



Sectional President's Address: PROTOHISTORIC RESEARCH IN SOUTH ASIA- ACHIEVEMENTS AND CHALLENGES

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Section V: ARCHAEOLOGY

Sectional President's Address

PROTOHISTORIC RESEARCH IN SOUTH ASIA- ACHIEVEMENTS AND CHALLENGES

Vasant Shivram Shinde

Dear Fellow delegates and friends,

I am deeply beholden to the Executive Committee of Indian History Congress for selecting me to deliver the Presidential Address for the Ancient History and Archaeology Section at this congress. This honour given to me is due to the Institute I belong to, which is a premier in the field of Archaeology not only in the country but also outside. I wish to record my deep sense of appreciation for the efforts made by the authorities of the newly established Malda-Gaur University in organizing this congress. The Congress has been organised in the Historic Gaur-Malda region, which was once the Capital of Bengal in the Sultanate Period. It is dotted with archaeological sites of different cultural periods including numerous Islamic and Hindu monuments and sculptures. The history and archaeology of this region need to be reconstructed systematically by the local students and scholars. I hope the newly established University will take a lead in establishing a Department for Heritage studies in the region. Institutions like Deccan College will be more than willing to help such Universities in their endeavour and I hope this congress will create the right atmosphere required for such initiatives.

Introduction

Until the beginning of the twentieth century, it was thought that there is a gap between Stone Age and Early Historic period in the History of India (Smith 1904) which was described as a "Vedic Night". Historians of the Colonial era always thought that the settled life in the Indian Subcontinent started with the Stupa (Buddhist) period only in the second half of the first millennium BCE. However, simultaneous excavations at Harappa and Mohenjo daro under the direction of Sir John Marshall in 1920s and the announcement of the discovery of the Harappan Civilization on 20th September 1924 pushed back the antiquity of the settled life in the subcontinent by 2000 years at one stroke. The discovery of the Harappan Civilization in 1920s is considered to be

the most significant archaeological event not only because the subcontinent could boast of the presence of a Civilization as old as the Mesopotamian or Egyptian but because it stretched back the antiquity of the settled life to the middle of the third millennium BCE and bridged the gap between Stone Age and Early Historic period.

Similarly, the discovery at Jorwe in the Deccan region of the Chalcolithic phase dated to the middle of second millennium BCE in 1950s changed the understanding of the History of the Deccan. Before this discovery, it was hypothesized that settled life in Deccan begins only in the latter half of the first millennium BCE with a gap between Stone Age and the Early Historical cultures. While ploughing his field, a farmer in the village of Jorwe near Sangmner, Ahmednagar District of Maharashtra stumbled upon some complete pots. These pots were first taken into custody by S.A. Sali, who was then working in the Block Office, Sangmner. Sali, who subsequently joined Archaeological Survey of India and retired as Superintending Archaeologist, happened to know Prof. H.D. Sankalia. He showed those pots to Dr. Sankalia, who realized that they were different from the known ceramic types and could sense the presence of a different hitherto unknown culture. Prof. Sankalia in the following season undertook excavation work at the site of Jorwe, discovering a new Chalcolithic Culture the "Jorwe Culture". This Chalcolithic culture is an early farming community of Maharashtra and this discovery was also significant as it helped bridge the gap between Stone Age and Early Historic period of this region.

The Harappan Civilization has attracted scholarly attention from all over the globe since its discovery on 20 September 1924. However with the partition of the country in 1947 all the known Harappan sites, save Kotla Nihang Khan in Punjab and Rangpur in Gujarat, were part of Pakistan territory. This was a major challenging and motivating factor for Indian Archaeologists to discover an extension of the Harappan Culture on the Indian side of the international border. The Archaeological Survey of India and many Archaeology Departments of different States and Universities concentrated their efforts on unravelling the history of the Harappan Civilization. In the process, due to this biased research strategy, the contemporary Neolithic and Chalcolithic cultures of India were neglected and suffered with lack of research. The Department of Archaeology of Deccan College, Post-Graduate and Research Institute, Pune, under the leadership of Prof. H.D. Sankalia, however initiated a systematic research on these cultures and tried to understand the relationship between the Harappans and their contemporary cultures. The most noteworthy work done outside the Deccan College sphere was that of Sir Mortimer Wheeler who conducted vertical excavations at Brahmagiri in Karnataka towards

the latter half of 1940s. According to me this was an epoch making work as it provided a complete cultural sequence for South India from the Neolithic period onward. The work of Prof. Sankalia at Nevasa and Ahar proved useful for the reconstruction of cultural sequence of Maharashtra and Rajasthan respectively from the beginning of settled life, i.e. Neolithic/Chalcolithic period.

Neolithic/Chalcolithic

Usually the terms Neolithic and Chalcolithic have been used to describe the life-style of the first farming communities, the difference being the latter showing overall development in technologies including copper/bronze and the material culture. These two different cultures have been properly defined and isolated in East and West Asia and Europe though are loosely and randomly used in India. The Neolithic culture in Northwest, particularly at Mehrgarh and in the North at Burzahom and Gufkral in Kashmir and Lahuradeva in mid Ganga basin have been successfully isolated from the Chalcolithic and defined. The first farmers of South India and the East India have been termed as Neolithic, which is a misnomer for the simple reason that these cultures show practically all the features of the advanced Chalcolithic cultural makeup. The First Farmers of the Deccan and Central India have been referred to as Chalcolithic in spite of the fact that they are contemporary with the so called South or Eastern Indian Neolithic culture and share many common features with them, including the material culture. Different terms have been introduced by different individual scholars as per their understanding and these terms were simply carried forward by the subsequent workers. However, there is a need to think over the existing terminology for the numerous cultural communities of the Neolithic and Chalcolithic and appropriately redefine them. It will be wise to reach a consensus as far as these basic terms are concerned.

Origins of the First Farming Communities

Earlier hypothesis of "Nuclear Zone of Origin of Agriculture" does not hold good anymore as more evidence from different parts of the globe indicates "Multiple Zone Origin". In South Asia too there appears to be four zones of development of agriculture and origins of village life as follows:

1. Northwestern Zone

The Northwestern part was developing possibly because of the contact with the cultures of Southwest Asia. This region has produced the

earliest evidence of agriculture and pastoralism in South Asia, which is best documented at the site of Mehrgarh situated on the north Kachi plain at the foot of the Bolan Pass. It is a buffer zone between the Iranian Plateau and the Indus Basin and therefore witnessed the cultural fusion from east and west right from the beginning of settled life. The barley-wheat dominated and cattle and sheep/goat domesticated economy of West Asian gradually began to spread towards the Indian subcontinent around 7000 BCE and the Bolan Pass, through which most of the foreign influences penetrated into the subcontinent, was the first area to be occupied. The site was first occupied by the Aceramic Neolithic farmers around 7000 BCE. The subsequent phase of the Neolithic and Chalcolithic show continuation and gradual development in the material culture, culminating into the formation of the Early Harappan phase. The early phase at Mehrgarh is characterised by the presence of a well developed flint lithic industry, circular to rectangular structures, some of which made of loaf-shaped mud bricks, terracotta female figurines and human burials within the site. The pottery begins to occur from the Neolithic phase around 6500 BC and copper from the Chalcolithic phase around 4500 BC. They all suggest Southwest Asian origins from somewhere in the Levant or Zagros regions (Jarrige 1984). A number of local Early Harappan cultures such as Hakra Wares, Kot Diji, Amri, Nal, etc. came into existence and all of them have contributed substantively to the development of the Harappan Civilization in the Indian subcontinent. Some of the cultural traditions, possibly related to those in the lower Indus sites of Amri and Kot Diji, extended east of the Indus into Gujarat and eastern Rajasthan, where they are found in the basal deposits of sites such as Loteshwar, Datrana, Nagwada, Padri, Dholavira and Prabhas Patan in Gujarat, and Sothi and Kalibangan in Rajasthan.

2. The Mid Ganga Basin Zone

The Vindhyan region overlooking the Mid Ganga valley has played a significant role in the emergence of early farming community. The archaeological investigation carried out by the Department of Ancient History, Culture and Archaeology, University of Allahabad in the Son and Belan valleys of the southeast Vindhyan region at the sites of Chopni Mando, Sarai Nahar Rai, Mahadaha and Warikalan-Damadama (Mesolithic) and Koldihwa and Mahagara (Neolithic) have produced evidence of the gradual evolution of the village life in this region (Sharma *et al.* 1980). The Mesolithic phase, a transitional from Upper Palaeolithic to Neolithic is characterised by the typical microlithic lithic tools made on siliceous stone, circular huts paved with stone and having wattle-and-daub construction, circular hearths in a pit, presence of

human burials within the site and coarse handmade pottery. Some of the sites have parts of saddle quern, muller, hammer stones, and anvil made on either sandstone or quartzite, both locally available. These food processing equipment are suggestive of the beginning of settled life and dependence to some extent on agriculture. Two types of coarse, handmade pottery is associated with the Mesolithic phase; red and Black-and-Red. The Red ware is further subdivided into burnished and coarse category. The pottery from Chopni Mando is divided into ordinary red ware and brownish red or Khaki ware. The pottery is decorated with Incised or impressed designs. The impressed pottery at Chopani Mando is represented by bowls and vases. Evidence of Cord Impressed pottery is recovered from the Mesolithic rock-shelter sites of Lakhahia in this region and Langhnaj in Gujarat.

The indications of early rice cultivation, datable to the 6-7 millennia BCE first came to light from the site of Koldihwa in the Ganga plain in late seventies and early eighties (Sharma, et al. 1980). But being the only site of such antiquity for rice, doubts were raised about the authenticity of the dates. There are now many more sites providing the same dates as Koldihwa and they include Lahuradeva (Tewari et al. 2007-08) on the bank of a horse-shoe lake in the middle Ganga plain, Jhusi on the confluence of Ganga and Yamuna and Tokwa on the confluence of the Belan and Adwa in the Vindhya (Pal 2009). The antiquity of the Early Farming Community (Neolithic) in this region, on the basis of recently acquired C14 dates, may be pushed back to the latter half of 8th millennium BCE. These sites have produced the evidence of burnt remains of *Indica* Rice along with cord impressed and black and red ware ceramics and microlithic tools. Though some of the archaeo-botanists have raised doubt about the identification of species as domesticated India Rice, scholars like Dr. Saraswat from Birbal Sahani Institute of Paleobotany, Luknow and Prof. Sato from the Research Institute for Humanity and Nature, Kyoto, Japan are certain about the identification. This region therefore can be identified as one of the zones the origins of rice and this is an indigenous development. The spread of rice cultivation may have been to all the direction. It gradually began to move towards the northwest and northeast parts and South India gradually. The recent discovery of the domesticated rice species from the Early Harappan levels at Girawad in Rohtak District of Haryana dated to the middle of the 4th millennium BCE (Shinde *et al.* 2008).

3. Gujarat and Mewar

The regions of North Gujarat and Mewar appear to be yet another important prime zone as far as the process of domestication and

formation of village life are concerned. These regions do not come under the sphere of Northwestern influence but witnessed an indigenous development. The site of Bagor in Mewar has produced the evidence of domestication of animal (plant remains were not recovered and studied from this site) and the sites such as Padri in Gujarat (Shinde 1998) and Balathal (Shinde 2000) have clearly demonstrated the emergence of village culture.

The earlier work at the site of Padri (Saurashtra), Nageshwar and Loteshwar (North Gujarat) and the recent work at Balathal in Mewar region of Rajasthan provide evidence of early village life going back to the middle of fourth millennium BCE. The site of Padri near Talaja town in Bhavnagar District and located near the Gulf of Cambay in Saurashtra, is the first in this region to produce the evidence of Early Harappan phase dated to between 3300 to 2600 BCE. In the basal level at Padri is found the evidence of coarse, handmade pottery, rectangular and squarish mud structures, evidence for copper and bead manufacturing technology and the presence of beads of semi-precious stones such as carnelian and steatite. A gradual development is seen in the material culture and towards the end around 2600 BCE the culture attains full maturity resulting in overall development. The early phase ultimately is transformed into the Mature Harappan phase at the site. The rectangular or squarish individual structures of wattle and daub found in the lowermost levels were replaced with huge complexes of mud-brick and mud in the upper levels. One such a complex was partially excavated at Padri. In all nine rooms of varied sizes and dimensions were exposed over an area of 12 m by 12 m and it was noticed that they were used for different purposes. On the basis of contents it could be confirmed that the complex was meant for storage cum craft activity. The storage evidence in the form of circular stone-topped mud platforms for supporting storage bin, small rectangular chambers made of mud bricks was found in the western part, next to which on the eastern side was the evidence of copper working and blade tool manufacture (Shinde 1998). The coarse handmade carelessly made pottery was replaced by fine and well made one in the upper levels. The characteristic Harappan pottery shapes, script and copper objects began to appear towards the end of this phase. The other purely local but pre-Harappan in nature came into being along the southwestern coast of Saurashtra, in the river basin of Hiran. Identified as Pre-Prabhas culture (2800-2600 BCE) after the type site of Prabhas Patan near Somnath, it is characterised by the presence of plain Black-and-Red pottery and painted black on red ware, which do not have similarity with either the early pottery of Padri or pre-Harappan of other parts of Gujarat and elsewhere (Dhavalikar and Possehl 1991). This culture is

known only from the excavations at Prabhas Patan so far.

The recent evidence from North Gujarat and Gilund and Balathal in Mewar region of Rajasthan suggests that the Chalcolithic community came into being much before the Harappan period. It is obviously therefore clear that the Harappans did not play significant role in the origin of the Chalcolithic culture in Gujarat, Rajasthan and Central India. The beginning of the settled life in these regions go back to the early third millennium B.C. as the radio carbon dates from the sites of Loteshwar in north Gujarat and Balathal in Mewar region would indicate. The Chalcolithic culture in Mewar and north Gujarat in fact were contemporary with the Pre/Early Harappan culture of Western Rajasthan and Gujarat. Small excavation carried out at Loteshwar, 17 km north-east of Shankheshwar in Mehasana district of Gujarat, has produced interesting evidence of the beginning of settled life that is earlier than the Harappan period. The Chalcolithic deposit overlies the Mesolithic material. The thin habitation deposit has revealed numerous large pits, some of which could have been even pit-dwellings, filled in with pottery, animal bones, clay lumps, etc. The other material equipment associated with the Chalcolithic culture includes micro steatite beads, microlithic tools and some crudely made shell bangles and beads.

The excavations at Balathal (Udaipur District, Rajasthan) roughly 42 km north-east of Udaipur city, have produced evidence in respect to the origin of the early farming community of central India (Shinde 2000). There is a transition from Mesolithic to Chalcolithic at the site of Gilund. A meter thick Mesolithic level at the base of Chalcolithic at Gilund has in the upper part coarser, handmade incised pottery. This pottery continues in the succeeding Chalcolithic indicating considerably a strong role of the Mesolithic in the development of Chalcolithic in the Mewar region. A considerable thick deposit at the base of the settlement (Phase A) at Balathal (around 1 metre) has produced evidence of the origin of the Chalcolithic culture and a gradual development in the ascending order. Excavation to the natural level in a limited area has demonstrated a gradual growth of the settlement from the modest beginning at the site. The people who established settlement on the bed rock constructed only mud and wattle-and-daub structures. In one of the index trenches (HX2) at Balathal, remains of a circular hut (2 m diameter) having well made floor and plastered with cow dung were found. Some of the characteristic Chalcolithic wares such as thick and thin Red, Black-and-Red were introduced right from the beginning. However, they are coarse, thick in section, inadequately fired and the majority of vessels are handmade. Shapes such as wide-mouthed deep carinated bowls, small narrow-mouthed

jars and storage jars with beaded rim, the fossil types of the Chalcolithic phase in this region, are present right from the beginning. A gradual development is seen in these different wares in terms of technology and quality. The wares gradually became finer and reached their highest quality in the middle level. The Reserve-slipped ware was also introduced by the pioneering settlers. Since the earliest known occurrence of this ware in the subcontinent is at Balathal, it may be inferred that the technique of its production was borrowed by the Harappans when they established a close contact with the Chalcolithic farmers of Mewar around 2400 B.C. The middle levels of the Chalcolithic period (Phase B), dated to the middle of third millennium B.C. have been extensively excavated. It is the people of this level who established close contacts with the Harappans in Gujarat, resulting in all round development that is visible in their structures and other material equipment.

4. Eastern India Zone

The Neolithic/Chalcolithic of Eastern India is relatively less researched. No major site of this period has been subjected to large-scale excavation and therefore we have very little idea about the life-style of the period. However, vertical excavations carried out at selected sites have produced sufficient date to discuss about the characteristic features of this culture. The Eastern Neolithic/Chalcolithic is characterized by the presence of shouldered axes, cord impressed pottery, Indica rice and bone tools. Though the dates, middle of third millennium BCE, are much later for the early farming community in this region, considering the overall material, it is assumed that the beginning will go back considerably. The Cord Impressed pottery and the shouldered polished axes do not form the characteristic of the Neolithic/Chalcolithic phase of the rest of the Subcontinent. It is the characteristics of the Chinese Neolithic, the influence of which may have travelled to the Northeast part of the Subcontinent through Burma. It is therefore presumed that the Eastern Neolithic owes its origin to the Chinese Neolithic, which is dated to the 7th millennium BCE.

New research methodology

The excavations at the Chalcolithic site of Inamgaon in Pune District of Maharashtra carried out between 1968-80 by Deccan College under Prof. H.D. Sankalia was a model research project in the country. However, unfortunately, the subsequent excavations were not carried out with same precision and the effective methods of collection of data and analysis were not followed rigorously. As a result such excavations

are not of much help to reconstruct social and economic organizations.

Some of the important concepts of New Archaeology were religiously followed at Inamgaon. The artefacts excavated at the site were related to proper context, which allowed reconstruction of social-economic organizations of the Chalcolithic people. The introduction of floatation technique proved a boon as the excavators were able to collect the smallest evidence of artefacts and ecofacts. This enabled reconstruction of agriculture system of the Chalcolithic period. Numerous scientific studies on human and animal bones such as X-Ray Diffraction, Trace Element analysis, etc. proved very useful as it enabled reconstruction of the health and diet of the people. The data from the Site Catchment Analysis carried out was used to understand the economic conditions and exploitation patterns as well as hinterland and long distance trade network. Without the application of these new research methods and scientific analyses it would have been very difficult to understand various facets of the Chalcolithic people and culture.

Harappan Culture and Basic issues

Sir John Marshall did identify the Harappan Civilization on 20 September 1924 and since then numerous scholars and institutions, both from India and outside, have been engaged in unravelling the history of this most important phase in Indian History. No other culture in the subcontinent has received as much attention as the Harappan Civilization. However, it should be mentioned that what we know today about this civilization is mainly their history of the urban life, as the reconstruction done is based on the data recovered from large settlements identified as either cities or towns. Compared to that very few rural Harappan settlements such as agriculture villages, industrial centres or ports have been excavated systematically on large scale. In order to understand the holistic life of the Harappans, sufficient systematic work on sites of different categories needs to be carried out. So far more than 100 sites have been subjected to various degrees of excavations, majority of which are large-size settlements. Unless settlements of different categories are excavated on large scale and sufficient data is not available, the reconstruction of holistic life-style is not possible.

1. Terminology- The culture when identified at the site of Harappa, in the jurisdiction of the modern large village of Harappa in the Punjab province (now in Pakistan) in 1924, it was termed as the Harappan Civilization. It was named after the type site where the culture was

first identified. However, with time and the discovery of more and more sites over vast geographical locations from time to time the nomenclature for the culture underwent constant change. Different scholars began to call this culture by different names and today the Harappan Civilization has three different terminologies- Indus Civilization, Indus Valley Civilization and more recently Indus-Saraswati civilization. There is no need to cite references to this as this is the fact known to every archaeologist/historian dealing with the Harappan Civilization and these different terms have been prolifically used in various writings. Of course, each one introducing different term, has provided convincing explanation as to why he or she prefers a particular term.

This trend is dangerous as there may not be full stop to this growing tendency. We should not be surprised if tomorrow someone would like to call the Harappan Civilization as Indus-Saraswati-Gujrat Civilization. He or she may have a valid reason for this name. There may not be end to this and will create more confusion. Students and others not so familiar with the archaeology of the Subcontinent are all confused and they are not sure if all these different terms are for the same culture or for different. We must stop this and go back to the archaeological ethics. The best way to avoid this confusion is to follow the unwritten convention in archaeology, e.g. name the culture after the type-site where it is discovered or identified for the first time. And therefore it is suggested that we maintain the original term "Harappan Civilization" instead of switching over from one term to another, which does no good but more harm to the subject.

2. Origins of the Harappan Civilization and the roles of Regional Cultures

Of many excavations undertaken over a long period of time in the Subcontinent, the one carried out at Mehrgarh between 1974-1985 (Jarrige et al. 1995) is in a real sense an epoch making. Not that it has provided the first evidence of settled life in the Indian Subcontinent going back to the seventh millennium BC, but for solid evidence it has produced to the steady and gradual emergence of the Harappan elements. The evidence that came out of this excavation laid to rest the earlier controversial theory of the Western world being responsible for the emergence of the Harappan Civilization. The excavations have demonstrated seven different stages of development prior to the emergence of the Harappan culture in the last stage (VIII). What is evident here is the introduction of various Harappan elements at various different levels at the site throughout the first seven phases, culminating

into the emergence of the Harappan culture in the last stage/phase (VIII). Three different phases of the Harappan culture - Early, Mature and Late demonstrate cultural processes from origin-development to decline of the culture. The Mature Harappan phase is the most prosperous, with development of its urban character and evidence from various excavated sites now leads us to believe that this has emerged out of the Early Harappan phase. As is evident the process of transformation from Early to Mature Harappan appears to have happened simultaneously over the major Harappan region including Baluchistan, Sindh, Saraswati and Gujarat.

The earlier belief that the Harappan Civilization (Mature Harappan phase) was homogenous in nature has turned out to be a myth. Within the Harappan region we find manifestation of the regional variation and three such regional variations (Domain according to Possehl (2002) can very distinctly be identified. The first scholar to point out this variation within the Harappan Civilization was J.P. Joshi way back in 1984 (Joshi, 1984). However, Possehl (2002) has identified more than 7 domains on account of geography and settlement pattern data. However, on the basis of variations in the material culture, three zones can clearly be distinguished. The excavations at Rojdi by Possehl and Raval (1989) were important from the point of view of identification of the regional variation of the Harappan Civilization in Saurashtra. It was noticed that the material culture associated with the Harappan culture at Rojdi showed some difference compared to that found in the Sindh-Baluchistan region. This was found true for the whole Saurashtra region. This difference was treated as a regional variation of the Harappan culture in Saurashtra and termed as Sorath Harappan (Possehl and Herman 1990). Similar regional difference in the material culture, more particularly in the ceramic assemblages of the Harappan sites in Saraswati is visible. The sites located in the Sindh-Baluchistan region have classical Harappan elements and forms one distinct region within the Harappan Empire.

We can try to explain why such variations have occurred in the material culture of the Mature Harappan period. A number of Early Harappan cultures flourished in various regions of the Harappan Empire and the Mature Harappan is supposed to be the result of internal development within these Early Harappan cultures. Naturally therefore the features of the Early Harappan cultures persisted through the Mature phase in their respective regions. In the Sindh-Baluchistan region the elements of the Early Harappan Amri-Kot Diji cultures dominated the assemblages of the Mature Harappan phase in that region, whereas in the Saraswati basin the elements of the early Siswal-Sothi continued

to be dominating in the Mature Harappan phase in that region. The so called Sorath Harappan phase evolved out of the Padri Early Phase (Shinde, 1998) and hence the continuation of the Padri elements in the Mature Harappan phase there. It is because of this factor that we see variations and the Mature Harappan phase does not look homogenous as was thought by the earlier scholars (Wheeler, 1968).

3. Biased reconstruction

Over two thousand sites of the Harappan culture have been discovered so far, of which only half a dozen are cities and slightly above one dozen towns. The rest of the settlements fall in different categories like small or big villages, processing centres, ports, and temporary camps for exploitation of local natural resources. A glance at research strategy adopted by the Harappan archaeologists reveal that barring the site of Ganweriwala all the Harappan cities have been excavated on large scale, producing large quantity of data on various aspects like town planning, trade, social, religious and economic. This data has enabled reconstruction of urban or city life of the Harappan people. This represents hardly less than even 3% of the Harappan population. We have however, very little idea of their rural lifestyle, where more than 97% Harappans were living, as in "Small non-urban Harappan Site" does not seem to be a priority of the Harappan archaeologists. Very few small Harappan sites have been subjected to large-scale systematic excavations. In fact there is a need to systematically identify and document different categories of Harappan sites and a number of sites in each category need to be systematically excavated on large scale. That will in a real sense give holistic picture of the Harappan life and history.

4. Climate and Harappan Civilization

Very little data is available at present on the climate that existed throughout the Harappan period (3500-1500BC) and the region. A few attempts have been made in the reconstruction of the palaeoclimatic sequence in the Indian Subcontinent with pioneer work being done by much quoted Gurdeep Singh (1971). The next substantial work was that of Enzel et al. (1999). Both these teams worked in Rajasthan and collected data from three salt lakes: Sambhar, Didwana, and Lunkaransar. But the explanation given for the timing and factors for the desiccation of the lakes and its correlation with archaeological data led to different interpretations. The first group led by Gurdeep Singh proposed good climatic conditions during the flourishing Harappan phase, whereas the latter group led by Enzel proposed that the Harappan

Civilization flourished when the climatic conditions were not very conducive for the human cultures. Both the group based their hypotheses on the basis of drying of lakes in Rajasthan. These limited studies have drawn a lot of criticism. According to Possehl (2002), the changing salinity of these lakes need not be attributed to changes in rainfall. The geology of Rajasthan is complex. The three lakes investigated are hypersaline today, but there are also freshwater lakes in this same region (Lakes Pushkar and Ganger). This observation leads to the conclusion that under one climate regime in Rajasthan, there can be both freshwater and hypersaline lakes, calling into the question of the Singh hypothesis.

Reconstruction of ancient climatic conditions is a multi-disciplinary approach. Only one core from such huge lakes is not enough. Besides, the study of catchment area, history of erosion, vegetation pattern, geology, carrying capacity of the catchment area, tectonic history of the region, etc. have to be taken into consideration when reconstruction of ancient climatic conditions of a region is done. It is absolutely essential to understand the climate of the Harappan period and its impact on the three different phases of the Culture. We need to find out the role of climate in the origin, development and decline of the Harappan civilization. We still need a satisfactory explanation for the emergence and growth of the most flourishing Harappan city of Dholavira (on the Khadir Island of Kutch in Gujarat) which is today surrounded by barren desert land (Runn). Ecological studies in this region for which a lot of data on climatic and ancient landscape will have to be generated is an essential research requirement. The GIS software and satellite imagery photographs can be used to reconstruct the ancient landscape.

5. Importance of Indus and Saraswati river basins, Saurashtra and North Gujarat

The Indus and Saraswati alluvium basins, no doubt the most important fertile units of the Subcontinent, provided solid agriculture base for the Harappans, where they could raise not only sufficient food grains for the Harappan population but also surplus. These two basins are quite congenial for wheat and barley agriculture. It is this surplus food that helped Harappans to acquire the required progress in technology and art for its evolution towards an urban setup. Besides, they had under their jurisdiction regions like Saurashtra and North Gujarat, which are covered by black cotton soil and coarse soils respectively. The main crop cultivated in Saurashtra was millet whereas the North Gujarat has vast tracts of pasture land. Such varied ecological conditions the Harappans occupied, gave them a lot of subsistence advantages. In case one agricultural zone fails due to may be some natural calamity,

they had another at their disposal to support them. Besides, they did maintain friendly mutual relations with the neighbouring Chalcolithic communities, both on the eastern as well as western borders.

Saurashtra region had access to the resources like carnelian, agate, chalcedony and chert, all semi-precious stones used either for bead or tool manufacture. Besides, the most important source of chank shell (*Turbinella pyrum*), one of the three sources in the subcontinent was along the Saurashtra coast. This was the most important raw material for the Harappans to make bangles and beads. Shell manufacture centre like Nageshwar on the western tip of Saurashtra was established for production of beads and bangles. They were meant for the supply to the domestic as well as international market. Other resources such as copper from Khatri belt in Rajasthan, gold from Hatti mines in South India, lapis lazuli from Badakshan region in Afghanistan, etc. located away from the core Harappan region were obtained with ease by the Harappans. By developing very effective communication network and exchange mechanism, they could manage to keep supply of essential raw materials uninterrupted and distribution of finished goods to other Harappan as well as non-Harappan contemporary settlements. The selection of varied ecological niches gave the Harappans considerable advantages over their contemporaries and enabled them to flourish. In their international trade the region of Gulf, particularly Oman has played an important role as the evidence from the site of Ras al Junayz will indicate (Cleuziou and Tosi, 1994). The Gulf region may have been convenient middle zone in their trade with their contemporaries that flourished in the Persian Gulf, Mesopotamia and Egypt. It is quite possible that the merchants from these four regions travelled to places like Ras al Junayz in Oman for carrying out business transaction and exchange of goods, as this is almost central place for all of them. Very rarely merchants from these cultures may have travelled directly to each other's territory.

6. Harappan Writing system and decipherment

In spite of numerous efforts by numerous scholars to decipher the Harappan script, there is no consensus and the script has remained the biggest enigma of the Harappan Civilization till date. If deciphered, a plethora of information on various aspects of the Harappan culture will come forth. The letters or script occurs from the Ravi phase dated to around 3300 BC (Meadow *et al.* 1999 and 2001) and continues until the end of the culture around 1300 BC. Asko Parpola, one of the scholars dedicated to the decipherment of the Harappan script states "uniformity of sign sequences throughout the Indus Valley points to only one

language having been written. Historically, Prot-Dravidian is the most likely alternative and a good working hypothesis. The script type, the other big unknown, is determined as logosyllabic by the number of signs, average word length and age. Without translations, this type of script can be deciphered only partially-sign by sign". He further admits that decipherment is obstructed by formidable difficulties. The script has no close relative and its language is debated. Multilingual text- the usual key to the unknown scripts- are lacking and all surviving texts are very short (Parpola 2005). The only way left is as Parpola (2005) states "successful decipherment of other scripts and the history of writing give methodological guidance. Useful routine tasks include collection of all texts, establishing a sign list, compiling concordances to sign occurrences and analyzing the text for word boundaries other linguistic features". Collective efforts by archaeologists, historians, linguists, computer analysts, etc. have to be done. At this stage it appears that we should pray to find for a Rosetta type of stone with multilingual script.

7. Climate and Decline of the Harappan Civilization

The decline of the Harappan Civilization was as dramatic and enigmatic as was its emergence. Of the many reasons, the climate appears to be the major villain in the decline of this great civilization. The reconstruction of the Holocene climatic sequence in the Indian subcontinent, particularly in the Thar Desert area of Rajasthan demonstrated lowering of annual rainfall around 2000 BC that may have caused major decline of the most flourishing first civilization of the Subcontinent. Scholars like Bryson and Swain (1981), Singh *et al.* (1990), Agrawal (1992) have emphasised the role of climate and environment in affecting habitations, especially the Harappan culture. Studies in respect to the reconstruction of climatic sequence carried out in various parts of the world suggest it was not only the Indian subcontinent that was affected, but the entire globe. In other words it was a major Global Climatic Change Phenomenon around 4000 BP or 2000 BC. Yasuda (2001) believes that it is not only the Harappan but all the civilizations of the Eurasia declined around 4000 BP as a result of dry (desiccating) climate.

Studies of regional late Holocene vegetation history have shown that the most drastic changes in the vegetation pattern and cover, an important indicator of climate change, appeared around 2000 BC in different parts of the world. In north-eastern China in the Changbai Mountain region, the most noticeable event of the Late Holocene forest development around 2000 BC was expansion of *Pinus koraiensis* (Sun

et al., 1990). Vegetation reconstruction at Kurugai site (northern Sichuan, China) in the eastern part of Qinghai-Tibetan Plateau revealed retreat of forest and spread of open areas at about 2000 BC (Gotanda, 1998). Around the same time in warm temperate forest zone located at lower elevation in the southern Sichuan, sclerophyllous drought adapted taxa expanded, suggesting weakening of the East Asian Monsoon activity with decrease in spring and summer precipitation (Jarvis, 1993). The oxygen isotopes analysis from the lake sediments in the Qinghai-Tibetan Plateau and North Xinjiang provinces recorded maximum aridity between 4500-3500 cal. yrs BP (Wei and Gasse, 1999). In parts of Europe, particularly in the Great Poland Plain the *Carpinus betulus* indicating dry climatic conditions, began its spread around 4100 BP and since 3500 BP has been dominating species in the forest and the lowering of the lake levels began at the same time there (Makohonineko, 1998). The results of pollen analysis from the Ghab valley and El-Rouj basin in Syria show that the climate became dry after around 2000 BC. This dry climate caused a drought and reduced the production of olives, wheat, and barley. People in northwest Syria abandoned their habitation sites completely in the Late Bronze Age because of drought (Yasuda, 2001).

In the Indian Subcontinent a few studies on climate reconstruction carried out also suggest similar trend of aridity around 2000 BC. A work on the core from the oxygen minimum zone off Karachi in Pakistan at water depth of 700 m has produced a unique record of monsoon climatic variability covering the last 5000 years (von Rad *et al.*, 1999). They further noticed that the period from 3900 BP is marked by varve thickness minimal and low turbidity activity, which they interpret as indicators of low precipitation and decreased river run-off. Thus, the results obtained by various independent researches in different part of the globe do indicate deterioration of climate, which must have had adverse impact on the human cultures including of course the Harappan Civilization.

The deteriorating climatic condition had adverse consequences. One of the mighty and important rivers for the Harappans, the Saraswati dried down and even though the exact contribution of the deteriorating climatic conditions to this effect is not known. There is a possibility of the main river Saraswati (represented by Ghaggar-Hakra today) and its main tributary the Drishdvati (modern river Chautang), changing their courses and merging with other main rivers like Yamuna due to some tectonic upheaval in the upper reaches. However, the fluctuating climatic conditions may also have contributed to the drying up of the Saraswati. This was perhaps the biggest blow to the Harappan

civilizations as nearly three-fourth of the settlements were located in the basin of this river. Good fertile arable land and ample supply of water made the basin of river Saraswati most attractive and the Harappans were able to produce surplus food grains here. It will not be farfetched to conclude that the Saraswati river was a life-line of the Harappans. After losing their agriculture base, the Harappans scattered and migrated more to the region having readily available pasture land.

There has been a strong debate going on whether the sea level receded around 2000 BC and if so by how many metres? No satisfactory work has been carried out on this so far. But it seems possibly due to decrease in rain fall, the sea level fluctuated. Whether it was a world phenomenon or a regional phenomenon is not yet clear. But a number of Harappan ports on the Makran coast fell into disuse as they became almost inland sites after the receding of sea level. This must have adversely affected their international trade with the Gulf and subsequently with Mesopotamia and Egypt. As is well known, the international trade which was surplus in favour of the Harappans, was one of the major causes of the prosperity.

After the drying of their international trade, the pace of the decline of the Harappans hastened. The economic decline affected overall Harappan life-style, which is reflected in their material culture. As they lost their agricultural base in the Saraswati basin, they began shifting their settlements away from the banks of the main rivers. New area such as the western part of Uttar Pradesh and the pasture rich area of Gujarat such as Jamnagar District, was preferred by the Harappans in the later stage (Sinha-Deshpande and Shinde, 2005). The culture got mixed up with different local cultures and slowly and gradually merged with them.

The overall development in South Asia particularly in science, technology and material culture has not happened suddenly but has deep roots going back to the Harappan Civilization. Unless their roots and how they have evolved over a period of time are understood it is not possible to visualize the modern development. It is believed that most of the sciences and technologies were developed during the Harappan times and continued to evolve till the modern times. The study of this civilization is essential to understand developments in South Asia. This is the culture of the whole humanity and cannot be claimed by any religion, caste or section. The South Asia is one of the most populous regions in the world and birthplace of major religions of the world. This region has attained importance mainly because of the birth of Harappan Civilization five thousand years ago. The Harappan Civilization has contributed substantially to the History of

the Country and World. This civilization was the first in the world to introduce a democratic set up. They were the people who taught the world importance of trade in the economic development. Harappans were the first in the world to build planned cities and dockyards. The header and stretcher method of construction, which forms the base of modern architecture, was first introduced by these people in South Asia. It is our duty to bring these aspects of our Early Civilization to the notice of the common people. People will then understand the importance of this subject. The Harappan Civilization has disappeared, but its legacy has survived till the modern times, particularly in Northwest and western part of the subcontinent.

New challenges/Directions

1. **Climate** - In order to understand the origins and development of Protohistoric cultures in India, it is necessary to assess the role of climate. Unfortunately, we do not have substantial data on the Holocene period in which the Protohistoric cultures of South Asia originated and flourished. Very few systematic efforts are being done in this direction and thus this is one of the challenges for this and next generation.
2. **Small site Archaeology**- There is a general tendency amongst archaeologists to explore and excavate large-size settlements as they produce large data and provide instant publicity. However, we should bear in mind that unless we understand the smaller sites, reconstruction of settlement and subsistence patterns, social-economic and religious organisations and holistic life-style of the Early Farming communities and their development cannot be understood. There were different categories of settlements during the Protohistoric period and sufficient number of sites from each category needs to be excavated on large scale.
3. **Introduction of New Research methodologies**- Contextual archaeology and floatation technique for the recovery of data need to be integral part of every excavation. The functional aspects and meaning of each and every artefact recovered from excavation will be understood only if its context is known. Artefacts torn from its context does remain mute and does not serve as a source material for writing history. Systematic works on settlement pattern and system, systems theory, site catchment analysis, systematic sampling, etc. are some of the methods that need to be adopted for generation of new and meaningful data.
4. **Problem Oriented Research**- Do not excavate archaeological site

only for the sake of excavation. It is necessary to identify research problem and formulate hypothesis and research methodology accordingly.

5. Application of scientific methods- Various scientific methods such as Isotope analysis, XRD and XRF, Starch Grain, Residue analysis, Strontium, etc. are very useful to understand composition of human population, health and diet of the people and contacts with various other places. The analysis of artefacts and ecofacts are absolutely necessary to throw light on various aspects of ancient population.

I would like to conclude that the Protohistoric period in Indian History is a link between Stone Age and Early Historic ages and some of the important innovations in technology and material culture took place in this era. It has contributed substantially to the history of the country and the world. Numerous sites of this period and that of other periods are being destroyed every day and if it continues at this rate, there will not be site left for future research. It is our duty to educate the people and sought their help to preserve and conserve this rich source of cultural heritage of our country. We should be proud of our antiquity and ancient past.

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