CHAPTER – I
THE INTRODUCTION

Harappan Civilization flourished during the third- second millennium BCE. It ranks amongst the four widely known civilizations of the world and covers an appreciably larger area than the early dynastic Egypt or Sumer. Like Mesopotamia and other old world civilizations, the Harappan Civilization seems to have grown out of the skilful exploitation of the rivers valley resources in the north –western region of the Indo – Pakistan subcontinent. Excavation in the 1920s had revealed ancient cities which have the vast proportions, with unique artifacts and a level of architectural planning that was unparalleled in the ancient world. The Harappans sites provided evidence of a systematic town planning, fortifications, elaborate drainage system, granaries, etc. which throw light on the surplus economy, standardization of brick size, weight and measures, geometric instruments, linear scales and plumb-bobs. The Harappans were the first who gave the idea of the welfare of workers for the first time by establishing separate worker’s quarters which has now become a necessity in a welfare state. A unique type of hydraulic architecture is another legacy of the Harappans besides other important contributions in social, economic and religious fields. There was a system of drains. The elites who lived in different

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2 G.L. Possehl (2002), The Indus Civilization; A Contemporary Perspective, p. 57
parts of the cities did not construct elaborate centralized palaces or temples as was common in Mesopotamia and Egypt, but they maintained well planned cities with massive walls and gateways to protect the citizens and to control trade evidence of many different communities living together equipped with numerous wells, bathrooms and an intricate. These distinctive features can be attributed to the fact that the Indus cities evolved from local cultures that had roots extending back thousands of years to the earliest farming and pastoral communities within large cities. They constructed their houses on immense platforms of mud bricks.

(a) NOMENCLATURE & TERMINOLOGY:

The earliest civilization of South Asia is known as Indus Valley civilization because a large number of sites were discovered in the Indus Valley. Marshall gave the term Indus Civilization in 1926. In the preliminary reports on the excavations at Mohenjodaro and Harappa prior to 1926 the term Indo-Sumerian Civilization was used to describe the remains. Some archaeologists have called it the Harappan civilization named after Harappa, the first discovered site. Some archaeologists have even re-christened the Harappan culture as the Indus-Saraswati Civilisation or Saraswati-Hakra Civilisation. The south Asian archaeologist, S.P. Gupta, has now come out with

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4 G.L. Possehl (2002), op. cit. p.2
5 B.B. Lal (1997), The Earliest Civilization of South Asia. p.4
a new nomenclature, Indus-Saraswati or Saraswati (Hakra) civilization, because a large number of sites have been discovered in Saraswati (Hakra) and its tributaries region.⁶

Jim Shaffer and other scholars introduced a new terminology that has been developed over the past ten years. This terminology reflects a comprehensive theoretical and chronological framework that is both meaningful and at the same time flexible enough to accommodate the ever changing archaeological data base.⁷

Instead of seeing the Indus cities as an isolated phenomenon association with a brief Phase of urbanism, Shaffer proposed the term Indus Valley Tradition, using a concept borrowed from American Archaeology.⁸ The Indus Valley Tradition refers to the phenomenon of human adaptation, beginning with the domestication of plants and animal, that resulted in the integration of diverse communities throughout the greater Indus Valley and adjacent regions.⁹ Shaffer identifies two other cultural traditions in Baluchistan and the Helmand basin that evolved alongside the developments in the Indus Valley.

As more research is conducted in peninsular India, we can expect to see additional cultural tradition being defined to the east of the Indus Valley.

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⁹ J.M. Kenoyer, (1991) op. cit, pp. :331-85
The Indus Valley tradition can be divided into four different eras that are distinguished by the following characteristics.\textsuperscript{10}

**Early Food Producing Era:-**

During this era people lived in scattered villages and nomadic camps with an economy based on food production. No elaborate ceramic technology had been developed at this time.

**Regionalization Era:-**

This is a long period, during which numerous crafts were invented, including ceramics, metallurgy, lapidary arts, glazed faience and seal making. Distinct artifact styles evolved in specific regions, and different regions were connected by trade networks.

**Integration Era:-**

This relatively short period of time saw the integration of many different regional cultures, resulting in a pronounced homogeneity in material culture over a large geographical area.

**Localization Era:-**

Comparable to the Regionalization Era, this period sees the breakdown of the previously integrated culture into smaller localized groups. Local trade networks and artifact styles show continuity from the previous period.\textsuperscript{11}

Each era can also be subdivided into different phases, which is characterized by specific region and period of time, but these


\textsuperscript{11} J.M. Kenoyer (1991), *op. cit*, p.331.
can be overlapped and linkage between Phases through exchange networks. This analytical framework allows archaeologists to organize and compare cultural developments in adjacent regions and understand changes over time.

The Early food producing Era of the Indus Valley tradition is represented at the site of Mehargarh Periods IA, IB and IIA (around 6500 to around 5000 BC) where there is conclusive evidence for the use of domestic wheat and barley and domestic cattle, sheep and goats.\textsuperscript{12} The small rectangular mud-brick houses of this site were subdivided into rooms and cubicles that could have been discovered in the houses and graves. The first cause chaff-tempered ceramics being numerous ornaments made from sea shells and colorful stones were buried with the dead along with ground stone axes and chert blades.\textsuperscript{13}

The Regionalization Era is much longer, extending from about 5000 B.C to about 2600 B.C. It includes many different phases characterized by different pottery, designs, ornaments, architectural developments and methods of farming and animal herding. During this era we see the development of such new technologies as hand built and then wheel thrown pottery, copper metallurgy, stone bead making and carving.\textsuperscript{14} Geometric seals were made from terracotta, bone and ivory and the beginning of writing is seen in the form of graffiti on pottery. Extensive trade networks were established along the major river routs and across

\textsuperscript{13} G.L. Possehl (1999), \textit{Indus Age The Beginnings}. pp. 18-21.
\textsuperscript{14} Micheal Jansen, Maire Mulley and Gunter Urban. (1991), \textit{Forgotten Cities On The Indus}. Early civilization in Pakistan from the 8th to the 2nd Millennium B.C. p.20
mountain passes to connect settlement to each other and facilitate the movement of goods and raw materials.\textsuperscript{15}

The later part of the Regionalization Era, often referred to as the Early Harappaan period, represent a phase of formative urbanism.\textsuperscript{16} The building of walled settlements, the use of specific types of painted pottery and ornaments, the appearance of seals and rudimentary writing and the expanded trade networks are thought to respective the initial steps towards urbanism.

During the integration Era of the Indus Valley tradition, the Harappan Phase, dating from approximately 2600 to 1900 B.C features the synthesis of all the different cultural groups into a single overarching system. Unifying symbols appear on painted pottery, ornament and ritual objects. This is also the phase of urbanism, characterized by large cities and their urban settlements, writing, the use of standardized weights and measures, taxation and a hierarchical social order.\textsuperscript{17}

The localization Era of Indus Valley tradition is a time of decline and disintegration for the Indus economics and political structure. It was succeeded by Vedic culture, so it is needed not to study in my research work.

(b) EXPANSION OF HARAPPAAN CIVILIZATION:-

The research and excavations after independence changed the position regarding the extent, culture contents, regional variations, etc. of the Indus Civilization. The evidence shows

\textsuperscript{16} J.M. Kenoyer (1998), \textit{op. cit}, p. 25.
\textsuperscript{17} J. R. Mughal (1990), \textit{op. cit}, p. 3.
variability in settlement patterns, social and religious fabric of the civilization. The entire scenario is based on material evidence that provides new insights into the understanding of the Harappan Civilization-settlement types, town planning and architecture.\textsuperscript{18} During the last eight decades, by the consistent efforts of archaeologists, hundreds of Early Harappan, Harappan and Late Harappan sites have been discovered in the Saraswati-Hakra basin.

After independence India was left with no important Harappan sites like Mohenjodaro, Harappan and Chanhu-daro. In 1951-52, A. Ghosh, Scholar of the Archaeological survey of India, undertook the exploration of the Ghaggar River in Rajasthan and discovered twenty-five sites of the Harappan Civilisation. During 1952-55, Y.D. Sharma undertook excavations at Ropar in Punjab and found the remains of the Harappan culture in the layers below the Painted Grey Ware (PGW) and thus the Harappan culture proved stratigraphically to be earlier than PGW. The explorations by A. Ghosh, B. K. Thapar, Suraj Bhan, S. R. Rao, P. P. Pandaya, Jagat Pati Joshi, K. N. Dikshit, U. V. Singh, R. N. Mehta, R. S. Bisht, V. H. Sonawane, G. L. Possehl and Francfort added a large number of Harappan sites in Punjab, Haryana, Gujarat and Uttar Pradesh. In Pakistan F. A. Khan, A. H. Dani, R. Mughal, F. A. Durani and Farid Khan also discovered a large number of sites.\textsuperscript{19}

\textsuperscript{18} Shereen Ratnagar (2001) \textit{Understanding Harappa Civilization in the Greater Indus Valley}, p. 18
\textsuperscript{19} J. P. Joshi (2008), \textit{Harappan Architecture and Civil Engineering} p. 9
Fig. 1: Map showing extent of the Harappan civilization
(courtesy: Archaeological Survey of India)
In India, a large number of sites related with early, mature and late Harappan phases have been excavated after partition. Prominent among them are Alamgirpur, Dhalewan, Dholavira, Kalibangan, Lothal, Manda, Mitathal, Padri, Rakhigarhi, Rangpur, Rojdi, Ropar, Somnath, Surkotada, etc. In Pakistan large number of such sites has been excavated, the prominent are Allahdino, Balakot, and Edith Sahar complex, Gumla Jalilpur, Kot Diji, Las Bela, Mehargarh, Rehman Dheri and Saraikhola, etc.

The Harappan Civilization was spread over vast area. Its settlements runs broadly from Sutkagendor in Makran (Pakistan) in the west to Hulas in District Saharanpur, U.P. (India) and Rehman Dheri (north Pakistan) in the north, Diamabad in Maharashtra (India) in the south and area about 2, 17, 557 sq. Kilometer. (Fig.1) The estimates of area vary according to the point of view of different scholars, Kenoyer estimated it about 680,000 sq km while Possehl estimated it 1 million sq km.\textsuperscript{20}

The expansion of this civilization in the subcontinent was far greater than contemporary civilization of the Nile in Egypt and the Euphrates and the Tigris in Syria and Iraq.\textsuperscript{21} The pre-Harappan, Early Harappan and Mature Harappan sites are located along the major rivers, while the Mature Harappan sites and the Late Harappan sites are along the tributaries and in the upper reaches of these rivers, S.R.Rao divides the area of Harappan

\textsuperscript{20} J.M. Kenoyear (1998), \textit{op. cit.} p.17.
civilization into six zones.

1. Punjab (type site: Harappa)
2. Rajasthan, Haryana (type site: Kalibangan and Banwali)
3. Bahawalpur (type site: Ganweriwala)
4. Sindh (type site: Mohenjo-daro)
5. Baluchistan (type site: Kulli, the Harappa phase)
6. Gujarat (type site: Dholavira)

(c) HISTORY OF DISCOVERY:

There are several good sources for the history of Indian archaeology, some of which also focus on the discovery of Harappan civilization and related Prehistoric remains in the subcontinent. They tell us that the story of discovery actually begins in March or April 1829 When Charles Masson visited the huge mound adjacent to the modern village of Harappa, near an abandoned course of the Ravi River in the Sahiwal District of the Punjab(Pakistan). Masson’s visit to Harappa was not his only discovery of archaeological significance. During his time in British India he recorded many sites, made a magnificent collection of ancient coins and conducted excavations in the Buddhist Stupa at Mohenjodaro.

In 1831 Lieutenant Alexander Burnes made historic journey upto the Indus River. The ostensible reason for this voyage was

22 G.L. Possehl, (1999), Indus Age the Beginnings, pp.44-45
to deliver a gift of five horses and a carriage from the King of England to Ranjit Singh, powerful Sikh ruler of the Punjab.  

Burnes also took the first scientific observation on the Indus River and its tributaries and prepared a chart of its course. In the course of the journey Burnes visited the site of Amri, and was the first man to publish it as an archeological site. He also visited Harappa in 1833.

Sir Alexander Cunningham was the first Director General of Archaeological Survey of India. He visited Harappa three times and published survey report. He also made several small excavations at Harappa between 1856 and 1872 to search more clues but he was unable to stop the devastation of brick robbing. In his report Cunningham noted the size of the site, 2.5 miles, and the height of the mounds (12 to 18 meters). His reports on site plan and other artifacts are still used today. He also found a stamp seal; he described the seal as “The seal is a smooth black stone without polish. On it is engraved very deeply a bull, without hump, looking to the right, with two stars under the neck, above the bull there is an inscription in site characters, which are quite unknown to me. They are certainly not Indian letters; and as the bull which accompanies them is without a hump. He concluded that the seal is imported from foreign to India.” Cunningham had published his finds and the unique seal with its

26 Alexander Burnes (1834), A voyage on the Indus. p. 80
27 Ibid. p. 48
strange motifs. His contribution is very important for the scholar those want to learn about Harappa.\textsuperscript{29}

M.S. Vats found evidence for the earth moving, including fish plates for the track of a railway that was apparently used in the brick robbing operation.\textsuperscript{30} A Scottish engineer, John Brunton, describes in his autobiography, his direction of the construction of the Sindh Railway in the latter half of the 1850s. Robert Brunton ordered the dismantling of Harappa, the same fate that John Brunton planned for Brahminabad. They used the Harappan bricks in making of ballast for the line of railways.\textsuperscript{31}

On 21 February 1902 the Government announced the appointment of John Marshall as the new director General of Archaeological Survey of India. He was 26 years old student of Greek archaeology in 1902. He came to the position with splendid recommendations and a fine background in Mediterranean archaeology.\textsuperscript{32} Marshall had been trained in field archaeology at Knossos under the tutelage of Sir Arthur Evans and had been recruited in part, because this background would allow him to bring the best and most recent methods of excavation to India.\textsuperscript{33}

Rai Bahadur Daya Ram Sahani was appointed as Superintendent Archaeologist, the northern circle, of the Archaeological Survey of India. Sir John Marshall enabled

\begin{footnotes}
\item[29] G.L. Possehl (1999), \textit{op.cit,} P.49
\item[30] M.S. Vats (1940), \textit{Excavation at Harappa.} Vols. 2, p. 60
\item[31] J.M. Kenoyer (1998), \textit{op. cit,} p. 21
\item[32] A. Ghosh (1953a) Fifty Years of the Archaeological Survey of India. \textit{Ancient India} 9, p. 31.
\end{footnotes}
Sahani to excavate at Harappa in the 1920-21 winter field seasons. The actual work began in the beginning of January 1921 and continued until the middle of February. His systematic exploration and excavation yield the different aspects of Harappan Civilization. He recovered seal with pictographic legends and the remains of large and small buildings at Harappa.

D.R. Bhandarkar was one of the young superintendents Archaeologist; he visited Mohenjo-daro in the winter of 1911-12 and was credited with the discovery of site. He recovered the architectural remains, seals, sculptures, pottery, etc. He also said that the size of bricks used by Harappans was uniform. Rakhal Das Banerji was an energetic Superintendent Archaeologist. He was appointed as Superintendent Archaeologist of the western circle. He excavated at Mohenjo-daro in the different seasons and revealed the different features of Harappan Civilization. He submitted his report of Mohenjo-daro to the Director General for publication in 1926. Banerji was also in search of Buddhist remains, and even though he discovered a ruined Buddhist stupa, he also found numerous seals and ceramics similar to those recovered at Harappa. John Marshall thought that the evidence at both sites were sufficient to announce to the world the discovery of a new civilization that was older than any previously known in the subcontinent. He published his findings with photographs of the seals and other objects in the Illustrated

34 D.R. Bhandarkar (1911-12), *Excavation Progress Report of the Archaeological Survey of India*, p. 52
London News (20 September 1924).\textsuperscript{36}

(d) CHRONOLOGY:

The date of the mature Harappan Phase, the times during which Mohanjodaro and Harappa were functioning as urban centers based on both comparative analysis with the well documented Mesopotamian chronology, and a growing number of radiocarbon determinations.\textsuperscript{37} The First absolute chronology of Mohanjodaro and Harappa was derived from the similarity among seals found at these two sites and in excavations at Ur and Susa as well as through a consideration of certain architectural features. The evidence suggested that the mature Harappan Phase could be dated as early as 3000 B.C. and then the civilization had duration of about 1000 years.\textsuperscript{38}

Sir John Marshall suggested that the Indus seals found at Mesopotamian cities of Ur and Kish belonged to the intermediate Period at Mohenjo-daro, and in 1931 wrote that the Indus cities flourished between 3250 and 2750 B.C.\textsuperscript{39} By 1953, with the appearance of the first edition of Sir Mortimer wheeler’s The Indus Civilization, revision to the Mesopotamian Chronology had shifted the absolute dates to 2500–1500 B.C.\textsuperscript{40} Shortly after the appearance of Indus Civilization the 1000 years chronology for

\begin{itemize}
\item \textsuperscript{36} G.L. Possehl (1999), \textit{op. cit}, p. 62.
\item \textsuperscript{37} G.L. Possehl, (1993b), The date of Indus Urbanization: A Proposed Chronology for the Pre-Urban and Urban Harappan Phases. In, Adalbert J.Gail and J. R. Mevissen eds,South Asian Archaeology 1991, p. 49
\item \textsuperscript{38} C.J. Gold and Sidney Smith (1924), \textit{New Links between Indian and Babylonian Civilization}. Illustrated London news, October 4.
\item \textsuperscript{39} G.L. Possehl (1998), \textit{op. cit} p.24
\item \textsuperscript{40} Mortimer Wheeler (1953), \textit{The Indus Civilization}. 1st edition. Supplementary volume to the Cambridge Ancient History of India. Cambridge: At the University Press. P.85
\end{itemize}
the Mature Harappan began to be challenged. Walter A. Fairservis, Journal noted the absence of internal development and change within the mature Harappan and suggested that the Period of time encompassed by these remains could hardly be a millennium.

The Fairservis dates for the Harappan Civilization were ca.2500 to 2000 B.C. D.P. Aggarwal also supported the hypothesis given by Fairservis for the short chronology. Aggarwal’s analysis of the dates from Kalibangan and Lothal, as well as a few samples from Niai Buthi, Kot Diji and Mohenjo-Daro suggested 2500 to 2000 BC.41

(i) The Radio Carbon Chronology:-

Archaeologists have learnt that construction of chronology is neither simple nor straightforward. Some important sites like Anjira, Kulli and Chanhu-Daro, do not have radiocarbon dates, which means that comparative methods have to be used to estimate their ages. Some radiocarbon determination for a phase cannot be relied on. A dependable laboratory can made an accurate determination of the point in time when the organism from which the sample has been taken stopped exchanging 14C with the outside environment.42

The absolute chronology for the stage and phases of the Indus Age has been developed which is given below.

41 D.P. Agrawal, (1964) Harappa Culture: New evidence for a shaster chronology Science, p.52
42 G.L. Possehl (1999), op. cit, p.21
(ii) The Absolute Chronology of the Indus Age:

**Stage one:** Beginning of Village forming communities and pastoral camps

- Kili Ghul Mohammad Phase 7000-5000 BC
- Burj Basket-Marked Phase 5000-4300 BC

**Stage Two:** Developed Village forming communities and Pastoral societies

- Togau Phase 4300-3800 BC
- Kechi Beg Phase 3800-3200 BC
- Hakra Ware Phase 3800-3200 BC

The Kechi Beg Phase and Hakra Ware Phase are thought to have been generally contemporaneous.

**Stage Three:** Early Harappan four phase are thought to have been generally contemporaneous

- Amri-Nal Phase 3200-2600 BC
- Kot-Dijjan Phase 3200-2600 BC
- Sothi-Siswal Phase 3200-2600 BC
- Dam Sadat Phase 3200-2600 BC

**Stage four:** The Early-Mature Harappan Transition Phase

- Early-Mature Harappan Transition 2600-2500 BC

**Stage five:** Mature Harappan Five Phase thought to have been generally contemporaneous

- Sindhi Harappan Phase 2500-1900 BC
<table>
<thead>
<tr>
<th>Phase</th>
<th>Date</th>
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<tbody>
<tr>
<td>Kulli Harappan Phase</td>
<td>2500-1900 BC</td>
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<tr>
<td>Sorath Harappan Phase</td>
<td>2500-1900 BC</td>
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<tr>
<td>Punjabi Harappan Phase</td>
<td>2500-1900 BC</td>
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<tr>
<td>Eastern Harappan Phase</td>
<td>2500-1900 BC</td>
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<td>Quetta Phase</td>
<td>2500-1900 BC</td>
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<tr>
<td>Late Kot Diji Phase</td>
<td>2500-1900 BC</td>
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**Stage Six**: Post-Urban Harappan

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<th>Phase</th>
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<tbody>
<tr>
<td>Jhukar Phase</td>
<td>1900-1800 BC</td>
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<tr>
<td>Early Pirak Phase</td>
<td>1800-1000 BC</td>
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<tr>
<td>Late Sorath Harappan Phase</td>
<td>1900-1600 BC</td>
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<tr>
<td>Lustrous Red Ware Phase</td>
<td>1600-1300 BC</td>
</tr>
<tr>
<td>Cemetery H Phase</td>
<td>1900-1500 BC</td>
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<tr>
<td>Swat Valley Period IV</td>
<td>1650-1300 BC</td>
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<tr>
<td>Late Harappan Phase in Haryana and</td>
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<tr>
<td>Uttar Pradesh</td>
<td>1900-1300 BC</td>
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<tr>
<td>Late Harappan Painted Grey Ware</td>
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<tr>
<td>Overlap Phase</td>
<td>1300-1000 BC</td>
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<tr>
<td>Early Gandhara Grave Culture Phase</td>
<td>1700-1000 BC</td>
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</tbody>
</table>
Stage Seven: Early Iron Age of Northern India and Pakistan

Late Pirak 1000-700 BC
Painted Gray Ware 1100-500 BC
Late Gandharan Grave Culture 1000-600 BC

The fact that the study of absolute chronology is one of most volatile topics in archaeology has already been noted and the schemes are constantly new things that cause them to re-evaluate their dating, and different archaeologists examining the same set of facts often develop very different chronologies.

(e) GEOGRAPHICAL STUDY OF HARAPPAN SETTLEMENT PATTERN:-

The Indus Civilization covered an area of approximately one million square kilometers. The westernmost Indus site is Sutkagendor, near the modern border separating Pakistan and Iran. The main regions are Northwest frontier, the mountainous eastern and of the Iranian Plateau. The plains of the Indus Valley, the Pakistani and Indian Punjab, Haryana and Ganga-Yamuna Doab are included. The northern and western tracks of the Thar Desert in Rajasthan were occupied by the Indus peoples, as were the sandy North Gujarat Plain, Kutch and the hilly savanna of Saurashtra.

45 J.P. Joshi (1966), Exploration in Northern Kutch. *Journal of the Oriental Institute*, Maharaja Sayajiorao University of Baroda. 16(1)
During winter the westerly jet stream brought snowfall to the mountains of Baluchistan and the Northwest Frontier and rain to the Punjab and northwest of India. During summer the southwest monsoon brought moisture to Saurashtra, North Gujarat, the Punjab and northwestern India. Sometimes, it also brought rainfall to the western domains.

The Indus & Saraswati were two important rivers of these regions. Large area of this Civilization was irrigated by these rivers. (Fig.2) The Indus River is also an important river of modern Pakistan. In the plain of modern Sindh, the Indus River is a fully mature stream. It has reputation for being a powerful, violent unpredictable river. It is estimated that Sindh would be a desert without the Indus River.

Fig. 2: Map showing the River System in Indo-Pakistan subcontinent (Curtsey: Randall William Law)
The Indus brought floods during summer in its plains region. It is due to Himalayan snow melt. The upper course of the Indus in mountains is deep and often it is blocked by ice dams and landslides. The release of these impounded waters is the source of the most devastating of the Indus floods. The alluvium brought by the Indus is very fertile and the Indus plain is renewed every year. Sindh is therefore a fertile region and serving as breadbasket since Indus civilization period. Famine is unknown for the people of this region.

The Saraswati was the second important river for the Harappan people. Today it is generally called Ghaaggar in Indian and Hakra in Pakistan. In ancient times it was called Saraswati and appears in the Rig-Veda in many places. It was a holy river, "the foremost of rivers" in the Vedas. During its early history, the Sarasvati flowed south of the Shiwalik Hills through Rajasthan and Sindh. A series of shifts took place in its channel, and the course moved steadily in a clockwise direction, eventually flowing east-southeast rather than south. Ultimately the stream was captured by the emerging Yamuna River compromised its watershed and Saraswati began to dry up. By mature Harappan times, it terminated in an inland delta near the modern Pakistani city of Fort Derawar. The Saraswati seems to have never reached the sea, at least in the third millennium when it was in the vicinity of Fort Derawar.

46 G.L. Possehl (2002), op. cit, p. 9
During Harappan Period Saraswati provided irrigation facility for the people and kept this region fertile. The Saraswati made an inland delta in this region. In the region of Fort Derawar about 140 Mature Harappan sites were settled and made it the most densely settled area of the Harappan time. There is actually an interesting succession of settlements in the Cholistan domain. Dense occupation during the Indus Age begins with 82 Hakra Ware sites and Early Harappan with only 20 Kot Dijjan settlements.

(f) CLIMATE:-

The area of Indus Civilization is dominated by two different weather systems that sometimes overlap the winter cyclonic system of the western highlands and the summer monsoon system in the peninsular regions. In the Northern subcontinent, the traditional division of the year is in seasons, beginning with the spring equinox. Spring lasts from the end of February through March; summer covers the hot months of April, May and June.\(^{48}\) The rainy season begins at the end of June and continues through September when it is followed by the autumn season. Winter and the dewy seasons are the last two seasons that extend from November through February.

Sometimes these six seasons are grouped as three major seasons with many variations depend on the specific region. Along the Southern Indus River in Sindh there is often little or

\(^{48}\) V.N. Misra (1984), Climate, A factor in the Rise and Fall of the Indus Civilization – Evidence from Rajasthan and Beyond, B.B. Lal & SP Gupta, Frontiers of Indus Civilization (eds), p. 463
no rain, but the rivers bring down the flood waters from the north and cover the land with rich silts.\textsuperscript{49} If the winter and dewy season rains from the western highlands occurred timely, then abundant harvests and vast grazing become available along the piedmont and northern Punjab in the spring.

During spring these same rains fall as snow in the highlands and water the fields and highland pasture the growing season begins in the spring and fields are harvested at the end of summer. When both the winter and summer rains are bountiful, the land is extremely rewarding usually one or the other system will provide enough water to sustain agriculture and herding from one year to the next. It is extremely rare for both systems to fail.

The current climatic cycle in this region is probably not much different from that experienced by the Indus cities, although evidence suggests that these may have been a stronger summer monsoon and more seasonal fluctuation of temperature. In July it would have been warmer than at present and in January slightly cooler.\textsuperscript{50}

The environmental and climatic diversity of these regions is extremely important. It provides a wide range of resources that are relatively accessible to human communities living in any one region. The Indus people established settlements in most of these regions and connected them to each other and the urban centers

\textsuperscript{50} J.M. Kenoyer (1991), “The Indus Valley Tradition of Pakistan and Western India.” \textit{Journal of World Prehistory} 5.4, p. 333
with trade networks. In this way when resources in one region were poor, people had the option of obtaining support from other sources. The different relief like mountains, river plains and coasts provides a unique pattern of seasonally available resources and abundant raw materials that is quite different from the situation in either Mesopotamia or Egypt.51

During the Harappan Period, there is no sound evidence for climatic change that had an effect pronounced enough to be picked up by archaeological methods. Marshall proposes that the high density of prehistoric villages in Baluchistan can be accounted for only by the existence of more productive environment.52 He also noted that elephants, tigers and rhinoceroses are all depicted on Indus stamp seals and are animals that prefer a wet habitat.53 The lion, a dry land animal, is conspicuous in its absence from Indus imagery. Baked bricks were used by the Harappans for shelters that provided protection from the rains rather than the sun-dried variety of bricks. The elaborate civic drainage system at Mohenjo-Daro must have been created to handle something more water than today’s scanty rainfall.

Gurdeep Singh published a paper in 1971, reviewing the finding from an investigation of Pollen cores from three salt water lakes in Rajasthan Sambhar, Didwana and Lunkaransar.

52 J.M. Kenoyer (1998) op. cit, p. 30
The pollen cores were also associated with several radiocarbon dates, and Singh notes an increase in salinity of lakes in the early second millennium B.C. He proposes that this increase in salinity was due increased aridity and this climate change could have been the root cause for the eclipse of the Indus Civilization. There has been additional polynological research at these lakes and others in Rajasthan.\textsuperscript{54} There are two critiques of this work and its findings, concluding that the salt lakes of Rajasthan do not provide sound evidences for climatic change.\textsuperscript{55}

The changing salinity of these lakes, which appears to be well documented, need not be attributed to change in rainfall. The geology of Rajasthan is complex. The three lakes are investigated hypersaline today, but there are also fresh water lakes, Pushkar and Ganger in this same region. This observation leads to the conclusion that under one climate regime in Rajasthan, there can be both freshwater and hyper saline lakes, callings into questions the Singh’s hypothesis.\textsuperscript{56}

Whatever the climate of the Harappan civilization, the weather was not exactly the same from year to year. But it does not appear that over the long run any period was markedly different from any other or that there were long term trends of increasing or decreasing precipitation or temperature or dramatic

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\textsuperscript{54} Gurdeep Singh R.J. Wasson and D.P. Aggarwal (1990), \textit{Vegetation and seasonal climate changes since the last full glacial in the Thar Desert, India}. Philosophical Transactions of the Royal Society of London, B, Biological Sciences 267 (889):pp. 469 - 510.
\textsuperscript{55} G.L. Possehl (1996b), \textit{Indus Age: The writing system}. University of Pennsylvania Press, Philadelphia. p.86
\end{flushright}
shifts in the weather from season to season.\textsuperscript{57}

During the whole of the Holocene, Virtually the entire greater Indus region had two principal seasons: one hot and wet, the other cold and dry.\textsuperscript{58}

\textbf{(g) GENERAL INTRODUCTION OF SOME MAJOR HARPAPPAN CITIES :-}

Harappa is one of the two metropolitan cities of The Harappan civilization. The modern village of Harappa lies 25Km West-south-west of Montegomery, the district headquar of the Pakistan Punjab. It is exactly situated in the North latitude 30°38’, East longitude 72°52’. The mounds at Harappa were firstly visited by Masson in 1826, by Burners in 1831 and by General Cunningham twice in 1853 and 1856.\textsuperscript{59} The mounds were declared protected under the Ancient Monuments Preservation Act (VII) of 1904. But a major part of the extensive city was destroyed during the mid-nineteenth century as a result of quarrying for ballast and a small portion of the ancient mound lies buried under the modern village of Harappa. The mounds were excavated systematically by the Archaeological Survey of India between 1923 and 1934 under the direction of Madho Sarup Vats and subsequently under Mortimer Wheeler in 1946.\textsuperscript{60} The highest mound is on the north-west and its height is 60 feet above the fields in surrounding. The smaller mounds range from 36-45

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{59} M.S. Vats (1974), \textit{Excavation at Harappa}, p. 2
\item \textsuperscript{60} S.R. Rao (1991), \textit{Dawn and Devolution of the Indus Civilization}, p.42
\end{itemize}
\end{footnotesize}
feet in height. Vats recognized several essential elements of city-planning such as the citadel and Lower Town, the criss-crossing of streets and surface drains and the existence of a number of private and public buildings.

The citadel, where the governmental authority lived, at Harappa was fortified with 14m thick mud-brick peripheral wall. In the western arm of fortification wall baked bricks were used as a further precaution against flood. The workmen’s quarters are identified to the north of citadel. They are along the both sides of east-west lane. Each unit was separated from the other by a narrow gap and each unit consisted of two parts, a courtyard in the front and a room at the back. The entrance of the unit was not straight but oblique so as to ensure privacy. These quarters were enclosed by a compound wall for safety and to provide a separate entity to the complex. 61

The Lower Town is situated to the south east of the citadel. Most of the part of Lower Town was wiped out by the brick robber. The Lower Town probably had its own walls and separate gates that faced on the exterior with baked bricks; it was gently tapering to the top. 62 The houses were constructed on the raised platforms. The Harappan set up their settlements in different periods. There was uniformity in the construction of house, bricks, pottery, etc.

61 B.B. Lal (1997), The Earliest civilization of South Asia, p.112
(i) **MOHENJO-DARO:-**

Mohenjo-Daro is also known as the “Mound of the Dead”. It is located on the right bank of the Indus in Larkana district of Sindh in Pakistan. The exact location of Mohenjo-Daro is 27°19’N by 68°8’E. The mounds which hide the remains of ancient city are in the riverine flat. The highest of them, near the north-west corner, rising to a height of some 70 feet and the others averaging from 20 to 30 feet above the plain. Some part of the city was eroded by flood. Some of the exposed surface of the city also decayed due to the slightest moisture in the air, these salts crystallize on any exposed surface of the ancient brickwork, causing it to disintegrate and flake away, and eventually reducing it to powder.\(^{63}\) The site was first visited by D.R. Bhandarkar in 1911-12, and the excavation was begun under the direction of Marshall in 1921-22 and continued up to 1930. Ernest Mackay excavated some part of the site from 1927 to 1931. Some other archaeologist who excavated at Mohenjo-daro was Mortimer Wheeler, George F Dales, M. S. Vats, K. N. Puri, K. N. Dikshit, etc. The city was divided as Citadel in the west and Lower Town in the east. In the citadel complex several important buildings like Great Bath, the Granary and the college, are built on massive platforms of mud-bricks. A series of twenty-four widely distributed “conservation well was also exposed in the citadel area.

At Mohenjo-Daro most of the houses or group of houses had at least one private well and along the streets there were public wells for travelers and the general public. Michael Jansen has calculated that the city may have had over 700 wells.  

Lower Town was to the east of high citadel mound. It consists of low mounds covering over 80 hectares. These mounds are named as DK-G area, VS area, HR area and Moneer area and they were divided into major blocks by four major north-south streets and four equally wide east-west streets. The width of the streets at Mohenjo-Daro varies from 1.5m to 9m or 10.5m. Three vehicles could go parallel at the same time in First Street. There were underground and open drains along the streets. The drains were used to take water outside to the city. Soakage jars were also there after an interval of distance in drains, so that the drains could be kept clean, the doors of house generally open in the lanes not in main streets. The average house consisted of four to six rooms, one kitchen, latrine, well and open courtyard. Some houses had cesspits and manholes. The standard baked bricks used at Mohenjodaro was 28×14×7 cm (4:2:1 ratio), but in some constructions bricks of different sizes were also used by the local people.  

The Great Bath is an important building in the citadel. It measures 11.89 ×7.01m. the depth being 2.44m. The brick-paved courtyard is surrounded by verandahs, at the back of which are

64 J.M. Kenoyer (1998), op. cit, p.59  
65 G.L. Possehl (2002), op. cit, p.107
ranged rooms are arranged on three sides. The water in the tank was supplied by a double ringed well. The vaulted culvert in the south-western corner was used to empty the tank. To the west of the Great Bath, a granary has been found which carried a high timber superstructure having intersecting channels below for ventilation and keeping the grain dry. There was a platform near the granary which was used to load or unload the grain in the wagon. Pillared hall is also one of the important buildings in the citadel area. Wheeler said that it may be a college building or a residence of the chief or the priest.  

(ii) CHANHU-DARO:-

Chanhu-daro lies 20km east of the Indus and 130Km to the south of Mohenjo-daro in Nawabshah district of Sind in Pakistan. Its exact location is 26°11’N and 68°19’E. The site was trial trenched by Majumdar in 1934 and late duly excavated by Mackay in 1943. Mackay identified three cultural periods; these were from bottom to top Harappan (I), Jhukar (II) and Jhangar (III). The Harappan periods showed the characteristic town planning, the streets and Lanes crossing one another at right angles. But the orientation of the streets and lanes was not north-south and east-west, as per the Harappan practice, but northwest-southeast and northeast and south-west. The main street at chanhujo-daro was 7.5m wide. Most of the streets were provided with covered drains made of kiln fired bricks. Generally the houses consisted of a few rooms, a courtyard, a privy and bath.

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66 J.P. Joshi (2008), Harappan Architecture and Civil Engineering, p. 50.
Brick floors were generally provided in the baths and privies.\textsuperscript{67}

The inhabitants of Chanhu-daro were primarily craftsmen such as bead makers, shell workers and coppersmiths. Mackay also said that Chanhu-daro was an industrial centre. He refers to a bead factory with furnace, covering an overall area of 9.9×3.75m. In one side of this complex there ran a series of well-built flues, averaging 5.5ins wide by 8ins high.

Some flues were identified in the kiln of bead factory. In these flues five running in one direction and three at right angle to the former have been identified. A number of finished and unfinished beads found in a house. Availability of chunks of raw material like amethyst, crystal, carnelian and agate along with drills, clearly proves that Chanhu-daro was a centre for bead making.\textsuperscript{68}

It is believed that after total desertion of Chanhu-daro by the Harappans in period IC, the pottery and other equipments used by the new people are similar to that of the Jhukar people arrived. But the overlapping of Jhukar and Harappan pottery at Chanhu-daro suggests that the Jhukar people were contemporaries of mature Harappans and represent the peripheral folk having socio-economic relations with them. At Chanhu-daro Jhukar people occupied and even reconstructed some of the houses deserted by the Harappans. A unique feature of Jhukar culture is fire place protected by low walls built outside the

\textsuperscript{67} B.B. Lal 1997 \textit{op. cit.}, p. 110
\textsuperscript{68} E.J.H. Mackey (1943) \textit{Chanhu jodaro Excavations 1935-36}, p. 41.
houses. It was used by them as ovens for cooking food or it was served a ritualistic purpose such as fire worship.

(iii) BALAKOT:-

Balakot is an important Harappan site in Las Bela district of Balochistan in Pakistan. Its exact location is 25°28’30”N and 66°43’30”E. During the winter of 1973-1974 preliminary excavations were conducted at the site by George F Dales. He gave the evidence of a Harappan habitation with a wide east-west lane crossed by two side lanes at right angles. Most of the buildings were made of mud bricks but in a few drains the kiln fired bricks were used. One toilet room has yielded evidence of a ceramic bathtub, a hearth, water storage jar and a drain made of broken pot. An ornate floor has also been found with intersecting circles on the terracotta tiles.\(^6\) A floor of a room has white line plaster with burnt remains of wooden column. A room has been found paved bricks around a ceramic tub in the centre. There was a wooden threshold on the eastern edge of the paving. The high mound was enclosed by a formal architecture, but maximum part was eroded by flood. An interesting building having a 7sq m courtyard with mud-brick plasters on the inner side has also been found at Balakot.\(^7\)

(iv) KALIBANGAN:-

Kalibangan is located along the left bank of the dried-up bed of the river Ghaggar (ancient Sarasavati) in Ganganagar.

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district of Rajasthan (India). Its latitudinal and longitudinal extant is 29°25'00"N and 74°05'00"E.\textsuperscript{71} The site was first visited by L.F. Tessitori in 1916-19, later by Aurel Stein in 1947 and A. Ghosh in 1952. The excavation at Kalibangan was conducted by B.B.Lal, B.K.Thapar and Jagat Pati Joshi from 1960-1969 in nine field seasons. They brought to light a grid layout of a Harappan metropolis. There are three mounds, two big and one smaller mound to the east. The western mound is known as KLB-I, the middle one as KLB-2 and the third KLB-3.\textsuperscript{72} But during Mature Harappan period there were only two parts, the citadel on west and Lower Town on the east, eastern mound contains a few ritualistic structures but has not been given any specific name.

The Lower Town was fortified. The fortification wall formed a rough parallelogram on plan, the eastern and western walls running due north-south but northern one was slightly deviating from east-west. In south the wall was completely eroded by flood. The east-west extent of the Lower Town was 240m; the north-south length was about 360m.\textsuperscript{73} The mud-bricks were used in the construction of fortification wall, but at a few places kiln-fired bricks were also employed.

In the beginning large-sized bricks (40×20×10cm) were used but in subsequent repairs only smaller ones (30×15×7.5cm) were used. The settlement within the Lower Town was laid out in a grid-pattern. The longer streets did not quite follow the

\textsuperscript{71} G.L.Possehl (1999) \textit{op. cit}, p. 773
\textsuperscript{72} B.B. Lal (2003), \textit{Excavation at Kalibangan the Early Harappans (1960-69)}, p.17
\textsuperscript{73} D.P. Agarwal (2007), \textit{The Indus Civilization An Interdisciplinary Perspective}, p.90
alignment of the north-south fortification walls, but the east-west street did follow the alignment of the northern wall. The Harappans did believe in standardization, like weights, measures or size of bricks. B.B. Lal points out that even the lanes and streets of Kalibangan followed a ratio of 1:2:3:4. The narrowest lane was 1.8m, wide and the others were 3.6m, 5.4m and 7.2m respectively.

The houses at Kalibangan had a courtyard with rooms along its three sides and an entrance on the fourth. The entrance was sufficiently wide, so as to let a bullock-cart in. The cooking was usually done in the open courtyard, to allow free escape to smoke. A well was also sometimes located in the courtyard. The citadel is located about 40m to the west of the Lower Town. It has unique configuration and has its own fortification. The fortification is forming a parallelogram on plan, 240m north-south and 120m east-west. The complex of citadel was divided into two equal rhombs by a partition-wall in the middle. In the northern rhomb there were residential houses located on each side of a street running up to a gateway in the north-west, but the southern rhomb had no such house. Small lanes were also connected with the main streets. There were two entrances for both the rhombs. The northern rhombs was on the north-western end and another in the south-eastern part which provided access to the occupants of the Lower Lane. The southern rhomb also has two entrances, one from the northern rhomb and the

74 B.B. Lal (1997), op. cit, p.122
other from the area south of the southern rhomb itself. The two entrances to the northern rhomb, allowed vehicular traffic to get in. The entrance to southern rhomb was of stepped nature and the ramp was serving as barrier to stop the entry of the vehicle in the southern rhomb.\footnote{D.P. Agrawal (2007), \textit{op. cit}, p. 93} It was religious area and the devotees were required to reach it on foot, and not on vehicles. In the citadel the houses were also built of mud-brick and baked bricks of different sized (3:2:1cm and 4:2:1).

The KLB-3 was situated about 80m to the east of citadel. It consisted of some ritualistic fire altars.\footnote{J.P. Joshi (2008) \textit{op.cit}, p. 56} The cemetery of the Harappans was located to the west-south-west of citadel. Three types of burials were exposed. They were extended inhumation in rectangular or oval graves, pot burials in circular pits, and rectangular or oval grave pits containing only pottery and other funerary.\footnote{M.K. Dhavalikar (1997), \textit{Indian Protohistory}, p. 25}

(v) BANAWALI:-

Banawali (29°31’N, 75°23’E) is a very important Harappan site, located on the bank of ancient Saraswati River in Fatehabad district of Haryana. It is about 120Km north-east of Kalibangan and 220Km north-west of Delhi. The site was excavated by R.S.Bisht. He exposed very interesting architectural features. The citadel and the Lower Town had a common fortification wall. It was spread over an area of about 400m square. It is one of the few
Harappan sites which were occupied in the Pre-Harappan, Mature Harappan and Late Harappan phases. At Banawali Period II represents the Harappa culture, which flourished between 2200-1700 B.C. During this period the settlement has a citadel and a Lower Town enclosed by a fortification wall and further encircled by a moat, the other elements of the defense-work are the berm and the moat which are indeed a unique feature of the planning of Banawali as both of them have so far not been reported from any other Indus site that has yielded a defensive system. On the southern side the citadel had common wall with lower town and it had its own fortification walls on the other sides, forming roughly a semi-ellipse on plan. Only about 25% of the citadel area was fully covered by Harappan structures which have been detected in the east central zone section. The rest of the area was possibly left vacant.

Another important aspect of the Banawali planning is that there was a ‘peripheral road running all through uninterruptedly on either side of the fortifications’ of both acropolis and lower town. The main entrance to the town was from the east and there was an elaborate gate complex in the thickness of the eastern wall, which consisted of a frontal moat, flanking bastions, a broad passageway, a postern stairway and a storm water drain. Like the other sites the town at Banawali was not divided like

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chessboard or gridiron pattern of planning. Here the roads are neither always straight nor do they necessarily cut each other at right angles. The widths of the seven streets, varying between 9.10m and 4.20m or less, have been traced in the town sector. The houses were constructed along both sides of streets and lanes.81

(vi) RAKHIGARHI:-

Rakhigarhi (29°16'N and 76°10'E) is located on the right bank of the dry course of the Drisadavati in the Hissar district of Haryana. A cluster of seven mounds marked from RGR-1 to RGR-7 cover a total area of about 105ha. It is one of the metropolitan sites of the Indus Civilization. The site was spread over large area of two villages: Rakhishahpur and Rakhihas. The maximum height of the site is 17meters. It was excavated by Suraj Bhan in 1963-64 and assigned it as the provincial capital.82 Both Sothi-Siswal and Mature Harappan occupational remains recovered at the site. Some fire altars of Banawali type have also been reported here.83 RGR-2 has the remains of fortified citadel of mature Harappan phase. The fortification wall of citadel was made of mud-brick but had a veneer of burnt-brick platforms have been reported from the inside of Rakhigarhi citadel. At Rakhigarhi there are plenty of evidences of rectangular pits with sign of burning and the presence of bones inside. In one pit a

81 Ibid, p. 58
82 Silk Ram (1970), Archaeology of Rohtak and Hissar District, Haryana, Ph.D. Thesis (Unpublished), Kurukshetra University Kurukshetra, p. 70
83 Suraj Bhan (1975), Excavation at Mitathal (1968) and other explorations in the Sutlej-Yamuna divide, Kurukshetra University, Kurukshetra. p. 95
brick was vertically placed in the centre.\textsuperscript{84} In one case it has been called ‘heart shaped’ while in another a semi-circular central projection has been noticed on its north and south sides. The RGR-1 is belonging to the Mature Harappan Phase and a structure aligned along its main street (north-south) has provided a bead-making workshop with 3000. Semi finished and odd finished beads of carnelian, chalcedony, agate and jasper are found. The evidences of plateforms and north-south streets were exposed during the excavation of mound RGR-4.

(vii) BALU:-

Balu was discovered by Suraj Bhan and Jim G. Shaffer in 1977. Its exact location is, 29°40’N and 76°22’E, about 17Km west of the Kaithal and 4Km north of the village Balu. Apaga, a tributary of Saraswati, provided water for irrigation in this region. The site was excavated by The Department of Ancient Indian History, Culture & Archaeology, Kurukshetra university, Kurukshetra’ from 1978-79 to 1989-90, 1992-93 to 1994-95 and 1996-97, first excavation was conducted under the direction of U.V. Singh and Suraj Bhan and later under the direction of S.P. Shukla with the assistance of B.K. Kathil, Arun Kesarwani and Mohinder Singh.\textsuperscript{85}

The site measures 250 meters East-West and 200 meters North-South. The total height of the site is 4.50 meters and the evidences of Pre-Harappan, Harappan and Late-Harappan

\textsuperscript{84} D.P. Agarwal (2007), \textit{op. cit}, p.85
occupations are found here. Pre-Harappans people were the first settlers at Balu who made their houses on natural soil. They used mud bricks of size $30 \times 20 \times 10$ cm. A Kankar-mixed clay bund was constructed on the southern side of the settlement, perhaps it was to protect the settlement from flood. This Pre-Harappan settlement spread over an area of 6700 square meters.  

The total deposit of Mature Harappan phase is 2.20 meters and the remains are found scattered all over the mound. Shukla divides Harappan Phase into several stages Pre-fortification Stage, Fortification stage, late classical stage and Post Harappan stage. During this period mud-brick ($40 \times 20 \times 10$ cm) fortification wall measuring 108 meters north-south and 96 meters east-west was constructed around the settlement. The width of the fortification wall was 12 meters but at one place it was wider than this. The width of fortification walls at other contemporary sites is not more than 5 to 7 meters. Mud-bricks were also used in the construction of houses. The sizes of bricks are $72 \times 36 \times 12$ cm.

The total cultural deposit of Late Harappan period is 1.30 meters. The classical phase of the Harappan culture began to decline. The surface of the mound was leveled. The fortification area was raised by spreading ashy soil. Mud-bricks of 1:2:4 ratios were used in the construction of houses.  

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86 S.P. Shukla (1977), *Form of the Harappan Civilization as Revealed from the excavations at Balu*, p. 9  
87 Ibid p. 10
(viii) KUNAL:-

Kunal is an ancient site and it is located, Lat. 29°30’N and 75°41’E Long, in district Fatehabad, Haryana. It is on the bank of dried up course of the Saraswati. The site was excavated by J.S. Khatri and M.Acharya (1994-95) of the Department of Archaeology & Museum, Government of Haryana. Excavations at Kunal have provided extremely significant evidence of Harappan domestication. The total cultural deposit is only around 4.10 metres.

The archaeological excavations revealed three successive phases of Early Harappan Culture which records the process of change that led to the fortification of the Harappan culture. Period-I belongs to Early Harappan and Period-II belongs to Mature Harappan phase. During Period-IA Early Harappan people started to live in dwelling pits. These dwellings were semi-subterranean. These living pits are approximately 2m in diameter and 1.10meter in depth. The Period IB represents the expansion of the settlement and elaboration of the semi-subterranean houses of round pits. The sizes of pits increased from half to one meter and were lined with finely moulded mud bricks (11x23x39). The three unearthed pits have outer diameter 2.92m, 2.75m and 2.64m.

During Period IC clearly demonstrates developing stages of culture. There is improvement in their houses, the drainage

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88 D.P. Agarwal (2007), op. cit, p. 88
system, the street, etc. the dwelling became slightly larger and better built than Period IB.

The deposits of Period II at Kunal are almost removed from the site. But one interesting remains is left it is the construction of a water channel. This ‘V’ shaped water channel was constructed around the habitation area. The depth and width of this channel vary from place to place. Its maximum depth and width is 3.45m and 4.15m respectively, from the top, respectively. The habitational area of village was divided in to two parts, one inside and other outside of the water channel. The pattern is almost same as the citadel and the lower town of the Harappan settlement. 

(ix) DHOLAVIRA:-

The Harappan site at Dholavira (23°53’10”N and 70°13’E), district Kachachh in Gujarat, lies in the north-western area of the island of Khadir which is strongly isolated by the cheerless and barren salt waste of Great Rann of Kachchh. The water channel Manhar in the south and Mansar in the north of the ancient city. Excavation was conducted at Dholavira by Archaeological Survey of India under the supervision of R.S. Bisht.

The full-grown cityscape consisted of the general fortification, reservoirs, a bipartite citadel, an extensive congregation ground, a smaller stadium, a middle town and a

lower town. The three principal divisions are designed tentatively as ‘citadel’, middle town and ‘lower town’.

The Citadel at Dholavira was established in the southern part of the city. It consisted of two subdivisions “castle” on the east and “bailey” on the west. The city has fortification wall and mud-bricks were used in its construction. There was the provision of projecting salient almost at regular intervals. Within the citadel, the castle was higher than the bailey. The castle had gateways on the northern and southern side as well. A good drainage system was there inside the castle. A large sized covered drain, starting at the northern end with cesspool and cascades, passed through the broadways and moved off to the western gateway to enter the Bailey from where it finally discharged into the open space on the west. The middle town located to the north of the Citadel complex and repeated from it by an open space, most probably it was used as a stadium. The Middle Town had its own fortifications. The houses in the middle town were fairly large with large courtyard, many rooms, bathrooms, etc.

The Lower Town did not have its own fortification wall, but it lies within the common fortification wall of the city. The alignment of streets is in north-south and east-west directions and they intersect each others at right angles. D.P. Agarwal (2007) op. cit, p.139.
sized stones were used by them.

Harappans were master in hydraulic engineering. They adopted an efficient system for the conservation, harvesting and storage of water at Dholavira. They constructed check dams on the water channels, so that they could use the water in irrigation. They also constructed reservoirs in the city to store the rainwater. These reservoirs were rockcut measuring 37m×25.30m×7.5m, 88.40m×12×7m.5m.92

(x) LOthal:-

Lothal is a Gujarati word, formed by combining the words Loth and thal (sthal) means ‘the mound of the dead’. Some scholars says that Lothal is the combination of two Sanskrit words, lodh and sthal which conveys the meaning that a place where boats are moored or repaired. The ancient mound at Lothal, Long. 72°14’25”E and Lat. 22°31’25”N, is situated 4 miles away from Bhurkhi (a small railway station), renamed Lothal-Bhurkhi, on the meter-gauge line of the Ahmadabad-Bhavnagar section of western railways. It lies between two ranns, the Rann of combay on the south and the Little Rann of Kutch on the north. The ancient mound was measuring 934ft×794ft.93

Lothal was discovered in 1954 by S.R.Rao and first excavation was conducted in February 1955. The evidence from excavations shows that there was a Pre-Harappan occupational structure at the site. The Mature Harappan Period (Period A) has

been divided into four phases from, Phase I to Phase IV, and the final Phase (Period B) represents the Late Harappan phase represented by phase V. During phase I it was a small village protected by a mud bund, after destroying by flood the elaborate township was laid in the second phase comprises an acropolis and Lower Town enclosed within circumvallation.  

Lothal was planned more or less on the same architectural pattern as Harappa and Mohenjo-daro. The streets were running in cardinal directions and interconnecting various blocks in the Lower Town. The gridiron plan of the town is more conspicuous at Lothal than in Mohenjodaro. The settlement was divided into various blocks from A to G. The Acropolis occupying the southwestern sector comprises Blocks B, C and D and the Lower Town includes ‘Blocks A, E, F and G. The main bazaar was situated in Street 1 in Block A and the warehouse in Block C. The ruler of the city lived in Block B.  

The Acropolis was situated south of the Lower Town. It measures 117 m on the east and west 136m on the north and 111m on the south. Block B was the seat of the power. It was on the raised platforms, 3.5m high, to overlook the dock, warehouse and Lower Town. There were Streets and Lanes with good drains and public well in Acropolis.  

Warehouse was a very impressive building at Lothal consisted of 64 cubical blocks, each 3.6m. square. on plan and 1m high. It was

95 S.R. Rao (1973) Lothal and the Indus Civilization, p. 62
used to store the surplus grains produced at Lothal and import from the interior region of Indus valley. It was near the dock so that the Harappans could export the grains to Egypt and Mesopotamia via sea route. Lothal was busiest part of its time.\textsuperscript{96}

The Lower Town consists of Bazaar Street (Street 9) and the Industrial sector of Block E and F (street 5-8). The Lower Town was also well planned like The Acropolis. The Bazaar Street met with several lanes and Street 9 at right angle and produces a gridiron plan. In the main bazaar, both sides of Street 1, wealthy merchants and craftsmen lived side by side.\textsuperscript{97} Fired and baked bricks were used in the construction of houses in the Lower Town. The houses consists of 3 to 4 rooms a kitchen and open courtyard.

Bead factory was also an important building in the Lower Town. Beads of different quality, size and colour were produced in this export oriented factory. Here the circular kiln of thin bricks plastered with mud was built nearby for heating the pebbles to facilitate removal of the cortex.\textsuperscript{98}

The greatest contribution made by the Lothal engineers to the advancement of science and technology consists in building an artificial dock for berthing ships. The Dock at Lothal is the largest structure ever built by Harappans or any Bronze Age community for handling cargo. Its western embankment wall is 5

\textsuperscript{97} S.R. Rao (1973) \textit{op. cit}, p. 66
\textsuperscript{98} S.R. Rao (1991) \textit{op. cit}, p. 135
to 6 ft. at the bottom and 2 ft. 3 ins. at the top. The Dock was helpful for the development of sea route trade.\(^9^9\)

The excavations at Lothal have revealed five phases of the occupation and given evidence to the occurrence of floods and the reconstruction of the platforms. Lothal might have been destroyed around 1900 BCE by floods, as revealed by the excavations.\(^1^0^0\) The signs of decline in construction are clearly visible in phase IVa when a large number of houses had to be built from the debris of ruined houses. The extremely poor standard of construction in phase Vb is reflected by the reed hut (195) with mud-floor built over the ruins of a house.\(^1^0^1\)

(xi) DIAMABAD:-

Diamabad is a deserted village and an archaeological site on the left bank of the Pravara River, a tributary of the Godavari River in Srirampur taluka in Ahmednagar district of Maharashtra state in India. Diamabad was discovered by B.P. Bopardikar in 1958. It was excavated in three phases. The first excavation was conducted under the direction of M.N. Deshpande in 1958-59. The second excavation was led by S.R.Rao in 1974-75 and the later excavations were carried out under the direction of S.A.Sali in 1975-76 and 1978-79. It is the southern most site of Harappan Civilization. The excavations carried out in 5m thick occupational deposit which revealed evidence of five different

\(^9^9\) S.R. Rao (1979) op. cit, p. 123
\(^1^0^0\) J.P. Joshi (2008) op. cit, p. 60
\(^1^0^1\) S.R. Rao (1979) op. cit, p. 122
cultural phases.

Phase I: **Savalda Culture** (before c. 2300/2200 BCE)

Phase II: **Late Harappan Culture** (c. 2300/2200 - 1800 BCE)

Phase III: **Diamabad Culture** (c. 1800-1600 BCE)

Phase IV: **Malwa culture** (c. 1600-1400 BCE)

Phase V: **Jorwe Culture** (c. 1400-1000 BCE)

It is thought that the Harappans in Saurashtra left this region due to regular flood and they settled here on this site. The Late Harappan people made their houses in same pattern as in Saurashtra. They use black clay in the making of mud wall and bricks. The bricks were of same ratio 4:2:1 and the sizes were 32×16×8 cm and 28×14×7 cm.\(^{102}\)

(xii) **ALAMGIRPUR:**

Alamagirpur is an archaeological site and it is easternmost post of the Harappan civilization. It is located, 29°00’00”N and 77°22’00”E, in Meerut district of Uttar Pradesh. The site was partially excavated in 1958-59 by Archaeological Survey of India under the direction of Y.D Sharma. The excavation has revealed that the Harappans reached this place at a slightly later stage in their chronology of cultural expansion. Some typical Harappan pottery was found there, and the complex itself appeared to be a pottery workshop. Ceramic items found included roof tiles, dishes, cups, vases and figurines of a humped bull and a snake.\(^{103}\)

At the site of Alamgirpur no evidence of town planning or

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103 A. Ghosh (1989) **An Encyclopedia of Indian Archaeology**, p. 52
cemetery has been found.

(xiii) SUTKAGENDOR:-

Sutkagendor is a low rocky plateau located on the extreme eastern edge of the wide Dasht Valley in the Makran on the Iran-Pakistan border and about 45 Kilometers from the present Arabian Sea cost. Its exact location is 25°30’00”N and 62°00’00”E. It is westernmost site of the Indus Valley Civilization. This site was first noticed by a British officer, Mejor E. Mocklar and partially excavated by him in 1876. Subsequently Sir Aurel Stein undertook a small excavation at this Mature Harappan site. George F. Dales also conducted a small excavation and published a preliminary report. The most important feature of structural remains of the site is the great fortified stone wall measuring 180×103 meters. The excavation conducted by Dales revealed that the site was divided into two parts, the Citadel area and the Lower Town. The citadel was fortified by a dressed stone wall with a gateway and bastions. Mud-bricks were used in the construction of houses. The bricks were laid in clay. The houses were constructed on the platforms.

(xiv) FARMANA:-

The village Farmana is situated at a distance of about 14Km from Meham, the tehsil headquarters, in district Rohtak, Haryana. The mound is located, 29°04’44”N, 76°17’10”E, about 2Km. west

105 G.F. Dales (1962), Harappan Outposts on the Makran Coast, Antiquity 36: p. 90.
of the village and it is locally known as ‘Daksha Khera’. The site falls in the revenue jurisdiction of three villages, Farmana, Seman and Bhaini, but its major portion falls in the village Farmana. Surender Singh gave the size of the site $250 \times 250$ m and reported remains of Early Harappan, Mature Harappan, Late Harappan, OCP and Early Historic Period. After Rakhigarhi (105 hectares), Farmana (18 hectares) is the second largest Harappan site in Haryana region. The recent excavation at Farmana was conducted by Dr. Manmohan Kumar and Dr. Vasant Shinde. The cultural deposit is divided into two periods.

Period-I Pre Harappan (Regional Hakra Culture Tradition)

Period-II Mature Harappan.\(^\text{(106)}\)

The early agricultural community in this area has been identified as the Pre-Harappan or regional Hakra Culture. This new term, Regional Hakra Culture, was given by Dr. V. Shinde, T. Orada, A. Vesugi and Dr. Manmohan after the excavation at Farmana. Mud-bricks (1:2:4) were used by Harappan in the construction of their houses.

(xv) BHIRRANA:-

Bhirrana, Latitude $29^\circ33^\prime$N and Longitude $75^\circ35^\prime$E, is a small village situated about 220 Km to the northwest of New Delhi on the New Delhi-Fazilka national highway and about 14 Km northeast of the district headquarter on the Bhuna road in the

Fatehabad district of Haryana. The mound, Bhirrana, measures 190m north-south and 240m east-west and rises to a height of 5.50m from the surrounding alluvial plain. Presently the site is under protection of the department of Archaeology and Museum, Government of Haryana. The Nagpur Excavation Branch excavated the site during 2003-2006 session, under the Saraswati Heritage Project of the Archaeological Survey of India. The excavations revealed three cultural periods.

Period IA: Hakra Wares Culture.
Period IB: Early Harappan Culture
Period IIA: Early Mature Harappan and
Period IIB: Mature Harappan Culture.\textsuperscript{107}

During Period IA the culture is characterized by structures in the form of subterranean dwelling pits, cut into the natural soil. The walls and floor of these pits were plastered with the yellowish alluvium of the Saraswati Valley.\textsuperscript{108} The HakraWare Culture was an early stage of Early Harappan culture. Prior to excavation at Bhirrana, no Hakra Ware Culture, predating the Early Harappan had been exposed in any Indian site. The cultural remains of this culture exposed at Bhirrana.

During the Period IB, the entire site was occupied but the settlement was without fortification wall. The houses were built

\textsuperscript{107} L.S. Rao, N.B.Shahu, U.A.Shartry and Samir Diwan “New Light on the Excavation at Harappan Settlement at Bhirrana” \textit{Puratattav No. 35.} p. 60
\textsuperscript{108} Ibid, p.61
of mud-bricks of buff colour in the ratio of 3:2:1. In the Period IIA. The culture is marked by transformation in the city lay-out. The entire settlement was inside the fortification wall. The twin units of the town planning, Citadel and Lower Town, came into vogue. Mud bricks were used in the constriction of houses.

Period II B belonging to Mature Harappan Culture with all the characteristic features of a well-developed Harappan city. Mud-bricks were used in the construction of massive fortification wall and Sun-baked bricks were used in the houses. The drains were made up of baked bricks (4:2:1).

(xvi) BHAGWANPURA:-

Bhagwanpura is an ancient site in District Kurukshetra, Haryana (Lat. 30°04’N; Long. 76°57’E). It is situated at a distance of 24km north-east of the district headquarter at Kurukshetra. The mound is situated on the right bank of river Saraswati, now the river is dry. The maximum available height of the mound is 2.40m above the level of the surrounding area. The site was discovered by Shri R.S.Bisht in 1974 and excavated in 1975-76. Bhagawanpura revealed a two fold culture sequence designated as Sub-Period IA and IB within a maximum culture deposit of 3.20m showing that the Late-Harappan culture was interlocked with Painted Grey Ware culture in the later period of the mound. Sub Period IA belongs to the late Harappan Phase and Sub-Period IB belong to PGW culture.

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109 L.S. Rao, N.B.Sahu, Prabash Sahu, U.A. Shartry and Samir, Diwan. Puratattva No. 35, p. 21
During Sub-Period IA, people raised mud platforms in two successive phases to get higher area which was safe against the flood waters of Saraswati. A platform measuring 4.25X10m was exposed during the excavation. The flood destructed the construction but the Late Harappan people continued to live at the site.

In Sub-Period IB there is continuous occupation of the Late Harappan and the arrival of Painted Grey Ware using people without any break. There are two layers which overlap with the Late Harappan pottery and yield thick Gray Ware. After a deposit of 0.15-0.20m, the occupation was damaged by a flood II which washed away a major portion of the habitation. This time also the settlement not completely deserted and it was reoccupied immediately after the devastating flood by both Late Harappan and Painted Gray Ware using folks.\textsuperscript{111}

The excavation at Bhawanpura has revealed for first time some important evidence on the house types associated within Sub-period IB which has exposed three phases of structural activity. In the beginning the people were living in the round or semi circular thatched huts of wattle and daub. In an area of 4.25×6.85m, twenty three post-holes in a trench have been found conforming a round or a semi circular hut. Inside the hut, on the floor, the find of four saddle querns and different types of pestles

perhaps indicate that the house belonged to a corn grinder.\textsuperscript{112}

In the second structural phase a complete mud walled house complex in a trench, having 0.70-1metre thick wall, have been found. This appears to be a well-planned house having thirteen rooms with a corridor in between two sets of rooms the length of the corridor is 14.35m and width 2.20m and a courtyard on the eastern side. The sizes of the rooms are varying from 1.60×1.60m to 3.35×4.20m. From these rooms Late Harappan pottery, copper objects, faience bangles, terracotta figures, the Painted Gray Ware Vessels and the plain Grey Ware Vessels have been found.\textsuperscript{113}

One oval structure measuring 1.60×.90m is also associated with this phase. It has yielded a dish-on stand of the Late Harappan variety. The oval structure appears that it probably had a domical roof. In the absence of any metal and charcoal, the structures appear that it may have had some religious significance.

In the third structural phase, the houses were built of baked bricks. Due to ploughing or agricultural activity, much of the evidence of the burnt bricks houses has been destroyed. The sizes of the bricks are 20×12×8 cm, 12×12×8 cm, 16×12×4 cm, 29×22×12.5 cm (wedge-shaped). One interesting features of burnt bricks of the sub-period is the finger marks on the bricks running longitudinally.

\textsuperscript{112} J.P. Joshi (2008), \textit{op. cit}, p. 191
\textsuperscript{113} \textit{Ibid}, p. 191