
Site Catchment Analysis of Balathal

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Abstract

The excavations at Balathal (Udaipur district, Rajasthan), have produced evidence in respect to the origin of early farming community of Central India and brought to light traces of infant urbanization or proto-urbanization. There is also strong indications of a class-structured society and craft specialization. Site catchment analysis of Balathal will help to assess economic potential of the site; exploitation of natural resources, the nature of interaction with the sites located in the catchment area of Balathal and beyond and also determine the reasons for location of the site in a particular environmental niche.

Introduction

Balathal is one of the important sites in Mewar region of Rajasthan. The extensive excavations carried out between 1993 and 2000 at the site have produced vast amounts of data. This excavation took back the antiquity of village life in the region to 3000 BC and enabled identification of three phases of the Chalcolithic namely Early, Mature and Late with traces of infant urbanization or proto-urbanization (Sinha Deshpande and Shinde, 2006). Some of the other contributions of the excavations include new domestic and public architecture, strong evidence for class-structured society and craft specialization (Sinha, 1999). For the first time the Early Historic phase was systematically and extensively excavated, which produced the evidence of large-scale use of iron implements suggesting its important role in the economy of that period (Misra *et al.*, 1997).

Site Catchment analysis is the attempt to work out a full inventory of a site's contents and their resources. Site's catchment enables the archaeologist to speculate/determine such things as environmental resources and likely subsistence strategies available to inhabitants. (Gary L. Christopherson, Patrick Barabe, Peter S. Johnson; 1987)

This technique was devised by Vita Finzi and Eric Higgs (1970) and they define Site Catchment as the relationship between technology and natural resources lying within the economic range of individual archaeological sites.

Site catchment of an archaeological site is an area, of potential or actual resources, natural or human, exploited by a group. The size of the area varies according to the size of the site and the available resources, but is usually limited to a reasonable travel distance. They more precisely represent the economic and political zones where ancient humans made their living.

The threshold limit of the Catchment area for a hunting gathering community is 2 hours walking distance, which is an area of 10kms radius from the site and for an agricultural community is one hour walking distance that is an area of 5kms radius from the site. The intensity of exploitation decreases as the distance from a site increases.

Site catchment analysis also incorporates the study of cultural and social systems. Archaeologists try to reconstruct the daily activities carried out by ancient communities. The exploitation of landscape by a particular society is primarily dependent upon the technological progress. Variation in the landscape inevitably leads to a variation in the economic value of economic produce due to transport and exchange of goods and also due to location of important economic resources both natural and cultural.

Work done on the site catchment analysis

The concept of site catchment analysis has been employed at a number of Prehistoric sites/regions in widely separated countries like – England (Ellision and Harris, 1972); Bulgaria (Denneal and Webly, 1975) Yugoslavia (Barker, 1975); Italy (Barker, 1975); Mexico (Flannery, 1976) etc.

In India work on site catchment analysis is still in its infancy. R. S. Pappu (1988) first employed this concept of site catchment at the site of Inamgoan, in Maharashtra and later at the Harappan site of Kuntasi in Gujarat with M.K. Dhavalikar (1993). The other works on these aspects include Shinde in central Tapi basin, Maharashtra (1990) and Debasri Dasgupta's at the Site of Gilund, Udaipur district Rajasthan (2004).

Site and Environment

Balathal (24° 43' N; 73 ° 59' E) is located around 40 km. northeast of Udaipur on the eastern margin of the modern village of Balathal and covers an area of less than two hectares (Misra *et al.*, 1995). Extensive excavations were carried out by the Department of Archaeology, Deccan College Pune and the Institute of Rajasthan Studies, Rajasthan Vidyapeeth. The site is away from the Banas River but it is close to the large depression spread over an area of 1 sq. k.m., which may have acted as a lake during the monsoon in the Chalcolithic and Early-Historic time as it is today and supported the water requirements of the settlement in the past.

Ecologically this region is characterised by fertile black cotton soil and a semiarid climate. The climate of this region is extreme both in summer and winter. The annual average rainfall is about 700mm. mostly during the unpredictable summer monsoon. Important crops of the area include wheat, sugarcane, mustard, millet and maize. This semiarid regions

typical vegetation includes a variety of grasses, thorny bushes like *ker* (*Capparis deciduas*), *khejdi* (*Prosopis spicigera*) and *babul* (*Accacia arabica*). There is also an abundance of pastureland around most of the sites in this region. Thus the most important factors which appear to have attracted the early farmers were the proximity of perennial source of water, fertile soil and abundant pasture.

Environmental Changes

A number of attempts have been made for the reconstruction of Palaeoenvironment of the area such as Singh et al (1971), Krishnamurty et al, (1981), Enzel et.al,(1999) and Shinde, s recent work in the Sambhar lake (2001).

Singh (1971) and Enzel, s (1999) climatic data totally negates the idea of improved climatic situation which led to the rise of Indus Culture and Chalcolithic cultures such as Ahar. Further Enzel stats that it was not the summer monsoon which was responsible for the increase of water in lake levels during the wetter phase but a higher winter perception, which could be the potential source for changed hydrological conditions in the middle Holocene period.

Environment and landscape experienced by the Chalcolithic people was different from the today's environment . The most recent work of palaeoclimatic reconstruction of Rajasthan have produced the following phases of the climatic conditions

Cal yrs 6200 B.C. -4100 B.C. Wet phase

Cal yrs 4100 B.C. -3800 B.C. Dry phase

Cal yrs 3800 B.C. -2200 B.C. Wet phase

Cal yrs 2200 B.C. – till present. Wet phase begins to decline (Shinde, 2001).

Palaeoclimate of western India has undergone series of dramatic changes either advancing or declining since the beginning of Holocene (10,000 B.C.). These Changes continued through out the Chalcolithic Period and stabilized only towards the end of Chalcolithic period which is more or less similar to today's climatic conditions.

Early Historic Environment- The archaeological records from Balathal points out to slowly creeping aridity from the Chalcolithic to the Early Historic. It is reflected in the faunal assemblage such as decrease in the deer species and increase in antelope species The palaeoclimatic and the archaeological work shows that climate became increasingly arid during in the Early Historic period (Thomas 2000:149).

Antiquities recovered from Excavation at Balathal

Excavation at Balathal revealed a Chalcolithic period stretching from 3000 to 1500 BC and an Early Historic period dated to 5th - 3rd century BC and the antiquities revealed from both are discussed in the following section.

Chalcolithic Period

This period is characterised by well-planned structures including massive fortified enclosure of stone as well as bricks. The evidence of pottery kiln and most probably small copper furnaces testify to the importance of craft during the Chalcolithic times.

Clay objects- A variety of ceramics both coarse and fine include white painted Black and Red ware, Tan ware, Chocolate slip ware, Reserve slip ware, Painted buff ware and Thin Red ware in the fine variety with shapes like carinated bowls and small globular pots. The coarse ware includes the Grey ware and Red ware in sturdy and basic shapes like storage jars and cooking pots.

T.C. objects comprise beads, animal figurine, stoppers, weights and gamesmen.

Stone objects- include saddle querns, mullers, rubber stone, hammer stone, and a small number of lithic tools such as blades, flakes and fluted cores of chalcedony, agate, carnelian as well as steatite, carnelian and faience beads (Misra *et al.*, 1997).

Shell Objects – Fragments of shell Bangles, Beads and spoon.

Copper Objects- include choppers, knives, razors, chisels and tanged arrowhead. These objects have been manufactured from copper sheets beaten into the desired shapes (Misra *et al.*, 1997).

Floral remains- Evidence of floral remains suggest practice of agriculture. Evidence of cultivated grains such as wheat, barley, rice and variety of pulses such as kodo millet, panicum millet, green gram, black gram and common pea in the floral remains suggest the presence and practice of agriculture (Kajale, 1996).

Faunal remains- Animal remains suggest the practice of animal husbandry and the domesticated animals include bones of cattle, sheep, goat, and buffalos in large quantity. Wild game also formed a small part of people's diet (Joglekar, 1996).

Early Historic period

After the Chalcolithic period the site was abandoned for a long time till the Early Historic period. Large scale burning activity and a couple of conical clay furnace suggest iron working was the main industry during this phase. The people lived in wattle and daub houses and the floors were made of mud and stone rammed together.

Iron working- The most important evidence during this phase is that of iron working in the form of furnaces with iron slags and abundant objects like nails, arrow head, lamps, needle, hoe, spatula, knife etc.

Clay objects- Ceramics in this phase are all coarse and include plain Red ware, Grey ware, Black ware and the shapes are globular pots, jar pots, pear shaped pots, carinated, pots, dishes, basins, cups, lids, bowls, storage jars, lamps and some toy pots.

TC drain pipes and Ring wells, beads, hopscotches, votive lamps, bangle pieces, ear studs, wheels, votive tank and pendants etc were also found.

Stone objects- Discs, beads, mullers, blades, flakes of quartz, sandstone, steatite, chalcedony, chert, amethyst, schist and agate.

Other *Miscellaneous objects* include:

Shell objects- beads and disc and bangle pieces.

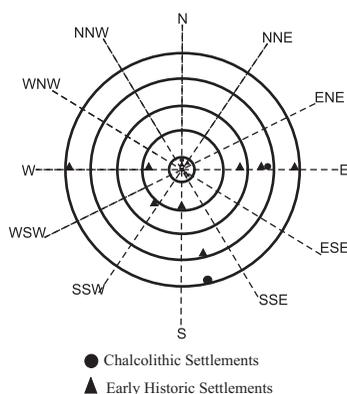
Glass objects-bangle pieces, beads, ear rings etc.

Ivory objects- bangle pieces

Site Catchment Analysis of Balathal

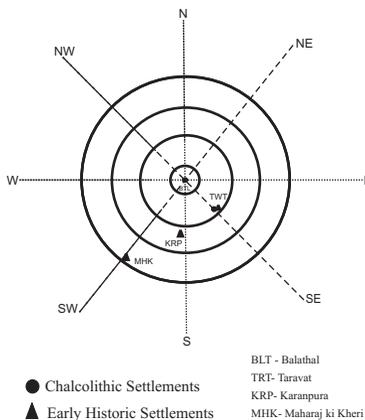
The site of Balathal was selected for the site catchment analysis mainly because the extensive excavations were carried out at the site. The excavations have produced vast amount of data, both from the Chalcolithic as well as Early Historic levels. The other important site Gilund in the same region has been subjected to a detailed site catchment analysis which led to the better understanding of Chalcolithic economy and its trading pattern with its satellite settlements. Balathal being one of the important Ahar cultural sites and this type of study was not carried out at Balathal this site is selected for the study. However the site of Balathal being a small, five km as the catchment area of the site was considered. The area around the site was divided into concentric circles of five km. The area was divided into North, North West, North North-West, North West West, West, South West, West South, South South West, South, South East, East East North, Northeast and North North East. The entire areas along these lines were surveyed with the help of Toposheets and Village-to-Village survey method. The data thus collected was combined and each concentric circle from 0-5 km was analysed. In the radius of 5 kms around Balathal it is estimated that 80% of the land is arable, 15% can be categorised as pasture land and 5% as barren land. The soil is also very fertile (black cotton soil) and the ancient farmers must have intensively cultivated this area.

Chalcolithic Satellite settlements within the radius of Balathal



In the radius of 5 kms there are several agricultural and pastoral satellite settlements. These sites are identified on the basis of cultural period, location, size, surrounding ecological conditions and the ceramic assemblage. The results of the explorations are given in the following chart

Fig. 1: Chalcolithic settlements within the radius of Balathal site.



Early Historic Satellite settlements within the radius of Balathal

Early historic settlements are identified on the basis of the occurrence of plain pottery like Grey ware and Red ware. The assemblage contains typical Early Historic bowls and designs on the pottery. Occurrence of iron slag on the field is an important evidence to identify the Early Historic settlements. The sites are listed in the following chart (Fig.- 2).

Fig. 2: Early Historic settlements within the radius Balathal site

Discussion and Conclusion

Site catchment analysis of Balathal has helped to understand the way resources were exploited, to assess the economic potential of the site and the nature of interaction with the sites located in the catchment area of Balathal and beyond. Availability of natural resources and feasibility for communication are the two main factors, which governed the location of this important site.

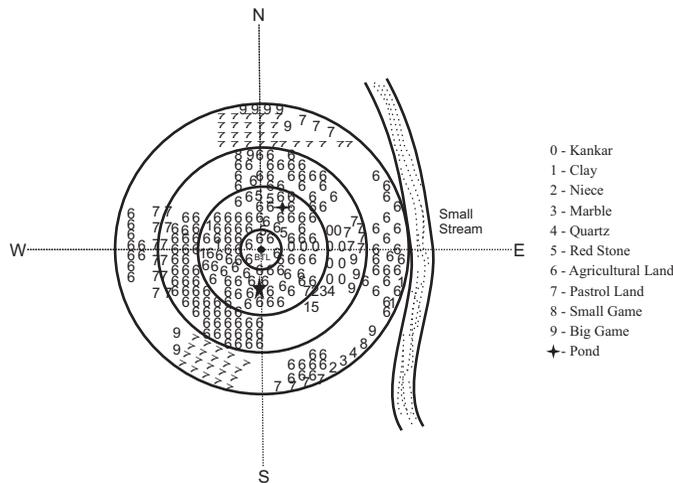
Balathal is situated between the two other important sites of Ahar culture in Mewar region namely Gilund and Ahar. Gilund has been identified as a regional centre and a food production site (Debasri,2004) and Ahar has been established as a copper artefacts manufacturing site (Sankalia, 1969). As the Gilund was the regional Chalcolithic centre some sort of exchange would have been there between Balathal and Gilund.

The survey around the site of Balathal shows that comparatively during Chalcolithic phase there were less satellite settlements compared to the Early Historic phase, and also some of the settlements such as Taravat, Karanpura and Maharaj ki Kheri are away from the catchment area of Balathal but still must have played an important role in the Balathal economy or as an supportive settlements for economic exchange. This study demonstrates the importance of settlement at Balathal and supports the evidence obtained from the excavations.

Chalcolithic phase

Site catchment analysis of Balathal has given clear idea of raw material utilised from the catchment area and relationship with the satellite settlements. It also shows the material procured from the outside.

Chalcolithic people of Balathal practiced mixed economy based on farming, stock raising and occasionally hunting but agriculture was the main occupation. within the catchment area of 5 km. there are three agriculture settlement one on the 1/2 km. North East,



second on 1/2 km. South West and third on 4 km. west. The less number of satellite settlements are there because Balathal is a small site and resources of catchment area were sufficient for settlers. Agriculture was main source of subsistence and Balathal was amidst of fertile black cotton soil, which is very fertile. Along with the agricultural land good pasture land is also available on the northern side of the site (fig.3).

Towards 5 km. south east from Balathal there is evidence of stone tool manufacturing settlement at Son talai(Fig.1,3)., in the form of microlithic debitage of Chalcedony, Chert, Banded Agate, Quartz and fragment of Garnet. The source of quartz out crops is locally available. The stone core making activity is done here and supplied to the main settlement for production of stone tool (Fig.3-4). Stone tool manufacturing was a rare phenomenon as the excavation evidence suggest. Balathal can be considered as a Chalcolithic trading centre as large number of precious garnet half finished beads are found at Balathal. These beads could have been one of the items of trade.

This settlement is surrounded by the jungle of Babul Khejdi and also supports wild animals such as hare and antelopes. This settlement must have served the dual function of stone tool manufacturing and hunting. Even today the settlers do the occasional hunting. This supports the hypothesis that hunting was done occasionally as the analysis of wild animal bones found in the excavations suggests (Thomas and Joglekar1996)

Other stones like chalcedony, chert, carnelian, agate etc. which are not locally available were acquired by trade. For this purposes they had established very good relations with the contemporary cultures that flourished on the periphery of the Ahar Culture area such as chalcedony, carnelian and chert may have been acquired from Gujarat through the Harappans also the Malwa region is rich for Chalcedony.

The site of Tarawat 10 km. southeast of Balathal does not come in the catchment area of Balathal. It is an agricultural settlement situated near the seasonal stream. This site may be acted as supportive settlement for Balathal. Some of the agricultural and craft products exchange may be done here (Fig 2).

The higher stony ground to the north of the low cultivable land supports a variety of

grasses ,thorny bushes such as ker (*capparis decidua*) and trees like Khejri (*prosopis spicigera*) and Babul (*Accacia Arabica*) these provide fodder for cattle, sheep, goats and camels the principal domestic animals of the farmers which appears to have attracted the early farmers to this proximity of perennial source of water, fertile soil and abundant pasturage.

Excavations at Balathal yielded abundant of terracotta objects, as well as large amount of locally made pottery and mud-bricks used in construction of houses, some of these can be locally manufactured as the fine quality clay is available in the vicinity of the site as evident from the natural depression area near the site and some other seasonal streams were also source of clay for Chalcolithic and Early Historic phase such as Govindpura and Dharta rivers which are tributaries of Banas River etc. (Fig. 5). But now days pottery making activity is stopped in the vicinity of Balathal site and it is slightly shifted to the Vallabhnagar Tehsil which has two or three ponds. These ponds are good source of clay so pottery and brick making activity is done here.

Stones which are used for construction or making other stone objects some of these are present in the vicinity of Balathal site such as Granite Gneissic, Marble, Schist etc. These stones might have provided raw materials to the Chalcolithic farmers for preparing stone objects such as hammer stones, rubber stones, sling balls, saddle querns, stone tools and also used for construction purposes. The sand on the bed of Berach River is full of mica. Pebbles of marble, basalt, quartz are found all along the Berach River.

The evidence of pottery kiln and most probably small copper furnace testify the importance of craft during the Chalcolithic times.

Balathal had also established trade contacts with the other regions for acquiring material, which is not available locally. Large amount of copper may have been obtained from the Khetri region of Western Rajasthan through their contemporaries the Ganeshwara-Jodhpura culture people. May be they acquired gold from Karnataka as the Karnatka is the only known source of gold in through the Neolithic and Deccan Chalcolithic, semi-precious stones from the Deccan and Gujarat and conch shells and marine fish from the Saurashtra coast.

Early Historic Phase

Evidence of iron smelting furnace, plenty of iron slags and a large amount of iron objects from excavations at the site suggests iron working was main occupation at the Balathal site in the Early Historic period. They obtained iron from Dariba mines 18 km from the site of Balathal; in this cultural period the site of Balathal appears to be an important iron working centre as the satellite settlement 700 m Northwest of the Balathal which consist iron slag's and melted iron also supports this idea. Agriculture and pastrolisam were equally important for the Early Historic people They practiced agriculture and pastrolisam by setting up large number of satellite settlements. Within the catchment area of Balathal there are four agricultural settlement, four agro-pastoral settlements, one pastoral settlement. This was interesting; as it appears that the main site was an important manufacture centre, where most of the people were busy in craft activities. They had very little time for agriculture This means someone had to supply them food grains in exchange for craft products. This was

achieved by setting up farmstead, agro pastoral and pastoral camp around the site and also establishing good relation with other close by large and independent sites such as Taravata, Karanpura and Maharaj ki Kheri. (Fig.2-4).

Agriculture was also one of the important source of subsistence as the evidences of carbonised grains from excavations suggests. Early Historic farmers cultivated Wheat, Barley, variety of Millets, Pulses, Oil seeds etc. Four purely agricultural settlements and four agro-pastoral settlements support this hypothesis. Today around Balathal region two types of crops are grown- summer (*karif*) and winter (*rabi*). Summer crops include makka (maize), jwar, urad, mungfali, guwar, tilli, and bhindi. Winter Crops are wheat, mustard, gram, barley, brinjal, tomato, carrot, pea, sakarkand, methi, palak, etc. These are the main crops grown by modern farmers in the catchment area of 5kms of Balathal site. The agriculture is completely dependent on both winter and summer rainfall. Change or disturbance of either of the two leads to major economic and cultural crisis. In the past however the natural depression close to the site must have been deeper and is likely to have retained rainwater throughout the year supporting the agriculture. The winter crops however are raised solely with the help of well irrigation. Even today the same practice is continued in Balathal village.

Pastoralism played an equally important role in the economy of Balathal in the Early Historic period. Good quantity of pasture land is available in the catchment area of Balathal. Some sites close to the pastureland might have been established for the exploitation of these resources. They can be identified as herding units, occupied for a short duration by a small group of people who stayed there for a couple of months with their flocks of cattle and sheep/goats. Four sites were pastoral in nature in the catchment area. The wild animals, which were found in the catchment area of 5kms, are jackal, fox, nilgai, rabbit, duck etc. Domestic animals such as ox, cow, buffalo, goat, sheep, dog, hen etc. are very common in this region. Long and short grasses of different varieties are available here as the fodder for wild as well as domesticated animals (Fig.5).

An agro-pastoral mode of life existed during both the cultural periods and they were dependent on the agriculture and domestication of animals for their subsistence. Both the domestic and wild animals contributed to the subsistence system of Balathal. But the contribution of wild animals in subsistence was negligible. However in the lower layers especially in the Chalcolithic phase there is increase of wild animal remains. Bones of nilgai, four horned antelop are more numerous than those of deer species suggests arid condition in the region particularly in Early Historic period. The wild life was more plentiful during the Chalcolithic period. In the domesticated animals Cattle population was vary high. Hunting was done occasionally at Balathal as the analysis of wild animal bones found in the excavations suggests that they indulged in hunting occasionally (Thomas and Joglekar1996).

Some settlements such as Taravat, Karanpura, Maharaj ki Kheri (Fig.2-4) are situated ten to twenty km. far from Balathal. The actual function of these sites is still not identified. But may be some of the craft products manufactured at Balathal would have been traded with these sites in exchange of food grains and some other raw materials which is not available around Balathal but present in the vicinity of these sites.

The source of glass has still not been identified.

The study of the site catchment at Balathal has not only brought to light new satellite settlements, but has enabled reconstruction of the exploitation pattern and strategy, long distance trade and interactions, overall economic and social conditions during both the Chalcolithic and Early Historic cultural periods.

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