Prehistoric Explorations in the Lower Manjira River Basin of Telangana State

A thesis submitted to University of Hyderabad, in partial fulfilment of the requirement for the award of the degree of

DOCTOR OF PHILOSOPHY

In

Anthropology

By

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CERTIFICATE

This is to certify that the thesis entitled **"Prehistoric Explorations in the Lower Manjira River Basin of Telangana State"** Submitted by Mr. **M. Ganesh** bearing registration number **14SAPH06** in partial fulfilment of the requirements for award of Doctor of Philosophy in the School of Social Sciences is a bonafide work carried out by his under my supervision and guidance.

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Further, the student has the following publications before submission of the thesis for adjudication and has produced evidence for the same in the form of reprint in the relevant area of his research:

A. Published in the following publications:

1. 'Nandikandi an Upper Paleolithic site from Manjira River Basin, Telangana State: Preliminary Observations'. *The Quarterly Journal of The Mythic Society*, 2021. Vol. 112(2-3), (pp. 12-21), ISSN Number: 0047-0555 (see appendix-i).

2. 'Recent Prehistoric explorations in the Manjira river valley of the Telangana State, India'. *Indian Journal of Archaeology,* 2019. Vol. 4(1), (pp.1-8), ISSN Number: 2455-2798 (see appendix-ii).

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B. Papers Presented in the following conferences:

1. Presented a paper titled '*Knappable stones (Raw materials) from the Lower Manjira River Basin of Telangana*' at the National Seminar on 'Anthropology and Biuo-Cultural Diversity in India: Retrospect and Prospect' Organized by Indian Anthropology Congress 2021 at Department of Anthropology, University of Hyderabad during 21-23 February. (National)

2. Presented a paper on '*Mesolithic Cultures of the Manjira river valley of Telangana state*' at the National Seminar on 'Anthropology for Developing India: Pathways to Policy Planning and Implementation' Organized by Indian Anthropology Congress 2019 at Department of Anthropology, University of Pune during 21-23 February. (National)

3. Presented a paper titled '*A Late Palaeolithic assemblage from the recent prehistoric explorations in the Manjira river basin of the Northwestern Telangana, India*.' At the National Seminar on 'Relevance of Medical Anthropology and Tribal Health Care Systems in the Globalizing World (REMATH)' 16-18, March- 2018 Organizing by Society for Indian Medical Anthropology, Mysore & School of Studies in Anthropology, Pt. Ravishankar Shukla University, Raipur. (National)

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6. Presented a paper on '*Palaeolithic Cultures and Ethnoarchaeological Explorations of Manjira River Valley of Telangana State*' at the workshop on "Lithic Studies" organized by Sharma Centre for Heritage Education, during 3-9, October 2015, Chennai, Tamilnadu. (National)

Further, the student has passed the following courses towards fulfilment of the coursework requirement for Ph.D.:

Sl. No.	Course Code	Name	Credits	Pass/Fail
1.	AN801	Advanced Anthropological Theories	4	PASS
2.	AN802	Advanced Research Methods	4	PASS
3.	AN805	Palaeolithic and Ethnoarchaeological Explorations in the Manjira River Valley of Telangana	4	PASS

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DECLARATION

I, **M. Ganesh,** hereby declare that this thesis entitled **"Prehistoric Explorations in the Lower Manjira River Basin of Telangana State"** submitted by me under the guidance and supervision of ***Prof. B.V. Sharma*** is an original research work which is free from plagiarism. I also declare that it has not been submitted previously in part or in full to this university or any other University or Institute for the award of any degree or diploma.

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By

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Abbreviations

ESA	Early Stone Age
MSA	Middle Stone Age
LSA	Late Stone Age
EP	Early Palaeolithic
LP	Lower Palaeolithic
MP	Middle Palaeolithic
M	Mesolithic
N	Neolithic
UP	Upper Palaeolithic
IAR	Indian Archaeological Review
GSI	Geological Survey of India
MBR	Mahabubnagar
RR	Ranga Reddy
HYD	Hyderabad
MDK	Medak
NZB	Nizamabad
ADB	Adilabad
KRM	Karimnagar
WGL	Warangal
KMM	Khammam
NLG	Nalgonda
BHEL	Bharat Heavy Electricals Limited
AP	Andhra Pradesh

Chapter 1
Introduction

1.1. Introduction

The Indian subcontinent is very well known in terms of lithic assemblage and vertebrate and invertebrate fossils and it has a very dynamic environment and climatic conditions at local and regional level (Misra 2001; Petraglia 2001). Extensive work on Lower Palaeolithic in India was carried out by Foote and located several Lower Palaeolithic sites in the Madras Presidency, the Bombay Presidency and between the Krishna Basin and Palar Basin. Cammiade and Burkit (1930), Krishna Swami (1938), de Terra and Paterson (1939), Sankalia (1946; 1952; 1956) Soundara Rajan (1952), Joshi (1964), and others extensively worked on Lower Palaeolithic cultures and found numerous sites in various parts of the country.

A large number of Middle Palaeolithic sites have been brought to light by Sankalia (1956), who discovered a flake industry in the Pravara valley region at Nevasa in 1955. Later Banerji (1957), Mohapatra (1964; 1966), Misra (1967), Ghosh (1972), Allchin (1973; 1976), Jayaswal (1974; 1978) located many Middle Palaeolithic sites. Some of the sites are Nandur-Madhmeswar, Nevasa in Maharashtra, Mandosar, Bhedaghat, Bhimbetka and Adamgarh in Madhya Pradesh and Kurnool in Andhra Pradesh. These cultures were distinguished by the crypto-crystalline silica raw materials like chert, chalcedony and jasper and also quartzite. The discoveries of stratified sites, bone tools and prehistoric art enabled the recognition of the Upper Palaeolithic in India. The blade and burin industries have been identified with these cultures. Newbold (1844), Foote (1884a, 1884b, 1885, 1916), Cammiade (1927), Todd (1939), Todd (1960), Murty (1966; 1970), Thimma Reddy (1968; 1970) and many others investigated Upper Palaeolithic Cultures in India. The sites include Rallakalava in Andhra Pradesh, Merlabavi, Yadwad in Karnataka and Belan valley in North-central India.

The Mesolithic sites are known from almost all parts of India. These sites are much larger in number than those of the Palaeolithic Cultures. The Mesolithic cultures are represented by Microliths. Sporadic discoveries of microliths were made by Foote (1914; 1916), Hunter (1935-36), Gordon (1950) later Sankalia (1965), Misra (1976), Sharma (1980), Murty (1981; 1985), Pal (1994), Cooper (1997), and many others

worked on Indian Mesolithic Cultures (Misra 2002). A few of the Mesolithic sites are Bagor and Tilwara in Rajasthan, Langhnaj in Gujarat, Bhimbetka and Adamgarh in Madhya Pradesh.

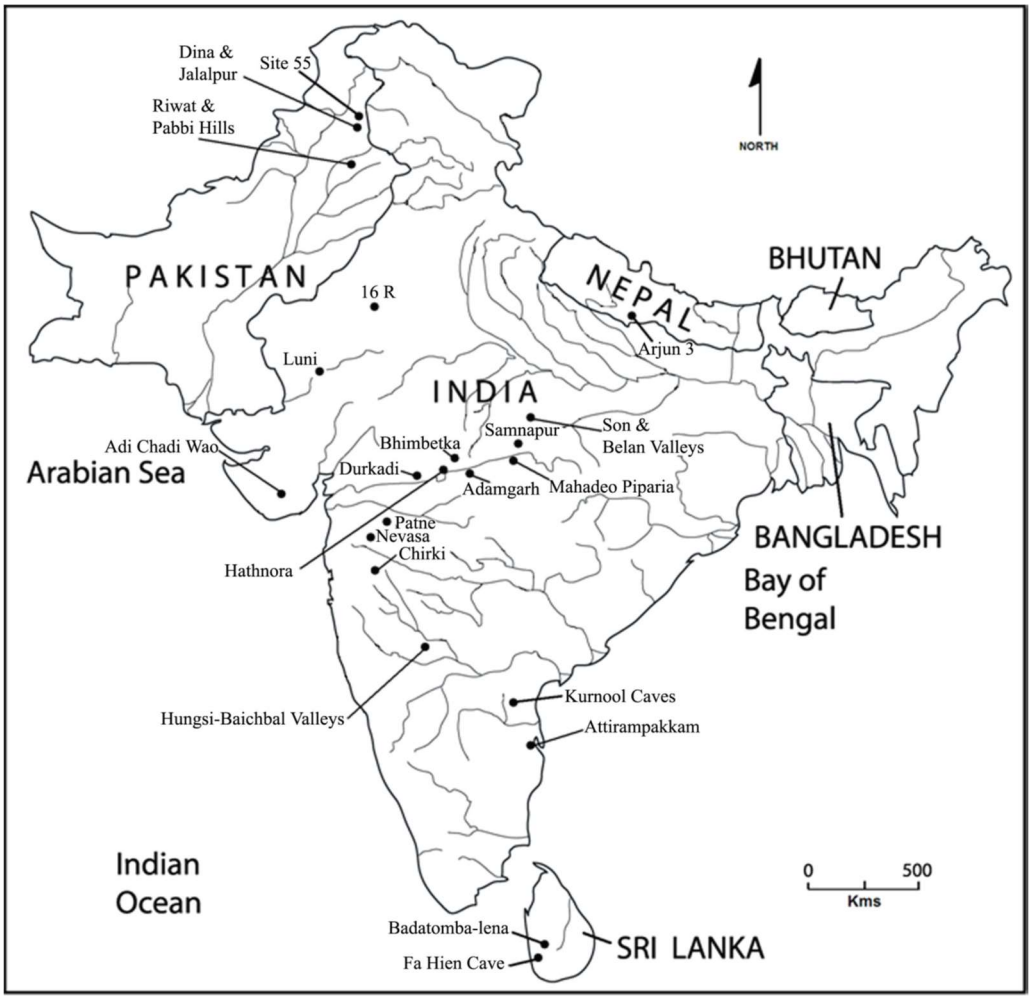


Figure 1.1: Key Paleolithic occurrences in the Indian Subcontinent and their locations (Source: Patnaik 2009)

Neolithic studies were started in the early 1840s. Newbold (1836, 1842-3) was the first to conduct systematic excavations on ash mounds, which he carried out at the Kupgal. But the first recorded collection of New Stone Age artefacts collected by Primrose in the year 1842 at Lingsugur of Raichur district in Karnataka (Allchin1960). Lubbock (1867), Foote (1887a; 1887b; 1914; 1916), Paddayya (1973; 1975; 1990; 1998), Sharma (1982), Singh (1987), and many other scholars worked on Indian Neolithic cultures. The Neolithic culture was represented by a sedentary and food-producing way of life and the sites include Burzahom, Kili Ghul Muhammad, Chopani Mando, Koldihwa, Maski, Utnur, Brahmagiri, Sanganakallu and many others.

1.2. Indian subcontinent and its geographical location in understanding its cultural history

Indian subcontinent plays a crucial role in understanding the human migrations due to its geographical location in between Africa and West Asia towards its western side and China and Indonesia towards the Eastern side (Fig. 1.4). As Zeuner (1951:5) argued that the position of India between Europe and Africa on the one hand, and Australians on the other, the two areas where important discoveries of Stone Age man have already been made, suggests that India is a kind of mode where different trends of culture and routes of migration must have crossed each other. Petraglia and Korisettar (1998:8) also says that the Indian subcontinent occupies a key role in the study and understanding of the Lower Palaeolithic cultures, mainly focused on the aspects of hominid distribution across Asia and adaptations to the local and regional environments. The Indian subcontinent is one of the most favourable environments for hominins and was probably the most essential region for some of the developments in human evolution (Mishra 2008:22).

R.S. Pappu (2001:13) made an in-depth study on a pan-Indian level for understanding the earliest human occupation in its totality. Pappu argued that the Peninsular region of the Indian subcontinent happens to be one of the richest areas for the Acheulian cultural material in the Old World (Pappu 2001:13). Pappu also explained that the absence or sparseness of sites in some parts of the country is probably due to ecological reasons. The total absence of sites over much of the Ganga plains is due to the lack of stone for making implements. Similarly, the sparseness of sites in north-east India and in the Western Ghats and the west coast is probably due to heavy rainfall and consequent dense vegetation. The reasons for population expansion such as the usage of microliths for hunting which assured them more food supply and increased rainfall must have contributed to greater plant growth and increase in animal populations, which in turn would imply increased availability of food to the human populations (Pappu 2001:69).

Andhra Pradesh/Telangana has emerged as one of the richest regions in the country from the archaeological point of view, where antiquarian studies were initiated two hundred years ago (Paddayya 2014:5). Evidences are reported from most of the districts specially the large clusters of prehistoric sites in the Kurnool and Cuddapah basins and the richness of evidence obtained from these since the times of Robert Bruce Foote, the

rich fossil findings from Billasurgam caves and the four-stage division of the stone age by Cammiade and Burkitt which subsequently became a model for the rest of the country. It was Sankalia (1974:55) who called Andhra Pradesh as "the classic land of Stone Age Man" due to its very rich prehistoric cultural evidence.

1.3. Prehistoric cultures of Telangana

Telangana area is rich in sites of archaeological interest that connect North, Central, and Eastern India on one hand and the Deccan and South India on the other. These sites range from Lower Palaeolithic, Middle Palaeolithic, Upper Palaeolithic, Mesolithic and Neolithic Cultures. Lower and Middle Palaeolithic artefacts like hand axes and flake scrapers were reported by Munn (1925:26) from Allur and Jangoan villages in Peddapalli Mandal (Referred by Singh 1979:1). Rajgopal in 1974 noticed cores, flakes etc., belonging to the Neolithic culture at Gunjepadiga (Manthani Mandal), Parlapallia, Kocheda and Shanigaram and Vemulawada. V.V. Krishna Sastry found microliths from Chinnakalavala and Takkalapalli in Pedddapalli Mandal. Haimendorf collected a large number of scrapers and blades from the Adilabad district. M.L.K.Murty along with Thakur Raja Ram Singh discovered a Middle Palaeolithic site at Allur-Julapally in Peddapalli of Karimnagar district (Singh 1979:1).

Thakur Raja Ram Singh in 1979 surveyed the regions of parts of Jagtial, entire Peddapalli, parts of Manthani, Huzurabad and Karimnagar Mandalss in Karimnagar district and also southern parts of Luxettipet, Pochera in Boath and Chitialpalli in Nirmal Mandals of Adilabad district. The extensive survey carried out by Thakur Raja Ram Singh (1979a, 1979b, 1984) in the middle Godavari basin proves to be a pioneering work that has proved this region to be highly potential as far as Palaeolithic cultures are concerned. He has reported a total of 28 sites in and around the Godavari river and its tributaries. Many significant features of these Palaeolithic cultures have been brought to light by Singh's work.

S.N. Rao worked on the Stone Age cultures of Nalgonda. The main of this study is to understand the environment of the region relating to its physical features, geology, the river system and the climate of the study region (Rao 1966). Tools of Early, Middle and Late Stone Age cultures were collected. Rao collected lithic evidences from the contexts of cemented gravel horizon, surface and river gravel beds. Quartzite is the

primary raw material used and chiefly depended on it. Rao in his field explorations collected 300 artefacts from the 13 sites (Tab.1.1), out of which 215 have been classified and studied in detail (Rao 1966, 26-34).

Table 1.1: Prehistoric sites explored by S.N. Rao (Rao 1966: 26-34)

Sl. No.	**Site Name**	**Culture**	**River**	**Context**
1.	Wazirabad	ESA, MSA	Musi	River bed
2.	Bhongir	ESA, MSA	_____	Surface
3.	Dindi	ESA, MSA	Dindi	River bed
4.	Krishnapur	ESA, MSA	Krishna	River bed
5.	Peddavura	LSA	_____	Surface
6.	Halia	ESA, MSA	Halia	River bd
7.	Minampalli	ESA, MSA	Peddavagu	River bed
8.	Ramatirthampaya	MSA, LSA	Ramatirthampaya streamlet	_____
9.	Raigirvagu	MSA	Aler river	Stratigraphy
10.	Rayavaram	ESA, MSA	Peddavagu	River bed
11.	Yeleswaram	ESA, MSA	Dindi river	Stratigraphy
12.	Aler	ESA	Musi	Stratigraphy
13.	Burhanpur	ESA	_____	Open-air site

The recent prehistoric explorations carried out by the Salunke in the Middle Godavarari Basin of Telangana; the region extends from Basar (18.8455N and 77.9466E) in Adilabad district up to Gangaram (18.59171N and 80.3407E) in Karimnagar district and explored a total of 21 Acheulian, Middle Palaeolithic and Late Palaeolithic sites (Tab.1.2). A total

of 2657 (Acheulian n=27, Middle Palaeolithic n=1315, Late Palaeolithic n=1315) artefacts were collected from these sites (Salunke 2019, 16)

Table 1.2: Prehistoric sites explored by Salunke in the Godavari basin of Telangana (Salunke 2019)

S.No.	Site Name	Geo-coordinates and Elevation	Context	Culture
1.	Boyapally	19.10001N, 79.47468E; Elevation: 238 m	Surface	Acheulian and Midle Palaeolithic
2.	Chikalavagu	18.8855N, 79.4918E; Elevation: 168 m	Stream	Midle Palaeolithic
3.	Indaram	18.8290N, 79.53680E; Elevation: 150 m	Stream	Midle Palaeolithic
4.	Asifabad	19.3559N, 79.2815E; Elevation: 205 m	Stream	Midle Palaeolithic
5.	Burugupalle	18.91785N, 79.6677E; Elevation: 166 m	Stratigraphy	Acheulian and Midle Palaeolithic
6.	Gunjapadugu	18.69820N, 79.5784E; Elevation: 151 m	Stream	Midle Palaeolithic
7.	Pochammapad	18.90006N, 79.40720E; Elevation: 154 m	Stratigraphy	Midle Palaeolithic
8.	Dharmaraopet	19.08376N, 79.39158E; Elevation: 241m	Surface	Acheulian
9.	Goutamnagar	18.74168N, 79.4837E; Elevation: 157 m	Stream	Midle Palaeolithic
10.	Kashipet-Somagundem	19.02475N, 79.4607E; Elevation: 174 m	Stream/bank	Late Palaeolithic
11.	Kerimeri	19.33218N, 78.30890E; Elevation: 506 m	Surface	Late Palaeolithic

12.	Narsapur-Kusli	19.12516N, 78.17455N; Elevation: 418 m	Surface	Late Palaeolithic
13.	Kadili	19.1325N, 78.20321; Elevation: 410 m	Surface	Late Palaeolithic
14.	Kouta	19.37346N, 78.3790E; Elevation: 423 m	Surface	Late Palaeolithic
15.	Kowtla Khurd	19.24071N, 78.22971E; Elevation: 384 m	Surface	Late Palaeolithic
16.	Rampoor	19.1044N, 78.1890E; Elevation: 373 m	Surface	Late Palaeolithic
17.	Boath	19.33218N, 78.3089E; Elevation: 506 m	Surface	Late Palaeolithic
18.	Pochera	19.32551N, 78.3669E; Elevation: 445 m	Surface	Late Palaeolithic
19.	Waghdari	19.32441N, 78.4438E; Elevation: 410 m	Surface	Late Palaeolithic
20.	Peddagundem	19.44640N, 79.0505E; Elevation: 282 m	Surface	Late Palaeolithic
21.	Kaghaznagar	19.36791N, 79.46396E; Elevation: 223 m	Surface	Late Palaeolithic

Salunke (2019) aimed at understanding their context, nature and distribution of prehistoric sites; the nature of lithic assemblages, and examined their significance in terms of understanding prehistoric behaviour. The study also highlighted varied geomorphological contexts for Middle and Late Palaeolithic sites in the region, and identified stratified sequences, aiding in placing the artefact assemblages within context.

Murty (2003) has given the detailed studies on Prehistoric explorations in both the states of Andhra Pradesh and Telangana, in which he has given the comprehensive history and culture of Andhra Pradesh (Undivided Andhra Pradesh) beginning with the Lower Palaeolithic cultures to the Early historic times. This study exhibits the rich

archaeological record of separate Andhra Pradesh and sporadic findings in the state of Telangana (Table. 1.3)

Table 1.3: Geographic distribution and number of Prehistoric sites in the Telangana region (Murty 2003).

Sl. No.	**District**	**LP**	**MP**	**UP**	**M**	**N**
1.	Adilabad	10	8	2	4	____
2.	Karimnagar	____	10	____	2	3
3.	Warangal	____	5	1	1	4
4.	Khammam	2	____	1	____	____
5.	Nalgonda	8	____	____	3	1
6.	Mahabubnagar	6	24	6	____	4
7.	Rangareddi	____	____	____	____	____
8.	Hyderabad	____	____	____	____	1
9.	Medak	____	____	____	____	____
10.	Nizamabad	____	3	____	____	____
	Total	26	50	10	10	13

Indrani et al. (2002) has given the details of prehistoric explorations and excavations conducted by Archaeological of India during 1953-1993. In this period ASI reported 1925 prehistoric sites (1890 explored and 35 excavated sites) in entire India. Out of 1925 sites, only 52 sites have been explored in the Telangana region (Indrani et al. 2002: 433).

Table 1.4: Prehistoric sites in the Telangana region (Indrani 2002: 482-483).

S. No.	**Site**	**Culture**	**District**	**IAR**
Early Palaeolithic site- Handaxes, Ovates, Cleavers, and few bifacially worked Choppers on quartzite				
1.	Rayavaram, Yelleswaram	EP	Nalgonda	1959-60
Lower & Middle Palaeolithic and Mesolithic				
2.	Kyaturu	LP, MP & M	Mahabubnagar	1976-77

Middle Stone Age tools				
3.	Iraladinne	MP	Mahabubnagar	1967-68
4.	Kudaveli	MP	Mahabubnagar	1967-68
5.	Kyaturu	MP	Mahabubnagar	1967-68
6.	Somasila	MP	Mahabubnagar	1967-68
7.	Gudeballur	MP	Mahabubnagar	1992-93
8.	Gurjala	MP	Mahabubnagar	1992-93
9.	Hindupur	MP	Mahabubnagar	1992-93
10.	Kalhalli	MP	Mahabubnagar	1992-93
11.	Krishna	MP	Mahabubnagar	1992-93
12.	Kusumurthy	MP	Mahabubnagar	1992-93
13.	Shukralingampalle	MP	Mahabubnagar	1992-93
14.	Belgera	MP	Mahabubnagar	1982-83
15.	Dasarapalle	MP	Mahabubnagar	1982-83
16.	Jadadoddi	MP	Mahabubnagar	1982-83
17.	Palava	MP	Mahabubnagar	1982-83
18.	Sasanur	MP	Mahabubnagar	1976-77
19.	Singavaram	MP	Mahabubnagar	1976-77
20.	Somasila	MP	Mahabubnagar	1976-77
21.	Uppalapadu	MP	Mahabubnagar	1976-77
22.	Yeddulagudem	MP	Mahabubnagar	1982-83
23.	Kishanpur	MP	Adilabad	1992-93
Middle Palaeolithic tools, Microliths, and Menhirs				
24.	Madmal	MP, M & Megalithic	Mahabubnagar	1992-93
25.	Muraharidoddi		Mahabubnagar	1992-93
Middle Palaeolithic tools & Neolithic culture				
26.	Kudavelli	MP & N	Mahabubnagar	1976-77
Mesolithic/ Microlithic				
27.	Basawaipalle	M	Mahabubnagar	1982-83
28.	Hasnapur	M	Mahabubnagar	1982-83

29.	Manchalakatta	M	Mahabubnagar	1976-77
30.	Mardumandinne	M	Mahabubnagar	1979-80
31.	Pentlavalli	M	Mahabubnagar	1976-77
32.	Polkampalli	M	Mahabubnagar	1982-83
33.	Pragturseripalli	M	Mahabubnagar	1976-77
34.	Tirmalaipalli	M	Mahabubnagar	1982-83
35.	Bandipur	M	Medak	1959-60
36.	Bodupatta	M	Medak	1959-60
37.	Buhiramdibba	M	Medak	1963-64
38.	Chevalla	M	Medak	1963-64
39.	Domargu	M	Medak	1959-60
40.	Pothalguda	M	Medak	1963-64
41.	Dongalagattu Tanda	M	Mahabubnagar	1982-83
42.	Yaparla	M	Mahabubnagar	1982-83
Mesolithic & Neolithic culture				
43.	Velaturu	M & N	Mahabubnagar	1976-77
Neolithic culture				
44.	Velaturu	N	Mahabubnagar	1967-68
45.	Gumakonda	N	Mahabubnagar	1976-77
46.	Malleswaram	N	Mahabubnagar	1976-77
42.	Rameswarpuram	N	Mahabubnagar	1976-77
48.	Rangapur	N	Mahabubnagar	1976-77
49.	Sheikpalli	N	Mahabubnagar	1976-77
50.	Appareddipalli	N	Medak	1958-59
51.	Satwar	N	Medak	1958-59

1.4. The Study Area: Manjira River Basin

The proposed study region, which comes under the Manjira river basin, is located in the North and Northwestern parts of Telangana. The river is one of the major and a southern tributary of the Godavari; it originates in Balaghat ranges at Patoda, Beed district of Maharashtra at an altitude of 823m. and flows through Osmanabad, Latur districts of Maharashtra and Bidar of Karnataka before entering Medak district of

Telangana state (Fig. 1.2). It almost flows parallel to the Godavari river and takes north direction in Sangareddy district and merges with Godavari river in Nizamabad district of Telangana (Fig. 1.1) The elevation of the source is 823m, the river length is 724 km, the average annual rainfall is 846 mm and the total catchment is 30844 sq. km. (CWC, Godavari Basin). (Further details of the study area discussed in Chapter- 2).

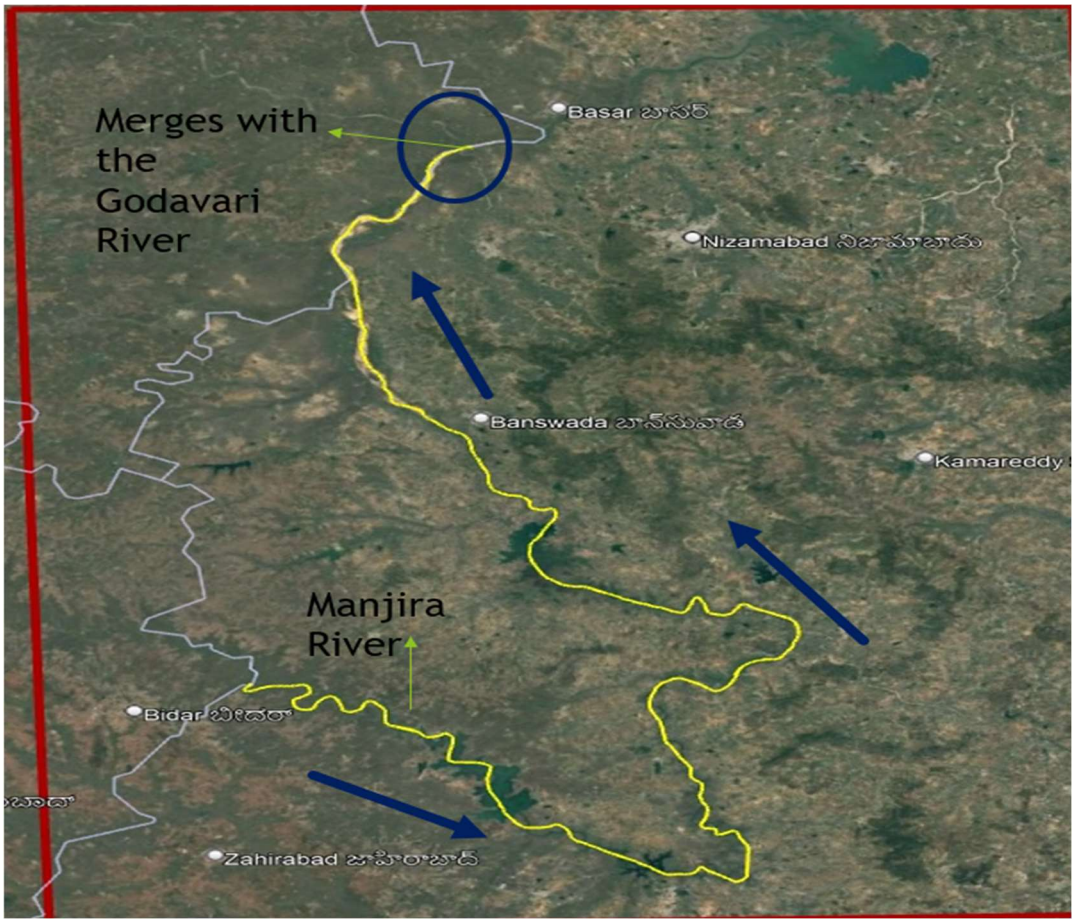


Figure 1.2: QGIS map showing the flow of the Manjira River in the Telangana state (Google, Landsat/Copernicus Digital globe 2020)

Figure 1.3: Map (circular mark) showing the study region of Manjira River in Telangana state (Source: India- WRIS).

1.5. Prehistoric explorations in Manjira

The prehistoric explorations in the Lower reaches Manjira i.e. in the districts Medak and Nizamabad (Present Sangareddy, Medak and Kamareddy and Nizamabad) of Telangana conducted by A. V. Narasimha Murty (IAR 1957-58, 1959-60), V.G. Sathe (IAR 1984-85; p. 6). D.L.N. Sastry (1985 & 1997) and Ganesh (2020). Earlier works in the Telangana region by Munn (1925-26), A.V.N. Murthy (1957-58), D.L.N. Sastry (1960-61), Rajgopal (1974), Thakur Raja Ram Singh (1979), and V.V. Krishna Sastry (1985) gives preliminary knowledge about the prehistoric sites and its geographic distribution in the Telangana region. There is a need to fill the gap in the Telangana prehistory in a systematic study. The present developmental activities in the study region like the construction of bridges, laying down of highways, roads and sand mining etc. erasing some of the prehistoric sites in the region, so there is an urgent need to explore and document the prehistoric sites in the region (See Chapter-2).

1.6. Statement of the Problem

The earlier explorations, which were carried out in this region are very few and most of the work done in this area is primarily focused to document the sites where there was

a threat of submersion due to the construction of the Singur dam on the Manjira River. As it is evident based on the published literature that still a larger part of the state is unexplored especially in the lower Manjira river basin, leading to a gap in the knowledge of our past in this region. Many parts of the state remain unexplored intensively and one of them is the Lower Manjira River Basin of the state. The present work has carried out intensive archaeological exploration in the river basin.

1.7. Objectives of the Present Study

Following are the main objectives of this study

1. To explore the prehistoric sites in the lower Manjira River Basin
2. To study and understand the geomorphology of the sites
3. To identify the source of raw material for making artefacts in the area
4. To study the nature and context of the archaeological record.
5. To analyse the typo-technology of the lithic assemblage.

1.8. Hypothesis

The study area has many prehistoric stone age sites. Earlier explorations have yielded some Upper Palaeolithic and Mesolithic sites in this region. Exploration is likely to yield more new sites of the same stone-age affiliation. The collection of artefact samples from the sites helps us in understanding the cultural trends of the Upper Palaeolithic and Mesolithic periods. The study of the distributional pattern of the sites helps us in understanding the settlement pattern in the said periods. Ancient communities preferred varied geographical zones for their activities. Terrain analysis helps in understanding their preferences in varied geographical settings. Micro study of the tools helps in understanding flaking and retouching techniques used by these communities. On the whole, the study also results in understanding the cognitive process of the prehistoric people.

1.9. Methodology

An intensive archaeological explorations have been carried out in the Manjira River Basin of Telangana, which extends in four districts (Sangareddy, Medak, Kamareddy, and Nizamabad) of Telangana State. An extensive explorations have been carried out

in the lower Manjira basin for four seasons (Dec 2017, Feb 2018, Nov-Dec 2018 and Feb 2019). Fieldwork was conducted in the study area and the earlier sites (Sastry 1985, 1997) were also reinvestigated in the study area. The fieldwork region comprises a part of the Lower Manjira river basin from Hussainnagar (17.948328 N, 77.648925 E) up to Kandakurthi (18.816991 N, 77.87252 E) with average elevations of 527 m and 332 m respectively. The study area was made into different small areas for the sake of convenience to conduct the explorations in different seasons and was explored thoroughly. A total of 30 sites were identified and discovered during this fieldwork out of 30 sites 25 sites were newly discovered and 05 sites were earlier reported by D.L.N. Sastry. The following methodology has been adopted to fulfil the above-mentioned objectives

Previous work regarding the development and issues of Palaeolithic in the Indian Subcontinent and in the global context was collected and studied. The available works and readings were collected from various and several other libraries and e-resources.

1.9.2. The collection and study of the old maps

The topological maps, that gives information about the geological formations and natural features of a region. Different types of maps such as topographical, geographical, drainage and planning maps of the districts of the study region were collected and studied.

Toposheets all published in 1927 with scale of 1 inch= 1 mile (56 F/9, 56 F/10, 56 F/11, 56 F/13, 56 F/14, 56 F/15). The sites were located by using the available secondary resources such as geological and district resource maps published by the GSI in 1995 and 1997 and Google Earth Pro (Copernicus) software.

1.9.3. Survey/Fieldwork

Archaeological surveys: The region under the study is made into small blocks for conducting the fieldwork which will be carried out along the various river channels and in the pediment regions where the scanning of the surface was conducted to find out the artefacts. These surveys were also helpful in the understanding of the surroundings of the site.

The author identified and discovered the sites by using the pedestrian survey and transect walk, in and around the Manjira river basin. Different areas of the proposed region were explored for identifying Palaeolithic sites and different artefact scatters, surface features and exposed sections of the sites were studied and documented both descriptively and photographically. The primary purpose of an initial survey is to establish whether or not there is evidence at the site that will justify going ahead with a full-fledged excavation. (Bill Mcmillon 1991).

The coordinates and elevations of the sites were noted using the Garmin Etrex GPS and GPS Status and Toolbox mobile app.

1.9.4. Sampling and Analysis of the Assemblage

Artefacts were collected using a random sampling method from all the sites. This was done due to the secondary nature of the sites. The artefacts were collected from different sized grids, which were laid out, and the representative sample were collected after proper recording. Artefacts were picked up from the site for a detailed study only after proper field documentation. The context of the artefacts was photographed with in their natural context.

1.9.5. Photography

All the surveyed Palaeolithic sites, the context of the artefacts and individual artefacts, naturally exposed sediment sections were photographed and mapped on the map. After detailed analysis of the artefacts, they were photographed with a Nikon D5300 DSLR camera, 18-55 mm lens.

1.9.6. Analysis of the data

All the assemblage collected from the surveys were analysed where all the metrical analysis was carried out. Zhart digital calliper was used for detailed analysis and for taking the length, breadth and thickness of the artefacts. Comprehensive analysis of microliths has been carried out with the help of Celestron handheld microscope and a magnifier was also used to observe the retouching and its types. After a detailed analysis of the artefacts, they were photographed with the help of a Nikon DSLR camera model: D5300 attached with 18-55 mm lens.

1.9.7. Typo-technological parameter

Raw materials were identified with the help of rocksmins mineral collection kit, and lithic assemblages were analysed with the classifications given by Inizan (1999) and Andersky (1998). Experimental knapping was carried out at the Sharma Centre of Heritage Education, Chennai in October 2015 and January 2018 to understand the lithic reduction sequence and analyse the assemblage under study.

1.9.8. Lithic analysis

To begin the analysis, the collected lithic assemblage were divided into cores, flakes, finished tools and natural objects by observing the morphology of the artefacts. A series of attributes were recorded for each artefact to gain further understanding of the typological and technological details of each artefact. These attributes include colour, the physical condition of artefacts, Breakage pattern, the preserved component of the tool, raw material type, maximum length, width, and thickness etc. Depending upon the different types of artefacts, different types of attributes were recorded. Standard variation and Average of all assemblage have been taken to understand the morphology and size of cores and finished tools.

Flakes less than 2cm were considered as debitage which were produced during manufacturing a tool/artefact., any working or retouching of them is checked properly as there is a possibility of any broken flake or blade tool within that.

All the collected cores were categorized based on their morphology and the flake removals from the cores such as flake cores and blade cores. Metrics taken on each core included the length, breadth and thickness, maximum length and width, raw material of the core, the physical condition of the core, blank form and number of flake/blade scars on the cores also noted.

1.10. The significance of this study

As the Telangana state and the selected region is not much explored and less represented for the prehistoric cultural sequences, the present study will be significant to explore and document new prehistoric sites in this region and collected data is helpful

in better understanding of the continuous cultural development of the archaeological record of the region and state.

1.11. Geological, Geomorphological, Environmental and Climatic background of the study area

The proposed study region, which comes under the Manjira river basin is located in the North and Northwestern portions of the Telangana state. The Manjira river is a major and southern tributary of the Godavari river, it originates in Balaghat plateau at Patoda, Beed district of Maharashtra at an altitude of 823m., and flows through Osmanabad and Bidar districts before entering Medak district of Telangana. Total catchment area of the Manjira river basin is 29485.75 sq. km. It enters Telangana at Janwada of Medak district. In Medak district, it flows for a length of 96 km., through Narayankhed, Zahirabad, Sangareddi, Narsapoor and Medak Mandals before entering into the Kamareddi district. It flows through Kamareddi and Nizamabad districts to join the Godavari river near Basara of Nirmal district. The tributaries of the Manjira river include Terna, Tawarja, and Gharni, Manyad, Teru, Lendi and Dabbavagu.

1.12. Hills

The region is situated in the tableland of the Deccan and hence hills of any significant range are quite rare in this area. The region is occupied with isolated peaks and rocky clusters, which are the characteristic of the Deccan are seen commonly. The rocks relate to the Archaean group and the Deccan Trap occurs mainly along the northern frontier of the Nizamabad district. Medak consists of numerous hillocks. Of these, one range extends from Ramayampet in the north to the southern portion of the Nizamabad district. Another range extends to the east from the north-western corner (Nizamabad District Gazetteer 1973 & Medak District Gazetteer 1976).

1.13. Rivers

The principal rivers in both Medak and Nizamabad districts are the Godavari and the Manjira (Manjra). The Godavari, which is the largest river in South India, takes its origin in the Western Ghats at Triambak near Nasik in Maharashtra State. It flows for about 113 kilometres on the northern boundary of this district separating it from Nanded (Maharashtra State) and Adilabad districts and finally passes into Karimnagar district.

The Manjira, the principal tributary of the Godavari, rising in Patoda Mandal of Bhir district in Maharashtra crosses the district from the south-west and joins the Godavari neat Khandakurthi (Kandakurti) in Bhodan after a course of 100 kilometres. The waters of this river are well utilised for irrigation in this district by constructing a dam (Nizamsagar) near Achampet in Banswada Mandal. The river Haldi, which is also known as the Pasupuyeru and a tributary of the Manjira, enters the Medak district from the north and flows through Medak town. The Kudlair river, which drains Siddipet Mandal, is another important stream in the district. (Nizamabad District Gazetteer 1973 & Medak District Gazetteer 1976).

1.14. Irrigation

In Medak, Ghanpur Project is the only medium irrigation project with an ayacut of 8,650 Hectares in the district. In the other areas completely depended on groundwater i.e., Borewells for irrigation. (Medak District Portal, Government of Telangana). In the Nizamabad district, the total area of ayacut from several irrigation projects is 2,44,566.58 hectares. These irrigation projects are classified into three types viz: major irrigation projects with an area of 2,26,285.72 hectares, medium irrigation projects with an area of 11,191.83 hectares and minor irrigation projects with an area of 7,089.03 hectares (Census 2011).

1.15. Climate

The climate of this region is characterised by a hot summer and usually dry weather, except during the southwest monsoon. The entire year is divided into four seasons. The period from March to May is the summer season. This is followed by the southwest monsoon from June-September. October and November constitute the post-monsoon or Monsoon retrieval season. The period from December to February is the winter season (Medak District Gazetteer 1976: 17-18).

1.16. Temperature

The mean daily maximum temperature of this region is about 42°C and a mean daily minimum is 28°C experienced during the summer. The maximum temperature of 45.3°C was recorded in May 2001. Due to the advance of the South-west monsoon by about the middle of June, there is a significant drop in temperature. By the month of

October, the day temperature begins to increase slightly, but the night the temperature steadily decreases. After November both day and night temperature decreases rapidly. The minimum temperature of 11.5°C is recorded in the region during December 2000 (Nizamabad District Gazetteer 1973 & Census 2011).

1.17. Rainfall

Most of the rainfall received in this region is by the South-west monsoon with a normal rainfall of 680 mm; followed by the Northeast monsoon with a normal rainfall of 133 mm. The wettest month in this region is July. The minimum normal rainfall of 10 mm is from the winter season; followed by 50 mm of normal rainfall from the hot weather season. During the later part of summer and post-monsoon season, the rainfall is sometimes in the form of thundershowers. The maximum rainfall of 896 mm is recorded during the year 2005-2006 as against the normal rainfall of 873 mm with a rainfall variation of 2.63 %. However, the total rainfall recorded during the decade is 7,160 mm as against the normal rainfall of 8,730 mm; giving rise to a rainfall variation of -17.98 % on the negative side (a reduction of 1570 mm of rainfall) (Census 2011)

1.18. Geology and mineral resources

1.18.1. Geology of the region

The area covered by Nizamabad and Medak districts formulae part of the Indian Peninsular shield which continued a stable landmass since the formation of the earth's crust. The rocks formed about 2,500 million years ago are identified as the Archaeans, which are generally igneous or highly metamorphosed rocks. Most of the area is occupied by the Peninsular granite complex of the Archaens, which occur in the form of hills, tors and sheets or dome-like masses scattered over a flat or undulating country. Minor inliers of Dharwar rocks occur as narrow bands of a small extent. A part of Sangareddy in the southwestern portion of the Medak district is covered by the Deccan trap (Basalt flows) formation. They form plateaus with a steppe appearance and are described as plateaus basalts. These traps were formed by the solidification of lava and are in the form of layers of different texture and thickness. Cryptocrystalline forms of silica such as chalcedony, agate, plasma and jasper are found filling the cavities at some places in the traps. As regards mineral wealth, the area has deposits of iron ore, clay,

semi-precious stones and others but these have not been considered so far to be of economic importance. (Nizamabad District Gazetteer 1973: 8)

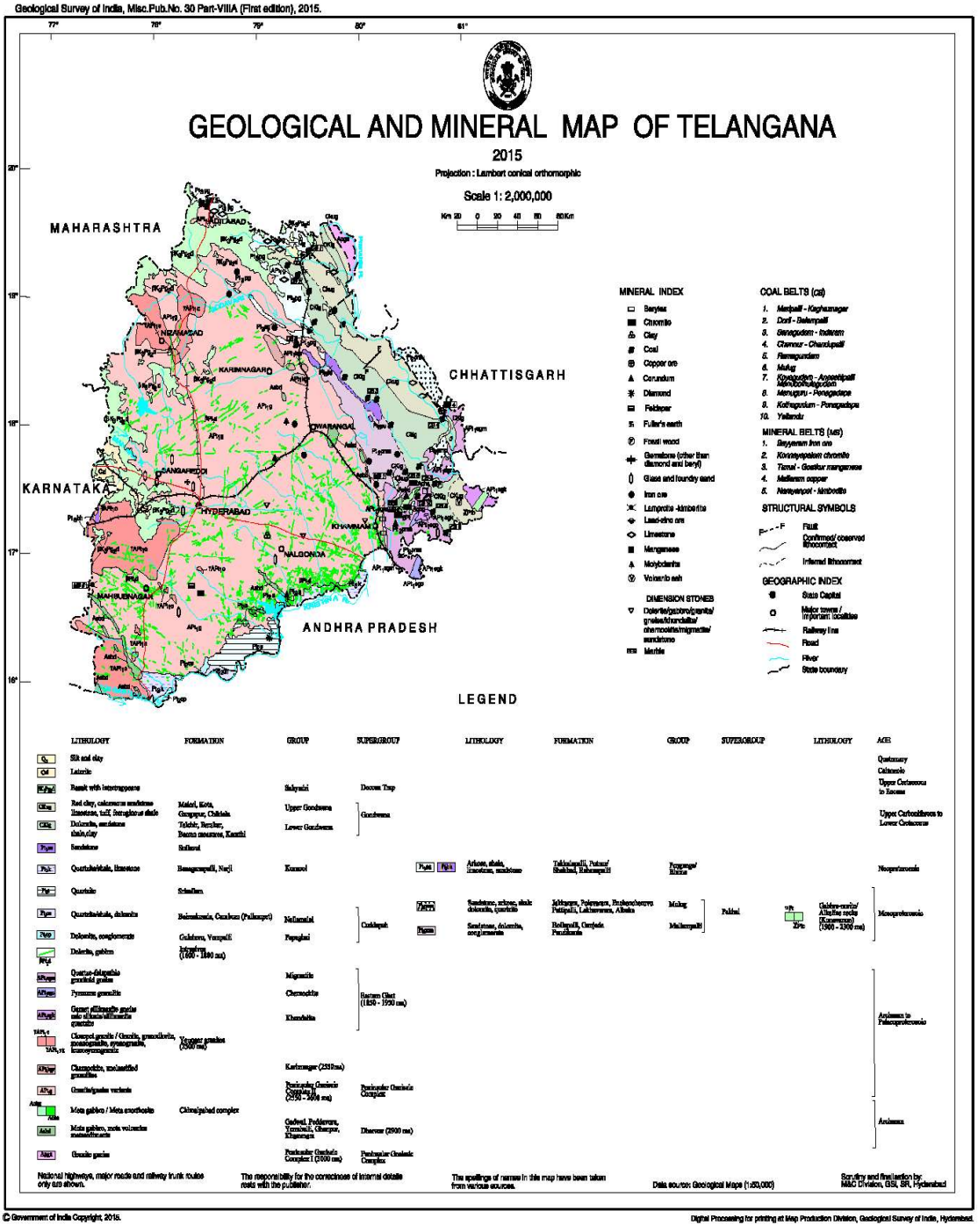


Figure 1.4: Geological and Mineral map of Telangana (GSI 2015)

1.18.2. Mineral resources

The commercial minerals known from the Nizamabad district are the building material, iron ore, clay, mica, manganese ore, talc, semi-precious stones and soap-stones and several quartz veins cutting across the granite occurred all over the Medak district (Fig. 1.5). (Nizamabad District Gazetteer 1973:8, Medak District Portal, Govt of Telangana)

1.18.3. Semi-precious stones

Amethystine quartz is occasionally found in quartz veins in the granitic areas. They are found crystal aggregates near Pedda Gouraram (Gowraram) and Potaipalle in Yellareddy of Nizamabad district. (Nizamabad District Gazetteer 1973:8)

1.18.4. Quartz

There are abundant quartz veins are located cutting across the granite all over the Medak district and quartz is useful for the glass-making industry may be obtained from some selected deposits. The more important among them are the three reefs, (1) about three kilometres south-west of Shankarampet (Shankrampet), (2) about six kilometres east of the same place and (3) near Papannape, all in Andole (Jogipet) mandal. Out of these reefs, the more promising ones are the two found south and east of Narsapur. (Nizamabad District Gazetteer 1973:8, Medak District Portal, Govt of Telangana

1.19. Soils

A vast part of the region is enclosed by the sandy soil, which is derived from the weathering of pink and grey granites. The black cotton soil is confined to the areas of basaltic rocks which are found in parts of Kamareddy, Armur and Nizamabad. Locally the basic dolerite dykes of the granite country have given rise to red to brown and even black soils. The laterites of the Lingumpet, Diemey and Gandhari areas have given rise to ferruginous reddish and black soils. The other types of the Medak district includes mainly Black cotton soil consisting of clay, clay loams, and silty clay sandy loams, loamy sands, and sandy clay loams (Nizamabad District Gazetteer 1973:8, Medak District Portal, Govt of Telangana).

Table 1.5: Soils of Andhra Pradesh issued by Department of Agriculture, Andhra Pradesh, Hyderabad (1972: 22)

Sl. No	**Soil**	**Location**
1.	Red sandy soils	Parts of Hyderabad and Medak
2.	Red loamy soils (deep)	Parts of Khammam
3.	Laterites	Zaheerabad of Medak
4.	Black cotton soils (deep) (Regurs)	Mahaboobnagar, Khammam, Warangal, Adilabad and Nizamabad
5.	Black soils (mod. deep to deep) (Regurs)	Parts of Adilabad, Nizamabad, Karimnagar, Warangal, Khammam, Medak, Hyderabad and Mahaboobnagar

1.20. Flora

According to Champion's classification of forest types, the study area is enclosed by the southern tropical dry deciduous forest and there are no distinct sub-types. The tropical dry deciduous forest has been stable for a very long time and the region enjoys an annual rainfall of 1,033.7 millimetres. The monsoon period is very much short-lived in this region it has an important bearing on the flora of the forests. (Nizamabad District Gazetteer 1973:8)

Acacia leucophloea grows in the clayey calcareous soils, while the eroded sandy soils produce Acacia Sundra or Soymida febrifuga. On shallow soils and hilltops, Boswellia serrata occurs almost as a pure crop, while along the stream banks Terminalia Arjuna grows. The chief trees are Teak, Blackwood, Ebony, Nallamaddi (Terminalia tomentosa), Yeppa (Hardwickia binate), Bijasal (Pterocarpus Marsupium) and Tarwar (Cassia auriculata). Some of the dry evergreen species like *Mimusops hexandra* (Pala or Sapota), *Ixora parvi flora* (Korivi) and *Memecylon edule* (Alli) are also found intermixed with the dry deciduous types. (Nizamabad District Gazetteer 1973:5-8)

The most important and valuable of all the species in the Medak district is the Tectona grandis (teak). Considering the occurrence of teak in variable proportions, the forests of the district is classified into three groups namely, (a) teak forests (where teak is more than 30 per cent), (b) mixed teak forests (where the proportion of teak varies between 10 to 30 per cent) and (c) mixed forests (where the incidence of teak is less than 10 per cent). (Medak District Gazetteer 1976:6)

Forests and Forest coverage:

The existing forests of Medak district are divided into six ranges including one sub-range namely, Medak, Narsapur, Zahirabad and Narayanakhed and Ramayampet and Siddipet of Kamareddy division. Nizamabad district has forest vegetation distributed in patches separated by cultivated lands. All the mandals have forest growth in them and some good patches exist roughly in the central part of the district. The forests are mostly confined to hilly portions though there are a few small forest blocks situated on the plains. Based on the topography, the forests can be distinguished into (1) The Manchippa Hill Zone and (2) the Godavari-Manjira-Mansa plains Zone (Medak District Gazetteer 1976:8-9).

These forests lie in Nizamabad and Kamareddy Forest Divisions which are further subdivided into the following ranges.

1. Nizamabad Forest Division:

(i) Nizamabad range

(ii) Kammarpalle range

(iii) Banswada range and

(iv) Yellareddy range

2. Kamareddy Forest Division:

(i) Kamareddy range and

(ii) Indalwai range

All the mandals are largely overgrown with jungles, which give cover to the wild animals. The local population gets all its requirements of fuel, timber and grazing from the forests. (Medak District Gazetteer 1976:9

1.21. Fauna

Earlier the forests of the Medak district were vigorous with various types of wildlife. The pocharam wildlife sanctuary, which is spreading from Medak to Nizamabad district had a various types of birds and wild animals. The lack of adequate drinking water facilities, the advent of modern weapons, adverse environmental factors and other means of hunting are lead to the destruction of the fauna of this region. Various carnivores such as jackals, wolf and foxes can be found on the outskirts of both the districts. Beautiful four-horned antelope, wild bear, blackbuck and sloth bear are also found in the jungles. Sometimes spotted deer and sambar appear in the interior forests of this region. Various types of birds such as avifauna (flying species), the great Indian bustard, Patridge, pigeon, green pigeon, peafowl, green jungle fowl and different varieties of cranes and ducks and are common. (Medak, Telangana District Portal).Tigers, panthers, wild sheep, jungle cats, blackbucks, blue bulls, sambars, spotted deer, common deer, wild boar, rabbits, hares, squirrels, porcupines and others are some of the common animals occurring in the district (Medak District Gazetteer 1976:12).

1.22. Agriculture

The major crops are branched into Cereals, Pulses, Oilseeds and other crops. Under Cereals Rice, Jowar & Bajra are the major crops of the region. Red gram and Bengal Gram are the dominant Pulses, while Groundnut & Sesamum are the major Oil- Seeds of the district. Other cash crops such as Cotton & Sugarcane are also seen in the districts. Green Leafy Vegetables, Tomatoes, Cabbage, Grapes and Papaya are the chief vegetables and fruits of the district (Census 2011).

1.23. People

According to the 2011 census, the total population of the Telangana state is 305.04 lakhs. The state consists of 32 tribal groups whose population comprises of 9.08% of

the total population, the major tribal groups of the state are Lambadis (20.46%), Koyas (4.86%), Gonds (2.98%) and Yerukalas (1.44%).

Table 1.6: Percentage of ST, SC and others population of the Telangana state

Population in percentage	**MBR**	**RR**	**HYD**	**MDK**	**NZB**	**ADB**	**KRM**	**WGL**	**KMM**	**NLG**	**State**
STs	8.99	4.13	1.24	5.57	7.56	18.09	2.83	15.11	25.18	11.3	9.08
SCs	17.49	12.32	6.29	17.73	14.54	17.82	18.8	17.54	16.84	18.27	15.45
Others	73.52	83.56	92.47	76.7	77.9	64.02	78.37	67.35	57.98	70.43	75.47

1.23.1. Medak District Population

The Medak district has a population of 30,33,288 as per the 2011 census which accounts for 8.62% of the total population of the Telangana State, out of 30,33,288; 1,523,030 are male and 1,510,258 are female. People lives in the Urban areas is 24%, while 76% resides in the Rural areas (Census 2011).

1.23.2 Nizamabad district population

The total population of the Nizamamabad district is 2,551,335 as per the Census 2011. Out of which 1,250,641 are males while 1,300,694 are females.

Urban Population

In the Nizamabad district, a total of 28.71 per cent live in urban regions of the district. A total of 452748 people live in urban areas of which males are 225316 and females are 227432. Sex Ratio in urban areas of Nizamabad district is 1009 according to 2011 census data. Likewise, child sex ratio in Nizamabad district was 962 in the 2011 census (Nizamabad District Profile: Govt of Telangana).

Rural Population

As per the 2011 census, 71.29 % population of Nizamabad districts resides in rural areas of villages. The total population of living in rural areas of the Nizamabad district is 1124360 of which males and females are 546133 and 578227 respectively. The sex

ratio in rural areas of the Nizamabad district is 1058 females per 1000 males (Nizamabad District Portal, Govt. of Telangana).

Chapter 2

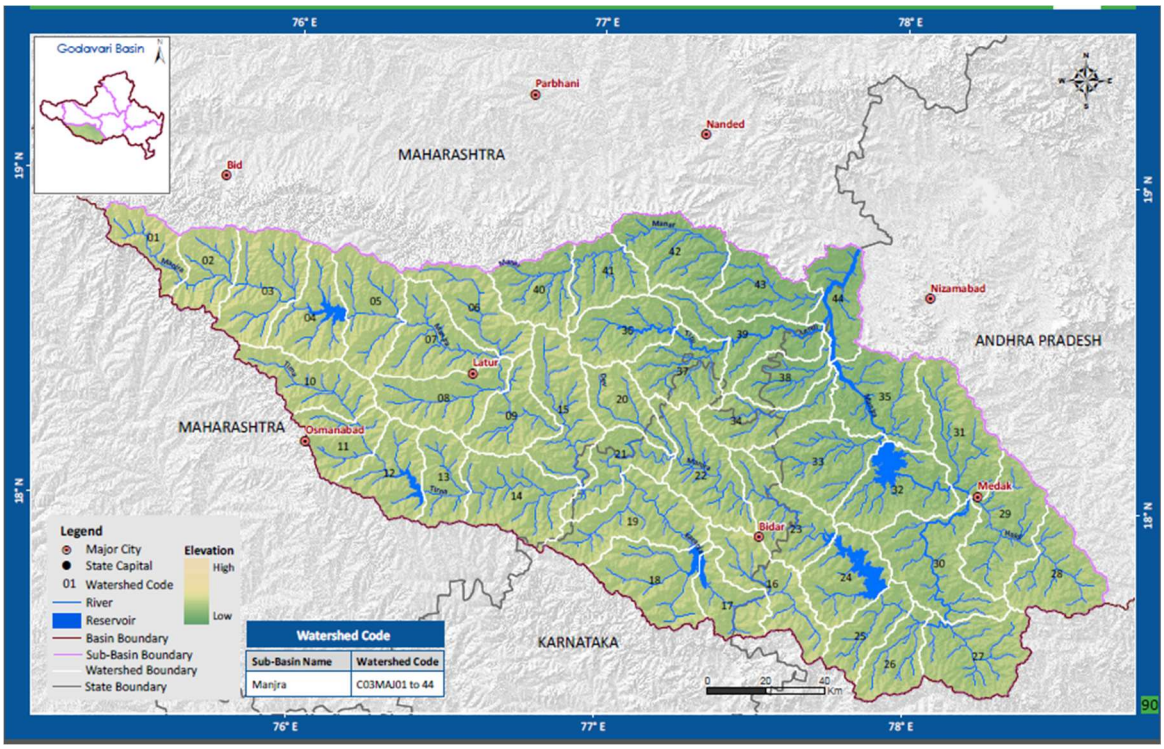
Earlier Prehistoric explorations in the Manjira River Basin

2.1. Introduction

The proposed study region, which comes under the Manjira river basin, is located in the North and Northwestern parts of Telangana. The river is one of the major and a southern tributary of the Godavari; it originates in Balaghat ranges at Patoda, Beed district of Maharashtra at an altitude of 823m. and flows through Osmanabad, Latur districts of Maharashtra and Bidar of Karnataka before entering Medak district of Telangana state (Fig. 2.1). It almost flows parallel to the Godavari river and takes the north direction in Sangareddy district and merges with Godavari river in Nizamabad district of Telangana. The elevation of the source is 823m (Fig. 2.2), the total length of the river at all the three states is 724 km, the average annual rainfall is 846 mm and the total catchment is 30844 sq. km. (refer, CWC, Godavari Basin)

It enters into Telangana near Hussain Nagar (17.95064N, 7765006E; Elevation: 526 m asl) of Medak district, it flows for a length of 96 km., through Narayankhed, Zahirabad, Sangareddi, Narsapoor and Medak district before entering into the Kamareddi district. It flows through Kamareddi and Nizamabad districts to join the Godavari river near Kandakurthi (18.81739N, 77.87556E; Elevation: 334 m asl) of Nizamabad district. In Telangana, it flows a total area of ~ 290 Km (Fig. 2.2). The tributaries of the Manjira river include Terna, Tawarja, Gharni, Manyad, Teru, Lendi, Haridra Nadi and Dabbavagu. and merges with the river Godavari near the temple town of Basar (18.81739N, 77.87556E; Elevation: 334 m asl) of Nizamabad district.

In Telangana Singur and Nizamsagar projects were constructed on this river in Sangareddy and Nizamabad districts respectively. Singur was the drinking water source of Hyderabad whereas the Nizamsagar was the oldest dam in the Telangana state.



Figue 2.1: The Manjira river basin (Source: CWC)

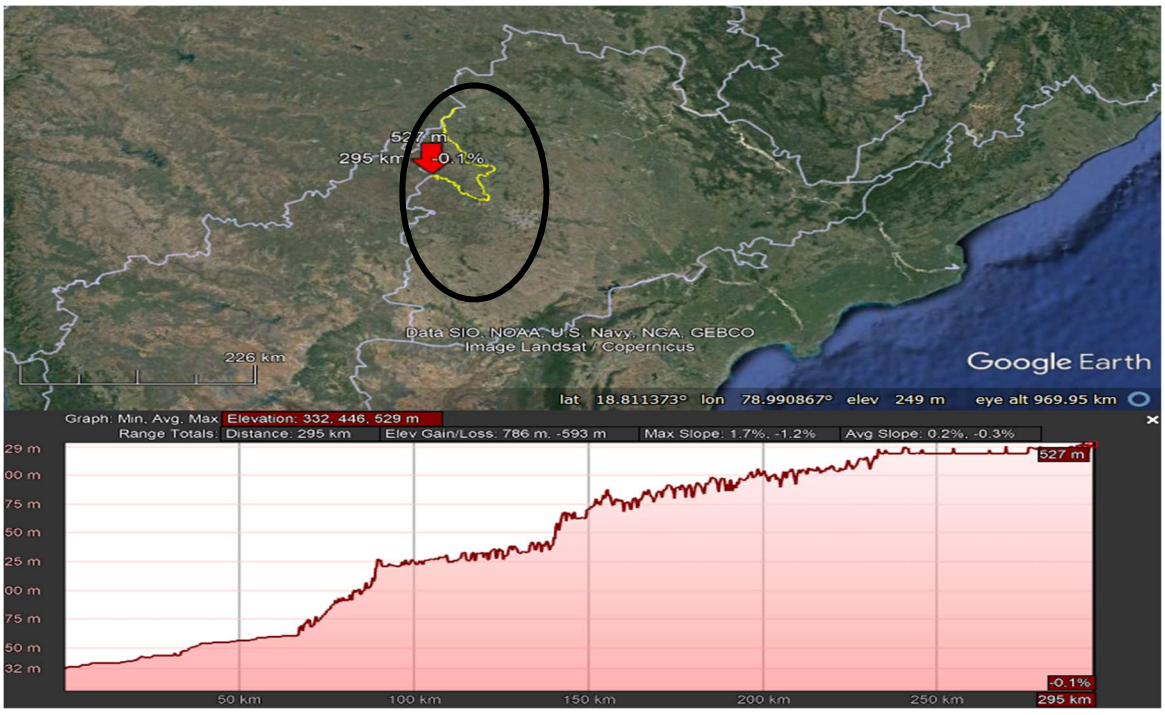


Figure 2.2: Elevation map of the study area (Circular area) (Google Earth Landsat/Copernicus)

2.2. Earlier explorations in the River Basin

The prehistoric explorations in the Manjira river basin were conducted by various scholars in different parts of the basin such as the Upper reaches, Middle reaches and Lower reaches. A.V.N. Murthy (IAR 1957-58:11), who conducted studies in the lower raches reported the discovery of series II tools and microliths at Appareddipalli and Satwar in Zahirabad of Medak district. Bopardikar (IAR 1971-72) explored the upper reaches of the Manjira (Ambajogai, Kalliam, Deoli, Tadul, Wagdari and Sirsa) in Maharashtra and found the middle and upper palaeolithic artefacts. Later R.V. Joshi et. al. (IAR 1975-76 1977-78 1981-82 and 1984-85) reexplored the same region in 1975-76 and reported the evidence for shifting of the river course.

Manjira is one of the principal source rivers, which provided rich evidence of fauna in peninsular India along with the major river valleys of India, such as the Narmada, Godavari, Son, Ghod, Mahanadi and Krishna rivers. (Chauhan, 2008: 21) and it has emerged as one of the areas rich in Pleistocene vertebrate fossils in recent years (Joshi et al. 1981, Badam et al. 1984, Sathe 1989, 2004, 2009 & 2015). The first archaeological and palaeontological survey in this basin was carried out in 1976-77 by Joshi and his colleagues (1981). Different areas of the basin have yielded different kinds of assemblages such as lithic and fossil assemblages. The upper reaches of the river has provided rich vertebrate fossil evidence and the lower reaches have provided with Middle Palaeolithic, Upper Paleolithic and Mesolithic artefacts (Joshi et al. 1981, Badam et al. 1984, Sathe 1989, 2004, 2009&2015, Sastry 1985, 1997& Ganesh.M (2019a, 2019b &2021).

2.2.1. Explorations in Maharashtra

The archaeological explorations in the upper reaches of Manjira have been carried out by Bopardikar (IAR 1971-72,31), Joshi. R.V. et al. (IAR 1975-76, 34-35; 1977-78, 37-38; 1981-82, 49 and 1984-85, 12), Badam et al. (1984), Sathe and Rajinder Ganjoo (IAR 1981-82, 49) and Sathe (1989, 2004, 2009 & 2015).

The earliest explorations in the Upper reaches of the Manjira basin were conducted by Dr. S. W. Chitale in the year 1972 when he happened to observe the deeply excavated trenches on both the banks of the river Manjira at Dhanegaon. During the same, he found the fossils of different animals at Tadula, Wangadari and Ganjur. The exposed

sediments at these places yielded fossils of elephant, horse and several fossil fragments of other animals as well as freshwater molluscan shells (see Joshi et al. 1981).

According to the IAR 1971-72 report, Shri B. P. Bopardikar, Prehistorian of the Archaeological Survey of India has conducted Explorations in District Beed and Osmanabad districts of Maharashtra and examined fossil-bearing sites at Ganjapur (Ganjpur) (Discovered by Shri S. W. Chitale), found two fossil-bearing deposits at Deola and Sirsa, and also collected lithic assemblage of Middle and Late Stone Age tools at Deola, Tadul and Kallam.

Ganjapur (Ganjpur), is situated on the right bank of the river Manjira. The Deccan Traps and outcrops are noticed near the river bed and also in the village. The lithic assemblage consists of cores, flakes and microliths which were collected on the surface of the site. The exposed cliff section at the site, which is 70-80 cm in height. The section is filled with gravel sandy ledges, overlain by black soil and mixed with *kankar.* Bopardikar noticed and collected a huge number of fossils from the section where the black clay is contacting with the gravel bed. He also noticed full of shells associated with the black soil and the molluscan shells of univalves and bivalves associated with the sandy gravels and no evidence of lithic artefacts was noticed in these layers. The collected fossil fragments belong to the animals such as elephants, Bos, etc. from these observations he noticed that the collected fossils deposit seems to belong to the Pleistocene Period (IAR 1971-72:31).

The site Wagdari is located on the left bank of the Manjira river and to the southwest of the village. One fossil was removed from the section consists a compact and hard gravel was found resting on the bedrock. It is similar to that of the same old gravel found at Ganjapur (IAR 1971-72:31)

The site Tadul is located ~5 km. to the west of Wagdari site. The cliff section of the left riverbank between Wagdari and Tadul bank, is composed of (from the bottom to upwards) sandy gravels, overlain by ~2 m. the thickness of black soils. The sandy gravel contained similar types of fossils, which are obtained from the site of Ganjapur. No lithic evidences connected with the fossils, but lithic assemblage belongs to the Middle and Late Stone Age cultures were found from the loose gravel in the river, which were

made on chalcedony. The assemblage consists of cores, scrapers, flakes and blades (IAR 1971-72:32).

Deola site is located on the left bank of the Manjira River. Bopardikar conducted a survey in the upstream region of the Manjira river and collected a few tools belongs to the Middle and Late Stone Age cultures made on chalcedony. The lithic assemblage included flakes, scrapers, points, cores and blade cores. A section near the village was identified and it showed the sequence of (from the bottom upwards) bed-rock, sandy gravel, brown silt and black soil (IAR 1971-72:32).

The site Kallam is located at ~56 km. to the southwest of Ambejogai on the Manjira river in the Osmananabad District Osmanabad. A thick section of 7 m, showed the following sequence of deposits (from the bottom upwards): bed-rock; sandy gravel with ledges and alternate bands of coarse and fine sand; silt; and black soil. a few lithic assemblage consists of flakes, scrapers, blades and cores were collected from the loose gravel in the riverbed, further a stray fossilised tooth of an animal were also collected (IAR 1971-72:32).

Indian Archaeological Review report of 1975-76 noted that R. V. Joshi along with with his team members surveyed in the Districts of Aurangabad, Beed, Nanded, Osmanabad and Parbhani. The main aim of this exploration is to understand the Quaternary history and to assess the prehistoric potentialities of the region. The survey yielded artefacts belongs to the Middle and Upper Palaeolithic cultures, fossils, chalcolithic and early historical evidences (IAR 1975-76:34).

Joshi et al. had conducted explorations in Beed, Nanded and Sholapur districts and continued explorations till Dhanegaon, where the area is submersible under the Irrigation Dam at on the river Manjira, with a view to salvaging the archaeological evidences. As part of this survey, Joshi. R.V. et al. (IAR 1977-78:37) continued their explorations in the adjacent areas of Karnataka and Telangana states.

The above explorations by Joshi. R.V. et al. resulted in finding a number of sites associated with the microlith assemblage along with the plantation surfaces ranging in elevation from 800 to 500 m above the sea level. These sites were found in Beed, Ambajogai, Mukhed, Sholapur, Barsi and Dharmpuri Districts of Maharashtra. Joshi et.al. noticed that the collected lithic assemblage were made on locally available raw

materials such as chert, jasper, chalcedony and other siliceous raw materials which are found in the intertrappean formations. Outcrops of these siliceous rocks have been observed by Joshi. R.V. et al. several kilometres away from the sites. The lithic assemblage typologically represented by blades, points and geometrical forms like lunates and triangles. Upper Palaeolithic assemblage consists of Patinated tools along with thick and unretouched blades (IAR 1977-78:37).

At Mugaon, Joshi et.al (IAR 1977-78:38) found rich fossil evidences of *Bos* sp., *Sus* sp. And *Cervus* sp. and lithic assemblage showing typological characters transitional between the Middle and Upper Palaeolithic traditions. These were found in the left bank of Manyad river at a height of about 6 m above the modern bed level, a northerly tributary of the Manjira.

In 1977, a joint project was carried out by Joshi et al., (1981) to explore the Manjira/Manjira river basin. As a part of it, they studied geography, Quaternary geology, palaeontology and the prehistoric cultures of the Manjeera river. Joshi et al. surveyed in the 51 villages which were likely to submerge under the dam water and they have discovered five Stratified sites, 11 Middle Palaeolithic sites and 34 Mesolithic sites in the different reaches of the river which are given below:

Important Stratified sites in the Upper reaches:

(i) Dhanegaon (18°36’ N, 76°10’ E)

(ii) Wangadari (18°35’ N, 76°23’ E)

(iii) Tadula (18°35’ N, 76°25’ E)

(iv) Mugaon (18°35’ N, 77° 27’ E)

(iv) Deglur (18°34’ N, 77°35’ E)

(v) Salura (18°42’ N, 77°47’E):

Joshi et al. (198: 81) discovered 11 sites (Tab. 2.1) of Middle Palaeolithic cultures in the middle and at the lower reaches of this river. At all the locations they found the chert sources and the allied raw material is plentiful. These raw materials are derived from the Deccan Trap formations of the area (Joshi et al. 1981; 83).

Table 2.1: Middle Palaeolithic sites in the Manjira basin (Joshi et al. 1981)

Sl. No	Site	Artefacts
1.	Sangam	26
2.	Kavadgaon	42
3.	Zahirabad	03
4.	Nandikalli	31
5.	Metakonda	97
6.	Yendikol	81
7.	Chintgunta	14
8.	Alladurg	07
9.	Deglur	20
10.	Salora	68
11.	Mugaon	15
	Total	**404**

A total of 34 Mesolithic sites (Tab. 2.2) were noticed by Joshi et al. (1981: 88-90) in this area and none of the collections showed affinities with the U.P cultures.

Table 2.2: Mesolithic sites in the Manjira basin (Joshi et al. 1981)

Sl. No	Site	Artefacts
1.	Borgaon	08
2.	Hingaongaon	21
3.	Kalam	09
4.	Pimplegaon (Tonga)	14
5.	Devla	06
6.	Tat Boragam	13
7.	Apegaon	07
8.	Isthal	05
9.	Soundara	07
10.	Pimplegaon Ghat	28
11.	Wadhwan	17
12.	Hingni (K)	28
13.	Hingni (B)	09

14.	Jeba	04
15.	Vizora	12
16.	Borgaon (Kaij)	18
17.	Lasara	08
18.	Wakadi	14
19.	Wanjekheda	09
20.	Pargaon	19
21.	Lotha	07
22.	Sone Sangvi	05
23.	Bhalgaon	03
24.	Kranjkheda	25
25.	Anandlgaon	07
26.	Lakha	07
27.	Bhopla	05
28.	Kale-Sawergaon	05
29.	Sangam	13
30.	Kavadgaon	07
31.	Biloli	17
32.	Mukhed	18
33.	Bijur	03
34.	Dharmapuri	12
	Total	**390**

Vijay Sathe and Rajinder Ganjoo (IAR 1981-82:49) of the Department of Archaeology, Deccan College, conducted explorations in the Tadula and Wangdari villages of Maharashtra along the Manjira River. They noticed Calcreted moderately-sorted pebbly gravels on the Deccan Trap at most of the sites. These pebbly gravels characterized old braided channels of the Manjira River. The overlying formations are represented by brown to dark brownish-coloured silty sandy clay. These deposits are fairly widespread in the area and characterize a low-energy depositional environment, representative of ox-bow lakes associated with the flood plain of the old Manjira river. Their explorations also resulted with a good number of fossils which include those of *Cervus unicolour, Hippopotamus* sp. and *Cervus duvauceli.* In addition to the fossils, a few Mesolithic

assemblage are also collected which were knapped on chert and chalcedony, from a cultivated land on a nullah, located about 3 km north-west of Parli, which is close to BHEL Thermal plant.

Later Vijay Sathe (2015) extensively worked on the discovery of fossil evidence on the main channel of Manjira in the Districts of Latur and Beed of Maharashtra to reconstruct the Palaeoenvironment of the region. The faunal record comes from sandy pebbly gravel which is the sole fossil horizon resting on the Deccan Trap and discovered various fossil bones and studied them to reconstruct the palaeoenvironment of the upper Manjira region. He discovered a large number of fossilized cranial and skeletal elements of tiger, horse, rhinoceros, blackbuck, deer, tortoise and several freshwater molluscs near Harwadi, Latur District, Maharashtra (Sathe 2015:2).

2.2.2. Explorations in Karnataka

Joshi et al (1977-78) studied the laterites in the Bidar district of Karnataka they noticed that the extensive primary laterites which are occurring in that area are with an average thickness of 12 to 15 m in Bidar district of Karnataka, this shows that there was a humid climatic phase with nearly 160 per cent rise in rainfall during the late Tertiary and early Pleistocene. General palaeontological, geomorphological and archaeological studies (Joshi et al IAR 1977-78:38) in the Manjira valley bring out the following chrono-environmental framework for the Manjira river of Karnataka (Tab. 2.3).

Table 2.3: General palaeontological, geomorphological and archaeological studies in the Manjira valley (Joshi et al IAR 1977-78:38)

S.No	Geomorphic features	Palaeontological evidences	Probable climate	Approximate age	Cultures
1.	Distinct rejuvenation with limited alluviation in channels	----------	Semi-arid monosonic	Early to Holocene	Mesolithic

2.	Distinct alluviation even in minor tributaries and in the source areas	*Bos. Equss*	Semi-arid monosonic with frequent storm	Terminal Pleistocene	Late Middle Palaeolithic
3.	Bedload braided rivers formation of gravel bars	*Bos. Cervis, Sus, Hippo*	Semi-arid monosomic	Late Pleistocene	Early Middle Palaeolithic
4.	Laterites	----------	Sub-humid monosonic	Early Pleistocene	----------
5.	Pediplains	----------		Late Tertiary	----------

R.M. Shasaksharaiah reported 21 Middle stone age and 11 Microlithic sites in the Bidar district of Karnataka. (Sastry 1997: 4-5) not much details are known about this study.

2.2.3. Prehistoric exploration in Telangana

The prehistoric explorations in the Telangana state i.e. in the districts Medak and Nizamabad (Present Sangareddy, Medak and Kamareddy and Nizamabad) of Telangana conducted by A. V. Narasimha Murty (IAR 1958-59,11; 1959-60, 12), V.G. Sathe (IAR 1984-85; p. 6). D.L.N. Sastry (1985 & 1997) and Ganesh.M (2019a, 2019b &2021).

A.V. Narasimhamurthy (IAR 1958-59:11 and 1959-60: 12) of the South-eastern Circle of the Archaeology Department Explored in District of Medak and discovered Series II tools and a few microliths at Appareddipalli and Satwar in Zahirabad. At Ismailkhanpet were found lithic assemblage of microliths, shreds of megalithic Black-and-red Ware and a few etched carnelian beads. In his later studies collected microliths from sites near Domargu, Bodupatla and Bardipur in the Medak district. The lithic assemblage is dominated by points, and scrapers.

D.L.N. Sastry (1985 & 1997) conducted prehistoric explorations in the Manjira (Manjira) river valley of Medak District during 1982-83. This study was conducted in the central portion of Manjira valley which was threatened with submersion due to the construction of Singoor dam across the river at Singoor, during that time. As part of it, fieldwork was carried out in this region covering an area of 60 km. between Janwada and Singoor with the main aim of surveying and recording of the archaeological wealth of the region.

The later investigation which was conducted by D.L.N. Sastry in the Middle of the lower reaches of the Manjira valley resulted in the discovery of several prehistoric, protohistoric, early historic and historical sites in this area. The prehistoric cultures consist of Upper Palaeolithic and Mesolithic sites. Acheulian and Middle palaeolithic cultures are almost absent or not found in these regions. Sastry (1985) found 40 localities (Table. 2.4) of Upper Palaeolithic and Mesolithic sites in this region, and these were dominated by the different types of scrapers. The Mesolithic assemblage is dominated by non-geometric tools and may be dated between 10000 to 4000 B.C.

Table 2.4: Upper Palaeolithic and Mesolithic sites explored by Sastry in the Manjira River basin

Sl. No.	**Site Name**	**Site Code**	**Latitude**	**Longitude**	**Culture**
1.	Chikurti	CKT	17.8996	77.617	UP & M
2.	Kaki Janwada	KJW	17.949	77.667	UP & M
3.	Murtuzapoor	MZP	17.933	77.667	UP
4.	Atmyal	ATL	17.983	77.667	M
5.	Badlagaon	BDG	17.983	77.7	UP
6.	Pulakurti	PKT	17.95	77.7163	UP & M
7.	Bellapur	BLP	17.933	77.783	UP & M
8.	Chalki	CLK	17.916	77.667	UP & M
9.	Raghavapur	RGP	17.833	77.667	UP & M
10.	Matoor	MTR	17.9	77.766	UP & M

11.	Khanjabalpur	KJB	17.8416	77.683	UP
12.	Pampad	PPD	17.9094	77.7688	UP
13.	Sirpur	SRR	17.888	77.788	UP & M
14.	Dowlatabad	DTB	17.876	77.7977	UP & M
15.	Pippalapalli	PPl	17.861	77.783	UP & M
16.	Raipalli	RPL	17.888	77.8047	UP & M
17.	Gattpal	GPL	17.891	77.8047	UP & M
18.	Jungle Husirikapalli	JKP	17.886	77.8216	UP & M
19.	Paladugu	PLG	17.8688	77.8466	UP & M
20.	Devanoor	DVR	17.88	77.8547	M
21.	Butkur	BTR	17.88	77.8736	UP
22.	Gorrekal	GRK	17.89	77.8986	UP & M
23.	Darkaspalli	DKP	17.8688	77.8844	UP & M
24.	Gowtapoor	GTP	17.8522	77.902	UP & M
25.	Husirikapalli	HKP	17.859	77.8736	UP & M
26.	Indoor	IND	17.854	77.845	UP & M
27.	Nirjappala	NJP	17.8477	77.8713	UP & M
28.	Bogulampalli	BMP	17.828	77.845	M
29.	khadirabad	KDB	17.828	77.9119	UP & M
30.	Kodur	KDR	17.8188	77.8666	UP & M
31.	Belur	BLR	17.8	77.895	UP & M
32.	Mantoor	MTR	17.792	77.923	UP & M
33.	Kallepalli	KPL	17.788	77.89	UP
34.	Honnapur	HNP	17.7736	77.9236	UP & M
35.	Regulpad	RPD	17.771	77.9047	UP & M
36.	Ser Pedareddipet	SRP	17.771	77.9427	UP & M
37.	Kesaram	KSM	17.759	77.888	UP & M
38.	Ramachandrapuram	RCM	17.754	77.842	UP & M
39.	Basireddipalli	BRP	17.9952	77.926	UP & M
40.	Singoor	SGR	17.7519	77.941	UP & M

D.L.N. Sastry explored a total area of ~100 km in the Medak district of Telangana, almost the region which comes under the Singur dam and discovered a total of 80 sites in this region which are Upper Palaeolithic and Mesolithic cultures.

V.G. Sathe (IAR 1984-85:6) explored in the Nizamabad district of Telangana. During the exploration, he revisited the earlier explored sites and also discovered a few of the Middle Palaeolithic sites which were located in the vicinity of 15 km from the Manjira river. These sites are distributed around the Peddavagu, Naragivagu and nullahs, flowing between Khajapur, Hunsa and Mandarna. These were yielded a large number of lithic assemblage belongs to the Middle Palaeolithic cultures, consists of various types of scrapers, large cores of prepared and unprepared cores mostly made on chert resources. The site at Salura given a good number of artefacts belongs to the Middle Palaeolithic cultures are cemented in a boulder pebbly gravel of the usual thickness of 2 or 3 m and resting on weathered Archaeans and capped by yellowish-brown *Kankary* silt. The fossils collected at Salura is represented by osteological fragments of different types of medium to small size fossil mammals mostly belong to *Cervus* sp., *Bos* sp., and a few unidentified bone remains.

The site Salura was earlier studied by Joshi et. al. (IAR 1977-78:37) and collected a huge number of Middle Palaeolithic assemblage, found in a cemented boulder pebbly gravel with a thickness of 2 to 5 m, which rests on a weathered gneiss and is capped by yellowish-brown *kankary* flood silt. The lithic assemblage at Salura contains of unifacial and bifacial scrapers, flakes and flake blades, large cores of prepared and unprepared varieties. Joshi et. al. compares this industry well with the end phase of the late Acheulian Wainganga-A type.

2.3. Quaternary Palaeontology

The Manjira has exposed one of the best palaeontological treasures in India- the second in order to importance and abundance to that of the Central Narmada Valley. The Manjira river has yielded the geological and archaeological data in terms of fossils with regard to provenance (Joshi et al 1981:74).

The rich evidence of animal fossils was found from the Late Pleistocene alluvial deposits of the river Manjira at Ganjapur, Dhanegaon, Wangdari and Tadul by Joshi et al (IAR 1975-76:35). Palaeontological studies from the collections of the Manjira river

exposed the presence of the Late Pleistocene fauna in the study region such as buffaloes (*Bubalus bubalis*), elephants (*Elephas maximus*), horse (*Equus namadicus*), deer (*Cervus Sp*.), and cattle (*Bos namadicus*). These studies were also showed that the region was covered by a dry deciduous scrubby forest. These studies by Joshi et al. have also helped in reconstructing the palaeoecology of the region. Joshi et al (IAR 1975-76:35) also found that near Ambajogai on the Manjira river elephant fossils predominate at Dhangaon and cattle at the Vangadari site. Such scattering of animals appears to have been controlled by local ecology. The dominance of the elephants indicates a marshy and swampy environment while the cattle suggest a savannah landscape. The faunal wealth of this region shows that they are slightly later in age, is comparable to that of the Siwaliks of north India and the Narmada in central India (IAR 1975-76:35).

The discovery of rich Late Pleistocene fauna encouraged to undertake a detailed exploration of the valley locating its source region up to its confluence with the Godavari. Interestingly this tract did not yield any Lower Palaeolithic site (Joshi et al 1981). The absence of the Lower Palaeolithic industries in the Manjira is however enigmatic, particularly when there was no dearth of suitable raw material, the fauna was abundant in the Manjira river basin of Maharashtra and had thick vegetation cover during the late Pleistocene period (Joshi et al 1981).

Vijay Sathe and Rajinder Ganjoo (IAR 1981-82:49) conducted explorations along the Manjira river between the Tadula and Wangdari villages of Maharashtra. The exploration also provided with a huge number of fossils which includes *Cervus unicolour, Hippopotamus* sp., and *Cervus duvauceli*. Vijay Sathe (2015) extensively worked on the discovery of fossil evidences on the main channel of Manjira in the Districts of Latur and Beed of Maharashtra, and discovered various fossil bones and studied them to reconstruct the palaeoenvironment of the upper Manjira region. He discovered a large number of fossilized cranial and skeletal elements of tiger, horse, rhinoceros, blackbuck, deer, tortoise and several freshwater molluscs near Harwadi, Latur District, Maharashtra.

The Manjira river basin provided with rich vertebrate fossil evidence in the upper reaches when once moves to the middle and lower reaches of the river the occurrence of this fossil assemblage is less and completely absent at some locations. Many of these

fossils are exceptionally well-preserved and are very promising in the reconstruction of accurate palaeoenvironmental evidences (Chauhan, 2008).

2.4. Discussion

The earlier prehistoric studies were conducted by State Archaeology Departments, Archaeological Survey of India, Universities and Colleges in and around the Manjira river of All the three states. The published Indian Archaeological Reviews by the State Department (IAR 1953-54; p. 38), I. K. Sharma (IAR 1969-70:64), Joshi et. al. (IAR 1977-78:37) were also worked in the study area.

I. K. Sharma of the Excavations Branch and Shri B. Ramakrishna Das, Artist, Kondapur Museum (IAR 1969-70:64) conducted explorations in the hill-slopes and surrounding fields, about one kilometre south of the Kondapur Site Museum and south-west of the Satavahana city at Kondapur, discovered burnished grey and coarse red wares, besides ground stone axe among which was a hoe from the granitic outcrops.

A number of rich surface and a few stratified sites of Middle Palaeolithic cultures were found in the lower Manjira. At Metkonda of Telangana discovered a Middle Palaeolithic site, which is one of the richest factory sites in this region, which was found near the outcrop of intertrappean fossiliferous cherty ash bed. The collected lithic assemblage consists of fluted cores, micro-blades and retouched large crescents and a few burins belongs to the the late phase of the Middle Palaeolithic cultures (Joshi et. al. IAR 1977-78:37).

Based on these studies which were conducted in the Manjira Basin it is evident that although the region is comparatively poor in cultural remains it is extremely rich in the material culture like laterite and alluvial deposits for the studies of the prehistoric environment. It is one of the important regions in India rich in Quaternary fauna, which helped in understanding the palaeoenvironment of the region. Joshi. et al, 1981 opined that the region as a whole became most suitable for extensive habitation from Mesolithic onwards. Sastry (1997) also opined that the upper reaches of the Manjira valley reported very rich fossil evidence and unimpressive findings of lithic assemblages. The rich occurrence of fossils indicates an open woodland-savannah environment with occasional marshes, developing in low-level zones.

Chapter 3

Result of Field Investigations

3.1. Introduction to the Study Region

The chapter discusses the present field investigation, which was carried out in this region. The study region was systematically surveyed and explored over the four seasons of the fieldwork, which was carried out in the months of December 2017, February 2018 November to December 2018 and February 2019. The present fieldwork aimed to discover the new Prehistoric sites, understand the nature of the site geomorphology and also revisit the previously reported sites (Sastry 1995) in the study region (see Chapter 1). The study area was divided into various sub-regions for the more systematic and controlled surveys.

3.2. Geology and geomorphology of the study area

The geography of the study area is often mountainous, rocky, and rough, with abrupt and varying slopes that cause significant erosion (Soils of A.P., 1972:4). The Medak district is characterised by gently undulating topography with low hills, the highest elevation is 610 m above msl reported at Zahirabad and the lowest 381 m above msl reported at Siddipet. There are two hill ranges located in the Medak district- one spreading from Ramayampet in the north direction to Tupran in the south direction, the other spreading from Narayankhed in the northwest to the Gajwel in the east in the district (Soils of A.P., 1972:4).

The region is covered under the Godavari basin. Manjira, a tributary of Godavari flows in both the districts and Haldia is a tributary of Manjira river. There are many rivulets and streams, notable among them being Kundair and Pasupuyeru. The drainage pattern of the Manjira is dendritic in granite terrain and parallel in Deccan Trap areas. The region is occupied by hard rocks viz., Archaeans and Deccan Traps with 79.53%, soft rocks viz., laterites with 20.63% and alluvium with 0.2% (Map of Geological Survey of India 1995&1997).

The landforms in the district are generally denudational, structural and fluviatile in origin. In the central and eastern parts, the crystalline complex characterized by

metasediments, granites and gneisses forms a distinct pediplain. Due to this denudational process in this region, the area is resulted with the landforms such as shallow weathered pediplain, inselberg and residual hills. In the western part of the study area, landforms are of moderately dissected plateau. Fluvial valley fills are found along the Manjira River (Map of Geological Survey of India 1995&1997).

Most of the study area in this district is occupied by the peninsular granite complex of the Archaeans. Minor inliers of Dharwar rocks occur as narrow bands of a small extent. A part of the Sangareddy district in the south-western portion of the study area is covered by the Deccan trap (Basalt flows) formation (Nizamabad district Gazetteer 1973& Medak district Gazetteer 1976). Precambrian rocks such as adamellite, amphibolite, tonalite, granite, and hornblende biotite schist occupy a large part of the Medak district. These formations were resulted due to the tectonic and metamorphism in the region., Most of the Medak district is occupied by granites except the western part of the district. The mineral composition of the district is further classified as adamellite, tonalite, alkali feldspar granite, trondjhemite magmatite granite gneiss and granodiorite. Amphibolite and pyroxene granulite patches are seen around the Siddipet region. (Medak district Gazetteer 1976:11). Table (2.1) shows the geological succession in both Andhra Pradesh and the Telangana States.

Table 3.1: The geological succession in A.P and Telangana (Medak district Gazetteer 1976:4, modified after Balasubramaniam 2017)

Period	Geological Formation	Rock Types
Recent	Alluvial deposits	Sedimentary
Eocene	Deccan trap	Igneous
Carboniferous	Gondwana	Sedimentary
Cambrian	Cuddapah and Kurnool & Dharwars	Sedimentary
Archaean	Granite-gneisses	Igneous

The Deccan Traps and intertrappean are seen in the north and west of Jogipet (17.8333N, 78.07083E), spreading up to the northern and western parts of the Medak district. The Deccan traps in Sangareddy (17.6250N, 78.0833E) district from the eastern extremity of the great mass of traps that extend westwards into Karnataka and Maharashtra States. They form plateaus with a steppe appearance and are described as

plateaus basalts. These traps were formed by the solidification of lava and are in the form of layers of different texture and thickness. Cryptocrystalline forms of silica such as chalcedony, agate, plasma and jasper are found filling the cavities at some places in the traps (Medak district Gazetteer 1976:4). The laterite capping is seen extensively around Zahirabad. Two major lineaments trending E-W and N-S seem to cross each other between Medak and Narsapur; the N-S lineament is occupied by dyke rocks. There are two major dykes, one in the central part, trending in the N-S direction, and the other one encountered at Kowdipally trending in the NE-SW direction (Map of Geological Survey of India, 1997).

Several quartz veins are cutting across the granitic bedrock all over the district. The quartz veins are more important and containing good quality silica are found among them are the three reefs, (1) ~3 km south-west of Shankarampet (18.03055N, 77.91666E), (2) ~6 km east of the same place and (3) near Papannapet (18.030556N, 78.08611E), all in Andole (Jogipet) Mandal (Map of Geological Survey of India, 1997). Out of these reefs, the more promising ones are the two found in the south and east of Narsapur. These two deposits were estimated to contain good-quality quartz. Another quartz deposit investigated in 1958 is the one near Andole-Jogipet. The northern extremity of the reef near Andole consists of good-quality quartz (Medak district Gazetteer 1976:4).

White china clay occurs in laterite about two km south-south-west of Shaikapur (17.6083N, 77.61111E) village, 10 km south of Zahirabad railway station. Here, lateritic clays and ochre form part of the overburden. The white clay band has light-coloured impurities. The area may yield a considerable quantity of clay. Besides these, the district has large reserves of building stones in the form of different varieties of granites, Agate, Jasper, etc. found in the Deccan Traps (Medak district Gazetteer 1976:4).

The area covered by the Nizamabad district forms part of the India Peninsular shield which remained a stable landmass since the formation of the earth cust (Nizamabad district Gazetteer 1973:3-4). As regards mineral wealth, the district has deposits of iron ore, clay, semi-precious stones and others but these have not been considered so far to be of economic importance (Nizamabad district Gazetteer 1973:4).

Table 3.2: The succession of the geological formation (modified Nizamabad district Gazetteer 1973)

Age	Geological period	Rock types
~1 Ma years	Sub-recent to Recent	Laterite soil and river alluvium
50-130 Ma years	Upper Cretaceous to Lower Eocene	Deccan Traps with Intertrappean
2,500 Ma years	Archaean	Veins of pegmatite and quartz; Dykes of dolerite; Peninsular granite complex; Banded ferruginous quartzites and schist (Dharwars)

Archaean formations include banded ferruginous quartzites, quartz, schists, peninsular granite complex, feldspar (pink or grey), potash, and mica or hornblendes as crucial minerals, while apatite and sphene occur either together or separately. Various dykes of dolerite and pegmatite and quartz veins traverse in the granitic bedrocks in different directions (Medak district Gazetteer 1976:4-5).

Deccan trap formations are found in the southern part of the district in Kamareddy and Yellareddy mandals as fairly extensive outcrops but as isolated outcrops in Armur mandal. The Deccan Traps consist of massive or vesicular and amygdaloidal flows of basalt which have given rise to flat-topped hills with plateau-like appearance. The minerals in the basalt are principally pyroxenes and plagioclase feldspars, which occur roughly in the same amounts. The Intertrappean beds consist of cherts and sandstones, which are of fossiliferous, the fossils being lamellibranchs and gastropods. The Intertrappean beds are found near Rajampet in Kamareddy (Rajagopal 1976:4). Recent formations include laterite soils and alluvial deposits. The laterites are found as capping over the Deccan Traps in Kamareddy and Yellareddy mandals and are formed by the weathering of the basalts under tropical conditions. These varied from highly ferruginous to practically aluminous types and constituted a source of iron-ore in the past. The alluvial deposits occur on the banks of the Godavari (Medak district Gazetteer 1976:4).

3.2.1. Mineral resources

The minerals which are of economic importance, known from this district are the iron ore, building material, mica, clay, manganese ore, semi-precious stones, soap-stones and talc (Medak district Gazetteer 1976:4). Semi-precious stones such as Amethystine quartz is occasionally found in quartz veins in the granitic areas. They are found crystal aggregates near Pedda Gouraram (Gowraram) and Potaipalle in Yellareddy mandal (Medak district Gazetteer 1976:7).

3.3. The archaeological record of the sites

A total of 30 sites were studied during this fieldwork out of which 25 were explored by the author and the remaining five were earlier reported sites (see chapter 2). Out of these 19 sites were Late/Upper Palaeolithic cultures, seven were Mesolithic and four were having a mix of Upper Palaeolithic and Mesolithic cultures (Table. 3.3)

Table 3.3: Upper Palaeolithic and Mesolithic sites explored by the author in the study area

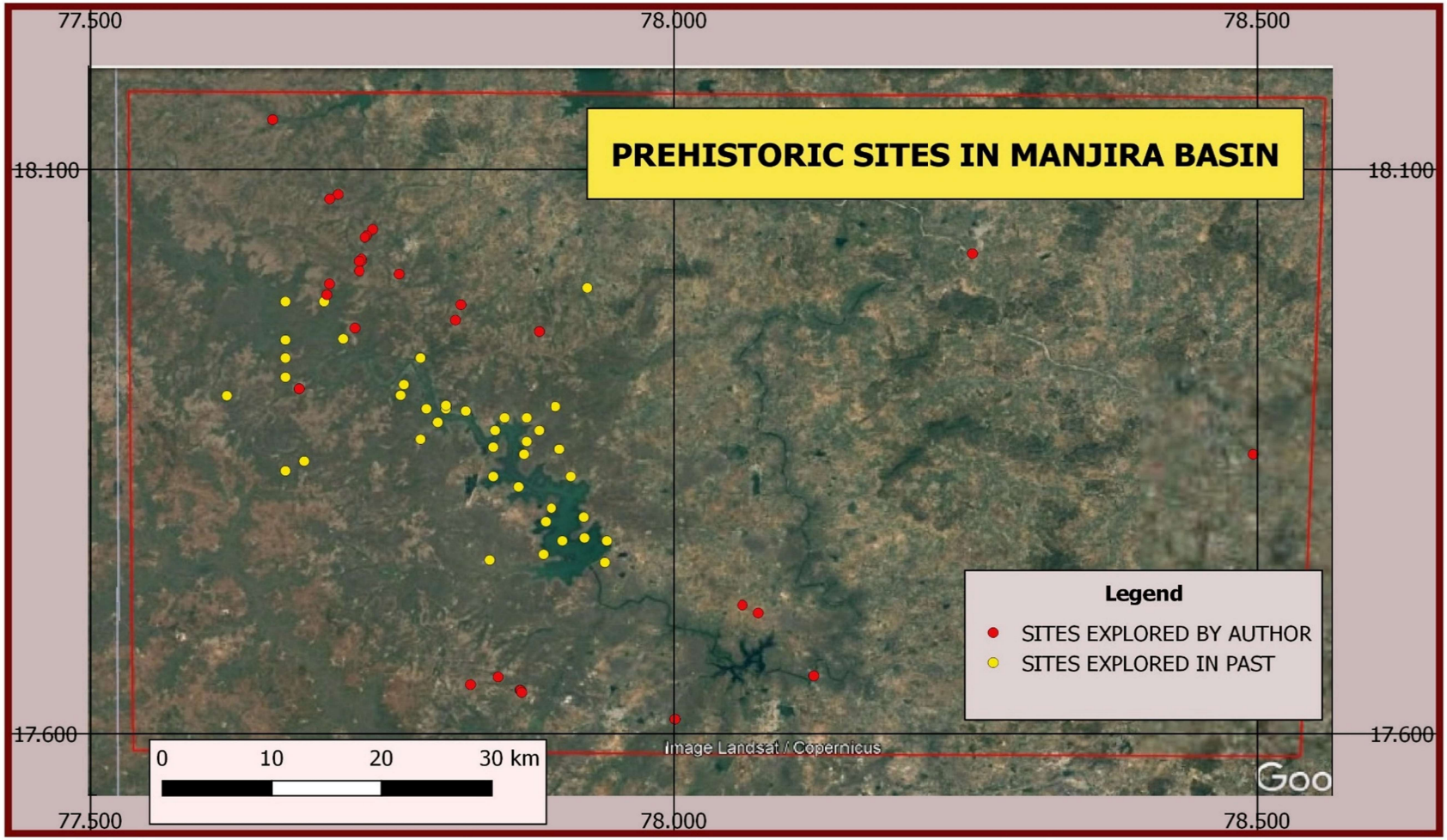
Sl. No.	Site Name/Code	Context	Latitude/ Longitude	Elevation	Culture
1.	Mitta Nayak Thanda[A] /MNT Loc-1	Surface/subsurface	18.04698N, 77.74212E	536 m asl	UP
	Mitta Nayak Thanda[A] /MNT Loc-2	Surface/subsurface	18.0414 N, 77.7367E	530 m asl	UP
2.	Dosapalle[A] /DSP Loc-1	Surface	17.95955 E, 77.72629 N	547 m asl	UP
	Dosapalle[A] /DSP Loc-2	Surface	17.9626 E, 77.72367 N	542 m asl	UP
3.	Jagannathapur[A] /JNP	Surface	18.007389E, 77.7647 N	535 m asl	UP
4.	Shelgara Gattu[A] /SGG Loc-1	Surface/subsurface	18.019 E, 77.73253 N	546 m asl	UP
	Shelgara Gattu[A] /SGG Loc-2	Surface/subsurface	18.02093 E, 77.73212 N	550 m asl	UP

	Shelgara Gattu[A] /SGG Loc-3	Surface/subsurface	18.0188 E, 77.73 N	552 m asl	UP
5.	Chaptakhadeem[A] /CKD	Surface	18.07803 E, 77.71199 N	528 m asl	UP
6.	Rudrar[A] /RDR Loc-1	Surface/subsurface	17.98024 E, 77.81745 N	529 m asl	UP
	Rudrar[A] /RDR Loc-2	Surface/subsurface	17.96654 E, 77.81277 N	541 m asl	UP
7.	Yelgoi[A] /YGI	Surface	17.98904 E, 77.70232 N	543 m asl	UP
8.	Allapur[A] /ALP	Surface	18.07394 E, 77.70476 N	541 m asl	UP
9.	Timmapur[A] /TMP	Surface	18.01014 E, 77.73027 N	552 m asl	UP
10.	Mukthapur[A] /MTP	Surface	17.99867 E, 77.70454 N	541 m asl	UP
11.	Tupran[A] /TPR	River bed/stream	17.8477 E, 78.4963 N	519 m asl	UP
12.	Abbenda[A] /ABD	Surface	18.04001E, 77.73501 N	537 m asl	UP
13.	Medak[A] /MDK	River bed/stream	18.0255 E, 78.2561 N	442 m asl	UP
14.	Kodcherla*/KDC	River bed/stream	18.5352 E, 77.7641 N	283 m asl	UP
15.	Khatgaon[A] /KTG	River bed/stream	18.4844 E, 77.7566 N	285 m asl	UP
16.	Fasalwadi[A] /FWD	River bed/stream	17.6514 E, 78.12 N	503 m asl	UP
17.	Sunkini*/SKN	River bed/stream	18.6244 E, 77.7461 N	275 m asl	UP
18.	Saloora*/SLR	River bed/stream	18.70166 E, 77.79777 N	342 m asl	UP

19.	Gorregattu[A] /GGT	Surface/subsurface	17.6504 E, 77.8492 N	591 m asl	UP
20.	Kondapur[A] /KDP	Surface	17.95648 E, 77.88442 N	534 m asl	UP & M
21.	Aroor[A] /ARR Loc-1	Stratigraphy	17.6389 E, 77.8679 N	561 m asl	UP & M
	Aroor[A] /ARR Loc-2	Surface/subsurface	17.6383 E, 77.8684 N	564 m asl	UP & M
	Aroor[A] /ARR Loc-3	Surface/subsurface	17.63671 E, 77.86932 N	546 m asl	UP & M
22.	Nandi Kandi[A] /NDK	Surface/subsurface	17.613 E, 78.0008 N	512 m asl	UP & M
23.	Chalki[A] /CLK	Surface	17.90577 E, 77.67876 N	549 m asl	UP & M
24.	Kandakurti*/KDR	River bed/stream	18.81727 E, 77.87953 N	336 m asl	M
25.	Mandarna*/MDN	River bed/stream	18.67083 E, 77.73722 N	346 m asl	M
26.	Wasar[A] /WSR	Surface	18.14424 E, 77.65612 N	478 m asl	M
27.	Hangarga[A]/HGG	River bed/stream	18.5652 E, 77.7541 N	278 m asl	M
28.	Koduru Thanda[A] /KDT	Surface/subsurface	17.95648 E, 77.88442 N	534 m asl	M
29.	Gonguluru[A] /GGL Loc-1	Surface	17.70709 E, 78.07254 N	519 m asl	M
	Gonguluru[A] /GGL Loc-2	Surface	17.71403 E, 78.05875 N	522 m asl	M
30.	Budera[A] /BDR	Surface	17.6436 E, 77.8257 N	595 m asl	M

A indicates sites explored by the author

*** indicates earlier reported sites**


PREHISTORIC SITES IN MANJIRA BASIN
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78.000
78.500
18.100
17.600
Legend
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0
10
20
30 km
Image Landsat / Copernicus

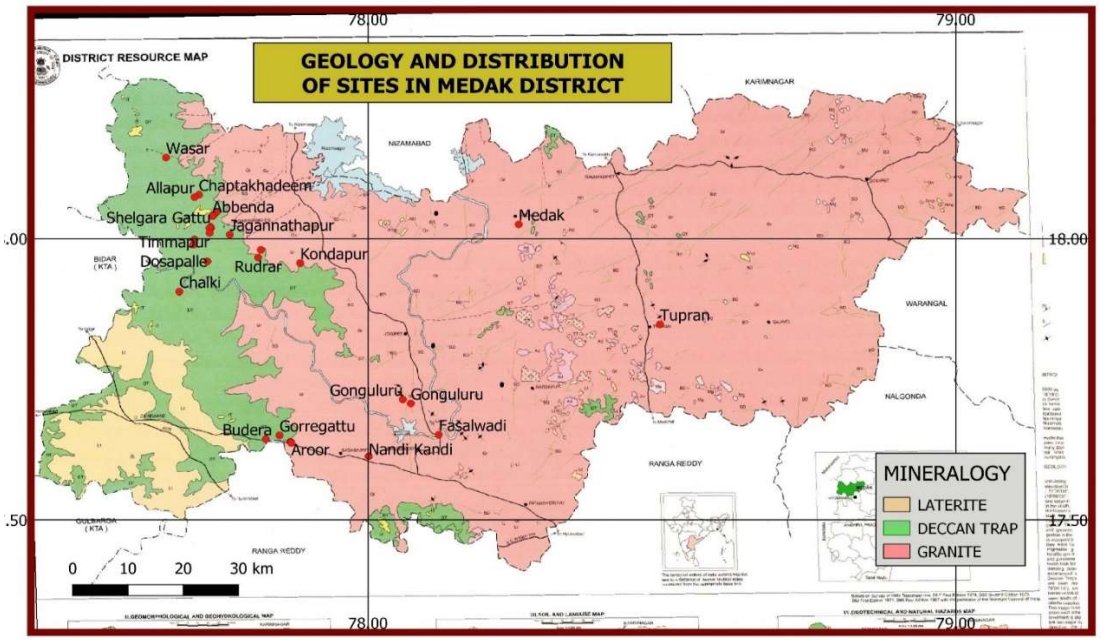


Plate 3.2: Geology and Distribution of sites in Medak District (Modified after District Resource Map, Medak, Geological Survey of India 1997)

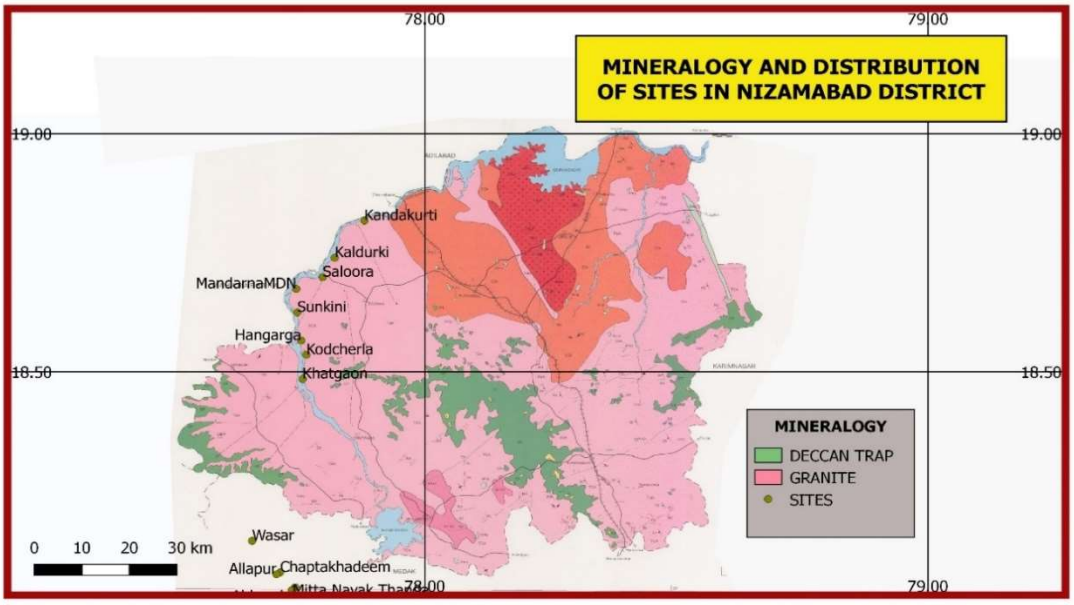


Plate 3.3: Geology and Distribution of sites in Nizamabad District (Modified after District Resource Map, Nizamabad, Geological Survey of India 1995)

3.3.1. Abbenda (18.040010N, 77.735010E; Elevation: 537 m asl)

The site is located ~1-1.5 km in the southeast of the Abbenda village and ~10 km northeast of the river Manjira (Plate 3.2). Artefacts are seen eroding out on the surface of the black soils. Presently the site is disturbed due to the agricultural activities within this site.

Table 3.4: Lithic assemblage from the site of Abbenda

Lithic assemblage	**Number of artefacts**
cores	2
debitage	1
finished tools	15
Total	**18**

A total of 18 artefacts were collected from this site out of which 15 were finished tools (side scrapers, side and end scrapers, convex scraper, and retouched flake), two blade cores and one waste product. The tools were made on chert and cherty quartzite. Overall assemblage suggests that the site belongs to the Upper Palaeolithic phase.

3.3.2 Allapur (18. 0739N, 77.7048E; Elevation: 541m asl)

The site is located ~2 km in the east direction of the Allapur village and ~10 km in the northeast direction of the Manjira river basin (Plate 3.29). The whole area is dotted with small hillocks where artefacts were collected from the surface, eroding out at the slopes of these hillocks from the weathered sediments. The artefacts are associated with the reddish-brown soils and regolithic context. Construction of the temple and the other agricultural practices near to this location poses a big threat to this site in the mere future.

Table 3.5: Lithic assemblage from the site of Allapur

Lithic assemblage	**Count of Basic type**
core	1
debitage	17

finished tool	48
natural	7
Grand Total	**73**

Artefacts were collected with the random sampling method where a total of 73 artefacts were collected. Out of 73 artefacts, 48 were finished tools (scrapers, retouched and unretouched bladelets), 17 were debitage/waste products (cortical flakes and flake < 2cm) and one blade core was collected from this site.

Chert is the dominant raw material along with some cherty quartzite, agate and chalcedony. The tools were fresh and few were weathered due to being exposed to the sunlight. Overall assemblage suggests that the site is of the Upper Palaeolithic phase.

3.3.4. Aroor Loc-1 (17.6389N, 77.8679E; Elevation: 561 m asl)

The locality-1 is situated ~1 km away from the village Aroor in the Northwest direction and located on the left-hand side of the Hyderabad to Mumbai highway road (NH-9). Artefacts were collected from the surface and from the section. The other side of the section is quarrying for granitic stone.

An exposed section was observed (plate. 3.7) where the weathered granitic regolith was capped with the pebbly-cobbly conglomerate which also includes the lithic assemblage. The thickness of the artefact-bearing layer is 35 cms. Tools were eroding out from the exposed gravel and reddish-brown soils overlying on the weathered granite regolith. Tools were also collected from the surface.

3.3.4.1. Aroor Loc- 2 (17.6383N, 77.8684E; Elevation: 564m asl)

The locality -2 is located on the way to the temple and is ~1 km away from the village Aroor in the northwest direction, and placed on the left-hand side of the Hyderabad to Mumbai highway road (NH-9). Artefacts were collected from the surface.Tools were coming out and exposed with the reddish-brown soils and regolith context.

3.3.4.2. Aroor Loc-3 (17.63671N, 77.86932E; Elevation: 536 m asl)

The Aroor locality-3 (Plate 3.8) is located opposite to the temple (Katta Maisamma Temple) and is ~1km away from the village Aroor in the northwest direction, and

positioned on the left-hand side of the Hyderabad to Mumbai highway road (NH-9). Artefacts were collected from the surface that are overlying on granitic bedrock. Tools were eroding out from the weathered sediments and were associated with reddish-brown soils and regolithic context overlying on the weathered granitic bedrock.

Table 3.6: Collected lithic assemblage from the site of Aroor

Lithic assemblage	**Count of Basic type**
core	7
debitage	60
finished tool	83
natural	2
Total	**152**

A total of 152 artefacts were collected from all these three localities. These artefacts belong to Upper Palaeolithic and Mesolithic cultures. Out of these 152 artefacts, 83 were finished tools, 60 were waste products/debitage and seven were cores. Among the finished tools, side scrapers occupy a large portion, retouched bladelets, Notches, borers, points and different types of scrapers were collected. Debitage includes flakes < 2cm, cortical and non-cortical flakes. Six blade cores and one flake core were collected. Chert is the predominantly used raw material, apart from it chalcedony, agate, cherty quartzite and quartz. Some of the artefacts are very fresh but some of them are weathered and rolled. Overall assemblage suggests that the site is of the Upper Palaeolithic-Mesolithic phase.

3.3.5. Budera (17.6436N, 77.8257E; Elevation: 595 m asl)

The site is situated ~2 km away from the village Budera (Plate 3.9) in the western direction. It is located on the left-hand side of the Hyderabad-Mumbai Highway (NH-9). The site is completely under thick vegetation, due to this only five artefacts were collected. Artefacts were collected randomly from the surface, these artefacts were associated along with the reddish-brown soils and regolithic context.

Only five artefacts were collected due to the thick vegetation and fell off dry leaves. Two finished tools, two waste products and one blade core were collected from here. All these were made on chert, the assemblage suggests that the site is of the Mesolithic phase.

3.3.6. Chalki (17.90577N, 77.67876E; Elevation; 549 m asl)

The site is located ~1 km in the southwest direction of the Chalki (Plate 3.36) village and ~2 km in the southwest direction of the Manjira River. Artefacts were collected through random sampling on the exposed surfaces. These were found on a small hillock and its slopes. The artefacts were associated with the weathered sediments and reddish-brown soils.

Table 3.7 Lithic assemblage from the site of Chalki

Lithic Assemblage	**Count of Basic type**
core	2
debitage	20
finished tool	17
natural	2
Total	**41**

A total of 41 artefacts were collected from this site. Among these 17 were finished tools, 20 were waste products/debitage and two were cores. These artefacts include side and end scrapers, backed bladelets, convex and concave scrapers. Flakes < 2cm occupies the larger portion of waste products/debitage. The tools were made on chalcedony, quartz, chert and agate raw materials. The artefacts are fresh and some of them are weathered. Overall assemblage suggests that the site is of the Upper Palaeolithic-Mesolithic phase.

3.3.7. Chaptakhadeem (18.07803N, 77.71199; Elevation: 528 m asl)

The site is located ~1 km away from the village Chaptakhadeem (Plate 3.15&3.16) in the western direction along with the Narayakhed to Kangti road. Tools were collected from the surface, slopes and from the top of the small hillock. Tools were present in the exposed sections also. Artefacts are associated with pebble gravel, reddish-brown soils

and weathered granitic context. Quarrying of the site is in progress and the exposed section is noticed in the site where the artefacts are associated with the pebble gravel above the weathered granitic context.

Table 3.8: Lithic assemblage from the Chalki site

Lithic Assemblage	Count of Basic type
core	6
debitage	31
finished tool	64
natural	6
Total	**107**

The collected lithic assemblage consists of a total of 107 artefacts which were collected through random sampling. The assemblage consists mostly of finished tools with 64 and 31 were waste products/debitage and six were cores. Side scrapers and end scrapers occupy the largest portion of the finished tools, other finished includes convex scrapers, double straight scrapers, straight scrapers, retouched flakes, point and borer. One blade core and three flake cores were collected. Debitage includes cortical and non-cortical flakes and flakes < 2cms. Chert is the major raw material; apart from it cherty quartzite and chalcedony were used to make these artefacts. A maximum portion of the tools was fresh and some of them were weathered due to exposure to sun and natural processes. The collected assemblage suggests that this site belongs to the Upper Palaeolithic culture.

3.3.8. Dosapalle Loc-1 (17.95955N, 77.72629E; Elevation: 547 m asl)

This locality is situated ~3 km in the north direction of the river Manjira and ~10 km in the southwest direction from the Narayanakhed town. The exposed section (Plate 3.19) at the Dosapalle locality shows the artefacts associated with the pebbly cobbly gravel. A 10 cms thick section yielding the artefacts. Artefacts were occurring with a high density. Presently the site is disturbed due to the agriculture practices in and around this location.

3.3.8.1. Dosapalle Loc-2 (17.9626N, 77.72367E; Elevation: 542 m asl)

This site is situated ~10 km from the Narayanakhed town in the southwest direction and ~3 km in the north direction of the river Manjira (Plate 3.18). Artefacts were collected from the surface through random sampling. These were occurring with the regolith and reddish-brown soil context. Artefacts were collected from the ploughed land, where the site is under intense cultivation, and the artefacts are occurring with high density.

Table 3.9: Lithic assemblage from the site of Dosapalle

Lithic Assemblage	**Count of Basic type**
core	6
debitage	20
finished tool	16
natural	7
Total	**49**

A total of 49 artefacts were collected from both localities. These include 16 finished tools, 20 debitage/waste products and six were cores. Finished tools include retouched flakes, side scrapers, side and end scrapers, straight scraper, point and borer. Cores include one blade core, four flake cores and one core debitage. Waste products/ debitage includes cortical, non-cortical flakes and flakes < 2cm. Chert is the majorly used raw material apart from it cherty quartzite, chalcedony and agate were used to make these artefacts. Tools were fresh and all these belonged to the Upper palaeolithic cultures.

3.3.9. Fasalwadi (17.6514N, 78.12E; Elevation: 503 m asl)

This locality is situated on the riverbed of the Manjira river and ~2 km away from the Fasalwadi village in a northwest direction (Plate 3.6). Artefacts occurring on the river bed at the site and are associated with the modern gravel bed.

Artefacts were collected from the stream. Noticed a high density of artefacts that are occurring on the sandy bars of the stream. No exposed section was observed and the river banks are thickly deposited with the alluvium.

Table 3.10: Artefacts from the site of Fasalwadi

Lithic Assemblage	Count of Basic type
core	2
finished tool	47
Total	**49**

A total of 49 artefacts were collected from the river bed of the Manjira. Out of it 49, 47 were finished tools and two were cores. These finished tools consist of side scrapers, convex scrapers, side and end scrapers, retouched bladelets, notches, borer and convex scraper. One flake core and blade core were collected from this site. Chert, cherty quartzite and chalcedony were used to make these artefacts. All the artefacts were rolled due to the water action. The collected assemblage suggests that this site belongs to the Upper Palaeolithic culture.

3.3.10. Gongulur Loc-1 (17.707090N, 78.072540E; Elevation: 519 m asl)

The site is situated ~1 km away from Gongulur village (Plate 3.39) in the northeast direction and ~4 km away from the Manjira river in the north direction. Artefacts are collected from the surface and are associated with regolith and reddish-brown soils context. The area was partially dug up and quarrying is taking place.

3.3.10.1. Gongulur Loc-2 (17.714030N, 78.058760E), 522 msl

The site is located ~4 km away from the Manjira river in the northern direction and ~1 km away from Gongulur village in the northeast direction. The microlithic assemblage was collected from the surface and these artefacts were associated with reddish-brown soils along with the weathered exposed sediments. Many anthropogenic activities are occurring in this location, which may pose threat to the site.

Table 3.11: Collected lithic assemblage form the Gongulur site

Lithic Assemblage	Count of Basic type
core	2
debitage	23

finished tool	4
Total	**29**

Lithic assemblages consist of a total of 29 artefacts. These consist of four finished tools, two cores and 23 waste products/debitage. Finished tools include side scrapes. One flake core and blade core were collected. Debitage/waste products consist of flake < 2cms, cortical and non-cortical flakes. Chert is the largely used raw material apart from agate, cherty quartzite, quartz and chalcedony used to make these artefacts. Though some of the tools are fresh, most of the tools are weathered. The collected lithic assemblage suggests that the site belongs to Mesolithic culture.

3.3.11. Hangarga (18.5652N, 77.7541E; Elevation: 278 m asl)

The site is located ~2 km away from the Hangarga village in the west direction and the artefacts were collected from the riverbank of the Manjira. These were associated with sand and thick alluvial clay. Small boulders and sandy bars are seen along with the modern gravel bed but no exposed section was observed along the river at this particular location. The artefacts were occurring in a less density and the river is flowing with a narrow channel.

Table 3.12: Lithic assemblage from the site Hangarga

Lithic Assemblage	**Count of Basic type**
debitage	4
finished tool	24
natural	1
Total	**29**

A total of 29 artefacts were collected from the riverbank of the river Manjira. These include finished tools and debitage. Finished tools consist of retouched and unretouched bladelets and backed bladelets. These tools were made on chert and chalcedony. The collected tools were fresh and weathered and shows that the assemblage belongs to the Mesolithic culture.

3.3.12. Jagannathpur (18.008510N, 77.762740E; Elevation: 535 m asl)

The site is located ~1 km in the southeast direction of Jagannathpur village and ~10 km in the northeast direction to the Manjira River (Plate 3.25). The site is located on the road of Narayakhed to Manoor village (map image reference). The site is located in the west of the Narayankhed (~6kms). Tools are occurring at the foothills of the hills. Tools were collected in an area of 30x40 mts area. Exposure of Cherty quartzite outcrops found at this site. Artefacts are associated with the regolith context comprising sub-rounded to rounded weathered cores stones. Rich debitage, flakes are found here. Flakes, cores, blade cores and microliths were found here.

Table 3.13: Lithic assemblage form the Jaganathpur site

Lithic Assemblage	**Count of Basic type**
core	5
debitage	18
finished tool	60
natural	2
Total	**85**

A total of 85 artefacts were collected from this location. These include 60 finished tools, 18 waste products/debitage and five cores. The finished tools consist of various types of scrapers such as side scrapers, side and end scrapers, convex scrapers, points notches, borer, retouched flakes and retouched bladelets. Three flake cores and two blade cores were collected. Waste products/debitage consists flakes < 2cm, cortical and non-cortical flakes. Artefacts were fresh and some were weathered. The collected assemblage suggests that this site belongs to the Upper Palaeolithic culture.

3.3.13. Khatgaon (18.4844N, 77.7566 E; elevation: 285 m asl)

This location is situated ~2 km away from the village Khatgaon (Plate 3.33) to the northeast direction and the lithic assemblage is collected from the river bed of the Manjira. Artefacts were occurring in a high density, and these artefacts were collected in an area of 2x2 m. Fossil bones were also collected which may belong to the sps. Bos (Communication with Prof. Vijay Sathe). Rich alluvial deposits were noticed on the

banks of the river. Sand quarrying is taking place and the area was partially destroyed and dug up for construction of a bridge to cross the river Manjira.

Table 3.14: Lithic assemblage from the site of Khatgaon

Lithic Assemblage	**Count of Basic type**
debitage	7
finished tool	17
Total	**24**

A total of 24 artefacts were collected from the river bed of the Manjira. These include 17 finished tools and seven waste products/ debitage. These finished tools include side scrapers, retouched bladelets, double straight scrapers, side and end scraper and convex scraper. Waste products/debitage consists of cortical flakes and flakes < 2 cm. these artefacts were made on chert, chalcedony, quartz and agate. Chert is the largely used raw material. All the artefacts were rolled due to the water action. The collected assemblage suggests that this site belongs to Upper Palaeolithic culture.

3.3.14. Kodcherla (18.5352N, 77.7641E; Elevation: 283 m asl)

This locality is situated ~ 1km away in the southwest direction of the village Kodcherla and the artefacts were collected from the river bed of the Manjira (Plate 3.32). These were associated with sandy and modern gravel belt. Thick alluvial deposits were noticed on the banks of the river and no exposed sections. Artefacts are occurring in a high density and all the collected artefacts were rolled out due to the water action on them.

Table 3.15: Lithic assemblage from the Kodcherla site

Lithic Assemblage	**Count of Basic type**
debitage	7
finished tool	41
Total	**48**

A total of 48 artefacts were collected from this site. These include 41 finished tools and seven waste products/ debitage. These tools were made on chert, agate and chalcedony

raw materials. All the artefacts were rolled due to the water action. The collected artefacts suggest that the site belongs to the Upper Palaeolithic site.

3.3.15. Koduru Thanda (17.95648N, 77.88442E; Elevation: 534 m asl)

The site is located along with the Minpur to Pulkal road. The site is situated ~1 to ~1.5 km away from the Minpur village. The area is covered with bushes and thick vegetation. Microliths of chert and quartz are getting along with the regolith context (Plate 3.12). Tools were collected in an area of 30x20 mts. Tools are eroding out from the weathered sediments.

Table 3.16: Lithic assemblage from the Koduru Thanda site

Lithic Assemblage	Count of Basic type
core	2
debitage	13
finished tool	35
Grand Total	**50**

A total of 50 artefacts were collected from this location. The collected artefacts consist of 35 finished tools, two cores and 13 waste products/ debitage. Retouched bladelets constitute a larger portion of the finished tools, apart from its retouched flakes, side scrapers were also collected from this site. These artefacts were made on chert, chalcedony quartz, agate and cherty quartzite raw materials. Artefacts were fresh and few were weathered. The collected assemblage suggests that the site belongs to Mesolithic culture.

3.3.16 Kondapur (17.95648N, 77.88442E; Elevation: 534 m asl):

The site is situated ~1 km away from the Kondapur village in the northwest direction and ~10 km to the Manjira river towards the northeast of the river (Plate 3.14). Lithic assemblage occurring on the surface with regolith context and reddish-brown soils. Artefacts are occurring with a high density.

Table 3.17: Lithic assemblage form the site of Kondapur

Lithic Assemblage	Count of Basic type
core	9
debitage	26
finished tool	53
natural	3
Total	**91**

A total of 91 artefacts were collected from this site. These include 53 finished tools, nine cores and 26 waste products/debitage. Side scrapers occupy a larger portion of the finished tools, apart from it retouched flakes, end scrapers, convex and straight scrapers, backed bladelet, point, botch and borer were collected. Cores include five blade cores, two flake cores and two broken cores. Debitage largely consists of flakes < 2cm and cortical and non-cortical flakes. These artefacts were made on chert, cherty quartzite, chalcedony and agate raw material, among them, chert is the largely used raw material. Tools were fresh and some of them are weathered due to the natural processes. The collected lithic assemblage suggests that the site belongs to the Upper Palaeolithic and Mesolithic Cultures.

3.3.17. Medak (18.0255N, 78.2561E; Elevation: 442 m asl)

The site is located ~2 km in the south direction of the Medak town (Plate 3.4) and the artefacts were collected from the river channel of Haldia river, a tributary of Manjira. Artefacts are associated with sand, pebbles and modern gravel belt. Sandy bars were seen along the banks of the river and no exposed section was noticed.

A total of 24 artefacts were collected from this site. These include 21 finished tools and three waste products/debitage. All these tools were made on chert and all the collected artefacts were rolled. The collected assemblage suggests that the site belongs to Upper Palaeolithic Culture.

3.3.18. Mitta Nayak Thanda (18.04698N, 77.742120E; Elevation: 536 m asl)

The site is located ~1 km towards the south of the Mitta Nayak Thanda and ~12 km to the north of the Manjira River (Plate 3.17). The area is dotted with small hillocks.

Artefacts are occurring on the top of the hillock and its slopes. Flakes, blades, debitage, chips are occurring heavily on the top and slope of the hills. Artefacts are seen eroding out on the surface and derived on the surface associated with the pebbly cobbly cortex.

3.3.18.1. Mitta Nayak Thanda Loc-2 (18.054N, 77.7412E; Elevation: 530 m asl)

This locality is situated ~1 km towards the south of the Mitta Nayak Thanda and ~12 km to the north of the Manjira River. The area is partly covered with vegetation. Artefacts are eroding our form the weathered sediments.

Table 3.18: Collected lithic assemblage form the site of Mitta Nayak Thanda

Lithic Assemblage	Count of Basic type
core	12
debitage	89
finished tool	87
natural	16
Total	**204**

A total of 204 artefacts were collected from this site. Among these finished tools and debitage constitutes equal numbers and 12 cores were collected. Finished tools consist of side scrapers, end scrapers, straight scrapers, retouched blades and bladelets, notches and points. Debitage/waste products include flakes < 2cm, cortical and non-cortical flakes. Cores include eight flake cores and four blade cores. These tools were made on chert, chalcedony, cherty quartzite and agate. Chert is the largely used raw material. Tools were fresh and few of them were weathered. The collected assemblage suggests that the site belongs to the Upper Palaeolithic culture.

3.3.19. Mukthapur (17.99867N, 77.70454E; Elevation: 541 m asl)

The site is located ~2 km towards the southwest direction from the village Mukthapur and ~5 km north of the Manjira River (Plate 3.30). The town Narayankhed is located ~8 km away in the northeast from the site. Artefacts are exposed along with the weathered sediments and are associated with the weathered regolith and reddish-brown soils.

A total eight number of artefacts were collected from this location, four were finished tools and four were debitage. These tools were made on chert and chalcedony raw materials. All these artefacts were weathered and rolled and the collected assemblage suggests that the site belongs to Upper Palaeolithic culture.

3.3.20. Nandikandi (17.613N, 78.0008E; Elevation: 512 m asl)

The site is located ~200 mts away on the right side of the Hyderabad to Zaheerabad highway road (Plate 3.22). The Sangareddy town is ~5 km away from the site, which is in the western direction from the site. The site is situated about 6 km southwest of the Manjira River. The artefacts were collected randomly as these were exposed on the surface in an area that is not under cultivation.

The locality covers approximately an area of 60x60 m where artefacts occur in the pebble-sandy gravel context and are associated with reddish-brown and black soils (Plate 3.23). The weathered granitic gneiss bedrock is capped by pebble and sand gravel. Calcretes are associated with pebble and sandy gravel. The surrounding land is under cultivation, and artefacts were also collected from the surface of the cultivated land and also from the weathered and exposed sediments. This site has yielded a high concentration of finished artefacts with a high frequency of scrapers and flake tools on the surface and stratigraphic layers.

Table 3.19: Lithic assemblage form the Nandikandi site

Lithic Assemblage	**Count of Basic type**
Core	11
debitage	52
finished tool	133
natural	6
Total	**202**

A total of 202 (n=202) samples were collected. The assemblage is dominated by finished tools with 133, debitage with 52, and cores with 11. Scrapers are the largest components in this lithic assemblage, which comprises side scrapers, convex scraper, retouched flake, retouched bladelets, end scrapers side and end scrapers, notches, and

concave scrapers etc. Besides these, the assemblage consists of borers, burins, double straight and end scrapers, points and straight scrapers. Cores consist of flake cores six and five blade cores and the debitage consists of cortical, non-cortical flakes and flakes < 2 cm. These tools were made on chert, cherty quartzite and chalcedony. Tools were fresh and few were weathered and rolled. The collected assemblage suggests that the site belongs to Upper Palaeolithic-Mesolithic Cultures.

3.3.21 Rudrar Loc-1 (17.98024N, 77.81745 E; Elevation: 529 m asl)

The site is located ~2 km east direction from the Rudrar village and ~8 km to the north of the Manjira River. It is placed on the right hand side of the road Hyderabad to Narayanakhed (Plat 3.27). The area is marked with the small hills and patches of vegetation noticed. Artefacts are occurring on the slopes and the top of the small hillocks and are associated with red soils and regolithic contexts. These artefacts were noticed on the exposed sediments. Quartz is occurring locally in the form of tablets and pebbles .

3.3.21.1. Rudrar Loc- 2 (17.96654N, 77.81277E; Elevation: 541 m asl)

This site is situated on the right side of the road Hyderabad to Narayanakhed and is ~2 km east direction from the Rudrar village and ~8 km to the north of the Manjira River. Artefacts are occurring on the slopes and on the top of the small hillock and are associated with the regolithic context and reddish-brown soils

Table 3.20: Lithic assemblage form the Rudrar site

Lithic Assemblage	**Count of Basic type**
core	5
debitage	30
finished tool	18
natural	7
Total	**60**

A total of 60 artefacts were collected among them 18 were finished tools, 30 were debitage/waste products and five were cores. Finished tools include retouched and unretouched bladelets, side scrapers, convex scrapers, end scrapers and backed

bladelets. Cores include three flake cores and two blade cores. Flakes < 2cm occupy the largest portion in the debitage apart from it cortical and non-cortical flakes were also collected from the site. These tools were made on chert, chalcedony, agate and cherty quartzite. Chert and chalcedony both occupy the largest portion of the raw materials on which these tools were prepared. All collected tools were fresh except a few, which were weathered. The collected lithic assemblage shows that the site belongs to the Upper Palaeolithic culture.

3.3.22. Saloora (18.701667N**,** 77.797778E; Elevation: 342 m asl)

The site is located around 2 km away in the northwest direction of the village Saloora, which is located around 40 km away from the Nizamabad (Plate 3.35). The lithic assemblages were found on the right bank of the Manjira River. The lithic assemblages include flakes, blades, blade cores and cobbles. The artefacts were associated with the modern gravel bar and occur in low density.

A total of 26 tools were collected from this site, out of which 12 were finished tools and 14 were waste products/debitage. Finished tools include side scrapers, convex scrapers, and side and end scrapers. The debitage include flakes < 2cm, cortical and non-cortical flakes. All these tools were made on chert and the tools were in different physical condition, few were fresh, rolled and few were weathered. The collected assemblage suggests that the site belongs to the Upper Palaeolithic culture.

3.3.23 Shelgara Gattu (18.019000N, 77.732530E; Elevation: 546 m asl)

The site is located around 200 mts away from the Narayanakhed to Zaheerabad main road The site is located ~1 km south direction of the village Shelgara and ~5 km to the southwest of the Narayanakhed town. The area is dotted with small hillocks and thick sparse vegetation. Microliths, flakes and blade cores occurred on the top of the hills along with regolithic context. These tools were coming out from the top layers where the sediments were weathered. Tools were made on chert, quartz and other siliceous raw materials. Tools were present where the surface soils were eroded and exposed.

3.3.23.1. Shelgara Locality-2 (18.020930N, 77.732120E; Elevation: 550 m asl)

The site is located ~1 km south direction of the village Shelgara and ~5km to the southwest of the Narayanakhed town and is located 100mts to 200mts away from the Narayanakhed to Zaheerabad main road. Tools are occurring on the slopes and top of the small hillock. Flakes, cores blades, blade cores and microliths of quartz and chert are getting on the top of the hills. Tools were occurring along with the regolithic context.

Table 3.21: Lithic assemblage from the site of Shelgara Gattu

Lithic Assemblage	**Count of Basic type**
core	14
debitage	104
finished tool	83
natural	19
Total	**220**

A total of 220 artefacts were collected from all these locations. Debitage constitutes the largest portion among the collected artefacts with 104, finished tools were 83 and cores were 14. Retouched flakes were highest in number in finished tools other tools include side scrapers, convex scraper, retouched bladelets, side and end scrapers, end scrapers, borers and a notch. Cores include blade and flake cores which are five and nine in number respectively. Chert, cherty quartzite, chalcedony, and agate were the raw materials on which these tools were chipped. All these collected tools were fresh and few of them were weathered. The collected lithic assemblage suggests that the site belongs to the Upper Palaeolithic culture.

3.3.24. Sunkini (18.6244E, 77.7461N; Elevation: 275 m asl)

The site is located ~1 km to the south of the village Sunkini and the artefacts were collected from the riverbank of the Manjira. Thick alluvial deposits are noticed on the banks of the river and no occurrence of exposed stratigraphy is noted in this region (Plate 3.34).

A total of 17 artefacts were collected located all the 17 were finished tools, side scrapers were more in number and other tools include retouched flake, retouched bladelets, side scraper and end scraper. These tools were made on chert, chalcedony and cherty quartzite. Chert is the primary source of raw material on which a maximum number of artefacts were prepared. All the collected artefacts were rolled due to the water action on these artefacts. The collected assemblage suggests that the site belongs to the Upper Palaeolithic culture.

3.3.25. Timmapur (18.01014E, 77.73027N; Elevation: 552 m asl)

This locality is located ~1 km in the east direction of the village Timmapur. And the area is noted with small hillocks. Artefacts derived on the surface are associated with the context of the regolith sub-rounded to rounded core stones. Artefacts are also derived on the surface associated with the pebbly cobbly context (Plate 3.20).

Table 3.22: Collecte lithic assemblage form the Timmapur site

Lithic Assemblage	**Count of Basic type**
core	2
debitage	26
finished tool	42
natural	2
Total	**72**

A total of 72 artefacts were collected from this location. There were 42 finished tools, 26 waste products/debitage and two cores. Finished tools consist of side scrapers, end scrapers, convex scrapers, double straight scrapers, retouched flakes, retouched bladelets and various other scrapers. Debitage includes flakes <2cm and cortical flakes and two blade cores were collected. Chert is the largest raw material on which these tools were prepared. These tools were fresh and few were weathered. The collected artefacts suggest that the site belongs to the Upper Palaeolithic culture.

3.3.26. Tupran (17.8477N, 78.4963E, Elevation: 519m asl)

The site is ~2km on the east side of the Tupran town and the artefacts were occurring on the riverbed of the Haridra river, a tributary of the Manjira River. Theses are associated with the modern gravel belt.

Table 3.23: Lithic assemblge from the Tupran site

Lithic Assemblage	**Count of Basic type**
core	1
debitage	8
finished tool	10
Total	**19**

A total of 19 artefacts were collected from this location, among them, 10 were finished tools, one core and eight waste products/debitage. All these tools were made on the Chert and all these collected tools were partially weathered and completely rolled due to the water action. The collected lithic assemblage suggests that the site belongs to the Upper Palaeolithic culture.

3.3.27. Wasar (18.14424N, 77.65612E; Elevation: 478m asl)

The site is ~2 km in the northwest direction of the village wasar and ~16 km north of the Manjira River. The area is marked with small hillocks. Artefacts are collected from the small hillock top and its slopes and are associated with the weathered sediments, reddish-brown soils and regolithic context (Plat 3.37).

Table3.24: Lithic assemblage form the site of Wasar

Lithic Assemblage	**Count of Basic type**
core	3
debitage	24
finished tool	8
natural	14
Total	**49**

A total of 49 tools were collected from this site debitage occupies a large portion of the collected artefacts with 24, there were eight finished tools and three cores were collected from this site. Finished tools consist of retouched bladelets, side scrapers, double side and end scraper. Cores include one blade core, one flake core and one broken core debitage. These tools were made on chalcedony, chert and cherty quartzite. Chalcedony occupies the largest of raw material on which these tools were prepared. These tools were in different physical condition few were fresh and weathered. The collected artefacts were suggest that the site belongs to the Mesolithic culture.

3.3.28. Yelgoi (17.98904N, 77.70232E; Elevation: 543 m asl)

The site is ~ 1 km to the north of the village Yelgoi. Artefacts were collected from the surface by using random sampling. These artefacts were collected from the exposed sediments and are associated with reddish-brown soils (Plate 3.28).

A total of 14 artefacts were collected from this site. All were finished tools, which includes side scrapers, double straight scrapers, end scrapers, retouched bladelet, notch and side and end scraper. These tools were made on chert and cherty quartzite. All the collected artefacts were weathered due to exposed to the nature. The collected assemblage suggests that the site belongs to the Upper Palaeolithic site.

3.3.29. Kandakurti (18.817278N, 77.879536E, Elevation: 336 m asl)

The site is located near the confluence of the three rivers namely Godavari, Manjira and Haldia. And is situated 35 km in a northwest direction from the Nizamabad town (Plate 3.40). Lithic artefacts occur in low density and occurred on the surface of the thick alluvial soil and near to the banks of the river. A total of eight artefacts were collected from this site all were finished tools and were made on chert. The collected assemblage suggests that the site belongs to the Mesolithic culture.

3.3.30. Mandarna (18.670833N, 77.737222E; Elevation: 346 m asl)

The site is located ~500 m in the northwest of the village Mandarna of Bodhan mandal. Artefacts were collected from the river channel of the Manjira. These were associated with the modern gravel bar. The banks were thickly deposited with alluvium. A total

of five artefacts were collected from this site. All are finished tools and were made on chert. The collected assemblage suggests that the site belongs to the Mesolithic culture.

3.3.31. Gorregattu (17.6504N, 77.8492E; Elevation: 591 m asl)

The site is located ~1- 1.5 km in the southeast of the village Gorregattu and ~13 km to the southwest of the Manjira River (Plate 3.26). This area is marked by small hillocks. Artefacts are eroding out from the weathered sediments. Artefacts were not collected from this site. Section observed on the top of the hillock, artefacts are occurring with the regolith context. The section at Gorregattu Locality is associated with pebbly gravel overlain on the weathered granite. The assemblage suggests that the site belongs to the Upper Palaeolithic culture.

a.

b.

c.

Plate 3.4: The UP site of Medak showing: a. Location of Medak site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Artefacts occurring on the riverbed of the Haridra river; c. The section shows the alluvial fill on the left bank of the Haldia river

a. 

b. 

c. 

Plate 3.5: The UP site of Fasalwadi showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Artefacts occurring on the river bed at the site; c. Fluted core associated with the modern gravel bed.

a. 

b. 

c. 

Plate 3.6: The UP-M Site of Aroor showing; a. Location of the site, 300 m (Google Earth: Image Landsat/ Copernicus); b. Aroor Locality-2 shows a regolith spread at the site; c. Regolithic context of the artefacts at the Aroor Locality-2.

a.

b.

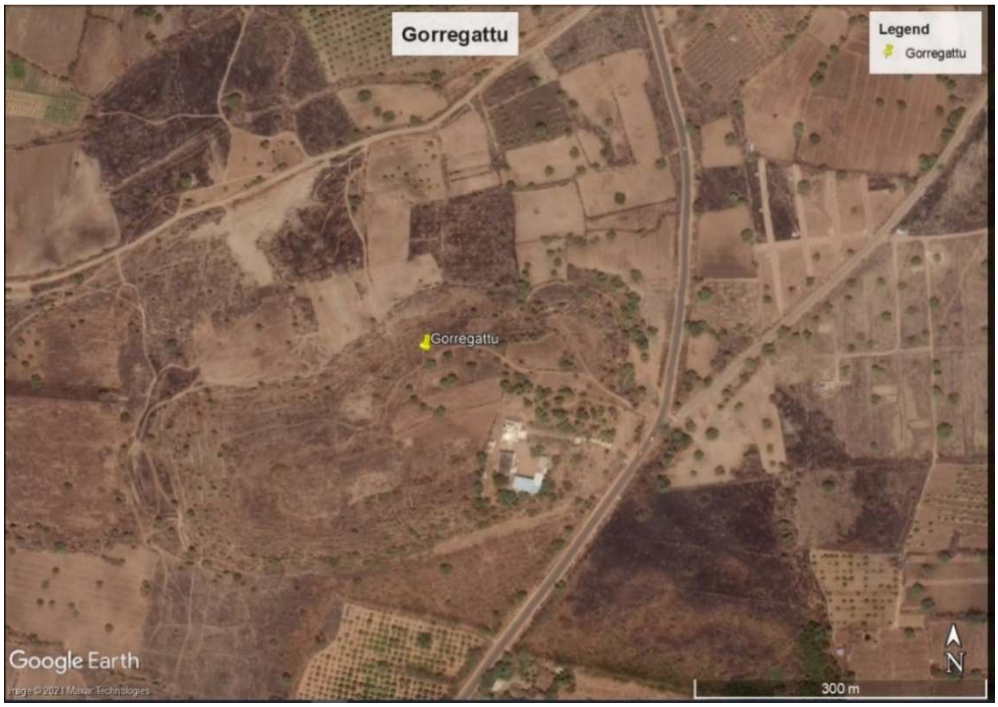
Plate 3.7: The site of Aroor Locality-3 showing the artefacts associated with pebbly cobbly gravel overlying on the weathered granitic regolith; b. Quarrying the granite at the other side of the site.

a. 

b. 

c. 

Plate 3.8: The M site of Budera showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Section showing the thick alluvium overlying on the weathered granitic regolith and the section is devoid of any artefacts; c. Regolithic context of the artefacts.

a. 

b. 

Plate 3.9: The UP site of Gorregattu showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Section observed on the top of the hillock, artefacts are occurring with the regolith context.

Plate 3.10: section at Gorregattu Locality showing the artefacts associated with pebbly gravel overlain on the weathered granite

a.

b.

Plate 3.11: The M site of Koduru Thanda showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Artefacts are occurring with the regolith context.

a. 

b. 

Plate 3.12: Lithic assemblage occurring on the surface at the M site of Koduru Thanda b. Artefacts are occurring with the regolith context at the M site of Koduru Thanda.

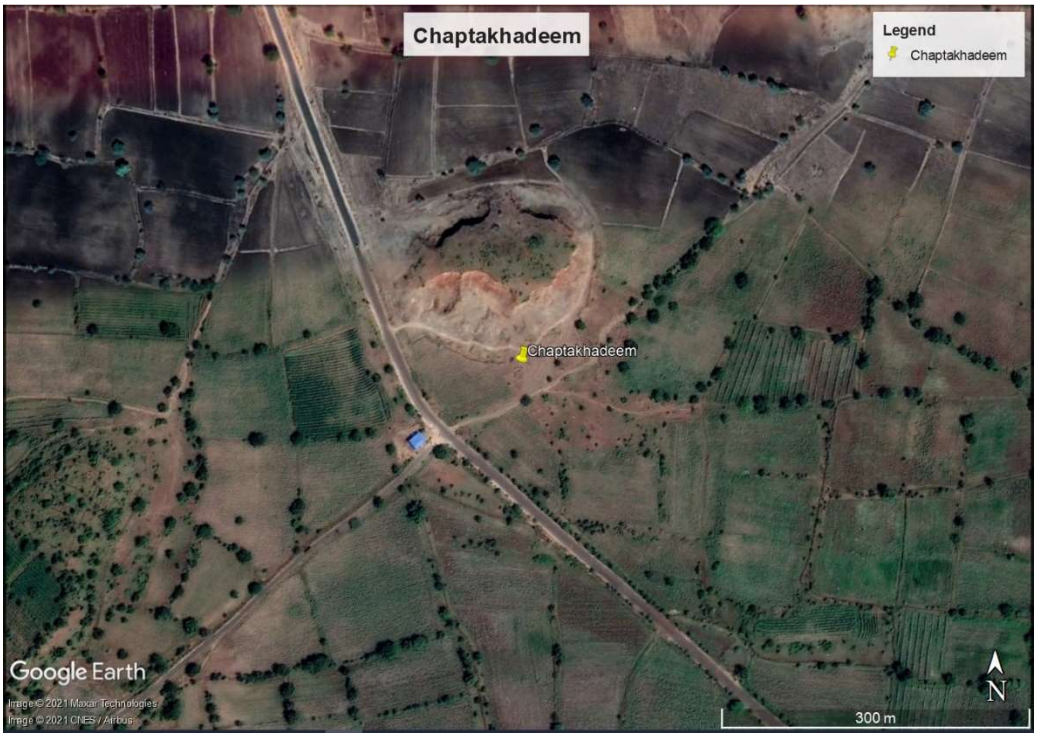
a.

b.

c.

Plate 3.13: The UP-M site of Kondapur showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Regolith context of the artefacts; c. Lithic assemblage occurring on the surface with regolith context.

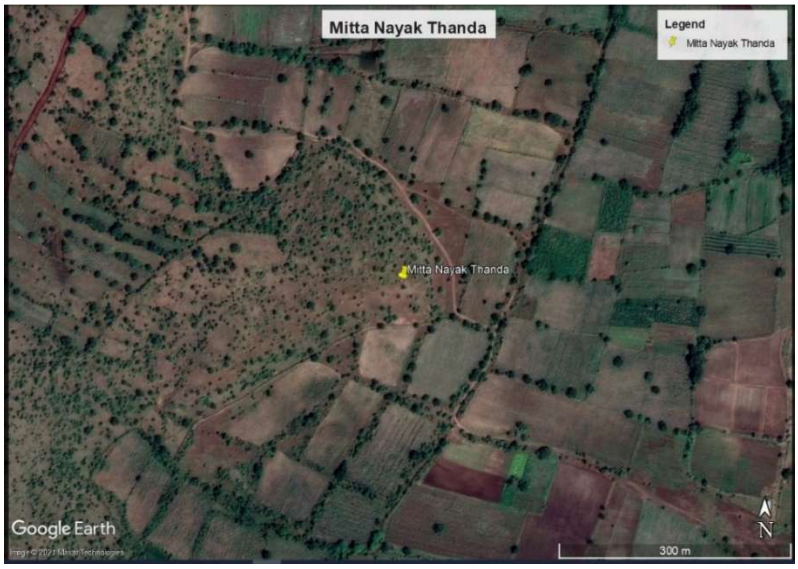
a.



b.

Plate 3.14: The UP-M site of Chaptakhadeem showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Quarried section observed at the site artefacts noticed from the section.

Plate 3.15: Section at the UP-M site of Chaptakhadeem showing the artefacts are associated with the pebble gravel and weathered granitic context.

a. 

b. 

c. 

Plate 3.16: The UP site of Mitta Nayak Thanda showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Artefacts derived on the surface associated with pebbly cobbly context; c. Context of UP artefacts on the top of the hillock.

a. 

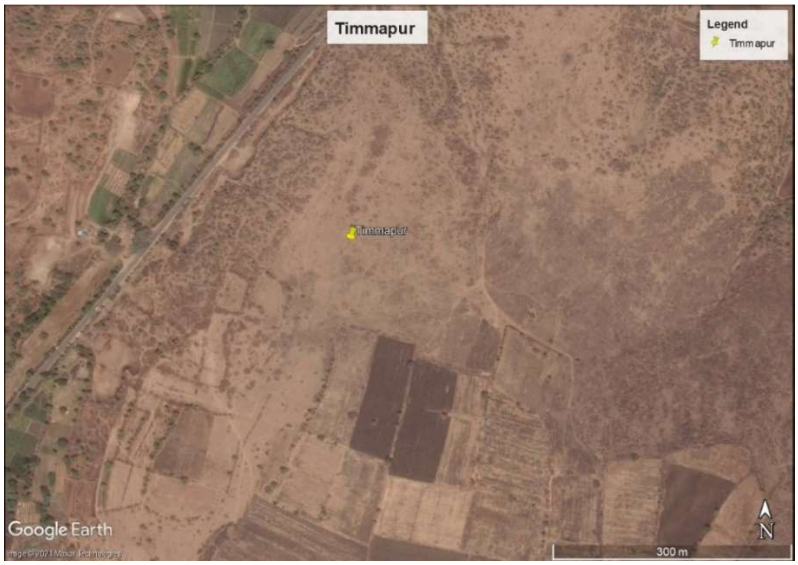
b. 

Plate 3.17: The UP site of Dosapalle showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Artefacts derived on the surface are associated with pebbly cobbly context.

a.

b.

Plate 3.18: a. Context of UP artefacts with the weathered sediments; b. The exposed section at the Dosapalle locality showing the artefacts associated with the pebbly cobbly gravel.

a. 

b. 

c. 

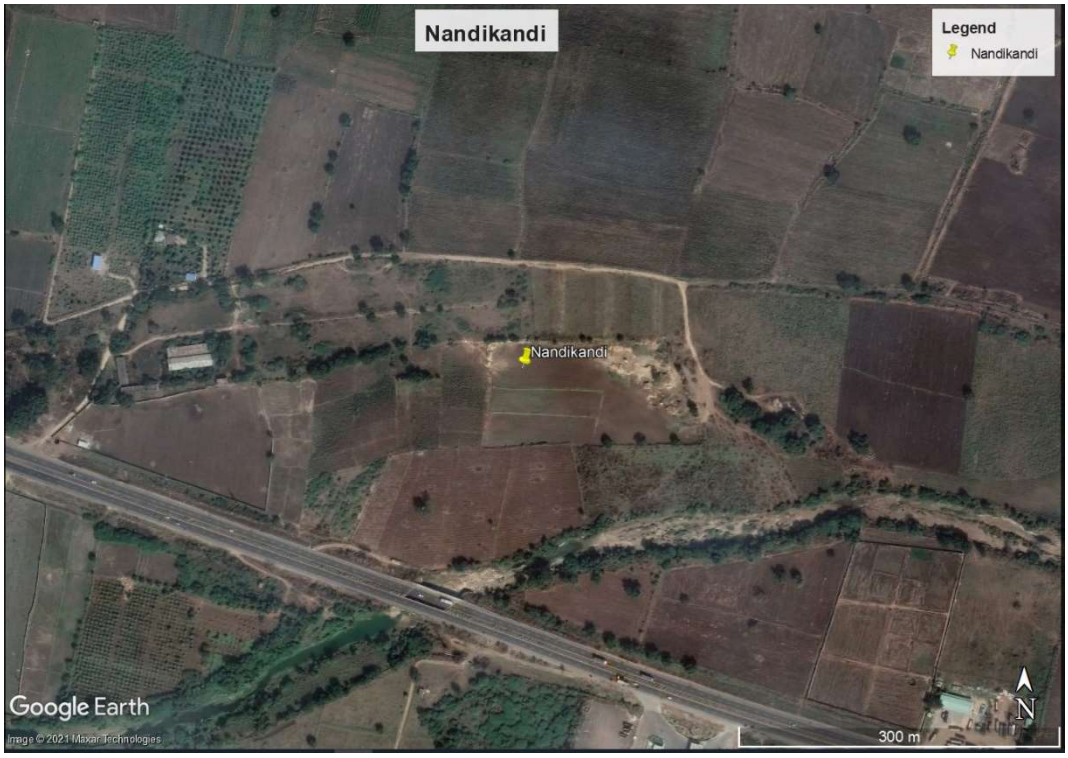
Plate 3.19: The UP site of Timmapur showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Artefacts derived on the surface associated with the context of the regolith sub-rounded to rounded core stones; c. Artefacts derived on the surface are associated with the pebbly cobbly context.

a. 

b.

Plate 3.20: a. Artefacts derived on the surface associated with pebbly cobbly context; b. Quarried section observed at the UP site Timmapur locality, the section is devoid of any artefacts.

a.



b.

Plate 3.21: The UP-M site of Nandikandi showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Quarried section observed at the UP site Nandikandi locality, artefacts are associated with the pebbly cobbly context overlain by weathered granitic bedrock.

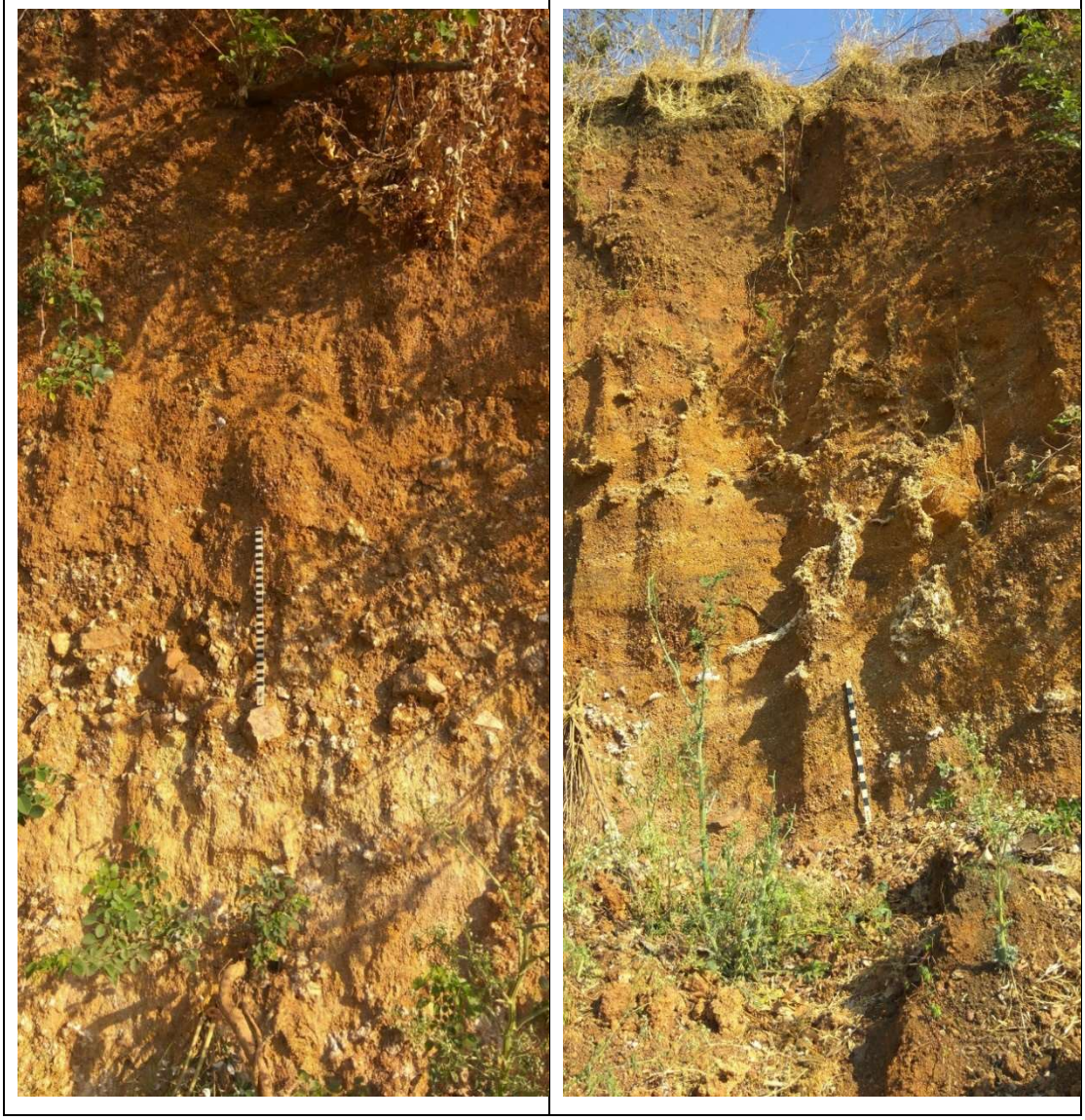


Plate 3.22: The site of Nandikandi showing: a. The quarried section showing the artefacts associated with the pebbly cobbly gravel context and sandy matrix above the weathered granitic bedrock; b. The section showing the artefacts with the context of pebbly cobbles and calcareous clays silts on the weathered granitic bedrock.

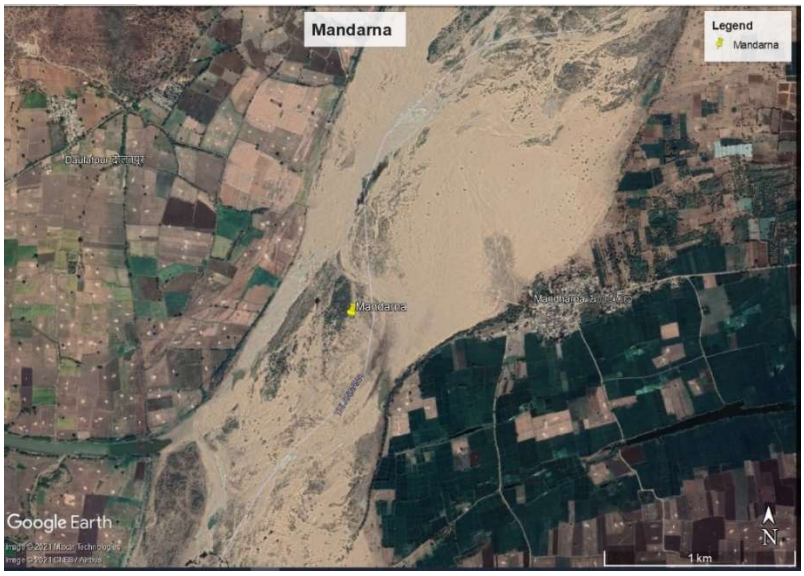
Plate 3.23: The site of Nandikandi showing: a. The quarried section showing the artefacts associated with the pebbly cobbly gravel context; b. The section showing the artefacts cemented within the pebbly cobbly context.

a. 

b. 

c. 

Plate 3.24: The UP site of Jagannathapur showing; a. Location of the site, scale 300 m (Google Earth: Image Landsat/ Copernicus); b. Artefacts are associated with the regolith context comprising sub-rounded to rounded weathered cores stones; c. Exposure of cherty quartzite at the site of Jagannathapur.

a. 

b. 

c. 

Plate 3.25: The M site of Mandarna showing; a. Location of the site, scale 1 km (Google Earth: Image Landsat/ Copernicus); b. Modern gravel bed which is the context of the artefacts; c. the site of Mandarna showing the context of the artefacts in the modern gravel bed.

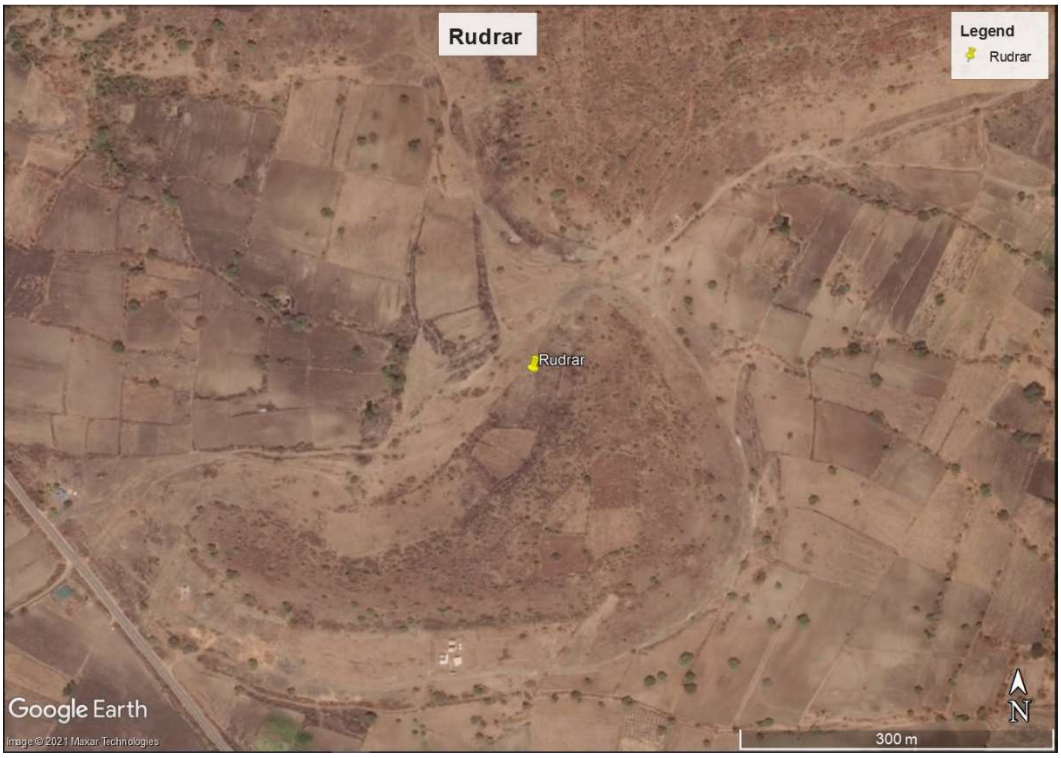


Plate 3.26: The UP site of Rudrar showing location of Rudrar site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

Plate 3.27: The UP site of Yelgoi showing location of Yelgoi site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

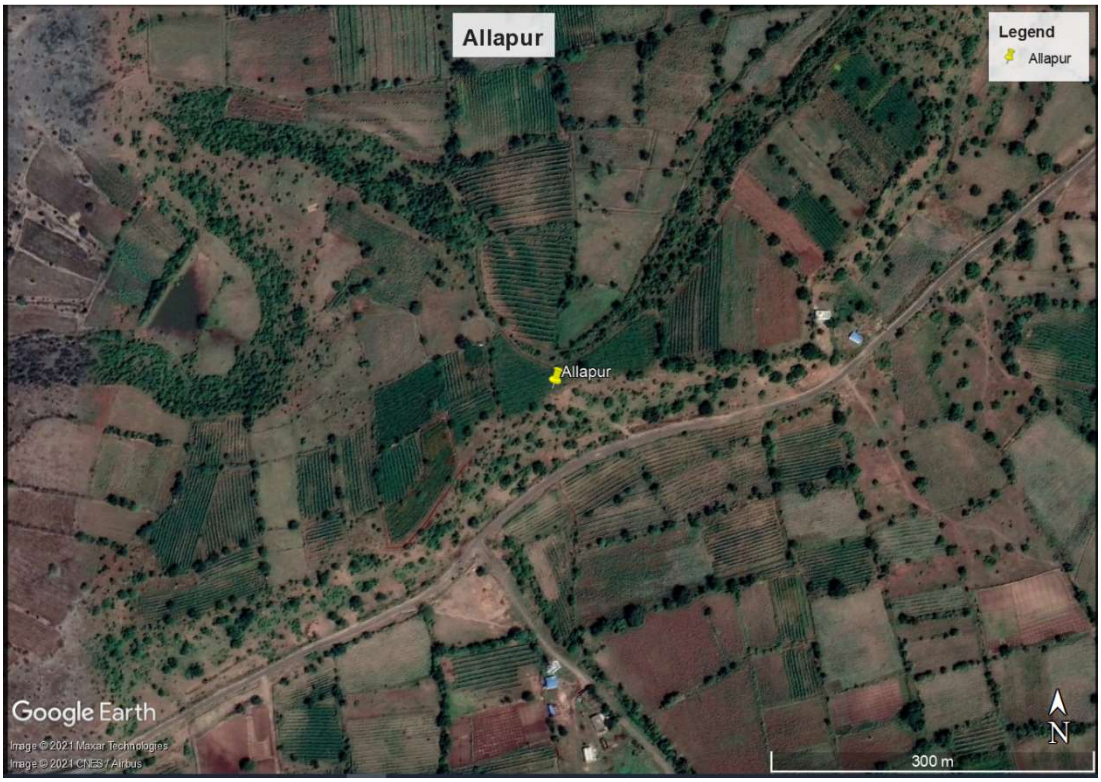


Plate 3.28: The UP site of Allapur showing location of Allapur site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

Plate 3.29: The UP site of Mukthapur showing location of Mukthapur site, scale 200 m (Google Earth: Image Landsat/ Copernicus)

Plate 3.30: The UP site of Tupran showing location of Tupran site, scale 200 m (Google Earth: Image Landsat/ Copernicus)

Plate 3.31: The UP site of Abbenda showing location of Abbenda site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

Plate 3.32: The UP site of Kodcherla showing location of Kodcherla site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

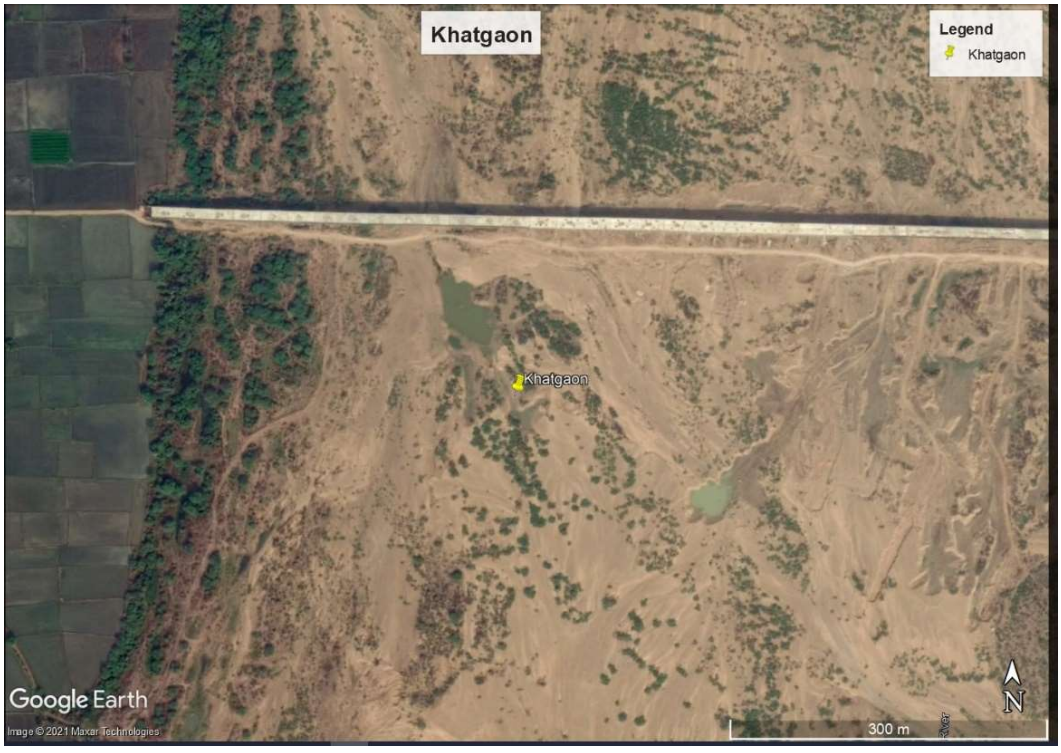


Plate 3.33: The UP site of Khatgaon showing location of Khatgaon site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

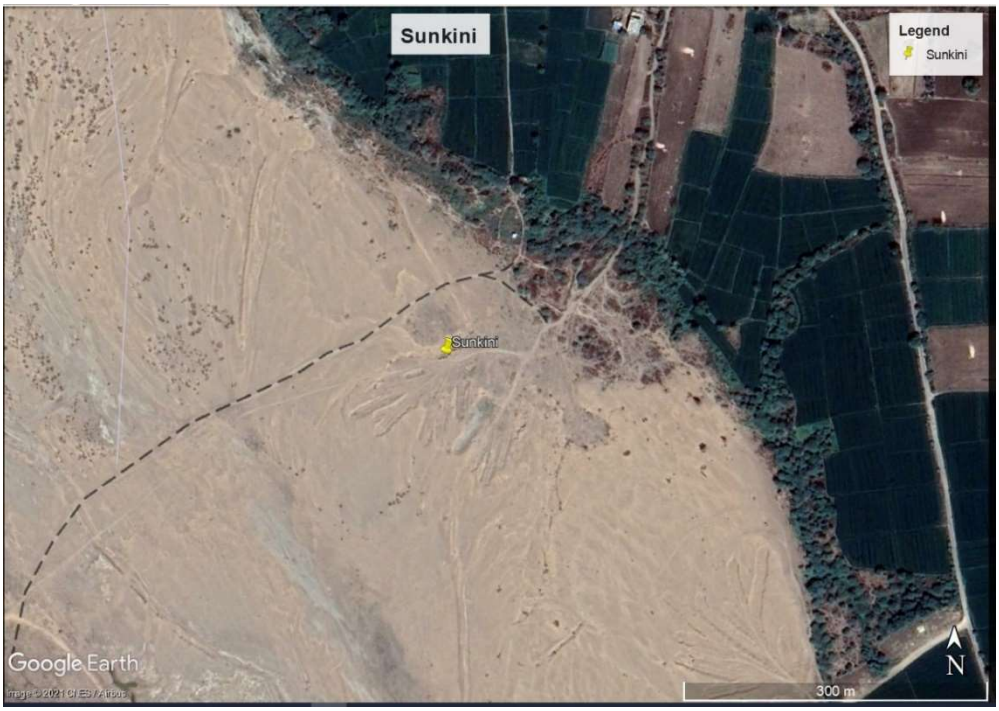


Plate 3.34: The UP site of Sunkini showing location of Sunkini site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

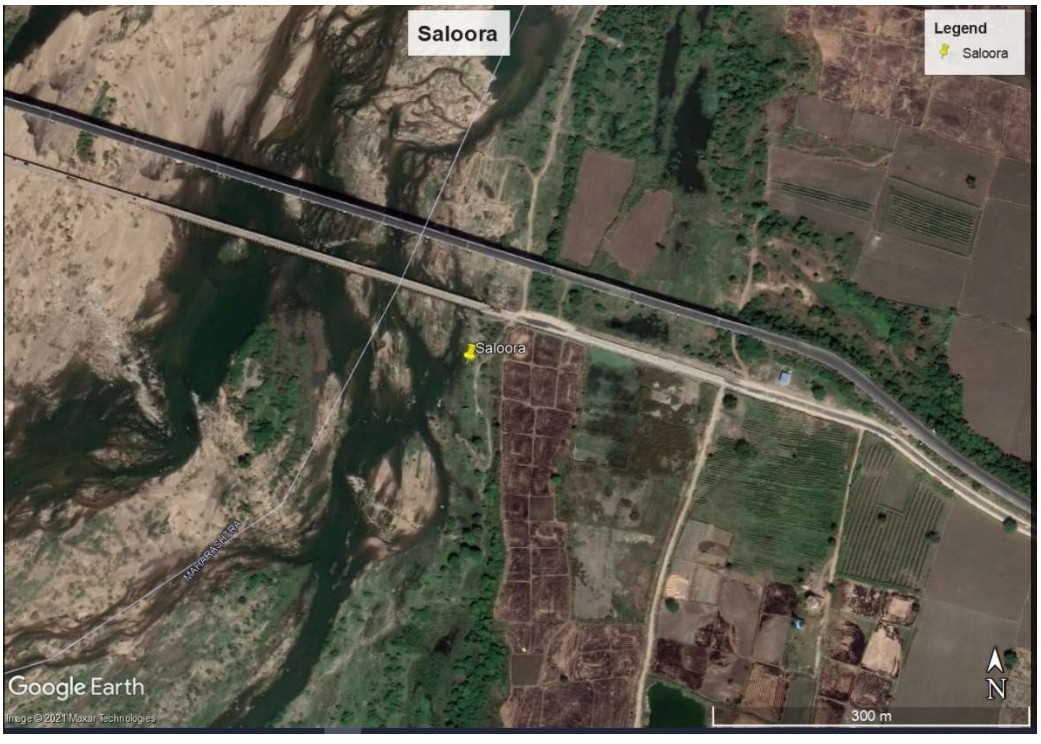


Plate 3.35: The UP site of Saloora showing location of Saloora site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

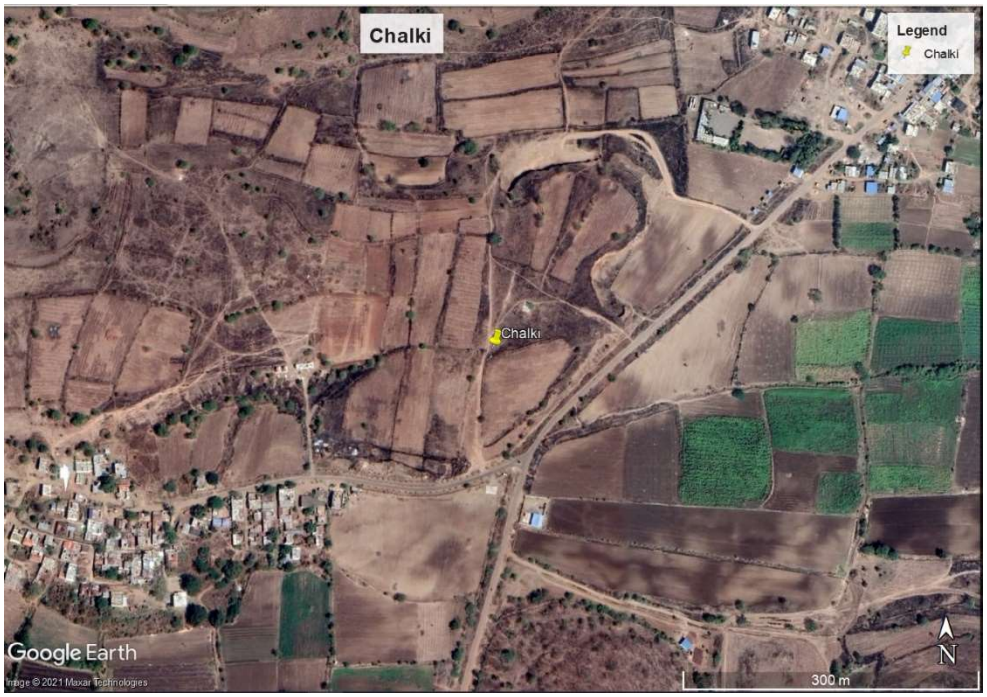


Plate 3.36: The UP-M site of Chalki showing location of Chalki site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

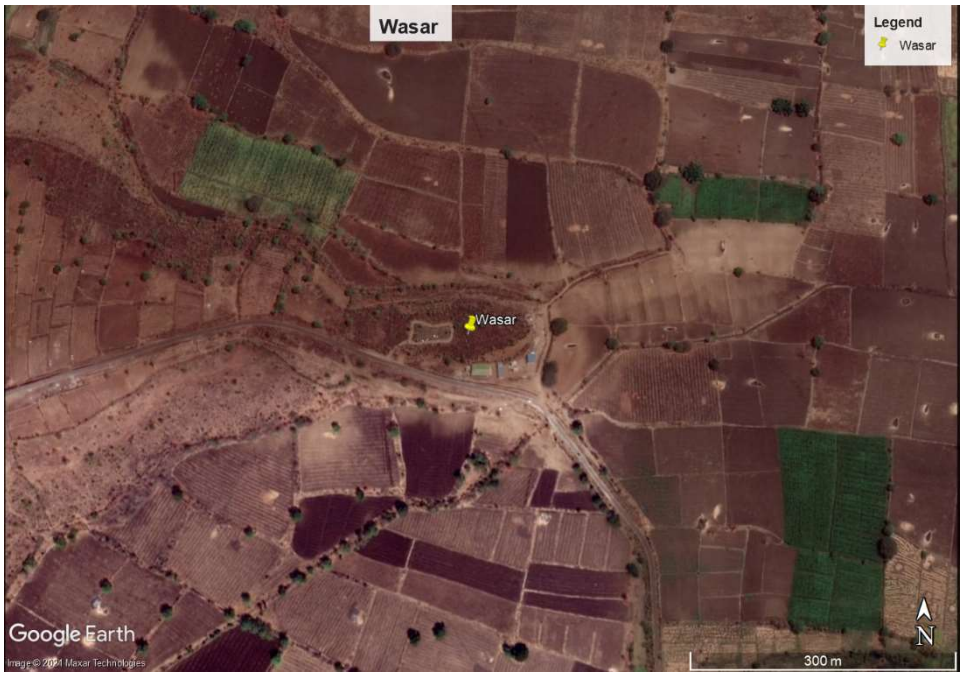


Plate 3.37: The M site of Wasar showing location of Wasar site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

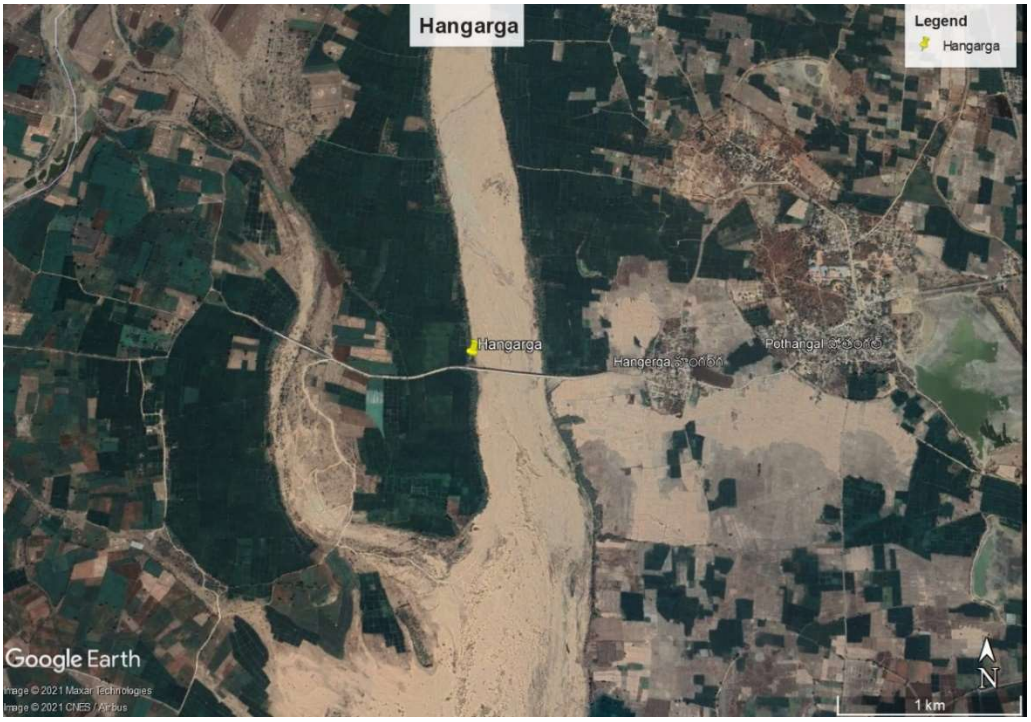


Plate 3.38: The UP site of Kodcherla showing: a. Location of Kodcherla site, scale 1 km (Google Earth: Image Landsat/ Copernicus)

Plate 3.39: The M site of Gonguluru showing location of Gonguluru site, scale 300 m (Google Earth: Image Landsat/ Copernicus)

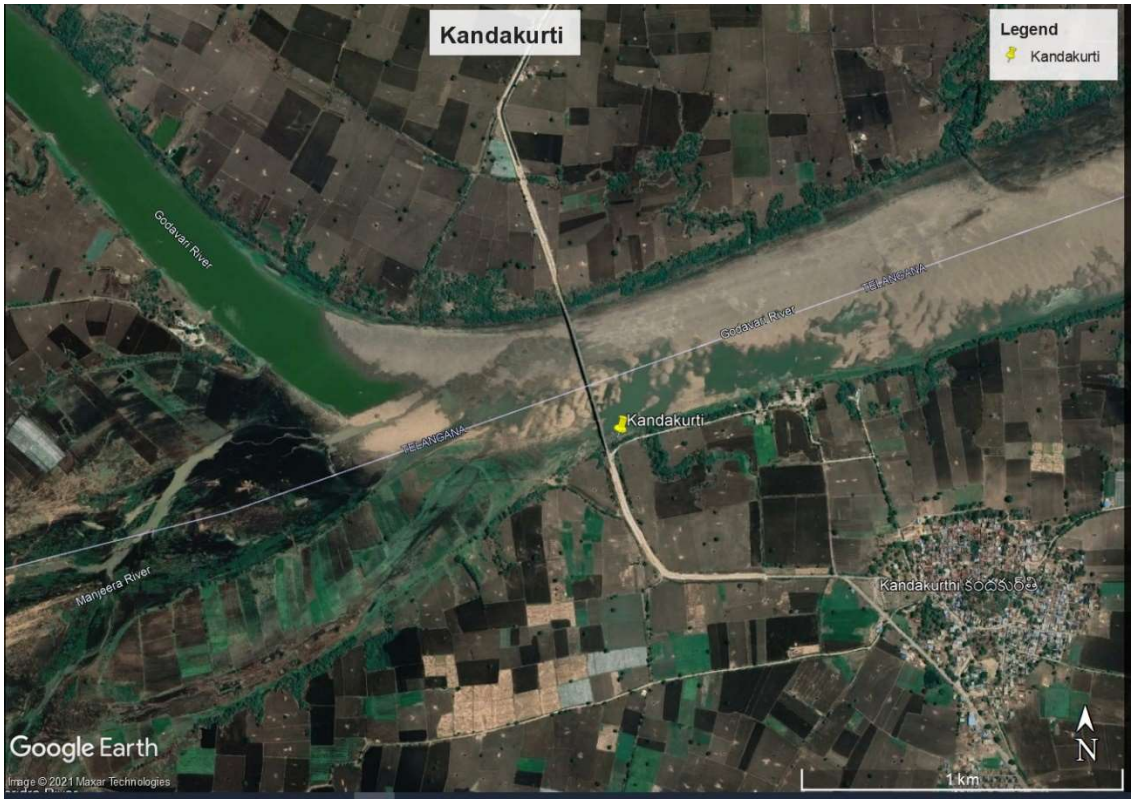


Plate 3.40: The M site of Kandakurti showing location of Kandakurti site, scale 1 km (Google Earth: Image Landsat/ Copernicus)

Chapter 4

The Late/Upper Palaeolithic assemblages from the study area

4.1. Introduction

The earlier works in the study region by Murty, Sastry, Joshi et.al and Sathe discovered various prehistoric sites. DLN. Sastry found Late/Upper Palaeolithic sites in the Manjira river basin area in both Medak and Sangareddy districts (see Chapter-2). The author discovered (n=23) potential Late/Upper Palaeolithic sites in the region and mentioned below (Table 4.1):

4.2. Late/Upper Palaeolithic sites

Table 4.1: Sites along with the lithic assemblage collected

Sites along with lithic assemblage	Number of artefacts	In Percentage
Abbenda	**18**	**1.12%**
cores	2	0.12%
debitage	1	0.06%
finished tools	15	0.94%
Allapur	**73**	**4.55%**
cores	1	0.06%
debitage	17	1.06%
finished tools	48	2.99%
nature facts	7	0.44%
Aroor	**152**	**9.48%**
cores	7	0.44%

debitage	60	3.74%
finished tools	83	5.18%
nature facts	2	0.12%
Chalki	**41**	**2.56%**
cores	2	0.12%
debitage	20	1.25%
finished tools	17	1.06%
nature facts	2	0.12%
Chaptakhadeem	**107**	**6.67%**
cores	6	0.37%
debitage	31	1.93%
finished tools	64	3.99%
nature facts	6	0.37%
Dosapalle	**49**	**3.06%**
cores	6	0.37%
debitage	20	1.25%
finished tools	16	1.00%
nature facts	7	0.44%
Fasalwadi	**49**	**3.06%**
cores	2	0.12%
finished tools	47	2.93%

Jagannathapur	**85**	**5.30%**
cores	5	0.31%
debitage	18	1.12%
finished tools	60	3.74%
nature facts	2	0.12%
Khatgaon	**24**	**1.50%**
debitage	7	0.44%
finished tools	17	1.06%
Kodcherla	**48**	**2.99%**
debitage	7	0.44%
finished tools	41	2.56%
Kondapur	**91**	**5.68%**
cores	9	0.56%
debitage	26	1.62%
finished tools	53	3.31%
nature facts	3	0.19%
Medak	**24**	**1.50%**
debitage	3	0.19%
finished tools	21	1.31%
Mitta Nayak Thanda	**204**	**12.73%**

cores	12	0.75%
debitage	89	5.55%
finished tools	87	5.43%
nature facts	16	1.00%
Mukthapur	**8**	**0.50%**
debitage	4	0.25%
finished tools	4	0.25%
Nandi Kandi	**202**	**12.60%**
cores	11	0.69%
debitage	52	3.24%
finished tools	133	8.30%
nature facts	6	0.37%
Rudrar	**60**	**3.74%**
cores	5	0.31%
debitage	30	1.87%
finished tools	18	1.12%
nature facts	7	0.44%
Saloora	**26**	**1.62%**
debitage	14	0.87%
finished tools	12	0.75%
Shelgara Gattu	**220**	**13.72%**

cores	14	0.87%
debitage	104	6.49%
finished tools	83	5.18%
nature facts	19	1.19%
Sunkini	**17**	**1.06%**
finished tools	17	1.06%
Timmapur	**72**	**4.49%**
cores	2	0.12%
debitage	26	1.62%
finished tools	42	2.62%
nature facts	2	0.12%
Tupran	**19**	**1.19%**
cores	1	0.06%
debitage	8	0.50%
finished tools	10	0.62%
Yelgoi	**14**	**0.87%**
finished tools	14	0.87%
Total	**1603**	**100.00%**

4.3. The Late/Upper Palaeolithic Lithic Assemblage

Lithic assemblages (n=1603) were collected from all the above-mentioned sites except the Gorregattu site, where the tools were noticed in the stratigraphy but no single artefact was collected from this site. The collected assemblage include cores (n=85, 5.30%)), debitage (n=537, 33.50%)), finished tools (n=902, 56.27%) and nature facts (n=79, 4.93%) (Table 4.2).

Table 4.2: Collected Lithic Assemblage

Lithic Assemblage	**Number of Artefacts**	**In Percentage**
cores	85	5.30%
debitage	536	33.44%
finished tools	903	56.33%
nature facts	79	4.93%
Total	**1603**	**100.00%**

4.4. Raw Material

The assemblage is dominated by chert (n=1218, 75.98%) followed by cherty quartzite (n= 143, 8.92%), chalcedony (n=109, 6.08%), agate (n=38, 2.37%), and quartz (n=03, 0.19%) (Fig. 4.1). Chert is the single largest raw material in all the sites the reason is

chert is available locally and other siliceous rocks are available in the Deccan trap regions (discussed in the Chapter-3)

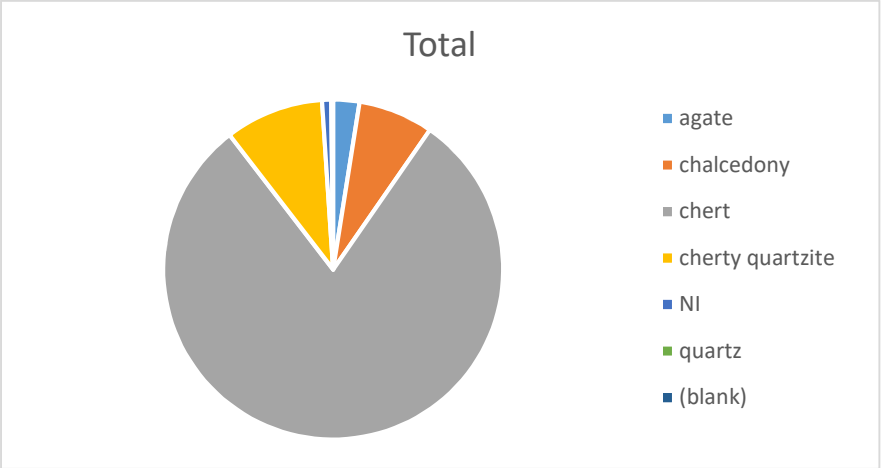


Figure 4.1: Different types of raw materials, which were used to make the artefacts

4.4.1 Raw material variability in relation to artefact types

In the case of cores (n=85), chert is largely used raw material for prepared cores and flake cores and chalcedony is the second-largest raw material, which was used for prepaed cores (chert n= 62 and chalcedony n= 13).

Other raw materials include cherty quartzite (n=7), agate and quartz (n=2 and n=1) (Table 4.3).

Finished tools (n= 902) are largely made on chert (n=763, 73.18%), other raw material include cherty quartzite (n=76, 8.43%), chalcedony (n=43, 4.77%), agate (n=13, 1.44%) and Non-identifiable raw material (n=7, 0.78%) (Table 4.3).

Debitage (n=537) is also largely consists of chert (n=393, 73.18%) and other raw marerial include cherty quartzite (n=60, 11.17%), chalcedony (n= 53, 9.87%), agate (n=23, 4.28%) and quartz (n=2, 0.37%) (Table 4.3)

Table 4.3: Raw materials in the collected assemblage

Finished tools	**Cores**		**Debitage**		**Finished tools**		**Nature factes**		**Total in numbers**	**Total in percentage**
Raw Maerial	**Total in numbers**	**Total in percentage**	**Total in numbers**	**Total in percentage**	**Total in numbers**	**Total in percentage**	**Total in numbers**	**Total in percentage**		
agate	2	2.35%	23	4.28%	13	1.44%		0.00%	38	2.37%
chalcedony	13	15.29%	53	9.87%	43	4.77%		0.00%	109	6.80%
chert	62	72.94%	393	73.18%	763	84.59%		0.00%	1218	75.98%
cherty quartzite	7	8.24%	60	11.17%	76	8.43%		0.00%	143	8.92%
NI		0.00%	6	1.12%	7	0.78%		0.00%	13	0.81%
quartz	1	1.18%	2	0.37%		0.00%		0.00%	3	0.19%
(blank)		0.00%		0.00%		0.00%	79	100.00%	79	4.93%
Total	**85**	**100.00%**	**537**	**100.00%**	**902**	**100.00%**	**79**	**100.00%**	**1603**	**100.00%**

4.4.2. Site-wise exploitation of raw material

Chert is the largest raw material at all the sites. Sites such as Abbenda, Allapur, Aroor, Fasalwadi, Khatgaon, Mukthapur, Sloora, Tupran and Yelgoi where the chert dominates among all the raw materials, Cherty quartzite is the second-largest raw material within the collected assemblage. Chalcedony is the third largest raw material that was used to flake the artefacts. And 13 artefacts are flaked on the Non-Identifiable raw material (Table 4.4)

Table 4.4: Site wise Raw materials in the collected assemblage

Raw Material	Agate	Chalcedony	Chert	Cherty quartzite	NI	Quartz	Total
Site Name							
Abbenda			13	4	1		18
Allapur	2	2	52	10			66
Aroor	11	13	122	3		1	150
Chalki	10	11	16		1	1	39
Chaptakhadeem		1	84	15	1		101
Dosapalle	1	3	31	7			42
Fasalwadi		1	46	2			49
Jagannathapur	2	7	67	7			83
Khatgaon	1	1	21			1	24
Kodcherla	3	2	42	1			48
Kondapur	3	8	65	12			88
Medak			24				24
Mitta Nayak Thanda	1	10	170	5	2		188

Mukthapur		1	7				8
Nandi Kandi		7	154	33	2		196
Rudrar	1	25	25	1	1		53
Saloora			26				26
Shelgara Gattu	3	12	142	40	4		201
Sunkini		3	13	1			17
Timmapur		2	67		1		70
Tupran			19				19
Yelgoi			12	2			14
Total	**38**	**109**	**1218**	**143**	**13**	**3**	**1524**

4.5. Physical state of the artefacts

Most of the artefacts are complete (n=990, 79.64%) in state whereas few broken (n=253, 20.5%) (Fig. 4.2). Finished tools occupy the largest portion in both the complete and broken states (71.01% and 78.66%) (Table 4.5). In case of broken finished tools most breakage is at the distal end (n=150, 62.50%) (Table 4.6), breakage at proximal end (n= 74, 30.83%) and both ends broken (n= 8, 3.33%) (Table 4.6)

Table 4.5: Physical state of the artefacts collected

Lithic Assemblage	**Broken**		**Complete**		**Total**	
Cores	6	2.37%	79	7.98%	85	6.84%
Debitage	48	18.97%	208	21.01%	256	20.60%
Finished tools	199	78.66%	703	71.01%	902	72.57%
Total	**253**	**100.00%**	**990**	**100.00%**	**1243**	**100.00%**

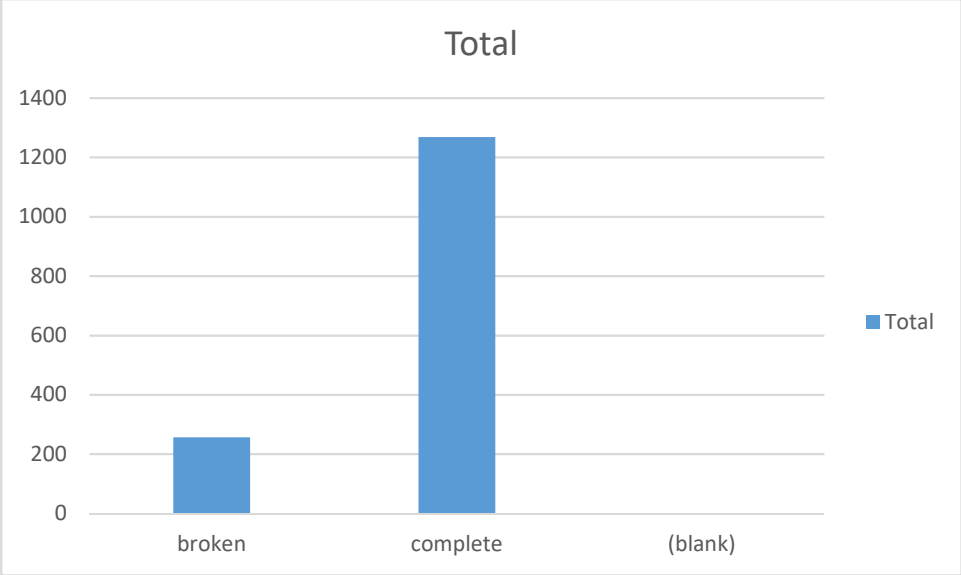


Figure 4.2: Physical state of the Late/Upper Palaeolithic assemblage

Table 4.6: Position of breakage of the artefacts

Position of breakage	In numbers	In percentage
both proximal and distal ends broken	8	3.33%
distal end broken	150	62.50%
lateral and distal ends broken	2	0.83%
lateral side broken	1	0.42%
NI	4	1.67%
proximal end broken	74	30.83%
right proximal broken	1	0.42%
Total	**240**	**100.00%**

4.6. Cortex coverage on the artefacts

The collected lithic assemblage consists of cortical and non-cortical flakes and also artefacts with different percentages of cortex on the dorsal side of the assemblage. Most of the tools are non-cortical (n=648), cortical (n=512) and others include Non-identifiable artefacts with cortex (n=79) (Table 4.7)

Table 4.7: Cortex coverage on the artefacts

Cortex	In numbers	In percentage
absent	648	52.30%
NI	79	6.38%
present	512	41.32%
Total	**1239**	**100.00%**

4.7. Preservation of artefacts

The tools which were collected, most of them are fresh (n=660, 53.18%)), few are weathered (n=361, 29.09%) and rolled (n=220, 17.73%) (Table 4.9). The site Nandikandi yielded a more number of fresh tools (n=108) among the collected lithic assemblage (Table 4.8)

Table 4.8: Site wise preservation of artefacts

Site Name	Fresh	Rolled	Weathered	Total
Abbenda	10		8	18
Allapur	36	3	16	55
Aroor	55	21	42	118
Chalki	17		6	23
Chaptakhadeem	50	2	32	84

Dosapalle	20	3	5	28
Fasalwadi		49		49
Jagannathapur	57	1	17	75
Khatgaon		19		19
Kodcherla		47		47
Kondapur	53		15	68
Medak		24		24
Mitta Nayak Thanda	86		53	139
Mukthapur		1	4	5
Nandi Kandi	108	11	61	180
Rudrar	28		6	34
Saloora	8	12	2	22
Shelgara Gattu	95		58	153
Sunkini		17		17
Timmapur	37		15	52
Tupran		10	7	17
Yelgoi			14	14
Total	**660**	**220**	**361**	**1241**

Table 4.9: Preservation of artefacts

Preservation	In numbers	In percentage
fresh	660	53.18%
rolled	220	17.73%
weathered	361	29.09%
Total	**1241**	**100.00%**

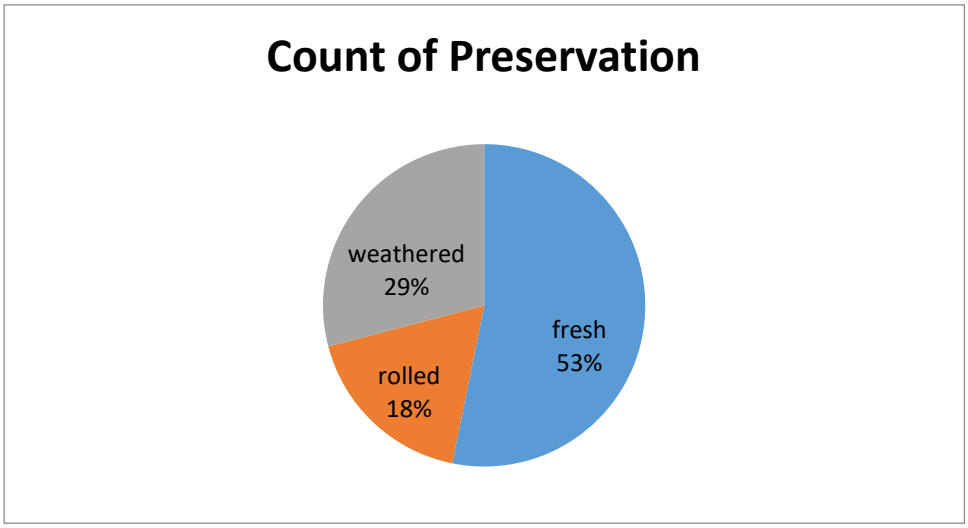


Figure 4.3: Preservation of the collected assemblage from the Late/Upper Palaeolithic sites

4.8. Cores

The assemblage consists of a total of 85 cores (Table 4.10). Cores include flake cores (n=43, 50.58%), blade or prepared cores (n=39, 45.88%) and core debitage or broken cores (n=3, 3.52%). Site-wise distribution of cores shows that a high number of cores were collected from Shelgara Gattu (n=13), more number of flake cores (n=8) were

collected from the sites Mitta Nayak Thanda and Shelgara Gattu, whereas blade cores (n=6) were collected from the site Aroor (Table 4.11)

Table 4.10: Number of collected Cores from the Lithic Assemblage

Cores	**In numbers**	**In percentage**
Blade cores	39	45.88%
Core debitage	3	3.52%
Flake cores	43	50.58%
Total	**85**	**100%**

Table 4.11: Site wise distribution of cores

	Type of blade cores		
Site Name	**Blade cores**	**Flake cores**	**Total**
Abbenda	2		2
Allapur	1		1
Aroor	6	1	7
Chalki	1	1	2
Chaptakhadeem	1	3	4
Dosapalle	1	4	5
Fasalwadi	1	1	2
Jagannathapur	2	3	5
Khatgaon			
Kodcherla			

Kondapur	5	2	7
Medak			
Mitta Nayak Thanda	4	8	12
Mukthapur			
Nandi Kandi	5	6	11
Rudrar	2	3	5
Saloora			
Shelgara Gattu	5	8	13
Sunkini			
Timmapur	2		2
Tupran	1		1
Yelgoi			
Grand Total	**39**	**40**	**79**

Chert is the largely used raw material (n= 58, 73.42%). Chalcedony is the second-largest raw material (n= 13, 16.46%) and followed by others (Table 4.12). Both blade and flake cores were majorly flaked on the chert raw material (Table 4.12)

Table 4.12: Raw material for the cores

	Blade cores		**Flake cores**		**Total**	
Raw material	**In numbers**	**In percentage**	**In numbers**	**In percentage**	**In numbers**	**In percentage**
Agate	1	2.56%	1	2.50%	2	2.53%
Chalcedony	8	20.51%	5	12.50%	13	16.46%
Chert	29	74.36%	29	72.50%	58	73.42%

Cherty quartzite	1	2.56%	4	10.00%	5	6.33%
NI		0.00%		0.00%		0.00%
Quartz		0.00%	1	2.50%	1	1.27%
Total	**39**	**100.00%**	**40**	**100.00%**	**79**	**100.00%**

Cortex on the cores varies from 0-100 percentage, non cortical blade cores (n=7), blade cores with cortex coverage of 0-25 % (n= 10), 25-50 % (n=11), 50-75 % (n= 4) and 75-100 % (n=1) noticed, whereas the flake cores, non cortical flake cores (n=10), cortex coverage of 0-25 % (n=9), 25-50 % (n=19), 50-75 % (n=7) and 75-100 % (n=3) identified in the collected assemblage (Table 4.13).

Table 4.13: Cortex coverage on the cores

Corex coverage	**0**	**100**	**0-25**	**25-50**	**50-75**	**75-100**	**blank**	**Total**
Type of core								
blade cores	7		10	11	4	1	6	39
flake cores	10		9	8	7	3	3	40
Total	**17**		**19**	**19**	**11**	**4**	**9**	**79**

Table 4.14: Organization of striking platforms on the cores

Row Labels	**90 degrees**	**multidirectional**	**opposite**	**parallel**	**unidirectional**	**N.I**	**Total**
blade cores	2		7	4	18	8	39
flake cores	12	1	3		14	10	40
Total	**14**	**1**	**10**	**4**	**32**	**18**	**79**

4.8.1. Blank types for cores

The blank type for most of the cores are chert nodules (n=61, 75.94%) followed by those that are on flakes (n=10, 12.65%) and cobbles (n=7, 8.86%). These belong to various raw materials such as chert, chalcedony, cherty quartzite, agate, etc. (Table 4.15).

Table 4.15: Blank types for the collected Blade and Flake cores

	Blade cores		**Flake cores**		**Total**	
Blank types	**In numbers**	**In percentage**	**In numbers**	**In percentage**	**In numbers**	**In percentage**
Cobbles		0.00%	7	17.50%	7	8.86%
Flake	4	10.26%	6	15.00%	10	12.65%
NI	1	2.56%		0.00%	1	1.26%
Nodule	34	87.18%	27	67.50%	61	75.94%
Total	**39**	**100.00%**	**40**	**100.00%**	**79**	**100.00%**

4.8.2. Flake cores

These flake cores are having flake scars ranging from one to six flake scars. The maximum number of cores having flake scars is two, two cores are having a maximum of flake scars with six in number. In addition, other cores are having flake scars one (n=10), three (n=7) and four (n=4) (Table 4.16).

Table 4.16: Number of scars on the fake cores

Number of scars	**1**	**2**	**3**	**4**	**6**	**Total**
Flake core	10	17	7	4	2	40
Total	**10**	**17**	**7**	**4**	**2**	**40**

The cortex is almost present on all the flake cores, and there are ten non-cortical cores with zero cortex, nine cores are having cortex <25% and 18 cores are having cortex >25%. (Table 4.17). Based on the pattern of flaking the debitage surfaces of these cores, they are further divided into i. cores having flakes in 90° (n=12), ii. Cores having scares in multi-direction (n=1), iii. Cores having scars with opposite direction (n=3) and iv. Cores having flake scars in unidirectional (n=14) (Table 4.14)

Table 4.17: Percentage of the cortex on the blade and the flake cores

Percentage of cortex	**0**	**100**	**0-25**	**25-50**	**50-75**	**75-100**	**NI**	**(blank)**	**Total**
Row Labels									
Blade cores	7		10	11	4	1		6	39
Flake cores	10		9	8	7	3		3	40
Total	**17**	**_**	**19**	**19**	**11**	**4**	**_**	**9**	**79**

The dimensions of flake scars of all the flake cores were measured. The length and breadth of all scars were noted. The length of the flake scars are ranging from 13.45 mm to 21.8 mm whereas the breadth of the blade scars are ranging from 5.97 mm to 17.23 mm. (Table 4.18)

Table 4.18: Dimensions of flake scars on the flake cores

Number of flake scars	**Dimensions of flake scars**
Flake scar 1	19.583 x 12.44mm
Flake scar 2	19.52 x 12.7mm
Flake scar 3	20.40 x 17.23mm
Flake scar 4	21.8 x 13.56mm
Flake scar 5	13.45 x 5.97mm
Flake scar 6	17.36 x 12.8mm

4.8.3. Prepared cores

The assemblage consists of 39 prepared cores. Most of them (<50%) were made on the chert nodules. Prepared cores are having a number of scars ranging from one to six blade scars. The maximum number of cores has two blade scars, three cores are having a maximum of six blade scars (Table 4.19). In addition, there are cores with three blade scars (n=11), four blade scars (n=4), and five blade scars (n=2).

Table 4.19: Number of blade scars on the blade cores

Number of scars	**1**	**2**	**3**	**4**	**5**	**6**	**Total**
Blade core	5	16	11	2	2	3	39
Total	**5**	**16**	**11**	**2**	**2**	**3**	**39**

The dimensions of flake scars of all the blade cores were measured. The length and breadth of all scars were noted. The length of the blade scars are ranging from 14.15 mm to 17.08 mm whereas the breadth of the blade scars are ranging from 5.87 mm to 9.65 mm. (Table 4.20)

Table 4.20: Dimensions of blade scars on the blade cores

Blade scars	**Dimensions of Blade scar**
Blade scar 1	17.08 x 6.92mm
Blade scar 2	16.9 x 6.97mm
Blade scar 3	14.74 x 7.0mm
Blade scar 4	15.07 x 7.65mm
Blade scar 5	14.71 x 9.65mm
Blade scar 6	14.15 x 5.87mm

The cortex is almost present on all the prepared cores, and there are seven non-cortical cores with zero cortex, ten cores are having cortex <25% and 16 cores are having cortex >25%. (Table 4.17). Based on the pattern of flaking the debitage surfaces of these cores, they are further divided into i. Cores having flakes in 90° (n=2), ii. Cores having scars

with opposite direction (n=4) and iii. Cores having flake scars in unidirectional (n=18) (Table 4.14)

4.9. Finished tools

The assemblage consists of 903 finished tools which are dominated by different types of scrapers, followed by retouched flakes and retouched bladelets. The scrapers consists of side scrapers (n=266, 29.45%) notably occupies the large portion, convex scrapers (n=115, 12.73%), end scraper (n=59, 6.53%), side and end scraper (n=58, 6.42%), double straight scraper (n=25 2.76%), straight scraper (n=29, 3.21%), concave scraper (n=14, 1.55%), double side scraper, double straight and end scraper, round scraper and straight and end scraper are <5 in number (Table 4.21). The blade tools are also occurring in the form of bladelets. The presence of retouched bladelets (n=108) are noteworthy. The assemblage also has notches (n=26), borers (n=15), points (n= 11) and burins (n=2) (Table 4.21)

Table 4.21: Different types of finished tools in the assemblage (n= 903 artefacts)

Finished tools	In numbers	In percentage
backed bladelet	9	.99%
bladelet	1	.11%
borer	15	1.66%
burin	2	.22%
concave scraper	14	1.55%
convex scraper	115	12.73%
double side scraper	4	.44%
double straight and end scraper	2	.22%
double straight scraper	25	2.76%
end scraper	59	6.53%
notch	26	2.87%

point	11	1.12%
retouched blade	8	0.88%
retouched bladelet	108	11.96%
retouched flake	131	14.50%
round scraper	1	.11%
scraper	3	.33%
side and end scraper	58	6.42%
side scraper	266	29.45%
straight and end scraper	3	.33%
straight scraper	29	3.21%
unretouched blade	1	.11%
unretouched bladelet	12	1.32%
Total	**903**	**100%**

4.9.1. Raw material

It is noted that most of the finished tools (n=746, 84.6%) were made on the chert. The other raw materials are cherty quartzite (n=76, 8.41%), chalcedony (n=43, 4.76%) and agate (n=13, 1.43%) and there are a few number of finished tools (n=7) were made on Not-Identifiable raw material (Table 4.22).

Table 4.22: Finished tools on the various raw materials (n=903 artefacts)

Type of Raw material	**Agate**	**Chalcedony**	**Chert**	**Cherty quartzite**	**NI**	**Total**
Finished tools						
backed bladelet	1	5	3			9
bladelet		1				1

borer		1	13	1		15
burin			2			2
concave scraper	1		13			14
convex scraper	1	1	100	12	1	115
double side scraper			4			4
double straight and end scraper			1		1	2
double straight scraper			20	4	1	25
end scraper		1	51	6	1	59
notch			24	2		26
point	1		9	1		11
retouched blade	1		6		1	8
retouched bladelet	3	16	87	2		108
retouched flake	3	3	108	16	1	131
round scraper			1			1
scraper		1	2			3
side and end scraper	1		53	4		58
side scraper	1	9	233	23		266
straight and end scraper			3			3
straight scraper		1	23	4	1	29
unretouched blade			1			1

unretouched bladelet		4	7	1		12
Total	**13**	**43**	**764**	**76**	**7**	**903**
In percentage	**1.43%**	**4.76%**	**84.6 %**	**8.41%**	**.77%**	**100 %**

4.9.2. Blank types

Blank types for most of the tools are flakes (n=656, 72.64%) (Table 4.23). Side scrapers (n= 230) and retouched flakes (n=125) is seen to be dominated on flake blanks followed by convex scrapers (n=93) and end scrapers (n= 58). Tools on blades (n=243, 26.9%) occupies the second-largest blank types. Retouched bladelets (n=105), side scrapers (n= 35), convex scrapers (n= 22) and double straight scrapers (n=16) made on the blades. There are four artefacts one end scraper, retouched flake (n=2) and one side scraper which are made on unclear blanks (n=4) (Table 4.23)

Table 4.23: Finished tools on various Blank types

Blank types	**Blade**	**Flake**	**NI**	**Total**
Finished tools				
backed bladelet	8	1		9
bladelet	1			1
borer	4	11		15
burin	1	1		2
concave scraper	2	12		14
convex scraper	22	93		115
double side scraper	2	2		4
double straight and end scraper	1	1		2
double straight scraper	16	9		25

end scraper		58	1	59
notch	2	24		26
point	5	6		11
retouched blade	8			8
retouched bladelet	105	3		108
retouched flake	4	125	2	131
round scraper		1		1
scraper		3		3
side and end scraper	4	54		58
side scraper	35	230	1	266
straight and end scraper		3		3
straight scraper	10	19		29
unretouched blade	1			1
unretouched bladelet	12			12
Total	**243**	**656**	**4**	**903**
In percentage	**26.9%**	**72.64%**	**.44%**	**100%**

4.9.3. Physical state of the finished tools

The lithic assemblage consists of complete (n=703) and broken (n=200) finished tools (Table 4.24). Among the broken finished tools notably a maximum number of tools were broken at the distal end. At the sites, Nandikandi (n=40), Aroor (n=33), Mitta Nayak Thanda (n=27) finished tools with >25 were noticed.

Table 4.24: Physical state of the finished tools

Physical state	Broken		Complete		Total	
Lithic assemblage	**In numbers**	**In percentage**	**In numbers**	**In percentage**	**In numbers**	**In percentage**
Cores	5	1.95%	80	6.31%	85	5.58%
Debitage	51	19.92%	484	38.20%	535	35.13%
Finished tools	200	78.13%	703	55.49%	903	59.29%
Total	**256**	**100.00%**	**1267**	**100.00%**	**1523**	**100.00%**

4.9.4. Cortex on the finished tools

Cortex is present on most of the finished tools (n=310, 34.33%) (Table 4.25). A total of 19 finished tools have full cortex (100%) on the dorsal side. Finished tools with < 50% (n=222) cortex and and >50% (n=88) cortex is observed. On 79 finished tools, the cortex is unclear (8.74%) due to abrasion and patination. (Table 4.25)

Table 4.25: Cortex on the finished tools

Cortex	**Absent**	**NI**	**Present**	**Total**
Finished tools				
backed bladelet	8		1	9
bladelet	1			1
borer	8		7	15
burin	2			2

concave scraper	7		7	14
convex scraper	55	10	50	115
double side scraper	1		3	4
double straight and end scraper	1		1	2
double straight scraper	17	2	6	25
end scraper	31	3	25	59
notch	14	4	8	26
point	8	1	2	11
retouched blade	8			8
retouched bladelet	87	7	14	108
retouched flake	82	3	46	131
round scraper			1	1
scraper	1		2	3
side and end scraper	35	5	18	58
side scraper	119	41	106	266
straight and end scraper	1		2	3
straight scraper	15	3	11	29
unretouched blade	1			1
unretouched bladelet	12			12
Total	**514**	**79**	**310**	**903**
In percentage	**56.9%**	**8.74%**	**34.33%**	**100%**

4.9.5. Striking platform

Most of the finished tools have plain platforms (n=521, 57.7%), followed by those with faceted (n=203, 22.48%) and punctiform (n=88, 9.75%) (Table 4.26). Out of these 8 have broken platforms and 2 are unclear platforms, and there are 74 tools on which the platform is absent owing to the breakage on the proximal end. The mean dimensions of the striking platforms were calculated. The mean of the striking platform (15.57 x 7.59), maximum of the striking platform (72.08 x 30.1), minimum of the striking platform (1.5 x 0.97) and standard deviation (8.39 x 3.99) were measured (Table 4.27)

Table 4.26: Types of striking platforms on the finished tools

Types of striking ploatform	In numbers	In percentages
absent	74	8.19%
broken	2	0.22%
cortical	8	0.89%
faceted	203	22.48%
NA	5	0.55%
NI	2	0.22%
plain	521	57.70%
punctiform	88	9.75%
Total	**903**	**100.00%**

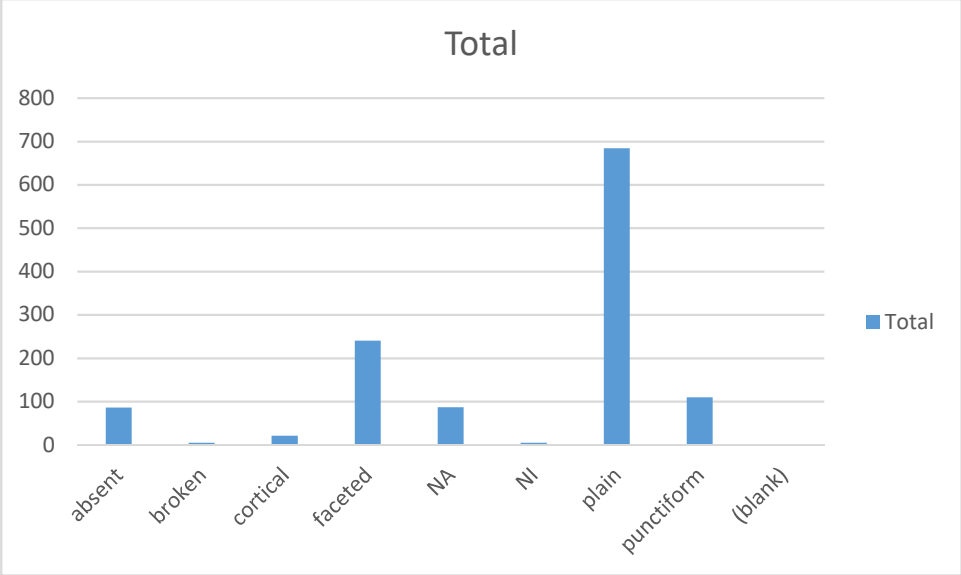


Figure 4.4: Different types of striking platforms observed on the finished tools

Table 4.27: Dimensions of the striking platforms on the finished tools

Length and Breadth of Finished tools	Mean Dimensions of Striking Platform			
	Mean	**Maximum**	**Minimum**	**Standard Deviation**
Length	15.57	72.08	1.5	8.39
Breadth	7.59	30.1	0.97	3.99

4.9.6. Bulb on the finished tools

The bulb is present on 863 finished tools (77.75%). Most of the finished tools have diffused bulbs (n= 475, 55.04%) (Table. 4.28). Eraillure is present on 216 (25.02%) of the finished tools and 28 (3.24%) of them are having lips on them.

Table 4.28: Bulb on the collected artefacts

Row Labels	Count of Bulb	Count of Bulb2
core	10	0.90%
debitage	237	21.35%
finished tool	863	77.75%
natural		0.00%
Grand Total	**1110**	**100.00%**

4.9.7. Retouch on the finished tools

More number of finished tools have been damaged on the distal and lateral ends. Retouch done on the different tools at the different locations of the artefacts. The tools with both the sides/location retouched (28.94%) dominating and others are left side retouch (25.09%), right side retouch (17.71%), right-left and distal ends retouch (8.97%) and distal end retouch (7.26%). There are different types of retouches irregular type of retouch dominating (n=461, 52.15%) followed by nibbling (n=180, 20.36%), regular (n=177, 20.02%), scalar (n=55, 6.22%) and there are 9 finished tools with unclear retouch (Table 4.29).

Table 4.29: Types of retouch on the finished tools

Type of retouch	In number	In percentage
abrupt	2	0.23%
irregular	461	52.15%
NI	9	1.02%
nibbling	180	20.36%
regular	177	20.02%
scalar	55	6.22%
Total	**884**	**100.00%**

4.9.8. Flake termination

Most of the finished tools have different types of termination (Fig. 4.5), among these feathered terminations (n=392, 43.41%) dominating, others have hinged (n=244, 27.02%), Unclear termination (n=142, 15.7%) due to broken distal ends and some non-identifiable terminations, plunging termination (n=91, 10.07%), step (n=15, 1.66%), retouched (n=12, 1.32%) and siret termination (n=3, 0.33%) (Table 4.30)

Table 4.30: Types of flake termination of the lithic assemblage

Flake termination	In numbers	In percentage
feathered	392	43.41%
hinged	244	27.02%
NI	142	15.7%
outrepass	4	0.44%
plunging	91	10.07%
retouched	12	1.32%
sirete	3	0.33%
step	15	1.66%
Grand Total	**903**	**100%**

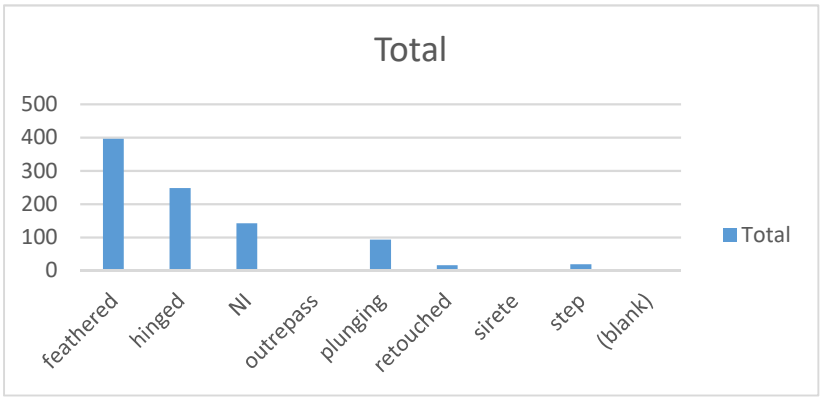


Figure 4.5: Various types of flake terminations on the finished tools

4.9.9. Mean dimensions of finished tools

Mean dimensions of all the collected artefacts are measured. The average length, breadth and thickness of the artefacts ranges from 28.70 x 22.25 x 9.98 (Table. 4.31), the maximum length, breadth and thickness of the artefacts is 125.1 x 97.89 x 66.51, the minimum length, breadth and thickness of the artefacts is 3.81 x 2.28 x 1.66 (Table. 4.31)

Table 4.31: Mean dimensions of the finished tools

Mean Dimensions of Finished Tools				
	Mean	**Maximum**	**Minimum**	**Standard Deviation**
Length	28.70	125.1	3.81	11.94
Breadth	22.25	97.89	2.28	10.21
Thickness	9.98	66.51	1.66	5.36

4.10. Debitage/Waste products

Debitage or waste products are the byproducts of the finished tools, waste products form the second largest portion in the collected assemblage (n=536, 33.44%). These include cortical, non cortical and flakes less than 2 cm. Flakes < 2cm (n=281, 52.42%) is the largest among these others cortical flakes (n=144, 26.86%), non cortical flakes (n=107, 19.96%), blade debitage (n=3, 0.55%) and core debitage (n=1, 0.55%) (Table 4.32)

Table 4.32: Debitage in the collected lithic assemblage

Debitage/waste products	**Number of artefacts**	**In percentage**
blade debitage	3	0.55%
core debitage	1	0.18%
cortical flake	144	26.86%

flake < 2cm	281	52.42%
non-cortical flake	107	19.96%
Total	536	100%

Most of the waste products are made on chert (n=392, 73.13%) and other raw materials such as cherty quartzite (n=60, 11.19%), chalcedony (n=53, 9.88%), agate (n=23, 4.29%), quartz (n=2, 0.37%) and 6 artefacts with unclear raw material (Table 4.33). Most of the artefacts are complete in state (n=485, 90.49%) and few are broken (n=51, 9.51%) (Table 4.34)

Table 4.33: Debitage on various raw materials

Raw material	**Blade debitage**	**Core debitage**	**Cortical flake**	**Flake < 2cm**	**Non cortical flake**	**Total in numbers**	**Total in percentage**
agate	1		2	18	2	23	4.29%
chalcedony		1	17	32	3	53	9.88%
chert	2		111	200	79	392	73.13 %
cherty quartzite			12	26	22	60	11.19 %
NI			1	4	1	6	1.11%
quartz			1	1		2	0.37%
Total	3	1	144	281	107	536	100%

Table 4.34: Physical state of the debitage

	Debitage	
Physical state	**In numbers**	**In percentage**
broken	51	9.51%
complete	485	90.49%
Total	**536**	**100.00%**

4.10.1. Cortex on the debitage

Cortex is present on most of the debitage (n= 145, 27.05%) and cortex is absent (n=109, 20.34%) on few of them (Table 4.35) And most of them are having > 25% cortex on them (Table 4.36). These are mostly flaked on the flake blank types (n=516, 96.45%) majority of them are flakes less than 2cm. (Table 4.37)

Table 4.35: Cortex on the debitage

Cortex	**Debitage**	
Row Labels	**In numbers**	**In percentage**
absent	109	20.34%
NI	1	0.19%
present	145	27.05%
(blank)	281	52.43%
Grand Total	**536**	**100.00%**

Table 4.36: Cortex coverage on the debitage

Cortex coverage (%)	Debitage in numbers
0	87
100	14
0-25	81
25-50	21
50-75	11
75-100	18
NI	
(blank)	304
Total	**536**

Table 4.37: Blank types for the debitage

	Debitage	
Blank type	**In numbers**	**In percentage**
blade	6	1.11%
chunk		
flake	517	96.45%
NI		
nodule	13	2.42%
Total	**536**	**100%**

4.10.2. Striking platforms on the debitage

Striking platforms are present on 243 (45.33%) waste products, most being plain (n= 155, 63.78%), followed by punctiform (n=22, 9.05%), faceted (n=36, 14.81%) and cortical (n=13, 5.34%) and platforms broken and absent on the waste products (n=3, 1.23% and n=12, 4.93%) (Table 4.38) Bulb is present on the 75 (30.86%) of the waste products and 155 (65.4%) of them are having diffused bulbs (Table 4.39)

Table 4.38: Types of striking platforms on the debitage

Platform type	In numbers	In percentage
absent	12	4.93%
broken	3	1.23%
cortical	13	5.34%
faceted	36	14.81%
NI	2	.82%
plain	155	63.78%
punctiform	22	9.05%
Total	**243**	**100%**

Table 4.39: Types of the bulb on the debitage

Bulb	In numbers	In percentage
absent	12	5.6%
diffused	155	65.4%
present	65	26.74%
prominent	5	2.10%
Grand Total	**237**	**100%**

4.10.3. Position of breakage on the debitage

There are 46 waste products that were broken at different locations, most of them are broken at the distal end (n=32, 69.56%) others with proximal end broken (n=8, 17.39%) and both ends broken (n=2, 4.34%) (Table 4.0). They are patinated with 20%. (Table 4.41)

Table 4.40: Position of breakage on the debitage

Position of breakage	In numbers	In percentage
both proximal and distal ends broken	2	4.34%
distal end broken	32	69.56%
lateral side broken	1	2.17%
NI	3	6.52%
proximal end broken	8	17.39%
Total	**46**	**100%**

Table 4.41: Patination on the debitage

Patination	In numbers	In percentage
no	204	80%
yes	51	20%
Grand Total	**255**	**100%**

4.11. Discussion

Flake and blade tools dominate the late/upper palaeolithic assemblage. The collected assemblage consists of a large number of finished tools and debitage. Scrapers of various kinds, bladelets, notches and burins dominate finished tools. The waste products are dominated by flakes < 2cm and cortical flakes. The cores include flake and prepared cores. Artefacts were mostly made on chert and other siliceous raw materials. This indicates that the people of this region preferred chert. At Nandikandi, Jagannathapur and Shelgara Gattu chert boulders and exposed and weathered cherty quartzite outcrops were observed. Cores and waste products are also mostly made on chert and cherty quartzite raw materials.

Quartz is noticed at Rudrar in the form of tablets and small nodules. Chert is derived from the intertrappeans of the Deccan traps and is available in all the sites in the form of boulders and cobbles. The assemblage is dominated by various types of scrapers, bladelets, notches, and borers. The waste products are largely composed of flakes < 2cms this indicates the microscopic nature of the finished tools. The number of waste products shows that many of them are factory sites. Both flake and blade cores were observed at various sites. Elongated fluted blade cores dominated among blade cores.

Finished tools on flake blanks are more than the blade blanks, it is also observed that the scrapers especially side scrapers dominate among these. These scrapers were observed both on flake and blade blanks. Other finished tools such as notches, borers, burins and backed bladelets are also present in the assemblage.

Inter and intrasite variability of artefacts identified. Each site has different proportions of artefacts few has more number of finished tools and a few with more waste products. Abbenda, Nandikandi, Chaptakhadeem, Jagannathapura and Kodcherla sites are having more finished tools than others, whereas Chalki, Dosapalle, Mitta Nayak Thanda, Rudra, Saloora and Shelgara Gattu sites have more waste products than others.

1.

2.

Plate 4.1: Scrapers from the site of Nandikandi in the above plate 1. Dorsal view and 2. Ventral view

1.

2.

1.

2.

Plate 4.2: Side and end scrapers from the Nandikandi site 1. Dorsal view and 2. Ventral view

1.

2.

Plate 4.3: Side and end scrapers from the site of Jagannathapur, 1. Dorsal view and 2. Ventral view

1.

2.

Plate 4.4: Scrapers form the Chaptakhadeem site, 1. Dorsal view and 2. Ventral view

1.

2.

Plate 4.5: Side and end scrapers and a burin from the Shelgara Gattu site, 1. Dorsal view and 2. Ventral view

1.

2.

Plate 4.6: Side scrapers form the site of Allapur, 1. Dorsal view and 2. Ventral view

1.

2.

Plate 4.7: Side scrapers from the Fasalwadi site, 1. Dorsal view and 2. Ventral view artefacts were rolled in state

1.

2.

Plate 4.8: Side scrapers from the Gongulur site, 1. Dorsal view and 2. Ventral

1.

2.

Plate 4.9: Side scrapers from the site Aroor, 1. Dorsal view and 2. Ventral

1.

2.

Plate 4.10: Side and end scrapers from Shelgara Gattu site, 1. Dorsal view and 2. Ventral

1a

1b

2a

2b

Plate 4.11: Side scraper (1) and side and end scraper (2) from Nandikandi site, a. Dorsal view, b. Ventral view

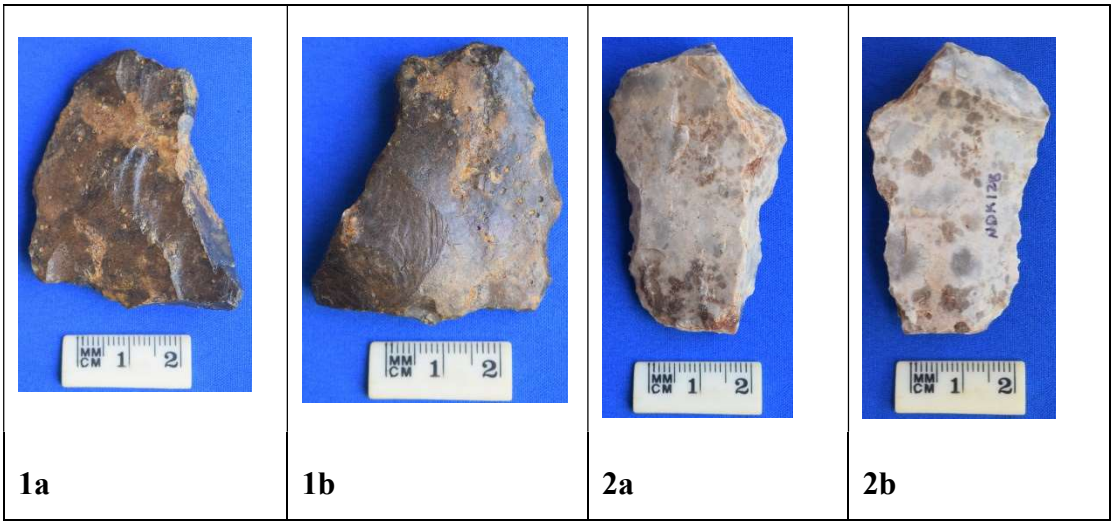


Plate 4.12: Side scrapers from Nandikandi site, a. Dorsal view, b. Ventral view

Plate 4.13: 1. Side scraper from Fasalwadi site rolled in state, 2. Unretouched flake from Chatakhadem, a. Dorsal view, b. Ventral view

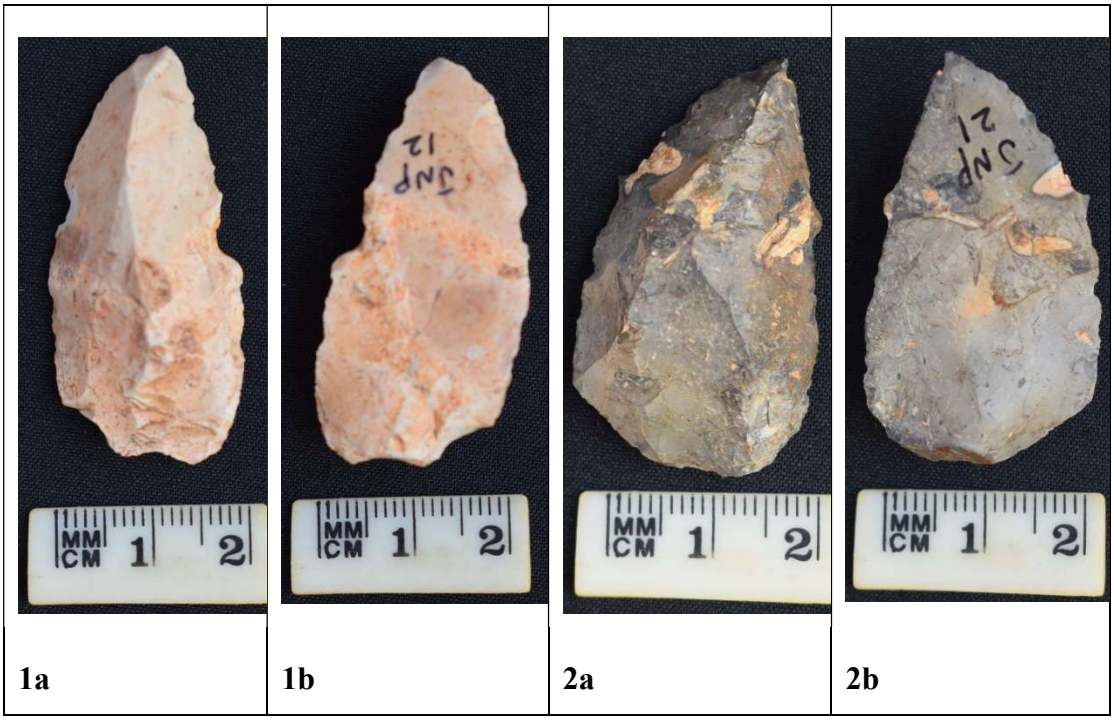


Plate 4.14: Points from Jagannathapur, a. Dorsal view, b. Ventral view

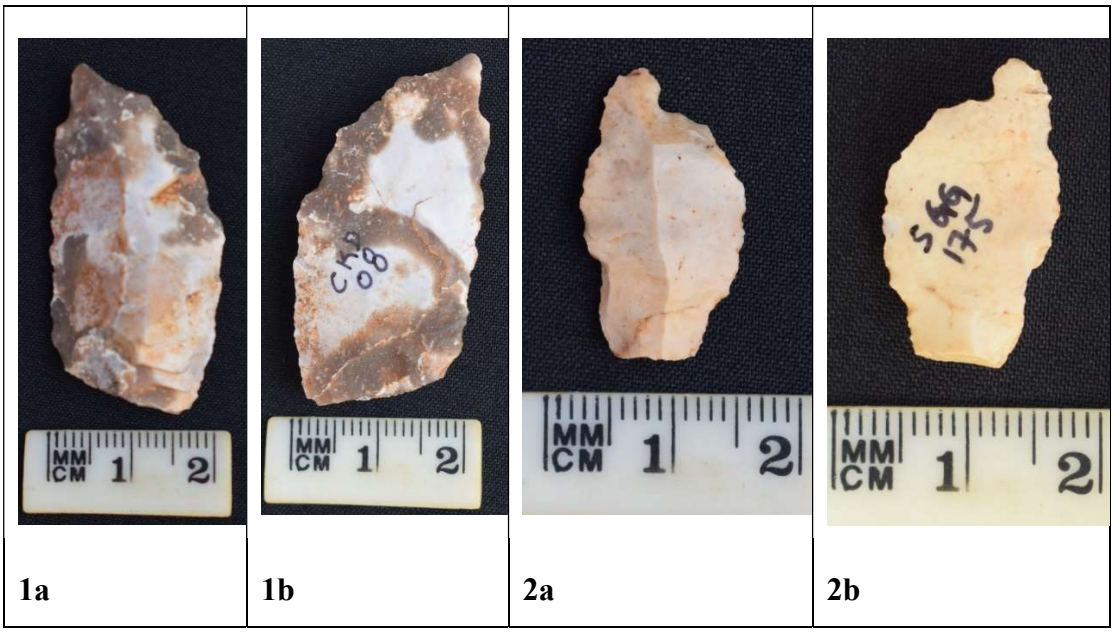


Plate 4.15: Borers from 1. Chaptakhadem and 2. Shegara Gattu site, a. dorsal view, b. ventral view

Plate 4.16: Flake core from the site Jagannathapur

Plate 4.17: Flake cores of Upper Palaeolithic Cultures

Chapter 5

The Mesolithic Assemblage

5.1. Introduction

Mesolithic assemblage were collected from seven sites, located in different locations in the study area (Chapter-2). Among these Budera, Gonguluru, Koduru Thanda and Wasar are located on the slopes and small hills of the Deccan traps, whereas Hangarga, Kaldurki and Mandarna were found on the banks and riverbed of the Manjira River. The stratigraphic and geomorphic context of these sites has been discussed in Chapter-3.

The Lithic Assemblages

The Mesolithic assemblage (n=212) consists of cores (n=10, 4.72%), finished tools (n=103, 48.58%), debitage/ waste products (n=84, 39.62%) and natural rocks (n=15, 7.07%) collected form these seven Mesolithic sites (Table 5.1). Intra and inter site lithic variability observed among these collected assemblage (Table 5.1) and the same is discussed in this chapter.

Table 5.1: Site wise distribution of collected lithic assemblage

	Lithic assemblage									
Site name	**Cores**		**Debitage**		**Finished tools**		**Nature facts**		**Total**	
Budera	1	10.00%	2	2.38%	2	1.94%		0.00%	5	2.36%
Gonguluru	2	20.00%	23	27.38%	4	3.88%		0.00%	29	13.68%
Hangarga		0.00%	4	4.76%	24	23.30%	1	6.67%	29	13.68%
Kaldurki	2	20.00%	15	17.86%	24	23.30%		0.00%	41	19.34%
Koduru Thanda	2	20.00%	13	15.48%	35	33.98%		0.00%	50	23.58%
Mandarna		0.00%	3	3.57%	6	5.83%		0.00%	9	4.25%
Wasar	3	30.00%	24	28.57%	8	7.77%	14	93.33%	49	23.11%
Total	**10**	**100.00%**	**84**	**100.00%**	**103**	**100.00%**	**15**	**100.00%**	**212**	**100.00%**

Table 5.2: Artefacts from the collected lithic assemblage

Lithic assemblage	In numbers	In percentage
core	10	4.72%
debitage	84	39.62%
finished tool	103	48.58%
natural	15	7.08%
Total	**212**	**100.00%**

The lithic assemblage consists cores of flake (1.52%) and blade cores (3.05%), debitage/waste procucts chiefly consists of flakes < 2cm (n=52, 26.4%), cortical flakes (n=15, 7.61%) and non cortical flakes (n=12, 6.09%), and finished tools dominates by retouched bladelets (n=55, 27.92%) others side scrapers (n=15, 7.61%), unretouched bladelets (n=14, 7.11%) backed bladelets (n=4, 2.03%) and bladelets (n=2, 1.02%) (Table 5.3) (Fig. 5.1)

Table 5.3: Finished tools in the collected assemblage

Finished tools	In numbers	In percentage
backed bladelet	4	2.03%
blade core	6	3.05%
blade debitage	4	2.03%
bladelet	2	1.02%
burin	1	0.51%
convex scraper	2	1.02%
core debitage	2	1.02%
cortical flake	15	7.61%

double side scraper	1	0.51%
end scraper	1	0.51%
flake < 2cm	52	26.40%
flake core	3	1.52%
non cortical flake	12	6.09%
notch	1	0.51%
retouched bladelet	55	27.92%
retouched flake	7	3.55%
side scraper	15	7.61%
unretouched bladelet	14	7.11%
Total	**197**	**100.00%**

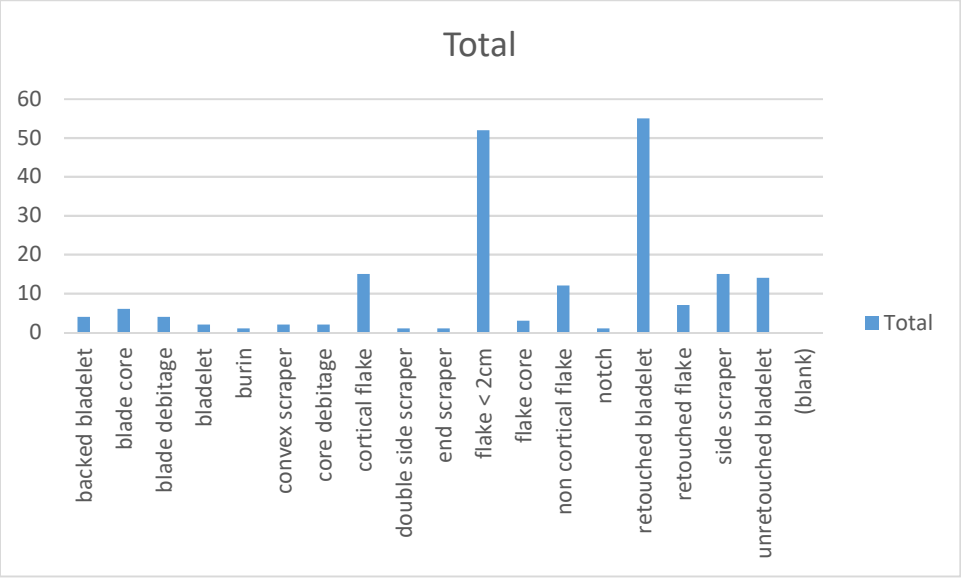


Figure 5.1: Different types of finished tools from the Mesolithic sites of the study area

5.2. Raw Material

Artefacts were flaked on different types of raw materials (Fig. 5.2). Chert is predominantly used raw material (n=120, 61%), others Chalcedony (n=47, 23.85%), Agate (n=16, 8.12%), Quartz (n=8, 4.06%) and Cherty quartzite (n=6, 3.04%) (Table 5.4). The source of siliceous raw material found at the sites located in the Deccan trap region is the Intratrappean exposures and occur in the form of cobbles, pebbles, nodules and tablets. The exploitation of raw material varies from site to site. Notably, a huge number of cores, finished tools and debitage are flaked on chert.

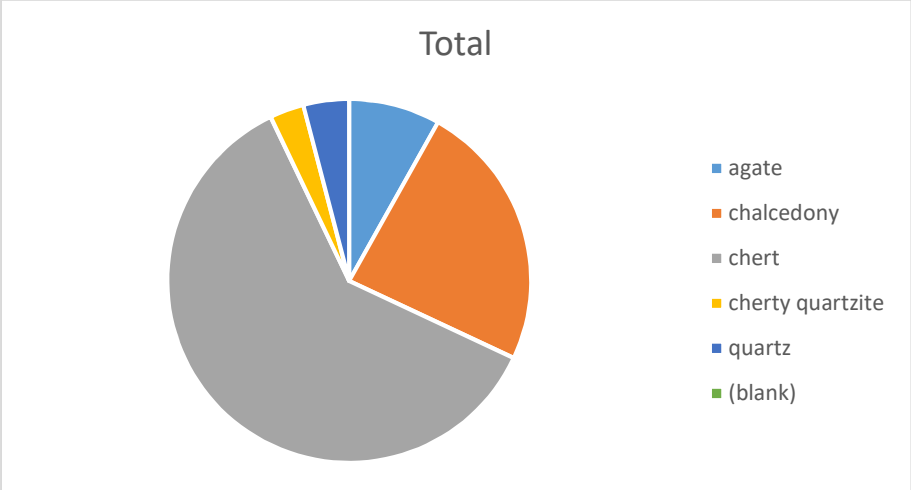


Figure 5.2: Different types of raw materials used for making the microliths

Table 5.4: Different types of raw materials used for flaking the artefacts

	Raw material											
Finished tools	**agate**		**chalcedony**		**chert**		**cherty quartzite**		**quartz**		**Total**	
cores			4	8.51%	5	4.17%	1	16.17%			10	5.08%
debitage	7	43.75%	26	55.32%	47	39.17%	3	50%	1	12.5%	84	42.64%
finished tools	9	56.25%	17	36.17%	68	56.67%	2	3.33%	7	87.5%	103	52.28%
Total	**16**	**100%**	**47**	**100%**	**120**	**100%**	**6**	**100%**	**8**	**100%**	**197**	**100%**

Raw material variability in relation to artefact types

Different types of raw materials were used at the different sites for different types of artefacts. Cores is mostly made on chert (n=5), chalcedony (n=4) and cherty quartzite (n=1). Finished tools are dominated by the use of chert (n=120), retouched bladelets (n=33), unretouched bladelets (n=12), and side scrapers (n=10) were made on chert. On chalcedony (n=7) retouched bladelets (n=10), retouched flakes (n=3), side scraper (n=2) and unretouched flakes (n=2) were flaked on chalcedony. 7 retouched bladelets and one convex scraper made on agate. 4 retouched bladelets and one unretouched bladelet flaked on quartz. One cherty quartzitic retouched bladelet was observed (Table 5.5)

Table 5.5: Finished tools on various raw materials

	Raw material					
Finished tools	**agate**	**chalcedony**	**chert**	**cherty quartzite**	**quartz**	**Total**
backed bladelet			4			4
blade core		2	3	1		6
blade debitage		3	1			4
bladelet					2	2
burin			1			1
convex scraper	1		1			2
core debitage		2				2
cortical flake	1	3	10		1	15
double side scraper			1			1
end scraper			1			1
flake < 2cm	3	18	29	2		52
flake core		1	2			3

non cortical flake	3	1	7	1		12
notch			1			1
retouched bladelet	7	10	33	1	4	55
retouched flake		3	4			7
side scraper	1	2	10	1	1	15
unretouched bladelet		2	12			14
Total	**16**	**47**	**120**	**6**	**8**	**197**

5.3. Blanks

Artefacts are mostly made on flakes (n=98) and blades (n=88), 9 cores both blade and flake cores made on the nodules. In the case of finished tools, 79 were made on blade blanks most of them are retouched and unretouched bladelets and 24 were made on flakes. Waste products were mostly made on flake nodules (n=73) of which most of them are < 2cm in size (Table 5.6). Most of the blade cores are microlithic blade cores.

Table 5.6: Artefacts on various blank types

	blades		**flakes**		**nodules**		**Total**	
Lithic assemblage	**In number**	**In percentage**	**In number**	**In percentage**	**In number**	**In percentage**	**In number**	**In percentage**
cores		0.00%	1	1.02%	9	90.00%	10	5.10%
debitage	9	10.23%	73	74.49%	1	10.00%	83	42.35%
finished tools	79	89.77%	24	24.49%		0.00%	103	52.55%
Total	**88**	**100.00%**	**98**	**100.00%**	**10**	**100.00%**	**196**	**100.00%**

5.4. Physical state

Most of the artefacts are complete (n=163) in the state among them debitage (n=79) and finished tools (n=75) (Table 5.7) occupies the largest (Fig 5.3), whereas 33were broken, most finished tools were broken (n=28) (Table. 5.8) at the distal end (n=13) and the proximal end (n=12) (Table 5.9)

Table 5.7: Physical state of the artefacts

	Physical state					
Lithic assemblage	**broken**		**complete**		**Total in Numbers**	**Total in percentage**
core	1	3.03%	9	5.52%	10	5.10%
debitage	4	12.12%	79	48.47%	83	42.35%
finished tool	28	84.85%	75	46.01%	103	52.55%
Total	**33**	**100.00%**	**163**	**100.00%**	**196**	**100.00%**

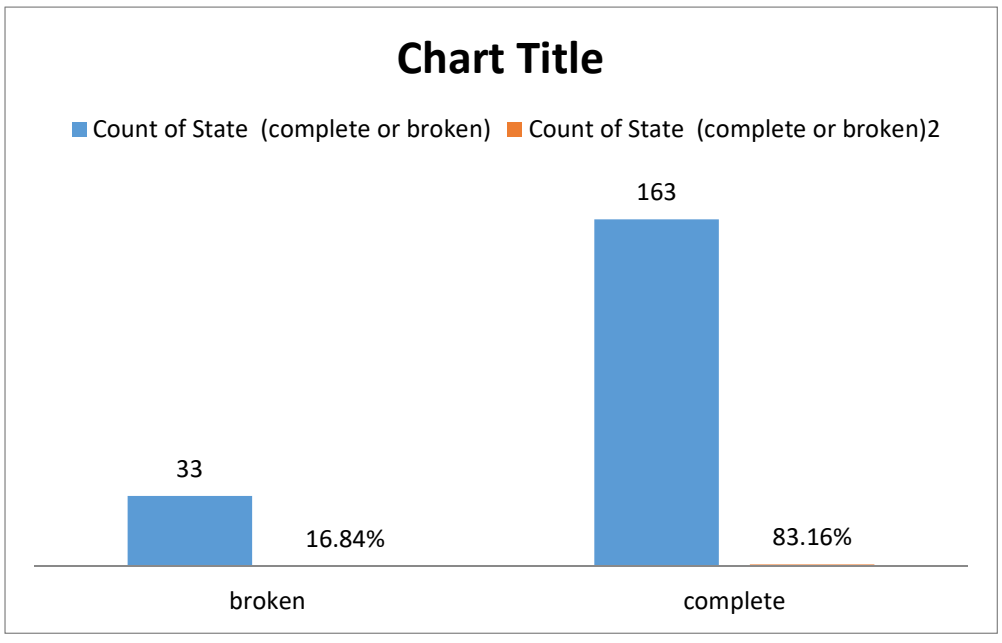


Figure 5.3: Physical state of the artefacts

Table 5.8: Edge damage of the artefacts

	Edge damage		
Lithic assemblage	**no**	**yes**	**Total**
cores	3		3
debitage	26	4	30
finished tools	72	28	100
Total	**101**	**32**	**133**

Table 5.9: Position of breakage on the artefacts

Position of breakage	**In numbers**	**In percentage**
both proximal and distal ends broken	4	12.50%
distal end broken	13	40.63%
proximal and mesial end broken	2	6.25%
proximal end broken	12	37.50%
retouched	1	3.13%
Total	**32**	**100.00%**

5.5. State of preservation

Most of the artefacts are fresh (n=64, 44%) and are non-patinated (n=125), others are weathered (n=42, 29%) and rolled (n=39, 27%) (Table 5.10). 25 artefacts are patinated on them (Table 5.11)

Table 5.10: State of preservation of the artefacts

State of preservation	In numbers	In percentage
fresh	64	44.14%
rolled	39	26.90%
weathered	42	28.97%
Total	**145**	**100.00%**

Table 5.11: Patination of the artefacts

Patination	In numbers	In percentage
no	120	82.76%
yes	25	17.24%
Total	**145**	**100.00%**

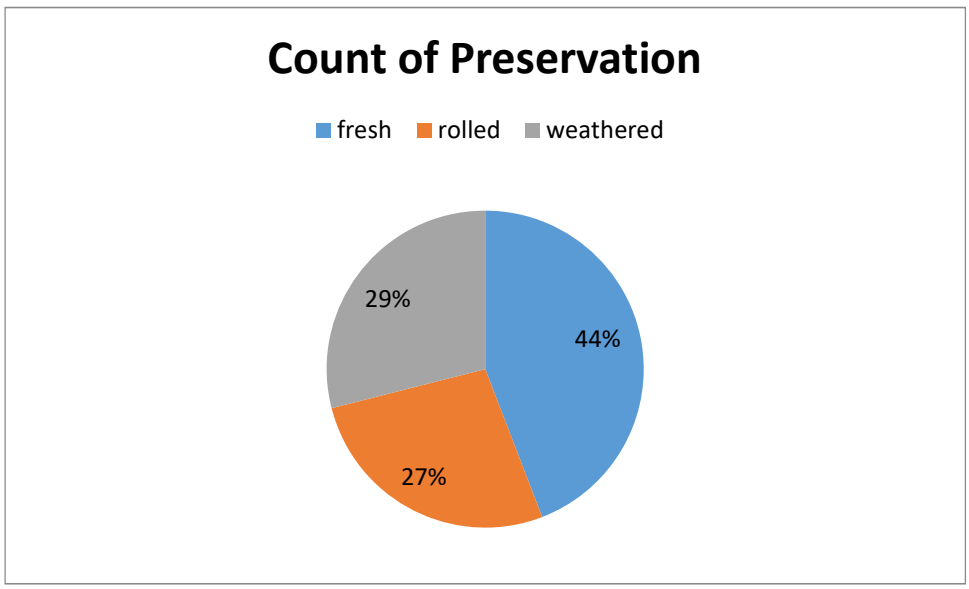


Figure 5.4: Preservation of the artefacts

5.6. Cores

A total of 9 cores one core debitage were collected from five sites (Table 5.12). These include six microlithic blade cores three flake cores and one core debitage (Table 5.13). The cores are made on chert (n=5) and chalcedony (n=4) (Table 5.13). These cores are made on nodule (n=6) and flake (n=3) blanks. Site wise at Wasar maximum number of cores collected (n=3), others from Koduru Thanda (n=2), Kaldurki (n=2), Budera (n=1) and Gonguluru (n=1) (Table 5.14)

Table 5.12: Cores from the collected lithic assemblage

Cores	Count in numbers
blade core	6
core debitage	1
flake core	3
Total	10

Table 5.13: Cores on various blank types

Cores on blanks	Count of Type of Core in numbers
blade cores	**6**
flake	1
nodule	5
flake cores	**3**
nodule	3

Table 5.14: Site-wise exploitation of raw materials

	Site names					
Raw material	**Budera**	**Gonguluru**	**Kaldurki**	**Koduru Thanda**	**Wasar**	**Total**
chalcedony			1	1	2	4
chert	1	1	1	1	1	5
cherty quartzite		1				1
Total	**1**	**2**	**2**	**2**	**3**	**10**

Table 5.15: Cores on the various raw materials

	Raw material			
Cores	**chalcedony**	**chert**	**cherty quartzite**	**Total**
blade core	2	3	1	6
flake core	1	2		3
Total	**3**	**5**	**1**	**9**

5.6.1. Types of Cores

Flake cores

There are three flake cores collected from Gonguluru (n=1), Koduru Thanda (n=1) and Wasar. (n=1) (Table 5.16), among these two cores are made on chert and one on chalcedony. All these cores were made on nodule type of blanks. These cores have the cortex ranging from 25%-75% on the nodules. These cores are having flake scars from 1-3 and the flake scars dimensions are ranging from 16.93 to 11.1mm in length and 9.93 to 6.73mm in breadth (Table 5.17) Organization of striking platform in flake cores consists 90° core (n=1) and unidirectional core (n=2) (Table. 5.16)

Table 5.16: Cores from the various sites

	Site names					
Cores	**Budera**	**Gonguluru**	**Kaldurki**	**Koduru Thanda**	**Wasar**	**Total**
blade core	1	1	2	1	1	6
flake core		1		1	1	3
Total	**1**	**2**	**2**	**2**	**2**	**9**

Table 5.17: Flake scars and their average dimensions

Flake scar	**Average dimensions**
Flake scar 1	16.93 x 9.93mm
Flake scar 2	15.02 x 8.04mm
Flake scar 3	11.1 x 6.73mm

Microlithic blade cores

A total of 6 microlithic blade cores collected from Budera (n=1), Gonduluru (n=1), Kaldurki (n=2), Koduru thanda (n=1) and Wasar (n=1). These cores are made on nodules (n=5) and a flake. Chert is dominating raw material (n=3) and others are chalcedony (n=2) and quartz (n=1). 3 blade cores are having the cortex >25% (Table 5.20). The cores are having blade scars ranging from 1- 4 scars maximum are having with 3 blade scars (n=2) and the blade dimensions are ranging from 29.9 to 12.6mm in length to 11.28 to 4.7mm in breadth (Table 5.18). Cores having oppositite striking platform (n=1) and unidirectional platforms (n=5) (Table 5.22)

Table 5.18: Blade scars and their average dimensions

Blade scar	Average dimensions
Blade scar 1	19.3 x 6.3mm
Blade scar 2	24.1 x 7mm
Blade scar 3	12.6 x 4.7mm
Blade scar 4	29.9 x 11.28mm

Table 5.19: Cortex on the cores

Cortex on cores	absent	present	Total
blade core	3	3	6
flake core		3	3
Total	**3**	**6**	**9**

Table 5.20: Cortex coverage on the cores

	Cortex coverage %						
Cores	**0**	**100**	**0-25**	**25-50**	**50-75**	**75-100**	**Total**
blade core	3			1	1	1	6
flake core			1	1	1		3
Total	**3**		**1**	**2**	**2**	**1**	**9**

Table 5.21: Blade/flake scars on the cores

	Blade/flake scars				
Cores	**1**	**2**	**3**	**4**	**Total**
blade core	1	3	1	1	6
flake core	1	1	1		3
Total	**2**	**4**	**2**	**1**	**9**

Table 5.22: Orientation of striking platforms on the cores

Cores	**90 degrees**	**opposite**	**unidirectional**	**Total**
blade core		1	5	6
flake core	1		2	3
Total	**1**	**1**	**7**	**9**

5.7. Finished tools

A total of 103 finished tools were collected from all the seven Mesolithic sites. From Koduru Thanda high number of finished tools (n=35) collected, others are form Hangarga (n=24) and Kaldurki (n=24) (Table 5.23) The assemblage is dominated by retouched bladelets (n=55, 53.4%), others side scrapers (n=15, 14.5%), unretouched bladelets (n=14, 13.6%), retouched flakes (n=7, 6.8%), backed bladelets (n=4, 3.88%) (Table 5.24).These tools are dominated by non-geometric microliths.

Table 5.23: Site-wise distribution of finished tools

	Site name							
Finished tools	**Budera**	**Gongluru**	**Hangarga**	**Kaldurki**	**Koduru Thanda**	**Mandarna**	**Wasar**	**Grand Total**
backed bladelet			3		1			4
bladelet					2			2
burin				1				1
convex scraper				2				2
double side scraper							1	1
end scraper							1	1
notch						1		1
retouched bladelet			6	15	26	4	4	55
retouched flake	2		2		3			7
side scraper		4		5	3	1	2	15
unretouched bladelet			13	1				14
Total	**2**	**4**	**24**	**24**	**35**	**6**	**8**	**103**

Table 5.24: Finished tools from the collected lithic assemblage

Finished tools	In numbers	In percentage
backed bladelet	4	3.88%
bladelet	2	1.94%
burin	1	.97%
convex scraper	2	1.94%
double side scraper	1	.97%
end scraper	1	.97%
notch	1	.97%
retouched bladelet	55	53.4%
retouched flake	7	6.8%
side scraper	15	14.5%
unretouched bladelet	14	13.6%
Total	**103**	**100%**

5.7.1 Raw material

It is observed that most of the finished tools were made on chert (n=68, 66.01%). The other raw materials are chalcedony (n=17, 16.5%), agate (n=9, 8.73%), quartz (n=7, 6.8%) and cherty quartzite (n=2, 1.94%) (Table 5.25).

Table 5.25: Finished tools on various raw materials

	Raw material					
Finished tools	**agate**	**chalcedony**	**chert**	**cherty quartzite**	**quartz**	**Total**
backed bladelet			4			4
bladelet					2	2
burin			1			1
convex scraper	1		1			2
double side scraper			1			1
end scraper			1			1
notch			1			1
retouched bladelet	7	10	33	1	4	55
retouched flake		3	4			7
side scraper	1	2	10	1	1	15
unretouched bladelet		2	12			14
Total in numbers	**9**	**17**	**68**	**2**	**7**	**103**
In Percentage	**8.73%**	**16.5%**	**66.01%**	**1.94%**	**6.8%**	**100%**

5.7.2. Blank types

Blades are the blanks for most of the tools (n=79, 76.7%), most of the retouched bladelets (n=52), unretouched bladelets (n=14), backed bladelets (n=4) and bladelets (n=2) were made on the blade blanks. Tools on the flakes (n=24, 23.3%) occupy the second-largest blank types. Side scrapers (n=13), retouched flakes (n=6), side and end scrapers were made on the flake cores (Table 5.26)

Table 5.26: Finished tools on various blank types

Finished tools	Blades	Flakes	Total
backed bladelet	4		4
bladelet	2		2
burin	1		1
convex scraper	2		2
double side scraper		1	1
end scraper		1	1
notch	1		1
retouched bladelet	52	3	55
retouched flake	1	6	7
side scraper	2	13	15
unretouched bladelet	14		14
Total in numbers	**79**	**24**	**103**
In percentage	**76.7%**	**23.3%**	**100%**

5.7.3. Physical state

The assemblage consists of both complete (n=75, 72.82%) and broken (n=28, 27.18%)finished tools. Most of the finished tools are complete in state, whereas retouched bladelets (n=17) and unretouched bladelets (n=8), retouched flakes 9n=2) and convex scraper (n=1) is broken at the distal end. (Table 5.27), Koduru Thanda (n=11) and Hnagarga (n=10) have more number of broken finished tools.

Table 5.27: Physical state of the finished tools

Finished tools	Broken	Complete	Total
backed bladelet		4	4
bladelet		2	2
burin		1	1
convex scraper	1	1	2
double side scraper		1	1
end scraper		1	1
notch		1	1
retouched bladelet	17	38	55
retouched flake		7	7
side scraper	2	13	15
unretouched bladelet	8	6	14
Total in numbers	**28**	**75**	**103**
In percntage	**27.18%**	**72.82%**	**100%**

5.7.4. Cortex

Cortex is present on most of the finished tools (n=25, 24.28%) (Table 5.28), non-cortical tools (n=77, 74.7%) and one unclear finished tool observed among the collected finished tools (Table 5.28). The assemblage is dominated by non-cortical tools. The cortex ranges from 0-25% to 75-100%, most of the tools are having cortex ranges between 0-25% (n=21, 20.38%) others are having cortex >25% (Table 5.29) and one tool is having unclear cortex due to abrasion and patination on it.

Table 5.28: Cortex on the finished tools

Finished tools	absent	NI	present	Total
backed bladelet	4			4
bladelet	2			2
burin	1			1
convex scraper	1		1	2
double side scraper			1	1
end scraper	1			1
notch	1			1
retouched bladelet	48		7	55
retouched flake	3		4	7
side scraper	6	1	8	15
unretouched bladelet	10		4	14
Total in numbers	**77**	**1**	**25**	**103**
In percentage	**74.7%**	**.97%**	**24.28%**	**100%**

Table 5.29: Cortex coverage on the finished tools

Row Labels	Unclear	0	100	0-25	25-50	50-75	75-100	Total
backed bladelet		4						4
bladelet		2						2
burin		1						1
convex scraper		1		1				2
double side scraper						1		1

end scraper		1						1
notch		1						1
retouched bladelet		48		7				55
retouched flake		2		3		2		7
side scraper	1	6		6	1		1	15
unretouched bladelet		10		4				14
Total in numbers	**1**	**76**	**None**	**21**	**1**	**3**	**1**	**103**
In percentage	**.97%**	**73.78%**		**20.38**	**.97%**	**2.91%**	**.97%**	**100%**

5.7.5. Striking platform

Various types of platforms on various finished tools were identified. The different kinds of platforms include broken, faceted, plain and punctiform types (Fig. 5.5). Most of the flake tools have plain platforms (n=41, 39.8%), others punctiform (n=33, 32.03%), faceted (n=11, 10.67%) and broken (n=2, 1.94%) (Table 5.30). There are 16 finished tools on which the platform is absent due to the breakage in the proximal end. The mean dimensions of the striking platforms are measured, these include mean of the striking platforms (8.98 x 4.7), maximum of the striking platforms (30.26 x 21.74), minimum of the striking platforms (3.42 x 1.25) and standard deviation (4.96 x 3.44) (Table 5.31)

Table 5.30: Striking platform types on the finished tools

	Striking platform type					
Finished tools	**absent**	**broken**	**faceted**	**plain**	**punctiform**	**Total**
backed bladelet			1	2	1	4
bladelet				2		2
burin		1				1

convex scraper			1		1	2
double side scraper			1			1
end scraper				1		1
notch					1	1
retouched bladelet	12	1	2	19	21	55
retouched flake			2	3	2	7
side scraper	1		1	9	4	15
unretouched bladelet	3		3	5	3	14
Total in numbers	**16**	**2**	**11**	**41**	**33**	**103**
In percentage	**15.53%**	**1.94%**	**10.67%**	**39.8%**	**32.03%**	**100%**

Table 5.31: Striking platform dimensions of finished tools

Length and Breadth of Finished tools	**Mean Dimensions of Striking Platform**			
	Mean	**Maximum**	**Minimum**	**Standard Deviation**
Length	8.98mm	30.26mm	3.42mm	4.96
Breadth	4.7mm	21.74mm	1.25mm	3.44

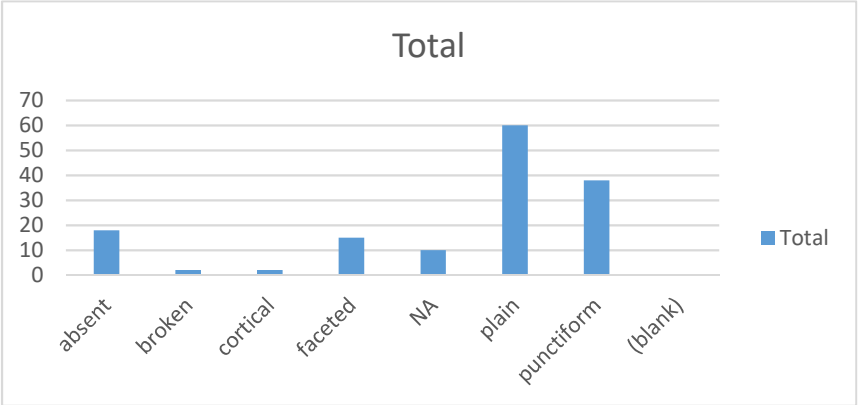


Figure 5.5: Different types of the striking platforms found on the artefacts

5.7.6. Bulb

The bulb is present on the finished tools (n=88) and absent on a few (n=15). Most of the finished tools have diffused bulbs (n=49, 47.57%), 4 tools have the prominent bulb and 10 with broken bulbs. Errailure is present on 14 finished tools and only two of them have lips on them.

Table 5.32: The bulb on the finished tools

Finished tools	absent	diffused	present	prominent	broken	Total
backed bladelet	2	2				4
bladelt		2				2
burin	1					1
convex scraper		1		1		2
double side scraper			1			1
end scraper			1			1
notch		1				1
retouched bladelet	8	27	9	2	9	55
retouched flake		2	5			7
side scraper	2	9	4			15
unretouched bladelet	2	5	6		1	1
(blank)						
Total in numbers	**15**	**49**	**35**	**4**	**10**	**103**
In percentage	**14.56%**	**47.57%**	**33.9%**	**3.88%**	**9.7%**	**100%**

5.7.7 Retouch

Retouch is observed on different positions of the artefacts with different types of retouch, these include nibbling (n=60, 68.18%), irregular (n=21, 23.86%), regular (n=6, 6.81%) and scalar (n=1, 1.13%) types. Most of the tools retouched on both right and left sides (n= 31, 35.22%), others are at left side (n=30, 34.09%), and at right side (n=22, 25%). There are 4 finished tools that were retouched on distal, left and distal, left proximal and right and distal ends (Table 5.33).

Table 5.33: Location and various types of retouch on the finished tools

Location of retouch	irregular	nibbling	regular	scalar	Total in numbers	In percentage
distal			1		1	1.13%
left	10	19	1		30	34.09%
left and distal	1				1	1.13%
left proximal	1				1	1.13%
NI		1			1	1.13%
right	6	14	2		22	25%
right and distal	1				1	1.13%
right and left	2	26	2	1	31	35.22%
Total in numbers	**21**	**60**	**6**	**1**	**88**	**100%**
In percentage	**23.86%**	**68.18%**	**6.81%**	**1.13%**	**100%**	

5.7.8. Flake termination

Different types of flake terminations were observed in the assemblage, among the feathered terminations (n=53, 51.45%) dominates, others have plunging (n=17, 16.5%), hinged (n=15, 14.56%) and step termination (n=5, 4.85%) (Fig. 5.6). There are 13 finished tools with unclear flake terminations due to breakage of the terminals (Table

5.34). Breakage observed on the 28 finished tools at different locations tools with distal end broken (n=12) dominates in the assemblage others proximal end broken (n=10), both proximal and distal ends broken (n=4), proximal and lateral end broken (n=2) (Table 5.35)

Table 5.34: Flake termination on the finished tools

Type of flake termination	Total in numbers	In percentage
feathered	53	51.45%
hinged	15	14.56%
NI	13	12.6%
plunging	17	16.5%
step	5	4.85%
Grand Total	**103**	**100%**

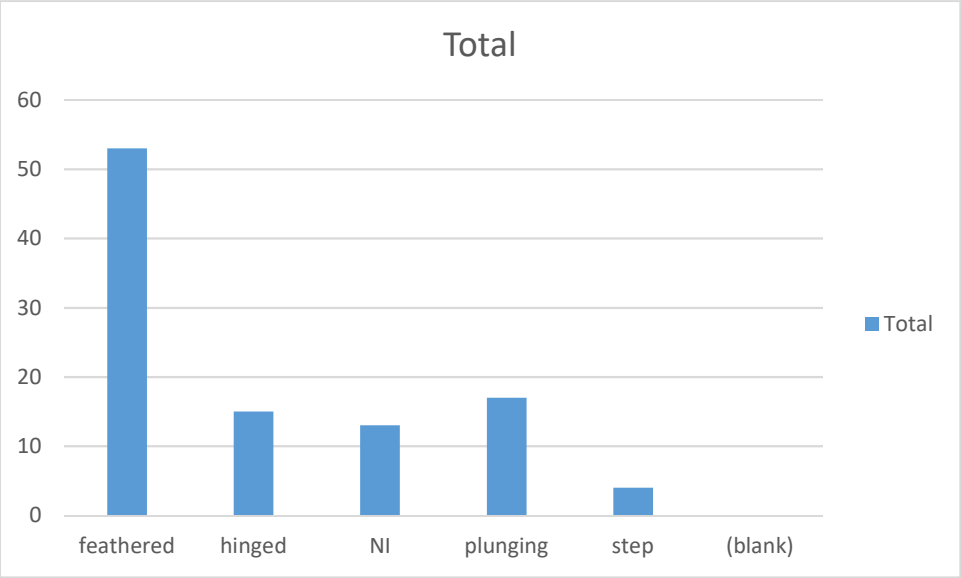


Figure 5.6: Flake termination found on the collected lithic assemblage

Table 5.35: Location of end broken in the finished tools

Finished tools	both proximal and distal ends broken	distal end broken	proximal and lateral end broken	proximal end broken	To tal
convex scraper		1			1
retouched bladelet	3	5	2	7	17
side scraper		1		1	2
unretouched bladelet	1	5		2	8
Total	**4**	**12**	**2**	**10**	**28**

5.7.9. Patination

Patination is observed on the 13 finished tools, and 90 are not patinated (Table 5.36). Finished tools with fresh preservation (n=52, 50.48%) dominates among the assemblage, others rolled (n=30, 29.12%) and weathered (n=21, 20.38%) (Table 5.37).

Table 5.36: Patination in the finished tools

Finished tools	no	yes	Total
backed bladelet	4		4
bladelet	2		2
burin	1		1
convex scraper	2		2
double side scraper	1		1
end scraper	1		1
notch	1		1

retouched bladelet	47	8	55
retouched flake	5	2	7
side scraper	13	2	15
unretouched bladelet	13	1	14
Total in numbers	**90**	**13**	**103**
In percentage	**87.37%**	**12.62%**	**100%**

Table 5.37: State of preservation of finished tools

Finished tools	fresh	rolled	weathered	Total
backed bladelet	4			4
bladelet	2			2
burin		1		1
convex scraper		2		2
double side scraper	1			1
end scraper	1			1
notch		1		1
retouched bladelet	24	19	12	55
retouched flake	5		2	7
side scraper	6	6	3	15
unretouched bladelet	9	1	4	14
(blank)				
Total in numbers	**52**	**30**	**21**	**103**
In percentage	**50.48%**	**29.12%**	**20.38%**	**100%**

5.7.10. Mean dimensions of the finished tools

Mean dimensions of all the collected artefacts measured. The average length, breadth and thickness of the artefacts ranges from 20.52 x 12.1 x 5.7 (Table 5.38), the maximum length, breadth and thickness of the artefacts is 43.19 x 35.09 x 34.64, the minimum length, breadth and thickness of the artefacts is 8.78 x 3.42 x 0.66 and the standard deviation of the length, breadth and thickness of the artefacts is 7.31 x 6.88 x 4.72 (Table 5.38)

Table 5.38: Mean Dimensions of finished tools

Length and Breadth of Finished tools	**Mean Dimensions of finished tools**			
	Mean	**Maximum**	**Minimum**	**Standard Deviation**
Length	20.52mm	43.16mm	8.78mm	7.31
Breadth	12.1mm	35.09mm	3.42mm	6.88
thickness	5.7mm	34.64mm	.66mm	4.72

5.8. Debitage/waste products

A total of 85 waste products/debitage collected. These form the second largest portion in the assemblage. The debitage includes blade debitage (n=4, 4.7%), core debitage (n=2, 2.35%) cortical flake (n=15, 17.64%), flake < 2cm (n=52, 61.17%) and non cortical flake (n=12, 14.11%) (Table 5.39)

Table 5.39: Debitage from the collected lithic assemblage

Debitage	**In numbers**	**In percentage**
blade debitage	4	4.7%
core debitage	2	2.35%
cortical flake	15	17.64%

flake < 2cm	52	61.17%
non-cortical flake	12	14.11%
Grand Total	**85**	**100%**

5.8.1. Raw material

Most of the waste products are made on chert (n=47, 55.3%) and others on chalcedony (n=27, 31.76%), agate (n=7, 8.2%), cherty quartzite (n=3, 3.52%) and quartz (n=1, 1.17%) (Table 5.40).

Table 5.40: Raw material for the debitage

Raw material	blade debitage	core debitage	cortical flake	flake < 2cm	non-cortical flake	Total in numbers	In percentage
agate			1	3	3	7	8.2%
chalcedony	3	2	3	18	1	27	31.76%
chert	1		10	29	7	47	55.3%
cherty quartzite				2	1	3	3.52%
quartz			1			1	1.17%
Total	**4**	**2**	**15**	**52**	**12**	**85**	**100%**

These were made on the flake blanks (n=73, 85.88%) blades (n=9, 10.5%) and nodules (n=2, 2.5%) (Table 5.41) Most of the artefacts are complete in physical state (n=79, 92.9%) whereas 6 artefacts are broken in the state (Table 5.42), these are broken at different locations of the artefacts.

Table 5.41: Debitage on various blank types

Blank types	blade debitage	core debitage	cortical flake	flake < 2cm	non-cortical flake	Total in numbers	In percentage
blade	4		1	1	3	9	10.5%
flake			14	50	9	73	85.88%
nodule		2				2	2.5%
(blank)				1		1	1.17%
Total	**4**	**2**	**15**	**52**	**12**	**85**	**100%**

Table 5.42: Physical nature of the debitage

Physical nature	blade debitage	core debitage	cortical flake	flake < 2cm	non cortical flake	Total in numbers	In percentage
broken	2	1			2	6	7.1%
complete	2	1	15	51	10	79	92.9%
Total	**4**	**2**	**15**	**52**	**12**	**85**	**100%**

5.8.2. Cortex

Cortex is present on the 18 artefacts and is absent on 15 artefacts (Table 5.43), the debitage is dominated by flakes with less than 2cm cortex coverage and the percentage of cortex coverage is not recorded due to its size. The cortex coverage on the other artefacts are having > 25% cortex coverage on them.

Table 5.43: Cortex on the debitage

Cortex	blade debitage	core debitage	cortical flake	flake < 2cm	non-cortical flake	Total
absent	3				12	15
present	1	2	15			18
(blank)				52		52
Total	**4**	**2**	**15**	**52**	**12**	**85**

5.8.3. Striking platform

The waste products are having different types of platforms, plain type of platform (n=19) dominates in the assemblage, others are punctiform (n=5), faceted (n=4) and cortical (n=1) (Table 5.44). The bulb is present on the 29 artefacts among these diffused types of bulb dominates (n=20) (Table 5.45)

Table 5.44: Striking platform types on the debitage

Type of Striking platform	blade debitage	core debitage	cortical flake	flake < 2cm	non-cortical flake	Total
absent	1				1	2
cortical			1			1
faceted	1		1		2	4
NA		2				2
plain			12		7	19
punctiform	2		1		2	5
(blank)				52		52
Grand Total	**4**	**2**	**15**	**52**	**12**	**85**

Table 5.45: Types of bulbs on the debitage

Bulb type	blade debitage	core debitage	cortical flake	flake < 2cm	non-cortical flake	Total
absent	1				1	2
diffused	3		8		9	20
NA		1				1
present			7		2	9
(blank)		1		52		53
Total	**4**	**2**	**15**	**52**	**12**	**85**

5.8.4. Patination

There are 11 artefacts that were patinated and 22 are not (Table 5.46). Preservation of the artefacts include fresh (n=8), rolled (n=6) and weathered (n=19) (Table 5.47)

Table 5.46: Patination on the debitage

Patination	blade debitage	core debitage	cortical flake	flake < 2cm	non-cortical flake	Total
no	2	2	9		9	22
yes	2		6		3	11
(blank)				52		52
Grand Total	**4**	**2**	**15**	**52**	**12**	**85**

Table 5.47: Preservation of the debitage

Row Labels	blade debitage	core debitage	cortical flake	flake < 2cm	non-cortical flake	Grand Total
fresh		2	3		3	8
rolled			1		5	6
weathered	4		11		4	19
(blank)				52		52
Grand Total	**4**	**2**	**15**	**52**	**12**	**85**

5.9. Discussion

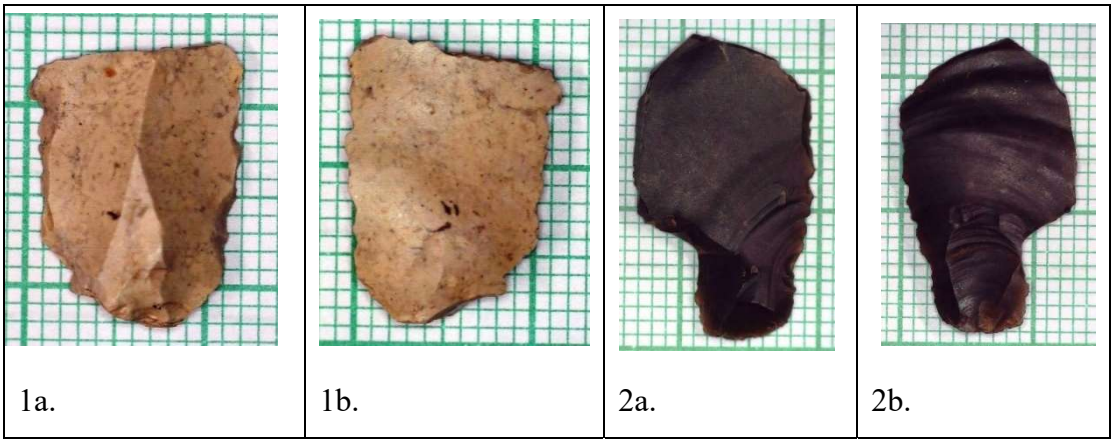
The Microlithic assemblage consists of finished tools, cores and waste products. Finished tools dominate in the assemblage, these consist of retouched bladelets, various types of scrapers made on blades and flakes, retouched and unretouched flakes. Cores consist of flake cores and microlithic blade cores, whereas the waste products consist of flakes < 2 cm, cortical and non-cortical flakes, blade and core debitage, among these flake < 2cm dominates.

Chert is the largest raw material, which is used to make these artefacts, and others are chalcedony, agate, cherty quartzite and quartz. These raw materials are occurring in the interrrappeans of the Deccan traps, Chert is noticed in the form of cobbles and boulders at various sites.

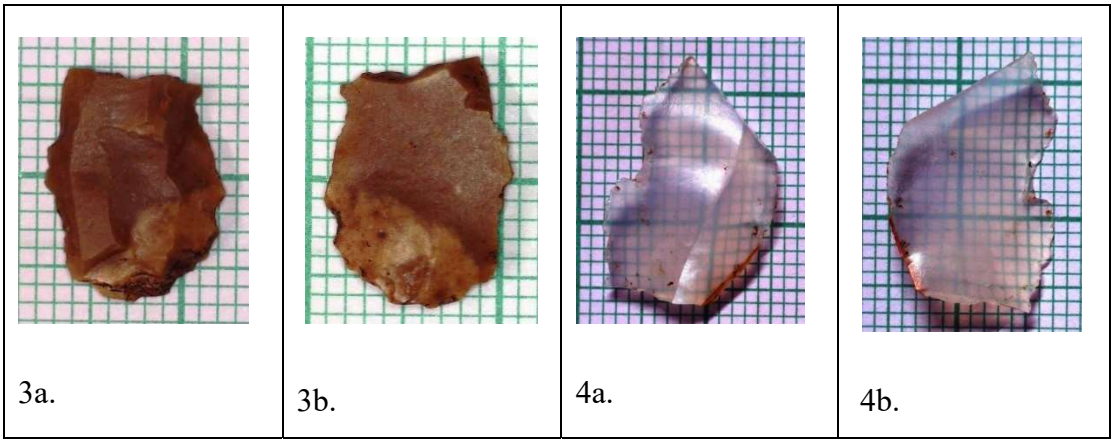
Finished tools on blade blanks dominate in the assemblage, these consist of non-geometric bladelets, backed blades, scrapers of various types made on blades and flakes and one notch and burin noticed.

Inter and intrasite variability of artefacts identified. Each site has different proportions of artefacts few has more number of finished tools and a few with more waste products.

5.10. Microscopic analysis and microstructure of microliths:



1a. 1b. 2a. 2b.



3a. 3b. 4a. 4b.

Plate 5.1: Retouched bladelets (1,2,3&4), a. Dorsal view and b. Ventral view, 1. Patinated bladelet

5a.

5b.

6a.

6b.

7a.

7b.

8a.

8b.

Plate 5.2: Retouched bladelets (5,6,7&8), a. Dorsal view and b. Ventral view, 8. Patinated bladelet

9a.

9b.

10a.

10b.

Plate 5.3: Retouched bladelets (9&10), a. Dorsal view and b. Ventral view

 11a.	 11b.	 12a.	 12b.
 13a.	 13b.	 14a.	 14b.
 15a.	 15b.	 16a.	 16b.

Plate 5.4: Retouched bladelets (11,14,15&16), 12. Unretouched bladelet, 13. Weathered bladelet a. Dorsal view and b. Ventral view

17a.

17b.

18a.

18b.

Plate 5.5: 17. Retouched bladelet (broken and 18. Backed bladelet, a. Dorsal view and b. Ventral view

19a.

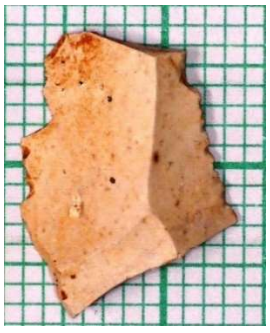
19b.

20a.

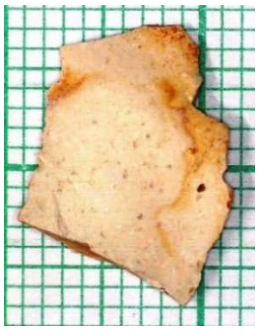
20b.

21a.

21b.



22a.



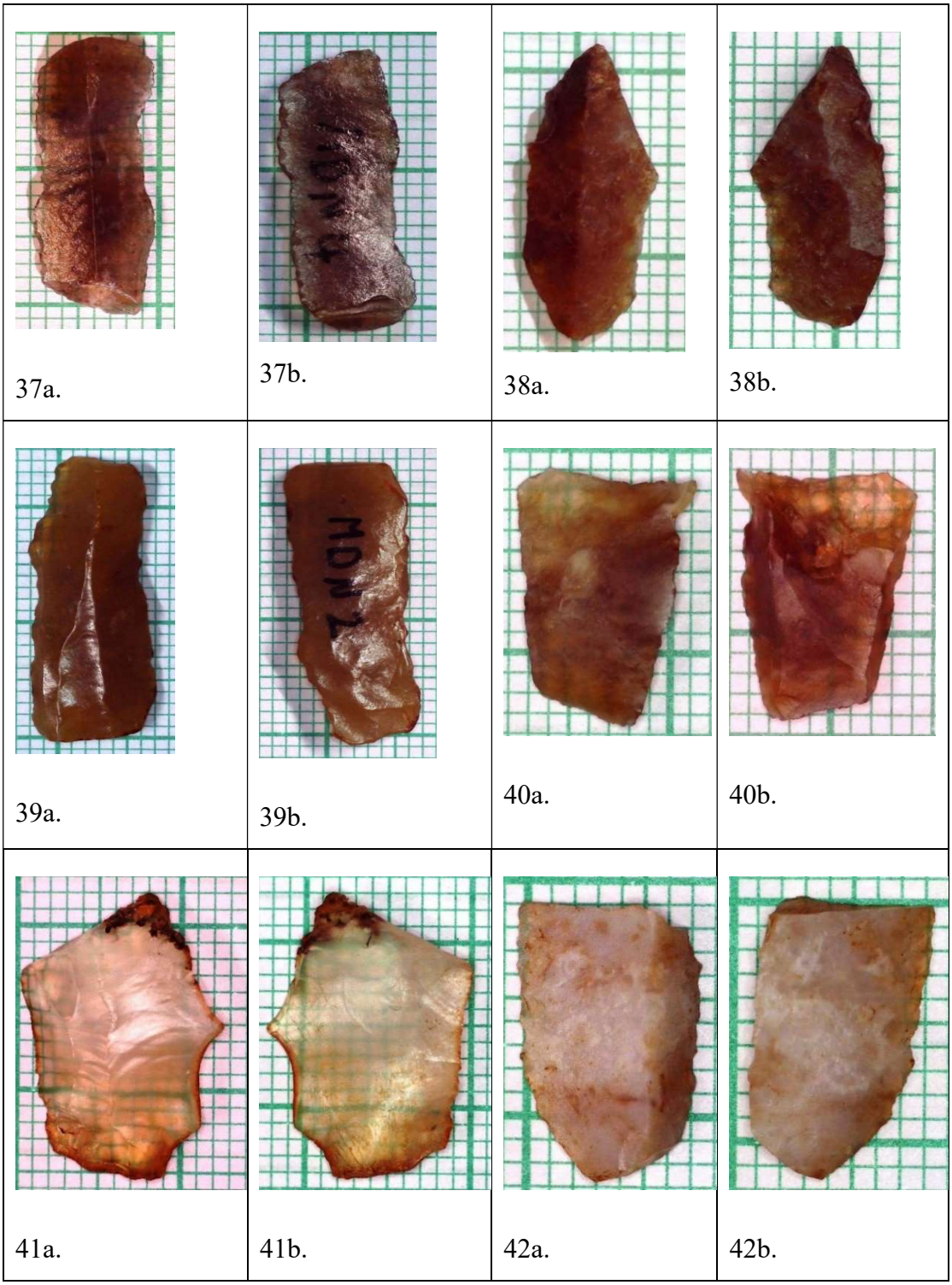
22b.

5.6: Retouched bladelets (19,20&21) and broken retouched bladelet (22), a. Dorsal view and b. Ventral view

 23a.	 23b.	 24a.	 24b.
 25a.	 25b.	 26a.	 26b.
 27a.	 27b.	 28a.	 28b.

Plate 5.7: Retouched bladelets (23, 24, 25, 26, 27 & 28), Bladelets shows patination (23, 25 & 26), a. Dorsal view and b. Ventral view

Plate 5.8: Retouched bladelets (29, 30, 31, 32, 33, 34, 35 & 36), a. Dorsal view and b. Ventral view



37a. 37b. 38a. 38b.

39a. 39b. 40a. 40b.

41a. 41b. 42a. 42b.

Plate 5.9: Retouched bladelets (37,38,39, 40, 41 & 42), Bladelets shows erosion (37&39), a. Dorsal view and b. Ventral view

	
1a.	1b.

Plate 5.10: Retouched bladelets, a. Dorsal view and b. Ventral view

Plate 5.11: Retouched bladelets

Plate 5.12: Microlithic blade cores from Aroor and Budera sites

Plate 5.13: Microlithic blade cores

Chapter 6
Conclusion

6.1. Introduction

The present study aims at exploring and understanding the Prehistoric cultures in the Lower River basin, Telangana. Prehistoric explorations in this region have started in the 1950s lead to the discovery of Late Palaeolithic/ Upper Palaeolithic and Mesolithic cultural lithic assemblages and fossils. The earlier works in this area laid to the foundations for an understanding of the distribution of Prehistoric sites and their lithic assemblage. The present study aims at investigating questions related to study and understand the lithic assemblage, geographical distribution of sites, stratigraphy and context of the lithic assemblage and its typo-technology and behavioural patterns in different cultures (Chapter 1)

The study has been surveyed and explored systematically. Fieldwork has been carried out in Four seasons (December 2017, February 2018 Nov-Dec 2018 and Feb 2019) were carried out to discover the new prehistoric sites and to reinvestigate previously reported sites (Sastry 1995) in the study area, field investigations in terms of the archaeological and geomorphological contexts of Prehistoric sites visited during the explorations. A total of 30 sites were studied during this fieldwork out of which 25 were explored by the author and the remaining five were earlier reported sites (Chapter 2). Out of these 19 sites were Late/Upper Palaeolithic cultures, seven were Mesolithic and four were having a mix of Upper Palaeolithic and Mesolithic cultures (Chapter 3).

The topography of the region, in general, is rocky, hilly and rather rugged with abrupt and diverse slopes. Most of the region in this district is occupied by the Peninsular granite complex of the Archaeans. Minor inliers of Dharwar rocks occur as narrow bands of a small extent. A small portion of the Sangareddy district in the south-western part of the district is covered by the Deccan trap (Basalt flows) formation (Chapter 3).

Cryptocrystalline forms of silica such as chalcedony, agate, plasma and jasper are found filling the cavities at some places in the traps (Rajagopal 1976, Pg. 4). The laterite cappings are seen extensively around Zahirabad. Two major lineaments trending E-W and N-S appear to cross each other between Medak and Narsapur; the N-S lineament is

also in part occupied by dyke rocks. There are two major dykes, one in the central part, trending in the N-S direction, the other one encountered at Kowdipally trending in the NE-SW direction (Map of Geological Survey of India 1997).

6.2. Earlier Prehistoric explorations

In the upper course/reaches Bopardikar (IAR 1971-72), Joshi *et al.* (IAR 1975-76, 1977-78, 1981-82 and 1984-85), Joshi. R.V. et al, (1981), Badam *et al.* (1984) , Sathe and Rajinder Ganjoo (IAR 1981-82) and Sathe (1989, 2004, 2009 & 2015)

The exposed section at Ganjapur and the black soils with sandy gravels consist of fossils of different animals, yielded fossils of elephant, horse and several fossil fragments of other animals as well as freshwater molluscan shells. At Deola, Bopardikar collected lithic assemblage, which includes flakes, scrapers, points, cores and blade cores made on chalcedony. A section at Kallam noticed with bedrock, sandy gravel with ledges and alternate bands of coarse and fine sand; silt; and black soil. From the loose gravel in the riverbed, a few flakes, scrapers, blades, and cores were collected by Bopardikar.

Joshi et al. conducted explorations Exploration in Districts Beed, Sholapur and Nanded and found a large number of microlith-yielding sites in the Deccan Trap areas. Most of the tools that were collected are made on chalcedony, while in the granitic locations tools are made on chert and jasper which are occur as siliceous segregations in the intertrappean formations. Joshii et al, (1981) studied geography, Quaternary geology, palaeontology and the prehistoric cultures of the Manjira River. Later Vijay Sathe and Rajinder Ganjoo conducted explorations along the Manjira River between the Tadula and Wangdari villages of Maharashtra. They found Calcreted moderately-sorted pebbly gravels on the Deccan Trap at most of the sites. Sathe (2015) extensively worked on the discovery of fossil evidence on the main channel of Manjira in the Districts of Latur and Beed of Maharashtra to reconstruct the Palaeoenvironment of the region.

In Karnataka Joshi et al (1977-78) studied the laterites in the Bidar district of Karnataka they noticed that the extensive primary laterites which are occurring in that area is with an average thickness of 12 to 15 m in Bidar district and R.M. Shasaksharaiah reported 21 Middle stone age and 11 Microlithic sites in Bidar district, the thick laterites of the region indicates that there was a humid phase with increase in rainfall during the late Tertiary and early Pleistocene.

In the lower reaches of the river (Telangana) the explorations were conducted by A. V. Narasimha Murty, V.G. Sathe, D.L.N. Sastry and by the author. A.V. Narasimhamurthy collected various upper palaeolithic and Mesolithic artefacts from various locations of the Medak district. D.L.N. Sastry conducted in the central portion of Manjira valley with the main aim of surveying and recording of the archaeological wealth of the region and discovered several prehistoric, protohistoric, early historic and historical sites in this area. Sathe found fossils along with the lithic assemblages in the lower reaches of the Manjira river valley.

6.3 Field Investigations

During the recent explorations, a total of 30 sites were discovered. Out of these 19 sites were Late/Upper Palaeolithic cultures, seven were Mesolithic and four were having a mix of Upper Palaeolithic and Mesolithic cultures (Table. 3.1). Artefacts were collected from the surface, sections and streams. And the altitudes vary from 275 m asl to 595 m asl.

Artefacts were collected from the surface, sections/stratigraphy and the streams. The tools were eroding out from the weathered sediments at the top and slopes of the hillocks. They are associated with the black and brownish red soils, pebbly-cobbly conglomerate gravels and also with rich alluvium deposits near the river valleys.

At Aroor an exposed section was observed where the weathered granitic bedrock was capped with the pebbly-cobbly conglomerate which also includes the lithic assemblage. Budera, the site is completely under thick vegetation. Artefacts were collected randomly from the surface. **Koduru Thanda** The area is covered with bushes and thick vegetation. Microliths of chert and quartz are getting along with weathered sediments.

Nandikandi artefacts that occur in the pebble-sandy gravel context and are associated with reddish-brown and black soils, were exposed on the surface in an area that is not under cultivation. The surrounding land is under cultivation, and artefacts were also collected from the surface of the cultivated land and also from the weathered and exposed sediments. At Dosapalle, Artefacts were eroding out from the weathered sediments and are associated with reddish-brown soils and pebbly gravel context.

Jagannathpur Tools are occurring at the foothills of the hills, Tools were collected in an area of 30x40 mts area. Quarzite outcrops are found at this site. **Kondapur** Artefacts were associated with the pebbly gravel and reddish-brown soils. Artefacts are occurring with a high density.

Fasalwadi, Artefacts collected from the stream (Manjira). Noticed a high density of artefacts that are occurring on the sandy bars of the stream. **Khatgaon** Artefacts were occurring in a high density, and these artefacts were collected in an area of 2x2 m. Fossil bones were also collected which may be belongs to the sps. Bos. Rich alluvial deposits were noticed on the banks of the river.

Mitta Nayak Thanda Artefacts are occurring on the top of the hillock and its slopes. Flakes, blades, debitage, chips are occurring heavily on the top and slope of the hills. Artefacts are seen eroding out on the surface and associated with gravel and reddish-brown soils. **Rudrar** Artefacts are occurring on the slopes and the top of the small hillocks and are associated with red soils and gravels. These artefacts were noticed on the exposed sediments. Quartz is occurring locally in the form of tablets and pebbles.

Shelgara Gattu Tools are occurring on the slopes and top of the small hillock. Flakes, cores blades, blade cores and microliths of quartz and chert are getting on the top of the hills. **Wasar** The area is marked with small hillocks. Artefacts are collected from the small hillock top and its slopes and are associated with the weathered sediments, reddish-brown soils and gravels.

The Late/Upper Palaeolithic assemblage:

A total of 23 potential Upper Palaeolithic sites were explored in the study region. The assemblage consists of Cores, debitage and finished tools among which finished tools dominate with 56.33 %. These tools were mostly flaked on chert, cherty quartzite, chalcedony, agate and quartz.

Flake and blade tools dominate the late/upper palaeolithic assemblage. The collected assemblage consists a large number of finished tools and debitage. Scrapers of various kinds, bladelets, notches and burins dominate finished tools. The waste products are dominated with flakes < 2cm and cortical flakes. The cores include flake and prepared cores. Artefacts were mostly made on chert and other siliceous raw materials. This

indicates that the people of this region preferred chert. At Nandikandi, Jagannathapur and Shelgara Gattu chert boulders and exposed and weathered cherty quartzite outcrops were observed. Cores and waste products are also mostly made on chert and cherty quartzite raw materials.

Quartz is noticed at Rudrar in the form of tablets and small nodules. Chert is derived from the intertrappeans of the Deccan traps and is available in all the sites in the form of boulders and cobbles. The assemblage is dominated by various types of scrapers, bladelets, notches, and borers. The waste products are largely composed of flakes < 2cms this indicates the microscopic nature of the finished tools. The number of waste products shows that many of them are factory sites. Both flake and blade cores were observed at various sites. Elongated fluted blade cores dominated in blade cores.

Finished tools on flake blanks are more than the blade blanks, it is also observed that the scrapers especially side scrapers dominate among these. These scrapers were observed both on flake and blade blanks. Other finished tools such as notches, borers, burins and backed bladelets are also present in the assemblage.

Inter and intrasite variability of artefacts identified. Each site has different proportions of artefacts few have more finished tools and few with more waste products. Abbenda, Nandikandi, Chaptakhadeem, Jagannathapura and Kodcherla sites are having more finished tools than others, whereas Chalki, Dosapalle, Mitta Nayak Thanda, Rudra, Saloora and Shelgara Gattu sites have more waste products than others.

The Mesolithic Lithic Assemblage

The Microlithic assemblage consists of finished tools, cores and waste products. Finished tools dominate the assemblage, these consist of retouched bladelets, various types of scrapers made on blades and flakes, retouched and unretouched flakes. Cores consist of flake cores and microlithic blade cores, whereas the waste products consist of flakes < 2 cm, cortical and non-cortical flakes, blade and core debitage, among these flake < 2cm dominates.

Chert is the largest raw material, which is used to make these artefacts, and others are chalcedony, agate, cherty quartzite and quartz. These raw materials are occurring in the interrrappeans of the Deccan traps, Chert is noticed in the form of cobbles and boulders

at various sites. Finished tools on blade blanks dominate in the assemblage, these consist of non-geometric bladelets, backed blades, scrapers of various types made on blades and flakes and one notch and burin noticed. Inter and intrasite variability of artefacts identified. Each site has different proportions of artefacts few have more finished tools and few with more waste products.

6.4 Conclusion

This study highlights the new prehistoric sites/discoveries in the study region and also resulted in a rich archaeological record. The key findings of this thesis are 1. Sites were found both on the hills and in and around the river basin, it indicates people of these cultures settled and occupied in different geographical locations; 2. Sites were found in the Deccan trap regions and on the granitic bedrock locations; 3. Upper Palaeolithic and Mesolithic cultural assemblages found in the study area; 4. No evidence of Acheulian artefacts; 5. Artefacts were mostly made on chert and other siliceous raw materials such as cherty quartzite, chalcedony, agate and quartz. This indicates that the people of this area mostly favoured chert for making the tools; 6. Deccan Traps are the source of siliceous raw materials, and the chert is available in the form of boulders and cobbles; 7. The locally available raw material was exploited to make the stone tools; 8. Inter and intrasite variability of artefacts identified. Each site has different proportions of artefacts few have more number of finished tools and few with more debitage; 9. The rich collection of debitage indicates that these were the factory sites; 10. The distribution pattern of sites and exploitation of different types of raw materials by the people of these cultures tells about their knowledge about the selection of habitation sites and behavioural patterns.

The present research adds to the existing knowledge in a significant manner and it also opens the way for new research in this area. This also further helps in understanding the people's priority in selecting different regions, different raw materials, lithic reduction sequences and their other behaviour patterns.

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Prehistoric Explorations in the Lower Manjira River Basin of Telangana State

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NANDIKANDI A LATE/UPPER PALEOLITHIC SITE FROM MANJIRA RIVER BASIN, TELANGANA STATE

M. Ganesh*

Abstract:

The present study has been carried out as part of prehistoric explorations in the Manjira River basin of the Telangana state. The prehistoric explorations/sites in this region are negligible. The present study, which resulted in finding the new late/ upper palaeolithic and Mesolithic sites in this region. The site Nandikandi is one, that has given good evidence of lithic assemblage. This has thrown light on a rich lithic assemblage, dominated by various types of scrapers, blades, bladelets and blade cores that were predominantly made on chert and other siliceous materials. This paper briefly discusses the geomorphology of the site and preliminary observations of the lithic assemblage, that was collected.

Keywords: Flake tools, scrapers, blades, flake and blade cores Manjira river and Telangana State.

Introduction:

Andhra Pradesh (now the region is divided into Telangana and Andhra Pradesh states) has emerged as one of the richest regions in the country from the archaeological point of view, where antiquarian studies were initiated two hundred years ago (Paddayya 2014, 5). Due to the rich prehistoric cultural evidence discovered from Andhra Pradesh: Sankalia (1974) called Andhra Pradesh ""the classic land of Stone Age Man'' (Sankalia 1974, 55). Except for a few regions of Andhra Pradesh, every tract of the state has preserved an unbroken sequence of cultural phases ranging from the Lower Palaeolithic to the Iron Age and the Early historical period to the medieval period (Paddayya 2014, 5).

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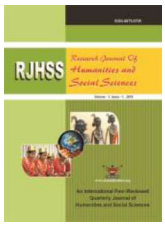

RESEARCH ARTICLE

Stone age artefacts from the recent prehistoric explorations in the Manjira river basin of the Telangana State: A Preliminary Study

Ganesh Moolinti
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ABSTRACT:
The recent prehistoric explorations which were carried out in the Manjira river basin of the Telangana resulted in a discovery of stone age tools in the study region. An extensive archaeological survey has been carried out in the districts of Sangareddy, Medak and Nizamabad. This assemblage will help in the understanding of the Prehistoric cultures of the study region and also in the reconstruction of the past life and Prehistoric climate.

KEYWORDS: Manjira River, Telangana, Late Palaeolithic assemblage, Flake tools, and Microliths.

INTRODUCTION:
The roots of Indian Prehistory can be traced back to 1830s with the earliest prehistoric evidence provided by Primrose (1842), T.J. Newbold (1836, 1843) and Meadows Tylor (1851). Later in 1863 Robert Bruce Foote a British geologist found the first palaeolithic in India at Pallavaram, Chennai (Foote 1866a; Foote 1866b). Indian subcontinent plays a crucial role in understanding the past human migrations due to its geographical location between Europe and Africa on the one hand, and Australians on the other (Zeuner 1951; Petraglia 1998; Mishra 2008; Pappu et al. 2011).

The occurrence of Stone Age artefacts in the Manjira river valley was first reported by A.V.N. Murthy in the year 1957-58. In 1971-72, Bopardikar systematically explored the upper reaches of Manjira and the same area was re-explored by R.V. Joshi and his associates. R.M. Sadhakrishnan and reported several Middle and Microlithic sites.

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D.L.N. Sastry surveyed this basin between Janwada and Singoor over 60km stretch and he found 40 sites of which belongs to Upper Palaeolithic and also he noticed the absence of Lower and Middle Palaeolithic evidence. A.V.N. Murthy (1957-58) reported the discovery of series- II tools and microliths at Appareddipalle and Satwar in Zahirabad taluq (Sastry 1985). The present study aims to explore prehistoric sites in the study region and also to investigate the past human behaviour with the available lithic assemblage. Extensive field surveys have been carried out re-examine the previously discovered sites and also to locate the new Prehistoric sites.

About the study region:
The Manjira river is a southern tributary of the Godavari river, it originates in Balaghat plateau of Maharashtra at an altitude of 823m. and flows through Osmanabad (Maharashtra) and Bidar (Karnataka) districts before entering Sangareddy of Telangana state. It is having a catchment area of 30,844 sq. km. In Telangana, it flows through Sangareddy, Medak, Kamareddi and Nizamabad districts before joining the Godavari River at an altitude of 333m. near Kandakurthi of Nizamabad district. The tributaries of the Manjira river include Terna, Tawarja and Gharni, Manyad, Teru, Lendi and Dabbavagu.

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Recent Prehistoric explorations in the Manjira river valley of the Telangana State, India.

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Introduction

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