

# SUBSISTENCE STRATEGIES OF THE CHALCOLITHIC PEOPLE OF WEST BENGAL : AN APPRAISAL.

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## ABSTRACT

*This paper compares four Chalcolithic sites in West Bengal with respect to their patterns of animal and plant exploitation. It is suggested that reliance on domesticated animals was more important for those communities that were located in semi-arid regions of dry farming, as opposed to the more agriculturally based communities on the alluvial soils. Bharatpur and Mahisdal were both located on laterite soils, whereas Pandurajardhibi and Mangalkot were located on alluvial soils.*

## INTRODUCTION

The fragmentation of the Harappan Civilization around 1750 BC led to the development of a number of village farming communities largely occupying the major alluvial plains of India. These early agricultural communities were characterized by regional identities, but agriculture seems to have served as a common link between them. The pottery of these early agricultural people was Black and Red Ware, which occurs in a variety of cultural contexts (Agrawal 1985). But, in sharp contrast to this development, there were also many isolated pockets where people continued to pursue their age old hunting/gathering practices.

By the middle of the 2<sup>nd</sup> millennium BC, the south-western part of West Bengal, comprising the districts of Bankura, Midnapur, Burdwan, Birbhum, Purulia and Murshidabad, was effectively colonized by Chalcolithic agricultural communities. Many articles have been published on these communities in the past 40 years, for instance by Dasgupta (1964); Chakraborty and Hassan (1982, 1983); Ghosh (1984); Ray (1990, 1991); Ray and Mukherjee (1993); Datta (1981, 1989, 1990a, 1990b, 1991, 1995, 2001); and Nag (1987). This paper attempts to understand the subsistence economy of the Chalcolithic people on the basis of the archaeobotanical and archaeozoological remains found in excavations.

Four important Chalcolithic sites are selected for analysis; Mahisdal, Bharatpur, Pandurajardhibi, and Mangalkot. These sites lie on the western plain of Bengal (Fig. 1), where there are two distinct geomorphological units consisting of laterite and alluvium, the latter having

older and newer formations. The laterite belongs to the upper Lalgah formation, which consists of redeposited boulder conglomerate sediments of the lower Lalgah formation. The laterite soils are generally poor in nitrogen, phosphorus and humus, and therefore are only marginally suitable for cultivation.

The alluvium developed over the Lalgah formation is a thick sequence of rather compact, ferruginous, brown sand and sandy loam, with more than one horizon of caliche, and occurs at 25-50 m above sea level. These sediments have been mapped as the Sijua Formation in the Kasai Basin by Ghosh and Majumder (1981), and are rich in nitrogen, phosphorus and humus, and therefore more suitable for cultivation than the laterite. The newest alluvium occurs at a much lower elevation, only 10-20 m above sea level, and consists of grayish black to black fine sand, silt and clay of middle Holocene age, with no caliche horizon. This sediments have been mapped as the Daintikri Formation in Kasai Basin by Ghosh and Majumder (1981).

The climate in West Bengal is generally of tropical monsoon type, with most rainfall from June to September. The relative humidity is generally very high through the year. The major drainage system of the region under study is the Bhagirathi/Hooghli, a north-south distributary of the lower Ganga that debouches into the Bay of Bengal. Tributaries include the Damodar, Ajoy, Rupnarayan and Kasai, all originating in Chotanagpur. The Ganges delta lies to the east (Fig. 1).

## EXCAVATED SITES

Bharatpur is situated at an elevation of 60-90 metres above sea level in the lateritic or red soil area of the western part of Burdwan District, on the left bank of the Damodar River. The site was excavated jointly by the Archaeological Survey of India and Burdwan University in 1972-4. The excavation revealed two periods. Period I is Chalcolithic, with evidence for both hunting/fishing and agriculture. The material culture comprises microlithic tools, Neolithic axes, bone tools, beads and rare copper objects. The pottery includes Black and Red Ware and Red Ware, sometimes painted in white or black with linear designs such as wavy lines in groups, vertical and horizontal bands, oblique strokes, dots and dashes. The bone industry includes bangles, decorated combs, simple points and tanged points. Two hearths 50 cm in diameter



were also found, associated with mud house floors. Period I at Bharatpur is dated to about 1500 BC. The material culture of the Chalcolithic phase at Bharatpur is less sophisticated than the material cultures of both Pandurajardhibi and Mangalkot. Period II at Bharatpur sees the introduction of iron and the reported occurrence of a few NBP sherds.

Mahisdal is also located in the semi-arid zone, like Bharatpur, in the red laterite soil area of Birbhum District. The site was excavated by the Archaeological Survey of India in 1964 and the site has a two period cultural sequence very similar to that at Bharatpur. Period I is pre-iron, and has microliths, copper objects, and Black and Red pottery. The most significant discovery of Chalcolithic Mahisdal was a pit filled with carbonized rice grains.

Pandurajardhibi is the classic Chalcolithic site in West Bengal, located about 38 metres above sea level on an old alluvial terrace on the right bank of the Ajoy river in Burdwan district. It has a total settlement area measuring approx. 250 x 200 metres. The site was excavated by the Directorate of Archaeology, Government of West Bengal, under the supervision of P.C. Dasgupta between 1962 and 1965. Further excavation was carried out in 1985. The site has a four-period cultural sequence. Periods I and II are Chalcolithic, III is Iron Age and IV is early historic. A silt deposit 70 cm thick existed between the period I and II layers, perhaps due to a flood.

Period I at Pandurajardhibi has both hand made and wheel made pottery of grey and pale red wares. Rice husk impressions occur in some of the pottery. Pandurajardhibi houses had mud walls and were circular, oval or square in shape. A few Black and Red Ware sherds were also reported from this phase, but copper was completely absent. People practiced both fractional and extended burial, the latter oriented east to west.

Period II at Pandurajardhibi represents a fully-fledged Chalcolithic culture, after a short stratigraphic break. The ceramic industry is exceptionally rich, comprising Black and Red, Red Polished, Red, Black Polished, Black, Chocolate, Grey and Buff wares. Twelve human burials, both extended and fractional, were recovered. The bone industry of this phase is exceptionally rich, comprising arrowheads, awls, tanged points, socketed points, harpoons and daggers. Copper objects include rings, bangles, nails and fishhooks. Microlithic tools continued, and iron appeared in the upper level.

Period III at Pandurajardhibi is fully Iron Age. Black and Red Ware continued to occur, while Black Polished Ware became more frequent and sophisticated.

Mangalkot is another important Chalcolithic site in West Bengal with a total settlement area measuring 300 x 200 metres. It lies on an old alluvium terrace at the confluence of the Ajoy and Kunoor rivers in Burdwan district. The site was excavated by the Department of Archaeology, University of Calcutta, from 1986 to 1991. The excavation has revealed a total cultural deposit of 4.50 metres in thickness (Fig. 2), divided into six broad cultural periods by the excavator. Period I is 2 to 2.50 m



Figure 2. Section through the site of Mangalkot (1984 photo).

thick. The pottery is similar to Pandurajardhibi II and copper objects consists of rings, bangles, fishhooks and beads. Bone tools comprise points and arrowheads. Microliths are very rare, and only a few flakes of quartz have been found. But iron objects are present during this period and comprise points, arrowheads, chisels, nails and rods. Postholes and mud floors suggest that houses were either semi-circular or oval in shape.

Period II at Mangalkot is a continuation of Period I. The frequency of Black and Red Ware decreased and bone tools almost disappeared, while microliths are now totally absent. Iron tools substantially increased in number, including chisels, points, nails, arrowheads and axes. This phase is transitional from the Chalcolithic to the Early Historic.

#### ARCHAEOBOTANICAL EVIDENCE

Rice was the staple food of the Chalcolithic people in West Bengal. Rice grains have been found at Mahisdal, Pandurajardhibi, Bharatpur, Mangalkot, Tamluk, Dihar and Pakhanna, mainly in the form of husks encased in the cores of potsherds. But we do not have any evidence for other cereals and pulses. It is therefore assumed that rice was a staple. At Mahisdal, Ghosh (1984) excavated two pits containing huge quantities of carbonized rice grains, each 1.28 m in diameter and 1.25 m deep, with volumes of 1.6 cubic metres, sufficient to store 900 kg of paddy. According to Ghosh (1984), yields at that time could have reached 250 kg per acre. Ghosh (1984) assumed the former existence of 20 such pits from the total 8000 square meter Chalcolithic settlement area at Mahisdal, which could therefore have stored 18,000 kg of paddy. At a yield of 250 kg per acre, this quantity of rice would be the produce from 72 acres of arable land.

How many people could have been fed by 18,000 kg of paddy? This amount would convert to about 11,880 kg of edible rice, sufficient nowadays to support approximately 66 people. But with a size of 8000 square metres, it is likely that the population of Mahisdal was over 66 persons. This might explain why these Chalcolithic folk integrated domesticated animals into their subsistence economy. It is also likely that wild

cereals were gathered when available (Bhattacharyya 1984). Hunting of wild animals also continued to form a major part of the subsistence regime.

#### ARCHAEOZOOLOGICAL EVIDENCE

The animal remains from Bharatpur, Pandurajardhibi and Mangalkot have been identified by S. Banerjee (1981), M. Ghosh (1991), and Ghosh et al. (1992). The following animals, including marine species, have been identified from the Chalcolithic levels in West Bengal.

Teleostean fish

*Trionyx gangeticus* Cuvier turtle

*Chitra indica* turtle

*Lissemys punctata* turtle

*Batagur baska* turtle

*Gallus gallus murghi* jungle fowl

*Canis familiaris* dog

*Canis aureus* jackal

*Sus scrofa* pig

*Cervus duvauceli* swamp deer

*Axis axis* spotted deer

*Muntiacus muntjak* barking deer

*Axis porcinus* hog deer

*Boselaphus tragocamelus* nilgai

*Bos namadicus* wild cattle

*Bos indicus* humped cattle

*Bubalis bubalus* buffalo

*Ovis orientalis* sheep

*Capra hircus* goat

*Rattus rattus* rat

*Columba* sp. pigeon

Despite substantial support from agriculture, the Chalcolithic people continued to intensify the process of domestication of animals in order to supplement their total food production. They maintained large animal herds, including both high protein and milk animals like humped cattle, buffalo, sheep, goat and pig. The exact percentage ratio of agricultural plant products to animal foods consumed by the Chalcolithic people is very difficult to ascertain, but it is presumed that both contributed substantially to the economy as a whole.

The animal bones from the Chalcolithic levels at Bharatpur comprised 290 specimens (Banerjee 1981), from Pandurajardhibi 106 specimens, and from Mangalkot 128 specimens (Ghosh, 1991; Ghosh et al. 1992). All the major domesticated species are present at Bharatpur (Fig. 3), but at Pandurajardhibi sheep are absent, and at Mangalkot both sheep and goat are absent. The wild species present at Bharatpur comprise deer, nilgai, dog, wild cattle, and jungle fowl. At Pandurajardhibi (Fig. 4) they comprise deer, jackal, fowl and rat, and at Mangalkot (Fig. 5) deer, fowl, rat and bird. The marine species include only fish and turtle, which are present in all the sites in different proportions.

The domesticated species at Bharatpur (Fig. 3) comprise 72 percent of the total of bones, 50 percent at Pandurajardhibi and 53 percent at Mangalkot. The percentage of humped cattle bones at Bharatpur in terms of the total domesticated animal population is 60 percent,

but at Pandurajardhibi and Mangalkot this animal contributed to only 25 and 30 percent respectively. Moreover, cattle and buffalo together, which are considered high protein animals, constitute 65 percent at Bharatpur, but only 34 and 42 percent at Pandurajardhibi and Mangalkot respectively.

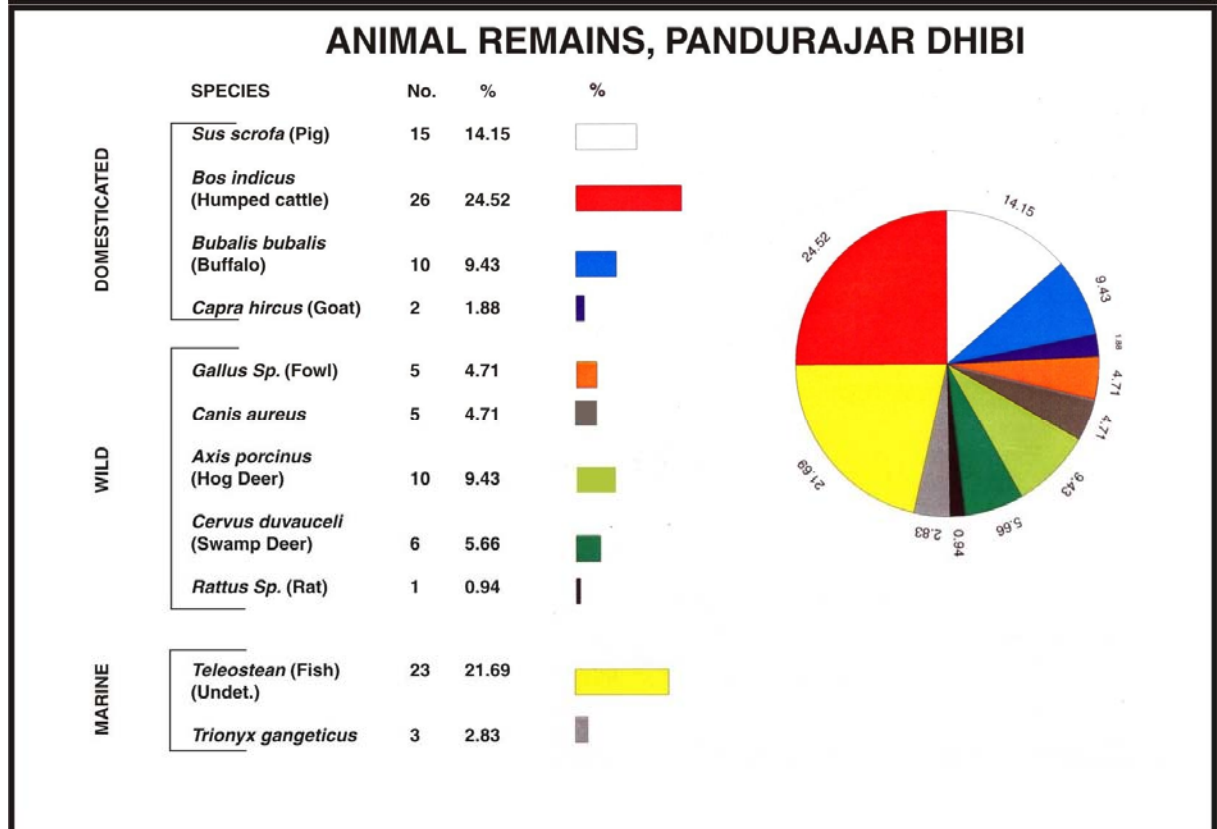
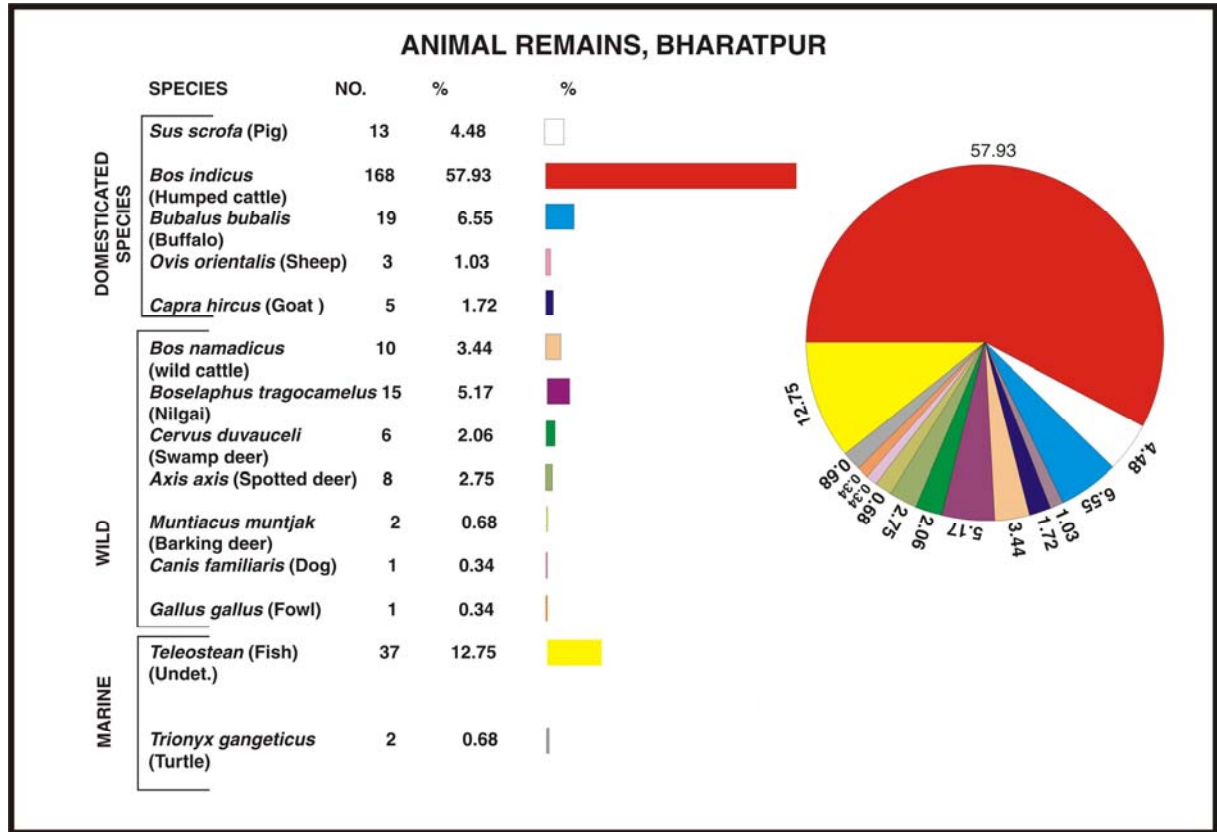
The percentage of wild species at Bharatpur is 14.5, while Pandurajardhibi has 25.5% and Mangalkot 14%. The marine species comprises 13% at Bharatpur, but are more common with 25% at Pandurajardhibi and 33% at Mangalkot. The people of Mangalkot relied more on marine food resources than hunted animals.

It has been suggested (Davis 1987) that the present day dietary and climatic preferences of different species of domesticated animals were the same in the past. Humped cattle and goat are grazing animals that prefer a dry environment with minimum forest coverage. These animals together constitute 60% at Bharatpur, but only 26% at Pandurajardhibi. At Mangalkot goat is absent, but humped cattle alone comprise 30%. Deer and jackal are considered forest animals. Their combined percentage at Pandurajardhibi is 20%, but jackal is absent at both Bharatpur and Mangalkot. The percentages of deer at Bharatpur and Mangalkot are 5% and 6% respectively. Finally, pig and buffalo are animals of damp and swampy environments. These animals comprise 11% and 23% at Pandurajardhibi and Mangalkot respectively, but only 4% at Bharatpur. These figures suggest that Bharatpur was a dry territory with minimum forest coverage, whereas Pandurajardhibi had a damp and swampy environment with moderate forest coverage. The environment of Mangalkot was intermediate. We can suggest that the animal domestication patterns of the Chalcolithic people of West Bengal were very much influenced by climatic and environmental factors.

#### CONCLUSION

Rice was the staple cereal food of the Chalcolithic people of West Bengal. But the production of rice per acre of land would not have been uniform, and was probably much less in the dry farming zone of red soil where Bharatpur is located, compared with the alluvial terraces on which Pandurajardhibi and Mangalkot are situated. The Chalcolithic people also had to depend on domesticated stock, comprising mostly cattle, sheep and goat. Thus, they had a true agro-pastoral economy. This is especially true for the dry zone sites of Bharatpur in Burdwan and Mahisdal in Birbhum. The people in the alluvial zones were able to manage their subsistence largely through agricultural production. No doubt, they too exploited marine food resources to a great extent, but they never had to rely so heavily on domesticated animals.

The settlements on the alluvium of the Ajoy/Damodar/Rupnarayan riverine complexes gradually emerged as nucleated centres from the 7th century BC onwards, with market networks under central authorities controlling their production and distribution networks. Such socio-economic transformations are documented at



Figures 3 and 4. Animal remains from Bharatpur and Pandurajardhibi

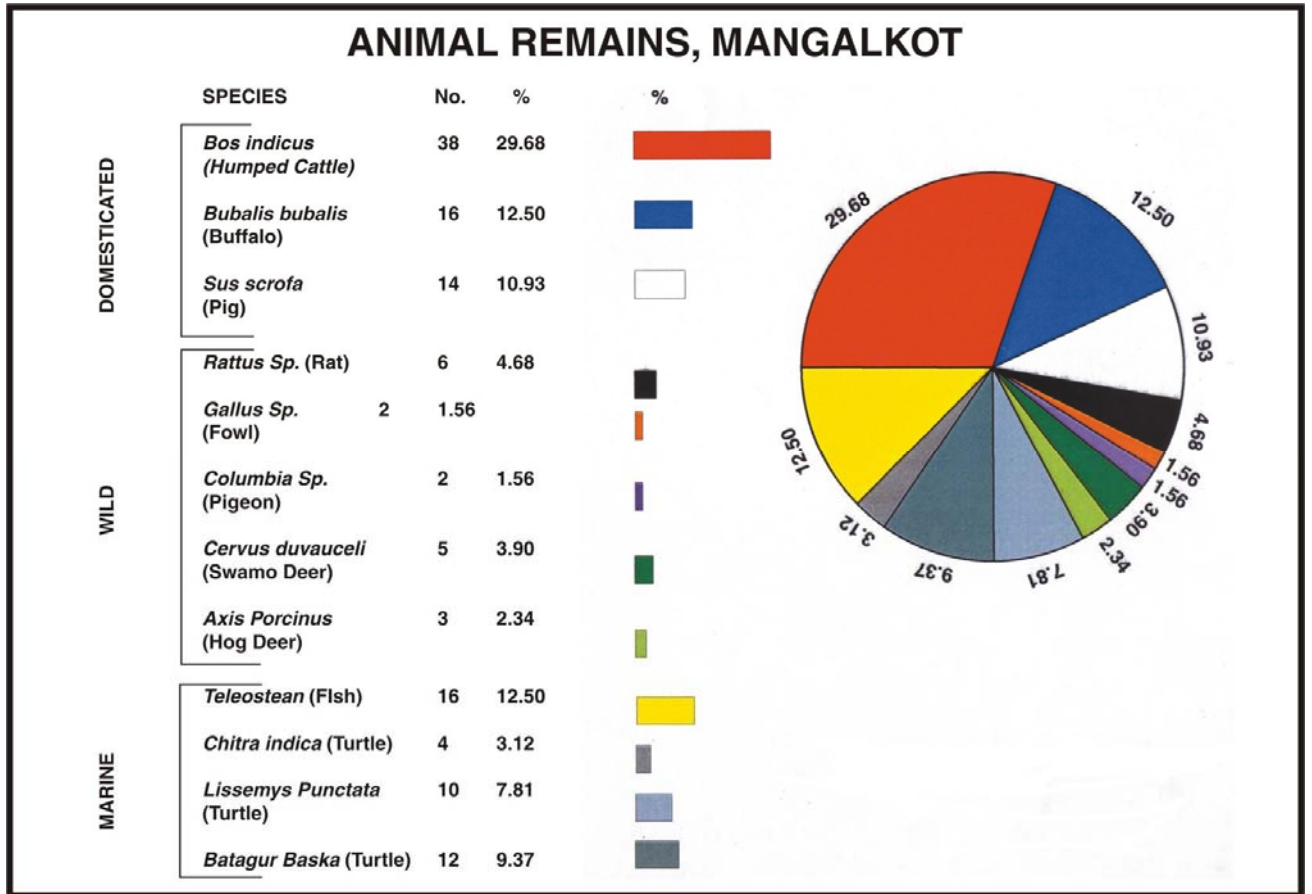


Figure 5: Animal remains from Mangalkot

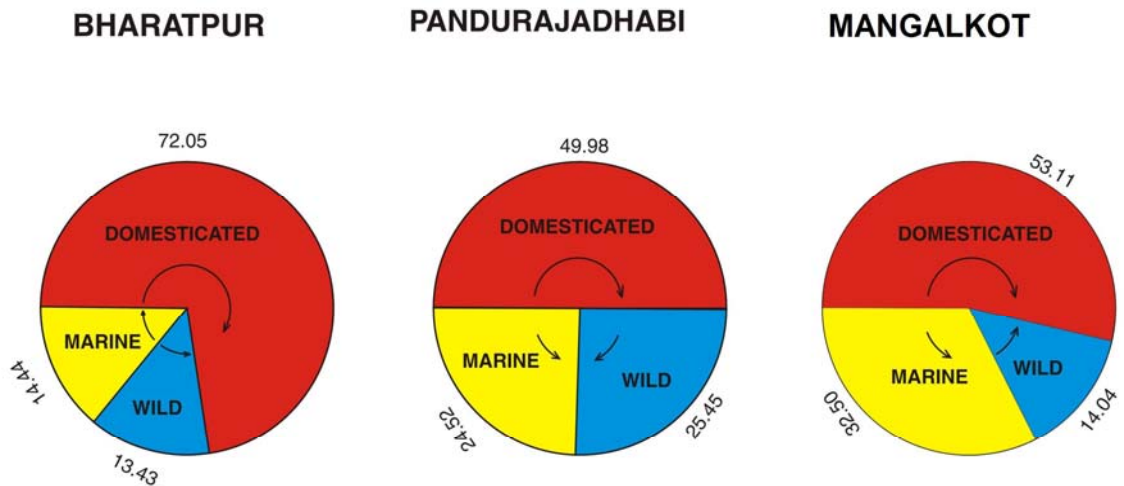


Figure 6. A comparison of the animal remains in the three sites of Bharatpur, Pandurajardhibi and Mangalkot

Mangalkot and Pandurajardhibi. On the other hand, the settlements on the red lateritic soils in the semi-arid dry farming zones were more dispersed and less nucleated. The distinctive feature of this zone is the growth of an agro-pastoral economy. Cattle/sheep and goat formed the major livestock. This kind of development is documented at Bharatpur, Mahisdal, Dihar and many other sites in the lateritic red soil zone, where settlements ceased to exist into the Early Historical period, or were only settled intermittently.

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