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**Research Article**

# Settlement Pattern in Indus Valley Civilization

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**ABSTRACT**

The settlement patterns study is a significant innovation in the field of archaeology to study civilizations. The Harappan civilization is largest among them with a geographical extent of one million square kilometres. Through the glimpses of settlement patterns of grand structures like Great Bath, Granary, citadel, Warehouse, College of Priests, Pillared Hall, a sudden rise of civilizational features is argued. The drainage and criss – cross road is completely new innovation of mature Harappan period. The general features of western and eastern mound plans and other simplistic structures are derived from the settlement structures of earlier period. The external and internal influence on the settlement patterns is also re-visited and a location is also tried for gendered settlement structures. In this short Travers It is argued that while bearing the tremendous impact of Neolithic, Mesolithic, and Chalcolithic of earlier periods there is a paradimical shift to urbanization in a very short lighting speed. This led to a complete metamorphosis from early to mature Harappa.

## Introduction

American archaeologists pioneered settlement pattern studies, beginning with Lewis Henry Morgan's 1881 work, which linked social structures with residential architecture **(Morgan 1881).** Mindeleff (1902) advanced methods for reconstructing settlement chronology is a great Innovation in understanding Settlement Patterns . Settlement pattern archaeology investigates how human settlements are distributed and arranged across time and space, shedding light on the socio-economic and cultural dynamics of past societies. This field has developed significantly through key studies, starting with Philip Wegner's argument that settlement patterns reflect the activities of people within their cultural environments **(Wagner 1960).** Knudson's contributions emphasized the idea that settlements are units where human groups manage and exploit local resources, resulting in a variety of settlement forms, from simple to complex urban systems **(Knudson 1978).**
**Sanders (1956, 1960)** differentiated zonal and communal settlement patterns, while after post 1960s , sophisticated methods like systematic sampling and quantitative analysis were introduced **(Winters 1969)**. Sanders (1962) introduced the idea of 'Symbiotic Zones,' emphasizing the interconnectedness of settlements within a region. **Chang (1958)** made a key distinction between "settlement pattern" and "community pattern," focusing on the spatial organization and its cultural implications. This distinction was further refined by **Winter (1969)** and **Trigger (1963)**, who explored how settlement size, structure, and environmental conditions are interrelated.
The 1950s and 1960s saw increased methodological rigor, with studies like Gordon R. Willey's 1956 work highlighting settlement patterns' importance in understanding cultural development **(Gordon R. Willey 1956).** Gordon Willey's pioneering research in 1956 on prehistoric settlement patterns in the Americas marked a turning point, encouraging archaeologists to view settlement processes as central to the broader study of archaeology. **Vogt (1956)** expanded this perspective by advocating for an interdisciplinary approach that incorporates geography, anthropology, and ecology to interpret settlement patterns through the lenses of geographical, social, and temporal factors.
In the Indian context, early research by **Sankalia (1960)** focused on prehistoric and early historic settlements, examining how environmental and subsistence factors influenced settlement choices. Dhavalikar focused on different patterns of habitation and houses from Pre – history : the early historic period **(Dhavalikar 1975,1985)**. Makkhan Lal in 1985 extended his analysis of PGW settlement patterns of Ganga river valley to prove the interaction of PGW culture with environment and technology **(Lal 1985).** George Erdosy's work in Kaushambi region of Uttar Pradesh in which he carried out a wider context of the evolution

of settlement pattern on regional level **(Erdosy 1985).** K. Paddayya's work on the Acheulian culture was a significant contribution to the study of lower Palaeolithic archaeology **(Paddayya 1985).**
Today, settlement pattern archaeology has evolved into a multidisciplinary field, incorporating insights from geography, sociology, and anthropology to better understand ancient human settlement strategies and their cultural significance.

## Grand Structures

One of the most notable aspects of India's settlement patterns is the baked-brick architecture of Mohenjo-Daro, featuring remarkably preserved structures along its streets and alleys. This is the largest Bronze Age city globally, where one can stroll through roads bordered by the tall walls of houses and other buildings, ascend staircases from ancient times, gaze into old wells, and could stand in bathing areas that were used over 4,000 years ago. The atmosphere evokes a sense of being within a living community; Mohenjo-Daro is a truly exceptional and unparalleled site.

## The Great Bath

The most important and complex structure of Harappa is the "Great Bath" . It is the only place found which is considered as a ritual structure in the Mature Harappa. Although it does not look like a temple but the construction and the motive of Great Bath clearly indicates the presence of some rituals.
There is a discussion of the function of this important structure in the tour of Mohenjodarro – First, the building in which the bath is housed is elevated and secured away from the Lower Town both highly symbolic. The Bath was filled with water and was a place of taking one's ablutions, in part evidenced by bathing rooms on the eastern side of the building, the notion of that bath was to make a great deal of sense **(Posshel, G.L ,The Indus Valle Civilization – A Contemporary Perspective, p.p 14).**
The Great Bath is located on the western mound, distinct from the College of Priests situated on the eastern mound. It was part of what seems to have been an extensive hydropathic complex and is quite prominent of all the structures uncovered at Mohenjodaro. The layout is straightforward: an open courtyard bordered by verandas on all four sides, with various galleries and rooms positioned behind three of the verandas. On the southern side, there is a long gallery with a small chamber in each corner, while the eastern side contains a row of small chambers, including one with a well. At the centre of the open courtyard lies a large swimming pool, approximately 39 feet in length, 23 feet in width, and sunk 8 feet below the court's pavement.

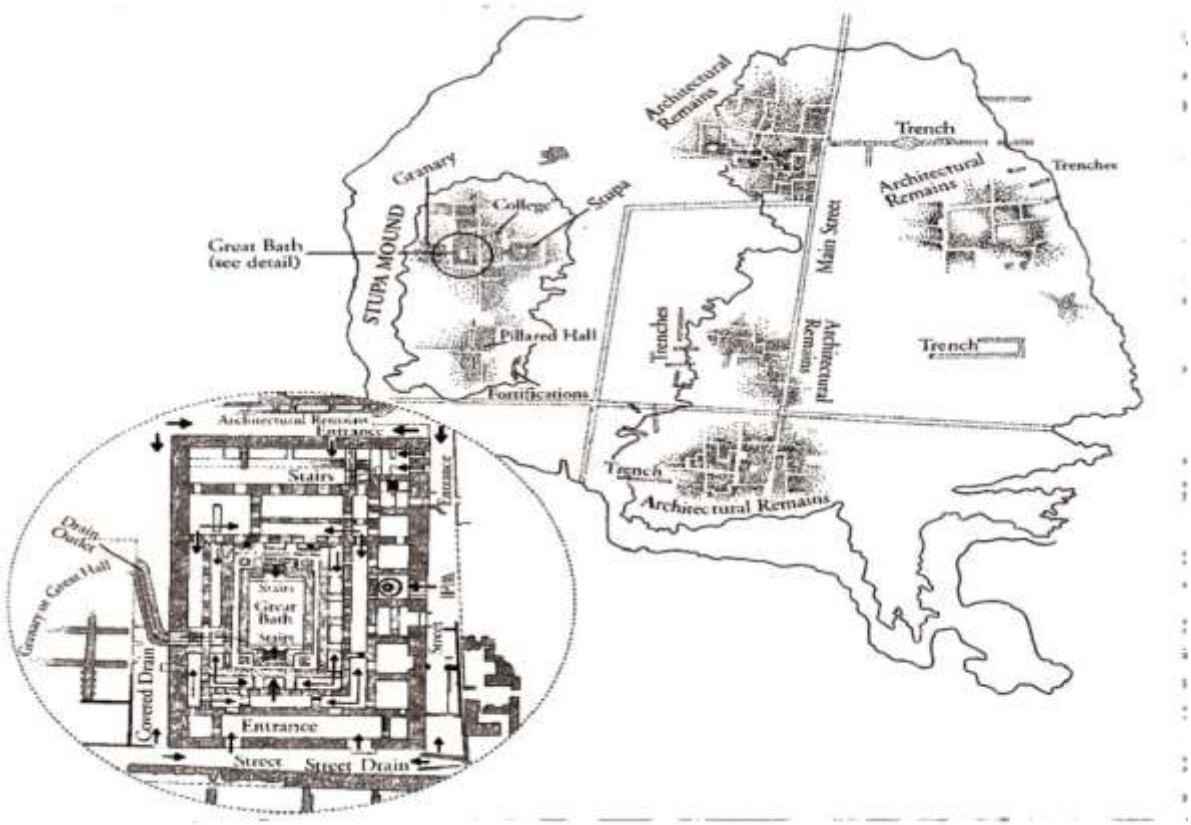


***Figure 1. Mohenjodaro City Plan (see Mcintosh Janner 2002 , A Peaceful Realm, The Rise and fall of Indus Valley Civilization, p.p. 86).***

The Bath is located just off-centre of the Mound of the Great Bath, slightly to the northwest. The Warehouse adjoins the south-western corner of the Bath structure, indicating that they might have operated together. The bathing pool was constructed from meticulously fitted baked bricks. The four walls of the pool were consistently 1.36 meters thick. This had been covered and made waterproof by a regular lining of bitumen (tar) 2.4 centimetres thick that was kept in place by a course of brick. The bottom of the pool was not examined deeply enough to determine if the bitumen sealed it as well, but it is a reasonable assumption.

Two rows, with their doorways opening into a central passage along which runs a well-made drain. The floor of each room in this curious bathing establishment was most carefully paved and sloped down to an open drain along one side, which 208 journal of the royal society of arts Jan. 5, 1934 ran out through the doorway to empty into the drain along the pass was taken in the construction of these rooms that no door should face an and the jambs of the doorways were made sufficiently thick to prevent the passage seeing into the rooms, unless he went right in. From each bathroom a flight of steps led up into a now destroyed upper storey. The whole arrangement suggests the utmost privacy, and it seems likely that these ablution chambers used for ritual purposes by some form of priesthood. The priests probably lived in cells in the upper storey and each had a bathroom to himself. The water for these bathrooms was drawn from a well in the south-east corner of the building and was deposited in each room in pottery vessels, of which we found broken pieces in several of the rooms. We have, then, in this quarter of the city a system of bathing establishments whose proximity to the probable remains of a sacred building certainly suggests that the baths themselves were used for ritual purposes The Great Bath would have been used by the general public and the rooms just described by the priests **(Mackay E.J.H , Further Excavations at Mohenjo-daro, 1934 p.206-224)**

A drain was discovered in the south-western corner of the bath. It was a hole in the black lining measuring 38 by 20 centimetres, extending through two baked-brick walls and an intermediate layer of clay, all 3.12 meters thick. The water leaving the pool would have travelled through a charred-brick conduit, which enters into a culvert featuring an elegant corbelled arch, 0.71 meters wide by 2.3 meters high, ample enough for a fairly sized person to walk through. There is a manhole at the bathing end of the culvert, which would have permitted inspection and cleaning of the drain, a characteristic also present in the sumps of the drainage system at Mohenjodaro.

Marshall proposes that the impressive corbelled arch of the bath drain was provided for cleaning and "may have served as a secret exit in times of need". If it was only a drain, there was certainly no need for it to be 2 meters high. It simply enlarges an area of flow to no particularly good end. But Mackay has the answer, "I think, by proposing that the culvert was where the bathwater was blocked and the water to fill it put down the manhole, causing the drain in the bottom of the pool to flow backward"( **Posshel , 2002 pp.190)**

### Granary Settlement Patterns in Harappa

The most crucial agrarian settlement is the granary structure in Harappa, found on Mound F .It was a masonry structure constructed on a substantial brick base, over 45 meters north -south and 45 meters east-west. Two rows of six rooms that appear to be foundations are arranged with a central passage about 7 meters wide and paved with baked bricks. Each room measures 15.2 by 6.1 meters and has three sleeper walls with air space between them. A wooden framework supported in some areas by massive columns would have been erected upon the brick foundations, with stairs leading up from the central passage area. Small triangular opening may have served as air ducts to allow the flow of fresh air beneath the hollow floors.

Settlements usually built within or on top of massive mud – brick walls or platforms **(Dales, 1965a).**

Reconstruction of the Granary at Harappa **(after Wheeler 1966).**

The Great Granary at Mohenjodaro was one of the massive structure uncovered in the Indus Valley Civilization . Granary was built on a mound structure.

The massive walls, platforms, and gateways could have had several functions, including protection from monsoon flooding, protection from erosion and water accumulation in the site **(Dales and Kenoyer, 1990b; kesarwani, 1984).**

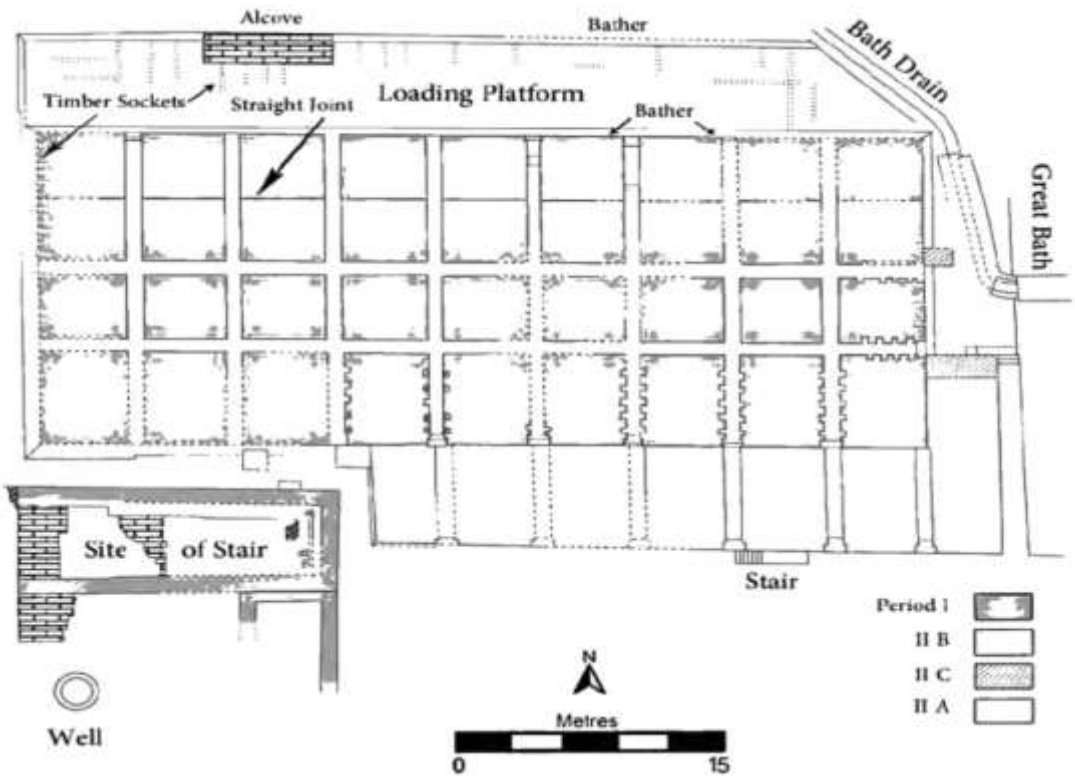


***Figure 2. Plan Of Granary at Mohenjo-Daro, (Coningham Robin and Young Ruth, The Archaeology of South Asia: From the Indus to Asoka, c. 6500 BCE–200 CE; p.p. 187.***

Lables auch as "Great Bath" and "Granary" are speculative and one do not know the precise functions of these structures. In the case of "Great Granary" of Mohenjodaro, grains were not reported from this building. **(Kenoyer, J.M. The Indu Valley Civilization of Pakistan and Western India , page 353).**
Even the granaries discovered at Lothal appear to have been a large structural platforms for a superstructure that is no longer apparent.
The large structures could be the remains of places, temples, public meeting places, or public store rooms; unfortunately, the stratigraphy and associated artifacts are lost or inadequately recorded **(Fentress, 1984).**
At the south – west corner of the Great Bath which is raised on a tapered brick platform, is a structure that was originally identified as a *hammam* or hot – air bath, and later identified as the "Great Granary". To the north of the Citadel there were 18 circular brick platforms, the "granary" was located to the north of these brick platforms – consisted 12 units arranged in 2 rows in 6 rooms and divided by a central passage, situated between the Great Bath and the Warehouse. The sites report of Mohenjo-Daro gives references about the "storage facilities" thus, it is be believed that there was rich commercial life in Mohenjo-Daro which was enjoyed by the upper class people.

## Warehouse of Mohenjo-Daro

Warehouse is also one of those structures which crucially linked with agrarian practices. In 1966, Wheeler , excavated the adjacent Warehouse– one of the important structure of Mohenjo-Daro located on the western side of citadel. Warehouse was also used to store grains as well as cloth, leather, food, fuel, wood, etc in raw and finished form ... **(The Indus Valle Civilization – A Contemporary Perspective, Gregory L. Possehl, 2002, p.p 191 )**
The Warehouse would have been a formidable structure primarily constructed of wood, with a thick, flat roof. This roof was likely repaired numerous times by adding layers of Indus reeds and mud, interwoven and stacked. Though not particularly advanced, the roof was immensely heavy, requiring a strong framework to support it.

***Figure 3. Plan of Warehouse at Harappa ,(Nath Jitendra, R.N.Kumaran and Bipin Chandra, 2015, 'The Ware House at Khirsaraan Amazing Harappan Architecture ', in Indian Culture & Art: Continuity and Change R.C.Tripathi Felicitation Volume, Agam Prasad (G.ed.), Swati Publications, Delhi, Pp 205-212 )***

The Warehouse was a single-story building, lower than the bath, and the light on this side of the Mound was much brighter compared to the dim, shadowy Main Street. The building's walls and supports were made of wooden planks and beams. The exterior planks were arranged vertically and might have been sourced from massive deodar trees in the mountains, then floated down to Mohenjo-Daro from Kashmir. We do not know exactly what role the goods stored in the Warehouse played in the
lives of the inhabitants of Mohenjo-Daro or the area surrounding the Great Bath. A wide staircase made of baked bricks led visitors from the Warehouse down to the Indus floodplain. Besides these structures, several other large buildings have been uncovered at Mohenjo-Daro, which are believed to have been centres for traditional ritual practices.

## College of Priests

The College of Priests is now a set of stabilized walls that are challenging to interpret without the aid of technical drawings and excavation tools. The possible institutional role of the "college" was likely that of a residence for a very high-ranking official, perhaps the High Priest himself, or possibly a group of priests. The building's overall dimensions are approximately 70.3 meters in length and 23.9 meters in width. Over time, the structure underwent many internal modifications. It was probably initially designed with large rooms to the north and south, as well as similar rooms in the centre. One of the more intriguing spaces seems to have been modelled after the northern end of the Great Bath, featuring interior windows. The main entrance to the college appears to have been on the western wall. Upon entering the building through its main entrance during the late days of Period III, the visitor stepped into a broad foyer, measuring 23 feet by 14.5 feet. To his right, a wide doorway opened into a large, windowed courtyard; ahead of him was a set of rooms—likely belonging to the head of the establishment—possibly including a reception chamber. To his left, two doorways led to a smaller courtyard, from which one could access a large number of residential and public rooms on either the ground floor or the upper levels. Many of the largest and best known buildings of this Harappan Phase are located on the citadel mound at MohenjoDaro. Perched high above the surrounding plains, these important buildings would have been visible from all parts of the city to legitimize the power and authority of the rulers.

## Pillared Hall

The southern end of the mound where the Great Bath is located was designated as "L Area." This area was first excavated by Mackay in 1926-1927, during his initial year at Mohenjo-Daro. L Area is clearly a significant location. The main structure within L Area has been interpreted by Marshall as a gathering place for monks and has been likened to Buddhist caves, though Mackay considered it to be a marketplace. In this instance, Wheeler agrees with Marshall, suggesting that the building served as an assembly hall: "The overall design of the structure somewhat recalls an Achaemenian apadana or audience chamber." This building is known as the Pillared Hall. The structure is an open, columned hall measuring roughly 23 by 27 meters. The main entrance

to the building appears to have been located at the centre of the northern wall. The roof was supported by four rows of five columns each, aligned north to south. The bases of these columns are constructed from baked brick. Mackay dates the original construction to the Intermediate Period and notes that later modifications have altered parts of the original layout.

## General Town Planning In Indus Settlement Patterns

The fundamental technology required for an urban society was already in place during the initial stages of the Regionalization Era and later developed as necessary.Essential items like stone, bone, and wooden tools had been utilized for millennia. Agricultural techniques were capable of adapting to various ecosystems; the main crops (wheat and barley), legumes, pulses, and possibly even cotton were grown across the region.

A range of specialized crafts was established during the Regionalization Era, which produced status and utilitarian goods that were distributed locally and regionally **(Jarrige, 1984b; Kenoyer, 1992; Wright, 1985 ; The Indus Valley Of Pakistan and Western India, Jonathan Mark Kenoyer 1991).**

The most significant architecture in Indus settlement patterns in lower towns and the Grid town planning of Mohenjodaro.

## Grid Town Planning

Although Mohenjo-Daro exhibits a general sense of planning, the layout does not appear to be entirely systematic. Two main roads, First Street (7.6 meters wide) and Second Street (9.1 meters wide), run north-south through the Lower Town and have been verified through excavation, with Second Street only confirmed in the DK-B Area. The east-west streets, however, present more challenges. Central Street (5.5 meters wide) serves as the northern east-west route in DK-G Area. It is centrally broad and straight street, it ends abruptly at First Street, where it meets a building wall. Eleven meters south of Central Street, another wide road connects with First Street—this is Dikshit's Trench E, measuring 3.8 meters in width and similar in scale to Central. The proximity and size of these streets suggest that, if Mohenjo-Daro's planners had been committed to a strict grid pattern, they would have aligned them instead of creating a jog. Mackay suggests that "The urban planning regulations of Mohenjo-Daro were clearly disregarded in this instance" . This deviation from the grid plan theory complicates the notion of a perfectly organized layout.

In their reconstruction of the grid town plan, Piggott and Wheeler overlook Mackay's Central Street and position the main east-west axis at the northern edge of DK-G. This area, however, has only been excavated on the northern side, leaving uncertainty as to whether it is truly a street. There is a rough alignment between this feature and a road (9.1 meters wide) in the DK-C Area, located 245 meters to the east. However, the DK-C road is only exposed for 55 meters and appears to slope southward, rather than continuing directly toward DK-G. It's possible that the DK-C street serves as a local byway, internal to the neighbourhood—its true purpose remains unknown. The southern east-west road was designated as "East," though logically it should be called "South Street." This street has not been uncovered, much less confirmed by excavation. It appears on maps solely due to the presence of a gully, which hints at a deep, narrow architectural depression.

Ultimately, there is strong evidence supporting the existence of First Street, a primary north-south route in Mohenjo-Daro's Lower Town. In contrast, the evidence for Second Street is tenuous—it remains a possibility but lacks solid proof. The southern east-west street is unexcavated but plausible. The northern east-west streets—Central, Trench E, or the street at the southern boundary of DK-G South—remain open to debate but are unproven.

Within the major blocks, the street layout is poorly aligned. Many routes feature jogs and occasional dead ends. Though the walls along the roads and lanes may constrict the avenues, causing them to narrow, curves are infrequent in Mohenjo-Daro's road network.

## Platforms of Lower Towns

There is evidence supporting the existence of platforms around the Lower Town. In 1964, Dales discovered "a large mud-brick structure with a solid, burnt brick wall," which acted as a facade and support for the mud-brick construction, stretching over 183 meters along the western side of the HR mound. A geophysical survey conducted by M. Cucarzi in 1981-1982 also identified a linear anomaly approximately 400 meters long at the southern end of Mohenjo-Daro, beneath the HR Area. This anomaly could represent part of a clay or mud-brick platform marking the southern boundary of a construction phase at Mohenjo-Daro. Moreover, excavations at Mohenjo-Daro have consistently revealed masses of mud brick at the site's lowest levels, often interpreted as platforms.

These early platforms served as foundational structures that significantly elevated the city above the Indus plain, protecting it from floods. The construction required a tremendous amount of labour and resources. Given that a single laborer could move about one cubic meter of earth per day, the task would have demanded around 4 million days of labour. This equates to 10,000 workers toiling for 400 days—just over a year. If the labour force were reduced to 2,500, the project would have taken 1,600 days, or roughly four years and four months, merely to lay the foundations.

### The Plan of Water Management in Lower Town

Water and its management are thought to have been central to the beliefs of the Indus civilization. This idea is most clearly demonstrated at Mohenjo-Daro but can also be seen at several other Indus sites, particularly Dholavira. A notable characteristic of mature Harappan settlements is the presence of brick-lined wells. Jansen has estimated that Mohenjo-Daro had approximately 700 of these wells. Brick-lined wells have also been discovered at Harappa, Chanhu-daro, and Lothal. The bricks serve two main purposes. Firstly, they provide structural support to prevent the surrounding earth from collapsing and help minimize erosion, particularly at the well opening. Secondly, brick-lined wells supply clean, fresh water with minimal silt and other large particles. When properly constructed and maintained, these wells can provide crystal-clear water, even in river floodplain areas. Some wells at Mohenjo-Daro are as small as 60 centimetres in diameter, while one was as large as 2.1 meters. The average diameter is around 1 meter. Ardeleanu-Jansen provided the data regarding 75 wells uncovered at Mohenjo-Daro. The area each well served and the average distance between wells in the Lower Town are notably consistent, further highlighting the careful planning that shaped Mohenjo-Daro from its inception. A few wells were abandoned during the city's lifespan, and Mackay suggests this may have occurred because someone jumped into them.

**Drainage System of Indus Settlement Pattern** One of the most notable aspects of Mohenjo-daro and several other Mature Harappan sites (such as Harappa, Kalibangan, Nausharo, Chanhu-daro, Allahdino, Dholavira, and Lothal) is the sophisticated drainage system. In Mohenjo-Daro, all streets and alleys in the various neighbourhoods were equipped with drainage infrastructure. There were also measures in place for managing wastewater within the houses, including internal drains, vertical pipes embedded in the walls, chutes through the walls leading to the streets, and drainage systems from bathing areas connected to street drains. Mohenjo-Daro receives less than 13 centimetres of rain annually, similar to what it likely received in the third millennium BCE. This limited rainfall seems insufficient to warrant such an intricate system. At Mohenjo-Daro, drains were discovered at every level of the site, suggesting that they were constructed right from the outset of the Indus Civilization. This may indicate a technological advancement developed during the crucial Transitional Stage.

Generally the street drains at various sites were built using fired bricks, although the one at Allahdino was constructed from stone. In the SD Area of Mohenjo-Daro, some drains featured a bottom made of gypsum and lime plaster, with sides composed of fired bricks. While most drains used standard fired bricks, some in the SD and DK Areas included specially shaped bricks. These specially crafted bricks were used to create the smoothly curved corners of the drains. The stability of the drains was ensured by closely fitting the bricks with a small amount of mud mortar, and the use of specially dressed bricks improved the precision of the fit. At Mohenjo-Daro, drains were frequently reused across different construction phases.

***Figure 4. Plan Of Drainage System of Harappan Towns (Mortimer Wheeler 1959)***

For example, at the end of First Street in DK-G, the walls of a drain were reinforced by adding more bricks. In the southern part, the drains were repaired and raised at least twice. By the final phase, the drains were at least 20 centimetres wide and up to 2 meters deep in some places. Most drains had covers made of brick or stone due to their location under the streets or ground surface. Open drains were also found alongside streets, a common feature in contemporary villages in Pakistan and north-western India. The most common type of cover was a simple fired brick laid flat across the drain's sidewalls, though bricks placed on edge across the channel were also used. Wider drains were covered with large limestone blocks sourced from the nearby Rohri Hills.
These drains were mostly concealed underground to avoid interfering with traffic. Mackay estimates that the average depth of these drains was between 46 and 60 centimetres, although some were very close to or at the surface. Limestone covers in the SD Area often showed a distinct polish on their top surface, likely from the feet of pedestrians. It is imagined that these covers were level with the ground, some slightly buried. As the street surface shifted over time, some covers became exposed and developed a slight polish from frequent use.

## Residential Architecture of Indus Settlement Pattern

Most of the structures in the Lower Town of Mohenjo-Daro appear to have been residential. While some of these buildings may have had additional functions, the Lower Town was primarily where people lived and conducted their daily activities. Marshall provides a detailed and well-illustrated description of two buildings that could have been residences. The buildings in this area are typically substantial and robust, with walls commonly measuring one to two meters in thickness. In the most recent layers of the site, however, the structures appear to be rundown and resemble makeshift shelters. Mackay notes that this was generally characteristic of Mohenjo-Daro.
The thickness of the walls in the houses at Mohenjo-Daro, combined with the presence of stairways leading to open areas, suggests that many, if not most, of these buildings had at least one upper story. While the stairs could have provided access to the roof, the wall thickness indicates that this was not the typical configuration. Although the exact number of floors cannot be precisely determined, it is reasonable to assume that many buildings had at least one story above the ground floor. It is likely that the standard layout included a ground floor, an additional story for living space, and a roof. However, some of the larger buildings might have had two or even three additional floors beneath the roof.
The occurrence of fires at Mohenjo-Daro is a minor but intriguing subject. There is considerable evidence of burning at the site, with many buildings having been consumed by fire. Dikshit's report on his excavation near the "Jewelry Block" provides additional information, noting that the destruction of the latest city in this area appeared to be caused by fire, as evidenced by stratified layers of ashes alternating with debris from collapsed structures. This contrasts with Mackay's observation that evidence of houses being burned is extremely rare and that accidental fires were carefully avoided. Some Mature Harappan buildings feature windows, and fragments of terra-cotta resembling grilles might have been used as window coverings. Mackay notes that the goal at Mohenjo-Daro was to block out heat, similar to how we block out cold, making windows counterproductive. There are only a few door sockets, fewer than expected if every door had one. This scarcity may suggest the use of wooden doors and frames with sockets built into the frame. Dales discovered part of a door frame in his 1964 excavations at Mohenjo-Daro but did not mention any sockets.
The only detailed discussion of roofs on Mature Harappan buildings concerns those at Mohenjo-Daro. Both Marshall and Mackay propose that flat roofs supported by timber were typical for buildings at Mohenjo-Daro.

## Internal And External Influence on Harappan Settlement Patterns

India's earliest urban society has remained open to interpretation since Near-Eastern or external stimulus or simple diffusions starting from overlapping networks from Anatolia to Indus and also to Nile Valley, replaced by new regional interactions with direct formative relationships of pre/post urban. The term 'urban Harappa', 'Greater Indus Valley' along with post-Harappa, Post-Indus to signify Cemetery H Culture, Jhukar Culture, Gandhara Grave Culture, Black and Red Ware of south India which is now revealing connections **(Shaffer 1988)** has been invoked. However, it is difficult to delineate fixed boundaries in time and space but the phases of pronounced homogeneity, intense Interactions, networks, avenues of communication, cross-cutting phases and traditions is possible from a mass of data. Why the urban development happened remains debated from village to urban interaction, gradual transformation, rapid or explosive transformation or punctuated evaluation models, may coexisted rural/urban together in a peaceful co-existence. Moreover, the growth, continuity and geographical expansion may be the main slogans of urbanism. Shaffer and Linchestein argued in 1989 that 'mature Harappa is a fusion of their Baghor, Hakra and Kot Diji ethnic groups in the Ghagghar/Hakra Valley (Shaffer 1988) In the 100 years of (2600–2500 BC) of unusual conflagrations, a socio-cultural complexity emerged hallmarking urbanisation, symbolized in Mohenjodaro, Harappa, Ganeriwala, Dholavira and Rakhigarhi. The new trend in archaeology to capture and calculate the site population on the basis of settlement and stratigraphic details of the excavated sites. The total population of the Indus Civilization may be around four million, and the city population may be around 2,50,000 **(Lemmen and A. Khan 2012).**
The development around 3300 BC or earlier in Iraq, and around 3000 BC in the Indus basin and in the Helmund basin, was the combination of a number of innovations as shown in Figure 5. It establishes the connection links of Indus basin with Helmund basin. It includes symbiosis between agriculture and cattle rearing, castration as means of making the male of bull tractable and emergence of vertical cartwheel. The

archaeological evidence suggests cattle-use changed (3200–2600 BC). The toy-ploughs have been found in the mature Indus Civilization sites of Banawali (Haryana) and Jawaiwala (Bahawalpur) (2500–1900 BC). The traces of cart-ruts in pre-Indus levels at Harappa and finds of terracotta models of cart-wheels, cart-frames and oxen at Jalilpur (Kot-Diji phase) show that ox-drawn carts could now, before 2600 BC, supplement load-carrying oxen. The emergence of trading patterns, both internal and external, cannot be possible without the load-carrying carts. The oxen-driven carts might have provided the impetus of significance for the emergence of urbanization in the Indus Valley Civilization.

Internal trade and exchange are indicated by standardized weights, sealings, the sourcing of raw materials, and the identification of specialized centres **( Fentress, 1977; Shaffer, 1982a).**

## Evidences for presence of Trade in Indus Settlements

The third millennium B.C. marked a period of distinctive economic and political developments in a region that can be referred to as "Middle Asia." This area encompasses the lands between the Indus River and the Mediterranean, bordered to the north by Bactria and Central Asia and to the south by the Arabian Gulf. Maritime trade in the Gulf during the third millennium eventually connected ancient India with Mesopotamia and had broader, yet still largely uncharted, dimensions.

IN 1952, carl O. Sauer suggested that the route following the east coast of Africa to Arabia and on the southern coast of Asia "may be a great lost corridor of mankind" . He was looking at the early dispersal of domesticated plants that were moved out of Africa into the economies of Arabia and South Asia at the same time **( Carl O. Sauer, 1952).**

Many of the goods exchanged within the Middle Asian Interaction Sphere seem to be luxury items, meant to fulfill the desires of elites and the requirements of the Mesopotamian religious system. The trade directly evidenced in the archaeological record includes semi-precious stones, metals, seals, jewellery, various forms of artwork, exotic animals, food products, textiles, common construction and manufacturing materials, as well as items from the material culture of everyday use.

"The long distance Trade in luxury products" that V.G. Childe used as one of his markers of Bronze Age urbanization. It is the trade for aggrandizement, of elites and their cult system, not the common people may have acquired the products in their raw form and played the central role in manufacturing and transport, but they were not the consumers of these wares **( V.G. Childe).**

During the Early Dynastic Period, a region called Meluhha is first mentioned in the Mesopotamian historical accounts . Another early mention comes from Sargon of Akkad (2334-2279 B.C.), who described ships moored at the docks of his capital, Akkad. Dilmun, Magan, and Meluhha were significant locations during the third and early second millennia B.C. , Dilmun was an island in the Arabian Gulf that could be reached in 30 beru, or double hours, a reasonable estimate for the sailing time from the northern tip of the Gulf to Bahrain. The presence of merchants and a commercial centre has also noticed. Magan is believed to be located east of Dilmun, with Oman and south-eastern Iran being the most likely candidates for its location. Shereen Ratnagar notes seven ancient textual references to the boats of Magan. She also lists, with ancient textual citations , fifteen products associated with Magan **(Posshel, G.L ,The Indus Valle Civilization – A Contemporary Perspective,2002. P.p 220).**

Magan seems to have been both a source of goods, particularly copper, and a trading hub. It served as a point through which products from Meluhha were passed on to Dilmun and Mesopotamia. Gold, carnelian, and ivory are the most notable items that indicate this trade network.

The written records in Mesopotamia are complemented by a collection of material artefacts, which are significant in understanding the interactions between the Indus Valley and Mesopotamia, as well as in identifying Meluhha.

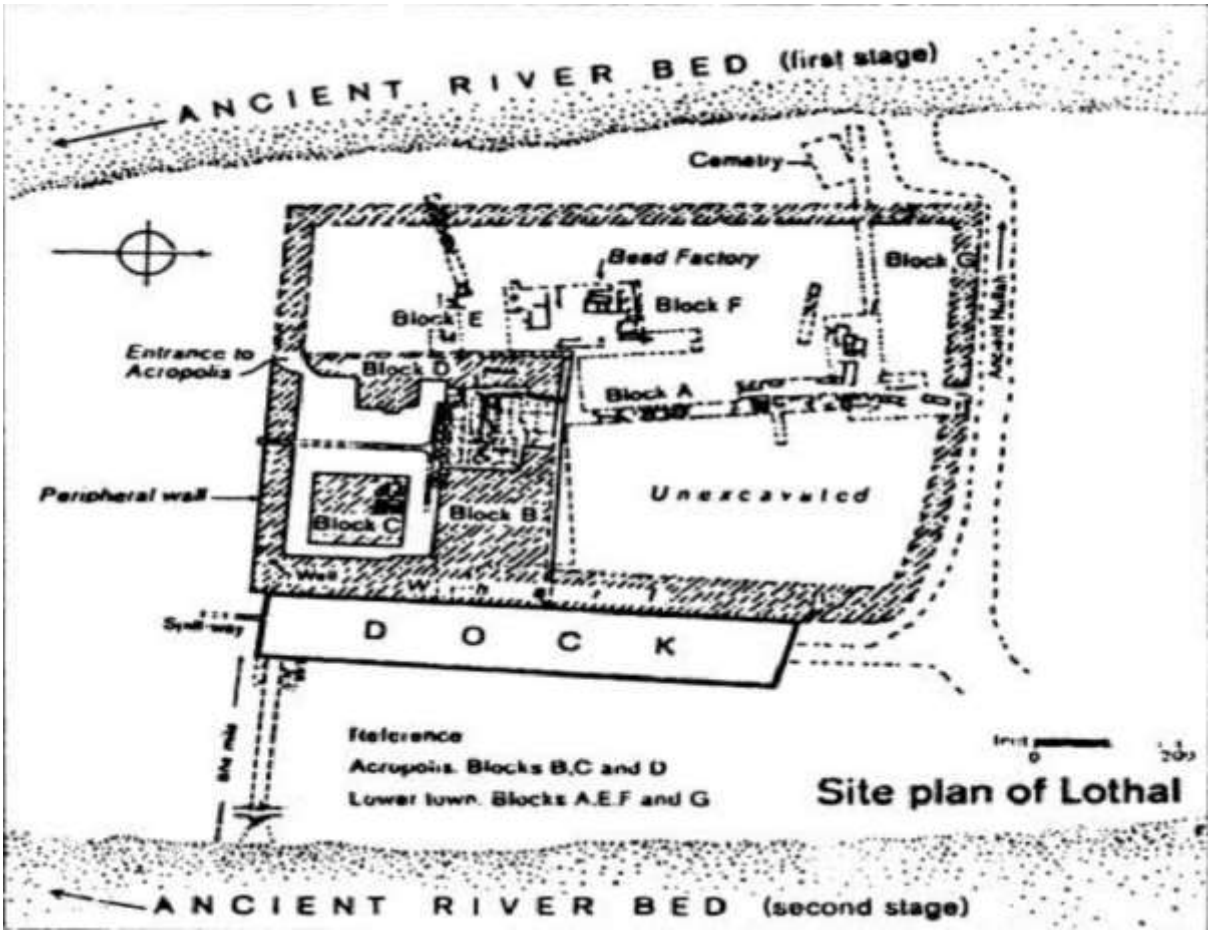


***Figure 5. Plan of Harappan Trading Centre At Lothal ( Bridget and Raymond Allchin, 1997; Origins of a civilization, p.p. 167)***

Evidences of long distance trade with external settlements have been discovered, but these evidence are extracted from mega trading centres of Harappa . There are many cities which have separate trading centres from where tools, pottery, ornaments have discovered which has some foreign influence and proves that there must be a presence of long distance trade. One the major cities where mega trading centres are situated, is Lothal. Here, a small rectangular settlement, encircled by a strong mud-brick wall, was located near a branch of the Sabarmati river (Fig. 5). It is unclear whether certain parts of the site were elevated on a brick platform, and if so, to what extent. However, in the south-east corner, a large expanse of brickwork was discovered, which the excavator referred to as an 'Acropolis'. In this section, a cluster of twelve brick platforms has been reasonably interpreted as a storage facility, as numerous clay sealing were found there, some bearing impressions of the cords and materials used to wrap bundles on their undersides. Along the eastern edge of the site ran a brick platform, identified as a wharf, and next to it was an extraordinary burnt-brick basin measuring approximately 219 x 13 meters, which the excavator described as a dockyard. A innovative structure at the site uncovered an entire bead workshop, with abundant raw materials and discarded waste, allowing for the identification of its purpose and the deduction of its manufacturing techniques.

### Indus – Mesopotamian relations

The written accounts In Mesopotamia complemented by a collection of material culture that plays a crucial role in interpreting the relationship between the Indus Valley and Mesopotamia. The objects that verify the connection between Indus and Mesopotamia are seals, beads, figurines, Dice, ceramics, metal artefacts. Seals are the most important evidence for understanding Indus – Mesopotamian relations, there is a seal from Tell Brak that bears a design similar to the swastika, with notable parallels found at Harappa and Lothal.

Parpola has examined the writing on these seals and the others from the gulf and Altyn Depe. He found a mix of writing systems. Some of them are clearly pure Indus script, as in two from kish, and the one from Nippur **( The Indus Valle Civilization – A Contemporary Perspective, Gregory L. Possehl, 2002, p.p 222).**

Beads are the second most prominent material that can be considered as defining the Indus – Mesopotamian relations. Etched carnelian Beads , have been analysed in the context of Indus-Mesopotamian connections. Etched beads in India and the Near East have a long history, originating with the Indus Civilization. Although the technique may have been lost during the Indus transformation, it is well documented by the mid-first millennium B.C., especially at Taxila.

Geogre Dales gas brought attention to four male terracotta figurines, three from Nippur and one from Chanhudaro. They were puppets, with arms separately attached at the shoulders , which are well out of proportion to the rest of the body. They are also all fat nudes with prominent buttocks and traces of penises still visible. They may have prominent holes at he naval and between the buttocks, and there is sometimes evidence for a tail **( George Dales, The Indus Valle Civilization – A Contemporary Perspective, Gregory L. Possehl, 2002, p.p 119,224 ).**
Indus ceramics were distributed throughout the Middle Asian Interaction sphere. "Feeding cups" and knobbed pottery have been found in Mesopotamia, albeit in very limited quantities. However, significant amounts of Indus "common wares" have been discovered at many, if not most, of the third millennium sites in the Gulf region. Additionally, Sorath Harappan pottery from Gujarat is found in substantial quantities at the third millennium site of Saar on the Island of Bahrain (Dilmun), along with other Indus ceramics.

## Western influence on Indus settlement patterns

A few types of Western metal artifacts have been discovered in Indus Valley sites. For instance, a copper toilet set consisting of an ear scoop, piercer, and tweezers was found in the later layers at Harappa. This set closely resembles examples from Ur and Kish, where eleven or twelve similar sets have been documented. These implements appear to belong to the Early Dynastic III period and are commonly associated with Mesopotamia. Additionally, animal-headed pins with Western counterparts have been unearthed at both Harappa and Mohenjo-daro. The stone bust of a male found at the Dabar Kot site has been likened to a head discovered at Khafaje. Additional parallels have been noted at Tell Asmar, Lagash, and Al'Ubaid. Recently, four more sculptures have been identified that appear to align with the Dabar Kot example. Two terra-cotta figurines from Mehrgarh are particularly notable for their bald heads and the distinctive slit-like treatment of the eyebrows. These pieces, dating from Period VII (around 2800-2500 BCE), possess a unique quality that may evoke comparisons with Near Eastern artefacts. Lastly, a terra-cotta head from Lothal, featuring a square-cut beard, has been suggested to represent a Mesopotamian figure.

## Agricultural Settlement

It was the agrarian background in which Indus cities emerged as an urban Civilisation. V. G. Childe coined the term "Urban Revolution" to emphasize its importance and formulated a theoretical scheme to account for its occurrence **(Childe 1944).** In 1950, he delineated the basic features of the civilization accompanying the first urban growth on the basis of archaeological data. An alternative approach to urban studies in archaeology soon became evidence in the writings of the Chicago School of Oriental Archaeologists. Braidwood characterized civilization in eight ways which did not differ significantly from the indices offered by Childe: (i) fully efficient food production; (ii) cities, Urbanization; (iii) formal political state; (iv) formal political laws—a new sense of moral order; (v) formal projects and works; (vi) classes and hierarchies; (vii) Writing; and, (viii) monumentality in art **(Braidwood 1952: 41)**. Whether or nor writing was an index of civilization and cities came to be hotly debated in the context of the "pre-pottery A" stage of Jericho in the eighth millennium BC **(Kenyon 1959; Wheeler 1956).**
Mumford points out that though objects to the word because he believes that by its use "an impression of violent, and especially of purposeful change in make which the facts do not suggest" **(Mumford 1961: 51).** Childe himself admits that 'the process is so finely divided in the successive building levels that it seems arbitrary to fix the exact critical point at which quantity passed over into quality, when the Revolution was accomplished' **(Childe 2009: 89).** While analysing the Ancient Egyptian centres Wilson has even gone to the extent of arguing that 'one may accept a truth in Childe's "Urban Revolution" provided that it is understood that it was not 'urban' and was not a revolution (Wilson 2013: 34). However, As Adams pointed out, the term has its advantages: "[a]mong its important advantages are that it places stress on the transformative character of the change, that it suggests at least relatively rapidity, and that it specifies a restricted, urban locus within which the process was concentrated" **(McCAdams 1973: 9).** This enumeration gave us a "mixed bag of characteristics" **(McCAdams 1973: 10).**
Mumford suggested that "the key-agent in the foundation of the early city is the King and that one of the attributes of that he founded cities, is in fact an all but universal attribute of kings" **(Mumford 1960: 233).** Jacobsen commented that The king as a city-builder appeared later in Egyptian literary rtcords (Jacobsen 1960: 88). City-builders later appeared in Egyptian records. The king-agriculture relationship is not only an important category of understanding for Egyptian Civilization but also for all other civilizations. Hence, the agrarian potentials of the civilization is dependent upon the king and vice versa. In case of Harappa, it is not sure, however, some kind of political elite having a closer tie with agrarian villages cannot be negated.
Nissen draws attention to the concept of the centre and surroundings **(Nissen 1988: 10).** A concise discussion on the significance of the systems theory in this context is offered by Renfrew in Approaches to Social Archaeology and Renfrew and Bahn in Archaeology, Theories, Methods and Practice **(Renfrew 1984: 248ff; Renfrew and Bahn 2008).** Renfrew, for instance, tries to account for the birth of the Early Bronze Age Cycladic civilization by underlining the possible multiplier effect caused by vine cultivation which was linked to the manufacture of drinking vessels and, at a remove, religion: or by the production of, and trade in degrees

which was related to the development of better boats, the longships. Erdosy in his discussion on The Emergence of Civilization in the Gangetic Valley, apparently accepts the logic of systematic thinking; however, he does not attempt at any point to build up or outline the "system trajectory" in the context of the Gangetic Valley **(Erdosy 1988: 87ff)**. The appearance of writing was not a sudden or arbitrary event but that does not make the appearance of literati as a class less significant **(Schmandt-Besserat 1994).** All these writings accept that the basic element in urbanization is agriculture, while enumerating the other focals of their arguments. The Indus urbanization was definitely a product of agriculture and other related developments like trade, state, literati, religion, domestication, etc.

### Gender In Harappan settlement patterns

The people of the Indus Age were part of a socially complex and specialized system. Their roles within this sociocultural framework varied, with gender playing a significant role. Although detailed information on this aspect of the Indus Age is limited, some observations can be made. Key data come from figurines and Cemetery R-37 at Harappa. The extensive collection of figurines from Mehrgarh provides additional historical context and extends our understanding from the Indus Civilization to the Indus Age. As the gender of many figurines from Mehrgarh is often clear, it serves as an excellent starting point for this investigation.

Indus figurines exhibit a much greater variety compared to those from Mehrgarh. This observation is confirmed by examining site reports from Mohenjo-Daro and Harappa. However, this diversity has its origins in the Transitional Stage and even earlier. The gender of human figurines from Indus sites is not always immediately clear. A prominent beard typically indicates males, and beards are also often depicted in steatite and limestone sculptures from Mohenjo-Daro. Male genitalia are commonly included in these figurines. Some male figures appear nude but are adorned with hats and jewellery. Female figurines are usually distinguished by prominent breasts, though males can also be depicted with breasts. It seems that the figurine creators at Mohenjo-Daro occasionally portrayed breasts in ways that make it challenging for modern viewers to determine the intended gender. For instance, the breasts on the bronze dancing girl from the HR Area at Mohenjo-Daro are not very pronounced, but the figurine is clearly female.

The ambiguity in gender markers on Indus figurines suggests that some may represent beings who are both male and female, or androgynous. Alternatively, they might depict individuals who chose to present themselves as the opposite sex. Figurines displaying a combination of sexual markers might not accurately reflect the everyday realities of Indus society, though cross-dressing is a recognized feature in many cultures worldwide. Sexual ambiguity is also a significant aspect of Hinduism, exemplified by deities like Ardhanarisvara, who is depicted as half-male and half-female. While female breasts are a prominent feature among Indus figurines, the depiction of the female pubic region is rare. The only figurine with a clear representation of this gender marker is the notable copper-bronze dancing girl. In contrast, male genitalia are commonly shown, which may have been perceived as a mature and dignified aspect of male representation, similar to the red jasper torso from Harappa. Figurines of women carrying children are found at Mohenjo-Daro and Harappa.

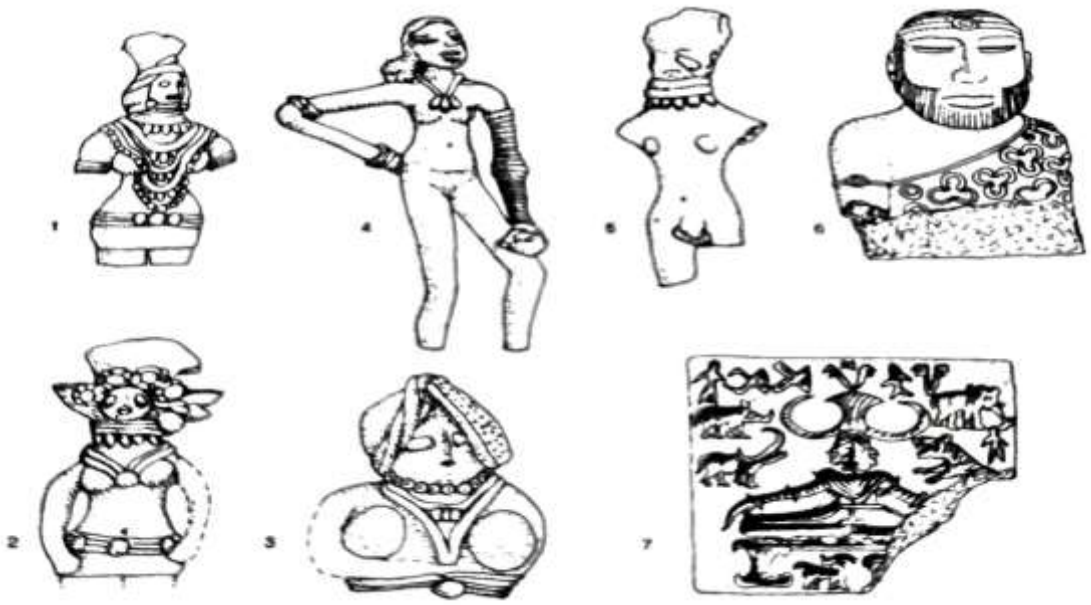

***Figure 6. Omament styles of the Harappan Phase. 1. Terra-cotta female figurine (Marshall, 1931. XCIV, 14). 2. Terra-cotta female figurine (Vats, 1940, HP 160.3). 3. Terra-cotta female figurine (Vats, 1940, PI. LXXVII, 31). 4. Copper/bronze female figurine (Marshall, 1931, XCIV, 6). 5. Terra-cotta male figurine (Dales and Kenoyer. 1990a). 6. White steatite male figurine (Marshall. 1931. Pp. 356-357, PI. XCVIII). 7. Fired steatite intaglio seal (Mackay, 1938, PI. C).***

Mackay identified four examples from his excavations. One particularly valuable figurine, clearly marked as female, depicts a woman either kneading bread or grinding grain. This figurine comes from Mound F at Harappa, where the Granary is situated. Vats, who examined the original, believed she is kneading bread. This provides strong evidence of women's involvement in food preparation. Although it is unclear if men also performed this task, it confirms that women did. Notably, the figurine is elaborately dressed, complete with a hair fan, panniers, and a head cone. The cemeteries at Lothal and Harappa provide insights into gender. For example, the series of double burials at Lothal has prompted some debate regarding the sex of the skeletons involved. Sarkar claims that one of these burials contains two males and that the others consist of one male and another individual of uncertain sex, or possibly another male. In contrast, Kennedy's examination of these skeletal remains indicates that, in two cases, the double burials each contained one male and one female, while the third burial contained two males. Despite the differing interpretations, it appears that at least one of these joint burials included two males, and it is prudent to rely on Kennedy's thorough analysis.

## Conclusion

The transition of Early Harappan Settlements into Mature Harappan settlements seems to be very sudden in nature. This transitional stage is defined by various historians, according to the radiocarbon dating of evidences, it suggests that the transitional stage is between 2600 – 2500 B.C . Shaffer and Lichtenstein's noticed the presence of ethnic diversity in the early Indus settlements. Indus civilization was marked by a fusion of ethnic groups which happened very rapidly. It is suggested that within 100 years the Harappa became the largest ethnic group within the Indus Settlement Pattern. This fusion of urban ethnic groups was a cultural system promoting rapid territorial expansion. Various scholars have pointed out that there was a short period of change that separates Early Harappan settlements with Mature Harappan settlements. It is suggested that the inhabitants of Mohenjo -Daro dedicated significant time and expertise to crafting small, finely-made stoneware bangles. These bangles were engraved with symbols in the Indus script. The layers of clay used to create the containers in which the bangles were fired were also marked with Indus symbols and sealed with an impression on the outside. In early civilizations, where literacy was often restricted to a select few, writing served as a tool for exercising spiritual or political power. The use of Indus symbols in this context suggests either official oversight of the production of these bangles, an effort to imbue them with spiritual protection during the firing process, or perhaps both. A. Ghosh points out in a discussion on the evolution of settlement patterns in the Indus Valley that "all these transformations, as extensive as they may be, could occur within a single generation." S.P. Gupta cites Mortimer Wheeler's observation: "The urban expansion of the Indus settlement pattern happened so abruptly and rapidly that it could spread across a vast area in the span of one generation." In another discussion, J.F. Jarrige remarked that "the continuity between the end of Period I and the onset of Period II is so pronounced that it leaves little room for any significant time gap between them." Jansen's colleague, M. Cucarzi, observes:

"Jansen's argument is that Mohenjodaro marks the point at which the urban phase of the Indus civilization emerges dramatically, and to construct Mohenjodaro, they built massive mud platforms". This suggests that the transitional stage is very rapid. This sudden transition resulted in rise of new technologies that are quite different from early settlement patterns. Mature settlement patterns consists of new style of pottery, including clay fabric, vessels forms, and paintings. New innovations in Town planning and emergence of writing appeared with this transition. Agriculture became more prominent during the mature settlement patterns. This agrarian phase expanded its routes and there was a rapid rise in the economic development as well as architectural development . Innovative architectural plans of Lower Towns have been observed during mature Harappan settlements. It is Observed that with the arrival of mature settlement patterns, all the Structures which were linked to Early Settlement Pattern were demolished and new structural base was created. Great Bath in Citadel and Drainage system in the Lower Town is the best known example of this transitional phase.

Development of civilization is often referred to as the "urban revolution" cities are virtually synonymous with civilization. Many researchers have highlighted the position of Harappa, situated not at the core of a settled area but on its outskirts. Consequently, Harappa functioned not only as the administrative, industrial, and religious hub for the agricultural zone to its south and the pastoral groups roaming its surrounding regions, but also as the gateway and regulatory point for various resources brought in from the territories to its north. The Indus Civilization appears to have been a unified, singular society rather than a federation of comparable communities more of an empire than a group of city states, though not all scholars concur with this perspective. At the pinnacle of Indus society was a ruler, possibly divinely endorsed, perhaps the Priest-King depicted in the renowned sculpture is considered as the ruler of Harappa. It has been plausibly suggested that the rulers of the Indus Valley civilization wielded power through religious authority. While there is limited evidence to directly test this theory, some support may be found by examining the later caste system. This distinctive method of structuring society is rooted in principles of Hinduism.

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