



Insights into a Large Flake Acheulian Site Samardhara: Bargarh, Odisha

*¹Neena Thakur

¹Assistant Professor, Department of History, Sambalpur University, Odisha, India.

Abstract

Acheulian Industries have been identified in all parts of the world. In the wake of recent discoveries made by many foreign and Indian scholars, India is being held as one of the core regions for having evidence of Prehistoric cultures (Petraglia 2009). Acheulian industries in Western Orissa are mostly explored yet they can establish the gradual developing technical stages within the assemblages. About 25 sites in Districts Bargarh and Sambalpur of Odisha have yielded 4226 artefact belonging to the Late Acheulian and Early Middle Palaeolithic (Behera *et al.* 2015; Thakur 2015, Behera *et al.* 1996). Even though the artefacts are found on the erosional surfaces and rain gullies all mixed up, appear to be of two different contexts. This assumption is based on their distinct nature regarding change in raw material choice, preservation and techno-typology. Among all sites, Samardha deserves to be highlighted due to its large flake mostly made on medium-grained quartzite knapped from giant cores. This paper deals with the significant features of Samardhara assemblage.

Keywords: Large flake Acheulian, Kombewa, giant core, Entame flake.

Introduction

Between 1993-2021, the History Department of Sambalpur University under the supervision of Behera and his team brought to light numerous Lower Palaeolithic, Middle Palaeolithic and Microlithic sites in primary and semi-primary contexts in the Middle Mahanadi valley. The last three decades of his relentless research revealed the potentiality of Dari Dungri hills, Lohara reserve forest, Debrigarh and Barapahar hill ranges along the Middle Mahanadi valley and its tributaries and sub-tributaries. The systematic surveys were carried out in Western Orissa. Numerous sites were discovered in Sambalpur (SBP) and Bargarh (BRG) districts (Behera *et al.* 1997, Thakur 2015, 2016, Behera & Thakur 2018, 2020). This article deals with 25 sites (Gopalpur Complex 1-11), Torajonga Complex (1-3), Ainlapali (ANP), Kenduguria (KDG), Brahmanipali (BMP), Beherapali (BHP), Mendhapali (MDP), Jamchhapar (JMCH), Badpadar (BDP), Katapali (KTP), Samardhara (SRD), Kamgan (KMG), Dharokhusum (DKM) in Bargarh (BRG) and Dari Dungri (DDGR) in Sambalpur belonging to the Lower Palaeolithic period found in varied landscapes. The antiquity of the hominin in the Bargarh Upland has been well attested by their stone artefacts yielding sites in the region. Most of these sites have succeeding phase of Middle Palaeolithic cultures just above the lower Palaeolithic.

Among all above-mentioned sites, Samardhara needs a special mention as it has yielded large flakes with large cleavers and handaxes produced on mostly medium grained quartzite. The flakes collected from the site are generally large sized thus heavy. About nine Cores are giant and immovable. They

show big and deep scars produced presumably by direct hammer technique. During this study, papers of several archaeologists have also been followed i.e.; Sharon 2007; Pappu 2003a, Mishra, s 1992, 2010 ; Deo, S. 2023; Mcnabb 2004; Madson and N. Goren Inbar 2004 ; Chauhan 2011;. Petraglia 2009; Owen 1938; Casini 2010 and many others.

Geography and Environmental Settings

Physiographically, the district Bargarh belongs to the South-Western Hill Region of Odisha highlands (Singh 2004: 771), situated between the coordinates N. 20°43' and 21°41' latitudes and E. 82°39' and 83°58' longitudes. While it is flanked by Raigarh and Mahasamund districts of Chhattisgarh in the northwest and west, it is bounded on the north, southwest, south and east by Jharsuguda, Nuapada, Bolangir, Subarnapur and Sambalpur districts of Odisha, respectively. It extends over an area of 4662 sq. km. and occupies about 4% of the state's landmass. The district is divided into two subdivisions, viz., Bargarh and Padampur, and comprises twelve Blocks, which greatly vary in their physiography, soil, climate and vegetation. Geomorphologically, the area is represented by three natural divisions i.e.:

- i). Denudational hills,
- ii). Upland plain and
- iii). The vast pedepain with sporadic hills and ridges (Fig. 1), which vary in height from 255m to 312m (GSI 2002).

The Upland is represented by the Chhattisgarh plateau on the north; denudational hills comprised by the rugged hill ranges of the Eastern Ghats on the south and the pedepain in the

central low undulating land is represented by granite gneisses and migmatites. The granitic terrain is weathered to varying depths at different places, leaving behind isolated patches of unweathered rocks. The massive weathering has given rise to the formation of the extensive pedepain in the region. The area is not a leveled tract, but an expanse of undulating country sloping down from the hill ranges in the northwest and north to the Mahanadi valley in the east and southeast. The overall drainage pattern of the area is dendritic to sub-dendritic with moderate drainage density and is primarily controlled by tributaries of the river Jira and the Ong of the Mahanadi river system. Except for the Jira and the Ong, all other streams of this area retain water only during the monsoon and post-monsoon seasons, from July to March. In a nutshell, it is an undulating table-land of elevation varying from 130m to 600m and above, interspersed with some open valleys which are highly fertile.

The district has also been divided physiographically by some scholars into four natural zones, viz.

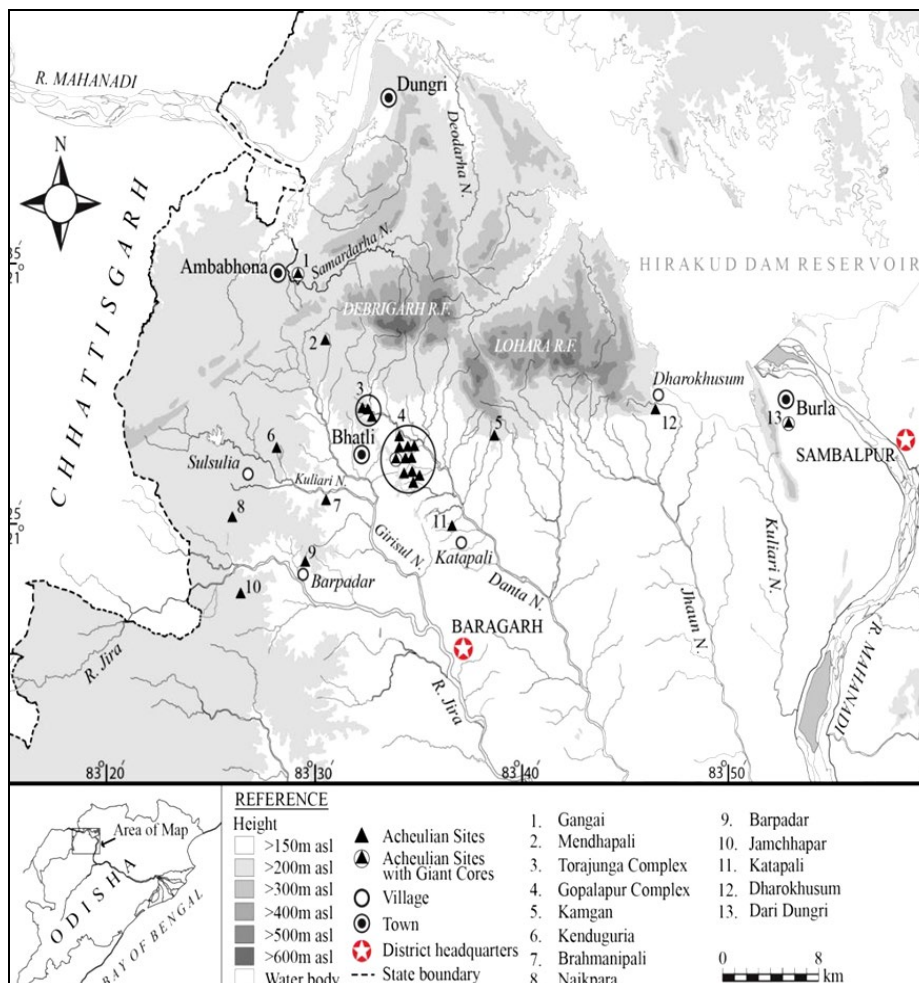
- i). North-Western Barapahar Forest,
- ii). North-Western Ambabhona Plain,
- iii). Southern Bargarh Plain and
- iv). Western Ong Valley (Mishra and Mishra 2008; Mishra 2008).

While the former two occupy the northern and north-western parts of the district, the other two zones occupy the central and southern Parts.

The Site

Samardhara stream (Village name is Gangai/Ambabhona), a

tributary of Danta (21°34'25.04"N and 83°29'03.92"E) rises in the Debrigarh hills and independently joins the River Mahanadi. The artefacts are collected from the stream bed near the village, located about 5 km north of an Acheulian site Mendhapali. Apparently the site is a quarry site as many large/giant quartzite stones are found in abundance. Its strategic location is bounded on the north by Saraidamak Burharaja hills and on the eastern side it is close to the Debrigarh Reserve hill forest. The nearest town Ambabhona is situated within one kilometer range. The site is located in the dried bed of ephemeral Samardhara stream. The land elevation is about 235-250 amsl. The site area is about 100 x150m. The site has yielded huge blocks and boulders of quartzite clast are strewn over the surface might have provided raw material to the hominin to produce desired stone artefacts. It is marked for its giant cores in the form of boulders. Large Cores cross their weight beyond > 20 kg. It seems to be a typical LFA site on the basic criteria provided by Sharon 2007, however, no chip/debris is found. Due to the sloping nature of the site, debris could have slipped down. However, a few artefacts have escaped rolling and appear in mint fresh condition. Some fresh artefacts are either of the later context or they remained on the margin of the stream-bed thereby escaped rolling. Most of the artifacts are in secondary context and it seems that they are eroded and rolled down with water from upstream. Quartzite has been principle raw material that might be procured from the quartzite hills in the nearby forests. The position of the site is at a higher altitude in comparison to other sites. (Refer to Map).



Map: Acheulian sites in Bargarh district

In a preliminary exploration, the site has yielded a moderate quantity of artefacts (152). (Table: 1). A few points could be mentioned below.

- i). Large artefacts include; Handaxes, Cleavers Cores and large Flake blanks flake with small tools (15-80 mm)
- ii). Most of the artefacts have deep and bold scars presumably showing hard hammer technique.
- iii). Also, it is noteworthy that cleavers (3:1) dominate handaxes at SRD in contrast to other sites in Bargarh Upland.
- iv). Quartzite is the only raw material used to produce artefacts.

This is the only site where most of the artefacts have suffered constant rolling so much so that it has been hard to recognize secondary retouching on most of the artefacts. The location of the site is on the slightly sloped surface which help to assume that the existence of quartzite source must be somewhere in upper hills which came down rolling to the current position. The site is significant due to the presence of giant quartzite cores and large flakes. It also cannot be ruled out that it might have played a role in supplying the raw material to other sites located in the lower areas in river plains and foothills.

Assemblage

The assemblage yields core, flake, handaxe, cleaver in considerable number however others i.e.; meagre quantity of small flake tools, pick, point, polyhedron and 4 indeterminates are also recorded. A total of 152 artefacts are not enough to assess an industry yet the very nature of it indicates it's nature of being a large flake Acheulian site. The ratio of large immovable cores and large flakes with huge cleavers help to observe that it is a true LFA. (Sharon 2007,

2008, Madsen, B. and N. Goren-Inbar 2004). The hominin did not bother to practice economy. The artefacts collected from the site are discussed below (Table 1):

Table 1: Artefact Distribution at SRD (Short form of Samardhara) assemblage

Samardhara	F Qtzite	M Qtzite	C Qtzite	Silic Qtzite	FelsQtzite	Total	%
Handaxe	1	5	-	-	-	6	3.94
Cleaver	2	13	3	-	-	18	11.84
Core	1	24	-	1	1	27	17.76
Flake	-	41	27	-	-	68	44.73
Ret.flake	2	12	10	-	-	24	15.78
Leva. Point	-	1	-	-	-	1	0.65
Pick	2	-	-	-	-	2	1.31
Polyhedron	-	2	-	-	-	2	1.31
Indetermina.	-	4	-	-	-	4	3.28
Total	7	103	40	1	1	152	99.94
%	0.46	67.76	26.31	0.06	0.06		100

Cores at SRD

The large-sized artefacts were found in the dried bed of Samardhara. The industry has yielded large flakes and giant cores. Possibly it provided large flakes for other neighbouring localities of the BRG (Bargarh). A total of 27 cores are found at the site. It couldn't be explored fully but the site certainly promises to be potential for having the Early Acheulian evidence (Fig: In SRD at least 9 largest cores weigh more than 20 kg. Others are within 2 to 8 kg.

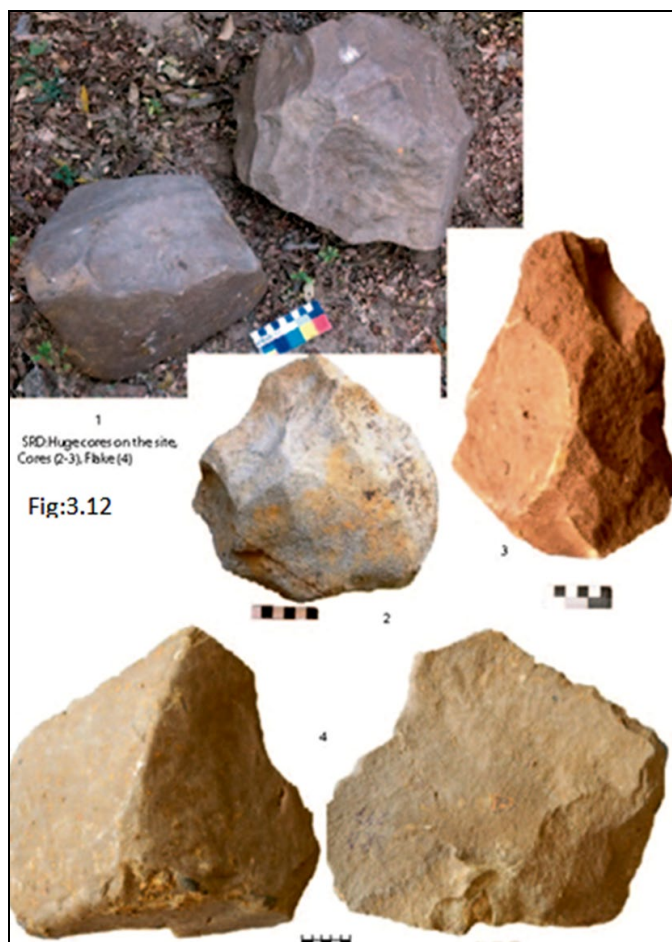


Fig 1: Large Flake

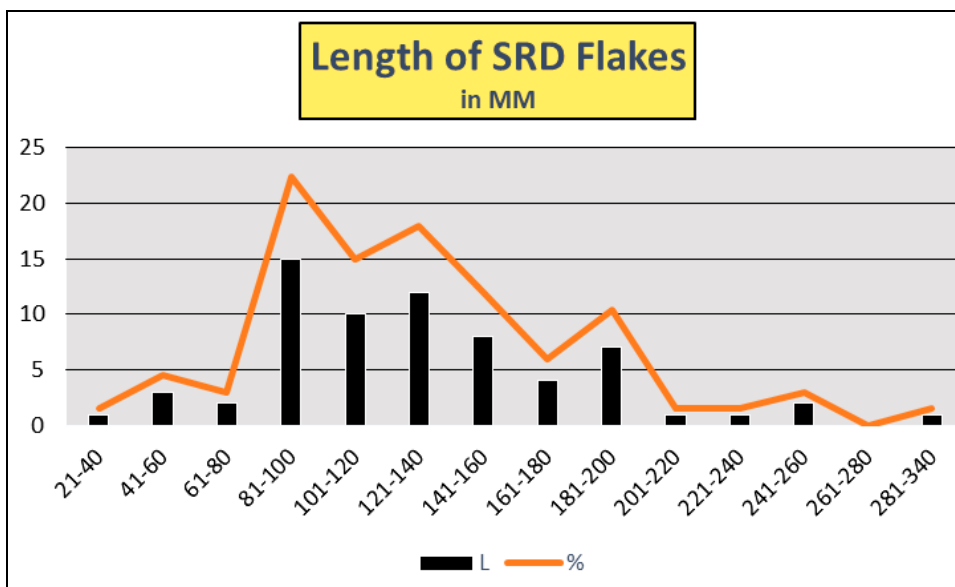
Large-sized cores are lying in the dried bed of the Samardhara stream in rolled and abraded condition. The blank of the core at SRD is in the form of a huge block/giant boulder (19). About 7 cores are made on flake. One core is broken and thus kept under indeterminate. The slab edges are mostly angular providing a scope of slab edge. Technologically they are categorized as Giantcore (20) but smaller ones are Discoidal core (2) and Kombewa core (2), Flake-blade core (1) and Levallois score (1). The remaining 1 broken core is kept under indeterminate. Many slab edges bear evidence of knapping for the flake. Cores are usually large and not exploited fully. About 22 Cores are in rolled/semi rolled and abraded condition. The platforms are natural cortex plains on the cores. Presumably, the Hominin had stricken on the angular edge of selected rock then the first struck flake scar edge guided further flaking. Two cores are noticed to be made on recycled artefacts. The large static cores are having sub-triangular, square, rectangular, irregular, and elongated with cross-sections i.e.; sub-triangular, parallelogram, quadrangular or irregular etc based on their form. Kombewa cores were achieved on large opening/entame flakes struck from huge boulders (Pappu). The ventral bulbous face of some of these are further struck to achieve thick symmetrical Kombewa flakes. This action helps to produce a flake with two ventral bulbous faces. One Levallois core found at the site registers the knowledge of prepared core technique by the hominin.

At SRD the size of the cores starts from 95mm and reaches up to 350mm. Owing the fact of giant static amorphous cores it was apt to measure the size of the broadest area on it.

Flake Component

Around 92 flakes were collected from Samardhara stream which provide a fair idea about size range of the flakes. The reduction strategy becomes clearer with the comparative study of cores cars and the size of flakes. The absence of Primary flakes (4 primary flakes) implies the possibilities of temporal climatic cycles which might have displaced the debris. The focus seems on producing the large flakes with a sole purpose of producing cleavers.

The big flakes were shaped into handaxe, cleaver, pick and uniface. It may be suggested that smaller flakes (Approx 15-80 mm) might be produced in the process of the shaping of handaxes and cleaver flakes. The general small sized flakes were modify into scraper, awl, denticulate, point, notch etc., This locality has yielded the largest quartzite flakes mostly rolled, abraded and Patinated due to long time exposure in the dried stream of Samardhara, About 78% of flakes are tertiary. Why is it so? It is not difficult to explain. It is possible that flakes might have dressed at the site. The debris have flowed down with the current of stream. According to Behera, there is a great possibility of finding some more sites at the upper part of the stream Samardhara which needs to be explored further. Fig:3



Graph 1: L. vs Q of Flakes

Generally, the flakes of SRD size-wise differ from other localities (mentioned in the Introduction) and therefore stands alone. Another significant factor of the site appears that the flakes were largely knapped to turn them into bi-faces. Mostly these are broad thick and transverse or side flakes appropriate for shaping them into cleaver. Morphologically at least 15 flakes can be identified as cleaver flakes. (Fig: 4.5.6.7). The site has the credit of having the largest static quartzite cores, cleavers and flakes. The size range (LXBXT) of some of the flakes with the size of flake scar on the cores goes along well. SRD has yielded 55 (65%) non-Levallois or amorphous 28 (24.95%) Levallois, 4 (6.15%) Kombewa and 3(5.99% core rejuvenating and 2 indeterminate flakes. Most of the large flakes are knapped from huge immovable cores. Keeping in view the large cores it is quite justifiable that the platforms are usually plain. In due course of time, the hominin learnt the

potential use of the slab edge of a giant core. The action might have involved many hominins with organized execution of labour. This idea may give us a faint idea of a rudimentary band system or some sort of co-operation among them. As Kleindienst puts it “A finished tool at least 10 cm in size requires a larger blank to allow for the process of reduction and shaping.” (Kleindienst 1962). It is not surprising when one says that the hominin was focused on producing larger flakes so that even after secondary works on them, these must be above 10 cm. Broadly speaking, a total of 92 flakes were found, out of which larger fakes measure up to 340 mm. Fig: 3 Large Flake at SRD.



Fig 3: Giant cores

Observing the core pattern and big bifaces, particularly cleavers and little quantity of small flakes, the site may qualify to be called as a Large Flake Acheulian (LFA) industry. Non-Levallois flakes have irregular scar patterns. No particular attention was given to the dorsal preparation of the core. These were knapped from cores having uni-directional/bi-directional or multi-directional scars.

Cleavers and Handaxes

SRD has the large cleavers, large flakes and large cores of quartzite. These have rolled down over the period due to various climatic and Taphonomic factors. However, it can be accepted that we could not spot any sources of quartzite yet the situational study helps us to presume certain points such as:

The quartzite source in the deeply forested hills of Debrigarh might be accessible to the hominin of the site which was within a range of 8 km. The hominin might have not only

exploited the source but also supplied quartzite to all other sites in the neighbourhood through the Mendhapali which worked as an intermediary site (Refer to the Map).The site has a symmetrical balance between the size of artefacts and that of large cores lying in the stream bed. The metrics of Cleavers and handaxes (Table: 2, table: 3) are given below.

Table 2: Metrics of Cleavers (above)

No	Weight gr.	Length	Breadth	Thickness
1	560.8	11.5	5.4	4.7
2	403.1	11.6	7.2	3.7
3	1493.4	19.5	12.8	6.3
4	876.2	15	10	6.1
5	713.5	12.8	10.6	5.3
6	809.9	15	9.5	5.8
7	7.9	15.7	7.9	3.5
8	513.7	14	9.2	3.5
9	1107.8	19.9	12.1	4.7
10	364.1	11.5	8.4	3.1
11	450.1	Bro	9.5	5.1
12	489.6	Bro	8.2	5.2
13	1150.7	19.3	11.3	5.3
14	582.3	13.8	9.1	4.5
15	739	15.8	8.4	4.7
16	779.9	15	8.7	5.4
17	768.6	18	9.3	8.8
18	704	14.1	10.1	5.1
Mean	740.26	15.15	9.3	5.04

Table 3: Metrics of Handaxes

	Weight	MAX L	MAX B	Max. T	L/B	B/L Elongation	T/B Refinement	T/L
1	367.80	12.20	7.20	4.10	1.69	0.59	0.57	0.34
2	531.10	13.50	8.70	3.50	1.55	0.64	0.40	0.26
3	1671.80	19.80	13.00	8.50	1.52	0.66	0.65	0.43
4	622.50	15.40	9.00	4.00	1.71	0.58	0.44	0.26
5	1022.80	14.70	10.00	7.00	1.47	0.68	0.70	0.48
6	367.60	12.00	7.20	4.10	1.67	0.60	0.57	0.34
Mean	763.93	14.60	9.18	5.20	1.33	0.63	0.56	0.35
St Dev	505.86	2.88	2.16	2.04				

Hand axe: A total of 6 handaxes are found which are length wise ranging between 101mm-200mm.

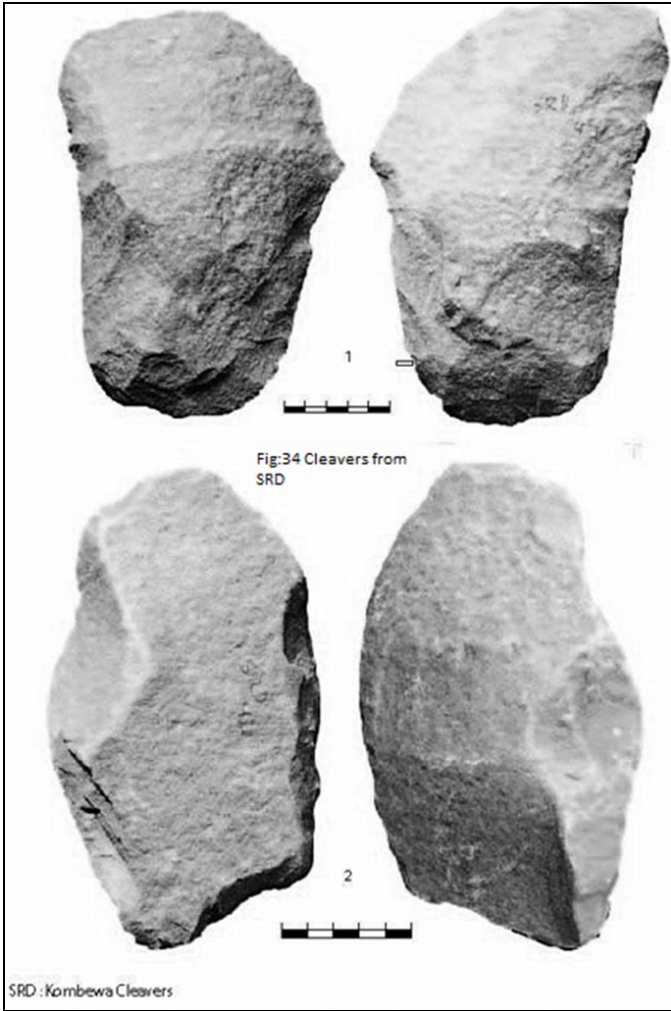


Fig 4: Large cleaver on kombewa Flake

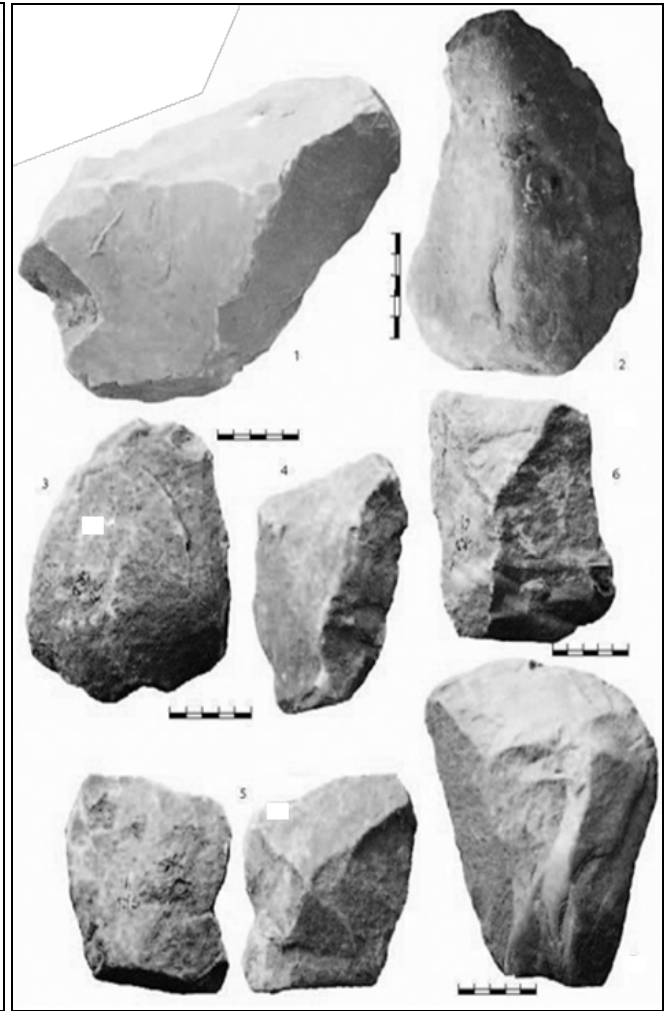


Fig 5: Large flakes

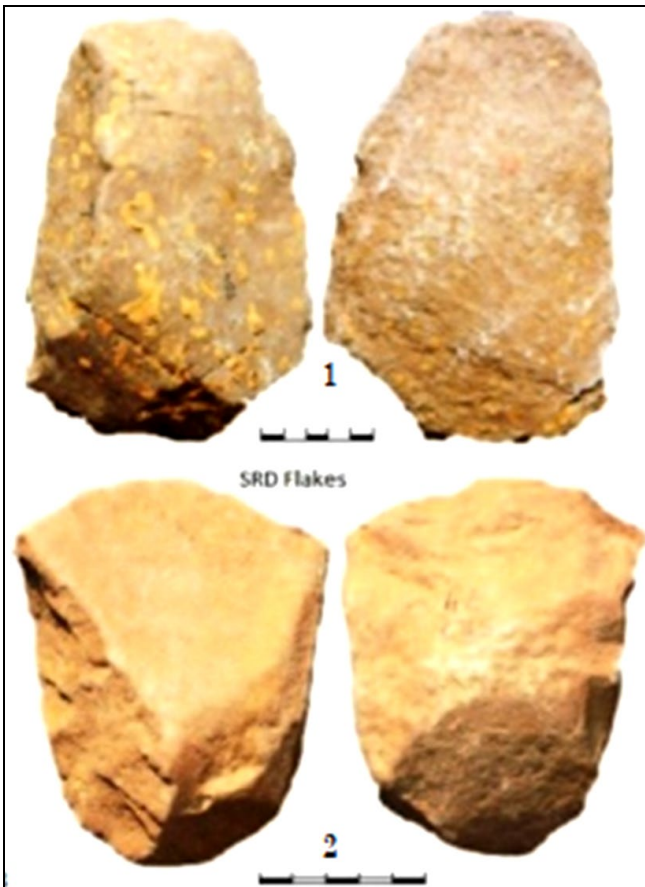


Fig 6: Large flakes



Fig 7: Large flakes

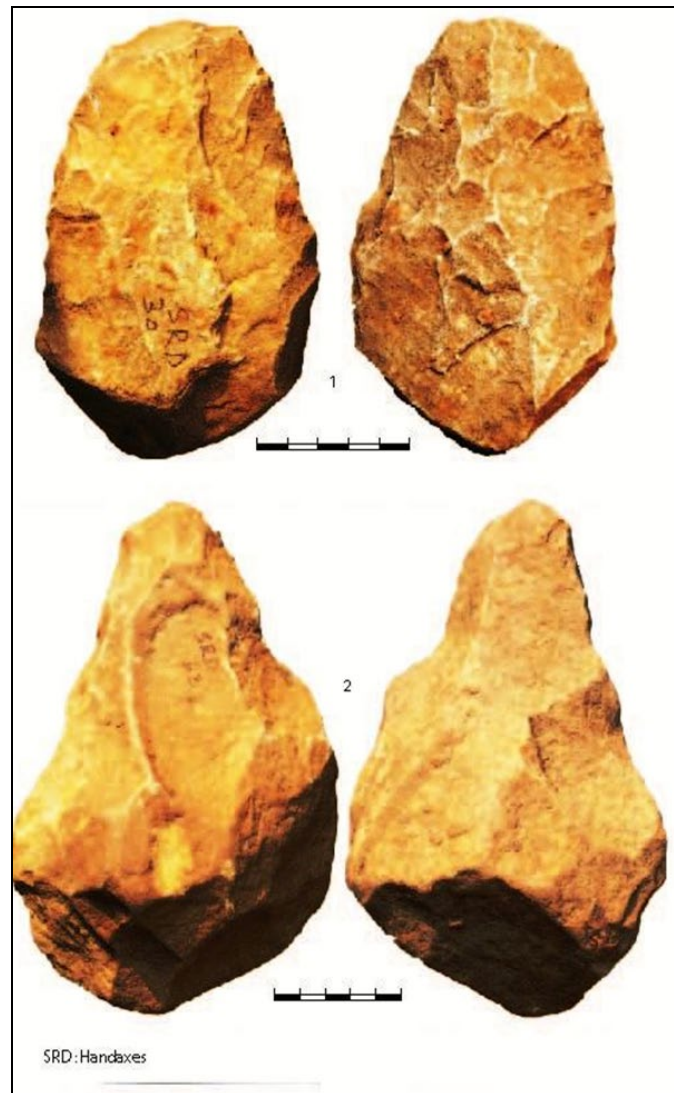


Fig 8: Handaxes

Large Flakes: Were they detached to Produce Cleaver?

Usually, medium-sized flakes are recorded in most of the Bargarh sites. However SRD has a substantial number of large flakes which were supposedly meant to be modified into large tool such as cleaver and handaxe. These are so visibly close to *cleaver shape* that there remains little doubt that these were produced with the sole purpose of turning them into cleavers. It is the only site where cleaver dominates handaxes with 3:1 in contrast to other localities where handaxes hold a dominant position with a ratio of 2.16:1. Keeping in view the cleaver dominating assemblage, the occurrence of considerable number of cleaver flakes at the site is justifiable. The flake blanks from the boulders seem to be removed with a preconceived idea of a certain shape which required very little labour to turn into a cleaver. Just a few flaking on the ventral and dorsal could be done to remove the thick platform area/bulb to make it holdable and symmetrical. Thinning of the bulb is a common trend in the cleavers of all BRG sites. The production of Entame, transverse and side flakes with broad distal ends makes the site unique. The site has yielded merely 24 flake tools in comparison to 64 flake blanks authenticating the priority was fixed for large flake production over the flake tools. It can be accepted that the site has not been explored to the fullest. It bears the immense possibility of retaining the early Acheulian Phase.

General Observations

Some observations on the assemblage of Samardhara are enumerated below:

- i). The flake tools at the site might be made on the *by-products* of bifaces. These small thick flake were used to produce retouched tools i.e.; scraper, denticulate, awl, notch etc.
- ii). Two cleavers on the Kombewa flakes show abroad shape with a thick but and controlled symmetrical splayed-out lateral edges that needed a few secondary flaking on the proximal to produce shapely cleaver. Similarly some handaxes made on Kombewa flake could be discernible on the basis of its controlled retouching, symmetrical shape and straight Profile.
- iii). The blanks for bifaces are large flakes (>10 cm).
- iv). The *chaîne opératoire* could not be reconstructed due to the nature of the site.

Overall study of the Samardhara assemblage testifies that the utilization of Slab edge and angular giant blocks to produce large flakes to finally turn them into cleaver and handaxe.. The site is found in semi-primary context thus the chances of the post-depositional disturbances cannot be ruled out. Besides of modern humans have played a damaging role as archaeologically potential areas are being cultivated and also being used as roads and railway track.

Keeping in view the size of the dormant quartzitic cores and the flake scar on them at SRD it definitely cannot be the work of one hominin as it requires a collective effort. This assumption indicates the earliest group activities in the first human cultural phase.

Acknowledgement

I am indebted to Prof Pradeep Kumar Behera to allowing me to study his material of Samardhara site. I sincerely thank him from the core of my heart

References

1. Behera PK, Premanand Panda and Neena Thakur 1996, Techno-Typological Analysis of Lithic Artefacts From Dari-Dungri Acheulian Sites, Sambalpur District, Orissa, *Man And Environment*, 21(2), 13-26.
2. Behera PK, Prakash Sinha, Neena Thakur. Barpadar: A late Acheulian Site in the Upper Jira river, Bargarh Upland, Orissa, *Man and Environment*, 2015, XI(1).
3. CASINI, Anna Iliana 2010 The meaning of "kombewa" method in Middle Palaeolithic: techno-economic analysis of lithic assemblages from Riparo Tagliente (VR), Carapia (RA), Podere Camponi (BO) and Fossato Conca d'Oro (MT) *Annali dell'Università di Ferrara. Museologia Scientifica e Naturalistica. Volume speciale*.
4. Deo, Sushama. Large Flake Acheulian from Moregaon, District Pune, Maharashtra, India. *Book of Abstracts. Saarc International Conference on Archaeology of Buddhism-Recent Discoveries in South Asia*. Colombo, 2012.
5. Madsen B and N Goren Inbar. Acheulean Giant Core Technology and Beyond: An Archaeological and Experimental Case Study, *Eurasian Prehistory*. 2004; 2(1):352.
6. McNabb JF. The large Cutting Tools from the South African Acheulian and the question of Social Traditions. *Current Anthropology*. 2004; 45(5):653-677.
7. Mishra A and BB Mishra. Soils of Bargarh District. *Orissa Review*, 2008, 36-38.
8. Mishra MK. Natural Wealth of Bargarh District. *Navratna Journal*, 2008, 28-34.
9. Mishra S. The Age of the Acheulian in India: New Evidence. *Current Anthropology*. 1992; 33(3):325-328.
10. Mishra S. Claire Gaillard, Sushama Deo, Mukesh Singh, Riza Abbas, Nitu Agrawal. Large Acheulian in India: Implications for Understanding Lower Pleistocene Human Dispersal. *Quaternary International*-223-224. 271-272, 2010.
11. Mishra S. The Indian Lower Palaeolithic. *Bulletin of Deccan College, PG and Research Institute*, 2006-2007, 66-67:47-94.
12. Owen W. The Kombewa Culture, Kenya Colony. *Man*. 1938; 38:203-205.
13. Pappu S. Excavations at the Palaeolithic site of Attirampakkam, South India. *Antiquity*. 2003a; 77:297: 1-5.
14. Petraglia M. Acheulian Landscapes and Large Cutting Tool Assemblages. In *The Evolution of Human populations in Arabia* ed. M.D. Petraglia and Bridget allchin: Springer, 2009, 103-115.
15. Senapati N and B Mahanti. *Orissa District Gazetteers: Sambalpur*. Cuttack, Orissa Government Press, 1971.
16. Sharon G. *Acheulian Large Flake industries: Technology, Chronology, and Significance*. London: BAR International Series, 2007.
17. Thakur N. Dharokhusum: A newly discovered site in Sambalpur District. In *New Horizons in History and Culture* ed. Benudhar Patra. Pratibha Prakashan, New Delhi, 2015.
18. Thakur N and Pradeep Kumar Behera. Palaeolithic Industries on the foothills of Lohara Reserve Forest, Bargarh Upland, Odisha. *Jagruti-Online Journal*. Kanchi University, 2015.
19. Thakur N. *A Study of Acheulian Industries of Bargarh Upland: With Special Reference to Jira River Valley*. Aayu Publications-N Delhi, 2023.