

## Animal Remains in Neolithic-Chalcolithic Period of Odisha: A Review

MANAS RANJAN PATTANAYAK<sup>1</sup> AND RANJANA RANI SINGH<sup>2</sup>

<sup>1</sup>Research Scholar, P.G. Department of Anthropology, Utkal University.

E-mail: [mp.2342@gmail.com](mailto:mp.2342@gmail.com)

<sup>2</sup>Assistant Professor in Anthropology, M.P.C. Auto. College, Baripada

**Abstract:** During the last three decades a number of excavations have been undertaken in Odisha highlighting the Neolithic–Chalcolithic phase. The present paper aims at compiling the animal remains of excavated sites. Needless to say, the hunting-gathering mode of subsistence gave way to settled agriculture and emergence of farming communities during Neolithic-Chalcolithic phase. This implies a changing man-animal relationship during this phase. In this paper an attempt has been made to establish interaction between the man and animal during the second millennium B.C. in Odisha, where an early farming culture flourished.

**Keywords:** Animal Remains, Chalcolithic, Excavation, Farming, Neolithic

**Received :** 05 October 2023

**Revised :** 26 October 2023

**Accepted :** 09 November 2023

**Published :** 30 December 2023

### TO CITE THIS ARTICLE:

Pattanayak, M.R., & Singh, R.R.  
2023. Animal Remains in neolithic-  
Chalcolithic Period of Odisha: A  
Review. *South Asian History, Culture  
and Archaeology*, 3: 2, pp. 233-246.

## Introduction

During the last three decades a number of excavations have been undertaken in Odisha highlighting the Neolithic–Chalcolithic phase (Basa 1994, 1999, 2000, 2013). The present paper aims at compiling the animal remains of excavated sites. Needless to say, the hunting-gathering mode of subsistence gave way to settled agriculture and emergence of farming communities during Neolithic-Chalcolithic phase. This implies a changing man-animal relationship during this phase. The present paper has two sections, a short account of the excavated sites of Odisha followed by a descriptive account of animal remains in various forms. Towards the end, an attempt is made of different man-animal relationship of Neolithic chalcolithic phase of Odisha. Animals play an important role in man's life. Man depends upon animals primarily for food and subsistence. These include animals of the wild and domesticated varieties, fish, insects, etc. In the beginning of Acheulian phase man had killed small land animals for his food. In subsequent periods the activities like trapping, snaring and catching of birds and fish was

witnessed. But the role of hunting began to decline in the beginning of Neolithic period as he was able to kill domestic animals for food and began using animal's milk as source of food (Pawankar 1995, Sahoo D and Mohanta 2003).

### *Neolithic-Chalcolithic Period of Odisha*

In Odisha the study on Neolithic-Chalcolithic Period began with the discovery of Neolithic artefact by P. Acharya 1923-24 in Baidyapur. But the excavation at Kuchai conducted by B.K. Thapar gave stratigraphic sequence of Neolithic layer for the first time. The emergence of Chalcolithic period came into lime light after the discovery of copper double axe from Baghrapidha in Mayurbhanj (Agarwal 1982:203; Basa 1994, 1999, 2000, 2013). Since then excavation conducted in Sankerjang (Dash 1986, 2008, Yule et al 2000) has given better knowledge about the Chalcolithic culture of Odisha. Subsequent excavations in sites like Golabai Sasan (Sinha 1993, 1997, 2000, Mohanty et al 2012), Bang-Harirajpur (Pattanayak 2013, Singh 2013, Basa et al 2014), Suabarei (Pattnaik 2016), Asuradhipa (Vaidya et al 2020), Deltihuda (Acharya et al 2017), Kuanr (Ray et al 2000), Hikudi (Behera and Thakur 2016), Khameswaripalli (Behera 2001, 2013, Hussain 2018), Subulia (Behera and Hussain 2017, Hussain 2018), Nuagarh-Asurgarh (Pradhan 2006, Hussain 2018), Bhejidihi (Pradhan 2000, Hussain 2018) and Kurumpadar (Behera 2002-03) have given evidences remains of Neolithic-Chalcolithic Period. Besides these explorations conducted on a wider scale in Coastal Odisha by Anam Behera (2013, 2019), especially at Gopalpur (Kar 2000) in Nayagarh district brought many new sites of Neolithic-Chalcolithic Period. Before going to discuss the various animal remains found in Neolithic-chalcolithic period of Odisha it is important to provide an outline of the exploration and excavation conducted in different parts of Odisha.

### *Exploration*

**Gopalpur:** The site of Gopalpur was explored by Department of Anthropology, Utkal University, Bhubaneswar. On the basis of ceramic remains the site has been identified as a Neolithic-Chalcolithic site. It has shown the similarities with the material recovered from Golabai Sasan (Kar 1995, 1998, 2000). From this site ceramic, lithic and animal remains were recovered. Animal remains included cattle, buffalo, nilgai, chital, wild pig and rhinoceros were lived around the area.

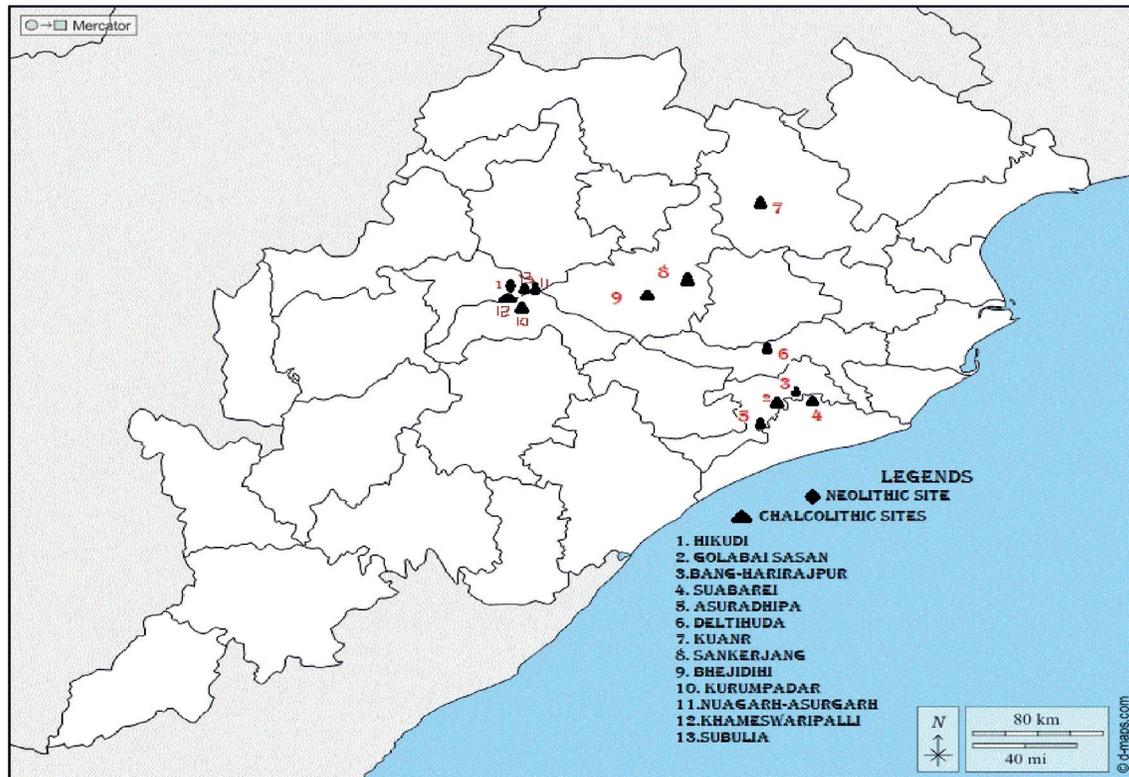
**Excavations:** As stated earlier excavation conducted at various sites gave the evidence of Neolithic-Chalcolithic period of Odisha. Among these sites Hikudi, Golabai Sasan, Suabarei have produced the evidence of Neolithic period. Bang-Harirajpur has produced the sequence of Neolithic-Chalcolithic period. Other sites are Chalcolithic period sites. Among these chalcolithic sites Kuanr and Bhejidihi have not produced any evidences of animal remains.

The ensuing paragraphs listed the short account of Neolithic-Chalcolithic excavated sites of Odisha.

**Hikudi** (20°5' 17.74" N and 83° 54' 14.09" E)

Hikudi is located on the left bank of the Mahanadi and situated about three kilometres north-east of the district headquarters of Subarnapur. The mound which spreads over an approximate area measuring 170 x 130m is located towards the northern side of the village Hikudi (Behera and Thakur 2016).

Trial excavations at the site revealed two phases of human habitation, Period-I (Neolithic) and Period-II (Early Historic). Among the recoveries the site has produced wattle daub structure, lithic, ceramic, animal, bone tool remains and terracotta objects.



Map 1: Distribution map of Neolithic-Chalcolithic sites of Odisha (map credit: d-maps.com)

### Golabai Sasan (20° 1' 45" N and 85°33' 22"E)

The site of Golabai Sasan is located on the bank of the river Mandakini in Khurda district. It was excavated by Archaeological Survey of India during December 1991 - April 1992 and by Deccan College Pune and University of California, Los Angeles in 2010-11 (Sinha 1993, 1997, 2000, Mohanty *et al* 2012). On the basis of material recovery, the excavator has divided the sequence into three cultural phases, Period I - Neolithic, Period II - Chalcolithic and Period III - Early Iron Age. The antiquities are ceramic remains, bone tool remains, floral remains, animal remains, lithic remains, terracotta objects, beads, structural remains, copper and faience, skeleton of an adult girl.

### Bang- Harirajpur (20° 08'45" N and 85°43'0" E)

The site of Bang-Harirajpur is located Delanga block of Puri District of Odisha. The Site was excavated by Department of Anthropology, Utkal University in collaboration with Centre of Heritage studies, Bhubaneswar, Deccan College Post graduate research Institute, Pune and Odishan Institute for Maritime and South East Asian Studies (OIMSEAS) Govt. of Odisha. It was directed by Prof K.K. Basa and Prof. R.K. Mohanty. Excavation was conducted for two seasons i.e. in 2012-13 and 2013-14. The site has two cultural periods, Period-I Neolithic and Period-II Chalcolithic (Pattanayak 2013, Singh 2013, Basa *et al* 2014). The excavation conducted has yielded ceramic remains, lithic artifacts, one copper spiral wire bead, terracotta objects, beads, animal remains, 18 post holes in a half-circle as well as remains of hearth. Besides, three skeletons - one male, one female and a child - were recovered. The preliminary analysis of animal remains reveals those of some domesticated and wild varieties. They are cattle, buffalo, chital and wild pig. For further identification and anatomical analysis the animal remains were put under study. So the culturewise animal sequence yet to be prepared.

### Suabarei (Lat. 20° 09' 14" N; Long 85° 48' 33"E)

Suabarei is located in Poporangapanchayat of Pipili tehsil in Puri district. Cultural deposit of Suabarei has been divided into two periods, Period-I Neolithic and Period –II Chalcolithic Period, which is further divided into three sub phases viz. Period-IIA- Incipient Chalcolithic, Period-IIB- Mature Chalcolithic and Period-IIC- Late Chalcolithic (Patnaik 2016). The Chalcolithic period material are lithic, animal, Bone tool, floral, Ceramic remains, Painted sherds, Terracotta objects, Beads, Copper, and structural remains included.

**Asuradhipa:** The site is located in the Kanchilo village of Narangarh Panchayat of Khurdha district. It was excavated during 2019-20 season. It was excavated by Deccan College Post Graduate & Research Institute, Pune and Odishan Institute for Maritime and South East Asian Studies (OIMSEAS), Govt. of Odisha (Vaidya *et al* 2020). The site has yielded remains of Chalcolithic period which included structures, ceramic, lithic, animal and bone tool remains.

### Deltihuda (20° 32' 33" N and 85° 41' 50" E)

Deltihuda site is located at Talagarh village in Kulailo Gram Panchayat of Athagarh Block, Cuttack District Odisha. Department of History, Ravenshaw University, Cuttack conducted excavation in the year 2014-2015 (Acharya *et al* .2017, Bihari 2021). On the basis of pottery assemblage, the Chalcolithic period is divided into three major sub-phases: Early Phase, Middle Phase and Last Phase. The cultural assemblages include ceramic and lithic remains, beads, terracotta objects, animal remains, plant remains and human skeleton of male and a pot burial.

### Sankerjang (20°52'08"N and 84°59' 19"E)

Sankerjang is situated 300m. South-east of the Jamnia and north of a usually dry stream called the Pandiani which is a tributary of Brahmani in the district of Angul. The site was excavated by the State Archaeology of Orissa (Dash 1989: 22-25; Yule *et. al*.2000). The antiquities are lithic remains, copper bangles, beads, human skeletal remains and teeth and as well as the first radio carbon date of the state.

### Bhejidihi (20° 57 03" N and 84° 22' 17" E)

The archaeological site locally known as *Purunadihais* located on the left bank of the San-Karandi Jor in the northern side of the present village of Bhejidihi in Athmallick *tehsil* of Angul district. It was excavated by S. Pradhan of Sambalpur University in the year 1998-99. Habitation deposit was divided into two different human occupational level viz. Chalcolithic and Early Historic by the excavator (Pradhan 2000, Hussain 2018,). The material remains included in this period are lithic, ceramic, bone tool remains, painted sherds, beads, terracotta objects and copper objects.

### Kurumpadar (20° 51' 10.1" N and 84° 07' 03.9" E)

The archaeological site locally known as Kurumpadar is located on the right bank of the Mahanadi about one kilometer west of the present village of Tentulipali in Boudh district. The excavation has revealed three cultural periods without any major abandonment at the site viz. Late Chalcolithic, Iron Age and Early Historic (Behera 2002-03: 96). The unearthed material remains included in this period are ceramic remains, animal remains, terracotta objects and painted sherds.

### Nuagarh-Asurgarh (20°26'4.87" N and 84°0.5'3E)

The site is situated at a distance of about six kilometers south-east of the Tahasil headquarters of Birmaharajpur in the district of Subarnapur. S. Pradhan conducted trial excavation of the site in 1999

(Pradhan 2006, Hussain 2018). The cultural periods are divided into two period viz. Period I has two sub-phases, Period IA & IB. This period IA belongs to late Chalcolithic period. The cultural material belongs to this period are lithic, ceramic and animal remains, painted sherds, bone artifacts, terracotta remains and beads.

### Khameswaripalli (20° 50' 14.6" N and 84° 00' 10" E)

The site Khameswaripali is situated about 4 kilometers south of Birmaharajpur tehsil headquarter, in the Subamapur district. The site was excavated in 1996-97 and 2006-07 by P.G. Department of History, Sambalpur University (Behera 2000-01, 2013:195-207, Hussain 2018). On the basis of stratigraphic evidences of cultural material, the site has divided into three periods with two sub-phases in period-I viz. Chalcolithic (Period I), Iron Age (Period II) and Early Historic (Period III). In period-I the findings are lithic, ceramic, animal, plant, terracotta and bone tool remain and stone bead.

### Subulia (20° 54' 13.04" N and 84° 9' 25.86" E)

Subulia is situated in Birmaharajpur subdivision of Subamapur district, Odisha. During Feb-March 2015, a trial trench was excavated (Behera and Hussain 2017, Hussain 2018). The site was divided into two cultural periods namely late Chalcolithic (Period-I) and Iron Age (Period-II). The Chalcolithic period material remains are ceramic remains, bone point, terracotta beads, and pottery disc, animal and plant remains.

## Animal Remains

The animal remains were found from different site in Odisha as a result of exploration and excavation. For better understanding these remains were further divided into different categories like bone remains, bone tools, terracotta figurines, ornaments and burials in the following table.

**Table 1: List of Excavated sites of Neolithic-Chalcolithic Period with Animal Remains**

Site	Bone Remains	Bone Tools	Terracotta Figurines	Ornaments	Animal Burials	References
Hikudi (HKD)	P	P	P	-	-	Behera and Thakur 2016
GolabaiSasan (GBS)	P	P	-	P	-	Sinha 1993, 1997, 2000, Mohanty <i>et al</i> 2012
Bang- Harirajpur (BHR)	P	P	P	-	-	Pattanayak 2013, Singh 2013, Basaet <i>al</i> 2014
Suabarei (SUA)	P	P	P	P	P	Pattnaik 2016
Asuradhipa (ADP)	P	P	-	-	-	Vaidya <i>et al</i> 2020
Deltihuda (DLT)	P	P	-	-	P	Acharya <i>et al</i> 2017, Bihari 2021
Sankerjang (SAN)	-	-	-	P		Dash 1986, 2008, 2009 Yule <i>et al</i> 2000
Kurumpadar (KRM)	P	-	-	-	-	Behera 2002-03
Nuagarh-Asurgarh (NAG)	P	-	-	-	-	Pradhan 2006, Hussain 2018
Khameswaripalli (KHM)	P	P	-	P	-	Behera 2001, 2013, Hussain 2018
Subulia (SBL)	P	P	-	-	-	Behera and Hussain 2017, Hussain 2018

P= Present, - =absent

Neolithic Period

The Neolithic period animal remains are represented from the excavation at Golabai Sasan and Hikudi. These were divided in the form of bone remains, bone tools and terracotta figurines. Neolithic period at Suabarei has not produced any evidence of animal remains.

### ***Bone Remains***

A few skeletal remains of animals were recovered from Hikudi but details are awaited. At Golabai Sasan bone pieces of antlers and semi mineralized bones were found which might have served as raw material for making bone tools found in this period.

### ***Bone Tools***

**Table 2: List of Bone Tools Recovered**

<i>Site</i>	<i>Bone Point</i>	<i>Piercer</i>
Golabai Sasan	-	P
Hikudi	P (broken)	-

The piercer made on bone and some bone pieces with secondary working were found at Golabai Sasan. One broken part of bone point was recovered from excavation at Hikudi.

### ***Terracotta Figurines***

From the excavation at Hikudi two small figurines (ox/goat?) and one bull figurine were recovered. These are ill fired and medium fabric. One animal figurine is hump less, from the four leg front right leg and back left leg is half broken, but the penis is prominent. The other one has prominent hump, but back side is broken. The head of a bull figurine which is recovered from the surface nearby the trench is good in texture and fabric. It is also ill fired. It is decorated with punch mark around its neck. The mark suggests artistic temperament. These objects were represented as a religious object (Behera and Thakur 2016: pg- 94, Garnayak 2008: pg 121).

### ***Chalcolithic Period***

The animal remains of Chalcolithic period were reported from the sites like Golabai Sasan, Bang-Harirajpur, Suabarei, Asuradhipa, Deltihuda, Sankerjang, Kurumpadar, Nuagarh-Asurgarh, Khameswaripalli and Subulia. Remains were divided into categories of bone remains, bone tools, ornaments, terracotta figurines and animal burials.

### ***Bone Remains***

Evidences of animal bone remains were gathered from the excavations at Golabai Sasan, Bang-Harirajpur, Suabarei, Asuradhipa, Deltihuda and Khameswaripalli. The bone remains were put under study, the detailed report of Bang-Harirajpur excavation is awaited. The other sites like Nuagarh-Asurgarh, Subulia and Kurumpadar have yielded some animal remains but details are not available. The animal remains are divided into three categories i.e. land animals, aquatic species and birds. The remains are recovered in both charred as well as uncharred varieties.

### ***Land Animals***

Land animals are divided into two categories viz. domesticated and wild animals.

### Domesticated animals

The domesticated varieties of animals like cattle (*Bosindicus*), buffalo (*Bubalusbubalis*), goat/ sheep (*Capra/Ovis*), pig, dog, and cat are found form different excavations.

**Table 3: List of Domesticated Animals Recovered**

Site	Cattle	Buffalo	Goat/ Sheep	Pig	Dog	Cat
GBS	P	-	P	-	-	-
SUA	P	P	P	P	P	P
ADP	P	P	P	P	P	-
DLT	P	P	P	-	-	-
KHM	P	P	P	-	-	-

From the above table it is noticed that cattle, humped cattle, buffalos, goat/sheep are the common animals which were domesticated in different areas of Odisha. While pig and dog remain were found only in Suabarei and Asuradhipa Excavation, cat is the only domesticated pet which was found only in Suabarei Excavation. The long bones were also used as the tool for hunting as well as fishing.

### Wild Animals

Among the wild animals, wild buffalo (*Bubalusarnee*), sambar (*Cervus unicolor*), blackbuck (*Antilopecervicapra*), nilgai (*Boselaphustragocamelus*), wild boar or pig, deer, spotted deer (*Axis axis*), jungle cat (*Felischaus*), porcupine (*Hystrixindica*), peafowl (*Pavocristatus*), gazelle, common squirrel, hare, rat, chital, chausinga, wild ungulates and elephant were recovered.

**Table 4: List of Wild Animals Recovered**

Site	Buffalo	Sambar	Black buck	Nilgai	Wild Boar/ Pig	Deer	Elephant	Antelope
GBS	-	-	-	-	P	P	P	P
SUA	P	p	P	P	P	P	P	P
ADP	P	P	P	P	-	-	-	-
DLT	P	p	P	P	-	-	P	-
KHM	-	-	P	-	P	-	-	-

As the table shows varieties of wild animals were roamed around different parts of Odisha. These wild animals were mainly hunted and consumed for meat. Notable mention here is evidence of elephant which found from GolabaiSasan, Suabarei and Deltihuda.

### Aquatic Species

The following table contains a list of aquatic species recovered from excavation at Odisha.

**Table 5: List of Aquatic Species Recovered**

Site	Fish	Turtle	Mollusc	Shark teeth
GBS	P	-	-	P2
SUA	P	-	-	P
ADP	P	P	P	-
DLT	P	P	-	-
KHM	-	-	P	-

The aquatic species are fish, turtle, mollusc and shark teeth. The fish remains are recovered from GolabaiSasan, Suabarei, Asuradhipa and Deltihuda excavation. The Ganga soft shell turtle has been recovered from Asuradhipa and Deltihuda excavation. The mollusc has been found from Asuradhipa and Khameswaripalli excavation. Shark teeth are recovered from GolabaiSasan and Suabarei excavation.

### **Birds**

Birds of common crane, black partridge, cattle egret and pond heron are recovered from Suabarei excavation. Some remains of birds were noticed from the site of Asuradhipa, but the details were awaited.

### **Bone Tools**

The following table contains the list of bone tools recovered from different excavation conducted in Chalcolithic period of Odisha.

**Table 6: List of Bone Tools**

<i>Site</i>	<i>PO</i>	<i>PI</i>	<i>SH</i>	<i>N</i>	<i>CT</i>	<i>AN</i>	<i>S</i>	<i>EN</i>	<i>BU</i>	<i>BO</i>	<i>A</i>	<i>BL</i>
GBS	P	P	P	P	-	-	-	P	P	P	P	P
BHR	p	-	P	P	-	-	-	-	-	P	P	-
SUA	P	-	P	P	P	P	P	-	-	-	-	-
ADP	P	-	-	-	-	-	-	-	-	-	-	-
BHJ	P	-	-	-	-	-	-	-	-	-	-	-
NAG	P	-	-	-	-	-	-	-	-	-	-	-
KHM	P	-	-	-	-	-	-	-	-	-	-	P

**Abbreviations:** PO- Point, PI- Piercer, SH- Spearhead, N- Needle, CT- Canine Teeth, AN- Antler, S- Stylus, EN- Engraver, BU- Burnisher, BO- Borer, A- Awl, BL- Blades.

The above table shows the recovery of bone tools from different excavation in Odisha. The bone tools include points, piercer, spearhead, needle, canine teeth, antler, stylus, engraver, burnishers, borer, awl and blades. These are generally made on the semi mineralized bones of humped cattle, sheep, goat, antlers. Majority of tool types are made up from the long bones of the animals. A broken part of the bone tool has been recovered from the excavation at Subulia, but author has not given its detail. From the excavations carried out so far, GolabaiSasan has produced many varieties of bone tools like points, piercer, spearhead, needle, engraver, burnishers, borer, awl and blade. Next to GolabaiSasan, Suabarei has produced second largest number of bone remains like points, spearhead, needle, canine teeth, antler and stylus. Besides these adzes, chisels, digging tools are found in GolabaiSasan. Point is the only category, which is found in all excavated sites of Odisha. In Golabai Sasan the excavator divided the entire bone tool collection into three categories: Hunting tools, Domestic tools and digging tools (Sinha 2000: pg- 332-333). Hunting tools include points, spearhead, barbed spear head, single row harpoons and long points. Domestic tools consisted of needles, engravers, burnishers, adzes, blades, scrapers, side scrapers, borers, awls, and denticulated blades. Probably these were used for harvesting. Digging tools represented by chisels, long tools and pointed edges.

### **Ornaments**

Ornaments were recovered in the form of ear stead, skin rubber, bangle and bead.

**Table 7: List of Ornaments Recovered**

Site	Pendant	Ear stead	Skin Rubber	Bangle
GBS	P	P	P	-
SUA	P	-	-	
KHM	P	-	-	P(2) ivory

**Pendant:** Some specimens of pendant made of long fish bone have been found from the excavation of Golabai Sasan. The bones are natural except for the hole. These were possibly used by the women's as pendants. Ivory pendant in rectangular shape is also found at Golabai Sasan. Two Shark tooth pendant have been recovered from excavation at Suabarei. In Khameswaripalli few specimens of pendant made of mollusc shell have been found (Behera 2001, 2006).

**Ear Stead:** It was recovered from Golabai Sasan excavation. These objects are made on backbone of fishes. They are circular in shape and decorated with holes on the sides.

**Skin Rubber:** One skin rubber has been found from Golabai Sasan excavation. It is made from the back bone of tortoise.

**Bangle:** Two bangles made on ivory recovered from excavation at Khameswaripalli (Behera 2013)

**Beads:** The **shell bead** is found from the excavation like Sankerjang and Nuagarh-Asurgarh. One bead made on mollusc shell has been found at Khameswaripalli excavation.

### **Terracotta Figurines**

**Animal figurines** consist of Bull, one horn of bull, puppy, dog, and horse. Both Bull figurine and horn of bull was recovered from Bang-Harirajpur excavation (Basaet al 2014: p 4). Other figurines like Puppy, dog and Horse were recovered from Suabarei Excavation (Patnaik 2016: pg-217-220).

**Bull:** One hand modeled bull figurine recovered from Bang-Harirajpur excavation.

**Bull Horn:** One horn of bull recovered from the Bang-Harirajpur excavation.

**Puppy:** Small hand modelled semi-oxidized animal figurine having flat base. It was recovered from Suabarei Excavation.

**Dog:** Hand modelled fine fabric and well-fired animal figurine which hind part is broken. It was recovered from Suabarei Excavation.

**Horse:** This object was recovered from Suabarei Excavation. Recovered head portion decorated with wavy incision marks to show the anatomical features (*maine*) in its snout and neck. Left ear of the object is intact while its right ear broken. The broken snout part of the figurine has been mended.

### **Burial of Animal**

An interesting feature of the burial of dog and cow were recovered from the excavation at Suabarei and Deltihuda respectively.

### **Dog Burial in Suabarei**

The unique finding during the excavation at Suabarei was of a dog burial associated with miniature pots and other animal bones which might have been kept as offering goods indicating strong attachment of the inhabitants of Suabarei with dog (Patnaik 2016: pg-239). The evidence is also substantiated from the finding of terracotta dog figurines from the excavation. It is one of the important findings that reflect man-animal relationship in the Chalcolithic community.

### *Cow Burial in Deltihuda*

Another notable finding of human pet relationship is known from the excavation of Deltihuda where one fractional cow burial has been unearthed. The burial contains the mandible portion of the cow. Two small burial pot of Dull Red Ware were also recovered containing burial offering. The presence of charred cow bones and burial suggest use of cattle in both food and sacred animal. Their belief in afterlife is reflected from this context (Bihari 2021:pg-118).

### *Human-Animal Relationship*

With the above discussion in perspective an attempt has been made here to understand the different facets of human-animal relationship during the Neolithic-Chalcolithic period of Odisha. The animal remains comprise more than 34 species consisting mammals, birds, reptiles, fish, molluscs. The diversity and wide spectrum of species of animal remains represented at the sites suggests the significance of these animals in various aspects and activities of the denizens of Neolithic-chalcolithic of Odisha.

### *Subsistence Economy*

Animals were played important role in subsistence economy. There was a major change in Palaeolithic to Mesolithic period is the issue of domestication of plant and animals. So domestication helps in agricultural activities implying a settled way of life and emergence of early farming communities. The evidence of domestication is known from recovery of animal remains. Domesticated animals were also a source of meat consumption. Bone remains of sheep, goat and pig implies the production of meat in the locality. Recovery of domesticated animals like cattle, buffalo and goat imply the consumption of milk. Use of buffalo, cattle shows the agricultural activities and dominant role of food economy. Animal dung might have been used in traction and agriculture. Despite the emergence of domestication of animals during Neolithic-Chalcolithic phase man didn't stop hunting wild animals. The evidences of Wild animals simply the dense vegetation of the area and their presence in the palaeo environment. The wild variety of animals suggests that these animals or birds were hunted near the sites. These have butchered in the same locality or even brought to the settlements where they are processed and consumed. As much as 12 varieties of wild species have been recovered from different excavations. The findings of elephant at Golabai Sasan, Suabarei and Asuradhipa show the living of largest mammal in coastal area. As Joglekar and Patnaik (2016) suggest the elephant bones were not used for consuming but they were collected and brought to the site as raw material.

The remains of **aquatic varieties** of turtle, mollusc and shark teeth imply the knowledge of fishing. The **bird** species suggests the consumption of meat in people's diet.

### *Rich Bone Tool Industry*

An important aspect of human animal relationship is known from Recovery of rich bone tool industry. Not only did they hunt but also made some excellent tools from the bones of animals. Different points, spearheads reveal about the small game as well as big game hunting. Fish hook implies the fishing activity. Needle shows the making of net and trap for hunting and fishing and making clothes for people. The tools might have been used for harvesting. Digging tools probably used for horticultural activity in the vicinity of hut or house. The rich bone tool industry implies an important craft activity of the contemporary society.

**Pet:** Dogs and cats were kept as pet from long ago. It is also evidenced from the excavation at Suabarei where no cut marks were found in the bones of dog and cat (Joglekar and Patnaik, 2016).

**Personal Adornment:** The ornaments like pendant, ear stud, skin rubber, bangle and beads were used for the personal adornment of the people. These were made from fish bones, mollusc, shell, tortoise and ivory. Mainly the ornaments were made from sea products except the ivory.

**Ranking of Class:** On the basis of animal bone remains one may try to understand the ranking of society. Upper section of society might have been used the ivory product. As it is a precious material a special craft is needed to entertain the special bangle as well as pendant. Ornaments made on fish bones, mollusc, shell, tortoise are implies of lower section of society.

**Children Amusement:** Objects like figurines were probably made for the amusements for children. These are like today's toys.

**Ritualistic Offerings:** Badamet *al* (2001) has argued that many species were used for religious offerings. During certain rituals large numbers of animals were sacrificed. Many castes and scheduled tribe population of Odisha has serve the offering in the form of buffalo, sheep, and goat as per their wealth. As per his view this has the age old tradition which follows till recently.

**Burial Practice:** The burials show the unique affection towards the pet animal in peoples mind. Cattle burial indicate sacred animal. Cattle flesh might be used for food. The presence of offerings with burial suggests beliefs of people in animal's afterlife.

## Conclusion

Neolithic-Chalcolithic period offers one of the best areas for archaeological studies and animal represented either by skeletal remains or findings provides a window for interaction of the people who not only acquired the skill and command of the livestock and better sedentary but also, they excelled in art and craftsmanship. During the phase of early farming community man has depended upon the agriculture, hunting and fishing as their main food sources. Rearing and herding was commonly carried out at the settlements. The relationship between human and animal reflects in the activity of personal adornment, pet, ranking of class, children amusement, exchange, their belief in burial practice and different offerings they made towards the final respect to pay animals. The growth of socio-cultural, religious and economic life of early farming communities is highly influenced by the exploitation of animal remains by the peoples since Neolithic-Chalcolithic period.

## Acknowledgement

We are grateful to our teachers Prof. Kishor K. Basa and Sri Daitari Sahoo for guiding us during the preparation of this paper. We are also thankful to authors of different research journals, research papers, books, excavation reports and Ph.D. thesis, which helps to analyse the core aspect of this paper.

## References

- Acharya S.K., L.K. Mishra, U. Mishra, S.R. Sahoo, V.M.-Tripathy, R.K. Mohanty and P.P. Joglekar. 2017. "Preliminary Report on the Excavation (2014-2015) at Deltihuda, Odisha", in *Man and Environment* XLII (1): 90-99
- Acharya, P. 1923-24. *Annual Report of the Archaeological Survey of India*, pp. 100-101
- Agrawal, D. P. 1982. *Archaeology of India*, London: Curzon Press.
- Badam, G. L., P. K. Behera and J. Mishra. 2001. "Chalcolithic Animal Economy at Khameswaripalli, Middle Mahanadi Valley, Orissa: A Bioarchaeological Perspective", in *Current Science*, 80(7), 828-30.
- Banerjee R. D. 1930. *History of Orissa*, Vol. 1, Calcutta: Prabasi Press.

- Basa K.K, D. Sahoo, R.K. Mohanty, S.Vaidya. 2014. "Archaeological Excavation at Banga of Harirajpur, DistPuri, Coastal Orissa: A preliminary report", in *The Tribal Tribune, Vol- 6, Issue-2*, pp.62-67
- Basa K.K. 1994. "Problems and Perspectives in Archaeology of Odisha", India Occasional paper-4, Bhubaneswar, *D.S.A., Department of Anthropology, Utkal University, Bhubaneswar*
- Basa K.K. 1997. Archaeological Heritage, in *Comprehensive History and Culture of Odisha Vol 1, Part I* (P K Misra Ed.), 18- 45. New Delhi: Kaveri Books.
- Basa K.K. 1999. Neolithic and Post-Neolithic Cultures of Orissa, in *Orissa: History, Culture and Archaeology* (S. Pradhan Ed.), pp. 9-31. Delhi: D.K Printworld.
- Basa K.K. 2000. "History of Archaeology in Orissa", in *Archaeology of Orissa*, (K.K. Basa and P. Mohanty Eds.), pp. 368-391. Delhi: PratibhaPrakashan.
- Basa K.K. 2013. "Prehistory of Orissa", in *Imaging Orissa*, edited by Hermann Kulke, Nibedita Mohanty, Gaganendra Nath Dash & Dinanath Pathy.
- Basa, K.K. and P. Mohanty (ed.). 2000. *Archaeology of Orissa*, New Delhi: PratibhaPrakashan.
- Behera A. 2013. Newly Discovered Archaeological Sites in Coastal Odisha, *Odisha Review* May 2013: 61- 65.
- Behera A. 2019. Recently Discovered Archaeological Sites of Odisha: An Analysis. *Orissa Historical Research Journal*, vol. LVIII No. 1&2, Odisha State Museum, Bhubaneswar pp-34-46
- Behera P.K., S. Hussain 2017. Subulia: A Late Chalcolithic Settlement in the Middle Mahanadi Valley, Odisha, *Indian Journal of Archaeology*, Dec 2017: 37-53
- Behera, P.K. 2000-01. Excavations at Khameswaripalli- a Proto Historic Settlement in the Middle Mahanadi Valley, Orissa: A Preliminary Report, *Pragdhara* 11: 13-34.
- Behera, P.K. 2002-03. Excavations at Kumersingha and Kurumpadar - the Iron Age Settlements in the Middle Mahanadi Valley, Odisha: Results of the First Season's Work, *Pragdhara* 13: 87-103.
- Behera, P.K. 2006. Investigations into the Mesolithic and Post-Mesolithic Settlements in the Middle Mahanadi Valley, Odisha, in *Art and Archaeology of Odisha: Recent Perspectives* (S. Pradhan Ed.), pp. 1-62. Delhi; Aryan International.
- Behera, P.K. 2013. 'New Light on the Neolithic and Chalcolithic Evidences from the Middle Mahanadi Valley, Orissa'. *Neolithic Chalcolithic Cultures of Eastern India*. Ed.in Dikshit, K.N. New Delhi: The Indian Archaeological Society, pp. 184-208.
- Behera, P.K. and N. Thakur (2016) 'Hikudi: A Neolithic Habitation site on the Middle Mahanadi Valley Region, Odisha,' in JeebanPatnaik (ed) *Glory of Archaeology, Art, Epigraphy and Protection of Cultural Heritage, Dr. Phanikant Mishra Felicitation Volume*, New Delhi: Kaveri Books: 90-97.
- Behera, P.K. and S. Hussain 2017. Subulia: A Late Chalcolithic Settlement in the Middle Mahanadi Valley, Odisha, *Indian Journal of Archaeology* 2(4); 37- 53.
- Behera, P.K., D.K. Behera, G.V.R., Prasad, T.R. Routray and R.K. Choudhury 2007. Radiocarbon dates from the middle Mahanadi valley, Odisha, *Man and Environment* XXXII(2), pp. 41-46.
- Bihari S. 2021. Chalcolithic & Early Historic Cultures of Coastal Odisha, unpublished Ph.D. dissertation Submitted to Ravenshaw University.
- Dash, R.N. 1986. Sankerjang: A Chalcolithic site in Orissa. *The Orissa Historical Research Journal* 32: pp. 99-125.
- Dash, R.N. 2000. The Neolithic Culture of Orissa: A Typo-Technical Analysis, in *Archaeology of Orissa*, (K.K. Basa and P. Mohanty Eds.), pp. 201-221. Delhi: PratibhaPrakashan.

- Dash, R.N. 2008. Historiography of Palaeolithic Archaeology in Orissa. In Ashok.K.Patnaik (ed) *Utkal Historical Research Journal*, vol. XIX, 2006, (pp. 5-22), Utkal University, Vanivihar.
- Garnayak D.B. 2008. Prehistoric Art in Orissa, Unpublished Ph.D. thesis submitted to Sambalpur University
- Harvey, E. L., D. Q. Fuller, R. K. Mohanty and B. Mohanta 2006. "Early Agriculture in Orissa: some Archaeobotanical result and field observations on the Neolithic", in *Man and Environment* 31 (2): 21-32.
- Hussain S. 2018. A Study of Early Settlements in The Middle Mahanadi Valley, Odisha, Unpublished Ph.D. dissertation submitted to Sambalpur university.
- Joglekar P.P., J.K. Patnaik 2016. "Animal Remains from the Chalcolithic Contexts at Suabarei, District Puri, Odisha", in *Bulletin of the Deccan College Research Institute*, Vol. 76 (2016), pp. 29-44
- Kar, S.K. 1995. Further exploration at Golpalpur, Odisha *Puratattva* 26: 105- 106
- Kar, S.K. 2000. Gopalpur: A Neolithic-Chalcolithic Site in Coastal Orissa, in *Archaeology of Orissa*, (K.K. Basa and P. Mohanty Eds.), pp. 368-391. Delhi: PratibhaPrakashan.
- Kar, S.K., K.K. Basa and P.P. Joglekar 1998. Explorations at Gopalpur, District Nayagarh, Orissa, *Man and Environment* XXIII (1): 107-114.
- Kingwell-Banham, E, E.K. Harvey, R.K. Mohanty D.Q. Fuller 2018. "Archaeobotanical Investigations into GolbaiSasan and Gopalpur, Two Neolithic-Chalcolithic Settlements of Odisha", in *Ancient Asia*, 9: 5, pp. 1-14
- Mishra U. and S. Bihari 2019 "Understanding Nature and Attributes of Early Historical Orissa: An Archaeological Perspective", in *Odisha Historical Research Journal*, VOL. LVIII No. 1&2, pp-1-33 Odisha State Museum
- Mohanty, R.K., P.P. Joglekar, T. Thakuria, S. Ray, S. Vaidya, C.S. Midhun, R. Wanapat, V. Sabnis, G. Bedekar, T. Padhan and Y. M. Mallinathpur 2012-2013. Preliminary Report on Exploration at GolabaiSasan, Talpada and the Surrounding Area, Dist. Khurda, Odisha, 2010-11, *Bulletin of the Deccan College Research Institute* 72-73: 153-166.
- Pattanayak, M.R. 2013. *Archaeological Excavation at Harirajpur, District Puri, Coastal Odisha*, unpublished M.Phil Dissertation Submitted to Department of Anthropology, Utkal University.
- Pattnaik J. 2016. Excavation at Suabarei, Archaeological Survey of India, Excavation Branch-IV, Bhubaneswar.
- Pradhan, S. 2000. Archaeological Investigations in the Karandi Valley, Orissa, *New Aspects of History of Orissa* IX: 27-42.
- Pradhan, S. 2006. Excavation at Nurgarh-Asurgarh: A Preliminary Report, in *Art and Archaeology of Odisha: Recent Perspectives* (S. Pradhan Ed.), pp. 63-78. Delhi; Aryan International.
- Ray R., Kundu A.K., and N. Bhattacharya 2000. Chalcolithic Cultural Remains from a Site near Kanjipani, Orissa. In *Archaeology of Orissa* (K.K. Basa and P. Mohanty (ed.)). (pp.356-367). New Delhi: PratibhaPrakashan.
- Sahoo D. and B.K. Mohanta 2003. Man-Animal Relationship in Orissa: Gleaned From Excavated Animal remains. *Orissa Review*, Dec 2003 (pp-11-13)
- Sahoo D. and K.K. Basa 2013. Neolithic and Chalcolithic culture of Odisha: an Overview. *Neolithic Chalcolithic Cultures of Eastern India* .Ed.in Dikshit, K.N. New Delhi: The Indian Archaeological Society, pp.173-183
- Singh, R.R. 2013. *A Study on Neo-Chalcolithic Ceramic Remains from Harirajpur, District Puri, Coastal Odisha*, unpublished M.Phil Dissertation Submitted to Department of Anthropology, Utkal University.
- Sinha, B. K. 1997. *Chalcolithic Culture of Orissa: A Case study of GolabaiSasan*, unpublished Ph.D. dissertation submitted to Sambalpur University.
- Sinha, B.K. 1993. Excavations at GolbaiSasan, District Puri, Odisha, *Puratattva* 23: 48-50.

- Sinha, B.K. 2000. Golbai: A Protohistoric Site on the Coast of Orissa, in *Archaeology of Orissa* (K.K. Basa and P. Mohanty Eds.), pp. 322-355., Delhi: PratibhaPrakashan.
- Thapar, B. K. 1985. *Recent Archaeological Discoveries in India*, Paris: UNESCO.
- Vaidya, S, R.K. Mohanty, S.K.Patnaik and others 2020. 'Preliminary Report on the Excavation at the Chalcolithic Site of Asuradhipa, Kanchilo village, DistrictKhurda, Odisha,' *Man and Environment XLV* (2): 34 – 42.
- Yule, P., Rath, B.K. and Hojgaard, K. 2000. Sankarjang: A Metals Period Burial Site in the Dhenkanal Uplands of Orissa<sup>1</sup>. In *Archaeology of Orissa*, (K.K. Basa and P. Mohanty Eds.), pp. 285-321. Delhi: Pratibha Prakashan