

SYNOPSIS

The aim

The aim of this research is to study the lithic assemblages belonging to different phases of Harappan civilization to better understand this civilization and other contemporary Chalcolithic cultures which flourished during the third millennium BC in Gujarat. To understand the evolution and development of lithic technology the lithic assemblages of preceding Mesolithic period, whenever present at a selected site, were also studied. This research is based primarily on studying lithic assemblages belonging to carefully selected five sites, namely, Loteshwar, Datrana, Bagasra, Shikarpur and Pithad. Emphasis is put on the role played by lithic artefacts in the economic and technological processes associated with the development of urbanism. Specific aspects of technology and raw materials are explored in order to distinguish between regional craft traditions, resource areas and trade/exchange network associated with these.

Introduction

The state of Gujarat has a unique Chalcolithic cultural pattern. Till recently, it was thought that Harappans migrated here during the Urban phase of the civilization. Recent research and a plethora of new data have forced scholars to rethink this hypothesis. There were already indigenous Chalcolithic traditions (Anarta, Pre-Prabhas, Padri etc), flourishing in Gujarat during the late fourth/beginning of third millennium BC which influenced the establishment of Urban phase of the civilization in this area (Ajithprasad 2002). It has also been shown after intensive archaeological studies that the Urban phase itself had two cultural strands: the Classical Harappan and the Sorath Harappan. Besides, unlike at other places, the civilization did not come to an abrupt end in Gujarat, instead it transformed slowly into a rural agricultural and pastoral society (Rao 1963).

In studying Harappan civilization through its various material remains till date, emphasis has been put on presence of different kinds/types of ceramic assemblages. This is due to fact that changes in style and type of pottery occurred in response to social, economic and technical demands and for this reason pottery is closely integrated with the development of a civilization. This approach though useful has its

limitations, since it misses the importance of other craft items and their production and exchange in the Harappan economic set up. Study of specialized crafts which are thought to reflect the occupational specialization, urban segregation and stratification can throw a lot of light on the socio-political and economic structure of a civilization (Kenoyer 1992). Study of craft items, including lithic blade tools is therefore important for a comprehensive understanding of cultural development. This study focuses upon the role of lithic blade implements in the Harappan cultural development in Gujarat.

Major objectives of this research

1. To determine if the regional diversity found in ceramic assemblages is reflected in the lithic assemblages that are associated with each of the various Chalcolithic cultures of Gujarat.
2. To look into the availability of raw materials for tool making. This helped to understand the existence of networks for procurement and trade of raw materials and also throw light on the initial processing and subsequent distribution of the finished product. This was done through an in depth study of procurement and transformation processes of the raw material, actual production process of the tools and distribution processes of the finished artefacts.
3. To examine if the economic changes associated with the changing cultural pattern (beginning of agriculture, its subsequent sustenance and its continuation) are reflected in the lithic assemblages.
4. Gujarat has a number of regional Chalcolithic cultures. As is apparent the Urban-Harappan culture developed and spread amongst these. The study of stylistic and technological continuity/discontinuity observed in the lithic assemblages associated with these is an important objective.
5. Over all, the study focuses on the role of lithic blade implements in the cultural development in Gujarat and how well the result of the studies could be used for a comprehensive understanding of the Harappan cultural ethos in general.

Organization of thesis

The organization of the thesis is as following.

Chapter 1: Introduction

This chapter includes an introduction of Mesolithic and Chalcolithic cultural development in Gujarat. It briefly reviews the evolution from hunters-gatherers to pastoralists and finally to farmers and the transformation associated with them. Here is discussed the beginning of settled way of life and the beginning and spread of one of the major civilizations of the world, namely the Harappan civilization.

Chapter 2: Methodology and Site Selection

This chapter incorporates methodology proposed for the study and site selection; its merits and limitations. The method adopted in the proposed study comprises of analyzing carefully selected lithic assemblages from cultural periods spanning from Mesolithic to the end of Chalcolithic phase in detail. A discussion about the geography of the region, criteria which were adopted for the selection of the sites, their environmental setting and regional diversity has been done here.

Chapter 3: Lithic Analysis

This chapter consists of an introduction about lithic analysis. A brief history of lithic studies in South Asia is provided as a backdrop. The analysis and results of lithic assemblages found from the five major selected sites of study, Loteshwar, Datarana, Bagasra, Shikarpur and Pithad is provided. Different types of tools from these selected sites are compared and analyzed.

Chapter 4: Raw-material Acquisition Pattern

This chapter reviews raw material acquisition pattern adapted by different sites. The patterns of exploitation and distribution of these raw materials is examined. A comparison of source areas versus production centers is also part of this chapter.

Chapter 5: Conclusion

This chapter includes the results, discussion and the final conclusion about the objectives dealing with the role of lithic tools in a diachronic perspective.

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STATEMENT – I

(Statement showing the particulars, on which the work is based, the discovery of new facts and of new relationships between facts observed by others and how the work tends to help the general advancement of knowledge.)

The term Chalcolithic describes a period where the discovery of copper brought major changes while continuing the significant dependence on lithic tools. However in studies of Chalcolithic cultures lithics have been neglected. lithic assemblages were given less importance and were most of the time clubbed under ‘minor antiquities, other antiquities or small finds’ (Rao 1963, Joshi 1990, Dhavalikar *et al* 1996, Bala 2003, Endo *et al* 2012). This mindset can be seen in the fact that the total number of lithic implements studied by various scholars (Kenoyer 1984, Cleland 1977, Inizan & Lechevallier, 1997, Raczek, 2007) is less than a thousand. Present study, by systematically analyzing more than 13,000 lithic tools and nearly a lack fragments of lithic debitage belonging to five sites, which date from the beginning of 7th millennium BCE to 2nd millennium BCE, has tried to show how lithic assemblages can provide important information regarding the spread and development of a civilization as well as the evolution of a technology. Following are the major findings of present work.

1. Loteshwar (Patan Taluka, North Gujarat, Mesolithic- Anarta culture site), the site which has been dated to be the earliest site of Mesolithic period (7000 BCE) as well as Chalcolithic period (3600 BCE) in Gujarat has shown a continuation of lithic technology for over almost 5000 years. Quartering technique of lithic tool manufacturing was observed to continue here throughout the cultural history of the site.
- One of the main differences observed between the lithic assemblages of both the period was the significant increase of tools during Chalcolithic period. Contrary to popular believe it was seen that Mesolithic blades are longer than Chalcolithic blades.
 - The Chalcolithic period also shows evidences of a few Rohri chert blade fragments and beads of lapis lazuli which strongly suggest some level of contact/interaction

either directly or indirectly with sites belonging to Indus valley of modern Pakistan, and Afghanistan.

- The raw material exploited during both the periods at the site follow a similar pattern. No nearby raw material source has been identified till now.
2. The excavation at Pithad/Jaidak (Jamnagar district, Saurashtra, Mesolithic - Sorath Harappan site) in 1992 unearthed a rich Mesolithic substratum at the site. Quartering technique for manufacturing of tools was observed from here. Majority of the lithic assemblage recovered during this season belong to the Mesolithic period. It was observed that contrary to popular belief the geometric tools increase during Chalcolithic period. This conclusion was reinforced by the data recovered during excavations of 2006-2007. Here too it was found that the geometric tools are significantly higher than non-geometric blades of Chalcolithic period.
- Significantly, Chalcolithic period at Pithad, though contemporary to Urban Harappan do not show the presence of blades of Rohri chert, reinforcing its regional character as a Sorath Harappan site.
 - Raw material exploitation from both the period at Pithad more or less follows a similar pattern. A number of raw material sources have been identified previously in the vicinity of the site and it is possible that these were exploited during the Mesolithic and in the Harappan times.
3. Datrana (Patan district, North Gujarat, Early Harappan site) has given evidences of being a mammoth blade factory site belonging to the beginning of third millennium BCE. This probably is one of the earliest blade factory site found in Western India.
- The earliest evidence of crested guiding ridge technique for mass manufacturing of blades in Gujarat has been seen from here.
 - Beginning of crested guiding ridge technology along with the evidences of Early Harappan Sindh type pottery from the site indicates contact with the Sindh region of modern day Pakistan.

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- A raw material source (Ratan tekri) has been identified about 20km northeast of the site. It is possible that this stone blade manufacturing factory site was set up at this place to exploit this nearby raw material source.
4. Bagasra (Rajkot district, Saurashtra, a Urban Harappan site) is a small industrial site and gives evidences of being self sufficient as well as importing specific type of lithic tools.
- Crested guiding ridge technique was used at the site to manufacture blades from the earliest phase of the site.
 - Evidence of exploitation of blades made of Rohri chert was also found to be in vogue from the earliest levels of the site. These blades were seen to follow the standardization observed for Rohri chert blades from other contemporary sites and were also broken to maximize their utilization. Though it was seen that these blades were being imported from Rohri chert sources, a few cores and a few fragments of lithic debitage of this particular chert gives evidence of local manufacturing of tools too.
 - Tools, geometric as well as non-geometric, manufactured out of locally available raw materials were also found and a number of raw material sources have been identified around the site, which most probably were exploited to make these tools.
 - A couple of blade manufacturing areas inside as well as outside the fortified area of the site were also identified based on the distribution of tools and lithic debitage.
5. Shikarpur (Kutchh, a Urban Harappan site) has given evidences of being one of the Urban Harappan sites from where extremely large numbers of blades made of Rohri chert have been recovered.
- A couple of cores and a few fragments of lithic debitage bear evidence of some amount of local manufacturing of Rohri chert at the site itself.
 - Tools made out of locally available raw material are very few in number.

- The majority of lithic debitage found from the site belonged to raw material which was favoured for the manufacturing of beads.
 - Mardek bet, a raw material source situated in the Little Rann of Kutchh or Khandek near Rapar, most probably were the raw material sources for the locally available crypto crystalline siliceous rocks found from the site.
6. By observing the distribution pattern of lithic tools it was seen that each site had its own unique character. While Datrana and Shikarpur had a preponderance of blades (more than 95% of all tools), Pithad was found to have a preponderance of geometric and non-geometric tools. Loteshwar shows a prevalence of blade flakes during Mesolithic period which changes during Chalcolithic where simple blades are found much more in number. Lunates were the most popular geometric tool present at the site during both the periods. Pithad on the other hand has shown occurrence of simple blades along with a majority of various types of scrapers during both its period. Datrana has simple blades as the dominant blade type while having points as the dominant variety amongst the geometric-non geometric tool category. Bagasra shows simple blades as the main blade type with various types of scrapers as the main type of geometric-non geometric tools. Shikarpur too has simple blades as the main blade type while showing a majority of points amongst geometric-non geometric tool category.
7. Thus it appears that the period preceding the Chalcolithic in Gujarat was dominated by a distinctive lithic tool technology which was discarded after the introduction of crested guiding ridge technology. The contact/interaction with sites belonging to the Indus valley in modern day Pakistan started much earlier than it was previously thought. Settlements preferred to make tools according to their needs, which are reflected in the diverse lithic assemblages found from them.

STATEMENT – II

(Statement indicating the sources of information and the extent to which the thesis is based on the works of others and the portion of the thesis claimed as original.)

The study is based on artifacts collected through systematic excavations of Loteshwar (one season in 2009), Datrana (one season in 2010), Bagasra (nine seasons between 1996-2005), Shikarpur (six seasons between 2008-2013) and Pithad (three seasons, one season in 1992, two seasons in 2006-2007). This data mainly consists of lithic assemblages belonging to above mentioned five sites. Primary library sources include published books, reports, research papers and articles on previous researches regarding Mesolithic and Chalcolithic Gujarat as well as about lithic studies. These sources helped to understand the development and spread of Harappan civilization and its regional diversity. These literary sources also enhanced understanding about environmental, geological and archaeological aspects which led to formulate strategies for data collection, artifact analysis and data analysis. For comparison and correlation of artifact data, excavation reports of major excavated sites from Gujarat and western India have been referred to.

The portion of the thesis claimed as original is the collection, metric analysis of the lithic assemblage in lab, statistical analysis and archaeological as well as cultural interpretation of lithic assemblages of above mentioned five sites. An effort is made to trace the evolution of lithic tool technology over 5000 years. An attempt is also made to co-relate these assemblages with identified raw material sources. Fractal distribution model has been used for the first time in the study of lithic assemblages belonging to the region. Fractal size frequency distribution has helped to describe lithic debitage and fractal analysis has helped in the discovery and description of patterns in the lithic debitage assemblages.

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