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Editor's Note

We are presenting the eleventh volume of the new series of *Pratna Samiksha:* A Journal of Archaeology. This volume contains articles on many subdisciplines of archaeology. The note section at the end contains short essays on important topics. While some of the writings exhibit the prospect of archaeology, some offer new data, there are a few articles that present a fresh look at known subjects. All in all, this edition of the journal reflects the trend of thoughts and actions current in archaeology.

This edition contains an index of articles published in the journal during 2010–19. I thank Dr Rajat Sanyal for his help in this matter and many other concerns of this journal. A special word of thanks is also due to Sri Subir Sarkar for his suggestion of preparing an index.

We have lost two members of the Advisory Board this year. Professor Krishna Bose had been a source of encouragement. She was also the Chairperson of the Centre for Archaeological Studies & Training, Eastern India. Mr Pratip Kumar Mitra has been with our institution from its inception and always forwarded ideas for the betterment of the journal. Their presence is missed.

Kolkata 9 October 2020 SHARMI CHAKRABORTY

EXPLORATIONS

Recently Discovered Intertidal Archaeological Sites Along the Shoreline of Bay of Bengal: East Medinipur District, West Bengal

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ABSTRACT: An exploration was carried out in a so-far unexplored region along the shoreline of Bay of Bengal, located in East Medinipur district, West Bengal. The survey resulted in the discovery of three intertidal archaeological sites represented by scattered mudflats and large ceramic assemblages just near the shoreline. The discovery of these sites in the region has thrown light on the early settlement near the shoreline which was previously considered to be of marginal significance and the detailed analysis of ceramic assemblage has shown some traces of possible coastal contact with Southeast Asian countries. This discovery has opened new possibilities for more geoarchaeological and marine archaeological research in this part of the coastal region in the future.

KEYWORDS: East Medinipur, intertidal, mudflats, ceramic assemblages, Shankarpur, Chandpur, Tajpur.

Introduction

The coastal tract of East Medinipur district and the areas located to its immediate southwest in the West Medinipur district acts as a passage between upland and the coast and has been under constant occupation during the early historic and early medieval period from secondthird century BCE to twelve-thirteenth century BCE (Basak et al. 2014). The coastal belt of East Medinipur district has been surveyed intensively for last few years, which led to the discovery of numerous protohistoric, early historic and early medieval sites and most importantly the recent excavations at the site of Erenda located in Egra subdivision by Kaushik Gangopadhyay for two consecutive seasons (2016 and 2017) has thrown new light on the protohistoric culture of the region (Gangopadhyay et al. 2017). In 2019, a three-member team from the Department of Archaeology, University of Calcutta consisting of

Kaushik Gangopadhyay, Sharmistha Chatterjee and the first author of this article made a pilot survey for locating archaeological sites in the region. This pilot survey resulted in an identification of few mudflats with buried ceramic scatters on the shoreline of Shankarpur located in the Contai subdivision of East Medinipur district. Observations during the survey showed that the embedded potsherds within the mudflats are much younger than the mudflats and the nearby sandy ridges, questioning the site formation process of the region. The stratigraphy of the sites is mixed in nature. A comparative study of the embedded potsherds with the potsherds from other explored or excavated sites will be an important tool for understanding the relative stratigraphy of the sites.

The concept of 'wetland archaeology' is becoming an important part of archaeological research currently. Nowadays, archaeologists are moving away from the traditional concept of 'mound archaeology' and the studies centring around the antiquities recovered from a site. The ideas like studying the formation process of coastal intertidal sites and sites located in the dynamic alluvial environment are becoming the area of current interest of archaeological research as the sites located in the intertidal zone and dynamic alluvial settings project a different kind of human adaptation and site formation and preservation (Rajaguru et al. 2011). Intertidal mudflats/tidal flats are generally located in tidal estuaries that can contain important archaeological remains either at the surface or in a buried form. Generally, the archaeological remains found in these regions are associated with maritime affairs. Sometimes, prehistoric material remains can also be recovered from these intertidal sites located near the shoreline (Mason 1993).

The present region of study has witnessed dynamic shoreline change for last 3000 years. Heavy monsoon, constant landfall and rise of sea level have an adverse effect on the region and its resources. The entire eastern coast of India is prone to heavy cyclonic activities and naturally, current area of work is no exception. In the recent past, devastating cyclones have affected the coastal tract of Medinipur in every worst way possible. The rate of the rise of sea level finally leading to a rapid shoreline change is increasing day by day. The above scenario had affected the intertidal archaeological sites of the coastal region of Medinipur to a great extent. Most of the sites are getting washed off due to the constant natural hazards. Modern human activities are also a major cause for the change in shoreline, as these activities diminish the natural vegetation along the shoreline, making it easier for the strong waves to cut the sediment bank along the coastline. All of these factors are standing as the biggest obstacle for continuing future archaeological research in the area.

An onshore pedestrian survey was done by a team comprising of two members, which resulted in the discovery of three intertidal sites in the region. The sites included Shankarpur, located in Contai Block, Chandpur in Patashpur Block 1 and Tajpur in Ramnagar Block (Plate 1). All of these three sites are represented by mudflats embedded with ceramic scatters.

The Region

West Bengal has a long coastline of almost 325 km, including the islands. This coastal region is represented by diverse geomorphic features (Plate 2), anthropogenic intrusions and high floral-faunal biodiversity (Bhattacharya 2001). This coastal region is a part of the Belda-Contai upland and has no proper evidence of occupation by any major river in the recent past. It has been noted that the Belda-Contai upland evolved from the ancient deltas of the Subarnarekha and Kasai (Niyogi 1970). The quaternary geological formation of this region is characterised by an olive-yellow and grey coloured sandy loamy clay with calcareous concentration. The age of the sediment found from this formation is mapped as 'Sijua Formation'. It is a Late Pleistocene to early-mid Holocene formation lying 5-10 m over sea level (Roy and Banerjee 1990; Vaidyanandan and Ghosh 1993). In Sijua formation, the traces of earlier fluvial activities have been eliminated due to prolonged erosional activity. In the upland region of West Bengal, fragmented fossils of mammals and microlith tools had been recovered from Sijua formation (Ghosh and Majumdar 1981, 1991). Interestingly, in the coastal region, no anthropogenic remains and fossils have been recovered from this formation. At Erenda, the human story began just over this formation (Gangopadhyay et al. 2017).

The present study area, along the coastal tract of Bay of Bengal, is located in the Survey of India toposheet map number 73-O/6 and 73-O/10 covering an area of 8752.63 acres and the latitudinal and longitudinal stretch of coastline is between 21°38′13.126″ N to 21°42′30″ N and 87°35′7.718″ E to 87°46′14.29″ E, respectively (Samanta and Paul 2016). Geographically this area is part of the Contai coastal plain and lies in a long stretch of 45 km from the mouth of Subarnarekha River in the west to the Rasulpur River in the east. Further, this area is divided into

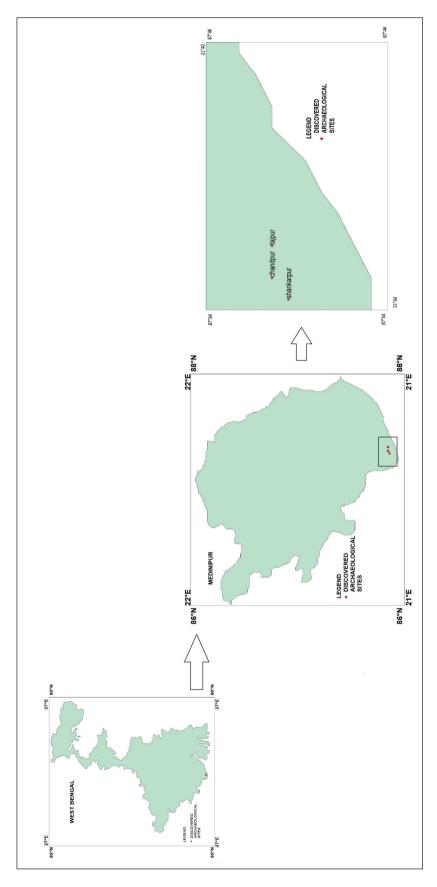


PLATE 1: Location of the newly discovered intertidal sites along the coastline of Bay of Bengal, East Medinipur, West Bengal

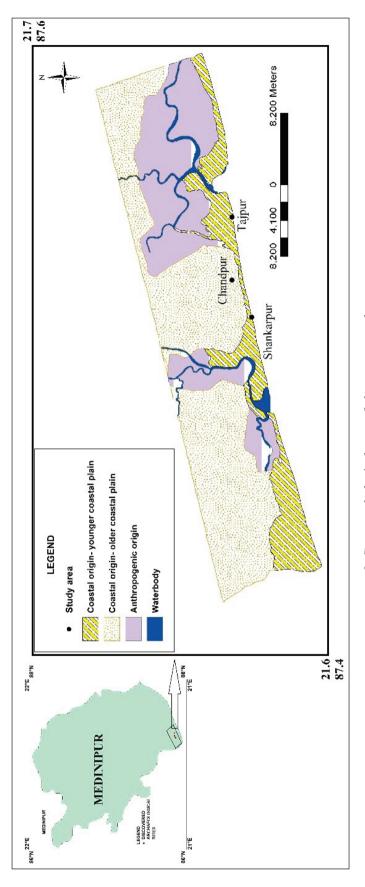


PLATE 2: Geomorphological map of the present study area

seven segments from east to west, viz. Junput coast, Shoula coast, Mandarmani coast, Tajpur coast, Shankarpur coast, Digha coast and Talsari coast (Dey and Shukla 2019). The Contai coastal plain represents a series of beach ridges, sand dunes, older tidal flats, beach plains and beach fringed sand dunes and low-lying alluvial tract bounded by Rasulpur, Haldi and Rupnarayan estuaries. This part of the coastal zone was formed as a result of geomorphic evolution during the mid-Holocene period about 6000 BP (Sahoo et al. 2014). Khadalgobra and Ramnagar canals drain the region and finally meets with the Bay of Bengal near Digha mohana. The Rasulpur River is located about 40 km east from Digha town near Nij Kasaba (Khejuri) and finally drains into the Hugli estuary. The beaches of this region are prone to marine erosion. Geographically, this vast coastal tract is characterised by a great geomorphic and environmental diversity in respect of landforms, soil texture, marine plants and animals (Das and Dandapath 2014).

Geology

The geological history of the coastal region is short and it is still in its formative state. Its current state is a result of fluvio-tidal and coastal processes happening due to the on-lapping sequence of Flanderian transgression 5900 BP and off-lapping sequence of delta progradation which happened till the stabilisation of sea level at around 3000 BP (Bhattacharya et al. 2003). The current coastal features have evolved as a result of different coastal processes like fluvial, tidal marine and also due to the local vegetations and human activities. The key geomorphic features of the region are estuaries, tidal flats/mudflats, sand beach, salt marsh, sand dunes, palaeodunes, inter-dunal depressions, neo dunes and salt-pans. As our current study area falls within the Contai coastal plain it is characterised by the presence of strand plain surfaces of Contai and Digha. During the Holocene period, this region saw a slow upheaval and successive shoreline regression, which further left a significant topographic impression of ancient marine features. The sandy beaches of the region Shankarpur, Chandpur and Junput are formed as a result of initial beach ridge formation and successive dune development by aeolian transport of fine sands from the dry foreshores. Mudflats are one of the most important geomorphic features of this study region. An extensive number of broad mudflats can be seen on the beaches of Shankarpur, Chandpur and Tajpur. All of these mudflats are sandy in nature with a fusion of sticky muddy clay. The mudflats of this region are formed as a result of low coastal gradient and gently shelving floor of the seaward prograding deltaic alluvial plain and the tidal range associated with high sediment influx (Paul 2003). In our area of study, most of the ceramic assemblage has been recovered from the mudflats.

Soil

Three types of soil are found in this region: alluvial soil, sandy soil and saline soil. The nature of the soil in this region is largely influenced by the local drainage system and the marine activities. Near the landform, the alluvial soil is very fertile in nature, therefore different types of crops mainly rice, vegetables are cultivated in this soil. The soil found in and around the sand dunes are generally devoid of organic matter. Just near the shoreline, the soil is of saline characteristic, which is a result of a constant influence of tidal water and salt pans (Das and Dandapath 2014).

Drainage

The Digha-Shankarpur canal runs from north to south keeping Old Digha in the west. The Jalda khal passes near Shankarpur. All of these are canals or tidal creeks through which the tidal water enters inland during tide and cyclones (Das and Dandapath 2014).

Previous Archaeological Field Research in the Region

Various archaeological fieldworks have been conducted in the adjoining region of our present

area of study. Previously an exploration was undertaken in the Egra and Balighai subdivision by a team from Department of Archaeology, University of Calcutta. This exploration led to the discovery of three Black and Red Ware sites. The name of the sites which were discovered during this exploration are Erenda, Kharai-Kotbar and Hatnagar (Basak et al. 2014). A large mound was found at the village of Erenda with a temple of Basuli on top of the mound. Later, Erenda was excavated by Kaushik Gangopadhyay in the years 2016 and 2017. The excavations at Erenda showed a presence of structures like hearth, pits and floors (Gangopadhyay et al. 2017). Recently the site was dated using the AMS (Accelerated Mass Spectrometry) dating method (Table 1). The protohistoric ceramic assemblage yielded from the excavation includes Black and Red Ware, along with Red Slipped Ware, Buff Ware painted in Red and Black. The early medieval potsherds yielded from the excavation includes Painted Grey Ware with linear lines on the body below the neck with black. The early historic ceramic assemblage consisted of Black and Red Ware and Red Ware. The other findings include bone, bone tools, stone tool debitage, metal objects, shells, etc. The site of 'Kharai-Kotbar' is situated in Kharuigarh which is on the Egra-Patashpur highway, a small mound with a section revealing three layers containing Black and Red Ware and Red Ware in in situ position. The site of 'Hatnagar' is located in the centre of the town near a late medieval temple. Black and Red Ware and Chocolate Slipped Ware along with some medieval potteries which were found within the premises of the temple located within the site (Basak et al. 2014).

Numerous researches have been conducted in the field of protohistoric archaeological research in Bengal. Excavations at Pandu Rajar Dhibi led to the discovery of Black and Red Ware for the first time in Bengal (Dasgupta 1965). Other important sites discovered from this upland region include sites from districts of Birbhum, Bardhaman, Bankura, West and East Medinipur. The important sites included Dihar, Tulsipur, Baneswar Danga, Nanur, Mangalkot,

Bharatpur, Mahisadal, Tamluk, Moghalmari and Natsal (Datta 1995). Birmingham (1972) marked Kansabati as the southernmost extent of Black and Red Ware culture. She believed that it was limited within the lower slopes of west 'Bhagirathi plateau' and within the tributary region of the rivers like Bakreshwar, Ajay and Damodar. The presence of Black and Red Ware found from Erenda and other discovered sites from the region like Hatnagar, Kharai-Kotbar, etc. clearly proves the extent of Black and Red Ware culture up to the coastal zone (Gangopadhyay et al. 2017). Black and Red Ware have been also found from different levels of Tamluk (Indian Archaeology – A Review 1954-5: 19-20, 1973-4: 32). It was found in association with Neolithic celts in Period I and with NBPW in Period II. In Natsal, Black and Red Ware has been found in Chalcolithic context (Datta 1997; Chattopadhyay et al. 2007; Gangopadhyay 2008). At Moghalmari, during the excavation a deposit of 1.48 m was unearthed from a single trench, yielding Black and Red Ware (Datta 2008).

Maritime Archaeological Researches in India

The coastal region has always been an important part of archaeological research in India. A large number of archaeological sites have been discovered near the shoreline and some of them have been excavated thoroughly. The coastal sites of Saurashtra, Maharashtra and Tamil Nadu have been the main focal point of marine archaeological researches in India as the sites along the coastline have always indicated a prevalence of a flourishing maritime practice in India. For last two decades, many marine archaeological researches have been carried out at sites like Dwarka (Ansari and Mate 1966; Rao 1988 and 1990; Vora et al. 1991; Gaur et al. 2000; Tripati et al. 2003b), Somnath (Rao et al. 1992; Gaur et al. 2002a, b), Vijaydurg (Apte 1973; Tripati et al. 1998a, b), Malwan (Apte 1973; Tripati and Gaur 1997), Goa (Tripati et al. 2001; Tripati et al. 2003a, b), Lakshadweep islands (Sharma and Khan 1994; Tripati 1999; Gaur et al. 1998;

Trench	Lab code	Depth (cm)	Layer	Dig	Median calendar age (cal BP), 2 sigma
ZA1	IUACD#17C1305	26	2	3	126
ZA1	IUACD#17C1304	122.5	4	19	2593
ZA1	IUACD#17C1303	130.5	4	20	2899
Al	IUACD#17C1317	45	2	2	1580
Al	IUACD#17C1316	160	3	17	2581
Al	IUACD#17C1315	160	3	17	3929

TABLE 1: AMS Dates obtained in two trenches of Erenda, East Medinipur district, West Bengal (Naskar et al. 2018)

Tripati and Gudigar 2001), Poompuhar (Vora 1987; Soundar Rajan 1994; Tripati et al. 1996), Mahabalipuram (Sundaresh 2003), Chillika and its adjoining regions, Machilipattanam, Kalingapattanam, Rameswaram coast, Calicut, Beypore, Mangalore, Honavar, Bhatkal, Ratnagiri, Dhoval, Chaul, Janjira (Tripati et al. 2004). In Saurashtra coast, ancient ports have been located near the tidal creeks and other archaeological findings have indicated a strong maritime activity in the past placing Saurashtra as an important region for the reconstruction of maritime history in India (Gaur and Bhatt 2008).

Observation

Field

SHANKARPUR: The site of Shankarpur (Plate 3) (21°38′12.11″ N and 87°34′30.91″ E) is located on the eastern side of the Digha seabeach. Scattered, slightly elevated mudflats embedded with potsherds can be observed all over the site. Fragmented potsherds can also be found on the sandy surface of the seabeach and even within the sections along the seashore. Presently, this seabeach is a hub of tourist attraction and the eastern part of this seabeach is being used by locals as a cremation ground. These scattered mudflats are located more or less in 30 m distance from each other and the length of these mudflats vary from 2.5 to 6 m, whereas the width of the mudflats vary from 3 to 4.5 m. The ceramic

assemblage found embedded within the mudflats is composed of Black and Red Ware, Reverse Black and Red Ware, Black Slipped Ware, Grev Ware, Red Slipped Ware, Buff Ware, Red Slipped Ware and Red Ware with paddle and basket impressions. The pottery density increases nearer to the shoreline. The soil of the mudflat is sandy, loamy, sticky in nature and olive-brown in colour. The soil of some of the mudflats also shows a grey and reddish texture. However, the natural section along the seabeach is composed of sand and has a yellowish-brown texture (Plate 4). The channel of 'Naikani Khas' flows parallelly along this seabeach and connects directly to the sea. The village of Lachimpur, located right on the seabeach near the channel, is currently used as a hub for local dry fish farming.

CHANDPUR: The site of Chandpur (21°38′34.10″ N and 87°36′9.90″ E) is located in between the seabeach of Tajpur and Shankarpur, adjacent to the village of Chandpur (Plate 5). The presence of numerous mudflats with embedded potsherds also can be located on this seabeach. The length of the mudflats is 3–6 m and the width of the mudflats is 1.5–2.5 m. Like Shankarpur, scattered potsherds can also be observed on the sandy surface of the seabeach. The ceramic assemblage found embedded within the mudflat is composed of Black and Red Ware, Reverse Black and Red Ware, Black Slipped Ware, Grey Ware, Red Slipped Ware, Buff Ware, Chocolate Ware and Red Ware with paddle and basket impressions.



PLATE 3: A general view of the mudflats at Shankarpur



PLATE 4: A view of the natural section along the seabeach of Shankarpur



PLATE 5: A general view of the mudflats at Chandpur

Like Shankarpur, here also the density of the potsherds increases near the shoreline. The soil of the mudflats is sticky and sandy in nature and olive-brown or greyish in colour. A large part of the seabeach is presently covered with boulders for protecting the sea line and also for saving the area from natural disasters like cyclones. The natural section located within the nearby village of Chandpur shows identical soil texture like the mudflats found along the seashore.

TAJPUR: The site of Tajpur (21°38′42.11″ N and 87°37′1.37″ E), is located just adjacent to the site of Chandpur (Plate 6). Like, Shankarpur and Chandpur, this site also displays a large scatter of mudflats embedded with potsherds (Plate 7). The ceramic assemblage observed here represents identical characteristics like the two other sites. A large part of this site is badly disturbed due to modern human activities. The western part of this seabeach has been dug recently for modern construction activities. This dugout

area unearthed similar ceramic scatters as found within the mudflats of the shore.

Ceramic Study

The preliminary assessment of the sherds from the sites demonstrated a long cultural haul, starting from the Chalcolithic period and continuing till the early medieval period. As these newly discovered intertidal sites have no proper context, associating the potteries with a particular cultural period becomes problematic. So, a comparative study with the chronologically predefined archaeological sites is the only tool for understanding the ceramic repertoire of the region. Some potsherds specimens recovered from these newly discovered sites show a strong synergy with the potsherds found from the early historic phase and early medieval phase of Bahiri. The Red Ware samples recovered from Shankarpur and Tajpur show a distinct similarity with the Red Ware sherds found from the early historic phase from Bahiri. The presence of paddle impressions



PLATE 6: A general view of the mudflats at Tajpur

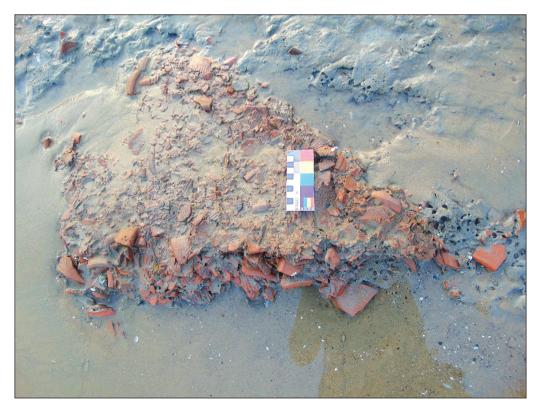


PLATE 7: Image of the potsherd cluster embedded within a mudflat at Tajpur

and grooves are very common in Red Ware, Red Slipped Ware, Black Slipped Ware and Grev Ware sherds found from the early historic and early medieval phases of Bahiri. Identical paddle impressions can be also observed in Red Ware and Red Slipped Ware sherds obtained from the present study area. These newly discovered sites also demonstrate a distinctive similarity with the Chalcolithic sherds from Erenda. Few Black and Red Ware samples found from Shankarpur shares similarity with Black and Red Ware samples found from the Chalcolithic level at Erenda. The site of Tajpur vielded a Red Ware lid, whereas, presence of lids appears as a prominent shape recovered from the early medieval phase of Bahiri. The potsherds from Bahiri, Erenda and these newly discovered sites have a sturdy trait, which marks their utilitarian nature. Some of the Red Ware and Black Slipped Ware sherds found from these sites are very coarse in nature because they have a large amount of sand temper present within them. The Red Ware sherds found from all three sites have a prominent basket and paddle impressions on their external surface. The ceramic assemblages of all the three sites (Table 2) are dominated by Red Ware body sherds, other than this, a good amount of Black Slipped Ware rim have been recovered from the site of Chandpur. The colour of the red slip varied from light red to dark pinkish-red. In the large 'handi' specimens found from Shankarpur, the slip was applied to both the surfaces and the presence of wash is very prominent in them. In some sherds, the wash is almost coming off on the hand. Most of the samples coming from

these three sites show a very thick slip, which can be well understood from the section of the vessels. All of the Red Ware samples were fired under oxidising conditions. The presence of carination and groove can be observed in most of the Red Ware and Black Slipped Ware samples. More or less, all the samples found from these sites show a strong presence of striation marks, which indicates an excessive use of wheel, mostly slow wheel during manufacture. Few handmade samples of Red Ware were also found from the site of Chandpur. The diagnostic shapes found from these three sites are Red Ware globular pots with in-turned beaded rims, Black and Red Ware large bowls with rounded rims, Red Ware handis with carinated neck and out-turned collared rims, Black Slipped Ware jars with splayed and featureless rims. They are all of burnished and unburnished varieties. One specimen of Black Slipped Ware channel spouted bowl found from Shankarpur has shown much affinity with the Black Slipped Ware channel spouted specimens found from the disturbed context at Erenda (Gangopadhyay et al. 2017). One specimen of minutely incised Black Slipped Ware rim has been recovered from the site of Tajpur. One fragmented piece of Red Ware dish-on-stand also has been recovered from the site of Tajpur. The Red Ware sherds showed better finish and texture than specimens of other wares found from the site. There were great variations in the surface treatment of Red Ware and Black and Red Ware sherds. Black and Red Ware samples found from Shankarpur are rounded or semirounded as a result of some kind of short or

TABLE 2: Quantitative data of the potsherds found from the sites

Name of the site	Total number of potsherds found from the site	Red Slipped Ware	Red Ware with paddle impressions	Red Ware with basket impressions	Black and Red Ware	Black Slipped Ware	Buff Ware
Shankarpur	68	16	12	13	9	15	3
Chandpur	47	13	8	7	4	11	4
Tajpur	55	15	10	12	6	12	NA

long transportation and few sherds have postdepositional marks too. Reverse Black and Red Ware and Buff Ware samples were also found in these sites and they show much affinity with the ones found at Erenda. Most of the Black and Red Ware potsherds found from Chandpur are manufactured through an inverted technique of manufacturing as the black slip extends across the black surface and gets mixed in the red inner surface. The Black Slipped Ware samples from these three sites have a greyish black core and it is porous in nature signifying some kind of uniform firing. The Red Ware specimens found from all the sites are large in size, indicating some kind of community cooking (Plate 8).

Discussion

The discovery of the intertidal archaeological sites on the coastline of Bay of Bengal has now thrown light on the earliest traces of occupation in this region, which was always considered of marginal significance in the past and also opened vast possibilities for future archaeological research in the region.

Archaeological sites in the coastal region play an important role in defining the ancient palaeoshoreline of a region. The coastal area always has created a conducive environment for human settlements since prehistoric period to present and the change of shoreline has a direct effect on the stability of the settlement (Sundaresh et al. 2017). An extensive shoreline change has been noticed in the coastal tract of East Medinipur as a result of heavy erosional activities in the shore due to rapid longshore sediment transport (Plate 9). Application of Geospatial technique will be conducive for understanding the ancient shoreline of the region and the effect of sea-level change in human settlement along the shore and its relation with the other inland sites.

For a contextual understanding of the site a detailed study of the site formation process is very important. The coastal region has always witnessed a different type of human adaptation throughout ages. Ceramic assemblages found

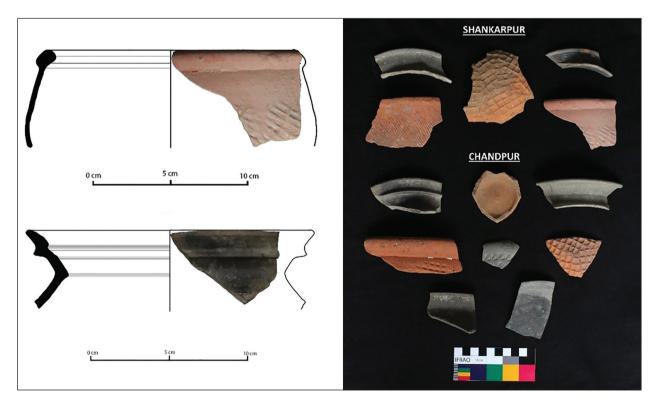


PLATE 8: Characteristic shapes found from the explored sites

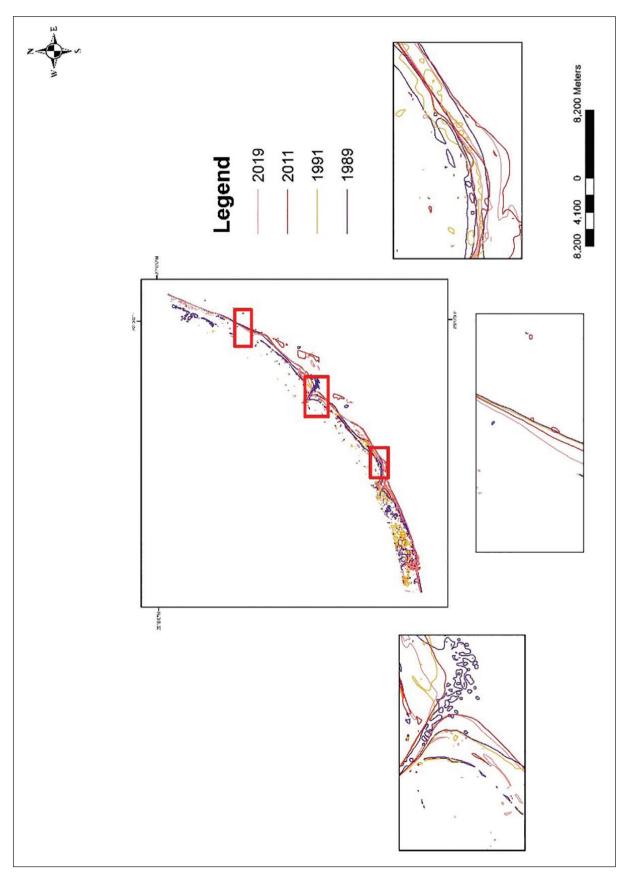


PLATE 9: Shoreline change along the East Medinipur coast of Bay of Bengal¹

within the mudflats of Shankarpur, Tajpur and Chandpur belong to different cultural periods. So, for the proper site chronology and for understanding the human-environment relationship in the region, it is very important to use absolute dating methods, e.g. OSL (Optically Stimulated Luminescence). As no organic remains was recovered from the mudflats till date, there is a limitation in using AMS (Accelerated Mass Spectrometry) or conventional dating methods. Ceramic samples found from the above coastal sites demonstrate a certain amount of roundness as an effect of constant transportation through the water in natural sedimentary environments. Here we can apply Allen's (1989) method of estimating the roundness of the transported sherds as a tool for a proper understanding of the nature of transportation and the site formation process. While working at Seven Estuary, Allen (1989) applied this method on the transported potsherds. The Red Ware sherds from Shankarpur and Chandpur demonstrates bioturbation marks. A detailed analysis of these bioturbation marks can help in developing a thorough idea of proper site use and the effect of man-induced changes in the site formation process of the region.

After the preliminary assessment, it has been found that some potsherd specimens from the assemblage have a similarity with the pottery found from the early historic site of Bahiri and the newly excavated Black and Red Ware site of Erenda. The synergy of ceramic characteristics signifies some amount of local interactions between these sites through different cultural periods. A large amount of Red Ware sherd with paddle impressions has been found from the site of Shankarpur and Tajpur. The early historic phase at Bahiri has also yielded potsherds with paddle impressions in Red Ware, Grey Ware and Black Ware. This kind of paddle impressions in sherds are very common in the entire eastern coast of India and can be also found in large numbers in Southeast Asian countries (Tomber 2008). Potsherds recovered from the site of Shankarpur, Chandpur and Tajpur are indicative of some level of coastal contact during early historic and early medieval periods. Potsherds found by Mukherjee (2019b) have shown affinity with some specimens yielded from Bahiri (Gangopadhyay and Chatterjee 2019) and Mahasthangarh (Lefrancq 2019). Moreover, these Tajpur sherds have also shown close affinities with some specimens found from Southeast Asian countries, especially Sumatra. She connected these sherds with Srivijaya dynastic period and questioned about a potential linkage and diffusion. A 780 BCE Nalanda inscription refers to the Srivijaya trade in Bengal. In between seventh and eighth century BCE, the Srivijayas maintained a strong trade relationship with the coastal sites of Bengal. The geocultural unit named 'Samatata' became the main area of their activity. The ancient port of Tamralipta (now known as Tamluk) connected them with the other commercial units located in the middle Ganga valley. Due to political turmoil this trade relation declined around eighth century (Mukherjee 2019a). Interestingly, early historic ceramics from Bahiri has a close affinity with the ones found from Tamluk and on the other hand, ceramic repertoire from currently explored sites demonstrates a strong affinity with the sherds recovered from the early historic and early medieval phase from Bahiri. This type of ceramic affinity calls for a potential linkage between the coastal sites over a long period of time. A more detailed study of the stylistic patterns of the potsherds from our study area and comparative study with the other sites of the coastal region is necessary for a proper understanding of the linkages and the transmission routes. It is evident from the above scenario that the coastline of East Medinipur not only had close contact with other coastal sites it also had some kind of linkages with the countries from Southeast Asia. The coastline of East Medinipur district shows a strong possibility to grow as a distinct region for maritime archaeological research in the course of time.

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Note

1. The shoreline change map (Plate 9) used in the current archaeological research is showing the rapid shoreline change that happened in the East Medinipur Coast of Bay of Bengal for the last 15–20 years. Remote Sensing Technique has been used for demonstrating the rate of shoreline change. Satellite images from the years of 1989, 1991, 2011, 2019 have been used for the process and finally, image transformation was done through ArcGIS software.

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