

Indus–Saraswati Civilization in Haryana Archaeological Evidence, Settlement Patterns, Economy, and the Saraswati River Debate

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Abstract: Indus Saraswati Civilization is said to have been one of the earliest as well as the most sophisticated city cultures of the ancient world that existed in the Bronze Age within the north western region of the Indian subcontinent. Although earlier studies had focused primarily on the Indus valley sites discovered in the modern Pakistan, recent archaeological discoveries have significantly widened the geographical boundary of this civilization particularly to other regions of India such as Haryana. The renewed interest in this area due to the growing number of sites being dug and explored within the region has rekindled interest in the Ghaggar-Hakra river system which has long been associated with the ancient Saraswati River. This has led to a re-evaluation of old understandings which had limited the civilization to the Indus basin.

The paper will consider Haryana within the framework of the greater Indus-Saraswati Civilization in terms of the archeological traces, the patterns of settlement, the economy, and the cultural activities. Rakhigarhi, Bhirrana, Banawali and Kunal are explored in the specifics to determine their impact on the development of the early urban life. These sites are well preserved evidence of continuous settlement, technology and social-economic structure, which indicates that Haryana was an active and was a part of the civilization.

The current controversy of the location of the Saraswati River also involves the study. Even though the scholars have thought that the Ghaggar-Hakra system coincided with the Saraswati of the old literature, there are geological contradictions that render it hard to assert so. This paper does not take a final position but instead speculates on the archeological significance of the river system in the dispersal of settlements and culture.

The qualitative approach of the paper is methodological, as the information has been based on the secondary materials, such as excavation reports, academic literature, and interdisciplinary studies. This paper provides a detailed picture of the role of Haryana in the civilization through the synthesis of these sources. The findings have shown that the region was not a peripheral extension but rather a central region that significantly contributed to the development and sustenance of the civilization. Overall, this research proves that there is a need to reconsider

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the conventional histories and recognize the importance of such areas as Haryana when it comes to rewriting the history of early urbanization.

Keywords: *Indus-Saraswati Civilization, Harappan Culture, Haryana Archaeology, Ghaggar-Hakra River, Rakhigarhi, Bhirrana, Saraswati River Debate, Bronze Age Urbanization, Material Culture, Settlement Patterns*

1. INTRODUCTION

The Harappan Civilization or Indus-Saraswati Civilization is a major milestone in the history of urbanization and human settlement. It was established during the third millennium BCE and is widely thought to have been very thorough with regard to planning cities, measuring quantities and trade networks. Archaeological understanding of this civilization in the greatest part of the twentieth century was largely affected by the discovery of the biggest sites of the Indus Valley including Harappa and Mohenjo-daro and the outcome was that the heart of the civilization was exclusively situated within the Indus Valley. This view has however been radically altered by subsequent archaeological discoveries which have also revealed a much more diverse and heterogeneous cultural topography extending to other regions of the country such as extending into Haryana.

The increasing catalogue of places discovered in Haryana has rendered the Ghaggar-Hakra river system a subject of attention, which appears to have been the foundation of a large system of settlements. This has led to the growing use of name of the Indus-Saraswati Civilization, as a more inclusive concept of its geographical region. Haryana, in particular, has been a province of great importance, due to the quantity and diversity of its archaeological remains. The examples of Rakhigarhi which currently turns to be one of the largest urban centers of the civilization challenge the past notions about the distribution of population and resources.

Besides its archaeological worth, the geographical position of the Haryana also contributed to its worth. The region served as a territory of transition between the Indus basin and the Gangetic plains and served as an interaction point of the various cultural and ecological regions. This strategic location most likely led to the development of trade relations and the exchange of ideas, materials and technologies.

The purpose of this research paper is to examine the Haryana in the Indus-Saraswati Civilization in a comprehensive manner. The purpose of the paper is to provide a delicate understanding of the influence of the area in the initial urbanization through a synthesis of archeological data with geographical and cultural studies. It also tries to address the existing controversies particularly that surrounding the Saraswati River by focusing on facts, rather than the perceived meanings. Through this, the study will be able to balance and inclusively re-write one of the oldest civilizations in the world.

2. LITERATURE REVIEW

The last century has seen an incredible shift in historiography of Indus Civilization due to the shift of the focus to include more than just limited locations of large urban centers to a more regionally aware perspective. Early archaeological excavations following the discoveries of Harappa and Mohenjo-daro in the 1920s were primarily centered on monumental architecture, urban structure and material culture (John Marshall 1931 and Rakhal Das Banerji 1924). These early sources portrayed the civilization as

Table A: Chronological Phases of the Indus-Saraswati Civilization with Key Characteristics

Phase	Period	Characteristics	Key Sites in Region
Pre-Harappan	Before 3300 BCE	Village communities; early pottery; subsistence farming; proto-urban traits	Bhirrana (Haryana), Kunal, Mehrgarh (Pakistan)
Early Harappan	3300–2600 BCE	Regional cultures merge; settlement expansion; standardized ceramics; craft beginnings	Sothi, Siswal, Kalibangan
Mature Harappan	2600–1900 BCE	Peak urbanization; grid cities; standardized bricks; drainage systems; long-distance trade	Rakhigarhi, Harappa, Mohenjodaro, Dholavira
Late Harappan	1900–1300 BCE	Urban decline; eastward migration; local traditions persist; deurbanization process	Bhagwanpura, Cemetery H, Pirak
Post-Harappan	1300–600 BCE	Cultural assimilation with Vedic traditions; Painted Grey Ware; Gangetic settlements	Hastinapur, Atranjikhera

Figure 1: Developmental phases of the Indus-Saraswati Civilization from Pre-Harappan to Post-Harappan (Based on Possehl 2002; Kenoyer 1998)

very much standardized and centralized, the civilization features such as grid cities, excellent drainage systems, and standard sizes of the bricks. However, this original paradigm tended to disregard regional variation and the contribution of regions beyond the Indus Valley hub.

A key shift of interpretation has been in the late twentieth century, with the adoption of newly discovered sites in northwestern India by scholars. Gregory L. Possehl (2002) contributed to the redefinition of the civilization as a complex cultural one, rather than a monolithic one. He emphasized regional differentiation and asserted that the Indus Civilization was more of a system of interacting communities, which shared common cultural features than a kingdom. Similarly, Jonathan Mark Kenoyer (1998; 2010) highlighted the diversity of craft production, trade and settlement systems, and demonstrated that the local adaptations were the main actors in the functioning of the civilization.

Archaeological research has had a unique role in changing the academic perceptions in Haryana. Rakhigarhi, Bhirrana and Banawali sites have been excavated where invaluable information about settlement patterns and continuity in cultures has been acquired. Lal (2002) proposed that the Ghaggar-Hakra basin, which houses the majority of these places, might be the same as the Saraswati River of the Vedic scriptures. This has been supported by the efforts of scholars such as S.P. Gupta (1995) who emphasized on the existence of settlements along this river system as an indicator of its historical significance. In the meantime, the chronology of the civilization has been dated to earlier by excavations in Bhirrana, reported by Rao et al. (2005; 2015), suggesting that the origins of the civilization might even be earlier than the traditional date of 2600 BCE. The findings disprove the earlier diffusionist theories and show a more complex system of indigenous development.

The discovery of the Saraswati River is one of the most debatable questions of the Indus studies. Despite the fact that the body of research that supports the linkage between the Ghaggar-Hakra system and the Saraswati of ancient sources (including Lal, 2002 and Gupta, 1995) is considerable, there are scholars who are more conservative in their approach. Clift et al. (2012) and Giosan et al. (2012) suggest, based on geological and remote sensing data, that the Ghaggar-Hakra was a monsoon fed river rather than a major glacial system, which would mean that it is not identical to the Saraswati. These publications show the complexity of the work of reconstruction of ancient river systems and the

significance of the interdisciplinary approach, incorporating the archaeology, geology, and climatology. Despite such differences, there is overall agreement that the river system was at the epicentre of the settlement distribution in regions like Haryana.

The new literature started to focus attention on the Indus Civilization even in the context of environmental factors. Researchers such as Madella and Fuller (2006) have researched on farming practices and historical trends in crop production and have demonstrated how individuals adapted to the new climatic regime. Similarly, Wright (2010) also noted the role played by environmental stress like alterations in river paths and the declining supply of water in the transformation and the consequent deterioration of urban areas. The case of Haryana has archaeological evidence that demonstrates continuity and adaptation to changes in material culture and settlement organization in the case of Late Harappan settlements in response to environmental changes.

Another prominent trend in new literature is the emphasis on socio-economic organization and trade networks. The long-distance trade has been highlighted by Kenoyer (2010) and Possehl (2002) as a way of connecting the Indus Civilization with other destinations such as Mesopotamia and Central Asia. Evidence such as the existence of artifacts such as beads, seals and standardized weights found in locations in Haryana is evidence of this since they indicate that the area was a member of these wider exchange networks. This complicates the earlier presumptions that the peripheral areas were economically peripheral, and instead suggested that they played a role in the sustenance of the economic system of the civilization.

Overall, the existing literature presents a clear tendency in the shift of the earlier models that were centralized to more dynamic and regionally oriented explanations. This shift in particular has played a major role with the incorporation of data in Haryana due to its history of early habitation, culture continuity and environmental adaptation. There is an increasing agreement among researchers that the Indus-Saraswati Civilization can not be described using a single explanation but that it should be seen as multi-dimensional and multifaceted as a cultural phenomenon. This brings out the need to conduct more interdisciplinary research that will bring together archaeological data with environmental and technological research to form a more detailed picture of the civilization.

3. METHODOLOGY

A qualitative, interpretative approach is adopted in this work to explore how Haryana fits within the bigger picture of the Indus-Saraswati Civilization. The given research is founded on the critical examination of the secondary data, i.e. the published excavation reports, the peer-reviewed articles in the journal, the monographs and the research findings of other disciplines, rather than the actual excavation. The method is specifically suited considering the tremendous archaeological works already done at various sites in Haryana which provides a hugely good platform to generalize and make conclusions. These materials systematically reviewed will assist the research to develop a coherent and evidence-based picture of the cultural and historical importance of this region.

The model of the research analysis is designed based on major thematic areas that include settlement distribution, material culture, economic organization and practices and social practices. The selection of these themes is based on the fact that these are the key areas around which the Indus-Saraswati Civilization can be understood. The paper will concentrate on how these are brought out in the archaeological record of Haryana and how this can be compared to the findings of other regions, like the Indus Valley, Gujarat and Rajasthan. The analysis therefore has a comparative

approach, which will enable the identification of similarities as well as regional differences. This helps to get rid of the generalizations of interpretations and focus on the heterogeneity of the civilization.

The study is interdisciplinary besides comparative analysis. Archaeological data is viewed alongside geographical, environmental science and paleo-hydrology to understand more about the relationship that exists between the human settlements and the environment around them. The distribution of sites in the system of Ghaggar-Hakra river and their varying river courses and climate are an example. By doing this, a more subtle study of how the environmental factors influenced the settlement pattern, resources exploitation and sustainability could have been done over time.

The work also critically engages with the literature, particularly the literature that addresses the locating of the Saraswati River and the time of the civilization. The study is not deterministic and it takes into account numerous various views and emphasizes on evidence-based arguments. It is a moderate approach that renders the analysis goal and grounded on empirical evidence.

In general, the methodology will offer the consistent and intertwined view of the location of Haryana in the Indus-Saraswati Civilization. The study will contribute to higher and context-sensitive knowledge of early urban development in the region by synthesizing, comparing, and integrating research results into the research field.

4. HARYANA IN PROTOHISTORIC CONTEXT

This work uses a qualitative, interpretative approach to investigate the way Haryana can be placed in the context of the larger picture of the Indus-Saraswati Civilization. The given research is based on the critical examination of the secondary data, i.e., reported excavations, peer-reviewed journal articles, monographs and interdisciplinary research findings, rather than the actual excavation. This method is specifically suitable, given the fact that so much archeological work has been done up to date in various areas in Haryana which offers a very favorable ground to generalize and make conclusions. It is the systematic review of these materials that will assist the research to construct a rational and evidence-based picture of how the cultural and historical value of this region can be understood.

The model of analysis of the research follows the major areas of analysis in the form of thematic areas, which include settlement distribution, material culture, economic organization and practices as well as social practices. The selection of these themes is based on the fact that these are the key areas around which the Indus-Saraswati Civilization can be understood. The paper will concentrate on how these are brought out in the archaeological record of Haryana and how this can be compared to the findings of other regions, like the Indus Valley, Gujarat and Rajasthan. The analysis therefore has a comparative approach, which will enable the identification of similarities as well as regional differences. This helps to get rid of the generalizations of interpretations and focus on the heterogeneity of the civilization.

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HARAPPAN SETTLEMENTS IN THE GHAGGAR-YAMUNA DIVIDE

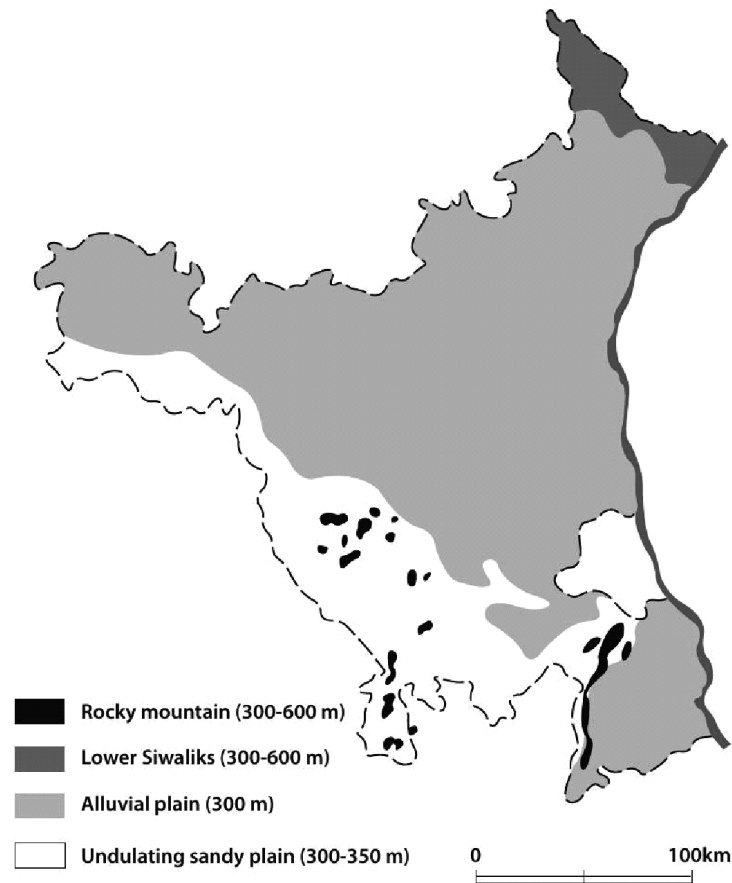


Figure 1 Geographical features in Haryana

Haryana Plain) was framed by the deposition of the alluvial sediments brought down by the rivers. This plain mostly lies under 300 m above the mean sea level. The rivers like Ghaggar, Tangri, Markanda, Saraswati, Rakshi, Drishadvati and Yamuna have their flood plains commonly known as the Khadar or Bet area (Figure 2). In contrast to these newly formed hills the Aravali outliners (Delhi System) belonged to the Lower Cuddapah (Algonkian) age (Wadia 1939: 89).

2001: 21).

The western Haryana plain is different from the northern Haryana plain because of the presence of a large number of sand-dunes of varying heights and magnitudes. This region is also geographically known as Bhiwani Bagar. The southern Haryana plain has the presence of the Aravali offshoots and slopes towards the north and is of undulating character. This region does have sand-dunes in the Mahendragarh district.

Figure 2: Geographical features of Haryana — Siwaliks, alluvial plains and sandy zones
(Source: Manmohan Kumar, Occasional Paper 7, RIHN 2009)

The work also critically engages with the literature, particularly the literature that addresses the locating of the Saraswati River and the time of the civilization. The study is not deterministic and it takes into account numerous various views and emphasizes on evidence-based arguments. It is a moderate approach that renders the analysis goal and grounded on empirical evidence.

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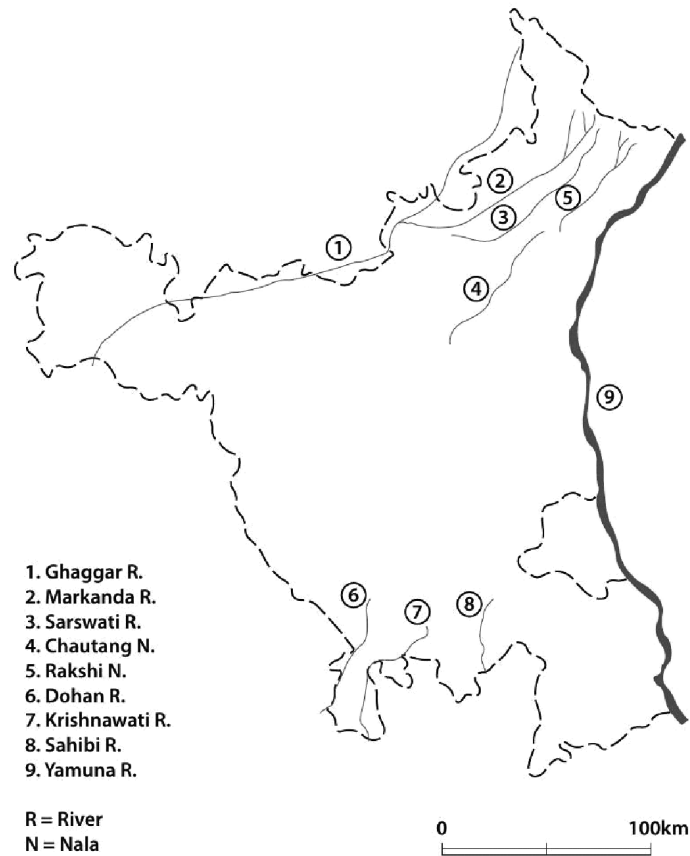


Figure 4 River systems in Haryana

of the writings of Chinese pilgrims (Cunningham 1871: 54-60, 212-30). In the early fifties of the twentieth century, B.B. Lal started his exploration and identified a few Painted Grey Ware sites in the region (Lal 1954-55: 138-146) which were mentioned in the Epic Mahābhārata. But the real exploration work was started by Suraj Bhan and he explored a number of sites in the region (Suraj Bhan 1975: 121-26). Under his direction, a number of M.A. students completed their dissertations and brought to light a number of Harappan sites. In the early seventies, the research

light hundreds of new sites.

As a consequent of these efforts the Ghaggar-Yamuna divide is one of the most explored regions in the country. These efforts have brought to light thousands of sites belonging to different periods, ranging from the Stone Ages to the Medieval times. This basic data is very useful for further empirical studies. The region is specifically important for the Harappan studies and the explorations have opened new vistas not only in the extension of the geographical limit of the civilization and have also

Figure 3: River systems of Haryana — Ghaggar, Saraswati, Yamuna and tributaries that shaped settlement distribution (Source: Manmohan Kumar, Occasional Paper 7, RIHN 2009)

On the whole, the methodology will give a consistent and unified view of the role of Haryana in the Indus-Saraswati Civilization. The study will contribute to a higher order and contextual richness of knowledge on early urbanization in the region by synthesizing, comparing and integrating research results into the field of research.

5. MAJOR ARCHAEOLOGICAL SITES IN HARYANA

There are several important archaeological sites in Haryana which have contributed tremendously to our knowledge about the Indus-Saraswati Civilization. Rakhigarhi is one of the biggest and most researched urban centers. Trenchings here have shown it to be a city plan laid out in grid-work, an elaborate drainage system and great houses. The size of Rakhigarhi and its complexity indicate that it was a large urban centre, which was as important as such historical cities as Harappa and Mohenjodaro. Another indicator of high level of technological and cultural development is the discovery of artifacts like pottery, beads, seals and tools.

Bhirrana is another important place of great interest particularly to the initial phases of the civilization. Archaeological data show that it was occupied during the pre-Harappan era and the mature Harappan era and hence one of the earliest known settlement in the region. This continuity provides nice hints to the evolutionary and adaptive patterns of culture over time. Early evidence of ceramic material and architecture can be found at Bhirrana, which has led some scholars to propose that the origins of the civilization may lie in places like Haryana and not limited to the Indus Valley.

Another special glimpse of the early and later stages of Harappan is in Banawali, in Fatehabad district. The site has been described as having a fortified design that comprises of fortified walls and designed residential areas. Its city form is a bit different than the others in the Harappans, and this indicates that there is a local difference in the city form. The Banawali pottery and the artifacts also possess unique styles that also emphasize diversity of the civilization.

Kunal and Farmana are other websites that add to the extent of knowledge. Kunal can be characterized in terms of its original cultural deposits and traces of craft work, but Farmana has given valuable information regarding the burial customs and the social organization. All these sites reflect the richness and depth of the Haryana archaeology.

The surveys of these regions reveal that Haryana was not just a periphery region, they were central regions where the urban, economical and cultural activities were very enriched. The variety of sites and the character of evidence that the latter bring underline the significance of the area in the rewriting of the history of the Indus-Saraswati Civilization.

Table 1: Major Indus–Saraswati (Harappan) Civilization Sites in Haryana with Archaeological Findings and Sources

Site Name	District	Cultural Phase	Archaeological Findings	Significance	Source
Rakhigarhi	Hisar	Mature Harappan	Urban layout, drainage, craft production, cemeteries, DNA study evidence	Largest Harappan urban centre; insights into population and social structure	ASI (2015); Shinde et al., Cell (2019)
Bhirrana	Fatehabad	Early Harappan	Early settlement layers, ceramics, radiocarbon dates	One of earliest Harappan sites; pushes chronology earlier	ASI (R.S. Bisht Excavation Report, 2003–2006)
Kunal	Fatehabad	Pre-Harappan	Silver ornaments, beads, storage pits	Proto-urban phase showing social differentiation	Man and Environment (Khatri & Acharya, 1995)
Banawali	Fatehabad	Pre & Mature Harappan	Fortification, fire altars, terracotta plough, barley remains	Agricultural economy + ritual practices	ASI (Bisht, 1980s Excavation Report)
Farmana	Rohtak	Mature Harappan	Cemetery, pottery, ornaments, habitation structures	Burial practices and social stratification	Man and Environment (Shinde et al., 2011)

Site Name	District	Cultural Phase	Archaeological Findings	Significance	Source
Mitathal	Bhiwani	Mature Harappan	Botanical remains (wheat, barley, rice, garlic), storage	Agricultural diversity and food habits	Man and Environment (Kachroo & Sharma, 1998)
Sothi	Hissar	Early–Mature Harappan	Fortifications, ceramics, settlement planning	Early urbanisation in Haryana region	Puratattva (Suraj Bhan, 1975)
Siswal	Fatehabad	Early Harappan	Distinct pottery (Siswal ware), habitation evidence	Regional cultural phase (Siswal culture)	Indian Archaeology – A Review (Suraj Bhan, 1973)
Bhagwanpura	Kurukshetra	Late Harappan	Painted Grey Ware, mixed cultural deposits	Transition from Harappan to Vedic culture	Indian Archaeology – A Review (Joshi, 1976–77)

HARAPPAN SETTLEMENTS IN THE GHAGGAR-YAMUNA DIVIDE

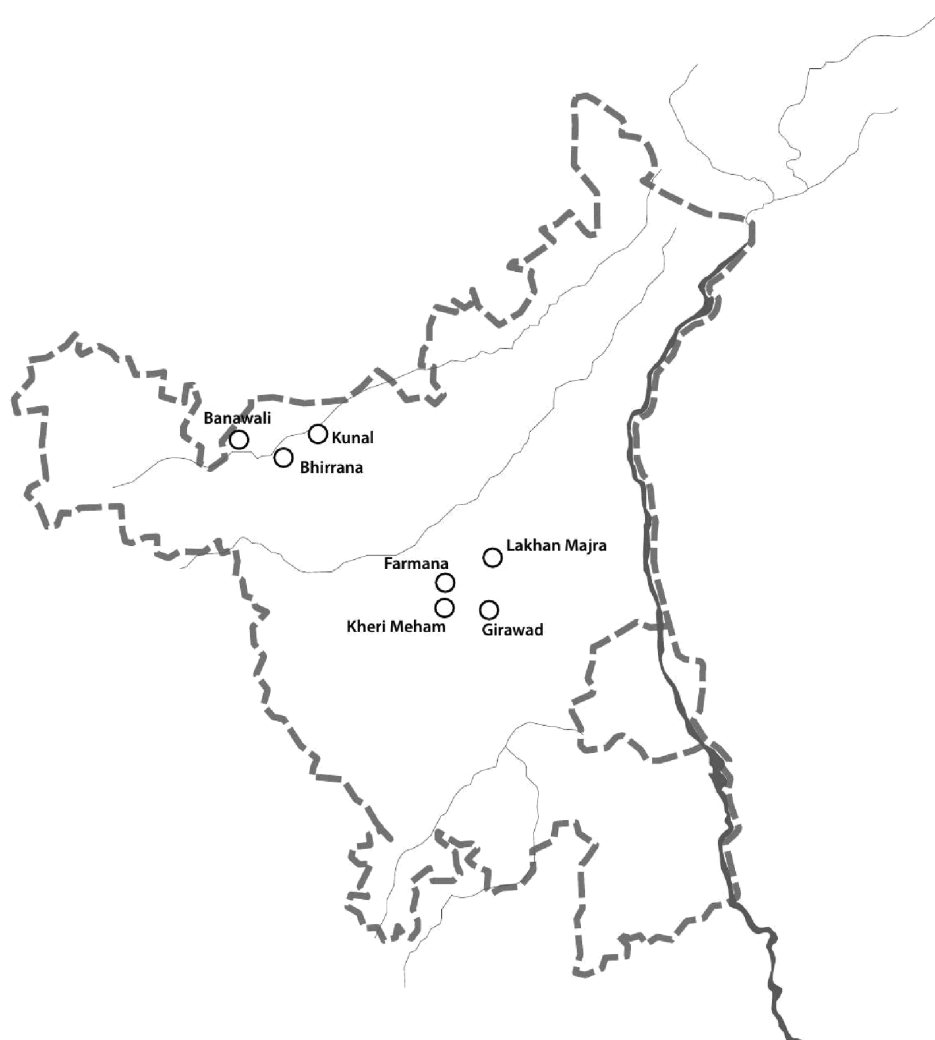


Figure 5 Pre-Harappan sites in Haryana

Kalka region on the terraces of the Ghaggar River, yet none has found here either any “base camp” or “periodic settlement” for exploration of seasonal

has been there from the Neolithic to the Harappan period. Such clear-cut evidence is not available in the Ghaggar-Yamuna Divide. The earliest evidence

Pre-Harappan sites in Haryana showing Banawali, Kunal, Bhirrana
(Source: Manmohan Kumar, Occasional Paper 7, RIHN 2009)

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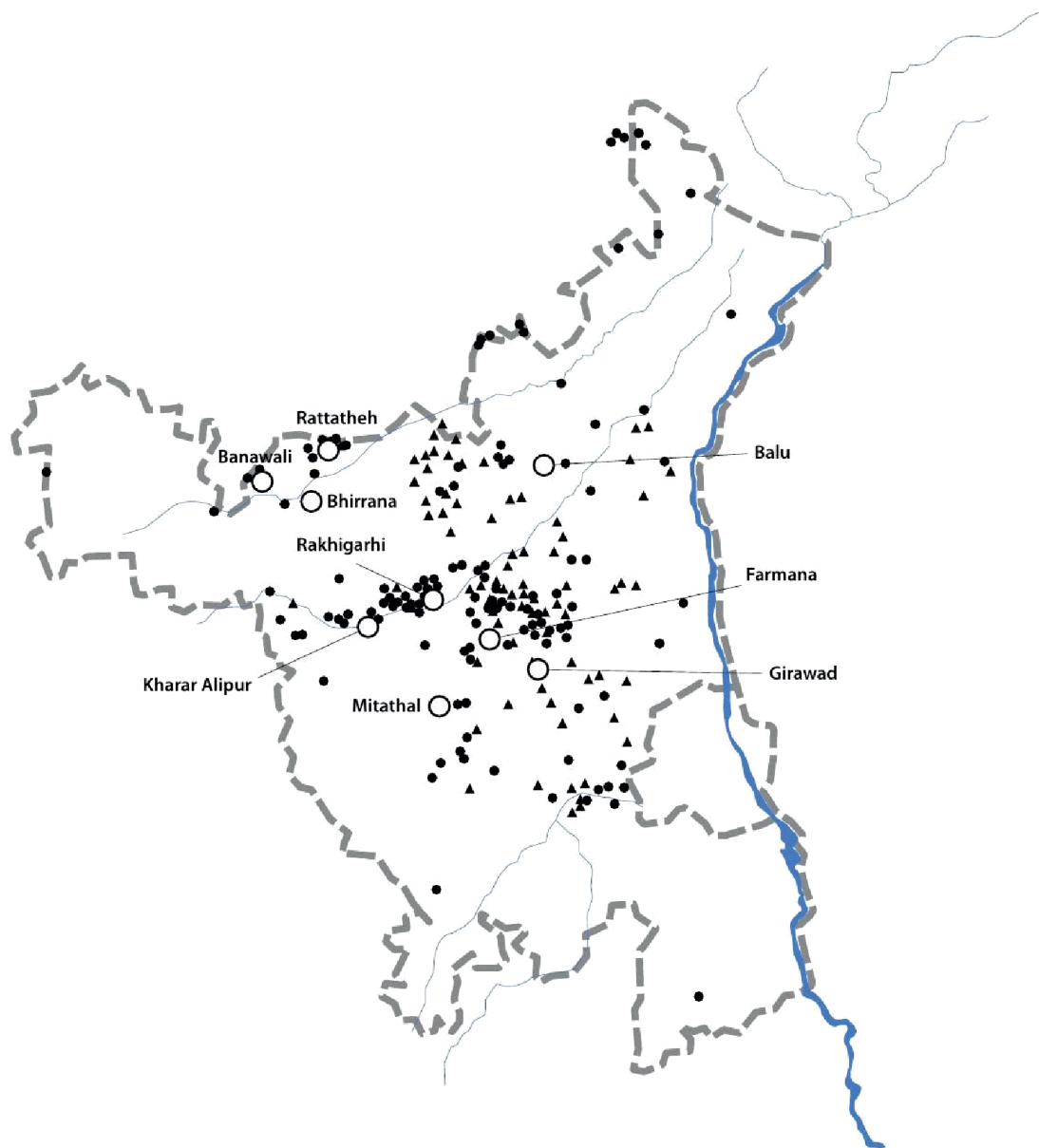


Figure 8 Mature Harappan sites in Haryana

Mature Harappan sites in Haryana — Rakhigarhi, Farmana, Mitathal and others
 (Source: Manmohan Kumar, Occasional Paper 7, RIHN 2009)

Figure 4: Major Harappan sites in Haryana — cultural phase, archaeological findings and academic sources
 (Source: ASI; Shinde et al. 2019; Bisht 2003–2006)

Table B: Regional Distribution of Harappan Sites — Proportional Bar Chart

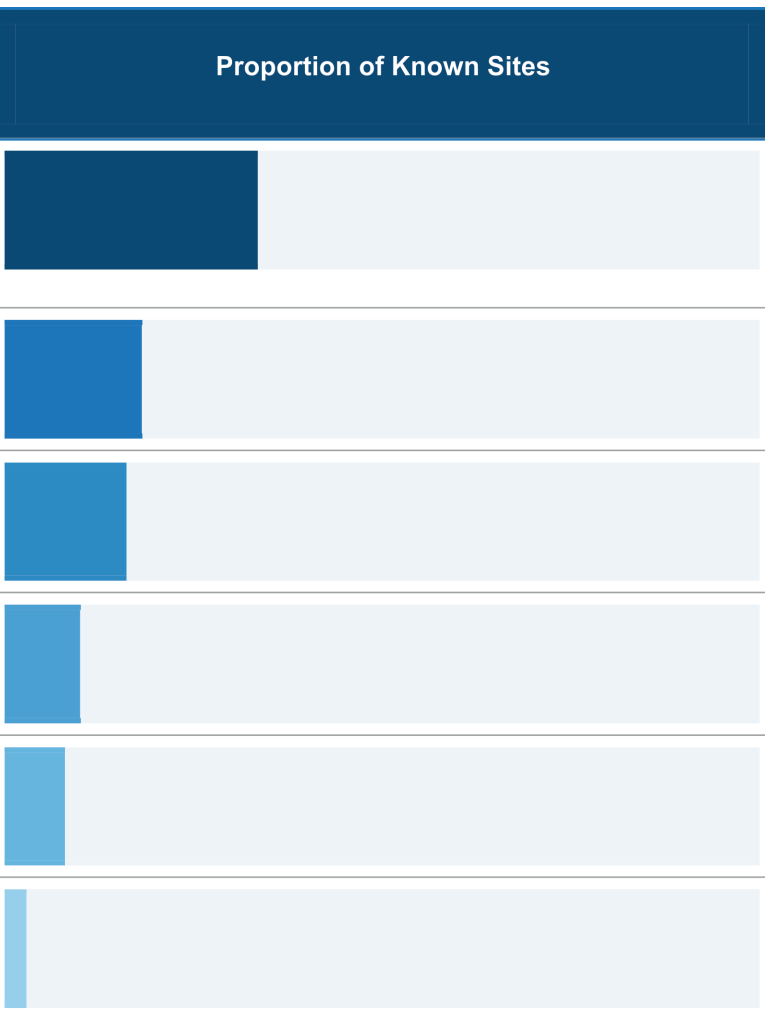
Region	Proportion of Known Sites	Share
Haryana / Ghaggar-Hakra (India)		35%
Rajasthan (India)		20%
Gujarat (India)		18%
Punjab India/Pakistan		12%
Sindh (Pakistan)		10%
Other Regions		5%





Figure 5: Proportional representation of documented Harappan sites by region; Haryana /Ghaggar-Hakra corridor has highest site density (Source: ASI 2022; Possehl 2002)

6. SETTLEMENT PATTERNS AND URBAN PLANNING

The imprints of occupation we can follow in Haryana during the Indus Saraswati Civilization are most systematized and hierarchical in structure echoing the adaptation to the environment and the complexity of the socio economic variables. Archaeology proves the existence of a tremendous variety of settlements, small rural settlements, and big cities. This variety implies a complex system whereby the various forms of settlements played a given role in the rest of the economic and cultural system.

An interesting feature of Haryana settlement distribution is that most of the settlements are concentrated along the river system of Ghaggar-Hakra. This trend underscores the importance of water

resources in decision of the settlement location. Agriculture and even domestic consumption and craft production would have depended on the availability of water. The proximity of the settlements to the river implies that there was a plan to provide that there was an optimum availability of resources and minimum harm to the environment.

Such cities as Rakhigarhi are very planned and standardized. Such cities are typically planned grid-like, with the streets oriented at right angles and dividing the space into well-recognised blocks. The bricks that were baked to construct buildings were standardized that is, there was a system of measurement and construction. The high level of drainage also refers to the issue of hygiene and health of the population which is also one of the characteristics of the Harappan urbanism.

Smaller settlements on the other hand were rather rural and were committed to agricultural production and local crafts. These villages were quite significant in supporting the urban centers to supply food and raw materials. The rural and urban communities had also become interdependent and thus had a single economic system.

The settlement pattern of Haryana is generally balanced between centralization and regional diversity. Whereas there is much uniformity in the urban centers, there is variation in the small settlements according to the local conditions and requirements. The combination of this standardization and adaptability allowed the civilization to be flexible to different environments and able to stand the test of time.

On the whole, we may conclude that the level of development and adaptability of the Indus-Saraswati Civilization is reflected in the patterns of settlement and urban planning in Haryana. They provide good information regarding the way the early societies organized space, resources and social and economic stability.

Table C: Key Urban Planning and Architectural Features of the Indus-Saraswati Civilization

<i>Urban Feature</i>	<i>Description</i>	<i>Evidence Sites</i>	<i>Assessment</i>
Street Grid Layout	N-S and E-W oriented roads creating rectangular city blocks; roads 9–34 ft wide	Rakhigarhi, Harappa	Advanced Planning
Covered Drainage System	Brick-lined underground drains connecting houses to main channels; sewage management	Mohenjo-daro, Rakhigarhi	World-First Sanitation
Standardized Bricks	Uniform 1:2:4 (H:W:L) ratio maintained across the entire civilizational zone	All major Haryana sites	Remarkable Uniformity
Granaries / Storage	Multi-roomed storage structures with ventilation; surplus food management	Rakhigarhi, Harappa	Organized Economy
Fortification Walls	Defensive mud-brick walls; controlled entry points; citadel and lower town division	Banawali, Dholavira	Urban Defence
Wells and Water Supply	Public and private brick-lined wells; step-wells; community water management	Farmana, Rakhigarhi	Hydraulic Engineering
Craft Workshop Zones	Dedicated areas for pottery, bead-making, metallurgy and textile production	Chanhu-daro, Rakhigarhi	Specialized Economy
Fire Altars	Ritualistic fire structures suggesting organized religious or ceremonial practices	Banawali, Kalibangan	Cultural Significance



Figure 6: Urban features documented at Harappan sites with evidence locations and archaeological assessment
(Source: Kenoyer 1998; ASI Reports)

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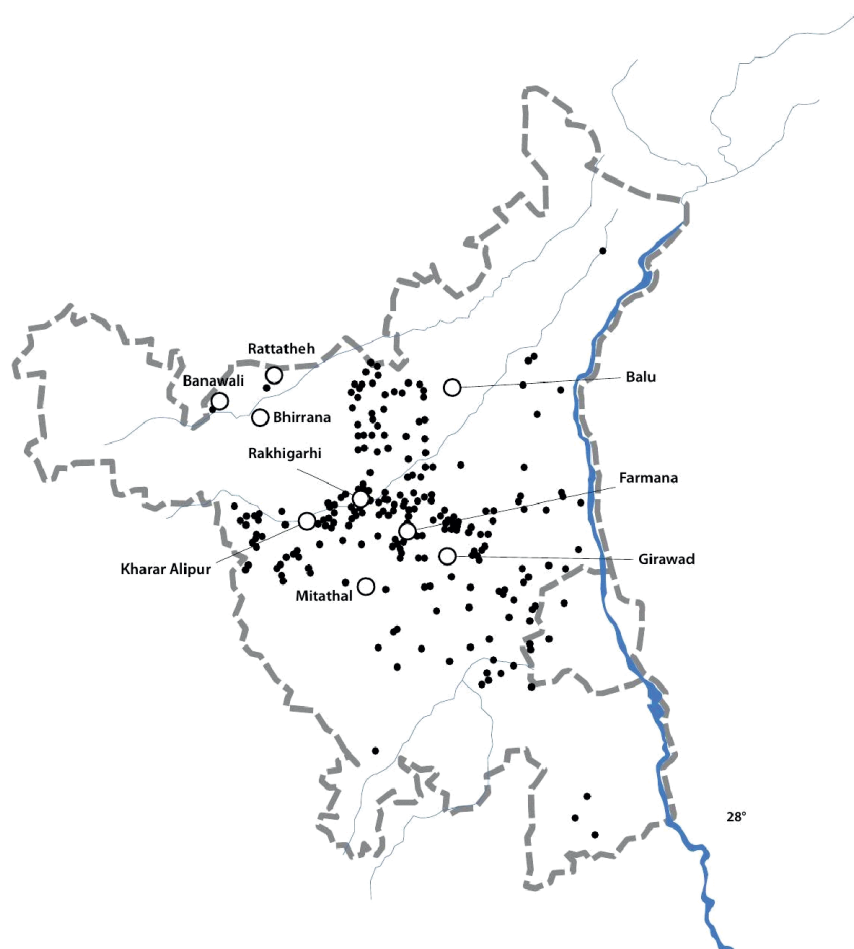


Figure 6 Early Harappan sites in Haryana

types. In this sub-phase appeared for the first time sturdy pots of well-levigated clay, resembling the classical Harappan forms, such as beakers, jars and

Harappan cultures originate in this region from the pre-Harappan cultures as is evident from the Bhirrana (Rao *et al.* 2004-05: 61) from where the excavation

Early Harappan settlement distribution in Haryana showing clustering along Ghaggar-Hakra corridor
(Source: Manmohan Kumar; Occasional Paper 7, RIHN 2009)

7. ECONOMY AND TRADE

Haryana was the Indus-Saraswati Civilization that was highly organized, diversified and integrated within the economy. The economy was predominantly agricultural and this was aided by the fertile alluvial plains and water supplied by the Ghaggar-Hakra river system. Archaeobotanical evidence of production based on subsistence and even surplus production has been presented by Rakhigarhi and Farmana of the presence of wheat, barley, pulses and possibly even millets. Presence of storage and granaries show that agricultural production was well structured and that it could support the immense population as well as feed the cities.

Animal husbandry was an addition to farming, and domesticated animals (such as cattle, sheep, goats, and possibly camels) were also important to the economy. Not only were these animals a source of food, but also a source of labour particularly in activities such as ploughing and transport. The art

of agriculture and pastoralism indicates towards a healthy and balanced economic system, which is capable of adapting to environmental changes.

Craft production was also another significant aspect of Haryana economy. The archaeological data shows that the specialization in various kinds of crafts like pottery, bead-making, metallurgy and textile production was very high. The discovery of semi-precious stone beads, terracotta figurines and copper tools prompts the existence of highly-qualified artisans and organized systems of production. These crafts were not only useful to the local use but also served to form the trade networks, which extended beyond the local area.

The trade helped Haryana to open up to the world of Indus-Saraswati and the external world. It is evident that the presence of standardized weights and measurements demonstrates that there existed a system of exchange that was controlled and that this would have eased internal and long-distance trade. The fact that the seals and other items that were inscribed suggests that there were administrative processes to govern the trade activities. The fact that the foreign materials such as lapis lazuli, carnelian and ocean shells are all foreign to Haryana indicate that the region had not only a huge number of trade relations with the rest of the world but also foreigners could visit the region.

Haryana was also enhanced in terms of geographical position as a key connecting point in these networks. It was in the middle of the great cultural spaces and was likely an exchange of merchandise and ideas. This would have led to economic prosperity and sharing culture that cemented the importance of the region during the civilization. The Haryana economic system is a generalized and combined system which took into account agriculture, craft production, and trade in a dynamic and sustainable manner.

Table D: Indus-Saraswati Civilization Trade Networks — Major Partners, Goods, and Routes

Trading Region	Goods Exchanged	Period (BCE)	Route
Mesopotamia (Sumer/Akkad)	Carnelian beads, etched carnelian, ivory combs, lapis lazuli	2600–1900 BCE	Maritime via Persian Gulf / Overland
Central Asia (Bactria)	Tin, silver, lapis lazuli, copper	2500–1800 BCE	Overland — BMAC route
Oman (Magan)	Copper ingots, diorite stone, shell	2300–2000 BCE	Maritime via Arabian Sea
Persian Gulf	Fish, pearls, bitumen, shell ornaments	2600–2000 BCE	Maritime
South India / Deccan	Gold, semi-precious stones, quartz	2000–1700 BCE	Overland / River routes
Rajasthan / Gujarat	Copper (Khetri mines), sea shells, marine goods	2600–1700 BCE	Internal overland trade
Afghanistan	Lapis lazuli (Badakhshan), tin, copper, silver	2600–2000 BCE	Overland

Figure 7: Long-distance trade connections of the Indus-Saraswati Civilization with documented goods and routes (Source: Kenoyer 2010; Possehl 2002; Ratnagar 2001)

8. MATERIAL CULTURE AND TECHNOLOGY

The material culture of the Haryanan Indus-Saraswati Civilization gives a lot of data on the technological aspect as well as life of the people. The dig of different sites has produced a diverse collection of artifacts which may be pottery, tools, ornaments, seals and architectural objects. Not only do these sources show high level of craftsmanship, but also, inform about standardization of practices and other related cultural norms in various settlements.

One of the most evident aspects of material culture in Haryana is pottery. The Harappan pottery usually appears to be of high quality, homogenous forms, a unique way of painted patterns and usually in geometric forms and natural subjects. The similarity of the types of pottery manufactured at different sites indicates the possibility that there were standardized modes of production, and perhaps that there was some control over part of the production process, by some centralized agency. Meanwhile, marginal regional variations represent regional accommodations and innovativeness.

The use of construction materials and techniques is also indicative of technological advancement. This is depicted by the huge consumption of baked bricks in most cases in normal proportions, which imply the level of coaching on construction and city planning. The houses, wells and drainage systems are well maintained and efficient, which means that they are designed considering durability and efficiency. Advanced drainage systems emphasize the role of sanitation and the value of public health.

The other significant technological innovation is the metallurgy. Copper and bronze tools, weapons and ornaments have been discovered in some Haryana sites. These objects denote expertise in metal mining, alloying and casting. The craft of bead-making using such materials as carnelian, agate, and faience is also a witness to the technical competence and specialization.

The seals and inscriptions are typical of the Harappan material culture. These seals are usually steatite, and frequently bear animal images and brief series of marks of the script, which remains undeciphered. Their presence everywhere suggests that they were in use in trade, administration or identification. The role of the script is unknown, but it indicates the level of symbolic communication and organization complexity.

Overall, Haryana material culture represents a balance between the standardization and local diversity. The artifacts not only show the level of technological development, but also the society values and practices. Through these materials one can recreate things of the daily life, small activity and the organization of the society focusing on the advanced nature of the Indus-Saraswati Civilization.

Table E: Material Culture Categories — Description, Evidence in Haryana, and Significance

Material Category	Description	Evidence in Haryana	Significance
Pottery	High-quality wheel-made; red/black painted; geometric patterns	Consistent forms across Haryana sites; slight regional variation	Standardized production system
Beads	Carnelian, agate, faience, steatite, lapis lazuli, shell	Found at Rakhigarhi, Kunal, Farmana in large numbers	Craft specialization; export trade
Seals	Steatite; animal motifs (bull, unicorn, elephant); undeciphered script	Present at all major Haryana sites; used in trade/administration	Administrative & symbolic system
Metal Tools	Copper and bronze axes, knives, fish hooks, chisels	Metallurgy evidence at Rakhigarhi; copper sourced from Rajasthan	Technological advancement
Terracotta	Figurines (human & animal), toy carts, wheels, whistles	Diverse figurines at Banawali, Rakhigarhi — mother goddess types	Cultural & religious expression
Weights	Cuboid stone weights in binary-decimal ratio (1:2:4:8...)	Uniform system across all sites enabling fair long-distance trade	Standardized economy
Architecture	Baked bricks (1:2:4 ratio); multi-room houses; courtyards	Consistent construction across Rakhigarhi, Bhirrana, Farmana	Urban planning expertise



Figure 8: Comparative analysis of material culture categories found at Harappan sites in Haryana
(Source: Chakrabarti 2004; ASI; Kenoyer 1998)

9. SOCIETY AND CULTURE

The Indus-Saraswati Civilization in society of Haryana appears to have been a relatively egalitarian, stable and well-organized society. Compared to the present civilization such as Mesopotamia and Egypt, monumental architecture and direct representation of leaders are not visible implying that power was not concentrated in a single regime. Instead, the resemblance between the city planning and material culture is a sign of shared set of norms and a common system of governance.

Social organization can be deduced by the patterns of settlement, housing structures and burial patterns. The fact that the houses vary in size and qualities implies that there is some degree of social stratification, although not as severe as in other ancient civilizations. This means that there was a stratified society whereby the resources were distributed fairly. The existence of well-developed cities, which also have social facilities, is also indicative of a concern about the common good.

Cultural practices may be reflected by a number of artifacts including terracotta figurines, seals and ritual objects. The female figurinations that tend to have been portraying fertility or the mother goddesses suggest that fertility and reproduction were important in religion. Similarly, animals (bulls and unicorn-like creatures on seals) could have had a religious or symbolic meaning. In other places, like those within Haryana, there are fire alterations, which indicate ritual practices, possibly of domestic or community worship.

The manner of the burials also provides more details on the cultural beliefs and social life. Other types of burials such as extended and secondary burials, and grave goods such as pottery and ornaments, have been discovered during excavations of sites such as Farmana. These rituals presuppose that the afterlife is believed in and that ritual plays an important role in the commemoration of death.

Agriculture, craft production and trade were to form the basis of the life in Haryana settlements on daily basis. The presence of toys, games and ornaments indicates that leisure and aesthetic expression was also an important aspect of life. The overall impression that we receive is that of a complex and rich society that valued order, functionality and continuity of culture.

In conclusion, Indus-Saraswati Civilization that prevailed in Haryana is much organized and socialized in both culture and lifestyle. In as much as the evidence is subject to interpretation in a couple of ways, it is evident that there was a stable and adaptive social system that played a critical role in sustaining the civilization in the course of time.

10. SARASWATI RIVER DEBATE

The discovery of the Saraswati River has been among the most debatable aspects of the exploration of the Indus-Saraswati Civilization that has had significant implications to understand the geographical location and development of the civilization. Many scholars have proposed that the Ghaggar-Hakra river system that traverses the Haryana state is the same river as the Saraswati found in the ancient Vedic books. This can be confirmed by the great density of archaeological sites along the river course which suggests that it had already supported the high density of settlements.

Proponents of this identification assert that the size and distribution of settlements indicate there would have been some extensive river system which could have supported agricultural and urban life. They also show written records of how the Saraswati was a large and a strong river, which is in line with the archaeological evidence of extensive settlement. In this case, Haryana will be the hub of the idea over the civilization since the state is located on the course towards the proposed direction of the Saraswati.

This interpretation was however disproved by geological and hydrological studies. Sediment studies and satellite imagery have suggested that the Ghaggar-Hakra was perhaps a seasonal/monsoon fed river, and not a perennial glacial river. According to other studies, major rivers such as the Sutlej and Yamuna might have changed their course over the years and this affected the flow of water in the region. Results like these render it hard to endeavor to personally equate the Ghaggar-Hakra with the Saraswati.

Despite the differences in these points of view, there is a general consensus that the development of the river systems played a considerable role in the settlement patterns formation and may have contributed to the decline of the civilization. The supply of water, agriculture and trade routes would have been affected by the shrinking or alteration of the river beds leading to a gradual desertion of settlements.

Rather than focusing on the identification question, many researchers today include the importance of understanding the way communities evolved in order to adjust to the new environment conditions. The fact of the controversy with the Saraswati River highlights, in that respect, the significance of an interdisciplinary approach, including archaeological data and geological and climatic findings.

On the whole, it can be said that the real name of the Saraswati River is a controversial issue, but the role it played in the development of the culture and environment of the state of Haryana is hardly overestimated. This controversy remains a subject of research and discussion, which will assist in creating a better understanding of the Indus-Saraswati Civilization.

Table F: Saraswati River Debate — Scholarly Positions, Evidence, and Academic Consensus

Scholarly Position	Key Proponents	Evidence / Argument
Identification (Pro)	Lal (2002), Gupta (1995), Valdiya (2002)	High density of sites along Ghaggar-Hakra; Vedic textual evidence; remote sensing data supports a once-mighty river course
Identification (Anti)	Clift et al. (2012), Giosan et al. (2012)	Sediment analysis shows monsoon-fed river, not glacial; Sutlej and Yamuna likely diverted; Ghaggar-Hakra insufficient for 'mighty Saraswati'
River Desiccation	Saini et al. (2009), Dixit et al. (2014)	Monsoon weakening ~2100 BCE caused river shrinkage; tectonic activity caused river capture by Yamuna and Sutlej systems
Settlement Impact	Madella & Fuller (2006), Wright (2010)	River shrinkage drove eastward migration; urban decline linked to water scarcity; cultural continuity survived through adaptation
Archaeological Consensus	Possehl (2002), Kenoyer (1998; 2010)	River system central to settlement distribution regardless of identification; interdisciplinary approach required for resolution



Figure 9: Summary of scholarly positions on the Saraswati River identification debate with key proponents and evidence base (Source: Lal 2002; Giosan et al. 2012; Valdiya 2002)

11. DISCUSSION

Finding the Saraswati River has had a highly controversial place in the research of the Indus-Saraswati Civilization with significant ramifications to understand the geographical region and development of the civilization. Many scholars have proposed that the Ghaggar-Hakra river system that passes through

the state of Haryana is the Saraswati as found in the ancient Vedic texts. This view is supported by the high concentration of archaeological sites along the river course, which suggests that it had supported a high concentration of settlements previously.

Proponents of this identification assert that the scale and dispersion of settlements indicate that there must have been an extensive river system, which could support agricultural and urban life. They also show textual evidence of the Saraswati as a big and a mighty river, which is in agreement with the archaeological evidence of widespread settlement. In this case, Haryana will be the epicenter of the idea of the civilization since the state lies along the proposed course of the Saraswati.

This interpretation has been disproved by geological and hydrological studies however. Satellite shots and sediment samples have shown that the Ghaggar-Hakra could have been a seasonal or monsoon-grown river, and not a perennial glacial river. According to other research, major rivers such as the Sutlej and Yamuna might have changed their course over time and this was what affected the flow of water in the region. These findings render it hard to strive to make direct comparisons between the Ghaggar-Hakra and the Saraswati.

Despite these divergent views, it is widely agreeable that development in river systems was a major determinant in the establishment patterns of settlements and may have contributed to the decline of the civilization. Reduction or alteration in the river beds would have influenced the water provision, farming, and trade paths and caused a slow desertion of the places.

Rather than focusing on the issue of identification, many scholars have included the importance of understanding how societies transformed to accommodate the changing environmental conditions. In that way, the scandal with the Saraswati River highlights the significance of an interdisciplinary approach, including archaeological findings and geological and climatic evidence.

Overall, the exact state of the Saraswati River is a disputable subject matter, and its contribution to cultural and environmental history of Haryana is difficult to overrate. The controversy continues to be a research and discussion topic, which will help in the understanding of the Indus-Saraswati Civilization better.

CONCLUSION

The Indus-Saraswati Civilization of Haryana gives a good idea of the type and form of early urban civilization of the Indian subcontinent. This piece of work brings forth the topicality of Haryana as part of the civilization and not a peripheral part by amalgamation of archaeological, geographical and cultural facts. The fact that the archeological sites are concentrated, the settlement was present, and the material culture is diverse on a whole indicates that the area was critical to the emergence, development and transformation of the civilization.

The necessity to escape the past Indus-centric discourses are among the main conclusions that can be drawn out of this work. The Haryana evidence especially at Rakhigarhi and Bhirrana is an indication that the civilization was not confined to a strict center, but it was characterized by a chain of development centers. Such a decentralized method permits to pay more attention to the cultural development because various regions played a role in it and defined the general course of the whole civilization. The role that Haryana has played in this is impressive and this shows the relevance of regional studies in reconstruction of ancient history.

Another theme that arises is human settlements and interaction between the environment. The reliance on river basins in which Ghaggar-Hakra is of high significance is the indication of the

importance of water resources in farming and urban lives. Concurrently, it can be seen that the variations in the river patterns and climate conditions have also caused differences in the settlement patterns with adaptation, and in certain instances, degradation. The interactions of human societies and the environment can be exploited to find valuable information regarding the resilience and vulnerability of early urban systems.

Haryana, economically, is integrated into the broader systems of production and exchange, this tends to indicate a complex and interlaced system. The combination of craft specialization and trade together with agriculture provided a stable diversified economic foundation, which served the rural and urban populations. This was also enabled by the strategic position of the area that allowed easy contact with the rest of the civilization and consequently cultural circulation and dissemination of technology. This interconnectedness was one of the features of the Indus-Saraswati Civilization and it was critical in the evolution of the civilization.

The picture of a well-structured and logical society is also contributed to by cultural and social aspects of the civilization. The relative similarity of the urban structure and material culture point to the fact that there are common norms and values and no clear indicators of centralized authority to suggest other types of social organization. The artifacts and the rituals used symbolically reveal that there was a rich cultural life and it is through this that we have the knowledge of the civilization, albeit not fully understood.

The controversy regarding the location of the Saraswati River has not been solved yet, though it makes a valuable research and discussion. Alternatively to focusing on its textual identification, this work sheds light on the archaeological importance of the river system in the process of settlement pattern, and cultural formation. This way, more evidence-based and less speculative concept of the issue can be attained.

Finally, Haryana is the center of the research of the Indus-Saraswati Civilization. Its archeology offers invaluable information about the structure of settlements, economic institutions, the level of technological development, and the cultural existence. This is another value the work adds to a more holistic approach to one of the oldest urban civilizations of the world as it brings out the significance of this region. The future studies especially on the interdisciplinary studies that will involve archaeology, environmental sciences and technological studies will elaborate more on what we already know and also give answers to the questions that still remain on the origin, growth and the decline of this great civilization.

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