of the mule, with beaded string on the neck is evenly excellent. The animal is standing on an oval shaped pedestal which is decorated by the pericarp of a lotus with double queue of petals.

Originally a primitive protector of children, *Hārīti* was admitted into the Buddhist pantheon and her worship become popular even among the Hinayanaists. According to the Buddhist legends she was the guardian deity of Magadha who was in the habit of stealing and devouring young children. But this aspect was converted into the protectress deity of children under Buddha's influence. She is easily

recognised in sculptures by her association with children. She is also some times reported as holding a pomegranate which Buddha gave her as a food a substitute of human flesh. A *Hārīti* image has been recovered from Nalgora[70] (c.10th century A.D) where the goddess is seated on a two tiered lotus like pedestal in *ardhaparyankasana*posture. She holds a baby in her left hand and her right hands a pomegranate respectively. The deity is seated under a pomegranate tree.*Pānchikā* the consort of *Harit*iis seated on the left side of the deity.

CONCLUSION

Historical evidences have revealed development and enlargement of Buddhist sites, uninterrupted temporal continuity of Buddhism on in the mentioned area of coastal Bengal in the period between 5th century but especially between 7th century and 12th century A.D. The *Vajrayāna* form of Buddhism, introduced a number of Buddha, Boddhisattvas, gods and goddesses. Some magnificent sculptural evidences have been discovered from several area of coastal West Bengal. A remarkable number of early medieval icons have been found from places still unmarked in the archaeological maps of West Bengal. A considerable number of images have been rescued from Sundarbans. The sculptures recovered from several vicinity of the coastal Bengal are not only significant from the artistic value, but are evidences conducive to reconstruction of the depiction of the socio-cultural and religious history of particular area as well as Eastern India also. This material evidences helps us to understand trade relation and cultural relation with aboard countries especially South and South-East Asian country.

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A Study of Ivory & Bone Sculptural Art of Bengal

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Abstract

Ivory carving is a centuries-old Indian art. Since prehistoric times, India has sculpted ivory and bone into ornaments. Ivory carving was regarded as a noble vocation and a premium craft in these parts. Ivory items have been discovered at Harappan sites. A thriving city with a population of creative energy in many professions also aids the growth of any craft. Bone combined with ivory has been utilised for both utilitarian and ornamental purposes since prehistoric times.

Key Words: Bone, Ivory Art, Bengal.

Introduction

Ivory craft is a very ancient craft of India. India has ornamentally carved ivory & bone since pre-historic times. Here ivory carvings were considered as a noble profession and the craft was a deluxe craft. Evidences of ivory objects are found from Harappan sites.

A flourishing city with a population of the creative energy in various fields also helps any craft to flourish. Bone with ivory has also been used from ancient times for making utility articles as well as decorative ones.

Epigraphic evidence: - A votive inscription from Sanchi Stupa on southern gateway mentions that the ivory carvers (*danta-karehi*) of Vidisa carved the figures of these gateway. This record reflects that during the first century B.C ivory-craft and trade-guild of the ivory carvers was flourished in these areas. So much so that readily lent their free-services for the sculptural embellishment of the said gateway. (Dwivedi, 1976:16)

The second evidence comes from Bengal. The Bhatera copper-plate inscription from the village Bhatera, now in Bangladesh, records that an ivory worker of a nearby village was attached in establishment of a Siva temple by the king. So, it is apparent that the craft was held in high respect and ivory objects were used in the temple. (Dwivedi, 1976: 17)

Another inscription, the Edilpur (District Faridpur, now in Bangladesh) Copper Plate inscription of Kesava Sena describes that king Balla Sena (1168-1169 A.D) carried away the fortune goddess of his enemies on palanquins resting on staffs made of elephant tusks Fortune goddess either means the idols of gods and goddesses of his enemies or the treasures of them.

Literary References: - In the Vedic literature there are no direct references of ivory craft, surprisingly though Vedic society was well acquainted with elephants and several words have been used for elephant- *Ibha*, *naga*, *mrigavarana* and *hastin.* Some scholars are of opinion that the word 'ivory' is derived from the word '*ibha*', means elephant. (Dwivedi**,** 1976**:**17)

Rig Veda has mentioned about a gambler and the brown dice. It is known to all that dice was generally made of ivory and it takes a brownish colour with time and by constant handling. (Dwivedi, 1976: 18.)

In *Ramayana* and *Mahabharata,* we often noticed the references of ivory and ivory carvers.

In *Ramayana Ravana's* palace in *Lanka* was decorated with ivory works-it had ivory inlaid floors, pillars, windows etc. Hanuman during his search for Sita noticed Ravana's bed, *rathas* were embellished with Ivory works. In the age of Ramayana palanquins and others wooden objects specially furniture was also adorned with ivory works. Even royal umbrellas which described as white in the Epic were probably heavily decorated with ivory. In Ayodhyakanda of the Ramayana the inhabitants of the city are represented as going out in procession with Bharat to seek Rama in the forest, in the order of the trade-guilds: - "Jewellers, potters, ivory workers, perfumers, gold-smiths, weavers, carpenters, painters, black-smiths, copper-smiths etc…."(Dutta, 1901: 1).

The Mahabharata gives more explicit information about ivory carvings of its age. The king of Pragjyotisa (Assam) presented Yudhisthira many swords with handle made of pure ivory on the occasion of Rajasuya sacrifice. From another reference we come to know that kings of Magadha, Bengal and Orissa gifted Yudhisthira valuable furnitures with inlay works of ivory, gold and semiprecious stones. The royal thrones were also embellished with ivory works. (Dwivedi, 1976:19.) Another very important information about the use of ivory is provided in the Karnaparva of the Mahabharata. It mentions Duryadhana anointing Karna as his Senapati by pouring on his head holy water contained in elephant's tusk. Pouring holy water on the head of the anointed was an ancient custom employed in the Rajasuya and Abhiseka ceremonies**.** (Dwivedi, 1976:19)

Arthasastra of Kautilya of often mentioned about ivory and several ivory dices have been recovered from the excavation in the Mauryan phase.

Silavanga Jataka mentions about ivory-workers' market at Banaras. The existence of a separate market of ivory –carvers shows that ivory products had certain popularity and the quantum of trade in them was large enough to support a full-fledged market. Chhandanta Jataka tale points to the great demand for elephant ivory.

In *Buddha Charita by Asvaghosa* (2nd century A.D) it is interesting to notice the mention of a palanquin embellished with ivory works. It also says that when Bodhisattva was an elephant, his tusks were cut seven times. Working with ivory appears to have been a recognised profession in most of ancient India's major towns.

Milindapanha informs us about the contemporary occupation of ivory-carvings.

Sudraka in Mricchakatikam, mentioned a high resplendent archway is encrusted with ivory.

In Kalidasa's Raghuvamsa we find references to an ivory-ear-scroll which has been compared to a pale-white ketaka flower petal. (Dwivedi, 1976:22.) In Meghaduta Kalidasa compares the whiteness of Mount Kailash with that of a freshly cut elephant tusk.

The Periplus of the Erythraean Sea (1st century CE) mentioned that India had flourishing trade in ivory with Rome.

Apart from these texts *Mahavastu, Divyavadana,Kamasutra* of *Vatsayana, Vishnudharmottara Purana* and *Brihatsamhita* of Gupta period, jain text *Angavijja*, datable to 4th-5th century CE, *Harshacharita* and *Kadambari*of *Bana* there are ample references of ivory works and these texts mention the existence of ivory craft in urban centres of India. It can be assumed that in early times the craft of ivory carvings was conditioned to a large extent by the availability of ivory. Also, a strong centralised power with several urban centres created a congenial condition for ivory and other deluxe crafts to flourish was needed.

In eastern India bone-ivory craft meant for ornamental and decorative purpose have been found mainly during Sunga-Kushan period. From ancient period till now bone-ivory plays an important role in the magico-religious beliefs of people of Indian sub-continent for the aversion of evil, death and misfortune.

In early ivory & bone carvings of Bengal woman figures and orgiastic group have been found in many parts of undivided Bengal. Woman plays an important role in magico-sexual rites which are performed with a view to increasing the fertility of the soil and vegetation, to bringing rain and in general to assuring agricultural fruitfulness. In contemporary terracotta art of Bengal we have similar types of fertility goddesses but in comparison as a precious craft ivory was produced for a few selected elite citizens.

Types of Ivory-The term 'ivory', though loosely applied to the tooth structure of the elephant, walrus, hippopotamus, whale and some others, is strictly speaking, confined to the dentine present only in the tusks of the elephant.

The teeth of hippopotamus are another source of ivory. These are denser, and have a closer grain than elephant ivory and are the hardest of all teeth used as ivory. The only limitation in this kind of ivory is that it can be used for small work alone because of its size and does not have the pattern of crossing lines. In colour it is pure white. (Dwivedi, 1976: 3)

The source of walrus ivory are the long tusks hanging perpendicularly downwards from the upper jaw of the animal. This sea animal resembles a seal and is found in the artic regions.

The tusks of the walrus are much larger than those of the hippopotamus are generally oval in section. However, the walrus tusks do not have the fine intersecting lines of elephant ivory. (Dwivedi, 1976: 3.)

A sub-variety of walrus ivory is 'beach ivory'. The name is given by the Alaskans to the fossil tusks of walrus.

Dugong ivory is a local variety of ivory used for carvings in Java, Sumatra and Philippines. The kind of ivory principally comes from the female sea-cow which outwardly does not appear to bear tusks. But inside the skull are huge tusks. The tusks of the male sea-cow have a deep basal cavity and prominent surface scoring, both of which reduce the amount of usable ivory. (Dwivedi, p-3)

Whale's teeth ivory came into use rather late. It can be easily be recognised by the short, stubby shape of the whale teeth, their broadly rounded ends, and their conical base cavities.

Asia and Africa are the two main ivory-producing continents, but their products differ considerably owing to climatic and geographical factors.

Difference between bone and ivory– Bone as a special material was easily used by men from the pre-historic age for technical and domestic purpose. The *Jatakas t*ell us that bones, particularly monkey's bones were used frequently for children's necklaces. Structurally, it is less fibrous but more brittle than ivory, and splinters easily. So, the use ofbone was restricted of awls, knives, kohl-sticks and mirror handles etc. The main difference between ivory and bone-which makes ivory more suitable for carvings than bone- is that there is an oily or waxy solution in the pores of ivory.

From different periods and different regions of India ivory objects have been reported though early ivory finds are restricted to utilitarian items such as combs, hairpins and arrowheads etc. Evidences of its existence are found in Harappan Cultural sites (*Circa* 2500-1500 B.C) of Western and North-Western India. (census p5)

Ivory seal set in a copper circlet has found from the monastery mound at Shah-ji-ki-dheri near Peshawar. Ivory seals and sealings have been found in Bhita near Allahabad, Nalanda and other Buddhist sites. (Ajit Ghosh, Rupam. p 122-129)

Excavations conducted in different regions of India have yielded many objects from different historical phases. The Kushana period shows the high-water mark of Indian ivory/bone carvings, the huge quantity discovered at Taxila and Begram indicated the popularity of the ivory medium during this period. (Dwivedi, 1976: 94.)Moreover, Begram was the summer capital of the Kushanas whose domain included Afghanistan.

Conclusion

The Chandraketugarh discoveries, which exhibit a broad array of items ranging from common hairpins and combs to sword handles and ivory dices, indicate that ivory was used for a variety of purposes in Bengal. For instance, beautiful carvings depicting mithuna, divine female figures and shalabhanjika or tree goddess.

The Mauryan sculptures and appliqué terracottas have been well defined by scholars. No such definite characteristics can be attributed to the ivories of this period. During this period ivory was used for producing seals and conventional items like arrow-heads, dice, hair-pins, kohl sticks etc. (Dwivedi, 1976: 60.)

The Sunga period has a very important place in the development of Indian Art. In Mauryan period the patronage of art was practised by the Mauryan court only. (Dwivedi, 1976:61.) But in the Sunga period it passed on to the commoners whose names are inscribed on the Bharhut, Bodhgaya, and Sanchi monuments. These three places represented the first organised art activity of the Indian people as a whole. The human figure is endowed with a new form and bearing. In the field of terracotta, moulds came into use for the first time, which meant greater accuracy and mass production. (Dwivedip, 61.)

In the field of ivory and bone, excavations have brought to light more objects of this period than the earlier ones. (Dwivedi, 1976: 62.)

It has been mentioned earlier that Kushana period was famous for ivory sculptures. The political, social and economic condition helped the craft to flourish. The kushana period is marked by the prolonged and fruitful co-existence of the various people who inhabited the empire and of their traditions, religious system and beliefs. At this very time Roman trade with Asia was almost at its peak. There was a free flow of travellers from one place to another. Many professions are known from literary and epigraphic records. Flourishing trade and consequent prosperity were instrumental in supplying a prolific patronage of arts, which attained a new height under the kushanas.

It is evident that the Gupta artists were not very productive in the medium of ivory and only a few ivory objects can be assigned to this period all over India. This is rather surprising as it is during the Gupta period that India was at the height of prosperity and artistic achievements.

In late medieval period the principal centre of ivory carvings in Bengal was Murshidabad. In those days the industry received patronization of the Nawabs and the noblemen of the court. Ivory craft of Murshidabad mainly followed a style exclusively developed in Bengal. The Bengal ivory-craftsmen acquired considerable proficiency in bone-ivory carvings. Decorative pieces of ivory carvings of Murshidabad were displayed in the museums across the world.

Majority of the ivory-bone objects of our collection belong to the Medieval and Late-Medieval period and most of them collected from districts of Murshidabad.

The only district of West Bengal in which the art of ivory carvings was practised a few decades ago is Murshidabad. Formerly they enjoyed rent-free holdings of the lands. But after the Independence Government of India declared ivory-trade illegal, the industry, on which they lived in affluence, is now lost much of the skill their ancestors possessed.

Some bone and ivory sculptures in the collection of State Archaeological Museum. West Bengal.

1. Handle of a knife, cylindrical in shape, showing a man and two women are standing in a row-(10.2cm x2.4 cm) **South 24 Parganas. West Bengal. Period- Sunga. (1st century B.C)**

This bone object probably depicts a scene of performance of fertility festival. The central figure is a female figure standing her left in akimbo and right hand touches the hand of another woman. Here she is most probably the principal figure. She wears a transparent lower garment through which her genital part is clearly visible and torque, bangles and anklets. Below on her left side a swan is appeared in profile, looks upwards. Another female figure is standing under a pillar with her both hands outstretched. She is holding bell like objects which are hanging from the pillar. She wears a two tired conical head gear with a circular object on the top, circular earrings, transparent lower garment up to knee, anklets and beaded waist girdle. A scarf-like object is visible hanging from the left side of her waist. The only male is also standing with two outstretched hands and his right is bent slightly at the knee-joint. The right hand of the male figure touches the body of the central female figure and the left hand touches a decorative hanging from the above. He wears circular earrings, necklace and beaded waistbands and bangles and armlets. He also wears anklets. His head-dress is simple but interesting, decorated with eye-shaped object, probably a leaf designed hair pin.

2. Bone plaque. Mongalkot, Bardhaman.West Bengal-(15.6cmx7.2cm) Period, Sunga-Kushana. (Circa 1st century B.C) This plaque fromMalgolkot is carved out of a fossilized bone. This fragmental plaque depicts probably a toilet scene. It is work of rich taste and shows a profound felling for slender form and graceful rhythmic expression. The plaque has carvings on both side of it. A female is sitting on a mat with both the legs folded from the knee. The right leg rests on the mat and the right-hand rests on the left upright folded knee.

She has a knotted hair-do, wears a heavy necklace which is hanging in between her two heavy breasts. She also wears a waist girdle, frilled lower garment and heavy anklets. Behind her there standing two head-less figures. The figure just behind the seated female figure is probably a female, because it has a very slender waistband a deep naval. It wears a heavy necklace and a waist girdle. The back side of the plaque shows two standings wearing dhoti with frilled hanging ends.

3. Bone Plaque, Chandraketugarh, North 24 Parganas. West Bengal. (7.8cmx4.6cm).Period: Sunga-Kushana.

This bone plaque depicts the scene of performance of fertility rites. A female figure is standing under a tree. Below there are two figures. The figure that stands is offering some fruits to the seated figure. There is also an offering bowl. The seated figure sits with his legs folded and his outstretched right hand is receiving the offer. In Indian art fertility scenes are very common. But either in stone or in terracotta these types of narratives details are not very common, at in Bengal art**.**

4. Female Figure. Bone. Chandraketugarh. North 24 Parganas. West Bengal. (Height- 5.6cm) .Period- Circa 4th Century A.D - The figure shows a standing female carved in round. She has prominent breasts and genital organ. She wears waist girdle, a transparent lower garment up to knee and anklets. Her hair tied like a knot and some parts hanging from her left, the end of which she holds with her left hand.

5. Durga Mahisasuramardini. Murshidabad. West Bengal.Period Circa late 19th Century CE (17.5 cm X 15 cm). An intricately carved ten-armed ivory image of Mahisasuramardi, accompanied by her four children. She is slaying the Mahisasura. The sculpture is placed on a rectangular pedestal with an intricately carved Chalchitra.

6. Lord Ganesh. Bengal. Period- Circa 19th Century CE. (Height- 11.2 cm) Standing ivory image of four-armed lord Ganesha on an octagonal lotus pedestal with his lower right hand shows *varada mudra*. The Lord holds a conch shell and a flower in his upraised right and left hand respectively. He is also holding a *Modaka* in his lower left hand. Mushika the mount is visible near his left foot

7. Goddess Kali- Bengal.Period-Circa 19th Century CE. (11.9 cm X 10 cm). An ivory image of four handed goddess Kali trampling on Shiva. She is wearing a 'mundamala' (garland of human skull) and a waist belt of human skull and bone.

8. Clam shell– **Murshidabad. West Bengal. Period-Circa 19th Century CE. (12.9 cm X 5 cm**)An ivory object depicting scenes of Ramayana's in Ravana's Asoka garden.

9. **Ivory comb-Bengal. Period- Circa 18th century CE. (7cm X 6.3 cm).** An ivory combwith figures of Goddess Lakshmi & Saraswati at the half circular butt-end. Goddess Lakshmi is accompanied by her vahana owl in the background of a cornfield while Goddess Saraswati is represented in the background of '*Kamala Vana'* (Lotus forest)

10. Goddess Durga with her two attendants. Murshidabad. Period- Circa 19th century CE. (7.2 X 9.5cm). An ivory image of two-armed Goddess with her two female attendants Jaya & Vijaya on both sides. This type of Durga images are also known as '*Abhaya'.*

11. Female Deity. Murshidabad, West Bengal. Period-Circa 19th century CE. (7.4 cm X 6.8 cm) An ivory image a four-armed female deity adorned with jewellery, crown and sari, seated on a tiger and trampling on an elephant.

12. A votive bone Plaque in the shape of a trident. West Bengal. Period-Circa 18th Century CE. (15.90c)A votive plaque with carvings on both sides. The upper part delineates Lord Brahma flanked by goddess Lakshmi and Saraswati on both sides. Lower part on one side shows seated four-armed Lord Vishnu with his consort and holding Chakra & Shanka in upper two hands, his lower two hands are resting on his knees. The other side shows seated four-armed Lord Shiva with his consort and holding *trisula*&*damaru*in his upper two hands.

13. **A votive bone plaque with carvings on both sides**. **Eastern India. Period- Circa 18th century CE. (5.8 cm X 10.9 cm)** Obverse delineates *Sesanagsayane* Vishnu with his consort Lakshmi. Lord Brahma is seated is on a lotus, the long stem of which originates from Vishnu's naval. The reverse bears a scene of pleasure trip on a stylised boat. The central figure represents a king with horns accompanied by his female attendants.

14. Brooch- Murshidabad. West Bengal. Period- Circa 19th century CE. (4.3 cm X 3 cm) A delicately carved ivory brooch with tin frame depicting a religious scene.

15. Figure of an infant. Kolkata. West Bengal. Period-Circa late 19th Century CE. (Height- 8.9 cm) Ivory figure of a standing naked male infant chewing the index figure of his right hand.

16. Six Ivory Female Musicians standing on semi-circular pedestal, wearing ghagra-choli playing different types of musical instruments. Murshidabad. West Bengal. Period- Circa late 19th Century CE (Height – approx. 7.8 cm) from left to right.

(i) Female figure playing flute.

(ii) Female figure playing small drums (Dugi in Bengali) attached to her waist band.

(iii) Female figure playing mridangam.

(iv) Female figure playing tambura/vina.

(v) Female figure playing esraj.

(vi) Female figure playing cymbals/ karatal.

17. Bullock Cart. Murshidabad. West Bengal. Period- Circa 19th century CE. (11.5 cm X 6.1 cm) Beautifully carved ivory bullock cart drawn by two bulls and driven by a man wearing pagri/headdress.

18.Well caparisoned elephant with howdah. Murshidabad. West Bengal. Period -Circa 19thcentury CE. (10.2 cm X 4.6 cm). Well caparisoned (intricately carved cloth covering) ivory elephant with howdah and two noble men seated inside it. The Mahut is sitting on the head of the elephant. This delicately carved ivory sculpture is placed on a rectangular very thin pedestal.

19. Ivory miniature carvings of two elephants grazing in a jungle. Bengal. Period- Circa early 19th century CE. (3.8 cm X 3.7 cm) & (4.7 cm X 4.5 cm).

20. An ivory boat. Murshidabad. West Bengal. Period- Circa 19th century CE. (length 15 cm)- Miniature ivory boat with sail placed on a wooden pedestal.

21. Mayurpankhi boat (Peacock faced). Harynarayanpur. South 24 Parganas. West Bengal. Period- Circa early 20t century CE. (Length-29.5 cm)A nobleman and his sailors ride on a wooden mayurpankhi (peacock faced) boat. The human figures are made of ivory.

22.An ivory glass- Bengal. Period- Circa 19th century CE. (7.4 cm X 3.4 cm) A small ivory glass with vertical flutingsall through the outer surface.

23. Mughal Soldiers. Murshidabad. West Bengal. Circa late 18th century CE. (Height approx. 4.5 cm)

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The illustrations of the above objects are given below

Figure 1 Bone handle of a knife. 24 Pgs (south)

Figure 2 Fossilized Bone plaque. Mangolkot.

Figure 3 Bone plaque.CKG

Figure 4Bone female Figure CKG

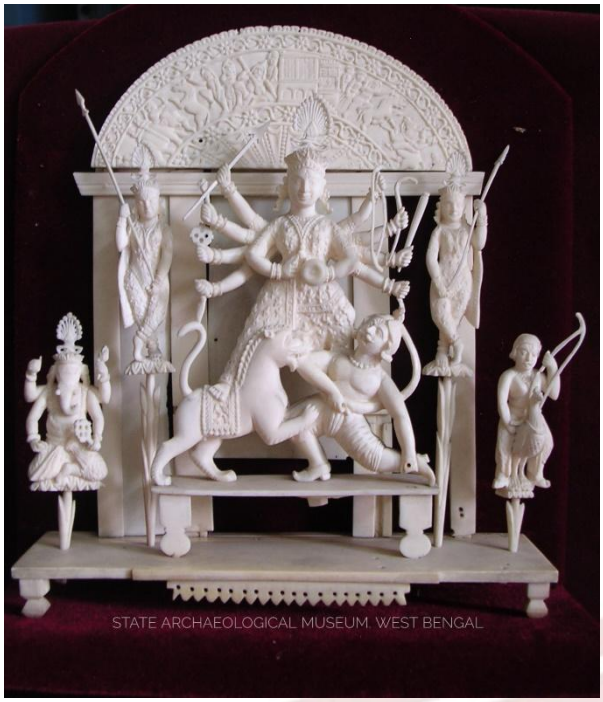

Figure 5 Ivory Durga Mahisasuramardini.Murshidabad

Figure 6 Ivory Lord Ganesh

Figure 7 Ivory Goddess Kali.Bengal

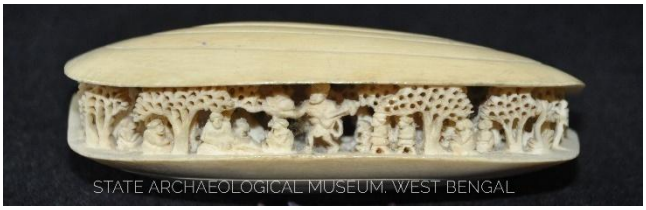

Figure 8 Ivory Clam shell. Murshidabad

Figure 9 Ivory comb, Bengal

Figure 10 Ivory Durga with her two female Attendant Murshidabad

Figure 11 Ivory female deity. Murshidabad

Figure 12A votive bone plaque obverse & reverse. (Two photos)

Figure 13 Votive bone plaque. Eastern India

Figure 14 Ivory Brooch. Murshidabad

Figure 15 Ivory Figure of an infant, Kolkata

Figure 16Six Ivory female musicians, Murshidabad

Figure 17 Ivory bullock cart. Murshidabad

Figure 18 Well caparisoned elephant with howdah. (Ivory)

Figure 19 Two Ivory elephants. Bengal

Figure 20 An Ivory boat with sail. Murshidabad

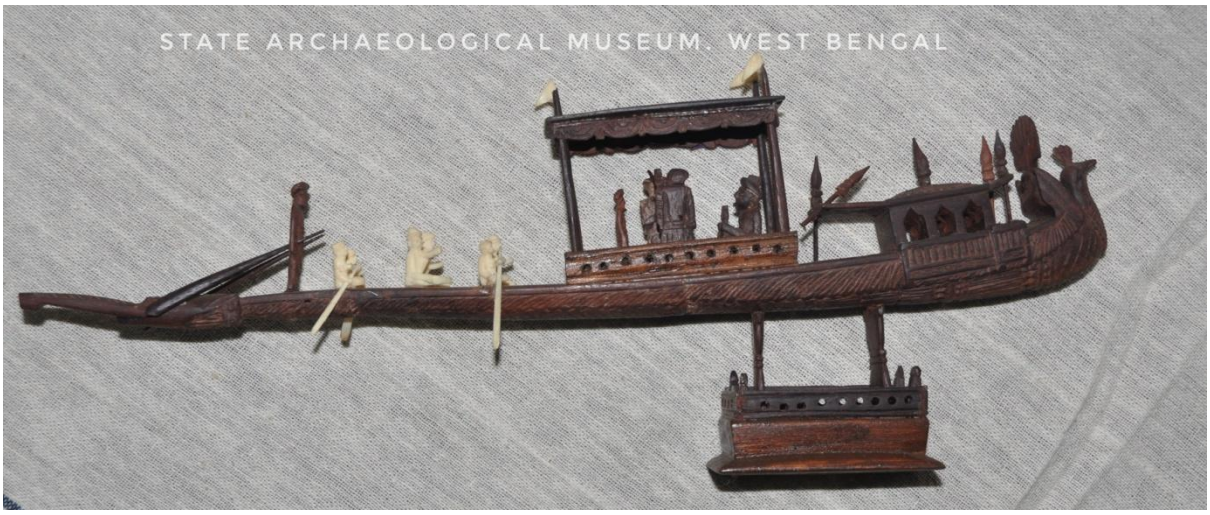

Figure 1Figure 21. Mayurpankhi boat. Harynarayanpur.24 PGS (south).

Figure 22.An ivory glass.Bengal

Figure 23. Ivory Mughal soldiers. Murshidabad.

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Terracotta Reliefs of Bhattabati Ratneshwar Temple, Murshidabad
A Study of the Contemporary Socio Religious Scenario of West Bengal

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Abstract

Bhattabati, a remote village in Murshidabad district, is located just opposite to Motijheel palace and mosque near Lalbagh, on the other bank of River Ganges. It is geographically positioned at 24°10'01" (N) 88°13'08"(E). The five pinnacles Ratneswar Shiva Temple is very famous for its terracotta panels fixed in the niches of various shapes and sizes on four walls of the edifice. The terracotta works are very remarkablehistorically, socially as well as artistically. Artistically the works are of superb quality which proves the dexterity of Bengal artisans of early eighteenth century. The subjects dealt with in the panel are also very meaningful and reveals a piece of social as well as religious history of the contemporary period.

Key Words: Terracotta, Bhattabati Ratneshwar Temple, Murshidabad

History

The founder of the temple either Jaynarayan or his Son Kalinarayan was Bangadhikari- a designation pertains to the Mughal Revenue system. Status wise in Nawabi Period Bangadhikari was the third powerful position after Nawab himself and Jagat Seth –the banker of the Nawab. Ramjiban aKayastha of Mitra dynasty was appointed as BangadhikarI (Principal Kanungo of half of Bengal Subah) in 1671 AD in the twelfth renal year of Aurangzeb. While the other half were assigned to Bangadhikari Hari Narayan. In 1704 when Murshid Kuli Khan, the Nayeb Diwan of Bengal shifted his head quarters from Dhaka to Murshidabad both the Bangadhikaris worked under him also shifted their office to Murshidabad. By this time due to expiry of both Ramjiban and Harinarayan their inheritors Jay Narayan and Darpanarayan were appointed as Bangadhikaris .Darpanarayan began to live in Dahapara. It is also located onthe opposite bank of Ganga but about six km north of Murshidabad. Jaynarayan began to live in Bhattabati just in the opposite bank of Murshidabad and built there palaces and temples. Jaynarayan built the temple in early eighteenth century during the reign of Nawab Murshid Kuli Khan (1704-25 AD) . According to legends the temple which was located near a tank named Kalisagar, was built in mid eighteenth century by Kalinarayan, descendant of Jaynarayan during the reign of NawabAlibardy Khan (1740-56 AD)(Roy, 1903). According to an anecdote prevalent in the area, 1200 (twelve hundred) Bhatta Brahamins from Karnataka made a settlement here during the reign of Sultan Hossain Shah (1494-1519 CE). That is why the name of the place is called

Bhattabati. However at present there is no one of the Bhatta Brahamins at Bhattabati (Murshidabad.net).

Architecture of the temple

The temple is of famous Pancharatna style of Bengal but the base is of triratha style. The smaller spires in four corners of the first floor and the central main spire are of Kalinga Peeda style. The spires areplaced on a cuboid base having openings in all sides. The temple is 8.75 meter square at the base and 10 meter high (Murshidabad.net). A small arched door in front leading to the sanctum and in all other sides false arched doors were built for ornamental purpose.

Terracotta Panels

The temple is very famous for its terracotta panels. All four sides of the temple are decorated with terracotta panels. But before discussion about terracotta plaques of the temple it will be better to delve into the prevalent socio religious scenario of Bengal because the prevalent socio religious culture has been depicted in the terracotta temples. The socio religious culture of the period from 17^{th} to 19^{th} century AD has its root in Gupta period also in Pre-Gupta period. Hence It is pertinent to discuss the evolution of socio religious culture from Gupta period not losing sight the pre-Gupta period.

Evolution of socio -religious scenario in Bengal from Gupta period

The religious beliefs as was prevalent during 17^{th} to 19^{th} century ,the period during which the terracotta temples were built in Bengal, was crystallised due to interactions of various cross currents of religious streams for about more than thousand years from Gupta period (300 AD to 550 AD) to Chaitanya period (sixteenth century AD) .Though Aryan culture started percolating to Bengal from pre Christian period through Buddhism and Jainism but it took its root deeply during Gupta and post Gupta period when Bengal (Sumbha, Rarh, Pundra ,Samatata) came under Gupta administration, due to mass advent of Aryan people during the period, establishment of Buddhism and north Indian Brahmanical culture. In Bengal, local religious culture which was predominantly consisting of worshipping of mother goddess as goddesses of fertility, ancestors, different folk deities for wish fulfilments and different rituals to propitiate evil forces, began to interact with each other**.** The interactions and the process of acceptance and rejection took place for several centuries and ultimately the Aryan concept of religion along with their gods and goddesses were assimilated into Bengali culture. However the religious practices as followed locally were not abandoned. In a number of cases the deities of pre-Gupta period were modified and Aryanised. Bengal also did not accept the north Indian religious culture intact but modified it to suit its own belief, outlook and world view and developed a unique culture which was its own. Three phases have been observed of this religious assimilation and new developments.

a) **Gupta and Post Gupta period (350-750AD)** - Establishment of north Indian Brahmanical culture and Buddhism in Bengal. Bengal gradually attracted towards North Indian Brahmanical cultures during the period. Buddhism though was established and subsequently became royal religion, was restricted to people of upper echelon. The

eighth century Paharpur Buddhist Stupa (Bangladesh) has revealedterracotta and stone figures of Krishnayan and Ramayana. There are also figures of Hindu gods and goddesses like Shiva, Balaram, Jamuna etc. It proves that by eighth century AD north Indian Brahmanical culture has taken deep root in Bengal(Ray,2009:313,314,499).

b) **Pala Period (750 – 1162 AD)** -Pala kings were devout Buddhists but were also great patronisers of Hindu Gods and Goddesses. During Pala period the Aryan Brahmanical religion greatly flourished in Bengal. Practically in various epigraphs related to Pala Period like Buddhagaya inscription , (Dharmapala- 765-800 AD) Khalimpur copperplate (Dharmapal) Munger Prasasti (Devapala, 800-40 AD) Jagajivanpur Copper Plate (Mahendrapala, 840-56 AD) (Bhattacharya,2007) Badal Prashasti (Narayanapala, 874-930 AD) , Bhagalpur Prasasti (Narayana Pala) etc we have found mention of various Hindu gods and goddesses like Brahma, Vishnu ,Maheswar, Krishna,Surya Devaraj Indra , Saraswati, Uma Lakshmi and various Hindu mythological characters like Daityaraj Bali, Vamanavatar, Devaki ,Karna . Sagar, Nala, Yayati. It transpires from above that during Pala Period Hindu religion was at its helm inspite of Royal religion being Buddhism. In closing period of Palas, five streams of Hindu religious sectsviz, Soura (worshippers of Sun), Shaiva (worshippers of Shiva), Vaishnaba (worshippers of Vishnu) Shakta (worshippers of Shakti- mother goddesses) and Ganapatya (worshippers of Ganesha) (Banerjea, 1960) were observed. Another stream also evolved from the declining tantric cult of Buddhism – Tantricism.

c) **Sena Period – Period of decline of Buddhism**. Unkike Palas, Sena kings were not liberal. They were antagonistic to Buddhists and Buddhism. During this period attempts were made to unite the five streams of worshipping. This was called 'Panchopasana'- worshipping of five gods.

Famous poet Jaydeva, composer of 'Geeta Govinda'- court poet of Raja Laxman Sena was Panchopasak(Ray, 2009:510-11).Elaborate Hindu religious practices were at its highest level during the period. Another important factor of this period is emergence of 'Radha' and introduction of 'Radha Krishna' cult. Though sometimes earlier, the concept of Radha as principal gopiniwas evolved in Bengal butin famous 'Geeta Govinda' for the first time Radha was introduced by Jaydevaas consort of Krishna in twelfth century AD.(Ray, 2009). This issue had great impact on Bengali culture from sixteenth century onwards. Moreover this period is the period of declination of Buddhism. Most of the Buddhists of higher status embraced Hinduism but the Buddhists of lower status were marginalised. Number of Buddhist Gods and Goddesses were also absorbed into Hindu fold which were depicted in terracotta temples.

d) **Islamic period (13th to 15th century AD)** -The darkage of Hindu religion and culture (Dutta,1975:712, 12). All the religious and cultural activities were suddenly stopped. Hindu religion relegated to underground. Its flow stopped. It lost its vibrancy. A dark age started in Bengali socio cultural life which continued for more than 200 years specifically up to ascension of the throne of Gaur by a Hindu King Ganesha in 1415 AD. As a result Hindu religious activities were to be performed in hiding. Secret rituals of Shakti worshipping (Guhya Sadhana) with Pancha Ma' Kar (five Ms) Matsya (fish), Mangso (meat) Mudra(gesture) , Madya (wine) Mithuna (copulation) spread throughout

Bengal. Immoralities, unsocial practices, illegal sexuality crept into the religious practices. (Mullick, 1910) Common people were divested from religious rituals. Society was infested with various evil practices like widow burning, multiple marriage, removal of any one or people en masse from Hindu fold due to very small reasons like drinking water unknowingly from pond, where from Muslim soldiers or Muslims in general drank water previously etc. Society fell into a dark abyss. The then state of affairs can be expressed aptly by this composition of Rabindranath.

'যে নদী হারায়ে স্রোত চলিতেনা পারে

সহস্র শৈবালদাম বাঁধে আসিতারে;

যে জাতিজীবনহারা অচল অসাড়

পদেপদে বাঁধে তারে জীর্ণ লোকাচার।' রবীন্দ্রনাথঠাকুর

e) **Chaitanya Period**- It is the most important era with respect to Bengali culture. Appearance of Sri Chaitanya in 1486 AD and advent of Gaudiya Vaishnabism based on 'bhaktibad' andhumanism engendered renaissance in Bengali culture. Gaudiya Vaishnavism percolated every strata of the society irrespective of class, caste, creed, and religion. Bengali culture revived from its moribund state of 300 years. (Datta, 1975:7)This revival took place in every area of Bengali Hindu culture – art, architecture, literature and all related areas. Temple constructions started with renewed vigour. New religious rituals and practices emerged. Lord Vishnu gave way to Krishna. Radha became epitome of Bhakti towards Lord Krishna –the supreme god. Poets composed Padabalis and Kirrtandrenched with bhakti for worshipping lord Krishna. Bengali culture was overwhelmed with this Bhakti movement. Even Shaktas (worshippers of Shakti) changed themselves in favour of Bhakti. Mother Goddesses like Durga, Kali worshipped as Shakti were began to be worshippedas one's own mother and daughter with Bhakti (devotion)as unique offering . Shyama Sangeets were composed by poets to worship Goddess Kali as mother .Durga (Parvati) also was worshipped as daughter coming to her parental house for three days. Agomoni songs were composed to celebrate the home coming of daughter Durga .Similarly Bijaya songs were composed to express grief for leaving the parental home by Uma (Durga) . Thus Sri Chaitanya completely changed the religio-cultural scenario of Bengali Hindus. Socially it also stopped mass conversion of Hindus to Muslims.

Ramayana Plaques

Themes of Ramayana became very popular in Bengal probably from eighth century AD though Ramayana and Mahabharata cult were introduced in Bengal by north Indian Aryans during Gupta periodwhich along with other Aryan cultural aspects began to be absorbed in Bengali culture since then (Ray, 2009: 219,364).

However during the process of assimilation of Aryan culture withlocal culture various changes took place and in the process a number of themes of Valmiki Ramayana underwent several changes as well as new themes were added. As documentary evidence of popularity of the epics we have had terracotta and stone panels in Sompura Mahavihara, Paharpur Bangladesh (8th century to 12th century AD) depicting various themes of the epics likeSetubandha, battle of Bali and Sugriva etc (Ray, 2009: 500).

Ramkatha was so popular amongst common people that in Pala period that Sandhyakar Nandi court poet of Pala king Rampala (1072-1126 AD) composed 'Ramacharita' having a dual character. First one is, it is the heroic battle of Rampala the Pala king against Kaibarta King Bhima and second one is the heroic battle of lord Rama of Ramayana against King of Lanka, Ravana (Ray, 2009: 583). The popularity did not wane subsequently but increased to a great extent through translation of Ramayana of Valmiki from Sanskrit to Bengali by Poet Krittibas in 15th century AD.

In early eighteenth century the terracotta artists followed the popular culture and depicted the following episodes from Ramayana through terracotta plaques fixed in the temple.

a) Slaying of Taraka –the female demon by Rama Lakshmana. It is a very popular theme. Sage Viswamitraa long with other sages being harassed by female demon 'Taraka' requested King Dasaratha to send Rama and Laksmana to kill the female demon. Accordingly Rama and Laksmana came to the hermitage of Viswamitra and killed her.
b) Haradhanu Bhanga(breaking of bow of Lord Shiva) .It is also a very popular theme. Rama breaking the Bow of lord Shiva to marry Sita, the daughter of King Janaka. (Figure -1)
c) Ram Laksman Sita strolling in the forest – while in Pancabati strolling in the forest was the pastime of Ram Sita ansd Lakshmana which enabled them to understand the forest in a betterway.
d) Slaying of Golden Deer (Mareech) by Lord Rama- Mareech was a commander of Ravana. He in the guise of a golden deer allured Sita staying in Pancabatito capture the deer . Though Rama was aware that the golden deer is not real someone was tricking them, but Sita forcibly sent Rama and Lakshmana to catch the deer. Rama followed the deer and ultimately killed it. (Figure-2)
e) Hanuman bowing down to the feet of Rama- Hanuman, an accompany of Sugriva brother Bali, king of Kiskindhya met Rama while Rama and Lakshmana was searching Sita abducted by Ravana. Hanuman on seeing Rama realizes the divinity of Lord Rama and he being the epitome of Bhakti (devotion) and Shakti (power) is bowing down to his lord. Lakshman is standing beside Rama.
f) Hanuman in front of Rama and Sita, both sitting on a table like structure- This is probably in Ayoddha after enthroning of Rama as the king of Ayoddha.
g) Ramayana Panel above the space of the entrance door, consisting of Ram Sita on the throne in the right side along with people of Ayoddha expressing devotion to Rama.

In the left side Yagna being performed by sages for birth of sons to King Dasaratha. Three queens of Dasaratha are there. The people of Ayoddha are rejoicing, Various musical instruments are being played.

Krishna Leela Plaques

Krishna Katha (Anecdotes regarding Lord Krishna) was in vogue in Bengal from Gupta period. In Sompura Mahabihar, Paharpur, (presently in Bangladesh) 8th century AD, number of stone plaques regarding life of Krishna are found. Lifting of Gobardhan hill by Krishna, Slaying of horse demon Keshi ,taking away of the new born child Krishna to Gokul by his father Basudeva from Mathura, Krishna grazing cows along with other cowherd, battle with Chanur and Mustik (commanders of Kangsa) by Krishna and Balaram, liberation of Yamalarjun etc are few of them (Ray, 2009: 499). But it is pertinent tomention here that though there are number of plaques regarding Balyaleela (childhood feats) and Aisharya Leela (Heroic feats) of Krishna there is neither any plaque in Sompura Mahavihar nor any inscriptions of Pala Period mentioning about 'Radha'-the consort of Krishna and the Madhura leela (episodes regarding love with Radha) . It appears from various evidences that though there may be mention of Radha as principal Gopini in 10th and 11th century that too very insignificantly, It is in twelfth century Jaydeva –the famous court poet of Raja Lakshmana Sena in his Geet Govinda conceptualised and established firmly the idea of Radha and her loving relationship with Lord Krishna (Ray, 2009: 548). Radha as per Nihar Ranjan Ray was conceptualised as the 'Shakti'of Krishna in line with the 'Shakti' concept of Shakta sect where there were individual mother Goddess as Shakti to Male Gods (Ray, 2009: 499, 548). Buddhist gods also had similar Shaktis (Ray, 2009: 518, 536; Sen, 2012).This concept began to take its root throughout Bengal in next centuries. Thus we have Shri Krishna Kirtan composed by Baru Chandidas in 15th century AD. Chaitanya Mahaprabhu absorbed the idea of Radha Krishna to the core of his heart and elevated the corporal love as propounded by Jaydeva and Baru Chandidas to transcendental love to God (Lord Krishna) (Sen. S. 2012) Radha became the epitome of Bhakti to the supreme lord. This concept due to his Bhakti movement was taken by storm in Bengali psyche. Thus in addition to Balyaleela and Aishrya Leela Madhura Leela also became very significant in Gaudiya Vaishnavism as propagated by Sri Chaitanya. Bengali terracotta artists made thousands of terracotta plaques of these three leelas of Krishna and ornamented the temples of Bengal profusely. In Bhattabati temple also there are very famous Krishnaleela plaques which are as follows.

1) Extraction of butter by Jasoda and Krishna (Balya Leela) (figure-3)
   A very popular theme. Krishna just after his birth was shifted to the family of Nanda, the clan leader of Gopa (Cowherds) of Gokula, due to fear of Kangsa. Yasoda, wife of Nanda brought up him as her own son. Extraction of butter by churning milk is a common practice of a cowherd family. Butter was very favourite to Krishna. He used to come to his mother when she churned the milk for extraction of butter. Sometimes he also helped his mother.
2) Slaying of Dhenukasur in a palm forest by Krishna (Aisarya Leela)
   Dhenukasur was the donkey demongurading a palm forest in Brindabon. He was hiding in the palm forest. Sridam and other companions were interested to consume

palm fruits. But Dhenukasur attacked them. Thereafter Krishna and Balaram came to save his companions and after a fierce battle with the demon killed him.

3) Rasa Mandal (Madhura Leela)
It is a very popular theme of Gaudiya Vaishnabas. Rasaleela has its root in Shrimad Bhagwat Gita. In the five chapters (29th to 33rd) of tenth canto of Bhagwat Gita Rasaleela has been described. It is a transcendental dance performance of Gopinis (Damsels of Brindavan) around Lord Krishna along with the principal Gopini (the name of the principal gopini as Radha was not ascribed till then). It is like a ritual performed by gopinis to unify themselves with supreme lord. The theme assumed great popularity throughout Eastern India.
The large Rasaleela terracotta panel in northern wall of Bhattabati temple where gopinis are dancing around Radha and Krishna is artistically unique and very famous. It is largest in West Bengal (Figure-4)

Chaitanya Leela

Though Shri Chaitanya was instrumental in introducing and propagating Gaudiya Vaishnavism based on complete devotion to Supreme Lord (Lord Krishna) and also in engendering renaissance of Bengal, the terracotta plaques depicting his life was few and far between in comparison to Krishna Leela Panels, especially in seventeenth and eighteenth century AD temples. Two reasons may be attributed here

Kheturi Mahotsab of 1574AD. After disappearance of Shri Chaitanya in in 1534 AD followers of Chaitanya became divided into various groups (sampradayas) who followed different procedures of worshipping lord Krishna. With a view to unifying all sampradayas six vaishnab Gurus (famous Sadagoswamis – Rup, Sanatan, Shri Jiva, Raghunath Bhatta , Raghunath Dasa and Gopala Bhatta of Vrindaban) congregated at Kheturi in 1574 AD in invitation of Narottam Das Thakura another famous vaishnab Guru having Sripata in the same place . There they decided that henceforth worship of Radha and Krishna will be the sole objective of Gaudiya Vaishnavism (Source:http://gaudiyahistory.iskcondesiretree.com/history/).Thusworshipping Chaitanya Mahaprabhu took a back seat.

a) Another historical reason is throughout eighteenth century AD Maharaja Krishna Chandra of Nadia was at the helm of Hindu Society. He was a devout Shakta. He did not recognise Chaitanya as incarnation of God, being a human being. He also opposed Chaitanya worshipping at Nabadwip. Several Chaitanya temples were closed down for want of patronage. Even the famous wooden image ofrGauranga which was made during the lifetime of Chaitanya and handed over to Vishnupriya for daily worshipping before His departure to Puri, had to be kept in hiding. Krishnachandra established number of Shakta temples of Kali, Shiva at Nabadwip and introduced Shakta Raas at Nabadwip to counter Vaishnava Rasa.

However Bhattabati Temple being constructed in early eighteenth century when reign of Krishnachandra not yet commenced and Murshidabad being a principal centre of Gaudiya Vaishnavism, we have two very famous Chaitanya Panel in the temple.

i) Sadavuja (six arms) Chaitanya - In this form Lord Chaitanya has six arms – lowest two arms with 'danda' (stick) and 'Kamandulu' (water pot) is of Himself as an ascetic, the middle two arms blowing flute are those of Lord Krishna and the upper arms with bow and arrow are those of lord Rama. There is first mention of Chaturvuja image of Lord Chaitanya in the twelfth canto of Chaitanya charitamritam of KabiKarnapur. Chaitanya Mahaprabhu first showed His chaturvuj form to Sarbobhouma Pandit of Puri .KrishnadasKaviraj in his famous composition 'Chaitanya Charitamrita "also mentioned about chartuvuj form of Lord Chaitanya. But Brindabandasin his book 'ChaitanyaBhagbat' added two more arms of Lord Rama, with bow and arrow. This form has become very popular in Bengal.(Basu& Basu, 2019:85-86)

In Bhattabati temple in the middle of the eastern wall there is a Sadavuja Chaitanya panelwhich is very famous. There are four other human figures two each in left and right side of Lord Chaitanya. The figures may be of Nityananda, Adwaita Mahaprabhu, ShriBas, Damodar Goswami Including Chaitanya Mahaprabhuin GaudiyaVaishnab Parlour they arecombinedly revered as 'Panchatatwa' (Basu& Basu, 2019:86)(Figure- 5).

ii) A Panel of Lord Chaitanya and Prabhu Nityananda along with Radha Krishna - NityanandaMahaprabhu is the alterego of Chaitanya. In Gaudiya Vaishnavism Shri Chaitanya is considered as the incarnation of Lord Krishna and similarly Nityananda prabhu is considered as incarnation of Balaram. To the devotees prabhu Chaitanya and Nityananda are uttered in the same time as 'Gaur Nitai' orNitai Gaur'.

The panel is in the easternwall of the temple just above the Sadavuja panel. There is a vertical lotus motif in the middle of the panel dividing two pairs- Radha Krishna and Gaur Nitai. (Figure -6)

Dashavatar plaques

Dashavatar is the ten incarnations (Avataras) of Vishnu in different ages. These Avataras respectively are Matsya, Kurma, Baraha, Nrisinha, Bamana, Rama, Parshurama, Krishna, Buddha (Jagannath) and Kalki.Dashavatar plaques of Vishnu were very favourite to the terracotta artists. Dashavatar was also a very favourite theme to the temple artists throughout India. Up to Sena period large Vishnu images of various types having distinct names according to the positions of Shankha (comch cell) , Chakra (disc) , Gada (mash) and Padma (lotus) in four hands were sculpted by famous Bengali artists. Hundreds of such Vishnu images have been unearthed andstill being unearthed in Bengal, which belong to Pala Sena period. But after Muslim invasion the worshipping of Vishnu practically was stopped and due to subsequent introduction of Gaudiya Vaishnavism in sixteenth century AD.Vishnu was replaced by lord Krishna who became the supreme god for worshipping. But Vishnu remained in the psyche of Bengalis as Dashavatar- the ten incarnations of lord Vishnuso also in the psyche of terracotta artists. Thus we have Dashavatar figures in most of the terracotta temples of Bengal but very few temples have all the images of all ten Avataras – most have images of lesser number.

In Bhattabati temple there are images of two Avataras and both of those are famous

i) Matsyavatara– the first Avatar of Lord Vishnu
A large Matsyavatara image having lower portion as the tail of a fish and upper portionas thefour armed figure of Vishnu is there in the western wall. (Figure-7)

ii) Vamanavatara(Dwarf incarnation of Vishnu- Fifth Avatara)
A very popular motif. Being defeated by Daityaraj 'Bali' or 'Mahabali' a just, benevolent, piousand generous king, Indra the king of Debalok (heaven) took refuge in Vishnu and prayed to Him to vanquish Bali as Bali has become all powerful and invincible due to the boon of Lord Brahma . Vishnu reincarnated himself as a dwarf Brahmin (Bamonavatar) . The brahmin approached the King Bali who just completed his Ashwamedha Yagna and started the ceremony of offering to all and sundry in accordance to the choice of the offeree. The dwarf Brahmin asked him for a three step land (tripadbhumi). King Bali naturally agreed. The Brahmin then began to expand himself infinitely and one more leg emerged from his navel. With his first leg he occupied all the areas of earth and with the second leg he occupied heaven and asked Bali to provide space for the third leg. Bali realised that the Brahmin is none other than Vishnu. He bowed down and offered his head for placing the third leg. The Brahmin placed his third leg on the head of Bali thus vanquishing him.

In Bhattabati temple in the northern wall in lower recess there is a large panel of Bamanavatara. Two legs are visible. One leg is directed upwards to heaven, second one is placed on earth and the leg placed on the head of Bali is broken and not visible. (Figure-8)

Mahishasuramardini Panel

Mahishasuramardini images are very popular throughout India. We have panels of Mahishasuramardini in 7th century Mahabalipuram temple complex,10th century Kichakeswari Temple of Khichng, Hallebidu 12th century Hoysala temple etc.(Bhattacharya.S.2009) In Bengal we have the oldest Mahishasuramardini terracotta figure in Gokarna (Murshidabad) Nrisinhadeva temple (1580 AD) (Basu.S. &Basu.A.2019). Thereafter so many Mahashasuramardini panelsare observed in Bengal terracotta temples.

But the Devi Durga Mahishasuramardini panel in the middle of western wall is unique at Bhattabati temple because it shows Durga (Parvati) along with her whole family members , Lakshmi and Ganesha in right side of Durga and Sarswati and Kartika in the left side along with all their vehicles. This concept of Devi Durga is unique to Bengal. This is also a very famous panel. (Figure-9)

Vyala

Vyalas are hybrid creatures of man and animals or of different animals like lion and horse (popular in Bengal). According to DD Kosambi in his seminal compilation "Myth and Reality"

(Kosambi, 2016) the concept of hybridisation of different creatures dates back to cave painting period. In various Mohenjodaro and Harappa seals there are number of examples of these hybrid creatures. Man tiger combination with body of tiger and head of human is one such example. According to him first four avataras of Vishnu: Matsya, Kurma, Baraha and Nrishingha have been imagined from this concept of vyala. Though there are many examples of vyala in other temples here we find only one and that is of horse and lion in the upper right and left corner of front wall.

Other semi gods and goddess

Kirtimukha – Kirtimukha is a popular relief of Indian temples from early medieval period. It is also seen in most of the Bengal terracotta temples as protector of door. It is a fierce head only figure having open mouth and protruding eyes. Sometimes two hands are also observed. In the temple in right side upper corner four figures of Kirtimukha is placed in four niches in a row.

Gandharva- Gandharvas are musicians of the Swargolok(heaven) . They have their lower portion as that of a bird. A Gandharvarelief is there just above the Mughal Soldiers' panel and by the side of a column. (Figure 10)
Mahabali– Depiction of a very strong personality catching hold of a pair of horses by his two arms and a pair of elephants by his two hands through terracotta relief work was very popular in Murshidabad and Bardhaman. Probably this very strong male figure was contemplated by the terracotta artists for protection of the temple. The terracotta relief is located just above the Mughal soldiers panel in lowest part of front wall, in the opposite side of Gandharva relief (Figure 11).

Social

Social Plaques are very common in terracotta temples. Throughout India in medieval temples we also have reliefs, sculptures images depicting contemporary social life of both aristocrats and common people. These reliefs and images are generally placed in the bottom panels.

Social plaques are there in Bhattabati temple in two places -

i)In the body we have two large social panels

a) Hunters - In the top of the western wall there is a large panel of hunters. Two hunters are there carrying a nest each with a hawk inside in one hand. Bow is in the shoulder of each A dog is walking along each hunter. (figure 12)
b) Vaishnab Akhada – A panel of Vaishnab Akhada in top of northern wall where two meditating Vaishnab Gurus in sitting posture and two disciples of them in folded hands in standing posture have been depicted.

Ii) In the social plaques which are placed in the bottom of front wall there are rows of Mughal (Nawab) warriors.Since during the period founder of the temple Bangadhikari Jaynarayan was serving under Nawab Murshid Kuli Khan this Mughal solders panel might have been fixed to please the Mughal (Nawabi) administration. However we get the ideas about the dresses weapons, head dresses, foot wears etc of Mughal soldiers of eighteenth century (figure -13)

Ornamentation

Various types of flowers –lotuses predominantly, creepers, birds (preferably parrots) other geometrical patterns have been profuselyused to decorate the temple as well as using it as fillers. Piers and pilasters in temple corners have been beautifully adorned by flowers, creepers, geometricdesigns and designer bricks. These ornamentations and keeping its balance throughout the structure also vouch for the skill and artistry of the artisans.

Assimilation of Shaiva, Shakta and Vaishnab religious ideals as depicted in the temple

The terracotta plaques reveal the religious characteristicsof later medieval Bengal (17th - 18th century). Though there are various streams of antagonistic Hindu religious philosophies upto 16th century Bengal like Tanticism, Shakticism , Shaivism, Vaishnavism (worshipping of Vishnu) , Folk religions , from seventeenth centuries onwards assimilation of different Hindu religious streams are observed. Two factors can be attributed for this assimilation. First is to resist the onslaught of the ruling religion-Islam and secondly due to overwhelming influence of Shri Chaitanya. Thus we have various Shaiva and Shakta panels in vaishnab temples along with Krishna Leela and Chaitanya leela Panels and similarly the panels of Krishna Leela and Chaitanya leela in Shakta and Shaiva temples are in plenty. Moreover this is the period when the Gaudiya Vaishnavism as propounded by Shri Chaitanya was at its helm. Consequently the worshipping of Vishnu which was prevalent up to Sena period, as is evident from discovery of innumerable number of different types of Vishnu sculptures throughout Bengal, gave its way to worshipping of lord Krishna especially Radha Krishna. Moreover during this period Shakta cult (worshipping of Mother Goddess) also underwent key changes. The fearful Tantric rituals involving worshipping the mother goddess with Pancha Ma' Kar (five Ms) Matsya (fish) , Mangso (meat) Mudra(gesture) , Madya (wine) Mithuna (copulation) in an isolated places like cremation ground, forest etc , began to lose the support of common people. Bhakti (devotion) movement of Shri Chaitanya overwhelmed entire length and breadth of Bengal and Bengali culture. It also overwhelmed the shakta cult also. Mother Goddesses like Durga, Kali began to be worshipped through bhakti by common people. Songs like Shyama Sangeet, Agomoni Bijoya songs began to be composed and sung. The terracotta plaques of the temple depict this transformation and assimilation of different cults as well as overwhelming

influence of Shri Chaitanya over the socio religious scene of Bengal. The instant temple inspite of being a Shaiva temple has accommodated number of panels of Krishnaleela and Chaitanya Leela.

Conclusion

BhattabatiRatneswar temple, a Hindu temple of repute apart from revealing the contemporary art and culture along with religious status of the society throw light on the prevalent Mughal revenue administration. Unlike early Sultani period of Bengal, fromthe reign of Raja Ganesh (1415 -1419 AD) Hindus were also appointed as top officials of Sultani and Nawabi administrations. Moreover Murshid Kuli Khan (1704-25 AD) felt comfortable with Hindu administrators; consequentlyhis administration had more Hindus than Muslims. Apart from respecting the honesty of Hindu administrators he felt that Hindu administrators and zamindars can be squeezed to any length for collection of revenue. That was whypunishment awarded by him towards defaulting Hindu zamindars sometimes was very severe and stretched beyond civilised norms.

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Illustrations

Figure 3 Mareech Slaying

Figure 4 Haradhanu Bhanga

Figure 1 Rasamandal

Figure 2 Milk Churning by Jashoda and Krishna

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Parvati- the Dance Devotee

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Abstract

The medieval Sanskrit treaties of India have classified dance into three distinct categories, viz., *natya, nritya, andnritta*. These texts significantly characterize dancing as masculine or *Tandava* and feminine i.e., *Lasya*. The *Tandava* dance is generally performed for the adoration of the gods. Lasya, according to mythology, is the dance movement of goddess Parvati as it manifests joy and ecstasy.This dance signifies beauty, grace, happiness and compassion. The rhythmical steps of this dance are full of harmony, tenderness and are supplementing to the rude male energy of the dance of Shiva. The dance of Parvati has been delineated in sculptural art. This paper intends to highlight a unique metal image of Parvati in her dancing posture.

Key words: Parvati, Shakti, Goddess,Transformation,Nritta, Lasya, Tandav

In the Brahmanical religion, gods and goddesses are paired in such a way that the god is able to fulfill his Dharma (divine purpose) owing to and by the grace of his consort Shakti (feminine power). Brahma is able to create because his wife is the goddess of wisdom, Vishnu sustains and preserves because his wife is the goddess of wealth and abundance. Shiva transcends physical reality and is enlightened because he has got married to Shakti who is incarnated as pure, raw, spiritual energy. In terms of her relationship with Shiva, Shakti personates five different forms: Kali, Durga, Uma, Sati/ Parvati, and the fifth being simply Shakti as all in one.

Parvati, is one of the significant representations of Shakti. The goddess Kali and goddess Durga are incredible, astounding, and terrific forms of Shakti. These goddesses have gained unprecedented importance and popularity in Brahmanical pantheon. They will not be ignored, diminished, or disrespected. Their strength and power are unparalleled. Goddess Parvati is the constant, understated and overwhelming current which cannot be seen on the surface. Like her name, she is the mountain- unmovable; stillshe is just, regardless of all that exists around her. She is known as a goddess of love, romance, and devotion. Parvati symbolizes devotion, and bhakti. In the Puranic stories her devotion is often touted as solely for her husband. Her husband is the personification of freedom, enlightenment and transcendence. Shakti as Parvati is the love and devotion that gives freedom and joy to our daily lives.

Parvati, is the personification of the desire, ambition, and bliss. She is the simple joy of the evolution of our days, weeks, months, and years, building towards and leaning into that which we become in life.

Shiva is able to transform because of Parvati's deep devotion. While Shiva performs the Tandava- a vigorous and intense dance, Parvati presents the Lasya, a graceful, sensual dance. While Shiva carries tools in his dance and things crumble around him, Parvati has nothing but herself, and life springs up around her. Shiva is creation through transformation.

Parvati is transformation through devotion. Devotions through which mountains are moved. Along with Shiva, Parvati symbolizes the harmonious union between the masculine and feminine forms of existence or the inextricable male and female beginning. In the Indian mythology, this union is called Shiva – Ardhanarishvara – this kind of iconography is symbolic and shows the inseparability of the female and male energies. This depiction of Mahadeva (Shiva) and his consort Parvati (in a combined and inseparable form)is one of the most well known and significant images of the two major Brahmanical deities and is also an expression of the indivisible fusion of both the male and female energies without which the Universe seizes to exist.

This harmony is particularly well expressed in both the dances – the Tandava and the Lasya performed by Shiva and Parvati. Apart from being a symbol of the cosmic creation and destruction, Tandava dance is also perceived as a symbol of the natural cycle of both life and death.

The medieval Sanskrit treaties of India have classified dance into three distinct categories, viz., natya, nritya, andnritta. These texts significantly characterize dancing as masculine or Tandava and feminine i.e.,Lasya (Vatsyayan, 1968).In contrast to the Tandavadance, texts mention about the dancewhich is known as Lasya or sukumara nritya particularly described in the Natyasastra(Nagar, 2005). The term Lasya, in the context of Indian mythology, describes the dance performed by the goddess Parvati.The very name of this dance form signifies beauty, grace, happiness and compassion. The rhythmical steps of this dance are full of harmony, grace and tenderness and are supplementing to the rough male energy of the dance of Shiva. It is a symbol of the harmony of the ancient tempo of the creation of the world. The Abhinayadarpana clearly describes Lasya as derived from Parvati who taught it to Usha, the daughter of Vana (Ghosh, 2018).

In Indian art the images of Parvati have been found in her variegated and splendorous forms. Majority of her images are associated with lord Shiva but single images are also numerous in stone and metal. Among many iconographical representations, her dancing form deserves special mention. Her gestures express the intellect, power of nature and the protection of the believers.

Figure 1 Dancing image of Parvati in metal

A unique dancing image of Parvati in metal has been recovered from the coastal area of West Bengal. The image has been found from Maipit, Sundarban and presently it is preserved in Dr. Tulsi Charan Bhattacharya Smriti Sangrahasala (museum). This image of Parvati stands on a pedestal in a dancing pose. Her bent left leg is upraised and right leg rests on the pedestal in a typical classical dance form. Adorned with many ornaments, like karnakuldala, hara, balaya and long conical kiritamukuta, the figure shows a unique Kapidhahasta pose of the classical dance style of Bharatanatyam. The goddess shows the Lasya dance reflecting the joyous mood and happiness.

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SOCIETY FOR HERITAGE ARCHAEOLOGY & MANAGEMENT

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Conservation of Historic Buildings and their Adaptive Re-use

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Abstract

The change in usage pattern of the historic buildings has called for some serious structural interventions by means of additions and alterations during their repairs and maintenance etc. Past users have used and enjoyed these buildings in a very different way while the present users mostly intend to use these buildings with all available modern facilities like electrification, air conditioning even installation of passenger lifts etc. In some cases, the surface finishes are also altered as per the choice of the present users without caring for the compatibility of such alterations to an old building or the internationally accepted principles of conservation of historic buildings. As a result, conservation of these buildings has become more difficult and challenging. Historic buildings were constructed as per traditional building construction techniques and basic building materials were mostly locally sourced. But the present interventions and alterations are being done following modern building construction techniques and modern building materials which are adversely affecting the originality, authenticity, aesthetics and above all the structural stability of those historic buildings. Repair and maintenance of many such buildings are laid in the hands of modern engineers who are trying their best to add structural strength to these buildings by using modern materials and techniques. But, the use of such strong materials in old historic buildings which are made of comparatively softer and porous building materials in old days is resulting to irreparable damages. Conservation of the historic old buildings requires specialized skill. Understanding the building and its original construction technique etc is important before taking up any repair or maintenance work to these buildings. Alterations and additions should be sympathetic to the existing original building structure and the new building materials to be used for repair and maintenance should not be stronger than the materials used for original construction.

Key Words: Historic buildings, Conservation, Adaptive re-use

Introduction

Almost all the historic buildings in our country which are being re-usedare built between eighteenth and early twentieth century. Basic construction materials of these buildings were mostly sourced locally and traditional building construction techniques were followed. Size, shape, access and facilities of these buildings were all designed according to the desire and also need of the original builders.

Usage pattern of almost all these heritage buildings which are being re-used has considerably changed over time. Take the example of a large three storied building designed in Italian style in Kolkata which was built in 1833 and was once used to accommodate one of the oldest Mercantile Banks is now accommodating permanent exhibition halls of art works in some portions of it and the other portions are accommodating some government offices. Similarly, a dwelling house of Rabindranath Tagore in Santiniketan which was built between 1858 and 1863 is now being used for exhibiting some paintings and photographs etc of those days to the visitors coming to Santiniketan. It is not very difficult to understand that most of the needs of the builders of these old buildings do not at all match with the needs of their present users.

As per the internationally accepted principles of conservation, originality, authenticity and integrity of the historic old buildings should be retained as far as possible with minimum changes and alterations. But the radical change in usage pattern of these buildings has called for some additions and alterations during their conservation and maintenance.

With the advent of new building materials and modern construction techniques, the traditional building materials as well as construction techniques used in historic buildings have now become obsolete. As a result, conservation and maintenance of the historic buildings for their continued performance have become more difficult and challenging to its present users. In fact, it required highly skilled experts and professionals for its proper upkeep. Detailed survey and investigation are necessary for understanding the original architectural details of the old buildings and their actual conservation needs for their prolonged usage and to satisfy the requirements of the present users. Proper maintenance and repair of these buildings require specialized skill. Conservation works are also required to be planned, estimated and supervised by expert engineer or architect having adequate experience in handling such works and the craftsmen deployed on conservation works should be used to working with traditional building materials and techniques.

Causes for Damage

Past users of many historic buildings had enjoyed the large airy and well-ventilated rooms with large window openings which were carefully designed for comfort of the users or dwellers of it. Besides for the user's comfort, these large window openings were also intended to effectively prevent dampness by evaporation of excess moisture from inside the massive masonry walls. But

the present uses of some of those buildings warranted the installation of air conditioners by permanently closing the large window openings perhaps mainly for the protection of the exhibits from dust, dirt and atmospheric moisture etc. In some cases, such serious structural alterations are also done to historic buildings for the comfort of its present users.

This particular action considerably hampered the original ventilation system of these buildings and serious dampness problems are invited. Such structural interventions within the original settings of the historic buildings are critical. It has the following risks involved;

- Some structural damages to the historic building fabrics are unavoidable during installation of air conditioners and providing necessary electric connections to those.
- It is not always possible to completely hide such installations. As a result, these additions and alterations adversely affect the original look of the interiors of the historic buildings.
- As a result of permanently closing the original window openings, the process of ventilation and extraction of excess moisture from the huge masonry walls by evaporation, which was the intension of the original builder for good health of the structure, is compromised and the building starts suffering from dampness.

Besides air conditioning, many more additions and alterations are to be done to historic old buildings for their adaptive re-use like high-capacity water tanks are placed on the old roofs and water pipes are laid indiscriminately to cater the growing need of water for the present users of many historic buildings. Also electrical cables and wires are laid over roofs and wirings done on historic wall surfaces and roofs

This not only causes structural damages to the old roofs but also causes stagnation of rainwater over the roof by preventing easy flow of rain water towards the carefully designed old spouts. This particular problem has seriously damaged the roofs of many ancient buildings and also monuments in the country. There are instances of relaying the original old floor of historic buildings by replacing old porous floor slabs by impermeable modern floor tiles. By doing so the permeability through the porous floor slabs which was the intention of the original builder for maintaining the floor free from damp, is compromised and serious dampness problem occurred causing damages to the floor and to the objects kept on it.

While planning for restoration or conservation of a traditionally constructed old building for its adoptive re-use, it is to be kept in mind that conservation of historic old building is not a one-time exercise but a continuous process. It is a preservative science and the efficacy of a good conservation work depends on the appropriate implementation of a well drawn maintenance protocol specific to the building and its present uses. Therefore, doing some good repair works to a traditionally constructed old masonry building does not guarantee for its desired performance as is expected from a modern building unless followed by regular maintenance. On the contrary,

such occasional repair adopting whatever good techniques and materials used, if not followed by a well-drawn maintenance plan (SOP) it is bound to produce frustrating results and even can lead to accelerated decay and damages to the building.

In order to draw an appropriate conservation plan for an old historic building under re-use, the entire building should be surveyed. The signs of distress or damages like dampness etc appeared in one corner of a building may be the resultant effect of a major structural defect developed on the opposite corner of it. If these signs of damages are only repaired without caring for their sources then the actual problem remains unseen and unattended which continues damaging the other portions of the building. We don't see them until those become serious and appear before us in the forms of cracks or peeling off or even partial collapse. So, carrying out some repair works to the damaged or distressed portion alone does not solve the structural problem rather makes it more critical and complicated.

Experience shows that most of the visible damages and distress in an old masonry building are the results of inappropriate repair and maintenance to it for years together either by its present users or by the present owner of it. It is also observed that while repairing an old building for re-use, more attention is paid to make it modern and scraping its old utility systems by introducing modern facilities and at the same time beautification of its interiors and exterior facades.

By and large, very less or no attention is paid to matching the repair works with the original as per the maintenance protocol of old and historic buildings. The present user is happy to see the beautiful building he uses compromising with the norms which kept the original building heal and hearty for years together.

Figures 1 and2 show that the roof of a century old masonry building has been covered with bituminous sheets in order to prevent ingress of rain water through the old leaky roof.

Figure 1

Figure 2

An old roof surface of a heritage building is covered with bituminous felt for water tightening

Concerned engineer or the owner of the property ordered for covering the entire lime concrete roof with bituminous felt as per maintenance protocol of modern buildings without considering the probable interactions between century old lime concrete surface and the bituminous felt spread over it. As a result, rainwater started entering through many more locations of the roof, got trapped in between roof surface and tar felt and the trapped water caused damages to adjoining masonry by developing cracks, rusting to embedded and supporting iron members of roof and cracking the old masonry walls etc(fig 3, 4 and 5). Thus, an inappropriate repair work to an old masonry building accelerated the damages more than it was anticipated.

Figure 3

Figure 4

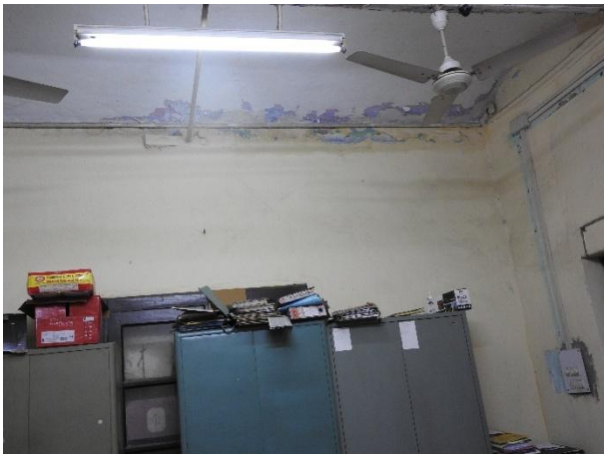

Figure 5

The inappropriate action of water tightening has resulted to damages to the old masonry walls and roof by trapping of moisture

Dampness is a very common conservation issue observed in almost every old masonry building particularly those which are under re-use. Before jumping upon an easy and quick fix solution to this problem it is important to understand why this building has started suffering from so much of dampness which has so beautifully performed for last so many decades.

If we first understand the building by close inspection and then properly scrutinize the records of repairs and maintenance of it for last 10-15 years, it will certainly arrive at a conclusion that "wrong maintenance and developmental works to this building and its surroundings arechiefly responsible for inviting dampness problem to this old building".

While taking up maintenance and developmental works to an old building, attention should be paid to retain the existing original drainage system all around the building. In many cases number of wash rooms are increased or capacity of existing washrooms are enhanced in a historic building to match the needs of its present uses but thewater drainage system is not improved ratherjeopardized. The outcome is stagnationof water along outer periphery of the building andsoaking of water by the bottom portions of the old masonry walls. Rain water pipes and their joineries are also not well maintained in many old buildings in use, causing ingress of water into the old masonry (fig 6).

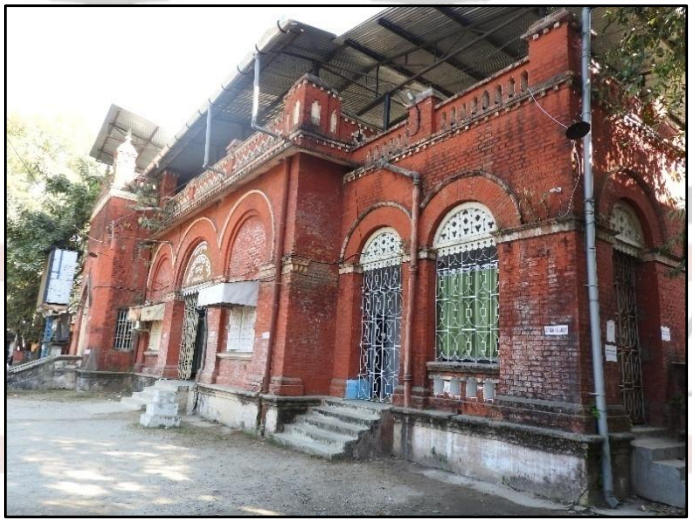

Figure 6 Existing old surface drainage system of the heritage building has disappeared and indiscriminate laying of rain water pipes etc have caused dampness into the old masonry walls

Thick masonry walls of these buildings allow entry and migration of water inside those much more than into the thin walls of modern buildings for the reason that old walls were constructed using porous lime mortar in old days while the modern walls are constructed using less porous and more rigid cement mortar. Hence, attention should be paid to retain the original pore

structures of the plasters and other surface finishes like colour washes etc to retain permeability of the old historic wall surfaces to avoid dampness. A deviation from this is bound to invite serious dampness problem to old buildings which are neither provided with damp proofing course at their plinth level nor are built in impermeable or less permeable materials like cement etc.

Conclusion

Keeping in view of the above facts, the custodians or owners of historic buildings should undertake periodic inspection to their properties by experienced engineer or architect having good knowledge of old building construction and uses of traditional building materials. The chief aim of such inspection is to examine the state of dilapidation of different portions of the building as well as to keep vigil on effects of the structural interventions, if anything is done to the historic building fabrics. Necessary repairs or alterations should be done using compatible materials which match the composition and strength of the existing original building fabrics as far as possible. Finally, for the sake of conservation of historic buildings, the extent of structural interventions aimed at to satisfy the needs of its present users should be kept as minimum as possible.

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Principle and Methodology of Scientific Conservation and Preservation for Built Cultural Heritage

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Abstract

India is one of the most ancient civilizations of the world and is famous for its rich cultural heritage ranging over several millennia. The ravages of time and various weathering agencies through physico-chemical processes have been responsible for deterioration of this built cultural heritage. Moreover, human vandalism and constant changes in environmental scenarios in and around monuments added new challenges in the field of conservation. This, paper reports the principles and brief methodology of scientific conservation and preservation of different types of stone monuments in general & marbles in particular of our built cultural heritage.

Key Words: Scientific conservation, Preservation, Cultural Heritage

Introduction

India is one of the most ancient civilizations of the world and is famous for its rich cultural heritage ranging over several millennia. All these heritage buildings are located through the length and breadth of the country representing social, religious and cultural developments during the different periods of history. These cultural exhibits are built by different building materials and are of specific structural designs. These monuments are also exposed to varied climatic conditions. Growing air pollution in urban and industrial areas is a hazard not only to human beings but also to building materials of the monuments. The nature and behavior of component materials depends on the magnitude of the problem. The ravages of time and various weathering agencies through physico-chemical processes have been responsible for deterioration of our built cultural heritage. Moreover, human vandalism and constant changes in environmental scenarios in and around monuments added new challenges in the field of conservation. Many of our important monuments are also places of worship and hence these living monuments also pose more challenges in conservation. To fully understand the causes of deterioration, we have to identify different problems which act simultaneously over the monuments. Hence the causes of deterioration are complex in nature and also challenging. In a nutshell, both intrinsic and extrinsic factors are responsible for deterioration of our built cultural heritage.

Ethics of Conservation

- The objective of conservation is to prolong the life of cultural property and, if possible, to clarify the artistic and historical message therein without the loss of authenticity.

- Conservation is a cultural, artistic and craft activity, supported by scientific investigations.

- The Conservator should have a flexible pragmatic approach based on cultural consciousness, proper training, sound judgment and a sense of proportion with an understanding of community needs.
- Conservation refers to the process of documentation, analysis, cleaning, stabilization and preservation.

Conservation is Classified as

- Preventive Conservation
- Curative Conservation

Preventive Conservation

- Prevention is better than cure. Care should be taken to prevent decay or damage by indirect action
- Prevent decay by daily care, strategy before curative conservation which involves major intervention.
- A strategy to eliminate emergencies as far as possible.
- Minimum intervention at one time.
- Less expensive.
- Inspection at regular intervals.
- The intervals required depend on climate, building materials used and its environment.

Curative Conservation

- Conservation carries major intervention
- Emergent restoration
- More expensive
- Conservation beyond preventive measures
- Depends on structure / object

Investigations/Inspections

- Deterioration of monument/object classified as
  - Intrinsic factor
  - Extrinsic factor
- Intrinsic factor
  - Due to inherent quality of building materials
  - Weakness in the structure/object
- Extrinsic factor
  - Natural agents
  - Artificial agents caused by man

Factors influence the rate of alternation of stone of a monument/object

- Initial freshness of stone, its texture, its cut, its orientation in the structure, its physico mechanical characteristics.
- Nature/type of stone
- Porosity of stone
- Migration and crystallization of soluble salt
- Building designs and functional environment
- Foreign materials within the structure
- Vegetational growth, moss and lichen etc
- Climate/microclimate and environment
- Light
- Temperature and Humidity
- Insects and micro-organism
- Dust and other atmospheric pollutants

Scientific conservation and preservation of Archaeological Monuments is the responsibility of a conservator which involves as follows:

- Conservation treatment and preservation of archaeological monuments including world heritage sites
- Conservation treatment of museum exhibits and excavated objects.
- Scientific and technical studies as well as research on material heritage of different building materials, to study the causes of deterioration with a view to evolve appropriate conservation measures, in order to improve the state of preservation of our built cultural heritage and physical heritage as well.

Conservation Approach

The systematic approach to formulate the Conservation Strategies for Stone Conservation is based on diagnosis and prognosis which mainly involves following steps:

- Identification of causes for the deterioration of monuments.
- Collection of precise information about the past and present status of the monument.
- The practice of conservation, in modern age, is thus both" Critical – historical judgement", which is reflected in the choice of most suitable methods and conservation techniques and " Scientific – technical knowledge", which is the direct result of laboratory analysis
- Each conservation approach must take into account the prevailing site experience
- No single practical conservation approach can ever cover all the eventualities
- Each case will have to be assessed on its own merits

Conservation Methodology

- STRUCTURAL CONSERVATION
- SCIENTIFIC CONSERVATION
- Documentation of before, during and after stages of conservation of monuments has to be undertaken

Structural Conservation:

This involves the following steps :

- Resetting of old stones
- Renewing the missing and worn out stones
- Replacing only the deteriorated portion of stone while retaining its architectural originality
- Replacing rusted iron dowels by stainless steel dowels
- Grouting, Pinning and pointing

Scientific Conservation

Generally scientific conservation is a follow-up of structural conservation. It consists of the following steps.

- Chemical cleaning
- Use of stone strengthener
- Desalination
- Biocidal treatment of cleaned surface
- Application of preservative

Chemical Cleaning

Application of 2-3 % of Ammonia solution and 2-3% Non-ionic detergent solution, followed by gentle brushing helps in removal of micro-vegetation from the stone surface.
Ammonia solution neutralizes the acids secreted by the roots of vegetational growth
Non-ionic detergent removes dust, dirt and other accretions without leaving behind any extra ions on the stone surface.
In case of lime to be removed from the stone surface- 2-3% acetic acid is used in place of ammonia.
Wash thoroughly with plain water to remove traces of chemicals left behind, if any

Precautions

- Chemical cleaning should not be drastic leading to losses of materials from the stone itself
- The cleaning process must not produce materials (soluble salts) which may cause further deterioration to stone
- The joints of stone blocks, in case of ashlar masonry, should not be abraded
- In case of marble surface, the cleaned surface must be as far as possible smooth with original surface unaffected

Observations

The behavior of micro-vegetation is significantly influenced by sulphate and nitrate ions, gaseous pollutants especially SO_2, NO_2 and in polluted environments the synergic effect is complex.

High level of particulate matter contaminated with soluble salts may favour the growth of vegetation whereas the gaseous pollutants make it dormant or may even cause death.

Desalination

- Desalination means to extract the soluble salts from the pores of the stones using paper pulp with deionized water
- The process is repeatedly carried out till the chloride test of the solution obtained by extracting the salt from paper pulp with deionized water is negative
- Cent per cent removal of salts from the pores of the stones is not possible
- The process is effective particularly for sea shore monuments

Use of stone strengthener

Chemical used – Wacker stone strengthener OH 100 based on ethyl silicate

It penetrates through' capillaries deep into construction material
Ethyl silicate reacts with water from atmosphere and forms a glass like silica gel binder (SiO_2aq)
Ethanol as by-product evaporates
Final hardness reached after two weeks

Features

- Easy to apply, one pack system
- Its low molecular weight ensures optimum penetration
- It dries to form tack-free film
- No by-product that damages building material
- It forms a mineral binder that is compatible with structure
- Binder is acid resistant, therefore, resists rain water
- Does not seal pores. Construction material remain permeable to water vapour

Fungicidal Treatment

- Chemical used – 1-2% Sodium pentachlorophenate / Zinc silicofluoride in water
- It arrests vegetational growth

Sodium Pentachlorophenate is more advantageous because

- It is better soluble in water
- Zinc silicofluoride may fill / block the pores
- Zinc silicofluoride appears to cause unattractive patchy or streaky grey patch accompanied by pitting and flaking

Application of Preservative Coat

A Good preservative should have

- Good penetration depth
- No incrustation but formation of even consolidation
- No formation of salt as by-product
- No colour change and shiny surface of stone
- Permit water vapour permeability
- Reduction of absorbency of water
- Reasonable life period

Preservative in use – Wacker BS 290 dilutable with Mineral Turpentine oil in the ratio 1 : 9 - 1:18 or SMK 1311 in water single or double coat depending on the porosity of stone.

History of Preservative coating

- 1-2% PVA (Polyvinyl acetate) in toulene in single and double coat
- 1-2% PMMA (Polymethyl methacrylate) in toulene in single or double coat
- 1:30 Repellin super (Potassium Methyl siliconate) and distilled water
- 1:30 Repellin super followed by 1% PMMA in toulene
- SMK 1311 in water
- Wacker BS 290 (Solvent free silicon concentrate based on silane/siloxane) and MTO (1:9 – 1:18)

Characteristics of Preservative

- Solvent free silicone concentrate based on Silane / Siloxane
- Diluted Wacker BS 290 serves as a high quality water repellant

Features

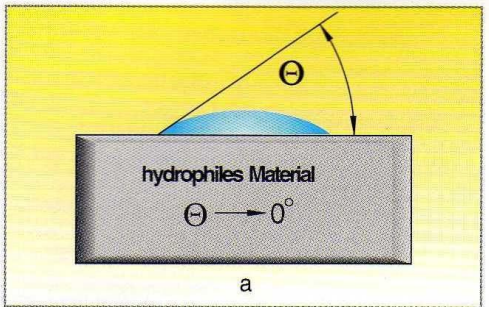
- Good penetration capacity
- High alkaline resistant
- Tack-free drying
- Effective even on damp surface
- Water repellency develops first
- Reacts with moisture first generates active ingredient and liberate alcohol
- Suitable for concrete, plasters, cement fibre boards, Sand-lime brick work and stones (Except Marble)

Protecting Facades with Silicones

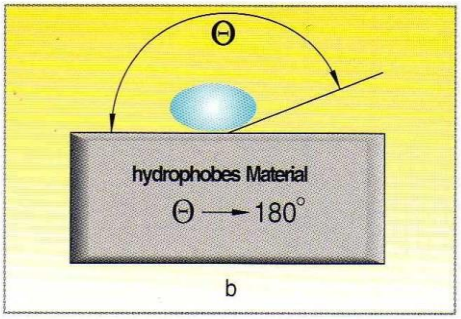
Unlike film-forming coatings based on acrylic, polyurethane or epoxy resins, organo silicon water repellents do not seal the pores, but simply form a very layer on the pore walls.

A mineral surface with (a) a hydrobhobic impregnation (b) filled pores
(c) A sealant
Pores which have been siliconized and therefore hydrophobic can no longer be wetted by water.

The degree of wetting can be determined quantitatively as the contact angle



Wetting of a hydrophilic porous surface



Water repellency of a hydrophobic porous surface

Water vapour can diffuse

Since, the pores in hydrophobically treated masonry remain open, the building material retains its water vapour permeability or "breathability" which is one of the main criteria for successful treatment

Water under pressure is a problem

It is of course obvious that water-repellent treatment cannot render a building material resistant to ground water or driving rain, since pores in the masonry are open.The larger the pores, the greater is the problem.However, the properly applied water repellents are perfectly sufficient to render many standard building materials.The water repellent should have maximum penetration into pores and then only the efficacy of hydrophobic impregnation be guaranteed for many years or even decades.

Hydrophobic zone and water beading effect

Restoration

The object of restoration is to bring an ancient building back to its original condition inappearance by faithfully and minutely reproducing all that has been lost or destroyed by making the new work and material compatible with the structure as far as possible. In the past, restoration theories have often emphasized specific types of treatment butin India the conservation of cultural heritage is not viewed simply as a series of recipes.Consequently, specific protection and conservation strategies are likely to vary considerably according to the context and values associated with each monument or site.Nevertheless, general principles of good conservation practice do serve as a foundation for the identification and protection of heritage resources.

The Essence of Marshall's Views

- Hypothetical restorations are unwarranted, unless they are essential for the stability of a building.
- Every original member of a building should be preserved intact and dismantling and reconstruction should be undertaken only if a structure cannot be otherwise maintained.
- Restoration of carved stone, carved wood or plaster moulding should be undertaken only if Artisans are able to attain the excellence of old and in no case should mythological or other scenes be recarved.
- The essence of Marshall's views about the aim of conservation is not to reproduce what has been defaced or destroyed, but to save what is left from further injury or decay and to preserve it as a national heirloom.

Clay Pack Treatment (Specially for Marble)

- Marble stone is first cleaned with water having small quantities of Ammonia and Non-ionic detergent with mild brushing
- A 2mm thick layer of mixture of Bentonite clay / Fuller's earth (100gms), 2ml Ammonia, 1ml Non-ionic detergent, 1ml H_2O_2 , 2gms Na_2CO_3, 2gms $NaHCO_3$ and
  2 drops of Triethanolamine is applied over the stone surface
- The consistency should be controlled to prevent its flow on the surface
- Cover it with Polythene sheet for at least 2 days
- The additive influences the thixotropic characteristic of clay pack to help the complete removal of greasy accretions, trapped gaseous pollutants etc.
- The Polythene sheet is removed and the clay pack is allowed to dry and then removed, wash with water and if required by Ammonia and Non-ionic detergent
- Repeat the same procedure, if required
- The treatment is non-abrasive, non-corrosive as well as quite effective

<u>Polishing Marble for surface protection</u>

- The application of preservative is not effective over marble surface
- The marble surface is polished with moss agate stone using lead oxide – tin oxide(1%each) with 1% solution of Oxalic acid as a polishing medium.
- The composite polishing method has advantage over other methods using abrasive or application of wax material.

- The polished surface having in-filled oxalate film and uniform smooth surface act as a protective layer
- Particulate matter and water have least sticking affinity on the polished surface, thereby inhibiting epilithic action

Vishwanath temple, Khajuraho - A World Heritage Monument

Before conservation treatment After conservation treatment

Cleaning of microbiological growth is important to improve the aesthetics as well as for effective preservation of the monument

Mahakal temple, Bijolia, Distt. Bhilwada, Rajasthan

Before conservation treatment After conservation treatment

Lotus temple, Hampi – A World Heritage Monument

Before conservation treatment After conservation treatment

Consolidation of basalt rock sculpture using Wacker OH – 100CaveNo.19AjantaCaves – A World Heritage Monument

Yakshni's figure before and after restoration work

Brass Statue Consolidated by Epoxy Resin + Filler (Different Stages of Conservation

Before conservation treatment After conservation treatment

Taj Mahal, Agra – A World Heritage Monument

Before conservation treatment After conservation treatment

Hoshang Shah's Tomb, Mandu

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In Search of a Lost Capital:
A Geo-archaeological Analysis of the Site-Debalgarh

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Abstract

In spite of its immense potential, Debalgarh archaeological site has been neglected through decades. It is evident from the Geo- archaeological investigations that as an advanced civilization it flourished over a vast area even before Gupta era. It is evident from the recovered archaeological objects that it was a centre of trade and commerce in ancient Bengal. A rural museum has been established to display and protect the recovered artefacts. Mass awareness has been developed. Palaeo-channels have been analysed and surveyed to reveal the Geo-archaeological importance of the site. Now the question arises- is present Debalgarhthe past Senacapital 'Vijaypur'? Continuous research and scientific excavation are needed to unveil the untold information which may add a new chapter in the history of ancient Bengal.

Key Words: Debalgarh, Palaeo-channel, Ancient trade route

Introduction

Through the present paper an attempt has been made to represent an account of Geo-archaeological study of 'Debalgarh' and associated potential areas, located in the district of Nadia, West Bengal, India. An attempt has been made to identify the palaeo-channels and nature of landform evolution by field survey along with the understanding of chronology of civilisations through centuries by archaeological evidences.

Preamble:

'Debalgarh ' or ' Debola' of 'Debagram gram panchayat' under Gangnapur police station and 'Anuliya Gram panchayat' under Ranaghat police station, Nadia district,can easily be described as a living archaeological site which is a neglected place through decades. Debalgarh archaeological site (along with Anulia and other adjacent spots) belongs to the trans-Bengal region at the interface of West Bengal and Bangladesh. The artifacts of the area date back to the eras as early as 3rd- 4th century, a period much prior to the Pre-Gupta era and shows evidence in the continuity of subsequent Gupta, Pala, Sena and Sultanate dynasties. The ruins of architectural structure also indicate that the site has been an immense potential centre of both administration and economics in the Pala-Sena era.

Spatial Location

The central location or the fort area of Debalgarh extends in an almost square pattern. Residual of four ancient earthen watch towers stand at four directions, covering almost one square km area. The latitudinal and longitudinal locations are following respectively:

NW: 23°9'38"N/88°39'17"E
NE: 23°9'50"N/88°39'55"E, SE: 23°9'16"N/88°40'5"E,
SW:23°9'04.3"N/88°39'31.3"E respectively.

Debalgarhis nearly seventy five kilometres from Kolkata, located equidistant from Ranaghat and Chakdaha railway stations in Nadia district. Though this site can be identified as a bi-nodal centre (Debagram and Anulia), thousands of artifacts have been unearthed within 10 to 15 kilometres radious area around Debalgarh. The central area of Debalgarh is located beside the palaeo-channel of river ' Marali'. The spot is much close and roughly eight kilometres away from the confluence of 'Marali' with river ' Ichhamati '.
Several spots with hundreds of artifacts have also been identified at Anulia Gram panchayat area under Ranaghat-I administrative block. The spots show a linear pattern allocation besides the palaeo-channel of river Ganga. The distance between Anulia and Debalgarh is less than ten kilometres in straight line distance. River 'Churni' flows from North-east to South-west direction towards Chakdaha to her confluence with Ganga.

Methodology

To asses properly the geo- archaeological importance, an extensive microlevel survey has been carried out through years. Primary survey has been carried out for both purposes- a) to study the nature geo- archaeological significance and recovered artefacts in general and b) to obtain the detailing of palaeo-channel analysis in particular. Both the paleo-channel of river Ganga at Anulia and Marali at Debagram have been analysed.
Different parameters like changes of slope, study of recovered organic substances from the dried up river bed, nature of sedimentation, study of soil texture from collected samples have been done. After receiving the data, the compilation and analysis have been conducted in post- field study. Location of palaeo-channels along the tributaries and distributaries, areas of archaeological findings has been plotted in maps to represent the spatial dimension.

Geo-archaeological Observations

Over the years, the evolution of the extinct river basin in the adjoining delta surrounding the Debalgarh archaeological site has been surveyed. The courses of rivers have changed and the process of delta formation has also evolved chronologically. The palaeochannels have been traced out through intensive field survey. The search was conducted across the region. Many important evidences of river based trade have been found. Several large sized blocks made of laterite stones were found from Debalgarh which were used to anchor large size boats and barges. Terracotta seals, anchoring stones, etc., prove conclusively that in ancient times the river Marali-Ichhamati flowing along the Debalgarh archaeological site and the Churni and Ganga flowing along the Anulia occupied a significant place in trade and commerce in ancient Bengal. Although the Ganges now flows through the western part of Nadia district, long-running geo- archaeological studies have shown that the location of the Ganges in ancient times was much different than it is today. Thousand years ago, the drainage system

and associated landforms of this Gangetic delta were quite different (Bagchi, 1944). Long ago, the river Ganga used to flow through the ancient town of' 'Ula' or present-day Birnagar in Nadia district. It used to flow in ancient time the Anulia Gram Panchayat of today's Ranaghat Police Station. Field surveys across the villages of Anulia and Gurpara have been able to identify the extinct river basin of the Ganges. With the help of field survey, the extinct river basin has been identified and its extinct streams along with the present streams have been compiled on the map with the help of geographical information system (GIS). It is understood that the process of formation of the delta in this part of Central Bengal many centuries ago was like. It is understood how the drainage system of this region has been for many centuries. At the same time, field surveys on both sides of the palaeo channels have uncovered many archaeological specimens. By ensuring these, we are presented with a picture of an advanced civilization over a vast area that was flourished many centuries ago.

Establishment of Rural Museum

Despite its immense potential, the Debalgarh archaeological site is still waiting for extensive excavation and unfolding the complete history. Inspite of continuous efforts taken, a few years ago, only but a few people knew about this archaeological site. Gradually, through systematic research and disclosure of information, Debalgarh is now appearing to the people. The information hidden under the jungle and mound is being revealed. Although numerous specimens have been found throughout the vast area over decades, one hardly cared about the research, excavation and presentation of the artifacts of this site. It is almost a decade ago that the mystery of Debalgarh has begun to unveil. From that time onwards, continuous research began and course of action has been commenced.

At first people suspected a lot and there have been many doubts. While conducting field surveys in villages, people have therefore looked at it with utter scepticism. For a long time, there has been an atmosphere of suspicion and mistrust in travel and mutual exchange. Mutual cooperation has gradually increased. The people of the village have come forward one by one to preserve the ancient culture. They have come forward to formulate the chapter of their lost history and heritage.

From the very beginning we believed that local people would be the pioneers in this work. By pushing the sediment of oblivion that has been lying on history for centuries, they will revive the trend of ancient history. Year after year has passed. One meeting after another with the villagers, the future course of action has been formulated through discussion. Finally, by the initiative of the local villagers, a rural museum has been set up at Debagram of Gangnapur police station in Nadia district, next to the Debalgarh archaeological site. Some of the villagers have left a part of their house, some have arranged a little furniture. People from all over Bengal, interested in archaeology, history, geography and folk culture have gradually flocked to this rural museum. Local farmers and villagers have donated their collected artefacts to the museum. All the artifacts are now carefully preserved in the rural museum today. Preserved for research, preserved for the future.

Today, the Debalgarh archaeological site is slowly gaining recognition on the history map of Bengal and India. Many experts have come. Officials of the Archaeological Department of the Government of West Bengal have arrived. Officials from Archaeological Survey of India have shown enthusiasm. The Asiatic Society has described Debalgarh as 'one of the major

archaeo- tourist destination in the map of Bengal' in their monthly magazine (The Asiatic Society, July 2018). Gradually, the importance of this archaeological site is becoming more and more apparent. Now all are waiting for scientific excavation and continuous research.

Selected Archaeological evidences

Remarkable archaeological specimens, recovered from multiple places of Debalgarh amaze us and draw our attention to a new avenue of possibility that has yet not been mentioned in conventional history. Along with other artifacts 'amphora' has been recovered (October, 2019) from the bank of river Churni flowing through Anulia gram panchayat of Ranaghat police station. This special type of pottery was supposed to be used in ancient times to transport wine, olive oil, pickles etc. According to expertise, throughout the second and third centuries, this special type of pottery produced by the fine clay of Bengal delta, was widely used for external trade. Most destinations were in various European countries, including Greece and Rome at the time.

It is not that single amphora has been discovered from a single place and thus, cannot be considered as a mere isolated discovery. The 'Parvati' canal in the Gopalnagar -Nahata area, adjacent to the Gangnapur police station, which connects the extinct river Jamuna with Churni; several amphoras along with other artifacts have also been found on the banks of that canal. The discovery of multiple amphoras, terracotta seal marks a significant addition so far as the archaeological history of ancient Bengal is concerned. Although various specimens of foreign trade including amphora have been found from the Chandraketugarh, Harinarayanpur archaeological site earlier (Sandhi Group, 2013) the discovery of such artefacts from the middle deltaic region of Nadia is a completely new phenomenon. Gold coins of the Gupta era have also been found from Debalgarh! Archer type gold coins or Dinar have been found where Gupta emperor Samudragupta marked standing with bow and arrow. It is found that in 1942, Binoy Chandra Sen in his book- "Historical Aspects of the Inscriptions of Bengal", writes about the receipt of Gupta era gold coins from (Sen, 1942) Debagram (Sen.1942). Even today,though nearly hundred years have passed from the first reporting, inhabitants of Debalgarh have witnessed several gold coins of the Gupta period recovered from the depths during cultivation and constructional works. It is evident that with the passage of time, in the Gupta period, this region became one of the major centres of trade and commerce in the ancient Bengal.

In Search of a Lost Capital

Now the question arises about the identity of Debalgarh archaeological site. Evidence of the innumerable artefacts suggests that an advanced civilization developed here before the Gupta period. In the Gupta period this region became a developed centre of trade and commerce. Later, with gradual development this civilization reached its peak in the Pala and Sena eras. But who was the ruler? What was their identity? Why this huge arrangement of watch towers, double rampart and trench- (Moat?) surrounded fort? Why Debalgarh is featured with such a huge defence? Which time was Debalgarh established as a centre of immense power? These issues will be solved in the series of studies.

Through the multiple religious artefacts, terracotta seals, pottery, amphora, gold coins of Emperor Samudragupta found at different times from Debalgarh, the prosperity of trade and commerce in the Gupta period and earlier is quite evident. Debagram has been mentioned in ancient literature. It is known from the 'Ramcharit Manas ' by Sandhyakar Nandi that Raja Vikram Raj of Debagram was one of the few powerful feudal lords of Bengal who helped Rampal to suppress the Kaivarta rebellion during the reign of Pala Raja Rampal (Nandi, 1937). In other words, Devagram became a strong political and administrative centre during the Pala period. More and more research will reveal more new mysteries of history.

Debalgarh site is connected with one of the major controversies in history which has not been answered till date. We know about the capital of Sena, namely 'Vijaypur ' from the poem ‘Pavandutam’ written by Sena royal poet Dhoyi (Chakraborty, 1926). The Vijaypur was simultaneously the capital or administrative centre (Rajdhani) as well as the military centre (Skandhabar). But where was the capital Vijaypur located? Following the verses of the Pavandutam, we find that it was near Tribeni in today's Nadia district. The spatial location and the archaeological evidences discovered matches completely. Is Debalgarh, surrounded by ancient Ganges-Marali-Jamuna, the lost Sena capital Vijaypur? The location of Debalgarh is in complete agreement with the location of Vijaypur by the description of palaeo -channels and landform evolution analysis.

But is this the centre where Sena Raja Lakshmana Sena clashed with Sultan Baktiyar Khilji and defeated here? Did Laksmana Sena retreat to his capital Bikrampura? For a long time, there has been an idea of introducing Nabadwip as the capital of Sena. The Debalgarharchaeological site and its potential were not included in the discussion. The reason seems very simple and normal. No one knew the identity of this archaeological site, nor its features were revealed. Today it is clear that Baktiyar Khilji did not attack Nabadwip, Nabadwip was never the capital of Sena. It is found that, Acharya Jadunath Sarkar, Ramesh Chandra Majumdar in their texts clearly stated that Nabadwip was never the capital of Sena, but it was a pilgrimage centre on the banks of the Ganges (Sarkar, 1943; Majumder, 1971). Nabadwip has been known as a religious centre since ancient times. After the excavation of the Ballal mound by ASI, it became clear that it was not the capital centre but a Buddhist monastery primarily, which was later converted into a Hindu temple. No archaeological evidence has ever found in support of Sena capital at Nabadwip. In addition, it should be remembered also that at the time of the birth of Sri Chaitanyadev, Nabadwip was just a village. Several Chaitanya kavyas refer that Nabadwip was a remote village in time of the birth of Sri Chaitanya, neither a centre of trade nor the capital. If Nabadwip had been the ancient capital before the birth of Sri Chaitanya, its mention could have been found in any one of the texts.

We learn about the invasion of Bakhtiar Khilji from the main text of 'Tabakat-i-Nasiri ' by Minhaj. According to the text, Baktiyar Khilji attacked 'Nudiya Nagar', not Nabadwip (Raverty, 1873). Which centre was the attack the site or the then capital? It is clear, from the description of the text that at that time Nudiya Nagar was a fortified city. That city had city gates, walls, moats. It was a famous centre of trade and commerce (Roy, 1999). That is why Baktiyar disguised himself with his teammates easily as horse traders. None of this matches with Nabadwip. Rather, it coincides with the newly discovered Debalgarh. Now the question arises, is lost capital 'Vijaypur' hidden under the mounds of present Debalgarh site?

Conclusion

Archaeological evidences show that there is a huge potential hidden deep in this long neglected archaeological site. The excavation and proper research of this archaeological site can change the various ideas prevalent in history till date. If the information of this archaeological site is published properly, many conventional beliefs in the history of Bengal and India will change and the answers too many unknown questions will be found. The search is therefore awaiting the addition of a new chapter in the history of India and Bengal. This archaeological site is therefore needed proper scientific investigation for writing the unknown history of this region.

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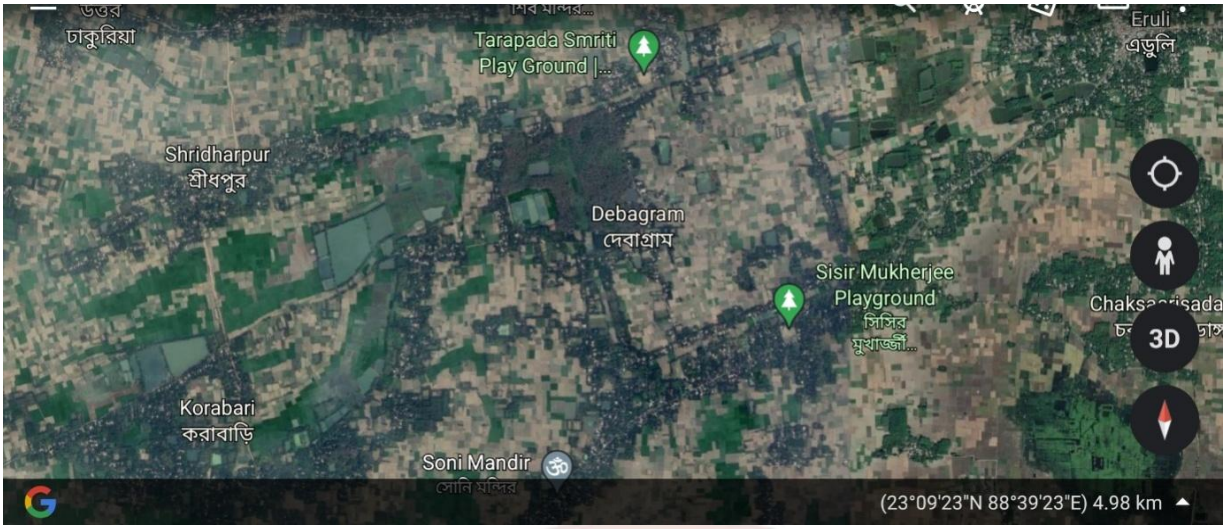
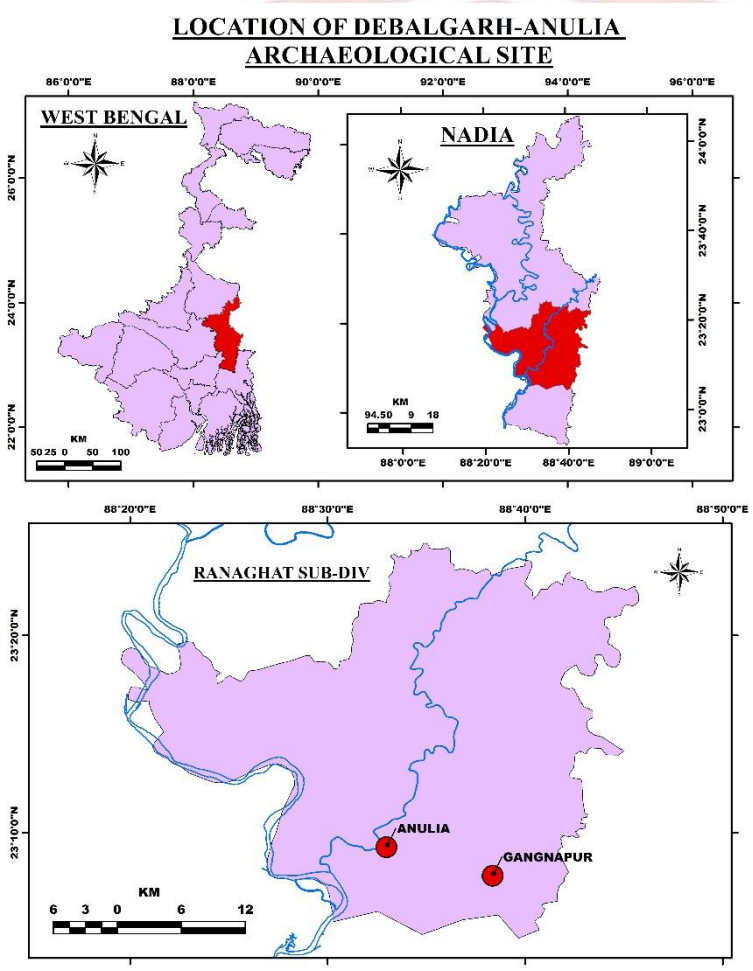
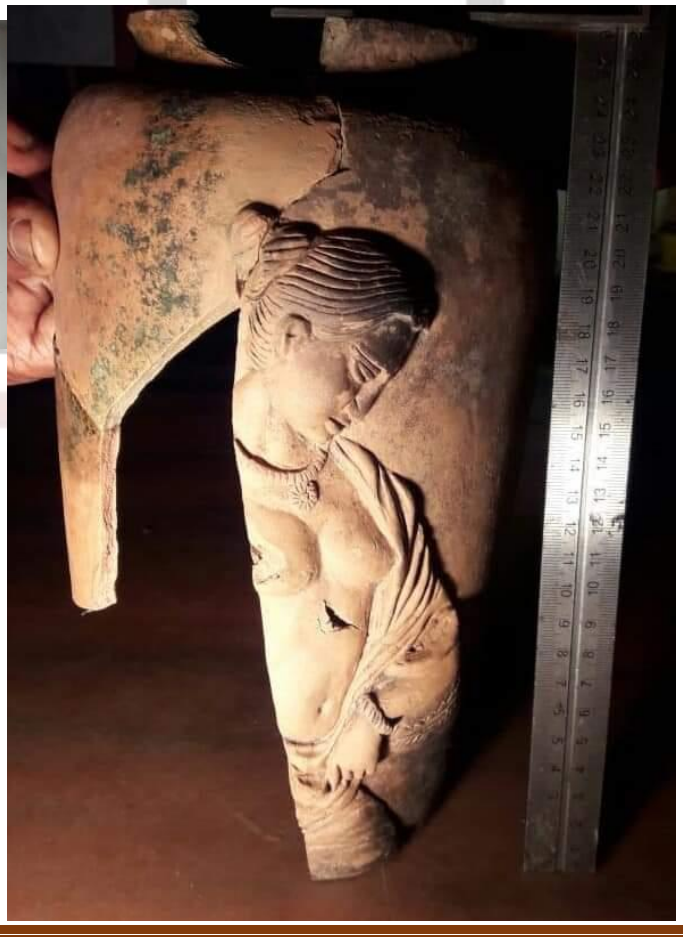
Illustrations







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