

Faunal Remains from the Peats at Baghia-Chanda *Beels* of Gopalganj and Khulna Districts of Bangladesh

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Abstract

Archaeological remains in Bangladesh have been found from the Prehistoric to the Colonial period. Among these, the architectural remains of the Early Medieval period are the most predominant. In Bangladesh, although a number of sites have been excavated since the beginning of the last century to the present day, a majority of them were monumental sites. The flora and fauna from the archaeological sites were never collected by archaeologists due to the lack of awareness about their potential. Another reason often cited is the acidic deposit which makes preservation of biological remains difficult. Nevertheless, a decade ago faunal remains were found from the Bengal Delta. With changes in the archaeological perspective, these remains have gained much prominence. This paper mainly focuses on the faunal remains recovered from the peat deposit of Khulna-Gopalganj *beels*. In this peat deposit remains of wild animals like elephant, gaur, wild buffalo, deer have been found. Elephant and gaur are now extinct from this area, and wild buffalo is completely extinct from Bangladesh. Available palynological data helped in reconstructing the past environment as pollen are preserved better in acidic deposit, and the radiocarbon dates of the peat deposit dated these faunal remains to the Early Medieval period. Historical evidence of Gupta and post-Gupta period like copper plate inscriptions and gold coins were also found.

Introduction

Bangladesh has a very rich culture and a glorious past evident in the archaeological remains found from the Prehistoric to the Colonial period. Among these, remains from the Early Medieval period are predominant. These records comprise of the architectural remains mostly temples and monasteries depicting Hindu and Buddhist pantheons. Temple architecture is very simple and small, whereas Buddhist monasteries tend to be larger in size, like a complex of Buddhist monuments that possess outstanding architectural styles. Buddhist art and architectural remains reveal the practice of a later phase of Buddhism, i.e. *Vajrayana*. This theological development of Buddhism flourished in Bangladesh as early as 6th-7th century CE and lasted till the 13th century CE. During this phase of Buddhism, Buddhist architecture developed a unique architectural style different from that found in the rock-cut caves of Western Ghats. The *Vajrayana* style was generally practiced in Early Medieval Bengal and influenced the Buddhist architecture of South-East Asia too. Although a number of such religious edifices were excavated to unveil the architectural features, yet the excavators never collected the flora and fauna due to lack of knowledge or awareness about the potential these biological remains could add to the history of the region. Consequently, the data on biological remains is thus permanently lost and makes

it impossible to reconstruct the environmental history of Early Medieval Bengal with authenticity. Besides, due to acidic deposit, zoological and botanical remains do not get preserved for a longer period and as a result zooarchaeological or archaeobotanical studies are difficult to conduct in Bangladesh. However, a few sporadic occurrences of ancient bones from Bangladesh were studied and a preliminary analysis was conducted to understand the essence of the ancient environment (Pawankar 2007).

Bangladesh is a riverine, tropical low-lying country covering an area of 147,570 km² surrounded by Indian states on the east, west and north, and the Bay of Bengal on the south. Geologically there are three formations: 1) Tertiary sediments cover an area of northern and eastern hills of Bangladesh, 2) Pleistocene formation covers Madhupur and Barind Tracts and 3) The recent alluvium occupies the remaining part of the country that is the flood plain and the estuarine areas formed by the mighty rivers like Ganga, Meghna and Brahmaputra river system. This developed the world's largest delta in the Bengal Basin covering an area about 40,225 km² (Rashid 1977; Khan 1991 and Brammer 1996). Present attempt is focused on the faunal remains recovered from the peat deposit at Baghia-Chanda *beels* of Gopalganj District in the deltaic area. Peat deposits in Bangladesh are mainly found in Sunamganj, Sylhet and Moulvibazar districts in North-East part of Bangladesh, Brahmanbaria District towards the Eastern part of Bangladesh, Dhaka District in the Central part of Bangladesh and Satkhira, Khulna, Gopalganj, Madaripur, Pirojpur, Patuakhali

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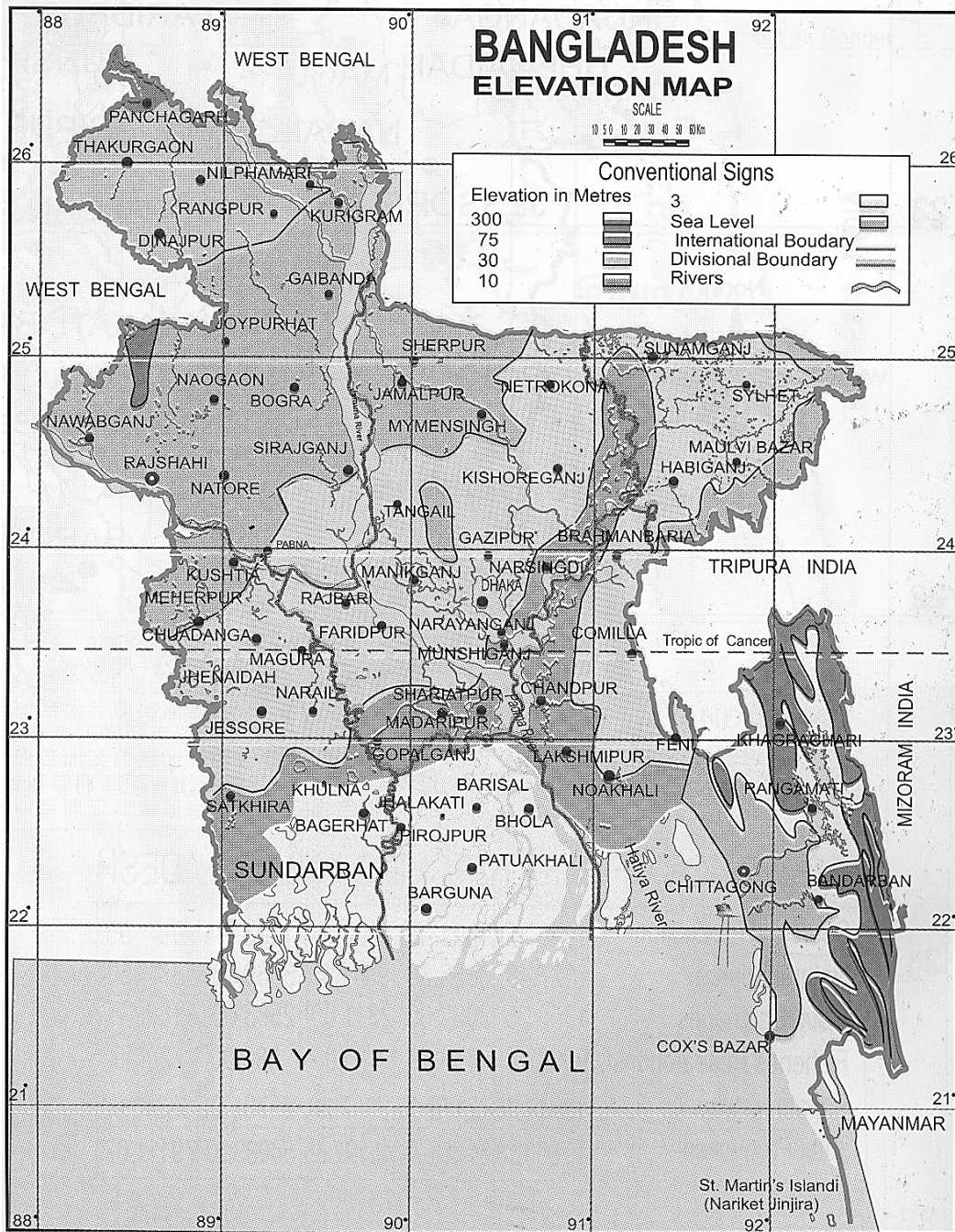


Fig. 1: Elevation map of Bangladesh (Source: Digital Atlas 2004 by M.N. Bhuiyan Mazed)

and Barisal districts of Southern part of Bangladesh. The Bengal Basin appears as an inverted funnel shape, wider towards south and narrower towards the northeast. In the Basin comprised of swamps and marshy land, this peat deposit developed since the mid-Holocene period. Available ¹⁴C dates for these peat deposits are from 800-8000 BP. Peats in Bangladesh were studied by a numbers of scholars as one of the most important mineral sources (Brammer

1996; Maitra *et al.* 2014; Masum and Khan 2015; Masum *et al.* 2014; Haque *et al.* 2013) (Figs. 1-2).

Peats from the Bengal Basin have been studied by different scholars from India and Bangladesh to understand the changes in sea level, ecosystem, climate change and also the mineral sources. Among these peat deposits, the author's main focus is only on the peat deposits of Khulna, Gopalganj and Madaripur districts where faunal remains

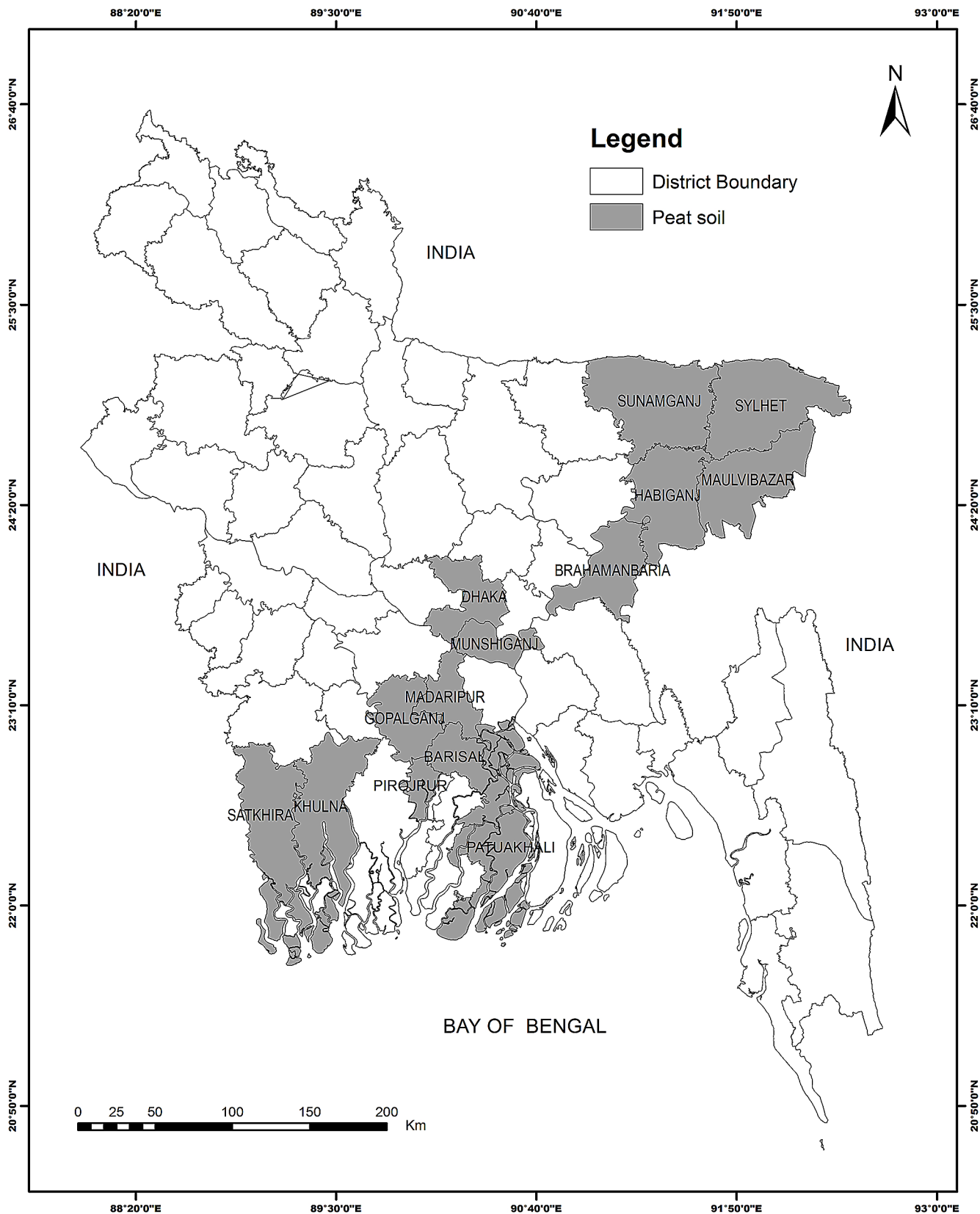


Fig. 2: Distribution of peat formation in Bangladesh (Map prepared by Ajmeri Afrin)

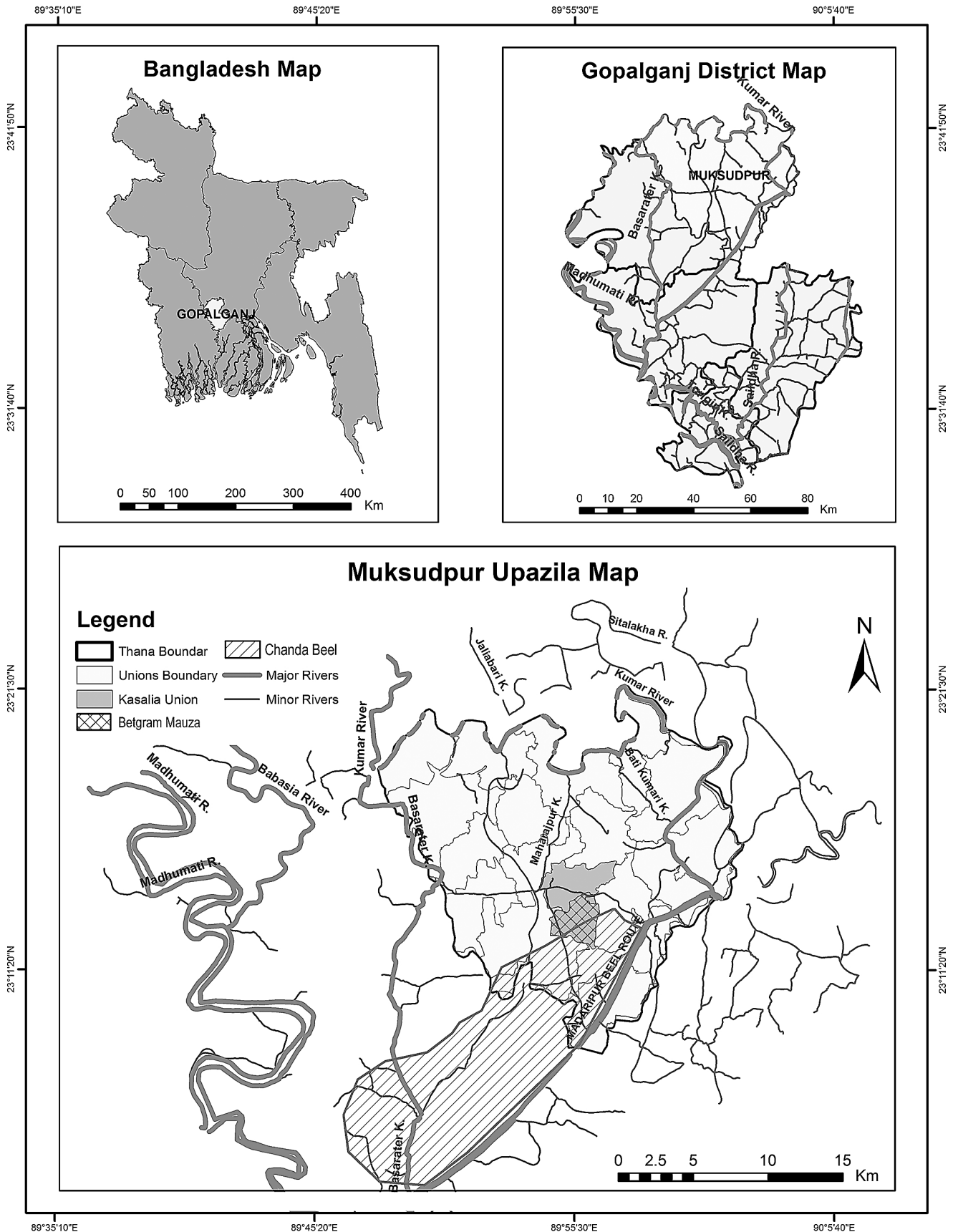


Fig. 3: The study area of Chanda beel (Map prepared by Ajmeri Afrin)

were profusely found at Baghia-Chanada *beels*. These *beels* are on the Madhumati river bank. This region has the largest peat deposit in the country covering an area of 320 km². It occupies low lying areas between the Ganges River floodplain and the Ganges tidal floodplain (Khan 1977). During the rainy season from May to November, the *beel* area submerges completely under water. Water level rises around 2.5 to 4 m in height. In this *beel* area, thick peat deposits ranging from 1-2 m in thickness are found at the depth of approximately 2-3 m below the surface. The peats are an accumulation of decomposed or partially decomposed organic matter in the soil. It is usually black or dark brown, fibrous, and containing plant remains. The degree of decomposition of organic matter in peat varies from place to place (Brammer 1996). Essentially animal bones widely occur in the peat deposits of Gopalganj-Khulna *beels*. In winter season, from January to May, the region is dry and during this dry season villagers start cutting natural lakes for soft coal from the peat and use it as a fuel and fertilizer. During the excavation of these natural lakes, villagers occasionally come across the faunal and floral remains from the peat deposits. At Betgram village, Kasaliya union, Moksedpur police station of Gopalganj District, villagers collected a lot of complete and incomplete bones from these natural lakes (Fig. 3). Villagers have the misconception that there is some mystical and supernatural energy in these bones and, therefore, they worship these bones and refuse to handover them for academic research. It is necessary to mention here that during our field visit it was observed that a householder was worshipping a skull of a gaur as though it was the remnant of their god. Nevertheless, a few specimens were collected during the field visit. The records are documented and identified at the species level to understand the species present in the faunal assemblage of this peat deposit.

Islam (2001) has studied the stratigraphy and pollen from the Khulna-Gopalganj region based on boreholes data to understand the sea level changes in this area. He recorded the data of 23 boreholes from Panigati, a site located about 12 km north-east of Khulna city. Borehole data revealed that the five peat layers were separated by organic silty-clayey sediments (Islam and Tooley 1999). These peat beds are the remnants of the herbaceous plants. The major components of peat deposits are herbaceous rootlets (*turfa*) and wood fragments (*Detritus lignosus*) of mangrove species. Plant remains like grasses, sedges and rushes that grow in freshwater marshy lands reveal that the peat layer developed in a freshwater swampy environment. Core samples at Panigati were also used for the pollen analysis. Palynological studies of the peats from the lower level reveal the den of mangroves with herbaceous plants and indicate the brackish to fresh water terrestrial ecosystem. The pollen from the lowest peat layer at the depth of 855-690 cm reveal the dense mangrove forest, and the upper part of this peat the pollen of a large number of herbaceous plants

and fern species with mangroves indicate the increase of freshwater influence and terrestrial ecosystem. Pollen from the upper most peat and peaty clay layer at the depth of 385-340 cm are characterized by high frequency of herbaceous pollen indicating the freshwater terrestrial ecosystem which is evident by high frequency of large and small Gramineae pollen pointing out the open grassland together with large number of ferns. Samples were collected at the depth of 351-357 cm for radiocarbon date. Radiocarbon date available is 1210±80BP (1095 BP). Pollen analysis of five peat layers at Panigati reveals that peat developed because of marshy swamps that existed in the brackish and freshwater conditions (Islam 2001).

To support the view of fresh water peat composition, the ancient river system needs to be discussed. The knowledge of the river system of Bengal Basin in the Quaternary period is very poor. Rivers like Padma, Brahmaputra and Meghna are the major rivers of the present river system of Bangladesh. These rivers changed their courses time and again. The known last major change took place in 1897 due to an earthquake which suggests the present flow of these rivers was just a century back. We do not have adequate data about the river system or ecosystem of those periods to understand the past environment. Therefore, it is very difficult to focus on the peat environment of those periods more correctly. However, Chanda *beel* is located on the banks of River Madhumati, a tributary of River Ganges. This *beel* developed in the flood plain of the distributaries of the Ganges, i.e. the Ariyal khan, Kumar and Madhumati. In Bangladesh the mighty River Ganges has many tributaries and distributaries in this region such as the Garai, Madhumati, Ariyal khan, Kumar and many other large and small channels before it discharges its water in the mouth of River Haringhata. Eastwards of River Haringhata, several fresh water swamps and forests are seen. We do not have an exact date when these tributaries and distributaries were created by the River Ganga, however, through this system, the mighty Ganges mainly developed flood plains, fresh water swamps and forest in this area, which was an ideal living ground for the wild animals in the past.

Pollens from the peat layers at the lower level show the mangrove forest and the pollens from the upper level peat layers indicate the freshwater swampy deposition. It is important to note here that the pollen of the Sundari tree was recovered from each peat layer. Roots of Sundari can tolerate the brackish water but it grows and attains its full height on the banks of sweet and fresh water in large quantity. Sundari associates with the species like *amur* (*Amora cucullata*), *gewa* (*Excoecaria agallocha*), *dhundhul* (*Carapao bovata*), and *baen* (*Avicennia officinalis*) (Bari 1978). However, the findings of pollen of Sundari and other associated species cannot be concluded as a brackish water peat formation. It is true that these plant species are presently found in the Sundarbans, a mangrove forest existing in the coastline of Bangladesh and West Bengal.

This forest was named Sundarban because of the forest of Sundari trees. But presently, the Sundari and the associated species are largely disappearing due to human interference and the Sundarbans is exclusively composed of mangroves (Bari 1978).

From the peat deposit, the faunal species identified are elephant (*Elephas maximus*), gaur (*Bos gaurus*) wild buffalo (*Bubalus arnee*), spotted deer (*Axis axis*) and fresh water turtle species. These faunal remains are dark black to brown in colour due to the peat deposit. The bones of these wild herbivores did not have any marks of human activities like butchering marks, cut marks, or charring marks. These bones were not used for making tools and the animals were not hunted. Bones were complete but got fragmented due to hitting of digging tools while cutting into the lakes and also became fragile due to sunlight exposure. In all circumstances, it indicates that this was the natural habitat of these animals and the remains can help us to reconstruct the past environment, to understand the past and present distribution of these animals and causes of their extinction. Described below are the following species so far studied and recorded from these peat deposits.

Elephant

Villagers of the locality collected all regular and irregular, long and small skeletal parts of the elephant while cutting natural lakes in the swampy areas. The skeletal remains were intact in the peat deposit but due to their lack of knowledge they collected skeletal parts instead of the complete skeleton. Based on the collected parts it was observed that the villagers had gathered bones of more than 3-4 elephants from different lakes and kept them in their homes. From this assemblage some bones were reused by the villagers; for example in one of the lakes women were found

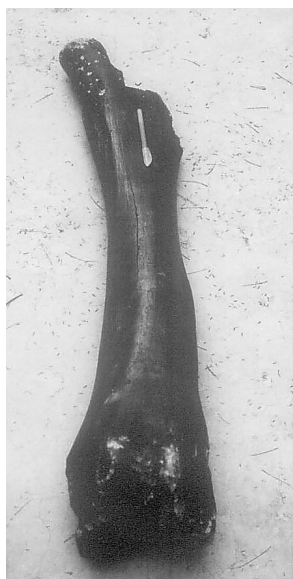


Fig. 4: Femur of an elephant



Fig. 5: Mandible of an elephant

washing clothes on the forehead of an elephant skull. This large and heavy elephant skull was fixed in the peat with its wide forehead exposed and used for washing clothes. Later on this skull was destroyed completely. Bones were found from the lakes approximately at the depth of 4 to 5 m. Other than the village, bones were also housed at one of the local schools, under the custody of Bangladesh Centre for Advanced Studies and a few bones were shifted to the IUCN (International Union for Conservation of Nature) office, Dhaka. A few vertebrae are now housed in the Zoo-archaeology Laboratory of the Department of Archaeology, Jahangirnagar University (Figs. 4-5).

Elephants live in hilly, undulating areas and in bamboo forests. In the dry season they live in much denser forests and come out into the open spaces during the rainy season (Prater 1971). As this animal migrates in herds; therefore, they inhabit a variety of tropical forests from humid evergreen low land forests to dry deciduous to cooler mountain forests. They prefer the low land forests and grasslands. They also need large amounts of water for drinking and cooling their body. At present, the natural habitat and the migration route of the elephant is on the hilly forested area of southeast and northeast of Bangladesh. This species is critically endangered due to human interference in their habitat (Motaleb *et al.* 2011).

Gaur

Skeleton of this animal has also been partly collected - skull, tibia, atlas and lumber vertebra, from a depth of nearly 2 m. Due to peat deposits the bones were black in colour. These remains were kept in the house of one of the villagers named Bijiten Mandal since he found these bones in the lake. He kept the skull and other bones of Gaur in the place of worship. His family and others worshipped this skull every day with flowers and vermilion as the remains of Mahishasur of Mahishasurmardini (Fig. 6). The Gaurs have the habit of salt licks and spot the ground where salt is available along with other minerals (Prater



Fig. 6: Skull and other bones of the gaur

1971). Here also the area has salinity, but it is now extinct from this area.

Wild Buffalo

Bones like skull, mandibles and atlas vertebra collected from the lake of Yuddhishtir Mandal. Skull is fragmented. Only frontal, occipital and the horn cores were complete. Bones were brownish in colour and not black in colour as noticed in case of the gaur and elephant bones. Right mandible was collected from villagers and preserved in the Zooarchaeology lab of the Department of Archaeology, Jahangirnagar University (Figs. 7-8).

Wild buffaloes like to stay in swamps and tall grass jungle (Prater 1971).



Fig. 7: Skull, mandibles and atlas vertebra of a wild buffalo



Fig. 8: Mandible of a wild buffalo

Spotted deer

Deer bones were also collected from lakes and identified. This animal prefers the open grassy forests (Prater 1971).

Turtle

Only carapace of the fresh water turtle species found from the Betgram village. Very recently some more skeletal parts of appendicular and axial skeleton of Gaur, wild buffalo and elephant were found from Betgram village in Gopalganj District.

Radiocarbon dates are available for this peat formation. Peat sample from the Gopalganj-Khulna *beels* from the depth of 76 cm was dated to about 800 years BP (Brammer 1996). From Panigati the available radiocarbon date from the core sample at the depth 351-357 cm is 1210 ± 80 BP (1095 BP) (Islam 2001). The remains of herbivorous animals like elephant, gaur, and wild buffalo, etc. from the peat are approximately at the depth of 180-360 cm in Gopalganj *beels*. This peat deposit could be comparable to the uppermost peat deposit (385-340 cm) at Panigati where herbaceous pollens indicate the freshwater terrestrial ecosystem with open grassland. This could be the habitat of these animals found. Besides the animal remains, the presence of a large number of buried trees, roots, and cortex of stems, etc. indicate submergence of the forests. Therefore, the animal remains found in Chanda *beel* could be put into 800-1200 BP time bracket. The radiocarbon date of the lowest peat layer at the depth 840-842 cm is 5980 ± 60 BP (6850 BP) and that at 999-1000 cm is 8210 ± 60 BP (Islam 2001).

Remains of animals found in the peat deposit are all herbivores; lived in tall grass lands with fresh water environment. None of these remains reveal any marks of human activity. It appears that this peat deposit might have once been the habitat of elephants, gaurs, deers and wild buffaloes, and the remains of a large number of buried trees, roots, cortex of the stems, etc. indicate the submergence of the forest along with the grazing animals. Presently, the habitat of wild elephants and gaurs are found from sea level to hill. They are still present in the southeast and

northeast hills of Bangladesh but they are not present in the Bengal Basin. The remains of elephants from different lakes of Chanda *beel*, and also found from the neighbouring District Satkhira, suggest that this area could have been the natural habitat or migration route of these animals that might have been totally abandoned due to submergence of forests during that time. Remains of elephants found from the Satkhira are nearly 50 km east of Kolkata. Similar peat deposits have also been found at Kolkata in West Bengal but no record of faunal remains appear. Pollen from this peat deposit have also been studied and indicates that the freshwater environment persisted in this area in ancient times (Vishnu-Mittre and Gupta 1972). Probably it could be migration route for the elephants from Jharkhand to southwest of West Bengal and continued to southeast of Bangladesh by keeping a track on the changing behaviour of Ganges tributaries and distributaries. A decade ago, an elephant from Jharkhand sanctuary crossed the political border of India and entered into Bangladesh and reached up to Narail District, very next to Gopalganj District and close to the coastal forested area. If forest authorities of India and Bangladesh would not have interrupted its path, very soon the animal would have reached the natural habitat of this region as their predecessors did long back. However, during the short visit the elephant would have crossed several major and minor channels of the Ganges which suggest water bodies are not a problem for animal migration.

Remains of wild buffaloes are obvious in the swamps, their presence reported in the district gazetteers of Khulna and Faridpur (Khan 1977 and Bari 1978). However, now the wild buffaloes are completely extinct from Bangladesh, and the elephant and gaur are in the list of critically endangered species in Bangladesh (IUCN report 2015).

Historically this area is very significant. Traces of political activities started in this region from post-Gupta period (circa 6th century CE) onward. Ruins of Kotalipada (Kota means fort in Bengali) mud fort on the left bank of River Ghaghar and 28 km southeast of Gopalganj city, is the remnant of an ancient political establishment. The fort is now in dilapidated condition. However, it was rectangular in shape and height of the mud walls were above flood level, i.e. approximately 5-7 m high and 65 to 80 m wide. The fort was surrounded by a moat and a small branch of the Ghaghar river flowed through the fort. Five copper plates and a few gold coins were recovered from Kotalipada fort and neighbouring villages. These copper plates reveal that Gopachandra, Dharmaditya and Samachardeva ruled in this Vanga region from 6th century CE, while Samachardeva was an independent ruler. The gold coins also show the features of post-Gupta characteristics (Banerji 1911; Bhattasali 1929 and Zakaria 1984).

Historical facts do not provide any clue on peat deposit of this region. Faunal and floral remains from the peat deposit of Gopalganj-Khulna *beels* reveal the submergence

of forests long before the political establishment, and the period can be assumed to be an early part of the Early Medieval Historic period. During this time the area had a fresh water terrestrial ecosystem with open grasslands and that was the natural habitat of herbivorous animals like the elephant, gaur, and wild buffalo, etc.

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