Archaeology of the Post-Harappan-Early Iron Age Culture of the Yamuna-Hindon Doab

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Abstract
In the Yamuna-Hindon Doab, which is in the neighbourhood of Delhi, the capital of India, asignificant number of early archaeological sites associated with the Iron Age culture, dated c.1200 to 600–500 BCE have been identified. These sites epitomize a pre-urban Iron Age culture, represented by the Painted Grey Ware (PGW). In this research paper, an attempt is made to study and analyze the archaeology of the PGW sites of the Yamuna-Hindon doab, which is a vital part of the larger Ganga-Yamuna doab. It is argued that in the absence of horizontal excavations in the region, settlement archaeology can help in understanding the nature of ancient sites.
Keywords: *Archaeology, Delhi, Doab, Hindon, History, Yamuna.*

Introduction

The region of the Yamuna-Hindon doab and its neighbourhood are often referred in the great Indian Epic, the *Mahabharata*. B.B. Lal (1954-55) has documentednumerous sites that are mentionedin the *Mahabharata*.Several scholars have questioned the historicity of the *Mahabharata* war itself and seem to disagree with B.B. Lal. However, it is to be noted that the region has brought to light a substantial number of ancient cultural sites, such as the Late Harappan culture, which may have persisted until at least c. 1000-900 BCE; the Ochre Coloured Pottery (OCP) culture, which was contemporary of Late Harappans, and was rural and agricultural in nature; the Painted Grey Ware culture (PGW), which was a pre-urban Iron Age culture, dated c.1200 to 600–500 BCE; and the Northern Black Polished Ware culture (NBPW), an urban Iron Age culture lasting c. 700–200 BCE. Further, the region has also revealed a significant number of early historic sitesas well as Gupta, Post-Gupta and Medieval sites.

A latest noteworthydiscovery in the Yamuna-Hindon Doab region is the site of Sinauli in the Baghpat district of the Indian state of Uttar Pradesh. The site is not very far from Delhi. The findings of the excavations conducted at Sinauli by the Archaeological Survey of India (ASI) in 2003-04, 2005-06 and in 2018 has again creates lots of interest in the region and the *Mahabharta* Epic. In 2018, chariot burials and Copper Hoard Weapons were found at the site by the archaeological team (Manjul, Sanjay Kumar & Arvin Manjul 2018).

Research Objective

Considering the identification of a large number of early sites in the Yamuna-Hindon Doab, and the latest findings of the site of Sinauli, an archaeological review of the Yamuna-Hindon doab occupies immense significance. Since there are limited horizontal excavations in the region, we do not have a clear picture of the pattern of distribution, spacing of settlements in different cultural periods and the role of ecological factors in shaping these aspects of cultures. Hence, a study of settlement history, using exploration techniques and survey of existing work, of the Yamuna-Hindon doab is important.

Research Methodology

Using the principles, tools, and techniques of settlement pattern studies, a survey of the PGW sites

of the Yamuna-Hindon doab has been taken up in an attempt to study the settlement pattern of this region. There are several limitations in this kind of work, as the hypotheses given are not absolute as they are not based on extensive horizontal excavations and the element of probability is always there.

Makkhan Lal (1984) has pointed out that "…settlement pattern studies by and large have revolved around the tradition initiated by Gordon R. Willey. The emphasis is one extensive regional survey, within regions of several hundreds to several thousands sq. km. In order to define the extent of the system, delineate the broad problems like migration and diffusion, and formulate hypotheses regarding site function, demography and polity, which can be tested and redefined through subsequent intensified investigations. Inferences have been mainly drawn from the gross outlines of settlement configuration, from surface indications of different architectural complexity within and between sites, from site locations with features and form the changes in these variables through time." The settlement pattern studies also involve finding out the manner in which human settlement are arranged over the landscape in relation to the physiographic, geographic, and environment (Chang 1958). Over a period of time settlement pattern studies have further developed (Adams 1965, Chang 1962, Trigger 1968, Flannery 1972, Renfrew 1972, Clarke 1972). In India too, several significant studies on the settlement pattern have been undertaken (Dhavalikar and Possehl 1974; Bhan 1979; Possehl 1980; Paddayya 1982; Makkhan Lal 1984; Erodsy 1988; Paul 1999-2000). These works highlight that the concept of settlement pattern is basically derived from the geography.

Geo-ecological Settings

The physical feature of the Yamuna-Hindon doab exhibits Bangar land rising upto 15-60 metres above the adjoining floodplains, the Khadar. This relief would have enabled settlers to make dwelling settlements on the higher land zones, while the adjoining floodplains, rich in alluvium, is ideal for any economy based on agricultural activity. Riverine setting plays an important role in the choice of the settlements. As Possehl has aptly said (1980 : 85), an obvious advantage to a riverine location is, reliable supply of water for human and animal consumption as well as for general domestic use. Further, it also afforded a potential for irrigation. There are also other significant sources of water that play a crucial role in the agricultural economy of the region and thereby influence the settlement pattern: wells (as the water table of the region is very high) and the annual rainfall between 80-100 cm. Gazetteer of Meerut, 1922, highlights the importance of wells as source of irrigation in the region. Panini mentions that villages depended for their water supply on wells (kupas) to which were attached water trough (nipanas) from which the cattle would drink (Agrawal 1953 : 141). Also, the famous legend of Lakkhi banjarra (a nomad) shows that it was easy to dig up well as the water level was very high.

The economic and ecological factors also affected the size and spacing of the settlements.

Most of the settlements are situated on the top of the high banks of the Yamuna and the Hindon. Two settlements, Baragaon and Khatta Pahladpur, are away from the river-banks but these have been settled only towards the early centuries of Christian era, when increasing population pressure forced people to settle in the ecologically less favourable zones. On the banks of the Hindon, land zones of even average height were also selected for settlements, as its floods were less threatening than the floods of the Yamuna.

The climate is sub-humid, the annual rainfall is between 80-100 cm and the plains are rich in alluvium. Consequently, the region is ideal for cultivation. Such soil types and the fertility of the soil

are important factors determining the location of human settlements, especially in the case of agricultural communities.During the monsoon period, often heavy rainfall causes considerable rise in the river bodies; the stream is then very deep and strong, and in time of heavy flood the rivers approach close to the outskirts of the settlements. However, they do little damages because the rivers are fairly regular in habits. On the other hand, the small areas of lowland on its banks are actually benefited by the alluvial deposits brought down by the rivers. The Gazetteer of Meerut (1922) reports that the land inundated by the rivers is occasionally cultivated for the rabi crops, and the harvests are of excellent quality.

Resource Potential

It is pertinent to note that copper and iron ores, as well as semiprecious stones like agate, jasper, carnelian, chalcedony and lapis lazuli are not found in the Yamuna-Hindon doab region. However, these artefacts have been reported from the region, suggesting occurrence of trade in the area. The settlements on the Yamuna, which is better suited for transport and commerce, were perhaps mainly involved in this trade and were probably served and fed by a group of small village settlements on the peripheries of these settlements. For example, evidences from Allahapur suggest presence of a bone and antler industry. This industry could well have been a part of the local trade, in which probably apart from Hastinapur, Loni, Manduala and Katha also played an important role.

Archaeological evidences from Hastinapur (Lal 1954-55 : 123) and Atranjikhera (Chowdhury et. al. 1977 : 63) suggests that rice (Oryza sativa), wheat (Triticum compactum), barley (Hardeum vulgare), peas and some other legumes were cultivated by the PGW people. However, it is to be noted only rice was found at Hastinapur while at Atranjikhera more quantity of rice was found than wheat and barley. This indicates that perhaps rice dominated the staple diet of the PGW people.

Animal sources of food also supplemented the economy of the PGW culture. Bones of goat, deer, horse, bull and pig have been found at Allahapur, Hastinapur and Atranjikhera. Spearheads and arrowheads found at sites, such as Alamgirpur and Allahapur indicate that they could be tools for hunting. Fish-hooks were found at several PGW sites, such as Atranjikhera.

Chronology Debate

A review of existing archaeological works highlight that one cannot assign a uniform date to PGW culture. Several dates have been proposed, such as based on archaeological data from Hastinapur and the literary sources, Lal (1954-55 : 21-23) has placed PGW in a time bracket of 1100 B.C.E. to 800 B.C.E. At Bhagwanpura, the PGW culture has been dated to 1400 B.C.E. to 1000 B.C.E. After making a critical study of C-14 data, Roy (1983 : 123) argues that the sites like Hastinapur, Allahapur, Alamgirpur and Hulas, which do not give the evidence of any pre-PGW (BRW) phase, cannot be dated earlier than 7thto 6thcenturies B.C.E. He notes that the C-14 dates from Hastinapur and Allahapur suggest that PGW culture continued up to 350 B.C.E.

Archaeological Context – Consideration of Stratigraphy

The PGW is found in four stratigraphical contexts in northern India, particularly in the Yamuna-Hindon Doab and its neighbourhood: (i) PGW after Late Harappan culture - At Alamgirpur, Hulas and Mandoli, it is preceded by Late Harappan culture but with a gap between the two cultures. (ii) PGW after the OCP culture - At Kaseri, Hastinapur and Ahichchhatra, it is preceded by OCP culture. At Hastinapur and Ahichchhatra, there is break between OCP nad PGW cultures. However, in the excavation report on Kaseri (IAR : 1969-70 : 43) it is not specified whether there

was a gap between OCP and PGW cultures. (iii) PGW interlocking with the Late Harappan culture -At Bhagwanpura in Haryana, and Daheri, Kathpalon and Nagar in Punjab, the PGW has an interlocking phase with the Late Harappan culture.(iv) PGW after the BRW culture - At Atranjikhera in Uttar Pradesh and Noh and Jodhpura in Rajasthan, the PGW is preceded by the BRW culture with a break in between the two cultures.

The causes for a break between the Late Harappan culture and the PGW culture at sites, such as Alamgirpur and reasons for an interlocking phase between the two cultures at sites, such as Bhagwanpura have been studied by Joshi (1993 : 24).He contendsthat the Late Harappan culture at Alamgirpur was priorto the Late Harappan culture at Bhagwanpura and the PGW culture at the former site was later than the PGW culture of Bhagwanpura IB. Thus, while there remained a gap at Alamgirpur, the same was bridged at Bhagwanpura. It is interesting to note that in almost all sites, the PGW overlaps with the NBPW culture.

Settlement Pattern

It is pertinent to note that Harappan settlements were established in the Haryana and Punjab, which are the adjoining regions of the Yamuna-Hindon doab (Dikshit 1985 : 58). It seems that during the Late Harappan phase, people from these settlements migrated in the Yamuna-Hindon doab and established the Late Harappan settlements in the region. The Harappan culture complex at Alamgirpur and Baragaon were found more influenced by the material remains of Sutlej Valley, whereas Hulas appears to have its mooring in the Sraswati-Drishadvati complex of Haryana (Dikshit 1985 : 57). In the Yamuna-Hindon doab, both these cultural waves are present.

Similarly, there seems to be an eastward movement of PGW people from neighbouring areas of Haryana, Punjab and probably Jammu into the Yamuna-Hindon doab as the PGW culture of the doab region and the whole of western Uttar Pradesh, is younger than PGW culture of Haryana, Punjab and Jammu.

The PGW sites of the Yamuna-Hindon doab are generally located on rivers banks. Some of the PGW sites identified during the present work in the region are Mandoli, Loni, Mandaula, Katha, and Baghpat which are settled along the Yamuna. Other PGW sites identified during the present work are Kaseri, Khurd Banhera, Garhi-Kalanjari. Mukari and Pashuram ka khera. These sites are along the Hindon River

A review of existing archaeological work suggests that the average distance between two PGW sites is about 10-12 km and in encouraging ecological zones it is even 5 km. It is interesting to note that the average distance between Mandoli, Loni, Mandaula, Katha, and Baghpat on the Yamuna is about 8-9 km, whereas the average distance between Kaseri, Khurd Banhera, Garhi-Kalanjari. Mukari and Pashuram ka khera along the Hindon River is 6-7 km.

Along the Yamuna, the distance between Loni and Mandaula is 8 km, between Mandaula and Katha is 8 km and between Katha and Baghpat is 6 km. However, along the Hindon, the distance between Banhera and Siti is 2 km, between Siti and Hateva is 1.5 km, between Hateva and Garhi Kalanjari is 2 km, between Garhi Kalanjari and Mukari is 13 km. However, if we include the smaller sites, then the gap between Garhi Kalanjari and Mukari is filled by sites, such as Singauli, Gauna, Shahbanpur, Laliyana, Chamrawal and Haresia. And, the average spacing between all these villages is 1.5—2 km.

The present research work highlightsthat the PGW sites along the Hindon river are more closely spaced as compared to the settlements along the Yamuna. However, the settlements along the

Yamuna are bigger in size than those along the Hindon and other tributaries of the Yamuna. A survey of the existing archaeological work suggest that the habitations were basically small villages with average size of 1 to 4 hectare. It seems that the population of these villages would have been also moderate considering the size of the villages. Over a period of time, an increase in population would have led to more settlements both along the rivers and away from them.

A survey of the existing archaeological works and the field surveys conducted during the present research work also reveal marks of fortification at few big sites. It is suggested that as the villages developedand spread on banks of rivers, particularly those along the bigger river, the Yamuna, for various natural advantages, the need of fortification to safeguard against floods and attacks of enemies was becoming more pressing. It is also pertinent to note during this period a considerable portion of the country was on the threshold of urbanization.The empires and the invaders of the past were aware of the fertile land of the doab and its prosperity, and hence this area witnessed frequent attempts by these forces to control the doab. O.H.K. Spate and A.T.A. Learmonms (1963) also state that in the past defence played an important part in defining the settlement pattern of a village, especially in the areas open to constant disturbance, such as the Sutlej-Yamuna and the Yamuna-Ganga doabs. Villages are severally grouped around a petty fort.

Structural Remains

In and around the Yamuna-Hindon doab, some of the structural remains unearthed from the PGW sites include: (1) From Alamgirpur: large lumps of clay, sometimes burnt, with red impressions, suggested that the houses had been built of reeds plastered over with a thick layer of clay. (2) From Allahapur: closed and open-mouthed hearths, mud floors with post-holes and burnt reed- impressed mud plaster were noticed. (3) From Mandoli: houses of rammed-mud floors and post-holes, suggesting that it was a village settlement, were noticed. (4) From Kaseri: as structural remains, only an oval-shaped hearth was located.

Structural remains suggest the nature of the houses of PGW sites. Roof may have had a wattle-cum-thatch base (Roy 1983 : 137) because the rains are expected to be heavy in the region, mud could not be relied upon for roof. Findings of post-holes at Mandoli and Allahapur, suggest that during the PGW period the houses were made by using wooden or bamboo screens. Similarly, findings of lumps of clay, bearing reed or bamboo impressions from Alamgirpur, Allahapur and Hastinapur, suggest that the houses were plastered with mud. The archaeological evidences from Hastinapur suggest that husk of rice was used to reinforce the mud or mud walls with plaster. As observed at Mandoli, the floors were made of rammed floor.

The archaeological findings suggest that the PGW Period is pre-Mauryan and is pre-urban in nature. Identification of a large number of Late Harappan and OCP sites in the region, particularly at Saharanpur, Muzaffarnagar, Bulandshahr, Meerut and Ghaziabad districts, suggest that even without iron the occupation of the Ganga-Yamuna doab, of which the Yamuna-Hindon Doab is a key part, was possible. However, introduction of iron seems to have ushered in the second urbanistion in the entire region as it brought changes in the social, economic, and political institutions of the PGW culture.

Conclusions

In the nieighbourhhod of the Yamuna-Hindon doab regain, more specifically, in the Indian state of Haryana and Punjab, several Harappan settlements were established (Dikshit 1985 : 58). It seems that during the Late Harappan phase, people from these

settlements migrated and settled in the Yamuna-Hindon doab. The Harappan culture complex at Alamgirpur and Baragaon were found more influenced by the material remains of Sutlej Valley, whereas Hulas appears to have its mooring in the Sraswati-Drishadvati complex of Haryana (Dikshit 1985 : 57). In the Yamuna-Hindon doab, both these cultural waves are present. Similarly, there seems to be an eastward movement of PGW people from neighbouring areas of Haryana, Punjab and probably Jammu into the Yamuna-Hindon doab.

The settlements in the Yamuna-Hindon doab are generally located on the higher banks of the rivers and are small in size. The settlements depended upon the nature of soil and easy availability of water for irrigation and domestic use, and rich vegetation.The presence of a favourable geo-ecological settings, such as fertile alluvial social and diverse and rich flora and fauna made the Yamuna-Hindon doab favourable for human settlements. The comparative vicinity of the Himalayas and the high altitude combine to render the region one of the healthiest parts of the plains of India.It seems that iron was introduced during the PGW period but copper remained the chief metal. PGW people cultivated wheat, rice, barley, gram, urad and pea and practised animal husbandry, hunting and fishing.

The geo-ecological settings and economic factors affected the size and spacing of the settlements. One can notice both the linear and circular pattern of settlement. The average size of an early settlement was about 200 metres in length and 150 metres in breadth. This shows that the inhabitations belonged to small cluster of families. The average spacing between two settlements is from 8 to 12 km. Though in the Saharanpur district it is between 5 to 8 km.The duration of these settlements must be short as evident from the limited thickness (between 1-2 m) of occupational deposit.

In the Yamuna-Hindon Doab, the settlements of the PGW culture are generally located on rivers banks. The average distance between two sites is about 10-12 km and in favourable ecological zones it is even 5 km. The settlements along the Hindon are more closely spaced as compared to the settlements along the Yamuna. However, the settlements along the Yamuna are bigger in size than those along the Hindon and other tributaries of the Yamuna. The habitations are basically small villages with average size of 1 to 4 hectare.

Over a period of time, due to favorable geo-ecological settings, the number of settlements gradually increased, and even sites away from rivers were occupied. It is suggested that an increase in settlements together with the use of iron technology generated agricultural surplus which gradually ushered in the second urbanization in the region and its neighborhood. Consequently, by 600 B.C.E., one notices a flourishing monetary economy and stable political institutions, such as republics, kingdoms, and empires in the region which gradually spread to the other parts of India and beyond.

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