Prehistoric Settlement Pattern of Jonk River; Upper Mahanadi Basin, India

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Abstract*: This paper deals with the prehistoric settlement pattern of Upper Mahanadi basin with particular reference to Jonk River, which flows in parts of western Odisha and Eastern Chhattisgarh. The paper vividly looks into the settlement pattern and subsistence strategy of the Palaeolithic and Microlithic community of the river basin. The study reveals that most of the Stone Age sites are located on the upper reaches of the river within a radius of 20 km*$^{2.}$*. All the reported Stone Age sites in the Upper Mahanadi basin are open air sites and devoid of any cave or rock shelter sites. Palaeolithic and Microlithic sites are found on variety of geological contexts i.e. foot hills, hill slope, erosional surface.*

Keywords: Jonk River, Mahanadi Basin, Settlement Pattern, Palaeolithic, Microlithic, Odisha, Chhattisgarh

Introduction

Settlement pattern studies in archaeology deals with variety of aspects relating to the paleo landscapes and their use by human, ancient habitation pattern, past population studies, movement, trade, exchange, resource area. In general man land relationship in broader sense within a particular area may be in any specific time period. The concept of settlement pattern studies in archaeology was introduced by Gordon Willey (1953) in Viru Valley. Willey (1953) defines Settlement pattern as the way in which man disposed himself over the landscape inhabited by him. Thus refers to dwelling structure, their arrangements and to the nature and disposition of other buildings pertaining to community life. Settlements reflect their environment, phase of technology social interaction and control maintained by the culture. The research on settlement pattern studies have been developed over time and reviews have acquired theoretical and methodological sophistication (Willey 1953; Chang 1972; Rouse 1972; Trigger 1978; Bettinger 1980; Trigger 1967; Parsons 1971; Ucko et al. 1972; Binford 1980).

The present paper deals with the Upper Mahanadi basin area in particular reference to Jonk river basin which reveals 62 Stone Age sites discovered during author doctoral

research (Padhan 2013). The paper vividly looks into the settlement pattern and subsistence strategy of the Palaeolithic and microlithic community of the Jonk river basins.

Palaeolithic Settlement Pattern Studies in India

Several studies of early Palaeolithic settlement patterns have been conducted in India, among which Hunsgi-Baichbal are the most well-known. In the last four decades, several possible studies were conducted by (Paddayya 1979, 1982, 2006) to understand the food habits, habitation patterns, seasonal behaviours, migrations and landscapes in habited by pre-historic men. The work of Pant and Jayaswal (1991) at Paisra suggest existence of possible circular huts and use of different types of stone alignment to support these huts. Excavations at Chirki provided possibility of structural evidence of crude boulder rows which was suggested as Acheulian floor (Corvinus 1983). In order to understand the settlement pattern of the Kaladgi basin in north Karnataka geomorphological approaches were used to comprehend the Palaeolithic landscape (Pappu and Deo 1994). The study suggested the influence of morphometric parameters such as relief, slope and drainage that played a vital role in location of the sites discovered by them. Rao (2002) emphasis on the exploitation of raw materials as an important factor behind choosing locations for the site in the Krishna-Tungabhdra Doab and Raju (1988) in Chuddappa regions in South India. In West Bengal Basak 1997 in Tarafeni river basin and Ray 1987 have also undertaken noteworthy studies on prehistoric settlement pattern. Several scholars in Odisha and Chhattisgarh have carried out ethno-archaeological and ethnographic studies in order to understand the late Palaeolithic and Mesolithic subsistence and settlement strategy. Pandey (1982; 1987) has conducted settlement pattern studies in upper Mahanadi basin and Behera 2006 in Middle Mahanadi; Nanda (1984; 1985) in Koraput, Mohanty (1989) in Kendujhar, Cooper (1983; 1997) in and around Bastal Fall, and Padhan (2008, 2013, 2014) in Nuwapada, Bargarh, Mahasamund and Raipur districts. Studies in this part have revealed that the scrub jungle and deciduous vegetation tracts of eastern Peninsular India are very rich in wild plant foods like berries, tubers, roots, nuts, legumes, seeds, edible flowers, and green vegetables.

In order to understand the prehistoric hunter gatherer settlement patterns several ethnographic studies on different tribes were conducted. These studies focussed on the issues related to prehistoric habitation pattern, subsistence pattern, migrations, movements, territoriality, resource exploitation patterns and land use patterns (See Murty 1981, 1985, Nagar 1982, 1985; Nagar & Mishra 1989, 1993; Misra 1990; Pappu 1996; 2001, Pal 1994; 2002, Ansari 2001; Selvakumar 2001 and Padhan 2008).

Study Area: River Jonk

The study was carried out in the Jonk river basin, one of the major tributaries of the upper Mahanadi (Fig. 1). The river originates from the Sunabera plateau (20°29'59.66"N; 82°26'35.08"E) in the Nuwapada district of Odisha at the altitude of 660

masl. The river flows through the Nuwapada, and Bargarh districts of Odisha and Mahasamund and Raipur Districts of Chhattisgarh.

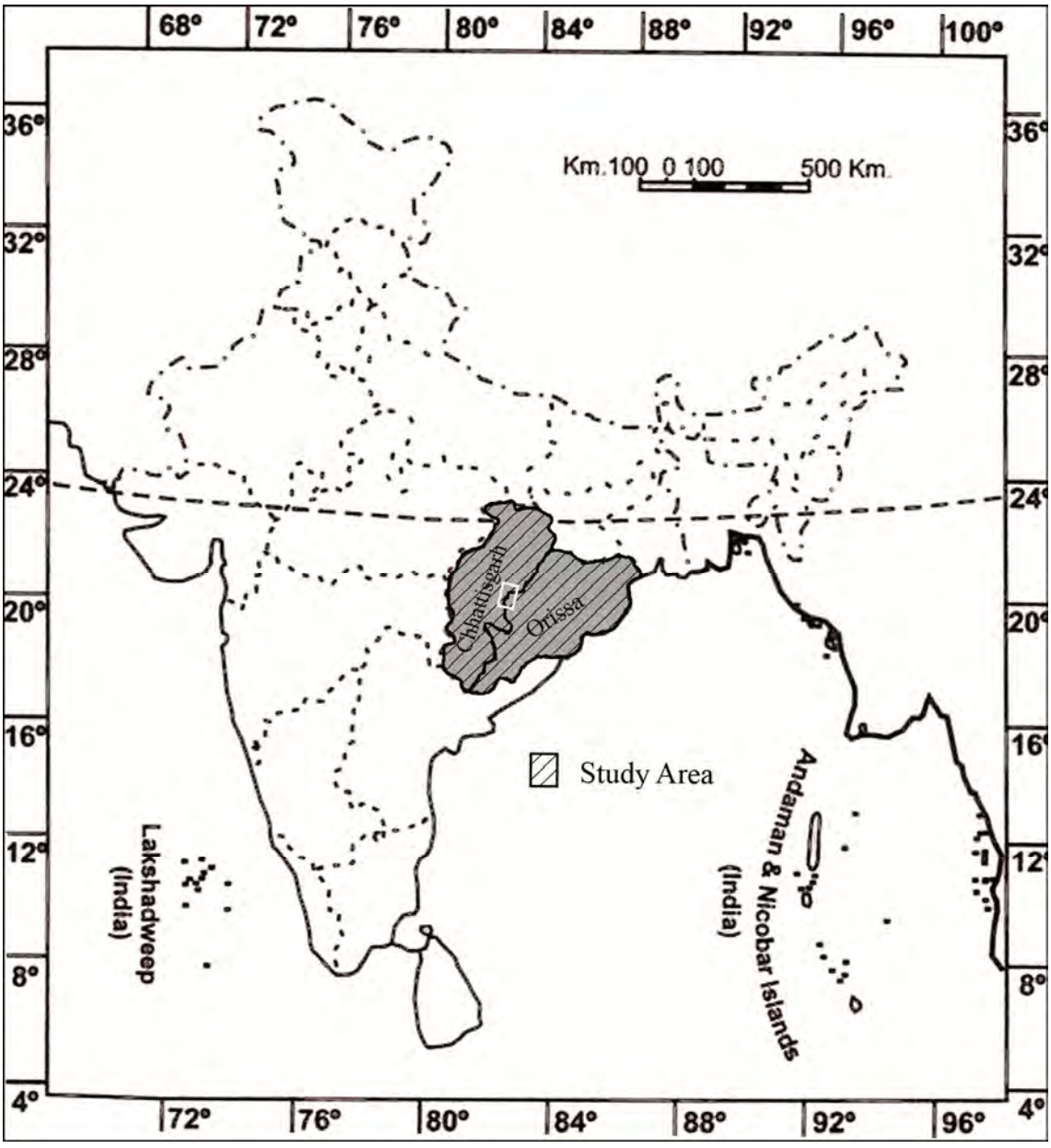


Figure 1: Location of the Study area in India Map

Geology and Geomorphology of the Jonk River Basin

Jonk river and its catchments are characterized by Precambrian granites, gneisses of the Eastern Ghat Supergroup, Bengpal Group and Sonakhan Group with local basic intrusive and volcanic lithologies; limestones, sandstones, and occasional occurrences of quartzite (Figure 2). The upper and lower Jonk is dominated by structural plateau of Proterozoic rocks. In its upper part its narrow and gradually coming down from the rocky terrain and entering into a pigmented landscapes. In middle Jonk within a

radius of few kilometres some structural hills are placed over the landscape which creates the basin divide between river Jonk and its sister/parallel river Ong. Jonk River and its tributaries are covered with the flood plain deposits and at some places it is filled in with older river channel deposit.

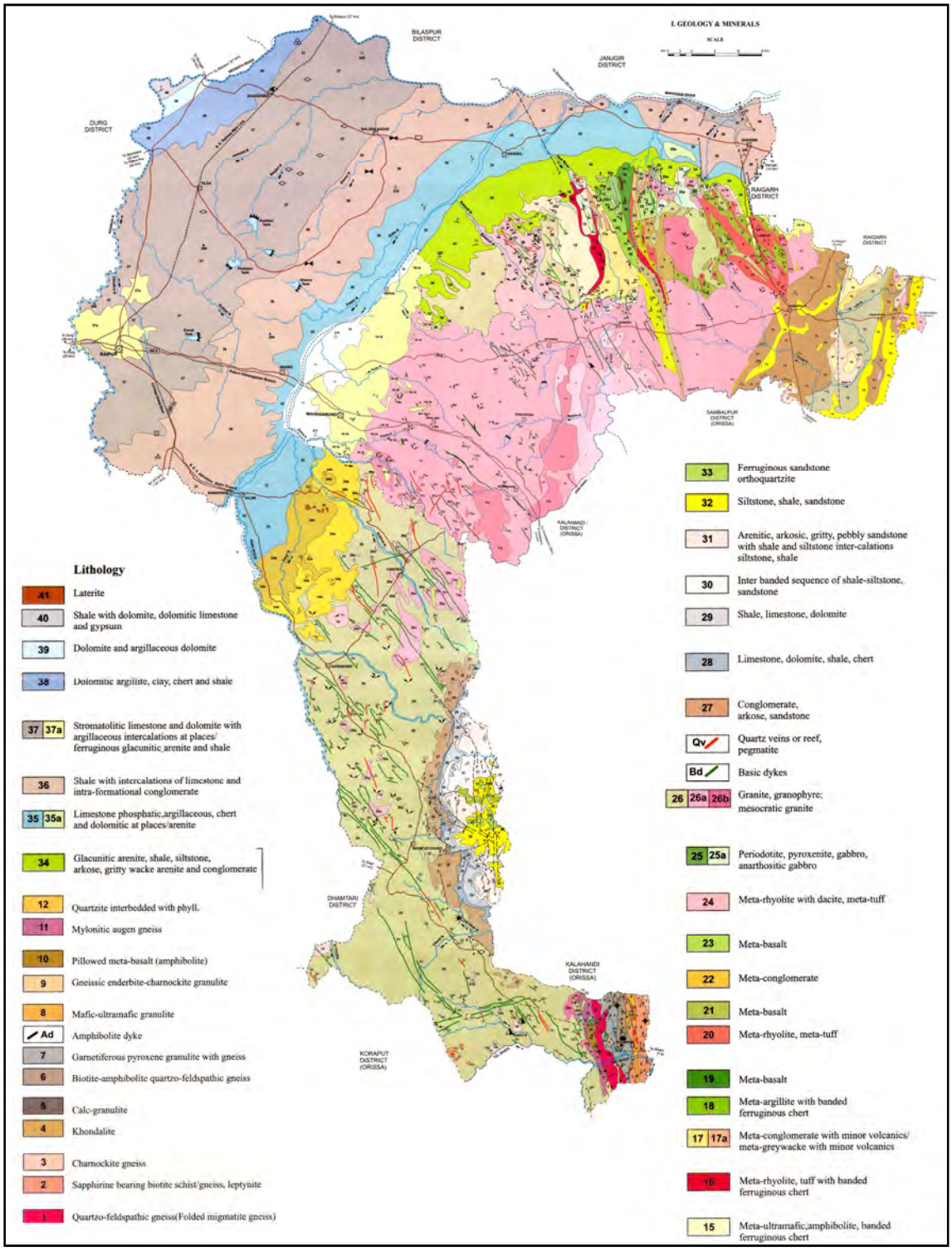


Figure 2: Geological map of study area

In the lower part of the river, after flowing through a narrow rocky channel at the foot of Nawapara Hill, the width of the river progressively becomes wider after cutting through the bedrock zone and it joins the Mahanadi near Seorinarayan (21°42'43.42"N; 82°34'34.03"E) at an elevation of about 234 masl. The river is fed by a number of small and big tributaries such as Silda, Bhandar, Kandajhari, Kolar, Machka, Chirar, Bagh, Bhuisa, Ama, Kantara, Karmel, Lamhar, and Maokha. These tributaries originate in the surrounding hills and plateaus and flow for distances up to about 35 km.The Jonk river passes through several mountain ranges of variable sizes throughout its course. The lower Jonk goes on cutting through several small and big hillocks of Nuwapada range and finally dibuches in to Mahanadi after a Journey of 200 km.

In order to understand the prehistoric settlement pattern five seasons of field investigation was carried out from 2007-2012 in the western highland of Odisha and eastern Chhattisgarh. The filed work was aim to find Stone Age sites and to understand their geology, geomorphology, and geo-archaeology and raw material source and lithic assemblages of the study area. The research carried out in the Jonk river basin resulted in the discovery of 15 Acheulian, four Middle Palaeolithic, 39 Microlithic, one Neolithic and three Early Historic sites (Figs. 3 & 4). To understand the prehistoric settlement pattern extensive use of satellite based imageries and remote sensing data were utilized for analysis of the location of the sites and their geomorphology and geoarchaeology (Figure 3). The lithic assemblage found in the sites are studied in details to understand the nature, raw material use, range, mobility and characteristic features of the particular prehistoric sites and culture in the study area.

Settlement Pattern of Acheulian Sites in Jonk

The filed investigations in the Jonk river resulted with the discovery of 15 Acheulian sites and total number of 306 artefacts were studied (Padhan 2013). The Acheulian sites found are either within the river section or situated near the hill slope near a natural lake thus making water readily available.

The sites found near the river were certainly very important as they must have served multiple purposes. Apart from being hunting and fishing stations, such sites provided for plant foods that could be grown in the river alluvium. These sites must have also served strategic locations for targeting animals when they came near the source of water for drinking. The sites located on the hill slopes must have been equally important for exploitation of the animal resources and gathering variety of available wild fruits, vegetables nuts and tubers grown in forested environment. The sites located in the hills slopes get several advantages in hunting or trapping the animal and served as an easy target while getting down from the hill for their food search. These hill slope sites were certainly preferred by the Stone Age man as they never get flood during rains, they are rich in variety of plant fruits during monsoon and provides shade during hard summer.

Among the 15 Achulian sites, 4 sites are big (300-500 m2) with large number of tools while the rest have lesser artefacts. These big sites are away from the river and located on the foot hills (Fig. 5). Among these sites, Chipajahar- Locality II, Bhajipala Locality-I, II, and Senbhata are located near the natural water lake. Presently the natural lake or pond found near these sites has been converted into artificial pond for irrigation and other common utility purposes. However the site Bherha locality-3, Banka, Muragaon, Girna locality-1, 2 and Devsaral located close to the river.

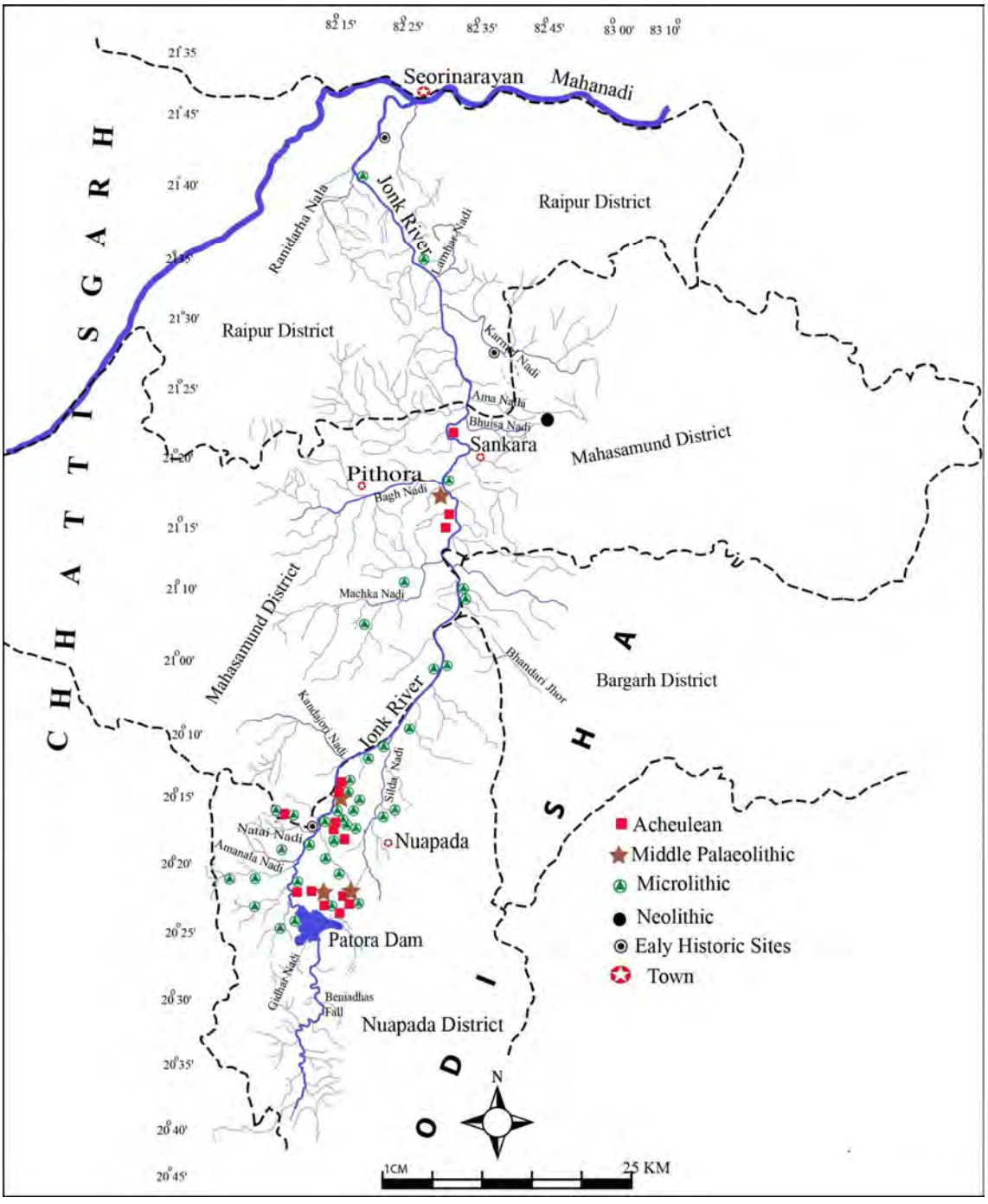


Figure 3: Distribution of sites in Jonk river basin

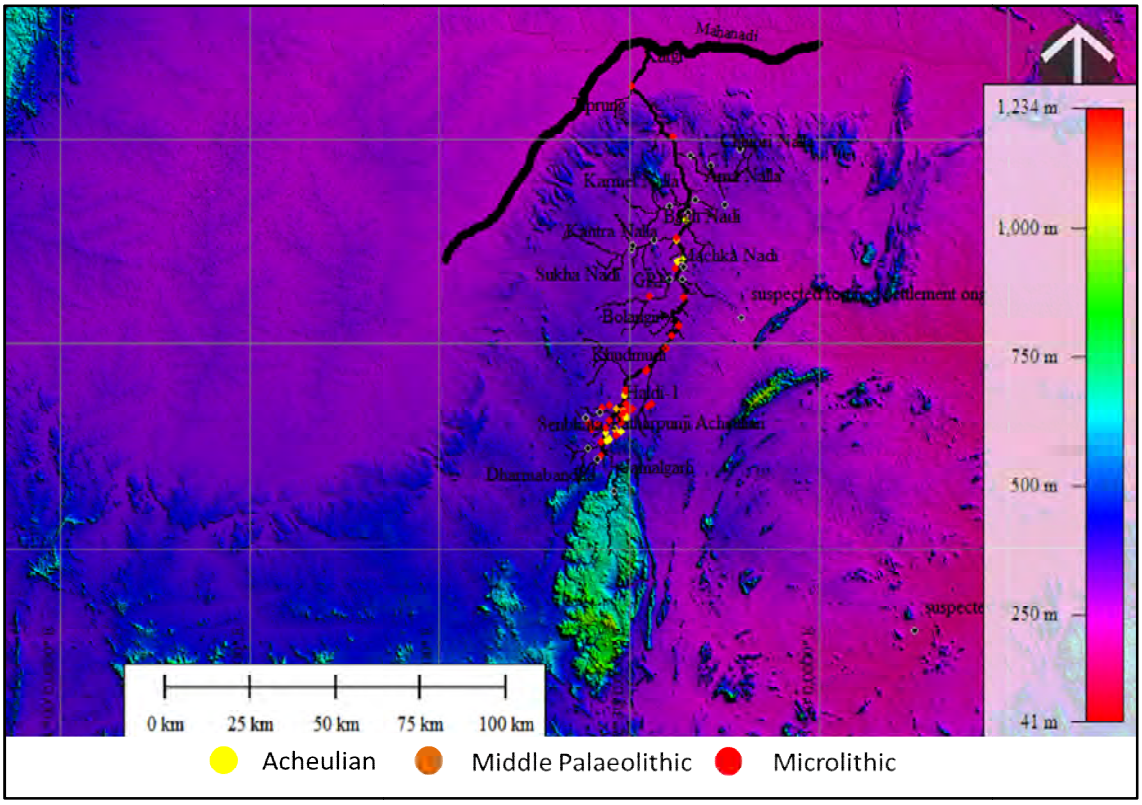


Figure 4: Digital elevation model (HSV Shader) of the Jonk river basin showing the distribution of discovered sites

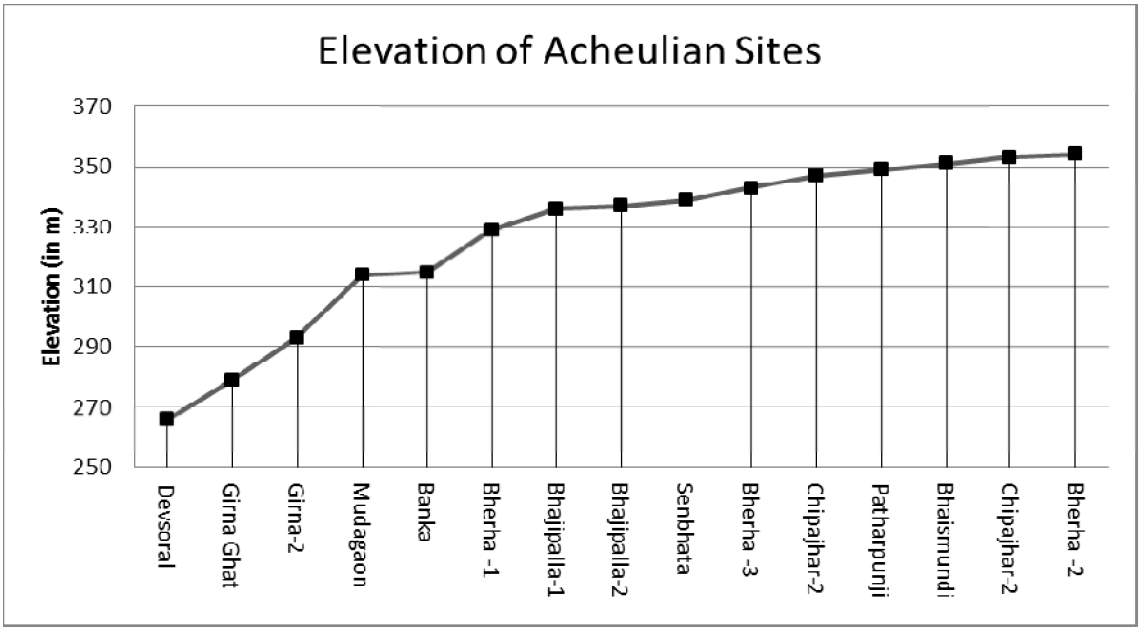


Figure 5: Elevation of Jonk Acheulian sites

The sites like Bhaira, Chipajhar, Kurkurbhatta, Bhajipala locality-2, Banka, and Senbhata are multicultural sites with Acheulian and microliths. These sites are located on the varied elevations (266-354 amsl), with an average elevation of 327 meters with

geographical situation ranging from foot hills, hill slopes and river banks to lateritic plains (Figs. 6 and 7).

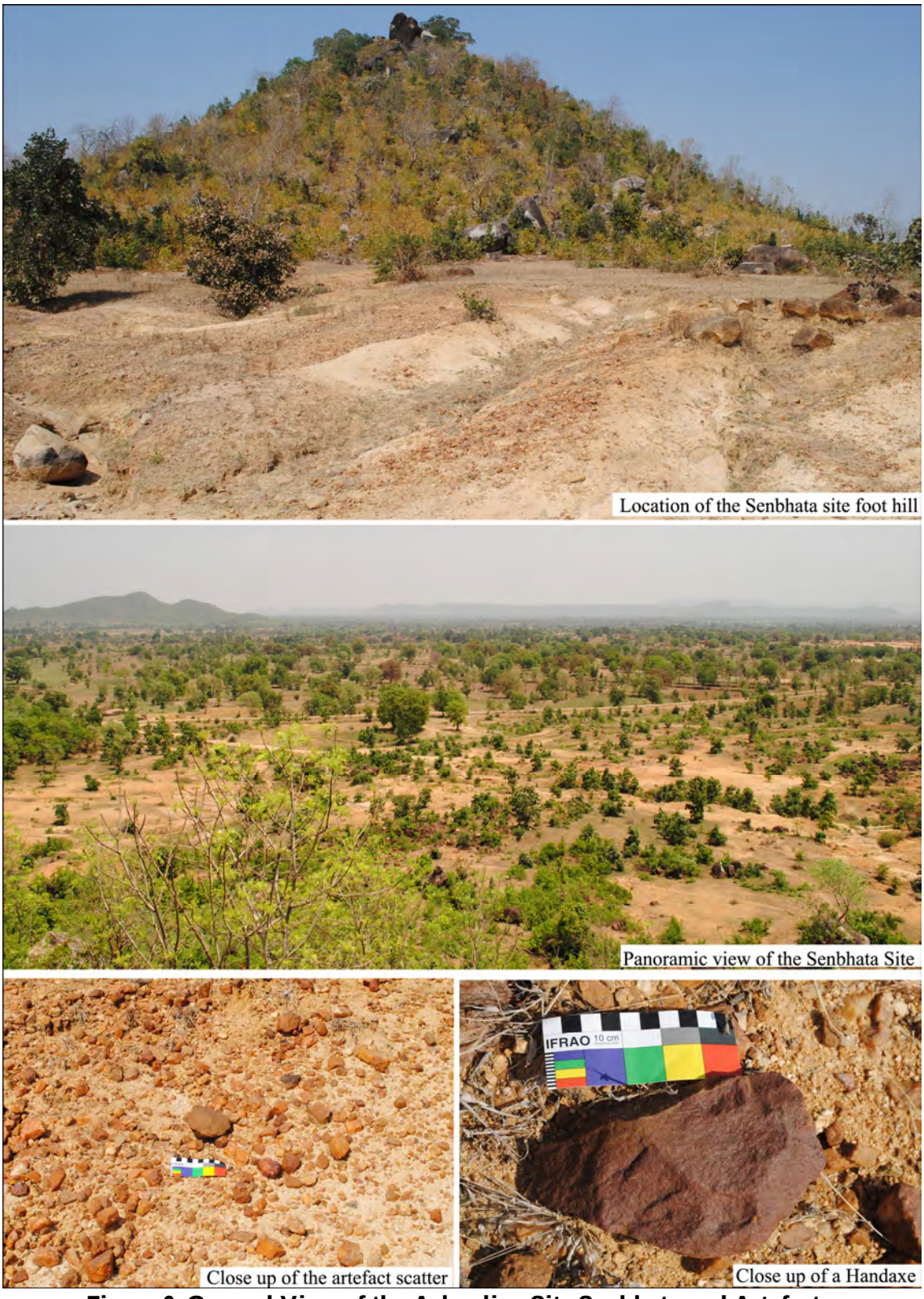


Figure 6: General View of the Acheulian Site Senbhata and Artefacts



Figure 7: General View of the Acheulian Site Chipajhar - I and Artefacts

None of the Jonk Acheulian sites were located on any of the tributaries of the river Jonk. Site on the tributaries were not found probably because of heavy siltation. All the small streams are carrying the weathered granitic sand and depositing it near the river bank or across the landscape resulted covering the older sediment by younger

alluvium. During the field investigations several Acheulian tools; hand axes, cleavers, choppers, knives, picks and scrapers, cores, flakes, and debitage were found. These tools were used for hunting, chopping, digging, scrapping and breaking and many other different purposes. Some of the sites must have served for different functions such as may be exploitation of raw materials, hunting, gathering, fishing, and collecting wild seasonal fruits or vegetables.



Figure 8: General View of Microlithic Sites



Figure 9: General View of Microlithic Sites

Middle Palaeolithic sites

The middle Palaeolithic sites in the river are not well represented and only two middle Palaeolithic sites are found near the river bank where as two are found on the foot hills. Some artefacts belonging to this period are also observed with Acheulian artefacts. The Middle Palaeolithic record in the river valley suggest low population density might be due to the climatic conditions and environmental variability persisted during this time in the Jonk.

Settlement Pattern of Microlithic Sites in Jonk river Basin

Total numbers of thirty nine microlithic sites were discovered and 12,725 artefacts were collected for studied. Out of 39 microlithic sites eighteen sites were found on the foot hills, five sites were discovered on the hill slopes, five sites were discovered near the granitic outcrop close to river or streams and nineteen sites were discovered on the bank of river mostly on the exposed or eroded river banks or streams (Figs 8 and 9). Besides this several places isolated microliths were also noticed but they were not consider as sites because of problems in their context and originality. Sites found near the hill slopes or foothills are ranging between 10 - 500 m^2. However the foothill sites are wider and larger than the riverine sites. The riverine sites are comparatively smaller and found in pockets on the exposed or eroded river banks. The small sites may have very few artefacts but their functional attributes to understand the human behaviour cannot be ignored. These sites were probably used for short durations or single episode spot involving an individual or small group of Palaeolithic population engaged in food collecting and processing. Such sites may include hunting sites, butchering sites, kill sites, gathering sites and manufacturing spots. Scholars have suggested that these sites might have served as satellite of large sites (Foley, 1981:164-166; Paddayya, 1991:131; Thomas, 1975: 62).

These microlithic sites are mostly situated on the banks of river Jonk, either on river section, eroded river gravel or away from the river bank near the hills or hillock or on the raised granitic surface. However few microlithic sites were found in the tributaries Silda, Machka and Ama Nala. The major tributaries of Jonk such as Bag, Karmel, Kandajhari, and Kantara Nala have not yielded any prehistoric sites. All the sites are discovered in open air context as the area of study has very limited cave formation and thus are devoid of pre-historic remains.

The sites such as Haldi locality-2, Gauria, Dumerpani-1, Dumerpani-2, Bolangir 1, 2, Patharpunji, Bhajipala-1, 2, Dharmabandha, Khudmudi must have been the habitational sites as they yield wider range of tool types. The presence of variety of tool types shows that they were used for various activities. These sites also show presence of raw material nodules that were quarried from somewhere else. The amount of debris such as manufacturing debitage of the finished or semi-finished tools, discarded tools as well as cores in these sites shows that the sites were used for habitation purposes for longer periods.

Microlithic sites yielded some finished flake and blade tools such as backed blade, lunates, backed points, backed knifes, triangle, borer, burin, and variety of scraper. Each sites may represents different tasks such as processing, repairing and extracting activities on all types of materials (Cooper 1983). The sites located near small natural lakes, streams and the presence of forest nearby must have offered large variety of game animals and plant foods. These places were certainly suitable for habitational purposes (Issac 1960; Clark 1975; Paddayya 2006). The main economic activity of the people certainly changed from seasons to seasons due to seasonal variations in the availability of games, fishes, fruits, vegetables, honey and other products. The Stone Age man in the area must have taken advantage of this seasonal natural food availability. Even today the tribal people exploit the seasonal natural resources and store them for future use.

Discussions and Conclusion

The Jonk river valley is covered with many forested land which also include some reserved i.e. Lodra reserved forests in upper Jonk the Nuwapada hills range and reserved forest in middle and lower Jonk. This forest still found with large number of wild animals and plant food. Till days which supported a large number of population since the Palaeolithic time as it is attested by the findings of 58 Stone Age sites. The understanding prehistoric settlement is not an easy task which needs very careful observations on several aspects. It is seen that wherever the ancient surface and sub-surface is exposed most of the sites are coming from those area which has undergone any erosional activities or partly being destroyed by the modern construction or habitation activity. This simply does not mean that except those hilly and near to river bed other landscape is not being used by the prehistoric populations. The landscape has been used as we are using today but we only getting the evidence from few areas where the ancient sediment or surface is exposed.

The open air spaces must have been used for habitation purpose as geologically there are no caves or rock shelters are found in the area. The area devoid of large caves or rock shelters suggest people must have taken shelter under large trees or made camps on the higher elevated ground such as granitic outcrops which gives a suitable natural floors for habitation. With absence of any organic reminiscences of structures either from the surface or excavation it is difficult to say anything about their hut types or temporary camps. But, observation from the few existed tribal nomads such as Birhors it can be said that they mobilised in groups and settled in places where food resources were available. However, once the food resources finished they shifted to a new area where ever they found new resources.

The riverside was continuously populated from the Acheulian times but there was increase in population during Microlithic period because of successful advancement in hunting gathering techniques. During this period also people were successfully utilising abundant natural resources found in the forests and valleys. Even now days

the river valley supports a large number of tribal populations, whose main source of subsistence are agriculture, gathering, fishing and occasional hunting.

Most of the sites are found on right bank of the river with concentration of sites being on the upper part of the river within a radius of 20 $km^{2.}$. Thus it is quite possible that the hilly terrain and densely forested area was probably avoided as none of the sites were found in such ecological setups. As the area form part of the peninsular India there are no sharp climatic changes in this region. However, the landscape has been modified due to the natural and anthropogenic activities.

The study area has very few rock shelters or caves and most of these are not suitable for habitation. Among the visited cave shelters none contain any rock art. Earlier works carried out in the parts of Odisha and Chhattisgarh have also not recorded any traces of prehistoric structures. There is absence of Palaeolithic artefacts in caves sites and rock shelters however presence of microliths in some rock shelters have been reported (Pradhan 2001). Similar kind of observation has been made by (Pandey 1982, 2002) in the Upper Mahanadi. It is presumed that they must have occupied the open air sites or established temporary camp sites.

Intimate knowledge of environment and it behaviours were well understood by hunter gathers as they adjusted with all kinds of climate and situations. As far as the carrying capacity of the area is concerned it appears that exceptionally wide range of forest products resources were available in its foot hills. During the monsoons large variety of fruits, tubers, fishes, shells and small animals became abundant, thus increasing the gathering activities rather than hunting. The fishes are available throughout the year in pools, waterfalls and gorge.

The area has different variety of flora and fauna and their exploitation need some techniques, skills and labour to collect or make them eatable. The large number of tools found, most probably had multiple purposes or specialised functions. The change in tool technology, their sizes, shapes and forms suggest the ways of exploitation of certain types of food items or even possibility of change in subsistence pattern with a developed stone tool technology and wider choice of exploitation of larger variety of flora and fauna and other eatables.

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