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**The Hakra Cultural Horizon in the Greater Indus Valley
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Chapter: 01

Introduction

The scope of this dissertation is to examine the Early Indus Civilization sites of Hakra period discovered in the Southern Punjab of Pakistan in the Greater Indus Valley (see chapter 2). According to different scholars it represents the early phase of the Indus Civilization. The principal research objective is to survey the sites and collect scientific evidences for the dating and their relationship and role with the Indus Civilization. The research objectives will regard the following main points.

1. What is the relationship between Hakra and the Indus Valley Civilization in the Punjab?
2. How do the regional variabilities relate to the Amri and Kot-Diji aspects of the Indus Civilization in Sindh?
3. Is the absolute chronology correctly defined or and does it justify the suggested sequence in a scientific way or is it suggested only on the basis of pottery comparisons?

The work is an effort to interpret the newly discovered aspect of called Hakra Culture (Mughal, 1997) and its relationship with the Indus Valley Civilization. The study will incorporate terms like culture and aspect or period for Hakra since there is no absolute terminology decided and associated with Hakra. Principal investigator Rafique Mughal has given its name Hakra and used Ware, Ware Culture, Period and Phases interchangeably (Personal Communication with Dr.Mughal, 20-2-2020). This study might follow the suite and try to reach its own approach for the convenience and clarity of research and the readers. Growth of Civilizations is characterised as a gradual development from early village farming communities to urban settlements and city states and finally to a full scale expansion with broader spectrum of all the socio-political and economic aspects. The discovery of the Hakra Culture (Mughal, 1980; 1982; 1997) diverted the research questions and revolutionised the

theoretical frameworks of Indus Civilization. The Hakra Culture is credited as one of the developmental phases of the Indus Civilization, the first urbanised people in South Asia. Since the discovery of the Indus Civilization questions of its origin and decline have been of utmost importance and greatly investigated as well. Answers to the questions have been sought mainly on the basis of comparative archaeology and hypothesized and theorized which are often debated and stand questionable. The incomplete story of Indus Civilization is totally understandable since there is no proper chronological sequence established on the basis of Radiocarbon dates and there are limitations to decipher Indus script.

The desert of Cholistan in Southern Punjab, Pakistan, is dotted with sites expanded all over and along the now dry bed of Hakra River (see chapter 2). Sites are majorly belonging to mature period of Indus civilization which is understood by the cities of Harappa in Punjab and Mohenjo-Daro in Sindh, Pakistan. Scholars believe that the Cholistan desert was home to early people who later inhabited the area and settled permanently and laid foundation for Indus Civilization Personal Communication with Dr. Mughal 20-2-2020). The Hakra culture might represent one of the epicentres of those early village communities which later led to the development of cities of Harappa and Mohenjo-Daro. Mughal surveyed across Cholistan desert and documented hundreds of sites among which he recognised 99 with characteristic of Hakra Culture which he defined separately only the basis of peculiarities involved (Mughal,1971).

Terminology of Hakra

He defined it as a revolutionary development in the chronological sequence of the Indus Civilization and South Asia as a whole thus named it as Hakra Ware first since he only came across pottery and later while contextualizing he used many different terms (Mughal, 1971;1990; 1997). One of the main limitations is to understand the role played by the Hakra Culture in the development of the Indus Civilization that lasted several hundred years. Mughal did the survey in 1970s and after that

no substantial effort was made to study further and establish a proper scientific context as well as contextualise it properly.

Indus Civilization is also known as Harappan Civilization because it was first discovered at Harappa Punjab, Pakistan. Our knowledge of the Early Harappan/Indus is increased in recent past. During Early period of Indus Civilization geographic extent was as much as during the Mature Indus. The period witnessed rise in the fortified proto-urban cities/towns with increased inter-societal contact and trade in foreign goods (Mughal,1970). Traditional interpretation of the origin of Indus Civilization is based on diffusion model which has been discarded by the scholars (Mughal, 1970; Shaffer,1970) given the fact that study of the indigenous environmental conditions was not conducted. The theory of indigenous origin was established on the fact that indigenous environment was suitable to let the civilization flourish. Keeping into view the ecological conditions, availability and exploitation of natural resources is a major indicator which suggests that civilization is an indigenous and native development. The study of Hakra was by Mughal was done on the basis of analytical study of the regional variations in the artefacts suggesting to understand the processes involved in the cultural development and indigenous origin of the Indus Civilization.

The present study is an effort to analyze the Hakra Culture to understand it in the context of the Indus Civilization. The Hakra Culture has not been studied properly to define it in clear manner and how it is imperative to incorporate in the course of the civilization. Mainly ceramics from Hakra Period are studied by Mughal. They are of many different types reflecting gradual improvement in technological production.

Theoretical Frame Work

The research is mainly influence by the following theoretical approaches. Though there is no hard and fast rules for application of the theory but roughly estimated it falls in the ambit of the given

approaches. Keeping into view the nature of the research questions and debate taken into account the Processual and Post Processual approach of Jim J. Shaffer is more relevant than others.

Cultural Historical Theory

Cultural-historical theory developed in the early twentieth century by American anthropologist Franz Boas and Australian-born British archaeologist V. G. Childe. The fundamental principle of the cultural-historical theory is to use archaeological data to build chronologies of main manifestations and cultural changes in the past. This theory emphasizes defining historical societies into distinctive ethnic and cultural groupings according to their material culture.

New Archaeology

Binford coined the theory of Processual Archaeology also known as New Archaeology. He believed that archaeologists mostly relied upon empirical nature of the interpretation and mainly depended upon relative approaches. Relativism has its limitations and logical reasoning becomes difficult as empiricist rely upon information coming from the field data but not taking into account data itself. In archaeology there are no direct sources of information or informants hence it does not serve the purpose Binford brought forth the concept of “human perspective” (Binford, 1987:400) which was an idea of Franz Boas who suggested that in order to achieve maximum information of behaviours and relationship they must be viewed inside out. Binford advocated a change in paradigm challenging the old beliefs that archaeological data does not provide enough information to the researchers and record had never been studied with through scientific methods. He criticized the idea of not questioning archaeological methods of explorations and interpretations. His best advocated approach was middle range theory to study and observe archaeological data. It is use of proper tools to seek accurate information by adopting “accurate means of identification and good instruments of measuring specified properties of the past culture systems” (Binford, 1983:49). The New Archaeology in fact promoted the idea of looking deep into the material cultures to derive information about

the past not past itself which in return triggered the idea of accepting new interpretative methods and approaches.

Processual and Post Processual Theory

Processual theory developed in 1958 with the work of Gordon Willey and Philip Phillips. According to the theory, it is possible to estimate from archaeological record that how the people have used the artefacts and interpretation they make about past societies is therefore objective whereas Post Processual theory claims that all archaeological data is contaminated by human interpretations and social factors and any interpretation they make about past societies is therefore subjective. Marxist archaeology, instead interpret archaeological evidence within a framework for how its exponents believe society operates and evolves.

As far as the present research is concerned, the research is very limited and based on surface collection, trial trenching and resurvey so that's why culture-historical theory is preferable. In case of stratified data, investigation with implementation of a combination of theories may be use. Culture-historical theory has certain cultural models, with the help of which archaeological data is interpreted. These are Inevitable Variation, Cultural Selection, Invention, Diffusion and Migration (Trigger 1968).

The Hakra Culture sites are the oldest so far known in the study region and most of the Great Indus Valley in general. According to the radiocarbon dates obtained from the lowermost occupation layers that yielded fragments of this kind of pottery at Harappa, it should be attributed to the Chalcolithic fourth millennium BC (Mughal: 1997). At present the radiocarbon chronology of the sites of this aspect is very poor the Hakra horizon have never not been properly studied and defined. The main difficulty derives from the interpretations of the materials recovered from the Early Harappan sites and their badly defined chronology.

Current research is focused on the origin of the Indus Civilization and the aspects that characterise it in Punjab and Sindh. The question regards the definition of the Hakra aspect, its absolute chronology, its geographic extension, any eventual regional variability and the relationships with the Amri and Kot-Diji aspects of Sindh. Why the study of this period is important for a better interpretation of the origin of the Indus Civilization? Focusing the research on a specific area, reassessing the published data, surveying the territory along both banks of the Hakra River bed, bringing new data obtained from new explorations in a chosen area, AMS radiocarbon dating of the sites and studying the pottery assemblages from a scientific point of view, lastly, integrating comparative studies and proposing an updated definition of the Hakra aspect is the main scope of my research project. In this respect I have to point out the scarcity of the radiocarbon dates so far available from Upper Sindh and Punjab, Cholistan in particular. It will be of key importance to produce a reliable radiocarbon sequence of the Hakra aspect, and possibly also Amri, in order to achieve a good knowledge of the chronology of the site and build up a time-scale for the Chalcolithic period of the Indus Valley. One of the key points of my project is to produce such a radiocarbon time-scale through identified charcoal samples collected from small trenches, opened in a number of sites just for this purpose. Opening small trenches just 1 sqm each just for that purpose is absolutely necessary to understand the relevance of the site if they are multi stratified, compare the finds with those from other sites and their absolute chronology once the results have been obtained. Given the long experience dating samples from Pakistani sites I believe that Groningen GrM-Laboratory would be ideal to obtain dates.

Methodology

Historical exploratory methods and background research to refine research questions has been utilised. Extensive field surveys were conducted in order to trace the foot prints of Mughal left while surveying the Cholistan Desert. The area near Drawer Fort was surveyed along with Mature

Harappan sites named Sonakhaywala and others unnamed yet. The five new sites were selected for exploration which are bearing evidences from Hakra Period and lying on the bed of now Hakra River but in central Punjab. It was decided to visit the sites and record exact GPS location and conduct trial trenches in order to see sections and take charcoal samples for Radiocarbon dating. The coordinates of the new sites are taken and maps are made with the help of Google maps and already published data. The major site which have yielded enough information is Hassokay which was measured and coordinated accurately. The section was cut to take out samples. A catchment analysis was done and surrounding landscape was studied in order to figure out the settlement pattern and nature of the site. The antiquity collected from the sites is studied on the basis of diagnostic methods. Ceramics have been drawn on archaeological methods and diagnostic methods have been used to contextualise them. All of the sites were in bad state and under the wrath of encroachment and illegal diggings. The topographic features of the sites were documented by taking photographs of the sites. The antiquity already obtained by the Directorate of Archaeology was studied to do comparative analysis and cataloging. Charcoal samples were collected from the sites and sent to laboratory for Radiocarbon dating. This is a major development after 40 years of the research originally conducted by Mughal. All the previous research is based on the comparative analysis. Present research is an effort to apply scientific methods to be accurate and define the chronological sequence with clarity. It is an effort to define the badly defined phase in correct manner.

Literature Review

A plethora of literary work has been written on the Kot-Diji, mature and Late Indus Civilization periods. Most of the books on the Indus Civilization in general deal with aspects of urbanization, art and architecture, sewerage system, trade, climate, religion , etc., and have consequently dealt with the phases about which we know the most and from which the largest examples come down to us.

A. Stein and ... Gosh's contribution to the Hakra phase in particular and the development of the Indus Civilization in the Greater Indus Valley has set foundation and opened avenue to trace the different steps through which the Indus Civilization originated. Though the very first step was taken by Italian Indologist Dr. L.P. Tissotiri who made explorations during 1916-1918 in Bikaner, northern Rajasthan but his work was never published. Then it was the work of Sir Aurel Stein entitled "Archaeological Tour along the Ghaggar-Hakra River (1943)" a summary of his explorations and limited excavations in Cholistan at three sites named Sandhawala Ther, Kalepar and Ahmadwala Ther and he did a comparative analysis. Henry Field took over the work of Sir Aurel Stein, micro-filmed his unpublished data and later, revisiting the findings of both led Dr. Mughal to identify several sites which were compared by Stein with the site of Kelaper, thus he identified it the old name of "Bhoot" and Early Harappan site discovered by Field.

However, it is only thanks to the extensive work by Dr. M. R. Mughal who conducted explorations in the Greater Indus Valley and Cholistan in particular, that 300 sites were discovered in the study region., data from India-Pakistan can be compared and the Hakra aspect horizon was defined as well as its suggested chronological attribution and boundaries and authored a very important volume entitled "Ancient Cholistan: Archaeology and Architecture". Outlining the geographical context to collecting material evidences and comparative analysis of previous research work, he has given a justified input to the oblivious part of the Indus Civilization.

He has tried to provide a clear picture of the relative chronological sequence and addition to nomenclature of the different phases into which the Indus Civilization is subdivided. As he did earlier to redefine the terminologies of the early phases of Indus Civilization like "Kot Diji" culture or "Pre-Indus" culture and termed them as early Harappan Cultures and their suggested continuity. Same is the case of the Hakra Valley along which he discovered an earlier aspect along the dried bed of the Hakra River that he called "Hakra Ware" aspect belonging to communities who lived be-

fore Kot-Diji, and introduced Pre-Early Indus Culture similar to that found in Mehrgarh I-II, Gomal Valley, Bannu Plains and Harappa (Mughal, 1971;1997;2012). He greatly contributed to establish a sequence for the Chalcolithic and Bronze Age aspects that developed and flourished in the Hakra region. He emphasizes his notion of Hakra Phase in contrast with that of Ravi Phase implied by Kenoyer (2011) after excavation at Harappa Period I-A and I-B preceding Kot-Diji Period Kenoyer termed it “Regionalization Era” though the term was originally coined and is associated with Shaffer. Mughal opined that the Ravi Phase does not represent a separate entity but a through representation of the Hakra Period at Harappa site which was discovered at Jalilpur (Mughal, 2012).

In 1938-1939 Sir Aurel Stein published the survey conducted on the either side of the River Hakra, and particulars regarding tributaries of the Ghaggar and its territory once irrigated by the river. He has discussed the traditional legends and beliefs of the people in context with “Rigveda” mentioning few famous hymns from the Vedic texts. Referring to a large part of Vedic text which mentions Sarasvati (Ghaggar) “the foremost of the rivers” he induced Professor R. Von Roth to recognize the Sindhu or Indus as the great river.

Mark Kenoyer (2011) has tried to establish chronology of the Greater Indus Valley. He called the earliest horizons discovered at Harappa Ravi Phase, and linked them with the Kot Diji phase suggesting his theory of ‘Regionalization Era’ which led to the emergence of urbanism (Kenoyer, 2011). To sum up, by taking into account regional cultures ca 5500-2600 BC he suggested earlier models to be reviewed and interpreted thanks to new researches and excavations (Kenoyer, 2011).

Mughal, (1990) in his work ‘Cities on the Indus, Early Civilization in Pakistan from the 8th to the second Millennium BC’ and subtitle “The Rise of Indus Civilization” strolled through the older concepts of the emergence of the Indus Civilization and threw light on the theory of colonization of Indus the from Mesopotamia, in contrast with the indigenous growth and development of the Indus Civilization. Further, by reviewing cultural, economic and political processes he concluded that the

process of cultural development and change was continuous from fourth to third millennium BC and the genesis of South Asia's first civilization took place on the Indus soil independent of the other civilizations (Mughal, 1990).

M.S. Wheeler (1968) "The Indus Civilization: Supplementary volume to the Cambridge History of India (3rd Edition)". His book was based on new sites and researches providing a clearer picture of the Indus Civilization. On the basis of the distribution of the sites to the early Indus Civilization he discussed in detail the four sites from which data regarding the origin of the Indus Civilization are available, namely Amri, Harappa, Kot Diji and Kalibangan in India respectively. After studying the stratigraphic patterns of the four occupational periods of Amri he found Indus material intrusive at Amri. Revisiting the theory of a diffusion of the Indus Civilization from Mesopotamia he speculated mere influences of the primary struggles of the Proto-Sumerians might lend any ideas or a pattern to the hands of the evolving Harappans to help excel in urbanization process. He suggested that the Indus communities were first driven towards civilization by the very civilization that had flourished or developed along the Euphrates and the Tigris.

Mughal (1974) in his article "New Evidence of Early Harappan Culture from Jalilpur Pakistan" reviewing the excavations carried out at the most important metropolises like Harappa, Mohenjodaro, Kalibangan, Lothal etc. tried to address the hypothesis of a manifestation of Indus as a foreign cultural influence and the presence of the early Indus culture at Jalilpur, located in the centre of the Indus Valley in Multan, Punjab. Mughal believes the ecology of the Indus River would favour the exploitation of the resources locally for subsistence and the development of an established culture. The material culture remains retrieved from Kot Diji (Khan, 1965), Amri (Majumdar, 1929), Kalibangan, Siswal, Mitathal, SaraiKhola, Gumla, Surkotada and Jalilpur (Mughal, 1974) provided enough information and stratigraphic sequence about preceding cultures in Indus Civilization. On some sites a temporary break was noticed between early and mature Harappan sites and

could not be explained. Jalilpur site in Central Punjab was excavated to find the answer to this very question. Mughal excavated the site in 1970-72 and attributed the discovery of Hakra cultural horizon here first and later in Cholistan Bahawalpur.

Petrie et al. (2017) in “Adaptations to variable environments, Resilience to Climate Change: Investigating land, water and settlement in Indus Northwest India” discussed in detail the environmental conditions that developed during ancient civilization in context to the human adaptation and resilience to environmental pressures. Considering Ghaggar-Hakra River and important Indus period waterway the authors on the basis of the surveys in various locations of the Ghaggar-Hakra old bed suggest that the palaeochannel of the Ghaggar-Hakra was not carrying water perennially, instead it was the monsoon flow and settlement sites of Kalibangan, Banawali and Bhirana were mainly exploiting the reliable annual monsoon. The ancient bed of the Ghaggar-Hakra remained important during the early Indus period for different reasons apart from often typically claimed for irrigation purposes solely. The people were dependent upon fishing and river played major role in subsistence pattern of the region (Petrie et al., 2017).

Kenoyer and Meadow (2000), with regard to history of research in early periods of Indus Civilization and Kot-Diji Period have discussed a new aspect which they came across and documented Harappa, termed Ravi Phase, and correlated it to the preceding cultural stage of Kot-Diji Period (Kenoyer and Meadow, 2000) which was previously described as Hakra by Mughal (Mughal, 1970). Though this discourse has triggered a heating debate among scholars.

Dani (1964) has conducted excavations at the site of Gumla in Gomal Valley. As a result of excavation, six phases are revealed, first is Killi Gul Muhammad Phase, second is Kechi Beg Phase, third is Early Kot Diji Phase, fourth is Late Kot Diji Period fifth is destructed graves and sixth is Gandhara Grave Culture Phase. The pottery of Gumla has been classified on the bases of periods and form, shape, function and decoration. A type-variety concept has been applied. The third and the

fourth period represents Kot-Diji phase and had produced a bulk of versatile pottery with regional variations (Dani 1964).

F. A. Khan (1965) had studied Kot-Diji pottery in detail and classified on the basis of the neck and rim forms of jars and bowls. These show development from simple to developed forms, from almost neckless and rimless shapes to further improved with prominent neck and rims (Khan, 1965).

Rafique Mughal classified whole pottery collection of Sarai Khola from the early levels belonging to Periods I and II could be grouped into 17 main types and 11 sub-types on the basis of a set of attributes distinctive of each group i.e. vessel form or shape, manufacturing technique, fabric and surface treatment or decoration (Mughal, 1972).

Connigham and Ruth in “The Archaeology of South Asia from the Indus to Asoka, c.6500BCE-200CE” is a commentary on the archaeology of South Asia with a focus on subcontinent ranging from Neolithic Period to Buddhist Period. The book throws light on the trajectory of the development of Indus Civilization. The synthetic discourse describes the sequence of early village farming community of Mehrgarh its different transitional stages and ultimate culmination into urbanized cultures with a detailed account about Hakra Culture in the region of Cholistan (Connigham and Young, 2015).

The site of Rehman Dheri in Dear Ismael Khan, KhyberPakhtunkhawa, has brought to light an imperative cultural sequence. The sites yielded results from Kot-Diji Period and the sequence survived independently. The site was not occupied after Kot-Diji Period and dates are ranging between 3300-1900B.C. the pottery from the site has been grouped into two categories I.e hand made and wheel made. Wheel made pottery is studied on the basis of types separating jars and bowls and further analysis is done keeping into view the surface treatments and decorations (Durrani, 1988).

Shinde et al. 2011 in their excavations report “Excavations at Farmana, District Rohtak, 2006-2008” has discussed the contemporary Hakra Period site on the other side of the border and brought to light its details and continuity. The sites belonging to Hakra Culture in India have been documented well and excavated scientifically. The evidences reaffirm Mughal’s notion and a large number of village settlement sites present a coherent picture of the continuous development of Hakra Culture (Shinde *et al.*, 2011).

Acharya (2008) in his article “Kunal Excavations; New Light on the origin of-of the Harappan Civilization” has given details about the Hakra Period site and the culture material provides sufficient insights to contextualise the knowledge. The systematic work on the site sheds light about the dwelling pattern and lifestyle adopted by the people from early Indus Civilisation i.e. the Hakra Culture (Acharya, 2008).

Rao *et al.* (2005-06) in “New Light on the Excavation of the Harappan Settlement at Bhirrana” has discussed the results of excavations and unfolded details of the Hakra Period settlement sites. Bhirrana site records a continuous sequence of the early to mature period in Indus/Harappan Civilization also yielded very interesting culture material for example Hakra ware along with bi-chrome Ware (Rao et al. 2005-06).

Chapter: 02

Background of the Indus Civilization

Prior to the Greek invasion and the Mauryan rule, no mention of the history of the study region has ever been reported. The detailed excavation reports written by the principal researchers and excavators of the cities of Harappa (Plate-I,c) in the Punjab (Vats,1940;1946) and Mohenjo-Daro (Plate-I,b) in Upper Sindh (Marshall,1931;1934) describe the two perfectly planned cities characterised by impressive infrastructure, a unique writing system, exceptionally well made crafts i.e. ceramics, jewellery, tools, weights and many other objects of daily use flaunting human genius, delicacy of the art and perception of utilitarianism.

The saga of the Indus Civilization (Plate-I,a) dates back to the 4th-3rd millennium cal BC (Vats, 1940) started from the city of Harappa that is located along the old course of the Ravi River in the Punjab. The prehistoric mound was first documented by members of the Archaeological Survey of India in 1856 and excavation were carried out in 1920-21 (Cunnigham,1979). Lord Cunnigham also published a seal with an unicorn that he interpreted as non-Indian (Possehl, 1991). Soon after Harappa, the city of Mohenjo-Daro was discovered along the right bank of the Indus in Upper Sindh (Marshall, 1931; Mackay, 1935; Vats, 1940; Possehl, 1979). The similarities between the two cities led authors think that they were contemporary with the cities of Mesopotamia and Egypt. The discovery revealed that the both cities were located ca 400 miles distance from each other.

The general characteristics of the Indus Valley Civilization include the town planning of urban centres, an aspect that has been largely discussed (Jansen, 1993). The city of Mohenjo-Daro still preserves many architectural details, while Harappa was badly damaged during the construction of the Lahore to Multan railway (Mackay, 1935; Vats, 1940; Possehl, 1991). Mohenjo-Daro has a fortified citadel made of burnt bricks to control the city. A similar structure can be observed at Harappa. In the upper part of the city of Mohenjo-Daro, otherwise called the citadel, are located the so-called

great bath and the granary. Below the citadel, the city quarters are built following a geometric plan, with parallel streets that cross with right angle crossings (Wheeler, 1966). The ordinary houses consist of rooms, a courtyard, and staircases leading to a flat roof, sometimes they are double-storey houses, with a bathroom and, in some cases a well which could be counted seven hundred for the settlement are of Mohenjo-Daro (Jansen, 1993). Harappa also has similar plan with two types of buildings, private houses and public buildings. Among which are the western citadel structure, lower city with fortification wall and grand granary (Vats, 1940). Apart from Mohenjo-Daro and Harappa a third city Kalibangan (Lal, 1979) in India is suggested to have a plan similar to those of the two afore mentioned metropolises (Raikes, 1968). It is ranked among major urban settlements of Indus Civilization. The people of the Indus Civilization employed a series of still undeciphered ideograms, perhaps a kind of pictographic script, whose symbols are reported on different items, mainly seals, 3500 of which have been so far recovered (Parpola, 1988). The "script" is considered to be a combination of a logo-syllabic writing with single valued graphemes. Sir Alexander Cunningham was so carried away by the script that he suggested that the Brahmi script in India is derived from Indus Script. He was seconded by Professor Stephen Langdon (Mackay, 1935).

The ceramics of the Indus Civilization are of utmost importance since a large part of the available information is taken from them. Most of the pottery is wheel thrown, rarely with painted motifs. The decorative patterns are black-on-red with zoomorphic and flowers designs, more rarely with leaves, peacock and fish motifs (Wheeler, 1966). Terracotta figurines of both humans and animals are quite common. A general impression, that is confirmed also by the craftsmen workshops of Mohenjo-Daro is that the Indus Valley ceramics are a case of industrial mass production (Dales and Kenoyer, 1986; Dales, 1986-1990).

The Indus Civilization is famous also for its seals made of heated steatite (Vidale, 1989; Kenoyer, 2005) and the patterns carved on their working face. An oral tradition terms the Indus Civilization as 'Steatite Civilization' probably referring to the sophisticated and widely used Steatite. The com-

monest motifs represented in the centre of the seals, below a line of ideograms, are the mythic al unicorn, zebu, bull, rhinoceros, elephant, crocodile (Kenoyer, 2008-2009). Economy was based mainly on agriculture and trade, cultivated wheat and barley (Meadow,1998) domesticated humped zebu, buffalo, goat, sheep, elephant, pig, dog and cat. Copper, bronze (Chakraborti and Lahiri, 1996; Miller, 2014), gold, lead and tin were in use with inherited pyrotechnology from the prehistoric sites of Early Food Producing Era i.e. Mehrgarh (Kenoyer and Miller, 1999), bullock carts and chariots were used as a vehicle hence rejecting the idea of horse driver chariots with Indo-Aryans who came after 1000 years of Indus Civilization (Kenoyer, 2004).

Chronology of the Indus Civilization

The first to propose a chronology of the Indus Civilization was Sir John Marshall comparing his finds with those from Mesopotamia (Mackay,1935). Later, many other scholars questioned his suggested chronological sequence. In 1964-1965 G. Dales collected charcoal samples from radiocarbon dating both the cities of Harappa and Mohenjo-Daro to start establishing a n absolute chronological scheme. The mature Indus witnessed the development of large urban centres with grid-plan streets, use of "script" and maritime trade across the Oman Gulf (Marshall, 1931; Piggot, 1950; Wheeler, 1968). The overall picture of the chronology as rightly elaborated by Mughal is influenced or overly focused upon the mature phase i.e. the peak period of the civilisation which is represented in the fully urbanised form. During the last decades our knowledge regarding the early phases of the Indus Civilization is slightly improved. At present, the Chalcolithic and Bronze Age of the Indus Valley are subdivided into three main periods: 1) Pre-Early-Harappan, 2) Early Harappan and 3) Mature Harappan (Mughal,1970;1973). Though till recent past most of the chronological sequence of Indus Valley Civilization was described in linear trajectory, a tripartite division in typical manner yet a new approach was developed by Shaffer in 1992 which helped to entail the complexity and chronology of the Indus Valley Civilization in one framework.

Conflicts and voids in the chronological sequence of the Indus Valley Civilisation have been debated for long and are still under consideration. The question related to inception which remained unanswered for long is contributing factor of confusion and frustration among scholars and researchers. Thanks to the updated knowledge came up in the recent past regarding the sites from a-ceramic and Neolithic Period i.e. Killi Gul Muhammad and Mehrgarh to Late Harappan sites has helped to design a sequence of the chronological sequence which is continued by explorations in the Greater Indus Valley (Mughal,1974;Rao, Shinde, Bhan1974).

In order to find more evidences, research continued and Sir John Marshall deputed his officer to explore the Lower Sindh (Majumdar,1929) where the site of Amri was discovered with a ceramic assemblage absolutely different from that of the Indus Civilization. Mr. Hargreaves visited the site of Nal in Balochistan where a material culture assemblage similar to Amri was reported though relationship with the Indus Culture was awaiting more evidences (Mackay,1935).The aforementioned research is being undertaken by scholars in order to improve our knowledge about the relationships between the Indus Civilization and Balochistan (Franke,2008; 2016).

Old World and Diffusionist Model in the Indus Civilization

In Childe's Old World (Childe, 1950) the process of domestication of plants and animals led to a "revolution" in human history due to the first ever food production. With the Natufians setting the scene of village farming in the Neareast typically it is believed that the agricultural techniques diffused by different regions, so was the case in South Asia. Taking the Near East as a centre of domestication the research in the borderlands started. The village farming communities in Western South Asia from Killi Gul Muhammad Kachi Plain in Pakistan discoveries of sites of Ghar-i-Mar and Aq Kupruk II in Afghanistan (Childe, 1950) brought to light new aspects of domestication which may have started around along the Bolan River (Possehl,1990). Following such a slow process human life changed from a mobile hunting and gathering subsistence economy to a village

farming economy which triggered the increase in population. Later, with the growth of complex Bronze Age communities life changed again and led to different forms of so-called civilization. The sophistication of the urbanized society like Indus Civilization and mastery achieved in agriculture and technology speaks about a continuous and inherent link which was contextualised by the pioneer researchers Piggot, Wheeler (1947), Jarrige (1985), Biagi(2011), Possehl (2002) etc. the Indus Civilization was reiterated as a civilization of the Old World on the basis of theories and models devised by principal investigators who predicted closer contact as a reason for the emergence of the Indus Civilization (Piggot,1950; Dani,1968;Wheeler,1968). Childe forecasted a direct diffusion of Indus Civilization from Mesopotamia and regarded emergence of 'civilization' within Indus (Childe,1942). Later, he revisited his theory and brought forth a different point of view soon after the discovery of the Kot-Diji and Amri; which actually raised pertinent doubts regarding the external factors as source of urbanization. He further emphasized upon the Mediterranean immigrants who brought the concept of Civilization and also equated the Dravidian people in South India with Proto-Australoid. He also equated priest-king with the city-gods and Egyptian Pharaohs who enjoyed control over wealth from agricultural resources and described it as economic exploitation (Childe, 1954) following Piggot (1950) and Wheeler (1953).

The Indus Civilization: Interpretative Models

Human history from its remote past is always analysed through the study of archaeological evidences supported by multidisciplinary approaches. The data are considered, thanks to comparative and absolute dating methods like radiocarbon dating that are applied to achieve a reliable chronological sequence. Along with that, the major portion of antiquity is interpreted by the archaeologists and scholars to derive new knowledge from existing context. As commonly believed there is always gap in the research and it is true to archaeology more than any other discipline. In archaeological

research mostly fragmentary pieces of antiquity are main source of the information. Theories and hypotheses are always open until they are proved scientifically and accepted widely.

In case of archaeology, scholars are always very careful and open to change their interpretations on the basis of data coming out of new excavations and researches. A great problem in the field of archaeology is that in some cases new results and interpretations are not widely disseminated. That is why old theories continue to circulate in some environments. For example till the recent past origin and decline of the Indus Civilization was considered to be enigmatic, mythical and somewhat beyond human imagination due to the lack of research and dissemination of new knowledge. Despite many new researches and results, these aspects have hardly been transmitted to the classroom knowledge in the colleges and universities. New researches and scientific analyses have brushed off many old theories and concepts.

Some of the main questions regarding the archaeology of the Subcontinent are:

- 1) Who were the people of the Indus Civilization?
- 2) Where did they come from?
- 3) How did they develop to become earliest urbanised people in South Asia?
- 4) And where did they disappear?
- 5) The mute Indus Script provokes the questions of their language and belief systems.
- 6) What language did they speak and what religion did they follow, if any?

Most archaeologists tried to answer these questions through the study of material culture remains, mainly pottery assemblages, structures, zoo-archaeological and archaeo-botanical remains, evidences of trade, trade routes and links , etc. One of the main hurdles is the undeciphered script and consequently, language adopted by the people of the Indus Civilization. The vacuum is still there despite plethora of research carried out in the last decades primarily on script carved on the Indus seals (Parpola, 2017).

Study of the Indus Civilization is subdivided into different phases of development and evolutionary stages (Possehl, 1995). The widely spread civilization was a complex society with many different aspects, various terminologies were used to describe during the last century. To understand civilizations in archaeological discourses, typically, three stages approach is adopted as nascent stage, developmental stage and later stage: same is true to Indus Civilization. Sir Mortimer Wheeler was the first to formally describe three stages of Indus Civilization as Early, Mature and Late and properly stated a chronological sequence supported by radiocarbon dates (Wheeler, 1966). Over the time adoption of scientific methods and comparative analysis on broader scale helped researchers design a framework under which chronology and development was contextualised and understood. Consequently, the Indus Civilization is being studied in broader perspective of South Asia and its relevance in South Asian archaeology.

Shaffer's Paradigm of Indus Valley Tradition

So far, a most comprehensive model was proposed by J. Shaffer who exploited innovative idea of describing the civilization in terms of Tradition, Phase and Era which is universally and unanimously accepted. A larger scheme of events is represented under the theme of Phase and it was further grouped into Era. The Phase is mainly defined by the distinctive ceramic style from one or more sites during a similar time period. The Era is reflecting a series of changes taking place within the geographical and cultural traditions (Shaffer, 1992). Though model of Shaffer is already ca 30 years old and they have never been updated. Shaffer has adopted a broader term as Indus Valley Tradition to demonstrate all the aspects involved in development, expansion and technological advancements with on focus on geographical continuity and cross cultural relationships in chronological sequence (Shaffer and Lichtenstein, 1989). In Pakistan the status of research has not been improved and no significant discovery has been made for almost 30 years though in India interesting results have been achieved. Many new sites on the Indian side adjacent to the Cholistan especially Dholavira in

Gujarat (Bisht,1991) Rakhigarhi (Nath,1997-98;1999-2000) and Kunal (Khatri and Acharya,1995) are of utmost importance.

Cultural tradition refers to “synchronic and diachronic cultural continuities” from the data available ca 35 years ago. Eras refer to the general developments that may or may not include chronological boundaries (Shaffer,1992:442). Gregory Possehl has developed a somehow a similar framework with seven stages and periodisation from Early Village Farming Communities and pastoral camps and later societies and Early and Mature Harappan to Late Harappan as Post-Urban Harappan Period (Possehl,2002). Shaffer’s framework has provided a comprehensive base to the complexity involved to understand the variations and different features developed during Early, Mature and Late Harappans. Shaffer’s phenomenal contribution helped to knit the theoretical fabric where Mehrgarh was contextualise as a starting stage of Indus Civilization. Mughal then took it further and theorized that the early village farming communities of Mehrgarh moved down to lowlands as pastoral camps and in Cholistan(Mughal,1997). As mentioned above since the discovery a diffusionist model of development from Near Eastern Civilization (Wheeler,1953;Childe,1954) was propagated. With the discovery of new sites new ideas started pouring in about nascent urban phase of the civilization. Which is specifically referred as Shaffer’s Regionalization Era including the aceramic Neolithic Period attributed to the seventh7th millennium cal BC

Shaffer incorporates Mehrgarh as a nascent stage of the development of the Indus Valley Civilization and unanimously accepted by the scholars as a reference to the developmental model. Cultural Traditions in Indus Valley Civilization have been used for spheres of interaction entailing continuity of different technological and cultural systems in a long-term trajectory and specific geographical area (Kenoyer,2011).

Classification of Era, Phase and Horizon

Franke believes that Eras are developmental stages, phases are combination of cultural complexes in broader region and time trajectory whereas Cultural Horizons or Cultural Complexes are recur-

rent configurations of features within archaeological assemblages mainly pottery (Franke, 2008). She further wrote that “*they reflect human abilities, stylistics and technological choices and preferences but not considered to represent particular social or ethnic groups*”(Franke,2008: 653-654). Her conceptualization and definitions befits the given research to reaffirm it as ‘Hakra Cultural Horizon’ as it was already named by the principal investigator Rafique Mughal (Mughal, 1970) also fits into the criteria of Phases established by Shaffer (1992).

Indus Cultural Tradition	Suggested Chronological Sequence cal BC
Early Food Producing Era Mehrgarh Phase	7000-5500 BC
Regionalization Era (Early Harappan Phases) Ravi, Hakra, Sheri Khan Tarakai, Balakot, Amri, Kot-Diji and Sothi	5500-2600 BC
Integration Era Harappan Phase	2600-1900 BC
Localization Era (Late Harappan Phases) Punjab, Jhukar	1900-1300 BC

(Shaffer,1992:442)

Chronological Sequence of Indus Valley Tradition Developed by Kenoyer

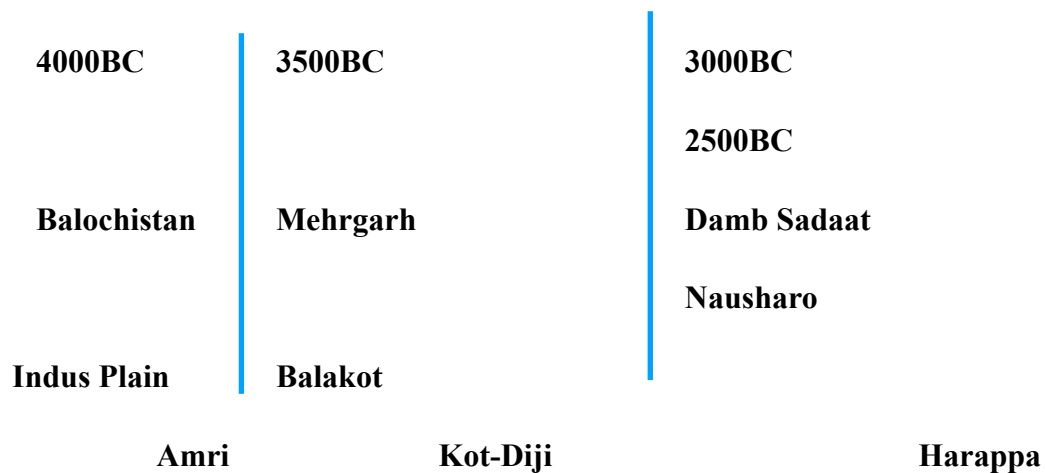
Early Food Producing Era	<ul style="list-style-type: none"> ○ Neolithic ca.7000-5500 BC ○ Mehrgarh Period I, Aceramic 7000-5500B.C
Regionalization Era (Early Harappan ca. 5500-2600BC)	<ul style="list-style-type: none"> ○ Mehrgarh Period II 5500-4800BC ○ Mehrgarh Period III 4800-3500BC ○ Mehrgarh Period IV-Vi 3500-2800BC ○ Ravi Phase at Harappa 3300-2800 BC ○ Mehrgarh IV (KotDiji) ○ Nausharo I ○ KotDiji at Harappa 2800-2600BC
Integration Era	<ul style="list-style-type: none"> ○ Harappan Phase/ Mohenjo-Daro, Harappa 2600-1900 BC ○ Harappa 3C final 2200-1900BC
Localization Era	<ul style="list-style-type: none"> ○ Harappa 3A/ Nausharo II ca. 2600-2450BC ○ Harappa 3B/Nausharo III 2450-2200BC ○ Harappan Period 4-5 1900-1700BC ○ Late Harappan 1900-1300 BC

The Food Producing Era represents the aceramic period of food based economy and **the Regionalisation Era** is the developmental stage when ceramic technology started appearing and taking shape as “distinct artefact styles, essentially ceramics, which cluster in time and space, and interaction. Networks which link dispersed social groups” (Shaffer, 1992: 442). **The Integration Era** according to Shaffer shows a “pronounced homogeneity in material culture distributed over a large area reflecting an intense level of interaction between the social groups” (Shaffer, 1992: 442). Most scholars use this era to refer and elaborate the social, political and economic consolidation of the civilization, when resources and matters of the state were being controlled from centres.

The Localization Era is described as the time period of general continuity of similar characteristics but the disintegration of the society and economy is also reflected which indicated the level of interaction between people was decreased. The framework has been borrowed by Kenoyer and he has applied the framework in his writings mainly *Early City-States in South Asia* (1997) and *Ancient Cities of the Indus Valley Civilization* (1998) and "*Changing Perspectives of the Indus Civilization: New Discoveries and Challenges*" (Keonier,2011). Rita Wright has suggested similar subdivision defining Early Food Producing Period followed by Pre-Urban, Urban and Post-Urban Phase (Wright, 2010).

The Regionalization Era includes Hakra cultural horizon and is taken as a reference to the developmental stage of the civilization during initial stages. Since there is a considerable gap in the chronological sequence of the region of the Indus Valley Civilization, the imprecisely defined aspects of the civilization are being anticipated to reconstruct the interaction. Mughal came up with the term Early Harappan is widely accepted and brought many things in line.

Chronological sequence in Regionalization Era and Social complexity in calibrated years BC



Discovery

“Not often has it been given to archaeologists, as it was given to Schliemann at Tiryns and Mycenae, or to Stein in the deserts of Turkestan, to light upon the remains of a long-forgotten civilization. It looks, however, at this moment, as if we were on the threshold of such a discovery in the plains of the Indus” (Marshall, 1924:105).

With these words Sir John Marshall introduced the world to South Asia’s earliest Bronze Age Civilization which was first termed ‘Harappan Culture’ or Civilization given Harappa as the type site, a village located near Sahiwal (formerly Montgomery) in the Punjab (Mackay,1935;Vats,1946) on the South bank of the Ravi River (Cunnigham,1979). In his introductory paper published in the Illustrated News, in London, Sir John Marshall clearly mentioned it an imported culture influenced by exogenous cultural schemes (Marshall,1931). He named it as Indo-Sumerian Civilization (Possehl, 2002:19;Robinson,2015:35). Nevertheless soon after excavations at Mohenjo-Daro, Marshall wrote in the excavations report that chances of Sumerian origin are very bleak. At first he used the word Indus Culture for material evidences (Marshall,1928) consequently submitted to the notion of local or native origin.

The new sites discovered in the Indus Valley led to the term Indus Civilization or Indus Valley Civilization which refers to Harappan Cultural traditions in broader sense. The discovery of the sites in highlands of Balochistan, Afghanistan and different parts of India belonging to Indus Civilization time and similar cultural traditions brought the term of 'Greater Indus Valley' referring to a pan-expansion of the Civilization also connected the highlands to low lands (Mughal,1970). Different terminology is employed to refer the different phases for example Harappan, Indus Civilization, Mature Harappan, Mature Indus, Indus-Sarasvati Civilization in India because of the high density of the Indus settlements along the banks of the now dry bed of Hakra River which seems far-fetched as the sites are way different than the sites on the banks of Indus River perhaps similar to the hyper Indian nationalist discourse referred by Ahmad in case of Kalibangan(Lal, 1977) report (Ahmed,2014) or Ghaggar-Hakra Phase etc.

Since the discovery of the Indus Civilization questions regarding its origin became imperative. As the comparisons suggested by the principal excavators with neighbouring civilizations, absence of affluent architectural and religious monuments comparable with the Mesopotamian Ziggurats and Egyptian pyramids led to many questions. For example a highly civilised society without any palaces of rulers, giant tombs or religious temples unlike contemporary world. The void baffled the scholars to understand this complex society: how did it emerged and develop? Was there any political system like those known from other contemporary civilisations? Were they religious people or not at all? Since no evidences of warfare have been recorded which led to the theory of secular society. Remarkably built cities helped understand their technological and scientific advancements. The political and social life of the urban centres was difficult to recreate because of the Indus Civilization script is mute unlike those of Mesopotamia and Egypt. Thus the notion of enigmatic civilization with mysterious decline took rise and aggressively believed until it was contextualised by V. G Childe in his famous work on the Urban Revolution (Childe,1950).

The first investigators/researchers of the Indus Civilization not only excavated in a systematic way and thought of scientific interpretations. Although most of them were based on comparisons which were rightly questioned later. To make an example, the Buddhist stupa located on top of the citadel mound of Mohenjo-Daro (Marshall, 1931) is not a Buddhist Stupa but a religious monument perhaps associated with the Great Bath. It is comparable to other religious monuments discovered in the contemporary societies of Mesopotamia and Egypt. Moreover, the pottery recovered during the excavation of the structure consisting features of funeral urns (Verardi and Barba, 2008-2009). Possehl has objected the absence of any burial places at Mohenjo-Daro to be compared with Cemetery-H at Harappa (Possehl, 2002). He further pointed out the granary area which was termed by the excavator Daya Ram Sahni as an area of parallel walls. It was interpreted by Sir Johan Marshall as a storage building similar to those of the Cretan palaces, Though for the Indus Civilization this parallel seems to be far-fetched (Possehl, 2002). Similarly raised platforms known as citadels were residing place of priest-Kings (Wheeler, 1946; Piggott, 1950: 153) 'wielding autocratic' powers from the two main cities (Wheeler, 1946; Piggott, 1950) are not convincing. Wheeler and Piggott subtly concurred Marshall's early theory of an Indo-Sumerian Civilization, though Marshall seems falling prey to comparative methods over his own peculiar reasoning ability (Possehl, 2002). If the interpretation of the data where masses were controlled by priest kings settling in citadels is correct than the Indus Civilization might have been the widest political entity before the advent of the Roman Empire (Fairservice, 1961). Possehl further argued that Wheeler-Piggott's paradigm of despotic, autocratic and absolute priest kings is contrary to Marshall's view of an austere, peaceful and merchants of urban society. Moreover Sir John Marshall's emphasis upon striking uniformity (Marshall, 1931) the symmetry, complete uniformity and sameness in the remains and artefacts despite the sites (Mohenjo-daro and Harappa) located at a 400 miles away, was reported by Piggott as monotonous regularity (Piggott, 1950) and by Wheeler astonishing sameness are unlikely (Possehl, 2002: 19). Wheeler and Childe had also favoured the concept of slavery or willing subordination in the Indus Civiliza-

tion and caste system for the uniformity and stagnation in the cultural remains (Wheeler, 1953; Childe, 1942). Fairervis found it influence of the Near Eastern Archaeology on these scholars as they were trained there and were occupied by the concepts of kingships, capitals and slavery (Fairervis, 1986). New research have shunned these theories and proved them almost obsolete. Regional relationships among India, Persian Gulf, Iranian Plateau, Central Asia and Mesopotamia could have favoured a political and ethnic diversity during Early and Mature Harappan/Indus (Possehl, 1997). Rahmstorf wrote that collective efforts put in sealings of Indus Civilization and equal distribution of weights across length and breadth of the Indus Civilization helps to envisage role of assemblies and councils. Where community representation could have been a phenomenon as “shared social power” (Rahmstorf, 2012). New researches conducted in the recent past have helped to establish new paradigms. Theories of diffusion and borrowed civilization are replaced with indigenous origin and monoethnic society is now recognised as highly complex one (Mughal, 1974; Chakrabarti, 1972, Shaffer, 1982).

Mughals believes that the quantity of material culture from the sites were always taken by scholars as basic frame of reference. The uniformity of architectural, cultural and socio-economic remains led them divide it in two major though elementary categories Harappan or Non-Harappan. Then any material uncovered below the Harappan/Indus period stratigraphical layers was simply termed Pre-Harappan (Mughal, 1980). Simply meant that it has nothing to do with Indus Civilization. One such example is Wheeler’s observation regarding Kalibangan in India along the Hakra River, where he recorded a ‘Pre-Harappan’ horizon below the Harappan one (Wheeler, 1966) not contextualised until late 1960s. Rafique Mughal is the pioneer when it comes to clearly define the ‘Early Harappan Period’: following a careful study of the of the Kot-Diji Period assemblages (Possehl, 1992) from the sites of Kot-Diji, Amri and Sera-i-Khola (Mughal, 1970). A comprehensive chronological sequence of Pre, Early and Mature Harappan/Indus Civilization preceded by Neolithic and Chalcol-

ithic Periods was elaborated by him. He defined in a coherent manner and in the broader context of the Indus Valley Civilization. He emphasised upon the notion of an indigenous origin of the civilization instead of external influence (Petrie,2000) i.e. Mesopotamia.

Contemporary research in the Indus Civilization has highlighted new dimension. At the cost of repetition it is stated that the term “Hakra ware” was used by Mughal for the material which he first came across at the site of Jalilpur in Multan, Punjab. Later he recognized it in the Cholistan desert spread on a larger-scale as a huge phenomenon. He described it as an early phase of Early Harappan/Indus Civilization. He further elaborated it as preceding the Kot-Diji Phase in the Indus Valley, Mehrgarh layer III and Amri in Sindh (Mughal,1972;1974;1997).

Many years before the discovery of Hakra cultural horizon the site of Amri was discovered in Sindh. Majumdar in 1929 discovered for the first time and underlying cultural layer which was preceding Harappan/Indus Culture(Majumdar,1929). He wrote a short report about excavation but later J.M. Casal did a detailed study of the pottery, published detailed accounts and established that the site is pre-Harappan (Casal,1964). Later, Mughal recognised appliqué type of Hakra pottery among assemblage with Amri IA reported by Casal scattered across Greater Indus Valley, Thar desert Sindh and Mehrgarh III level Balochistan as well as at sites in Gomal Valley Khyber Pakhtukhwa (Mughal,1997;2012). Indus Civilization is known after two mighty sites of Moenjodaro and Harappa and now Ganweriwala in Cholistan is also included, roughly measures 81ha (Mughal,2012). No other civilization has been this vast and geographical extended as was Indus Civilization. The number of documented site has crossed over one thousand (Mughal, 1987).

Major vacuum in the Indus Civilization is its pictographic script, its decoding is so difficult hence remains undeciphered unlike Mesopotamia and Egypt (Parpola,1988). Therefore the question of origin of the civilization, development of the socio-political integration, economic growth, trade links and decline of the civilization always remained of crucial interest.

Origin and Development of the Indus Civilization

The question of preceding Indus Civilization and immediate ancestors of the people has been largely debated. It is now a general understanding that the Indus Civilization cannot be interpreted as an isolated development. Much work has been carried out to establish reliable sequence but still it is far from achieved. At present, students of archaeology in Pakistani universities are taught that story begins from highlands of Balochistan. The Neolithic settlements are understood as a separate phenomenon or topic, better knowledge of the period is greatly needed (Plate-III,a).

Sir John Marshall (1931) reported that the sites of Mohenjo-Daro and Harappa bore some evidences locked into the layers of Indus Civilization in the form of stone tools. Hence the borderlands of east in Ganges Valley, Southern Balochistan and borderland of Iran (far eastern edge of the Iranian Plateau) attracted the investigations to trace the sources of civilization. Sir John Marshall accelerated the pace of the research in archaeology, due attention was paid to new researches. He gave brief account of Mr. Hargreaves exploration in the Nal area of Balochistan, reported funeral ceramics that Sir Aurel Stein divided into three groups within context of Indus Civilization.

Red and Black Ware	Hybrid Ware	Buff Wares
Red and Black 'Indus' Variety	Polychrome banded ware	Buff blanch ware
Red and Black Baloch Ware	Mehi Ware	Grey ware
Sur Jangal Ware		Shahi Tump ware
		Nal Ware

(Marshall,1931:97).

Sir Aurel Stein conducted archaeological surveys in Waziristan and northern Balochistan following the footprints of Neotlings (1899) who first reported the village sites of Rana Gundai, Periano

Gundai. Stein opened trial trenches at Rana Gundai, Periano Gundai, Moghal Gundai and Sur Jangal sites in Zhob Valley and Nal site in Kalat Valley Balochistan (Stein,1929:31-70).

Ceramics from Dabarkot in Loralai Zhob Valley were reported with similarities to Mohenjo-Daro (Stein,1929). In the stratigraphical layers of the mound Indus Culture was found bracketed in between (Wheeler,1950). Sir Aurel Stein's reports explain carefully linkages between Indus Valley and Balochistan however the survey continued. He further explored and took an archaeological tour in Gedrosia (Stein,1931) and found sites of Karghuski Damb, Miri Qalat, Shahi Tump, Sutkagondor, Kulli-Mehi, Nandara and Niani Buthi. Among these, at Karghuski Dumb Stein observed potsherds similar to those of Nal Culture already reported by M. Hargreavers (Stein,1931:38-51).

Majumdar also made important contribution by discovering site of Amri surveying the Lower Indus Basin between 1929-1931. He connected the cultural traditions of the site to the Harappan/Indus Civilization and suggested that the Amri and Nal Cultures are older than the Harappan/Indus Civilization in Sindh (Majumdar,1931) i.e. Mohenjo-Daro.

The accounts of Sir Aurel Stein were detailed and provided enough information for future research to define eventual interrelationship among prehistoric cultures. His incentive behind such surveys was to fetch out linkages between different cultures discovered in Indus River Valley and Indus Civilization, however his work remained in oblivion for long. With growing interest in the regional aspects of the Indus Civilization. He set a new trend which led to new explorations and studies based on the results his explorations. The following team of scholars put all efforts together to contextualise the material culture remains. R.J Rosso excavated Rana Gundai in 1946 (Chakrabharti,2014). Fairservis explained the sequence and noted that the sites clearly showed evidences of contact with Indus Civilization.He found the appearance of cultural traditions of painted pottery similar to those of Harappan (Petrie et al., 2010).

In order to contextualise the material culture assemblage retrieved from the above mentioned sites Piggott grouped the ceramics collected by A. Stein, into five complexes. He labelled the black-painted-buff ware as 'Quetta Ware', (Piggott,1950: 70-85) which was collected from five sites. Among which most important was Killi Gul Muhammad in the Quetta Valley of Balochistan. Fairservis divided the Killi Gul Muhammad assemblage into four different Periods from I to IV (Fairservis,1956). He recognized and compared parallels to Quetta Culture from Central Asia at the site of Tal-i-Bakun near Persepolis (Piggott,1950:75). Moreover, he noticed a distinctive type of pottery from Kulli-Mehi area and also another distinctive type in Zhob area similar to Periano Gundai that he termed 'Zhob Ware' (Piggott,1950:120-130). Gordon Childe was the first to propose a chronological sequence (Chakrabarti, 2014) basing on Aurel Stein's collection in his book *New Light on the Ancient East* (Childe, 1934). These explorations set the stage for incoming scholars and researchers that Balochistan bears evidences of Chalcolithic cultural sequence. That would help future research to trace the origin of the Indus Civilization. Unfortunately new explorations were halted due to the partition of the Subcontinent.

A new wave of explorations in Western Pakistan started in 1950 when Fairservis surveyed and excavated several sites in Balochistan and Southern Afghanistan. He surveyed the area and conducted excavations at four sites mostly marked by the presence of buff ware described by S. Piggott 'Quetta Ware'. He excavated at Kechi Beg area, Damb Sadat site and most importantly Killi Gul Muhammad. At Kechi Beg area he observed a distinctive type black-on-buff slip ware and suggested it to represent a prototype of Quetta Ware. Moreover, he tried to compare ceramics found in different sites to build up a chrono-typological sequence.

At Killi Gul Muhammad he documented the first aceramic phase with over imposed layers of basket ware and other material culture similar to those of discovered at Rana Gundai, Sur Jangal and Amri. His analysis produced a reliable cultural sequence. Fairservis revisited the sites explored by

Neotling, Stein and Ross and opened trial excavations at Rana Gundai, Dabarkot, Sur Jangal and Moghel Gundai to collect more information (Fairervis, 1956:173-402). Fairervis's work was followed and enhanced by De Cardi who excavated in the Kalat area of Balochistan. She worked on sites of Siah Dumb and Anjira and correlated her results with those by Fairervis. Both of them were able to achieve a precise and clear picture of the prehistoric sequence of Balochistan leading to the Chalcolithic and protohistoric period. They advanced the research and laid foundation for upcoming researchers. Their work diverted the direction of meaningful research towards Balochistan. All the work done previously became relevant with the discovery of Mehrgarh by French Archaeological Mission to Indus Basin. Professor F. Jarrige conducted excavations in the Kachi Plain and excavated at Mehrgarh which is believed to be the South Asia's earliest village farming community settlement so far.

Mehrgarh

Mehrgarh is a type site for Neolithic cultural formation in South Asia. It is the only site with complete formation and spread over a large area and researched in detail. Mehrgarh was inhabited by food producing community and site is named after modern village in Balochistan. The Neolithic levels of the site go back to the eighth millennium cal BC, although radiocarbon dates obtained are vague and ambiguous. Mehrgarh yielded evidences of the dawn of farming economy in South Asia at a geographically imperative location near Bolan Pass. The aceramic layers are 7 m thick, the oldest three of them has been named MR3 (Jarrige, 2006). The site is located in the Kachi Plain which is extension of the Indus Plain into the mountains of Balochistan, west of the Marri-Bughti Hills (MacIntosh, 2007). The deep alluvium of the area is the product of the Indus River flowed through the plain in Pleistocene. The Kachi Plain is now drained by the Bolan River which also connects Balochistan with the Indus River Valley (Possehl, 2002).

French Mission working on Mehrgarh opened a new horizon in the archaeology of subcontinent and Indus Civilization. Mehrgarh yielded evidences of hunter gatherers to settled agricultural communities. Excavated part of the site consisted of deposits of 7 m thickness ranging from aceramic to Neolithic Period. The structures excavated belonging to ceramic Period I are consisting of simple, double, triple, quadrangular multi-room houses total 77 in number. Multi roomed compartments like structures are excavated which served as storage houses. Some 320 graves excavated, dead were buried with ritual ornaments made of shells, copper, stone, steatite and figurines depending upon suggested settlement phases among which site is divided (Jarrige, 2005). The construction and dwelling pattern of the site kept on evolving. One portion of the site was abandoned while the other one was being occupied and built new houses with mud bricks. The abandoned part of the site was used as dumping area. At one stage not accurately defined these abandoned houses were used as graveyards. The site revealed a cycle of reuse of the graveyard as dwelling place after levelling it down perhaps after one or two generations and cycle continued. The settled life at Mehrgarh around 7000 years ago has been continued to be gradually growing. It gave birth to the phenomenal civilization of Harappa and Mohenjo-Daro. In simple words the culmination of settled life of Mehrgarh was achieved by first urbanized people of the Indus Civilization.

Period I witnessed arrival of steatite, turquoise, one lapis lazuli bead, copper bead and shell bangles have been discovered. The white steatite production with heating process indicates craft specialization as local craft tradition and during Period III glazed white steatite is evidence of sophisticated level of craft specialisation. Evidence of dental treatments in 11 dead bodies have been recorded. Hunting of animals was the source of meat and wild animals of 12 species of Richard Meadow's famous 'Big Game' Wild sheep, goat, gazelle, wild asses, water buffalo, black buck, deer, wild cattle, nilgai, onager, wild pig were domesticated at Mehrgarh (Meadow,1993). Mehrgarh, Period III is Chalcolithic and stands relevant to the scope of given research.

Mehrgarh Period I

Period I is subdivided into IA and IB, IA is aceramic and IB is ceramic. Period I has a dominated presence of seeds of wild barely (*Hordeum Vulgare*). The aceramic level is documented with evidences of wild barley cultivated but not fully domesticated also wheat and Jujube (Jarrige,2006). Mehrgarh is not the only Neolithic site in Balochistan but most comprehensively excavated and studied one. The aceramic Period I is comparable to the early occupation levels at Killi Gul Muhammad. Apart from hunting activities the people from Period I of Mehrgarh experienced pastoralism to some degree. Given Meadow's archaeozoological studies the Zebu Cattle's domestication at Mehrgarh during aceramic period has made strong point of Indigenous domestication. Jarrige debates the origin of the domestication of South Asian Zebu considering it indigenous to South Asia since the Middle Eastern Zebu has different genetic origin (Jarrige,2006).

Period II

Pottery at Mehrgarh which made its appearance during Period I (IB) and evolved during Period II together with stone vessels (Jarrige,2006). The ceramic potsherds from Mehrgarh IIA are soft, chaff-tempered pottery which is compared with the "Chaff Ware Horizon" in Iranian Plateau dated back to 5500 BC. Cal. (Ahmad,2014). Period IIB is marked by harder and red-painted pottery. Hearths and fire-pits with excessively burnt stone pebbles and terracotta cakes for an indirect heating have been documented (Jarrige, 2006).

Period III

Mehrgarh Period III is marked advancement in ceramics technology. Franke thinks that settlement structures expanded indicating rise in population. By the time settled life started in other parts of Balochistan i.e Niani Buthi, Adam Buthi, and Sheri Khan Tarakai in Bannu Basin (Franke, 2008) now KhyberPakhtunKhwa (KPK), wheel made and kiln baked pottery started being produced. The pottery types comparable with those of Killi Gul Muhammad and Togao Phase distributed across central and Southeastern Balochistan as well as Bannu Basin, Nal, Mundigak I and Amri in Sindh

(Franke, 2008). Period III revealed heaps of pottery scattered on a large area and 40% of the pottery is refined and painted geometric and animal motifs (Thapar and Sharif, 1992). Period III at Mehrgarh is dated back to 4000-3500 cal B.C. corresponding to Chalcolithic Periods of Killi Gul Muhammad III, Sur Jangal I-II, Surab-II, Rana Gundai I-II and early levels of Periano Gundai (Petrie et al. 2010).

Nausharo

Soon after Mehrgarh French Archaeological Mission excavated the site of Nausharo ca 7 miles from Mehrgarh. Nausharo's Period I is contemporaneous with Mehrgarh VI and VII and then it has a well defined occupation level of Indus Civilization. The discovery of the site of Nausharo helped bridge the gap between Kachi-Bolan region and the Indus Civilization on the basis of cultural similarities. This development provided basis to the earlier expeditions and efforts to find a sequence of Indus Civilization starting from aceramic (Jarrige, 2006). Hence Mehrgarh is of utmost importance from the point of view of yielding evidences of early village farming: which flourished in Indus Basin in the seventh millennium BC. The mature Urban Phase of Indus Civilization rests on this foundation and is definitely not an offshoot of the Mesopotamia (Possehl, 1990: 261-282).

Sheri Khan Tarakai

Same pattern is repeated at Sheri Khan Tarakai site that is located in Bannu Basin situated at a point where Indus Basin is abutting with highlands of KPK and Afghanistan. The site is a village settlement along the borderlands. The site is Neolithic with two distinctive cultures before Kot-Diji Culture existed (Khan et al. 2010). Petrie has recognized similarities between Ravi (Hakra), pottery from sites Balochistan, Bannu Basin Gomal in KPK Valley and Cholistan in Punjab. He sees transition of technological knowledge at Sheri Khan Tarakai where ceramic assemblage marked as SKT B and C has technological similarities with Ravi (Hakra) assemblage found at Jalilpur and Harappa mound AB and E (Petrie, 2010). SKT Ware B is ceramics were decorated externally with thick clay

containing grit and grog to provide a robust, rough and hard surface. Ceramic technology of Sheri Khan Tarakai is similar to that of in northern Balochistan which is also comparable to Togau Phase, some technological similarities are comparable to Kili Gul Muhammad, Sur Janagl, Periano Gundai and Jhandi Babur in Gomal Valley. The inhabitants lived in mud houses sometimes provided with stone foundations and flats roofs with wattle and daube (Petrie, 2013).

Regionalization Era

The Regionalization Era is one of the periodical classifications of the Indus Civilization. Regionalization Era (Shaffer 1992) is the period of developmental stages in Indus Civilization which is commonly referred as Early Harappan/Indus Period (Mughal,1970). It entails peculiar regional traditions processes involved and variations in the material culture from sites of Indus Civilization in different parts of the region. During Regionalization Era different cultures developed in Balochistan, Indus Valley and neighbouring regions (Mughal, 1990).ceramics and artefacts traditions started developing with regional variations. Regionalization Era witnessed cultural development, pastoralism, crafts, technologies, sociocultural and economic growth (Kenoyer, 1988). The inter-regional coordination and exchange of technological knowledge started expanding to major parts of the Indus Civilization and known as Early Harappan/Indus Period. Specialized technology in shell making, copper, architecture and transportation resources were most probably developed during this period (Kenoyer, 2014). Regionalization Era produced that conducive environment which gave birth to highly sophisticated yet complex urban society (Kenoyer, 2014; Mughal, 1990).

Subsistence Pattern During Regionalization Era

Data about this phase is very limited and results are still being produced on the basis of new expeditions. Subsistence pattern of Mature Indus/Harappan Period is helpful postulate that economic activities during Early Indus/Harappan Period. Agriculture and trade of commodities could have provided a basis for regional development (Plate-III,b). Keeping into view the advocates of indigenous

development (Mughal,1974,1990,1997,2012;Shaffer,1992;Kenoyer,1988,2011,2014) the village level settlements could have traded agricultural commodities with distant communities in larger areas. In-depth research is required to fully understand the economic pattern during Early Indus/Harappan Period which stimulated the urbanization in the Indus Valley. Regionalization Era in Mehrgarh can be attributed to ceramics production on larger scale. Jewellery produced at Mehrgarh was made of imported material like agate, jasper , etc. (Franke, 2016).

Killi Gul Muhammad

The site of Killi Gul Muhammad was first mentioned by Piggott (1947), and excavated by Fairservis (1956). The stratigraphic sequence of the Killi Gul Muhammad has made the relative chronological sequence clear to some extent. Rana Gundai I and Killi Gul Muhammad II are similar then Rana Gundai II (Shaffer, 1992) and Killi Gul Muhammad III are parallel on the basis of ceramic similarities of Killi Gul Muhammad black-on-red slip and Killi Gul Muhammad Red Paint Ware (Fairservis, 1956: 354). He divided the site into four levels the level I is aceramic, Possehl compared it to Mehrgarh Period I. Fairservis divided the pottery on the basis of types and technology involved in pottery making. He recorded handmade wares, Burj basket ware, Adam sandy and Nazim hard clay temper Ware as well as some wheel made ceramics. Period I at Killi Gul Muhammad was recorded with 18 floor levels and without any ceramics (Fairservis,1956:330-332). He further compared Killi Gul Muhammad IV is with Kechi-Beg Ware and Damb Sadat I which is closer to Amri- and Nal Culture though more closer to Amri in Sindh. Amri is contemporary to Killi Gul Muhammad and Damb Sadaat I, and Nal is parallel to Damb Sadaat II on the basis of pottery decorative patterns (Fairservis, 1956). The Killi Gul Muhammad finds are recorded in the Chalcolithic Period layers at Mehrgarh (Jarrige,1985). Such sequence is documented at Nausharo, Nal and Zhob also (Shaffer, 1992).

Kechi Beg

Kechi Beg is a small mound near Damb Saadat located on Bolan Road. It was excavated by Fairservis in 1951. He documented single occupation level termed Kechi Beg Phase. It is comparable to Killi Gul Muhammad, Period IV to Damb Sadaat Period I. The Kechi Beg phase has been documented at Mehrgarh where steatite seal and unique polychrome ceramics were found (Jarrige,1985).

Damb Saadat

Damb Sadaat Phase is also referred as Quetta Valley Culture which is also considered the hub of settlement trade and travel a natural corridor linking Afghanistan to Indus Valley through Bolan and Khojak Pass. It provides geographical affinity with Quetta Valley, Kandahar Region, Mundigak and Sahrai- Sokhta referred as Helmand Cultural Tradition (Ahmad,2014). Twenty-seven sites of Damb Saadat Phase are scattered in Quetta Valley. The biggest one and most important is Miri Qalat in Makran followed by Mundigak in the borderlands of Afghanistan have cultural similarities in neighbouring lands including Central Asia(Ahmad, 2014; Franke,2008). The occupation at Damb Saadat I (DS-I) is parallel to Killi Gul Muhammad final occupation. The following levels (DS-II-III) yielded black-on-buff wares not known to this area before. Fairsevis attribution of Damb Saadat II has been suggested around 3000 cal BC contemporary to Indus Civilization (Ahmad,2014).

Anjira and Siah Damb

Anjira is named after river surveyed by De Cardi and Fairservis excavated it and established the site as a in Southern Balochistan. De Cardi excavated Anjira and Siah Damb in Surab region of Kalat area in Balochistan. She conducted trial trenches and gave a sequence as follow:

Anjira Priod I	Semi-nomadic Neolithic Occupation (Killi Gul Muhammad II)
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Anjira Priod II/Siah Damb I-III	Continuing with settlement structures of mud-brick cultural similarity with Killi Gul Muhammad II-III
Anjira Period III/Siah Damb II-III	New architectural styles & Ceramics including TogaoWare and Kechi Beg Bichrome
Anjira IV/Siah Damb III	Quetta Ware
Anjira V	Periano Wet and Reserved Slip Wares / Rana Gundai IIIc designs

With miscellaneous artefacts and many other objects were recorded by the excavator (De Cardi, 1965).

Rana Gundai

The site was first published by Neotling (1899) followed by Sir Aurel Stein (1929). First serious excavation was conducted by Ross who dug up small section to record stratigraphy. Fairservis worked on the same section and provided some more details. Fairservis divided Rana Gundai I into two phases:

Ia	Ib
Jangal Coarse Painted	Jangal Painted Ware
Loralai Coarse Plain	Wheel Mad Plain Ware
Killi Gul Muhammad Balck-on-Red Ware	

Rana Gundai II Phase is characterised by Jangal Painted Ware and Phase III is Periano Painted Ware with fragments of Faiz Muhammad Painted and Quetta Wet wares. He determined that Rana

Gundai Ib corresponding with Sur Jangal I and Killi Gul Muhammad III, Rana Gundai II is parallel to Sur Jangal II, Rana Gundai IIIa is parallel to Sur Jangal III and Damb Saadat II (Fairservis:1959)

Sur Jangal

Sur Jangal means red waste located along the bank of Thal River. Sir Aurel Stein surveyed and excavated. He dug up around six trenches among which five were excavated by Fairservis. Fairservis observed that Stein could not reach virgin level. He excavated new trenches and partly observed Sir Stein's trenches. He described three occupational phases at the site:

Sur Jangal I	Jangal Coarse Painted
	Killi Gul Muhammad
	Black on Red Slip Ware
Sur Jangal II	Jangal Painted Ware (with distinctive bull motif similar to Rana Gundai)
Sur Jangal III	Priano Painted with many other types including Jangal Polychrome

Mughal Gundai

Mughal Gundai is located near Zhob River and Periano Gunda. Sir Aurel Stein surveyed and partially excavated, revisited by Fairservis. Stein observed the similarities into ceramics coming out of opposite edges of the site. He observed similarities between ceramics from Mughal Gundai and Periano Gundai. Fairservis studied all the material culture recovered by Stein and himself concluded that the site is contemporary to Sur Jangal I-III and Rana Gundai I-III (Fairservis, 1959).

Periano Gundai

The site is located in Zhob Valley. First documented by Neotling (1898) and surveyed and excavated by Sir Aurel Stein (Stein,1929). Fairservis defined occupation levels at the site and described sequence. Mughal excavated the site and clearly defined stratigraphic sequence. He studied the ceramics and earliest level named as Periano A recognized as handmade, burnished interior and grey and

black exterior with painted designs. He noted that red-on-black pottery from Periano A is comparable to Killi Gul Muhammad II-III and Surab I-II dated in fourth millennium B.C (Mughal,1972, Personal Communication 25-06-2019). He further characterized the polychrome and bichrome pottery as Periano B (Mughal,1972).

Periano C is characterized by ceramics comparable to Kot-Diji which appear along with black-on-grey Faiz Muhammad Painted and black-on-red wares and wet wares were contemporary to each other. Hence it is relatable to Rana Gundai IIIb-IIIc. Fairservis (1959) and Neotling(1898) also found fragments of Harappan pottery from the final phase of Periano Gundai named as Periano D, is comparable to Mature Harappan/Indus ceramics and belong to Rana Gundai IV and Dabarkot. Stein documented figurines from the site which Mughal interpreted them similar to those of Mehgarh VI-VIIB (Mughal,1972, Personal Communication 25-06-2019).

Balakot (Las Bela)

In the wake of the debate of origin and transitional phases which have been extensively discussed and investigated. The site of Balakot is of key importance to understand the transitional phase of Indus Civilization from early period to Mature Indus Period. Site is located at the northern edge of the Kurkhera Plain close to the northern bank of the Windar River. The site was excavated by G. Dales in 1970 and unearthed 14 occupation levels divided into two Period I-II. The trench A of Period I is characterized by the excavator as Early Indus Period which presents closer links to the pottery traditions of Nal tradition also known as Nal Cemetery Ware or Nal Polychrome tradition (Balochistan) on the basis of polychrome, zoomorphic designs on the wheel made ceramics from southeastern Balochistan. He also recorded Anjira sequence of Kalat of south-central Balochistan with famous animal head motif described by De Cardi famously known as 'Togao C' (De Cardi,1965) was present on shallow plates and bowls (Dales,1970). The gradual decrease of Nal tradition in Period I was followed by Amri C and D Phases. He further cited parallels with Early

Indus site of Pandi Wahi on the basis of potted plant located in Sindh between Amri and Mohenjo-Daro (Dales, 1970). He further cited parallels on the basis of painted pottery culture from different sites and established a link to Mature Indus Period i.e Integration Era (Dales,1970:14-17). The site provides information about settlement and paleoecological patterns during Early Indus/Harappan especially in context of linkage between Early and Mature Period. Balakot is among five coastal sites belonging to Indus Period_ Sutkagon Dor, Sutkha Koh, Pir Shah Jurio and Balakot in Pakistan and Lothal in India . Pottery discovered from Period A is belonging to Early Indus / Harappan Civilization similar to Nal polychrome (Dales, 1973:5-6). Pottery from Period IA to IC is comparable to Balochistan tradition of style and technology. It shows continuity and homogeneity of the ceramics throughout Period I. The transition to Indus Period started during Period II and Sohr Damb III contemporary to Balakot highlights its importance in context of interaction and transition (Franke,2005).

Amri

Thanks to the discovery of the of Amri (Plate-IV,a-b) ca 100 miles south of Mohenjo-Daro, in Sindh, along the same western bank of the Indus River a cultural aspect preceding Harappa and Mohenjo-Daro was recognized (Majumdar, 1929). At Amri, in 1929, N.G. Majumdar found the Indus horizons clearly stratified above the Chalcolithic period, characterised by different material cultural remains among which major ones are ceramic (Casal,1964). On the basis of this discovery he suggested the existence of a Chalcolithic Civilization chronologically preceding the cultures represented at Harappa and Mohenjo-Daro (Wheeler,1968).

Amri and Nal sites

Amri-Nal Phase is represented by almost 150 sites in Balochistan a few examples are Amri, Nal, Ghazi Shah, Anjira, Niani Buthi, Siah Damb, Togao and Kalat (Ahmad, 2014). Amri ceramics(Plate-IV,e) are fine and well baked with red or buff slips with black paint with different

types of geometric designs. Open bowls, jars and vases are the identical types of Amri Ware (Casal,1964). A distinctive feature of Amri ceramics is handmade red/beige pottery with geometric designs painted in black (Ahmad, 2014). Nal culture is marked by the best ceramic ware in South Asia fired in red to pink.

Mundigak

The site of Mundigak is important to discuss in connection with Balochistan sites and Helmand Cultural Tradition. It is located in Kush-i-Nakud Rud Valley in Kanshar, Helmand River Basin north of Indo-Iranian Plateau. The site has been developing in parallel to distinctive sites in Balochistan though it doesn't have any occupation level comparable to Mehrgarh but evidences of Regionalization has been ample to record (Shaffer,1992). Casal excavated the site and noted similarities with Killi Gul Muhammad also difference between handmade and wheel made pottery. Shaffer has dated the second phase of the site from 3500-2800 BC second phase also known as Helmand Phase is marked with existence of mud brick structures and ovens. The site of Sakhra-i-Sokhta appeared at the same stage which is dated back to fourth millennium BC

Hakra Ware (Culture) Sites

Hakra sites were discovered after Rafique Mughal's four fieldwork seasons in Cholistan, Punjab, Pakistan in 1972 promoted by the exploration project of Department of Archaeology, Government of Pakistan. He discovered new sites along the banks of now dried up River Hakra, he termed it *Hakra Ware Period* on the basis of distinctive characteristics of the sites. The ceramic assemblage of Hakra Ware Period are divided into different groups on the basis of surface treatment or decoration (Mughal,1970;1974;1997). It includes Hakra Incised, Hakra Appliqué, Hakra Black Burnished ware, well made and handmade cups, bowls and dishes as well as painted buff ware. The incised ware is wheel turned with horizontal and diagonal lines on exterior whereas Black burnished ware is handmade and the cycle goes on. Since the discovery of the Hakra Phase the chronology has been

established on the basis of comparative archaeology. The chronology is badly defined since there are almost six types of ceramics the transitional phase from handmade to wheel turned is measured within time span and how this evolution in technology travelled through. Moreover their role in the development of the Civilization is far from determined. This is the focus of the current study. The site of Jalilpur is very important in context of Hakra Period and early Indus Period too. The site was excavated by Mughal in 1963. It is located in Multan on the bank of Ravi River. Mughal excavated the site in 1971 he unearthed Harappan and pre Harappan occupational levels. He again excavated the site in 1975 and recovered potsherds of handmade globular ceramic vessels thick coated exterior similar to pottery coming from Amri IA and Serai Khola Period I. Burnt bones of animals with signs of butchery and potsherds of carinated cups and dishes were recovered. Mughal attributed them to the fourth millennium cal BC He further found evidences of transitional phase where he observed red slipped and bichrome painted pottery gauged them closer to Kot-Diji, Serai Khola II and Gumla II-III (Khan et al. 2000) the difference between Gumla and Rehman Dheri sequence believe that Jalilpur-II might be contemporary to Tochi-Gomal and Kot-Diji Phases in Gomal Valley.

Harappa (Indus Valley)

New excavations at Harappa carried out by the Berkeley University (later Wisconsin University) Mission (USA) brought to light oldest occupation layers in 1996. The results showed a new type of ceramics which were never observed before within the site. New occupation level has been named as Ravi Phase, characterised by the presence of handmade vessels. The material consists of large and shallow bowls, large carinated vessels, thick cooking pots with external surfaces coated with calcium carbonate nodules (Kenoyer and Meadow, 2000). The material has been studied and interpreted as comparable to the ceramics retrieved from Rehman Dheri I-II, Gumla II and Jalilpur I-II which were attributed to ca 3300-2800 cal BC Other finds that characterise the Ravi Phase Period IA are terracotta figurines, steatite beads, and shell bangles. Terracotta bangle and bone tools from

Period IB are suggested to find parallels in Kot Diji given wheel made and decorative motifs in Kot Diji style (Kenoyer and Meadow,2000).

In connection with the above discussed research expeditions in Balochistan the North Frontier province (Now KhyberPakhtunkhwa aka KPK) came to focus in 1970 when Professor Ahmad Hassan Dani explored the Gomal Valley in Bannu Basin. The southern part of KhyberPakhtunkhwa is sharing border with northern Balochistan. Dani explored the site of Gumla located 3 miles from the Indus River and during surface collection he came across Harappan potsherds. He discovered the sites of Rahman Dheri, Hathala and Kurum Shahi and several others too and sent the team to Quetta to find out any possibility of cultural link (Dani,1970). He excavated the site of Gomal and defined its sequence while linking to describe the parallels in Bronze Age sites in with the Zhob and Loralai regions in Balochistan. He recorded six occupation levels at Gumla from aceramic to Gandhara Grave Culture at Period VI and noted Harappan Civilization Period VI subsequent to Kot-Diji Occupation at Period III (Dani,1970: 37-39).

Rehman Dheri

The site of Rahman Dheri was excavated by F. A. Durrani from 1976 to 1980 located in Dera Ismael Khan Khyber Pakhtunkhwa(KPK). The site was investigated after Mughal(1974) and Fairservis (1975) highlighted new dimensions of Indus Civilization in Greater Indus Valley to seek more information about origin of urbanization. The site was successfully put into the bracket of Regionalization Era that continued till Integration Era on the basis of hand made to wheel made pottery comparable to Killi Gul Muhammad to Kot Diji Phase. The site has yielded a bespoke seal revealing ownership and potter's marks on pottery started appearing that is initial stage of Indus Script (Durrani et al. 1995). Rehman Dheri is biggest of the all settlement sites in KPK above that the Kot-Diji aspect of the site remained in practice even during Mature Harappan Period. A continuous oc-

cupation is recorded at the site since fourth millennium to second millennium BC and size was comparable to Periano Gundai and Kalibangan (Durrani et al. 1995).

Kalibangan

Kalibangan is located along the banks of the Ghaggar-Hakra River dry bed, in north-western India, ca 200 kilometres from Harappa. It was excavated during 1960-1969s by B.B. Lal and Early and Mature Harappan material culture was recovered (Lal et al. 2003). The site is said to have Sothi-Siswal ceramics followed by Mature Harappan/Indus pottery (Ahmad,2014). Some of the sherds were comparable to Hakra and Rehman Dheri I which reveals regional interaction and connectivity. The site repeated sequence of occupation similar to that of Rehman Dheri where Early Harappan cultural traditions of Sothi-Siswal continued along with Mature Harappan/Indus. Sothi-Siswal is comparable to Hakra and Kot-Diji in Pakistan (Lal, 2003). A sequence of Radiocarbon dating of the Kalibangan has been established.

Kot-Diji Phase

Thanks to the discovery of Kot-Diji 2800-2600 BC (Plate-IV,c-d) earlier aspects of the Indus Civilization were revealed for the first time. The site is located along an ancient band of the Indus River, at the western end of the present town in the Khairpur district of Upper Sindh (Khan,1957). The excavations brought to light a new distinctive ceramic assemblage with types significantly different from those of the Harappan Civilisation (Wheeler,1968). So far the largest number of sites belong to Early Harappan/Indus Period leading to urbanization of the Indus Civilization (Possehl, 2000-2001).

The 2.5 hectares mound of Kot-Diji was provided with defensive wall like Harappa and Kalibangan but instead made of mud bricks laid on the foundation of limestone blocks of Rohri Hills provenance. Kot-Diji cultural complex has been dated back to 3200-2600 BC (Khan, 1957) . Ceramics

with similar characteristics in north-western parts in India Rajasthan, Haryana and Cholistan are known as Sothi-Siswal Ware (Wright, 2010)

Ceramic and other material culture remains confirmed that the early levels of Kot-Diji and comparable finds from other sites were chronologically and culturally to be attributed as an early stage of the Indus Civilization. Hence it became more evident that many complex and interrelated cultural processes which led to urbanization of the Greater Indus Valley had begun already in the fourth millennium BC Mohenjo-Daro and Harappa represent the final stages of such a processes that took place around the middle of the third millennium BC (Mughal,1999). After him J. Shaffer provided us with the framework thanks to him, under which the Indus Civilization is studied now. Regarding the Early Indus his Era of Regionalization encompasses the different time periods. It helps to interpret the processes involved in the progress of Indus Civilization. Though the story is far from completion, now we can suggest that the lowlands of the Balochistan provide us with some information regarding the emergence of the Indus Civilization. The Hakra Culture may contribute to the interpretation of the regional variations involved in the early stages of development of the Indus Civilization. The transitional phase of Indus Civilization has many different regional cultures included among which Hakra is preceding Kot-Diji Culture and dates back to ca. 2800-2600 BC (Mughal, 1997) on the basis of comparative archaeology. The focus of the present study is to interpret the Hakra Culture, how long it lasted, where and how Ghaggar-Hakra River it developed.

Chapter: 03

Geographical Expansion and Physical Features of the Greater Indus Valley

The geographic extent of the Indus Civilization was very huge. According to Kenoyer it covered 68000KM while Possehl gave an area of 80000KM and 100000Km (Possehl,1999). He believed that the area is double than all the contemporary civilizations (Kenoyer,1991). Following R. Mughal it was affirmed that the geographical extent of the Indus Civilization was astonishingly widespread that it had never been achieved by any other Oriental Civilization. According to him it stretched far north to Badakhshan, in Afghanistan while southwards it touches Arabian Sea and Western India (Gujarat and Rajasthan) (Mughal,1988). Jansen estimates it 100000KM (Jansen,2002) Mughal later perceived it more than 81 ha area or 1 million square km excluding the presence of Indus structures and material culture remains in Oman and the Gulf (Mughal,2012) .

The Greater Indus Valley

The Greater Indus Valley term was used by Mughal first time after his discovery of Hakra Ware in Cholistan, Bahawalpur, Punjab, Pakistan. It encompasses two river systems, the Hakra and the Indus in Punjab and Sindh. Both were flowing in same directions but approached the sea through different courses. The Indus delta towards west is extending up to the Arabian Sea where Hakra delta is expanding towards east in Rajputana Gujarat(Wilhelmy,1969; Flam,1986) where plains of Punjab are merging into the Ganga and Yumuna drainage system(Allchin et al., 1978). Most of the area is part of present-day Pakistan whereas a small portion is located in the Rajputana Desert in India (Plate-I, a). The Greater Indus Valley covers the piedmont of the Kirthar range in Sindh, Sulaiman range in northeastern Punjab, the Potohar Plateau, the Peshawar and Bannu Basin Plains and the

submontane region in Rajputana and the eastern part of the Thar Desert (Mughal, 1970). Law believes that many Indus Civilization sites are located far from the Indus River Valley. This is why R. Mughal used the term Greater Indus Valley to refer to a broader region encompassed by the civilization (Law,2011). The Indus River and its tributaries with large and diverse geographical setting is known as 'The Greater Indus Region'. It includes the Indus Valley, the mountainous eastern edge of the Iranian Plateau (Balochistan and the KPK), Gujarat, the Punjab, the Indus Ganges divide and significant parts of the Thar Desert (Possehl,1999:1). The scope of this chapter is to describe the territorial extension, geological features and archaeological context of the Greater Indus Valley further narrowing down to Hakra cultural horizon of Cholistan, in Bahawalpur, Punjab Province of Pakistan.

Greater Indus Valley covers plains between two river systems of Indus and Ghaggar-Hakra in provinces of the Punjab and Sindh (Mughal, 1970). The most important geographic features of the Greater Indus Valley are represented by hills, piedmonts, rivers, desert and alluvial plains. As the civilization was covering a vastly extended and diverse landscape, the geographic characteristics undoubtedly played a vital role to connect the far areas by providing easier routes within civilization and neighbouring regions. Such an integration must have been possible through effective communication and transportation commodities as well as exchange of skills for which environmental conditions and economy are basic prerequisites. The floodplains of the both river systems could have provided grazing fields for cattle and

Starting from the North, the type site of Harappa (Marshall, 1930, Kenoyer, 1988,1995, 2011) one of the main centres of the civilization is located. It is located in the centre of the alluvial plain of the Indus River, the formidable mountain ranges are commonly believed to be possible routes for the people of the Indus Civilization. Since they all lead to Kashmir, Central Asia and China. Northwest of Harappa are the Kirana Hills, while to the West is the Sulaiman Range with passes leading to

Iran and Afghanistan and through the Khojak Pass to the northern Balochistan. It is further linking to the southern Indus Valley through Bolan Pass. The Karakoram and Hindu Kush passes have direct access to Afghanistan connecting the upper Indus Valley to the far regions of Afghanistan. The Sulaiman Hills are located at the piedmont of the Hindu Kush toward the North. The Sulaiman range have many passes leading to Balochistan and further Afghanistan. Moving northward from Balochistan is the Gomal Plain which is covering Indus River moving across the Salt Range and Indus alluvial plains in Punjab. On the eastern side of Pakistan are located the sites in Indian east Punjab i.e. Kunal and another large city site of Rakhigarhi and Arravalli hills (Kenoyer,2011). Moving south is located the centre of Ganweriwala and the Hakra culture sites of Cholistan that is adjacent to Rajasthan (India).

The Ghaggar-Hakra and the Indus Rivers flowed parallel in Sindh, south of Mohenjo-Daro (Kenoyer,1991). To the West is the Kirthar Range that runs west of the Indus River and divide Sindh from Balochistan. The Sulaiman Range runs south to the Indus Plains as the Marri-Bugti Hills. Further south is the Kirthar Range running from north to south. Between the Marri-Bugti and Kirthar Ranges extends the alluvial Kachi Plains. The Bolan River Valley that flows through the Kachi Plain creates one of the major passes that access to the highlands of Balochistan and the Iranian Plateau (Jane, 11).

Environment

According to Possehl environmental reconstruction of the Greater Indus Valley ca. 7000 cal. B.C. to 1000 cal BC has According to G. Possehl the environmental reconstruction of the Greater Indus Region from cal. 7000BC not received any systematic attention (Possehl,1999:268). Hence there is a partial consensus among scholars that the environment during Seventh millennium onwards was pretty much as that of today with regard to rainfall (Reikes,1961;Mughal,1970, Possehl 1999). The principal geographical feature of the Greater Indus Region is the drainage basin of the Indus River

that consists of the lower Indus Valley, Sindh, and the Punjab in Pakistan with four principal tributaries to the Indus Jhelum, Chenab, Sutlej and Ravi Rivers (Possehl, 2003: 1). The central part of the Greater Indus Valley consists of an great alluvial plain gently sloping from northeast to southwest and then southward with an average fall of one foot to a mile. The plains of the Punjab and Sindh collectively cover an area of 90,000 sq. miles (Mugahl,1970:18).

The Indus River

The origin point of the Indus River was discovered by Sven Hedin in 1907 at the sacred spring of Singikabab in Tibet at an elevation 5165 m (Possehl,1999). The Indus River springs out of the North slopes of Mt. Klias or Kangrinboche Feng to Tibet (Shoder, 1993). The province of Punjab is irrigated by Indus River. The river enters Punjab across the Salt Range and at the boundary between Sindh and the Punjab it is joined by five rivers named, Ravi, Sutlej, Beas, Jhelum and Chenab at a point known as *Panjnad* (meaning by five rivers). People in general traditionally believe that Punjab is named after these five rivers as the word *Punjab* literally means ‘a land of five waters’. Then it flows through Sindh and creates a wide delta before entering the Arabian Sea. Sindhu is the most ancient name of the Indus River mentions in *Rigveda* as a stream but for modern plains in Sindh it is the most powerful, violent and the lifeline (Possehl, 2003). According to M. Pithawala during the Cenozai Era, the mammals age marked by global cooling Sindh gulf was replaced by a valley with streams and lakes, bays and lakes and then sea ultimately dried out and plain was left to Indus River to flow. By the middle of the Pleistocene, the geography of Sindh was shaped by the Indus River and it solely credit of the Indus River to bring layers of Himalayan hills and formed and interesting topography. By the time Indus Delta started growing southwards and the level of the Indus Plain pushed the river to reduce in size . As a result it started to change its course from east to west and west to east. Also the mouths of the main watercourse the land is not settled. The Indus River is the life of the land (Pithawala, 1959 ed. 1979). Shoder has mentioned two more small rivers in the

region which seems important in the history of late Cainozoic period, namely are Soan River located between the Indus and the Jhelum forming the Potohar Plateau and their easternmost Ghaggar (Hakra) River that at the end of the Bronze Age started to disappear in the Thar Desert (John and Shoder, 1993). L. Flam has provided us with three former courses of the Indus dated from 8000 BP to 1300 AD. The oldest, he named Jacobabad Course that flowed at the beginning of the Holocene. The second river course (Middle Holocene) was the Sindhu Nadi subdivided into three courses in Lower Indus Basin. The most recent course is the present-day Indus River (Flam, 1981: 74). Without the Indus waters, Sindh would turn into a desert landscape, because it produces the most fertile alluvium and regularly renews it. According to Flam's classification the most recent Indus course flowed across the Kachi Plain west to the modern course and second course around third millennium BC flowed just west of Mohenjo-Daro (Possehl, 2003:7).

Nara Nadi

In the easternmost part of the lower Indus Basin, a separate river system is visible from aerial photographs. Among many names associated to it (Ghaggar, Hakra, Nara) in Pakistan, it flowed towards Derawar Fort and Fort Abbas Bahawalpur, Punjab, where it is known as Hakra River. From Derawar Fort to the Rohri Hills in Upper Sindh, its course is marked by two channels called Raini and Wahinda. From southeast of the Rohri hills to the Rann of Kutch its course is known as Nara Nadi (Flam, 1981: 76; Mughal, 1971: 19). The Ghaggar River flowed more or less parallel to the Indus in the southeastern part of the Punjab with its tributaries, the Markanda, Sarsuti (ancient Sarasvati) and Chitang (Mughal, 1970).

Landforms

The geomorphic evolution of the Punjab is not fully understood, though many tectonic movements and cross-divisions between the Indus and its tributaries has produced distinctive landforms i.e. *doabs*, piedmonts, meanders and bar uplands, etc. The plains of the Punjab and Sindh are generally

featureless, though natural elements helped form rich sediments and soils. All the rivers in the Greater Indus Valley originate from Himalayas. The Indus and Sutlej have a trans-Himalayan origin, while the Chenab, Ravi, Beas and Jhelum spring out from south Himalaya. Their flow result from heavy snowmelt and precipitation over the Siwaliks (De Terra and Paterson,1939). The Indus system forms a wide plain stretching from the Himalaya to the Arabian Sea. The plain has many confluence points known as *doabs* in Punjab (Beg, 1995).

Doab (land between two rivers) pattern is formed by the eastern tributaries, five rivers, of the Punjab. It does not extend to Sindh as the Indus forms a single channel at Mithan Kot that flows down to Sindh and to the Arabian Sea. Keeping in view the historical records of the Punjab Gazetteers, and on the basis of ethnohistorical observation, G. Possehl has reconstructed the farming and pastoralism pattern of the Bronze Age period. He suggested that the farmers of Punjab exploited the vast pastures in *doabs* or *bar* (middle of the *Doab*) to utilise water supply and cultivate fertile soil for agriculture (Possehl, 1999). *Bar* land belongs to most ancient alluvium now forming a plateau 15 to 20 feet high (Mughal, 1970). It could also be linked with contemporary trends among which agriculturalists and pastoralists could move closer to rivers for agricultural and herding purposes and keep their residential places above and away from the flood plains of the rivers. Such environmental settings and geographical locations would also have provided efficient movement routes for nomadic pastoralists, and trade routes for the transportation of the commodities through rivers or via land. Seasonal migrations were common in the Subcontinent until recently and its practice still continues today (Mughal,1997). People of the Mature Indus period were mobile, cattle keepers, craft and career specialists working and moving on seasonal rounds from Saurashtra to Sindh and from Sindh to Cholistan (Possehl,1999) Mughal has mentioned numerous pastoral camp sites in Cholistan (Mughal,1997; Possehl, 1999).

In the plains of the Punjab and Sindh, few distinct features include active floodplains adjacent to rivers, inundated almost every rainy season or when the snow melts in the highlands. When the water level is low, areas of coarse-textured sand and silt are exposed, and the surfaces are scarred by numerous active or abandoned channels. Active floodplains occur along all the rivers except the lower half of the Ravi. This belt is quite wide from Kalabagh to the Indus delta (Shoder and John, 1993:33).

Across the active floodplains meanders are visible beside recently abandoned river courses. They lie parallel to rivers though they are not continuous (Possehl, 1999). The meander floodplains usually adjoin the active floodplains, although they are slightly higher. They occur also away from the present river courses within old channels. Bars, meanders, levees, oxbow lakes are common. The soil texture is variable, because of the diversity of the material deposited. Meander floodplains are widespread along the Jhelum, Chenab and upper reaches of the Ravi also in Sindh though not in the upper reaches of the Indus (John and Shoder, 1993:34).

The cover floodplain of the Indus River is the largest spread of recent alluvium (Possehl, 1999). It was abandoned by rivers and the varying speed of the floods have deposited soil with different textures. The gentle floods bring fine alluvium also it is indistinct with meander floodplains (John and Shoder 1993; Possehl, 1999). Most of the plains of Sindh consist of cover floodplain, as are the Bahawalpur Plain between the Sutlej and the Thar Desert, the Ganji Bar area between the Ravi and the old course of the Beas, and the Rechna Doab area between Ravi and Chenab. Strong geomorphic changes have occurred in the Thar Desert during the late Pleistocene and the Holocene, when conditions have been both wetter and drier than they are at present (John and Shoder, 1993: 34). The Indus River is mainly responsible for the formation of the surface soils of its plain (Beg, 1993) and largely brings glacial sediments of sand, silt and clay from upper reaches of the northern mountain systems (Beg, 1977; 1993). The City of Larkana in Upper Sindh and the ancient location of Mohen-

jo-Daro has been for sometime slightly higher ground than the rest of the meander floodplain (Possehl,1999). From 1902-1930 the silt deposition of the Indus River between Sukkur and Kotri recorded 1300

square miles. From the time of ancient Mohenjo-Daro the floodplain has risen almost 30 feet (Lambark, ;Dales,; Mughal,1970). In Lower Sindh the ancient courses of the Indus have been traced. One buried channel is coincides with the modern upstream of the Indus near Hyderabad and another is beneath the old Nara (Hakra) Canal to the East, alongside the Thar Desert (John and Shoder,). Lower Sindh is filled with Tertiary and Quaternary alluvium (Flam,1993). One of the major occurrences of the geomorphologic changes of the Indus course was the passage across the limestone outcrops at Sukkur. According to Arab texts, the 'Sukkur gap' is dated to 900-1300 AD (Lower Indus Project 1965, Lambark, 1967, Holmes 1968) and since then it is the passage through which the Indus River flows (Flam,1993:270).

Starting from the southern edge of the Potowar Plateau, the Indus basin also includes the piedmont area between the Salt Ranges, along the Himalayan foothills, and the Punjab alluvial plains (John and Shoder,). The Western Piedmont includes the areas between the mountains of Balochistan (for which Sir Aurel Stein first and then Possehl has used Greek work Gedrosia) and the Greater Indus Valley. The importance of the Western and Eastern Piedmont plains in the Greater Indus Valley seems tantamount to the availability of the rich soil as Piedmont plains are the centre of erosion, deposition and accumulation of silts. In the Western Piedmont plains hill torrents called *nai* in Sindhi language are the most important source of water. The Western Piedmont is an old alluvial plain located between the Afghanistan Mountains and Balochistan highlands (Pithawala,1959). Western piedmont marks its northern boundary between the Sulaiman Mountains and the Kirthar Ranges forming its western border, where Kohistan hills hovering over Manchar Lake. The highlands of Kohistan in the extreme northwestern Sindh are composed of limestone tertiary rocks

(Pithawala,1959), while the limestone Kirthar range (Blanford,1880) joining the eastern side. Kirthar ranges includes also the Kachi plain in Upper Sindh and covers some foothills of the Sulaiman ranges in northwestern Punjab. Kirthar and Sulaiman ranges separate the greater Indus Valley from the sub-regions of Balochistan and is located between the two mountain ranges (Mughal,1970). From the Kirthar range many torrents and streams spring out (Possehl,1991). Most of the above watercourses flow directly or indirectly into the Indus (Panhwar,1999) Among them most important is the *Gaj Nai*. It is perennial and runs through the middle of the Kirthar Range above the Manchar Lake. Gaj Nai cut through the centre of the Kirthar Mountains and ends at Manchar Lake flowing through the Kaccho in Dadu district.

Gaj Nai is a fossiliferous limestone formation with shales and sandstones at its base (Blanford, 1880) belonging to the Miocene period that spreads over large area of Kohistan. It provides much building material. Inside it are aremarine fossil like corals, echinoderms and molluscs. Its last phase was the fluvial, formed Manchar Lake in Siwalik Age, which was mammals age in Cenozoic Era known after global cooling and blossoming flowers (Pitthawala,1959;1979:24). All the passes that cross the Kirthar Range have played a vital role to build its own alluvium. Most important passes associated with Gaj Nai are Mula and Bolan River passes that cut through Kirthar Mountains and also impacted the local trade and communications on larger scale. These *nais* have hot and smaller springs carrying calcareous minerals. Perhaps they had been used for irrigation along the Kirthar range since ancient past (Possehl, 1991).

The Manchar Lake is of utmost importance among all other *dhands*. It is not very deep on average it is 2.5 to 3.75 meters but important for small scale cultivation of *Rabi* crops in the region. It is fed by adjacent torrents, monsoon rains and occasional inundation of the Indus on its western bank. It is the largest freshwater lake in the Subcontinent. The Manchar rocks consist of Tertiary formations dating back to the Upper Miocene to the Pliocene. The Manchar group is underlain by the Gaj for-

mation (Khan,1979). G. Possehl has given account of Majumdar when he visited the lake in 1930 and noted that spreads over 25000-30000 hectares and during flooding seasons it swelled over several thousand hectares. The northern part of the Kirthar Ranges gives way to torrents through Sindh hollow or the Nara Valley where it drains to the Manchar and later to the Indus (Panhwar, 1999). The filling and emptying up pattern of the lake brings prosperity to the land and increases fertility by replacing silt layers. When the lake is filled it covers almost 200sq. miles and when emptied its 14-30 sq. miles (Pithwala,1959;Mughal,1970). After flooding seasons the lake is drained by the Aral River leading it to the Indus and during floods in Indus River it becomes feeder of the Manchar Lake carrying extra water from the river. The Nara Canal runs east of the Indus flowing along the western fringes of the Thar Desert. This is an old river bed with many names, Hakra, Sankara, Wandan, Dahan, Dhadhawah and Wahind etc.(Possehl,1991)This is a major canal and one of the main sources of irrigation. It might be the lower portion of the ancient Sarasvati River of the Vedic literature (Possehl,1991:284).

Among the Piedmont plains the most substantial soil is that of the Kachi Plain. It lies in Kirthar Piedmont and soil formation is bestowed by hill torrents like Bolan River and Western Nara assisted by Mula River and many *nais*. On the north-eastern side it is flooded by the Murri-Bhugti hills of Sulaiman Ranges, that extend farther to the Indus Plain. In the north of the Sulaiman hills flows the Gomal River. The Piedmont of the Sulaiman Hills forms a tract of hard soil in Dera Ismail Khan in Khyber Pakhtunkhwa. The tract shares its boundary with Dera Ismail Khan in Punjab where its called Derajat and appears a treeless plain. It is the region where provinces of Punjab, Khyber-Pakhtunkhawa and Balochistan meet. It connects Indus plain with different passes into the mountains. The hill torrents irrigate the tract annually thus local people prepare the land for the cultivation.

Sub-Montane Region of Indus

The submontane region of the Indus consists of plains of Peshawar, Kohat and Bannu, the Potowar Plateau and the Salt Ranges. The Potowar plateau is also referred as Rawalpindi plateau and it marks off the boundary of Indo-Gangetic plain but its peculiarity lied in the proximity with the Salt Ranges. Most of the Potowar Plateau is covered by Soan Basin. Soan is old channel of once a larger river flowing with Indus and connected Ganges and Brahmputra (Bhatti, 1949). Indus flows into the Punjab from north where the mighty Salt Range defines the northern edge of the of the Punjab. The Indus here passes west through the Salt Range at a right angle. John quoted Rynolds who noted that in Siwaliks once an east-northeast flowing river in eastern Potowar plateau was replaced by a southward flowing river which could be ancient Jhelum or upper headwaters of once Soan. He also quoted Pascese who wrote that Jhelum River bears evidence of being as headwater of the Soan River which was later captured by the lower Jhelum (John and Shoder,). Salt Range is the southernmost rampant of the Himalayas. The highest peak is Sakesar hill measuring 1524 meters and this ridge divides the Potowar Plateau from the Indus Plains. The Salt Range is flanked by the basin plains of Peshawar and Bannu on the North and northeast. To the Southeast it stretches up to the Siwalik hills which are running parallel to Himalayas for 200KM (Spate and Learnmonth, 1942; Mughal, 1970). Gaur mentioned four perennial rivers with small water discharge among them Gagghar River was cutting through the sediments of the upper Siwaliks. Along with them many seasonal torrents knowns as *Choes* in local language were also common. These Choes originate near northeastern margin of the Upper Siwaliks and disappear at short length. Upper Siwaliks in the east of Ghaggar are drained by the *Choes*. These Choes are usually carrying flood waters and marks a length of few meters. They are massive torrents during the rainy season and spread over in dendritic patterns (Gaur, 1855).

The thick sand dunes are defining the eastern border of the Greater Indus Valley. Which includes the districts of Jaisalmer and Bikaner on Indian side in the North and Tharparkar desert and Cholis-

tan desert in former state of Bahawalpur, Punjab, Pakistan. The desert tract of Cholistan is the portion of the Great Indian Desert and west depression is known as Hakra (Gazetteer Bahawalpur). Cholistan desert, also known as Rohi, is the western border of the Thar desert. It is marked by the old bed of Hakra River. The desert area is separated from the western plains by the dry bed of Hakra River which is believed to be one of the main sources of water in ancient past. It further moved to the South in Sindh and Rann of Kutch where it recognises as Eastern Nara. Now desert of Cholistan is partly cultivated and becoming focus of industrial development. The Siwalik floods and winter rains bring water which yields vegetation and soil aridity. The climate is mostly dry and long span of summer has yield the idea of establishment of the country largest Solar Park named Quaid-I-Azam Solar Park, by the Government of the Pakistan.

Climate of the Greater Indus Valley

The Greater Indus Valley (Plate-II,a) is dominated by two weather systems i.e. winter cyclonic system and summer monsoon system (Possehl,2003). The region lies under southeast monsoon and due to being in extreme west of subcontinent it attracts low monsoonal pouring, also winter winds coming from Mediterranean Sea and Persian Gulf lose its moisture while reaching Indus Valley (Khan,1968). Winter cyclonic system and summer monsoonal rainfall are two major weather systems of Indus Valley. Winter brings snowfall in Balochistan and rainfall in northern and western Indus Valley whereas summer monsoon brings heavy precipitation to the northern Indus Valley(Kenoyer,2013). The average rainfall in the Thar is 10 inches and in the southernmost formations of Sulaiman Range and Kirthar Hills it rains 10-15 inches annually (Munshey,1951). Mughal going through the Geological Review Pakistan and Report of has recreated the temperature and rainfall table of the Greater Indus Valley.

Region	Rainfall Average	Temperature Summer	Temperature Winter
Karachi	7.70 inches	93 F	66F

Badin	10 inches		
Hyderabad	7 inches	105 F	50 F
Tharparkar		104 F	47 F

He has characterised the level plains of Indus Valley including middle and Upper Sindh, Punjab and western Piedmont plains as Sub-Tropical Continental lowlands with following variables (Mughal,1970).

Region	Rainfall	Temperature Summer	Temperature winter
Sub-tropical lowlands	10 inches /variability 40%	105 F	40 F
Kachi Plain		113F / daily can shoot unto 126 F	
Kirthar Piedmont	3.6 inches		
Sukkur	3.70 inches	114 F / 73 F	85 F / 37 F
Bahawalpur	1.79 inches	110 F / 90 F	75 F / 45 F
Central Punjab	19.21 inches	105 F / 79 F	68 F / 40 F
Submontane covering Pothwar plateau	31.83 / 36. 37 inches	80 F / 105 F 75. 9 F / 103. 5 F	42. 2 F / 65/6 37. 9 / 62. 3 F

The combination of the rainfall and temperature shows that Indus plains are prone to high temperature and water desiccation. The evaporation and thermal efficiency in the Thar is the highest in the summer and coastal winds from the Arabian Sea keep it hot in the winter too. The cycle continues in the upper Indus Basin including Makran (Khan,1968). The climate of the Kachi Plain was the same for hillmen and Harappans in 2000 BC. As today (Reikes,1961). Posschl has interpreted that there has been no significant changes in the climate and rainfall of the Indus Valley since 9000

years ago (Possehl: 2003). The people of the Indus zone had been inhabiting an arid hot desert and dry winters with a precise change in the limits since mid Holocene. He also quoted Miller who argued that fluctuations in the climate of the Indus Valley was normal and minor changes in the rainfall were also common. The farmers were adapted to frequent changes to the environment (Petrie, 2019). The Archaeoclimatology studies by Wright et al. shows that during Harappan times there was dramatic transitions in the precipitation pattern following 4000 years of Holocene stability. Climatology studies on the River Beas, Indus and sediments of the Ghaggar-Hakra have demonstrated the fluctuation in the monsoonal cycle in the Harappa region around 4100 BC or 3600Bc to 2100 B.C.(Wright et al., 2008). Biagi has discovered many mesolithic sites in Thar desert and Radiocarbon analysis confirmed the abundance of rainfall and vegetation cover and humid climate by the beginning of Holocene (Biagi,2008) Most of the scholars agree that there was no significant difference in the climate of the Indus Region on the basis of the reconstruction of the research done using pollen cores Singh et al. suggest that there climate was more humid in 3000 to 2000B.C. whereas Global Climatic Models of (Bryson and Swain) suggested that rainfall was abundant during 5800B.C to 1800 B.C. and after 1800B.C a fluctuation occurred. However such interpretation are not trusted much and there is still vacuum in the details of the weather patterns of the Indus Valley (Possehl: 2003). Possehl further argued that the greatest difference in this regard would have been the drainage system since Ghaggar-Hakra river was present and Indus River was also flowing on different river channel than today. Indus and its tributaries would have been flowing with full force because the huge canal irrigation system of the Sindh and Punjab was not in vogue (Possehl,2003).

Soil and Minerals

Surface soils of Pakistan are deposits of Pleistocene, older Holocene and Younger Holocene. Soils of active floodplains are laminated silt loams, sand and silty clays. Indus River forms sediment of

its plain consisting sand, silt and clay. The Potowar Plateau is the conglomeration of Sandstones, shales and limestones. The middle and lower Indus is filled with cancerous alluvium from Pleistocene to younger Holocene and Tertiary rocks of limestone from early Eocene. They form a moderate sandy and clayey soil. The Kirthar and Sulaiman and Salt Ranges contribute additional material(Beg, 1993). The limestone of Rohri Hills in lower Indus basin is hard fissured and cracked flint(Flam,1993). Harappan mines at Rohri Hills discovery by Biagi show the extensive use of flint tools by people of Indus Valley (Biagi et al.,1995).

Hakra River

Hakra river(Plate-II,b) is often identified with and traditionally believed the lost Sarasvati River (Gupta, 1995), Ghaggar in India and Hakra in Pakistan since ancient times known as Sarasvati was the holy river mentioned in Rigveda as “foremost of the Rivers” in Vedas (Possehl, 2003:8) and it literally means “Chain of Pools”(Possehl,1999:359). In the third millennium BC Ghaggar-Hakra came together here from the streams of the Siwalik Hills (Possehl, 2003:4).

Regrading origin of the term Hakra Tod and has traced it from the words of the Caggara or Sankara. About Caggara, he mentioned was a river which was engulfed in the sands and Sankara was also once a stream, running parallel to Indus and used as a demarcation line during Nadir Shah’s time when he extended Persian Kingdom to the fertile Indus Valley. Possehl has seconded the origin from word Sankara meaning serpent a snake locally known ‘naga’ or Cobra and given its symbolism with ‘nalla’ from nag-a as Tod has mentioned the inability of the people from the northern region to pronounce ‘S’ slyabant (Tod, 1829:32 ;Possehl, 1999:361).

By going through the available written records one can understand that multiple efforts have been made to trace the origin and original course of the Sarasvati River. In recent times use of the technology like remote sensing and most latest LandSat imagery has helped scholars and scientists lot.

The course of the river whatever part of it has been discovered is more or less same described different scholars. However, modern scholars are trying to

It is not still clear whether Ghaggar-Hakra-Nara River ever flowed to Sea (Law, 2011, Flam, 1993, Possehl, 1998). Flam has also given accounts of two early scholars Pascese and Pilgrim who hypothesised and speculated existence of one river system in the submontane of the northern and northeastern Himalayan areas which flowed to the Arabian Sea. Pilgrim named it the Siwalik while Pascese called it Indo-Brahm. The river with either name was supposedly carrying drainage of the Brahmaputra, Ganges and the Indus. Pascese believed this river system lasted till Tertiary Period when the Indus System moved west to east, river by river it captured Jhelum, Chenab and Beas and its affluents. During this cycle of events the river of Yamnua(Jamuna) and Sutlej started flowing westward of the Himalayas in an independent Hakra-Nara course, Ganges started flowing independently. During Pleistocene tectonic dismemberment this single river system converted into three river systems and formed (i) the Indus (ii) the Ghaggar-Hakra-Nara (iii) the Ganges. During these events of geomorphological changes when Sutlej was captured by the Indus and Yamuna was captured by the Ganges the drying up course of Ghaggar-Hakra course was happened (see L. Flam PhD thesis).

Willhelmy calibrated the previous data and concluded that there were two river systems existed in the Indus lowlands around 2000BC also frequently changing Hakra-Nara course and Indus River. The watershed was divided between the Indus and the Ganges which was determined by Sutlej and Urjumna (Chautang), both passing in to the Indus Basin. The Sarasvati of the RigVeda was also a tributary to these rivers, which was suggested by Ghose et al. with the help of LANDSAT imagery that the river flowed few hundred Km further east of the present Indus River. Around 1000BC the Yamuna was captured by the Ganges but Sarasvati continued its course later when Sutlej changes its position due to avulsion and moved northwest it turned into Sarasvati-Sutlej. By the 600BC this

new Sutlej course was irrigating a river valley at the eastern margins of the Indus Plain throughout the year. The course of the Sarasvati was overlapped by Yamuna and Sutlej rivers multiple times and Hakra-Nara started drying up. Around 500BC when once again Sutlej changes its course and merged into Beas the old Sarasvati-Gagghar disappeared while all the old channels of Sutelj dries out. (Shoder,1993:26).

The Hakra River bed was filled mainly by the monsoon-rains which the Himalayan range of Siwaliks received abundantly thus it did not carry large quantities of water and ceased to carry a perennial flow of water (Stein,1942 ed. Gupta1995; Mughal,1970). The ancient bed of Ghaggar River lies in the 'Great Indian Desert' long stretch of the river bed passes through Bikanir and Jaisalmer districts in Western Rajputana in India. Jaisalmer adjoins Bahawalpur in Pakistan which contains major portion of 'Great Indian Desert' known as 'Thar Desert' also known as Cholistan through which bed of the Ghaggar continues and called as the Hakra (Stein, 1942 ed. Gupta 1999). Towards the South in Sindh it flowed through Raini and Wahinda rivers and then in the eastern through Nara and Hakra rivers to the Rann of Kutch (Oldham,1893; Wadia,1938; Stein,1942, Mughal,1970; Ghose,1979), however Alchin *et al.* are of the view that the Sarasvati River finding the channels through above mentioned course around third to second millennium BC either joined lower course of Indus in Sindh or independently drained into Arabian Sea through Rann of Kutch (Alchin,1978;Ghose,1979). On the basis of LANDSAT imagery Ghose has produced new conclusions that the Sarasvati River when severed itself from its tributary Luni River in Rajasthan and did not join Raini-Wahinda, Nara-Hakra in Pakistan known as Hakra-Nara course at once, (as it was believed earlier) instead first it moved westward and captured different channel to flow through the present desert in the District Jaisalmer in India and joined the said course later (Ghose,1979). The ancient bed of the Ghaggar-Hakra runs parallel and almost 20 to 70 miles northeast of Indus River in Bahawalpur, Punjab(Mughal,1970). The sand dunes and depression in Cholistan Bahawalpur are

carrying imprints of the old river. Flam has given location of the river channel from Fort Abbas to Derawar fort in Cholistan, which is supported by aerial photography as aerial photographs bear enough resolution to point out the marks and cavities left by the Hakra River channel in the past.

Weather System in Greater Indus Valley

Subcontinent has two main weather patterns. The northwestern part has a cyclonic winter of the highlands and monsoon system of the Peninsula (Snead, 1968). This climatic pattern is highly beneficial for the region providing alternate sources of water and irrigation and suitable environmental conditions for cultivation and agriculture. Rikes's detailed study and climatic models developed for Indus Valley in prehistoric times indicated that weather pattern in Greater Indus Valley were same as today (Rikes, 1965). Recent climatic models developed by Rita Wright revealed that weather pattern in Indus Valley that around 10,000 years ago might have experienced a slight reduction in monsoonal rains (Wright, 2010).

Weather Early Food Producing Era

During this period monsoonal pattern of the subcontinent provided enough moisture and soil fertility to cultivate and grow agricultural commodities (Gupta, 2004). This transformation could have helped hunter gatherer communities to develop an agricultural economy. The lake deposits from Rajasthan and adjacent areas in Gujarat India which are comparable to Hakra and the currently desert landscape is comparable to Cholistan indicate that there were high water levels in the lakes during Early Food Producing Era (Enzel et al., 1999). On the basis of several studies and climatic models it is safe to say that during Early Food Producing Era which is often termed as Pre-Harappan Era that triggered agricultural growth and community life. Possehl has rightly emphasised upon the village life emerged in high lands of Balochistan was the result of this environmental scheme (Possehl, 2002). It also accelerated the village settlements at larger scale due to growing

population and varying agricultural practices (Possehl, 2002; Gupta, 2004). The changing weather pattern and varying degrees of water levels led and eastward expansion of the village settlements (McIntosh, 2007). The lands along Indus River could have been favourite to grow lentils and barley given the availability of fertile and mineral rich soil. Tributaries of the Indus River were equally hosting communities and could have fed large population. Mehrgarh population was dependent upon barley, lentils and wheat (Meadow, 2011) they seem unaware of the rice crop (Agarwal, 2007).

Early Harappan/Indus Civilization Phase

Early Harappan Phase falling in the ambit of Reginalization Era of Shaffer is marked with same humid and warm climate suitable for agricultural growth. Indian monsoonal rainfall had been intense during this period. Fleitman did not notice any regional variation in the weather system from 5000-4600 BP but level of winter and summer rainfall decreased as compared to Early Harappan/Indus Period (Fleitmann et al., 2009). Increasing number of villages during this time period was most common and swift. The role of rivers in Indus Valley became relevant more than ever during this stage. The emergence of settled village life and gradual improvement in the production helped expansion of the Indus Civilization along the courses and banks of rivers. Hakra river played its role during this stage when it flowed parallel to Indus River but as a tributary to it. Possehl noted that the crop production remained same as during Early Harappan times but stability and gradual efficiency led to initial stage of urbanism. On the basis of Hakra Ware Culture by Mughal is justifiably relevant here to become incipient stage of urbanism. His speculation predicted accurately that the early village farming communities of Mehrgarh migrated to low lands of Cholistan as pastoral camps and settled in the long run.

Mature Harappan/Indus Phase

Weather system can easily be predicted as favourable for obvious reasons. The urbanization was in full swing during Mature Harappan Phase. Economy of the Indus Civilization was based on trade of surplus commodities which was supported by locally available resources mainly agriculture. Faunal representation on seals indicate a favourable climate during Mature Harappan Period. Bull, Rhinos, elephant and buffalos , etc., are species of tropical weathers with abundant water and vegetational growth. Ghaggar-Hakra channel came into focus for settlements during Mature Harappan Period. Ganweriwala in Cholistan is lying on an equidistance from Lothal which was state level port and coastal site. The abandonment of the sites along the Ghaggar-Hakra channel shows that water level started decreasing (Possehl,2002).

Late Harappan Phase/Localization Era

The reduction of water resources continued during Late Harappan Period and Indian Monsoon cycle was weaken alarmingly. Low Monsoon could have contributed in reduction of water level Ghaggar-Hakra. Drying up of Ghaggar-Hakra River pushed population towards eastward and settled in Ganges and Yumuna region. Settlement sites along with Ghaggar-Hakra were abandoned and nomadic life again resumed (Ratnagar, 2000).

Chapter: 04

The Early Period; Trajectory to Indus Civilization

The Early Harappan which represents four phases of occupations considered contemporary are:

1. Amri-Nal Phase (Though Amri is completely different from Nal Phase still it is generally referred as one, (Personal communication with Prof. Paolo Biagi, August 15, 2020).
2. Kot-Diji Phase
3. Damb Saadat Phase
4. Sothi-Siswal Phase

The most important thing about the Indus Civilisation is (Kenoyer, 2005) that even after passing decades of discovering of Harappan Culture the views, facts and findings of this civilizations are changing with every passage of day and with every new discovery of sites as well as things which belong to Indus Valley Civilization. But on the other side, (Shinde, 2016) the basic facts of the sites, such as, religion, territorial extent, trade means and character are unchanged. In the same way, different sites and material that was discovered in different regions of Indus Valley was analyzed in the pretext of Indus Valley Civilization. But it was the year 1960 which tilted the views and angles of archeologist regarding the pre-Harappan development and emergence of mature Harappan phases of Indus Civilization.

Furthermore (Sengupta, Deshpande, Bhushan and Sarkar 2016) different paradigms about the emergence and development of Harappan culture are changing with every coming day. But there are number of basic things which are crystal clear regarding the settlements of Indus Valley Civilization of regarding the basic culture of Indus Civilization. For instance, the rise of Indus Valley Civilization was the diffusion of Mesopotamian and Iranian Civilizations that were diffused and the people of this Harappan Region adopted the cultural values of these previously existing civilizations. Likewise, the other solid views regarding the Harappan Culture is that the cultural values that are diffused from Iranian and Mesopotamian Cultures to Harappan Culture were transferred in a very refine and developed shape. Furthermore, (Mughal, 1990) eluded that these values either they were kind of social or economic; they were mature and ripe in their natures. In this way, when these cultural values were adopted by the people of Indus or Harappan Culture people, these norms further developed with the passage of time.

Additionally, (Mughal, 1990) the Indus Civilisation was remained inelastic, rigid and unvarying throughout its historic period. And there were number of factors behind this rigidity and homogeneity. First of all, the nature of people of this region is antagonistic. They were not open for sudden change or change without any purpose. Secondly, the process of internal diffusion of values that are taken from outer side was very slow. Moreover, on the other side, there was a direct link between Harappan and Mesopotamian Civilization. Because there are lots of similarities between these two apart civilizations which are clear from the deep analysis of these civilizations.

On the parallel lines, this view about the demise of Harappan Civilization (Thapar, 1975) is also clear that this great as well as developed civilization of its time was ended due to the attack of Aryan speaking people from the North. In the same way, the other solid view about the end of Indus Civilisation is that it was demised due to the heavy flood in Indus River. As the main sites or heartland of Indus Civilisation people were living just at different banks of Indus River, therefore, it is great possibility that people living over there might be terminated due to occasional flooding in In-

dus River. Also, the other view regarding the demise of Harappan Civilization is that they might use the land resources in abundance or exploitation of resources in unnatural way which resulted in end of natural resources for living that further put an end the great Indus Civilisation.

Moreover, regarding the exact data and time of start of pre-Harappan period (Sarkar, Mukherjee, Bera, Juyal, Morthekai & Rao 2016) there are lots of things that can be compared at different already discovered sites. Likewise, the radiocarbon dating of archaeological carbonates from famous seven cultural stages of Dholavira, from excavated Harappan settlement of India and from Rann of Kach provide some clue of about the beginning of Pre-Harappan period some 5500 years BP which continued up to 38 years BP. The settlements under the pre-Harappan period developed in a very smooth and rapid way. As there are favourable elements (Madella & Fuller, 2016) that supported the growth of these early Harappan settlements under the shadow of Indus Valley Civilization. The plain and fertile land of Harappan region, availability of versatility in climate, and abundance of water from the great Indus River all these factors played significant role promoting the pre-Harappan culture in the nook and corner of territorial boundaries of Indus Valley civilization of Harappan Culture.

The geographical expansion during Early Harappan Phase was Potowar Plateau in Pakistan and Haryana, Rajasthan and Gujarat in India (Possehl, 2002). We have many sites of Harappan Phase in Piedmont region of Balochistan highlands, Gomal Plain, Indus Valley and Sarasvati basin. The Early Harappan Culture has been extensively studied and dated prior to the fully flourished phase of Indus Civilization. It represents the developmental stage in Indus Valley.

The Early Indus term was first used by Rafique Mughal who found the term Pre-Harappan as 'misleading' (Mughal,1970:5). He debated the approach of dealing archaeological material since Indus Civilization came to fore in 1920s. The abundance and uniformity of the material from Mature Harappan levels influenced the interpretations and discourses on larger scale. Less attention was paid to materials with differences in nature and form. The material coming from sites of Indus Civi-

lization different from the Mature Period and stratified below Mature Harappan was simply termed as Pre-Harappan and sometimes non-Harappan. In conclusion unconsciously two broad categories came to light Pre-Harappan and Harappan. Often Harappan material found with Pre or Non-Harappan was declared as intrusive which showed a scholarly bias (Mughal, 1970). Mughal well defined the term Early Harappan in his PhD thesis at Pennsylvania University (1970) and rejected the impression of any separate phase in Indus Civilization described as Pre-Harappan. He redefined Wheelers interpretation of the layer 26 and 26 A from Harappa which was originally defined as alien by Wheeler (1947) whereas Mughal reinterpreted this notion and termed it as Early Harappan (Mughal, 1970; Kenoyer, 1991).

“ In my opinion the term Pre-Harappan is misleading and it creates an impression that a chronological gap exists between the Pre-Harappan period of the first half of the third millennium BC and the Mature Period of Harappan Culture belongs to the latter half of the third millennium BC other terms ‘antecedent’ and ‘Proto-Harappan’ sometimes used in archaeological literature are vague, remain undefined and beg questions I feel that all of the material found stratified below the ‘Mature’ Harappan at Kot-Diji, Amri, Kalibnagan and the pre-defense level of Harappa and related material discovered at other sites belongs to an Early Harappan period assignable to the first half of third millennium B.C. Among these separately treated sites, having regional differences in ceramics, there are many common traits present in ceramics, stone tools and technology, terracotta objects and in architecture which also occurs in the Mature Harappan period. The radiocarbon dates also tend to strengthen the chronological priority of Kot Dijjan and related material over that of the ‘Mature’ Harappan culture. It is therefore quite justified to call this material Early ‘Harappan’ ” (Mughal, 1970:5-6).

Fairservis also proposed that *regional mosaic formed by assemblages from sites of Amri, Kot-Diji, Kalibangan and Nal should be considered "Early Harappan"*. By this we mean the Harappan artefact form and decoration not the civilization (Fairservis, 1971:221). However, idea of Early Harappan was coined by Mughal and credit goes to him (Possehl: 2002). Mughal clearly redefined the material culture coming from Kot-Diji and studied the deposition of materials in stratigraphic context. He found many features which were associated with later periods in Harappan Civilization existing long before time and their continuity in the Harappan Period such as terracotta cakes, beads, painted pottery and mud brick structures in well planned manner. Kot-Diji presented a well-defined picture of these features and became reference to contextualize Early Harappan Period. The above mentioned four phases form Early Harappan Phase in archaeological literature. The Early Harappan term covers these sites.

Amri-Nal Phase

The site of Amri was excavated by Majumdar in 1929-1930 (Majumdar, 1934) and his work was continued by J.M Casal in 1959-1962 (Casal, 1964). Majumdar explained pre-Harappan settlement at the site and termed it Amri Culture. Site is located in Western Sindh at 103KM south of Mohenjo-Daro opposite to Chano-Daro an important Mature Indus site. Mound is divided into two parts A and B. Amri culture is found in Balochistan, KechiBeg and Sur Jangal Phases and is as much part of Balochistan as Sindh (Fairservis, 1961). Amri is type site for this culture and it dates back to 3600 and 3300 B.C. Casal explained that first human settlement started at mound A which is 13 meters in height and then moved westward towards mound B. Period I at the site witnessed occupation of the site Casal noticed four developmental stages of the Amrian Culture and divided it into IA to ID. IA represented an occupation level by yielding vessels, bronze and copper objects, chert blades, terracotta beads and ceramics with geometric designs painted upon. The tradition continued in Period IB and IC and expanded on both mound A & B. IC and ID revealed structures in well preserved state comprising mud brick walls in angular orientation somewhere on rubble stone foundation, rooms

and courtyard these structures were adjacent to compartmentalized buildings formed by joined cells which were recognized by Casal as “store rooms or godowns” (Casal, 1964:6) which are similar to Mehrgarh structures. Since ceramic evidences have played a major role to define and contextualize these phases in Indus Valley Civilization and archaeological studies in general; the pottery of Amri is handmade in early phase where copper and bronze evidences and chert blades have also been recorded. Second phase brought to light well defined and stylized pottery with painted motifs and third phase yielded wheel made pottery with geometric designs in Palisade and polychrome. Painted humped bull and gazelle were found in ID which is a Mature Harappan feature, triangle terracotta cakes, shell bangles and terracotta figurines were also found in Phase ID (Casal,1964). The geometric designs of pottery at the beginning turned into curvilinear motifs by the end, generally fired light red or buff, red and buff slips with black paint and characteristics of ware are open bowls, jars and tall vases with simple featureless rims (Possehl, 2002: 40). New explorations brought to light more sites which are yet to excavate but provided considerable knowledge about the expansion of the phase and population ration.

Nal

Nal is located in Balochistan and was excavated by Hargreaves in 1925 (Hargreaves, 1929). The Nal material is documented in southern Balochistan and Sindh it has been merged into Amri and often identified as Amri-Nal Culture but Amri is dominating it. Ceramics are “best-made” and “most attractive” a fine ware fired buff to pink, slips are very light, buff or weak red giving a tint rather than a dense surface colour. Characteristic vessels include canisters, straight-sided bowls with simple, knife edged rims, designs inked in polychrome red, pink, blue and yellow. Painting in white over a black slip is similar to Amri Ware and White paint is a hallmark of Early Period (Possehl, 2002: 40).

Kot-Diji

The magnificent Kot Diji archaeological mound and historical fort KotDiji Fort is located in District Khairpur, Sindh. The site was excavated by Federal Department of Archaeology and Museums, Government of Pakistan in 1955-57 (Khan, 1965). Kot-Diji is a type of site like Amri the distinctive nature of the site merited separate nomenclature. The first twelve layers from level 4 to 16 of the sites from below occupation level were Pre-Harappan and termed as Kot-Diji Culture. Khan observed an overlapping of Harappa Culture at fifth layer and upper three represented pure Harappan material (Khan, 1965). At first it was Harappa that yielded few sherds from levels 26 and 26A which were identical to the ceramics coming from Kot-Diji and radiocarbon dates from below Indus Civilisation layers are 2605 B.C to 2255 B.C. (Mughal, 1970). The structural remains revealed a defensive wall built of mud bricks and lime stones foundations and buttresses; houses built of mud bricks inside the wall on rubble stone foundations. Pottery tradition of rich wheel made, well-refined painted and designed in sublime manner. Lithic tools of parallel sided blades and bone objects, terra cotta bulls, cakes carts and one bronze bangle (Khan, 1965) which helped to trace the continuity of the culture into Mature Harappan i.e. Integration Era. The defensive wall of Kot-Diji Period is also revealed at Harappa the massive walls from Period I and Period II at Harappa were constructed of mud bricks in famous Indus ratio of 1:2:4 and the tradition continued till Mature Harappan times. He elaborated that this tradition of walls is reflection of mobilization of skills, labour and production of bricks in large quantity. He further explained that presence of Kot-Diji material under the massive wall of Wheeler indicates that both walls were built at same time (Kenoyer, 1999). The ratio of bricks i.e. 1:2:4 remained same during Mature Harappan Period (Kenoyer, 2010) which shows the perpetuity of the Early Harappan traditions in the Mature Period or Integration Era. Traditions and features which culminated during the Mature Harappan Period were actually product of long time process from Mehrgarh to Early Harappan Period. The gradual progress is elaborated at Harappa in craft activities and economic growth which triggered trade and urbanism (Kenoyer, 2000). The sophistication and organization

achieved at Harappa and Mohenjo-Daro was a work of generations and hundreds and thousands of years of labour and human genius. The range of standardization started in Early Harappan times and continued in later periods. Since Kot-Diji is predated by Hakra Phase, traditions of standardization or diagnostic features from Hakra Period are scarce. However one feature spindle whorl was used from So-called Ravi Phase (Hakra) to Kot-Diji Phase in similar manner and size though in Kot-Diji Period smaller spindle whorls also appeared that could have been served purpose of finer thread production (Kenoyer, 2010). The terracotta and other precious stones appear in Hakra Phase and continue in Kot-Diji and Harappa. Steatite beads from Ravi Phase (Hakra Phase) were extremely micro in size and continued in Harappa Period in same fashion (Kenoyer, 2010). Gold and silver ornaments were found from Rehman Dheri, Jalilpur and Kunal in India but not from Harappa at this level. The current research merits background view since Hakra Period precedes Kot-Diji Phase hence Early Harappan Phase is imperative to contextualize the Hakra Phase.

Damb Sadaat

Damb Sadaat is located in Quetta Valley and divided into three main Periods I, II and III Period, first Period is representing Kechi Beg Phase. The sites related to Damb Saadat Phase were identified by Fairservis when he was surveying in Quetta Valley in 1950s (Fairservis, 1956) and next two were recognized as Damb Sadaat Phase by Shaffer (Shaffer, 1992). There are thirty-seven sites associated with Damb Sadaat well referenced with Damb Sadaat II-III and Mehrgarh VI-VII. The characteristics features include walls built of mud bricks on stone rubble foundations (Fairservis, 1956) a tradition parallel to Early Harappan sites. Fairservis collected human skeletal remains in the drain along with terracotta figurines and elaborated it ceremonial and the drain had something special in the functions of the site. Fairservis found Damb Sadaat I contemporary to late Amri and Damb Sadaat II with Harappan Period and Period III he proposed completely disappeared by the time of emergence of Harappan Culture probably merged or developed into Harappan Culture in Loralai and Kachi districts (Fairservis,1956). Mehrgarh VII which is contemporary to Damb Sadaat

yielded rich burial traditions and industrial crafts where graves were carrying carnelian, lapis lazuli and copper objects.

Sothi-Siswal

Sothi-Siswal is named after two sites in Rajasthan and Haryana respectively, from Early Harappan Period in Greater Indus Region in India. Sothi was excavated by A. Gosh in 1950 (Gosh, 1991) and K. N. Dikshit in 1977-78 (Dikshit, 1989) and Siswal by Suraj Bhan (1975). A. Gosh recognized Sothi Ware with Kalibangan I and observed its distribution across Ghaggar, Chautang and Sutlej Valleys. Gosh claimed the affinities of the Sothi Ware with pre-Harappan Wares in Balochistan (Gosh, 1964-65). The Sothi-Siswal ceramics have similarities with Kot-Diji Ceramics and are studied into 6 fabrics of Kalibangan -I which was originally done by B.K. Thapar from A to F (Possehl, 2000-2001). The Sothi-Siswal sites are spread over Haryana, Rajasthan and one site Navaban in Plains of Ganga and Yumna. Possehl set an arbitrary boundary between Sothi-Siswal and Kot-Diji where he established the fact that Kot-Diji sites in southeast of Kot-Diji are similar to Sothi-Siswal and passes Kalibangan and ceramics from Navaban and southwest of Sothi-Siswal it becomes Kot-Diji and suggested a strong interaction between the people and exchange of commodities and products (Possehl, 2000-2001).

Early Harappan Formation

Reiteration of the fact that Early Harappan Phase (Vidale, 1989) is prelude stage of fully urbanized stage of the civilization. The Proto-urban phase of the civilization has been identified and studied in the recent past which brought to light the gradual process of development. Since 1970s the discovery of Mehrgarh and subsequent discoveries of the village settlement sites at strategic locations where important trade routes helped expansion of the societies and movement of populations. Damb Sadaat is one of the key sites which helped transition from the simple to complex societies with infrastructural and craft production. The gradual development suggests (Parpola & Brunswig, 1977) community level interaction and collective wisdom which yielded a refined and meticulous

civilization ultimately. The settlement sites of this period are smaller in size and exposed limited information. The Kot-Dijian settlement and its definition in the context of the civilization helped to reconstruct early settlement patterns of village farming communities when moved down to the lowlands and settled in the Greater Indus Region which is said to be the centre of the developmental stage of the civilization. The idea of transition and link of the Ghaggar/Hakra and Balochistan hills is now a common understanding among scholars (Mughal, 1970; Possehl, 2001-2002; Gupta, 1996).

The idea was approved by Jim J. Shaffer and Lichtenstein on the basis of analysis of radiocarbon dates from Balochistan and Indus Valley and suggested that Indus Civilization is fusion of Bagor, Hakra and Kot-Diji Traditions or “ethnic groups” in Ghaggar Hakra Valley (Shaffer and Lichtenstein, 1989). The sites of Nausharo, Mehrgarh, Ghazi Shah (Mallah, 1978), Lal Shah, Dholavira, Harappa and Amri where transitional phase occurred. Nausharo and Amri have developmental phases in continuity from Early Harappan to Mature Harappan Phase (Possehl, 2001-2002). The Early Harappan population exploited the environmental conditions of highlands and lowlands of Cholistan, Sindh and Haryana. The formation process in Cholistan is seen in continuation of Hakra Culture which gave birth to subsequent cultures like Kot-Diji.

To draw the evidence of statement that early Indus Civilisation period was featured with development and larger level of growth in urban settlement there are lots of instances or facts from where or from which one can get considerable points to overview the evidences of urban settlement of early Harappan epoch. First of there are four basic areas, such as, Harappa, Kot-Diji, Kalibangan, Amri, Sarai Khola, Jalilpur, Bhoot and Gumla. The newly coined term (Grinin, 2009) that is Early Harappan period was so famous in the late 70's and 80's that after the collection of material evidence from the expected sites of early Harappan period almost more than 300 new sites have been discovered that relate to the pre-Harappan or early Harappan period. This is amazing and a new thing

for the archeologists who take interest in exploring new sites and versatile things about the Indus Valley Civilization.

The current data which is available in the shape of different material and based on scientific studies provide solid evidences regarding different site of Early Harappan period and their association with the current day Harappan civilization evidences that are currently available too. As Indus Civilization (Schuldenrein, Wright, Mughal& Khan 2004) was the contemporary civilization of Mesopotamia and Iranian Civilizations and there are lots of evidences and sites are there to draw the evidences of development of these Mesopotamian and Iranian Civilizations in the past. In the same lines, there are lots of scattered pieces of evidences are there in the desert of Cholistan and southern part of Indus Valley that is the bordering area of Punjab and Sindh Province which shows the settlement of Early Harappan period in this rich and fertile land region.

Graffiti as an incipient stage of Indus Script

The above sites with proto-urban inclinations revealed evidences of incipient stages of script. The graffiti marks on the pottery from Kot-Diji (Plate-VIII,a) Period were considered the nascent stage of the script started as potter's marks. Graffiti marks on potter and a seal with Early Indus Script along with limestone weight which continued in Harappan period (Kenoyer and Meadow, 1999-2000). Earlier basis of the script was solely traced in Kot-Diji Phase but so-called Ravi Phase (Hakra) at Harappa has also revealed pottery with marks which became basis for graphic expression of the Indus Script in succeeding periods. Many potter's marks in Early Harappan period were single stroke or symbol but during Ravi Phase(Hakra) a trident mark or plant shape. This tradition continued through Kot-Diji Phase along with painted motifs where origin of Indus Script was traced. Now Hakra Period marks on (Ravi Phase) sherds found at Harappa has provided the basis to revisit earlier notion. We can safely say that origin of Indus Script dates back to Hakra Period. The systematic growth and expansion of Indus Civilization can be traced back to Hakra Period.

Dholavira

Dholavira is a famous archeological (Bisht, 1999) site which is also important due to many features of it. It is located at Khadirbet in Bhachau Taluka of district Kutch in Gujrat State of western India.

The Dholavira contains many ruins of the Indus Valley Civilization or Harappan Era. Moreover, Dholavira site is one of the 5 largest sites of Harappan period and the most popular archeological site of Indus Civilisation in the Indian State. This site is also better known as the grandest of cities.

It is the widely accepted idea that this site of Indus Civilisation was to be occupied some 2650 BC and the descending period of it started some 2100 BC. But on the other side, the very current researchers suggest that this Dholavira site was started occupying by the people some 3500 BCE i.e. Pre-Harappan period and continued until 1800 BCE i.e. the early era of Late Harappan Period.

In addition, the Dholavira site (Sengupta, Mukherjee, Bhushan & Sarkar 2020) was discovered in the year 1967-68 by J.P. Joshi of the archeological survey of India and is considered as major sites of Harappan Region or Harappan Civilization. The site of Dholavira has opened new directions and vistas for new research regarding Indus Valley Civilization. According to many archeologists there are many unique and additional things which are discovered in Dholavira site of Indus Valley Civilization that are very helpful for future research groundings. So, this Dholavira site has provided a very tremendous evidences and goods for investigating the different things about the Harappan Culture in different ways. By and large, Dholavira site has added a new color to the features of Indus Valley Civilization. Likewise, other such sites of Harappan region which have been discovered so far are Mohenjo-Daro, Ganweriwala, Rakhigarhi, Kalibangan, Lothal and Rupnagar.

Regarding the language and literature of Indus Civilization (Dumka, Kotlia, Narain, Prajapati & Prajapati, 2019) people the picture of this region is vague. The facts regarding the culture of people living in Indus Civilisation provides that there are almost 400 basic symbols of things or words that were used for the purpose of communication. In the Dholavira site of Indus Civilisation these symbol and words are also clear. Instead of having the largest site of Indus Civilisation there is no clear

picture regarding the exact usage of language by the Dholavira region people which was discovered in the last century. Moreover, (Danino, 2010) with respect to the using of symbols, there were many animal symbols which were used on pottery pots, Neolithic goods and on many fabrics for different purposes. The symbols of animals include elephant, sheep and horse, etc. But until now the true and exact script of the Indus Civilization people is vague and not known to anyone. But the direction of writing of Indus Valley people was from right to left.

Kalibangan in context

Situated in Ganganagar district of Rajasthan on the southern bank of the Ghaggar River this site was excavated by B.B. Lal and B.K. Thapar (1961-69). This site also has two mounds yielding the remains of a citadel and lower city respectively. Excavations have revealed evidence of pre-Harappan and Harappan culture.

- a. The citadel and the lower city both were fortified.
- b. The citadel had mud-brick platforms having seven fire-altars in a row.
- c. The lower fortified town had two gateways.
- e. The people of Kalibangan used mud-bricks for the construction of houses, the use of burnt bricks has been found only in wells, drains and pavements.
- f. The cylindrical seals found at Kalibangan had an analogy in the Mesopotamian counterpart. The discovery of inscribed sherds clearly suggests that Indus script was written from right to left.
- g. Excavations at Kalibangan revealed the evidence of the ploughed field.

Coastal Towns

Lothal

It was an important trading centre of the Indus civilization and situated near the bed of the Bhogavo River at the head of the Gulf of Cambay in Gujarat. Lothal was excavated by S R. Rao which brought to light five period sequences of cultures. It was one rectangular settlement surrounded by a

brick wall. Along the eastern side of the town was a brick basin, which has been identified as a dockyard by its excavator.

- a) The house of a wealthy merchant yielded gold beads with axial tubes and sherds of Reserved Slip Ware related to the Sumerian origin indicating that the merchants were engaged in foreign trade.
- b) Metal-workers, shell ornament makers and bead-makers shops have been discovered here.
- c) The discovery of the Persian Gulf seal and the Reserved Slip Ware suggests that Lothal was engaged in the maritime activities.

(b) Sutkagendor

Situated at a distance of 500 kms to the west of Karachi on the Makran coast it functioned as a trading post of the Harappans. It was originally a port of Harappan according to archaeologist Dales but later cut off from the sea due to coastal uplift. Excavation at the site revealed the two-fold division of the township into 'citadel' and 'Lower city'.

(c) Balakot

It is situated at a distance of 98 km to the North west of Karachi this coastal settlement yielded the relics of the pre-Harappan and Harappan civilization. Baked bricks were used in few drains but the standard building material was the mud-bricks.

(d) Allahdino

The excavations at Allahdino were undertaken by W. A. Fairservis and are situated at a distance of 40 kms to the east of Karachi.

III. Other cities and township

(a) Surkotada

It is situated about 270 km. north-west of Ahmedabad in Gujarat the settlement pattern of Harappa, Mohenjo-Daro and Kalibangan was repeated here. As at Kalibangan, both the citadel and the lower town were fortified. There was also an inter-communication gate between the two.

In addition to mud-bricks, stone rubble was liberally used for construction. In the last phase of this site, bones of horses, hitherto unknown, have been discovered.

(b) Banawali

Banawali is situated in the Hissar district of Haryana it was on the bank of the River Rangoi, identified with the ancient bed of Sarasvati River. The excavations conducted by R.S. Bisht have yielded two cultural phases, Pre-Harappan and Harappan, similar to that of Kalibangan.

The Indus Civilisation phase showed significant departure from the established norms of town-planning (chess-board pattern as in Harappa, Mohenjo-Daro, etc.). The roads were neither always straight, nor are they cut at right-angles. It lacked systematic drainage system, a noteworthy feature of the Indus civilization.

(c) Chanhudaro

The township of Chanhudaro, situated about 130 km. south of Mohenjo-Daro, consists of a single mound divided into several parts by erosion. An evidence of material remains clearly shows that it was the major centre of production for the beautiful seals.

The hordes of copper and bronze tools, castings, evidence of the crafts like bead-making, bone items and seal making suggest that Chandhudaro was mostly inhabited by artisans and crafts-men.

Excavations have also unearthed a furnace with a brick floor used for glazing steatite beads.

The Bannu Basin (Evidences from NWFP current KPK)

One of the footprints site of Harappa Valley in current day Pakistan is in NWFP (Current KPK) i.e. Bannu Basin. This province has different topography and provide different environment to its dwellers. The land of the province is encircled by the three rivers, such as, Tochi, Kurram and Gambila. Moreover, with the imagination of Indus Civilisation existence over there, there are almost 40 sites of different period that are current discovered in this province of NWFP (Khan, 1987).

With regard to the Early-Harappan period there are approximately one dozen sites, for instance, Islam Choki, Mirzali Khan Dheri, Tarakai Qila, Sheri Khan, Zabta Khan Dheri, Dar-Dareez, Lewan

& Takhit Khel. Among all these mentioned sites the early existence or habitation of people was started at Tarakai and Sheri Khan. So, these two sites are also among the firstly discovered sites in NWFP.

Furthermore, the similarities (Khan,1986) among the sites of NWFP and Punjab are found in different ways. The resemblance or checking the monstrosity of the Early-Harappan period of Punjab and NWFP was checked by the archeologist in different ways. First of all, the tool making gadgets, such as, hammer and Neolithic items were studied to check the uniqueness and similarities among the goods found in two different place sites. In this way, lots of tools, ornaments and daily usage goods were found of same nature from the debris of these two poles discovered sites which shows the uniqueness of an epoch which relate to Early-Harappan Period. Likewise, there are clear picture of Early Harappan period that is ratified from the evidence of barley and wheat as well as lentils and peas in the Gumla discovered site.

The Tochi-Gomal Valley

The Gomal Valley in the current day northern part of Pakistan i.e. in KPK province (Jan & Khan, 2008) is also have lots of evidences for its association or parallel running with the Early-Harappan period. Typological and consecutive arrangement advocates that the Tochi-Gomal Phase co-existed for a definite period with other contemporary regional civilizations of South Asia, for instance Amri-Nal civilization of Sindh province, the Ravi culture or Ravi-Hakra Culture in Punjab, Togau and Kechi Beg cultures in the province of Balochistan and Sothi-Siswal civilization in Rajasthan-India. Even though reported earlier in the year 1970s, no proper thoughtfulness is paid to this cultural chapter of the Tochi-Gomal as a distinct unit having its own idiosyncratic topographies.

Moreover, the Tochi-Gomal Valley has lots of features in it which creates its association and resemblance with the other contemporary cultures of its epoch. For instance, the existence of this site people approximate to the Gomal River (Naseem & Jan 2016) which flow even currently from Balochistan to Pakistan. It shows its unique features with the Indus Valley People. Because they

were also dwelling along with the great Indus Valley Basin or Indus River. According to many of the archeologist (Piggott, 2000) the primary factor behind the early settlements in the vicinity to rivers or water resources is that nearness to water the only survival for early people because there was no advanced technology to provide water at a distance from the flowing rivers.

Likewise, the Tochi-Gomal Valley site of Early Harappan period is characterized with many features that helped the early civilizations in the region of south Asia in their trajectory of development growth and flight towards urbanization from the primitive society. Moreover, categorically the Tochi Gomal era is placed just after the Neolithic culture that us represented at Jhandi Babar as well as before Kot-Diji culture of Bronze Age represent at Rehman Dheri and Gumla (Jan, Ali, & Khan, 2008, pp. 16-18).

In addition, the Tochi-Gomal plains of NWFP have a very different archeological, linguistic and cultural past of human settlements that has put its footprints on different cultures and societies in the South Asia Regions for years. (Morris, 1938). In the same way, the historic and cultural values of Tochi-Gomal civilization is very much important to investigate the protohistoric civilization, for instance the late Early Chalcolithic culture of Neolithic culture of Jhandi Babar, and Early Bronze Age Cultures of the Tochi-Gomal, Kot-Dijian and the developed Bronze Age beliefs of the Indus Valley Civilization (Ali & Jan, 2009) Being a plain range in the slopes of Kohi-Suleiman, Bhattani and Marwat-Kundi ranges with adequate of recurrent and periodic cradles of water as well as obtainability of flora and fauna for the human manipulation, the Gomal Plain has been a perfect region for human occupation during the Early Bronze Ages. Owing to a usual favourable setting, a traditional phase emerged in the Gomal plain as well as to the head-to-head Bannu basin about the end of the fourth millennium BC (Ali & Jan, 2009, p. 22) or the first half of the third millennium BC (Petrie, Morris, Khan, Knox, & Thomas, p. 81) known to learned world today as the Tochi-Gomal Period. Gumla (period II), being the 1st place where this civilization was recognized in the year 1970-71 by A.H. Dani of University of the Peshawar. Though, the same cultural values have later

on been prolonged to numerous other spots such as, Hathala, Jhandi Babar I and II, Rehman Dheri, Gandi Umar Khan (P.I), Maru I, Darazinda, Gulgai Kot I, Maddi and Kot Musa in following studies (Jan, Ali, & Khan, 2008) (Rahman, 1997) (Khan, Knox, & Thomas, 2000). The fragments of Tochi-Gomal Phase have not only been exhumed on the Gomal plain, but also from some locations in the Bannu Basin, for instance, Islam Chowki, Lewan, Ter Kala Dheri, Lak Largae (Khan, Knox, & Thomas, 1991).

Language

There are lots of studies which have been conducted (Danino, 2016) on the linguistic features and linguistic styles of Indus Valley people. And there are different results of every study with the change in region of Indus Valley Civilization. With respect to the Tochi-Gomal phase of Early Harappan Era and the linguistic pattern of people over there, it is proved from the prints over the stone tools and pottery vessels that there is strong linguistic uniqueness between the people of Tochi Gomal region and Harappa Region people. Since this culture occurred long before the metropolitan phase of the advanced Indus and the early-Harappan cultures, henceforth it was first known as 'Pre-early Harappan' by some academics. Dani while exploring in the Gomal Plain, merely named it as Gumla II (culture) as it is principal exposed from period II at the archaeological mount of Gumla in Dera Ismail Khan. Though, in the later stage Durrani devised the term of proto-protoKot Dijian (Durrani, 1981, p. 135) for this ethos as he supposed on the basis of archaeological range from Rehman Dheri that definite ceramics forms and their tinted projects bear close resemblance with that of the Kot Dijian culture. Undistinguishable cultural substantial consequently exposed from the Bannu Basin by Farid Khan led to a new terms of the Tochi-Gomal Phase (Khan, Knox, & Thomas, 2000, pp. 52-53) (Khan, Knox, & Thomas, 2001, p. 87).

This language is grounded on terrestrial distribution of the archaeological locations fitting to this culture, which are in circumstance found in these two areas i.e. Tochi (Bannu) and the Gomal (Dera Ismail Khan) and the culture is solely indigenous in character with clear counterparts seen in the

relics of both the expanses. It is an significant culture of premature Bronze Age that can be dated between

3400-2800 BC. This retro can be protracted additional if fresh models for radio carbon dates are taken from deeper heights of greater sites such as Rehman Dheri (Khan et al., 2000, p.54).

Taxila Valley

The footprints of early history or origin of Taxila Valley (Khan & Khattak, 2009) can be traced back to 3500 BCE when this Taxila region was the center point of movement in south Asia as well as attracting point with respect to research, development, urbanization and different living techniques of the modern day. In this way, the important places which were later on discovered by Elden Johnson of University of Minnesota, such as, Mohra Moradu, Khanpur and Minnesota at Bhamala. These all sites were dating back to 900 CE that were all the way back to Dark Age or Stone Age. In addition, the Bronze Age that is commonly known as the Indus Valley Civilization was started in Taxila almost around 2700-2100 BCE and the evidences are cleared from the Saraikala with no pause between ends of Neolithic to Bronze Age debris. Even there are provisional era between two Ages that includes amalgamation implementation of Bronze Age and Neolithic Varieties. Moreover, the city Taxila (Marshall, 2013) previously better known as Takshasila was a very famous site of Buddhist community in the ancient time. And there are lots of holy cities of Buddhist community discovered in Taxila city. Additionally, (Khan, 2000) there are number of evidences which are collected by the archeologist from the discovered sites of Taxila and they show a clear association with the Early Harappan period in different angles. For instance, the third industry that developed in the early Harappan period was the pottery. In the same way, the Neolithic industry was also evident on the same trajectories as in the main land of Indus Valley as well as in the discovered sites of Taxila which show the existence of Early Harappan period at Taxila city.

In the search of Early Harappan period (Dar, 1993) and its different founding's at different places in current day Pakistan, Taxila has a very unique standing not only with respect to affiliation with Harappan Civilization, but also its standing in Ghandhara Civilization. Moreover, the history of this Taxila region can be traced back to early micro lithic societies at Khanpur caves up to approximately 1000 CE. At its climax time the Taxila was the epicenter of almost all the major civilizations, such as, Greeks, Mauryans, Achaemenids, Kushans, Parthians, Scythians, Indus Civilization and Huns. Because this Taxila Civilization that was located in the north of Province of Punjab was the center point of learning and research which was providing a role of beacon house to all other societies and civilizations of its time.

The current known or discovered archeological sites of Taxila Valley are almost 18 in numbers. According to the majority of current day archeologist there are almost 3 sites of Taxila that relate to the Early Harappan period of mainstream Indus Valley Civilization. The vital point about the importance of Taxila is that in the ancient or Early Harappan time Taxila was providing the transit point to all the '*Caravans*' (trade commuters) (Mughal, 1978) Furthermore, on the other side, while investigating the Early Harappan sites' evidence from 3 excavated locations out of total 5 so far discovered in Taxila Valley there was found a consistent pattern of living same as at Kot Dijian which shows the parallel existence of Early Harappan societies at different locations and one of them was at Taxila. In the same way, similar to Bannu Basin, the settlements in Taxila Valley shows a single period of settlement. On the contrary, there is no sound material or solid evidences are still found in Taxila Valley regarding the Mature Period of Indus Valley Civilization or Harappan Period.

Early Harappan in Punjab

Apart from collecting proofs from the different regions of early Indus Civilisation, the existence of the culture of Indus Civilisation at Harappa is evident from the researchers and investigations at Mound E by (Dales & Kenoyer, 1988). Later on in the year 1989 and in the start of last decade of

20th century there are number of classification of era and different development of various parts of society at Kot Dijian revealed the facts that there was a strong association between the Early Harappan period and Mature Harappan epoch. So, the antithesis regarding the association of Early Harappan period and Mature Harappan period at Harappa is not strong in this context of lots of solid evidences not only from the epicenter of the Harappan culture, but also from the rest of the adjoining regions. So, the existence, of Early Harappan period is an undeniable truth in the current world (Meadow, 1988).

Moreover, the most important thing which reveals truth regarding the various goods of Harappan period is the evidences of crafts at Harappan sites. At Jalilpur there were found many such goods of agriculture sector as well as construction industry which further proves the context of Early Harappan period and its sequence with the Mature Harappan (Mughal, 1972; 1974). In addition, the discovering of some bones of sheep and cows as well as other animals' bones show the presence of pastures and agricultural sites at different early Harappan sites, such as, at Jalilpur, Kot Dijian. Similarly, almost 40 discovered sites of Early Harappan period at the Harappan Valley may also provide lots of options to the archeologists and academics to probe more regarding the emergence, growth and development of Early Harappan period (Dar, 1983).

On the other side, there are much more chances of discovering of many other Early Harappan sites in Harappa region as well as in many other parts of the Punjab because there is high range of territorial area which is undiscovered. Likewise, the presence of Khadin Wala between the Sarai Khola and Harappa is a crystal clear indication of lots of undiscovered sites in Punjab which may provide a base to the archeologists for future research in Harappan Valley. Furthermore, with respect to discovering the different sites of Early Harappan, many researchers have tried to collect different things regarding the fabrics which were used in ships while voyage in the rivers and for trade purposes. Similarly, to the fabric there are many other sectors or sections from where the researchers

have collected the samples of goods to check the validity of Early Harappan period and its parallel development towards the Mature Period of Harappan Period.

The extension of Early Harappan sites can also be seen at Siswal (Bhan, 1971-72) at Banawali (Bisht, 1982) near the right bank of River Chenab. It shows the chances of many other sites at different sites of Indus Civilisation sites at different regions of Punjab as well as in other current vicinity provinces of Punjab. On the other side, checking the reliability of different goods of Early Harappan period, its development and Mature Harappan period with the help of ceramics, fabrics, pottery and animal bones contain much importance because cross examination of the (Dyson, 1982)

Primary Features of Early Culture of Indus Civilisation

Origin and Evolution

The culture of the Indus Civilisation arose in the north-western part of the Indian subcontinent. It is called Harappan civilization because this was discovered first in 1921 at the modern site of Harappa, situated in the province of west Punjab in Pakistan. It is also called as Indus civilization because it refers to precisely the same cultural, chronological and geographic entity confined to the geographic bounds of the Indus Valley. Sir John Marshall was the first person to use the term 'Indus civilization'. The Indus Civilisation belongs to the Chalcolithic or Bronze Age since the objects of copper and stone were found at the various sites of this civilization. Nearly, 1,400 Harappan sites are known so far in the sub-continent.

They belong to early, mature and late phases of the Indus Civilisation. But the number of the sites belonging to the mature phase is limited, and of them only half a dozen can be regarded as cities. Some of the noteworthy sites which have been excavated are Harappa (1921) by Daya Ram Sahni, Mohenjodaro (1922) by R.D. Banerjee, Dholavira (1967-68) by J.P. Joshi and (1990-91) by R.S. Bisht, Kalibangan by Dr. A. Ghosh, Lothal (1955-63), Chanhu-daro, Banawali (1975-77), etc. The

discovery of India's first and earliest civilisation posed a historical puzzle as it seemed to have suddenly appeared on the stage of history, full grown and fully equipped. The Harappan civilisation till recently showed no definite signs of birth and growth. The puzzle could largely be solved after the extensive excavation work conducted at Mehrgarh near the Bolan Pass between 1973 and 1980 by two French archaeologists Richard H. Meadow and Jean Francoise Jarrige.

According to them, Mehrgarh gives us an archaeological record with a sequence of occupations. Archaeological research over the past decades has established a continuous sequence of strata, showing the gradual development to the high standard of the full-fledged Indus civilisation. These strata have been named pre-Harappan, early Harappan, mature Harappan and late Harappan phases or stages. By reviewing the main elements of the rural cultures of the Indian sub-continent the origin of the Indus civilisation can be traced. Any Pre-Harappan culture claiming ancestry to the Indus civilisation must satisfy two conditions. The first condition is that it must not only precede but also overlap the Indus culture.

The second is that the essential elements of the Indus culture must have been anticipated by the Proto-Harappan (Indus) culture in its material aspects, viz, the rudiments of town planning, provision of minimum sanitary facilities, knowledge of pictographic writing, the introduction of trade mechanisms, the knowledge of metallurgy and the prevalence of ceramic traditions. The different stages of the indigenous evolution of the Indus can be documented by an analysis of four sites which reflect the sequence of the four important stages or phases in the pre-history and proto-history of the Indus Valley region.

The pre-Harappan culture of Kalibangan in Rajasthan is termed as Sothi culture by Amalananda Ghosh, its excavator. The Harappan were owed certain elements such as the fish scale and pipal leaf to the Sothi ware. The four Baluchi cultures, viz, Zhob, Quetta, Nal and Kulli, undoubtedly pre-

Harappan, also have some minor common features with the Indus civilisation, and cannot be considered as full-fledged proto-Harappan cultures.

The culture of Northern Baluchistan is termed as 'Zhob' culture after the sites in the Zhob valley, the chief among them being Rana Ghundai. This culture is characterised by black and red ware and terracotta female figurines. Nal culture is characterised by the use of white-clipped ware with attractive polychrome paintings and the observance of fractional burial. The characteristic pottery of the Quetta culture is the buff-ware, painted in black pigment and decorated with geometrical designs. Apart from the painted motifs such as the pipal leaf and sacred brazier, some pottery shapes are common to the Harappan and Kulli cultures. All these pre-Harappan habitations preceding the phase of the Harappan civilization shows evidences of people living in houses of stone and mud-brick.

Similarities were found in the cultural traditions of the diverse agricultural communities living in the Indus region in the 'early Indus period'. During the urban phase these little traditions were fused into one great tradition. However, even in the 'early Indus period', use of similar kinds of pottery terracotta mother goddess, representation of the horned deity in many sites show the way to the emergence of a homogenous tradition in the entire area. The people of Baluchistan had already established trading relations with the towns of the Persian Gulf and Central Asia. Kulli, situated on the southern foothills of the Baluchi Mountains near the Makran coast, occupies an important position on the trade route between the Persian Gulf and the Indus Valley.

Thus, the available evidence suggests that the Harappan culture had its origin in the Indus Valley. And even within the Indus Valley, several cultures seem to have contributed to evolve the urban civilisation. There is no evidence to suggest that the Indus people borrowed anything substantial from the Sumerians. It is thus difficult to accept Sir Mortimer Wheeler's assumption that "the idea of civilization came to the Indus Valley from Mesopotamia.

Chapter: 05

Retrospective View of the Hakra Cultural Horizon

Nomenclature

The term Hakra Ware Culture was introduced by Dr. Rafique Mughal, referring to the locational area of discovery and concentration of the sites along the dry bed of Hakra River (Mughal, 1981, 1982, 1997).

Origin of Hakra

The Hakra Culture came to be known after Prof. Dr. Rafique Mughal surveyed Cholistan Desert in 1973-77. He conducted four sessions of fieldwork and documented different small and large sites along the both sides of the dry bed of Hakra River, covering 300 miles and 10-15 miles wide strip (Mughal, 1997). Shaffer brought the Hakra Culture into the framework and put it under Regionalization Era and defined Hakra under the configuration of phases (Shaffer, 1992). The surveyed sites were 414 in number among which 99 were the oldest known cultural assemblage in Cholistan. Furthermore, among 99 sites, there were two sites that he found which were originally occupied during Early Harappan and four during mature Harappan Period. He observed among 99 sites 52.5% were camp sites, and 45.4% were settlement sites (Mughal, 1982). On the contrary, apart from that there are many other sites bearing similarities with Hakra culture including the Jalilpur, Multan, Mehrgarh, Balochistan and pre-defense period in Harappa (Possehl, 2002). Soon after this survey

another detailed survey was carried out in the flood plains of Sarasvati (Gagghar-Hakra) River on Indian side. In 1960-61 at the site of Kalibangan in Rajasthan on the left bank of Gagghar (Hakra) River a pottery assemblage similar to pre-defense Harappa and lowest levels of Kot-Diji was found which later on defined in connection with a definitive pre Harappan Culture. This particular pottery type was compared with different phases of Indus Civilization i.e.

Kalibangan I	Amri IC-IIB
	Gumla II-III
	Pre-Defense Harappa
	KotDiji I
	Jalilpur II
	Gomal II

Source: (Dikshit, 2012; 2013).

Later on the pottery type known as Pre-Harappa was redefined as 'Early Harappa' as a developmental stage by M. Rafique Mughal in his PhD work in 1970. Fairservis also supported Mughal's interpretation and suggested the regional cultural elements should be included in greater Indus-Sarasvati region as Early Harappan and cultural material found from the sites of Amri, Kot-Diji, Kalibangan and Nal below Mature Harappan should be termed 'Early Harappan' (Fairservis, 1971).

The sites of Kunal, Bhirrana and Farmana in India yielded similar cultural characteristics. Though the evidences for the first time came out at the site of Jalilpur , Multan, Pakistan, (1971) but it was not defined properly until the discovery of huge number of sites in Cholistan were discovered (Personal Communication with Dr. Rafique Mughal).

Further explorations in India along the banks of Gagghar-Hakra has revealed many important sites among which four are credited purely Hakra (Dangi et al., 2014). In the near zone Baror and

Kalibangan are the most important sites. At Kalibangan has not been found any separate horizon of Hakra but few ceramics in the Early Harappan levels of the site. At Baror a site at the border of Pakistan and India abutting with Cholistan, has a separate zone and it was labelled as Pre-Harappan (Samunder and Dangi, 2014).

Jalilpur

Jalilpur (Plate-VII,a) is located at few miles distance from Harappa in the centre of the Indus Valley Civilization. The fieldwork started in 1963 and brought to light two settlement periods at the time of excavation mound covered 1200x1400 feet with a height 15feet including a period from the Medieval times covering only Southeastern part of the site. The material culture came out of the site is consists of ceramics bearing similarities with different phases of Indus Civilisation including Amri Culture.

There are two periods occupation levels recorded at the site (Mughal:1972) (Plate-).

Period I

Period I revealed the use of mud bricks and mud floor. Pottery with external coating of pottery bits and pieces, similar to the ceramics from Amri IA period which according to Radiocarbon dates were declared fourth4th millennium BC same pieces were also reported from *Serai Khola* site Period I. Evidences of animal meat as human diet were also recorded. He found similarities between Serai Khola and Jalilpur as both of the sites have Early Harappan occupations but had not been occupied during Mature Harappan Period. Also he sought close relationship at Gumla, Hathala in Gomal Plain and Kalibangan I in Rajasthan, Mitathal and Siswal in Saraswati Basin with the sites in Greater Indus Valley Region during Early Harappan Period (Mughal,1972: 117-118).

Period II

Period II revealed the evidences similar to Kot-Diji and Early Harappan Cultural traditions of the Greater Indus Valley dating back to third millennium BC Bi-chrome Painted pottery with black-on-red, black-on-buff slip or on buff body and black on white ware was reported. The black-on-red is closer to the Kot-Dijian ware globular vessels with plain exterior, short neck painted with simple black band. The bi-chrome pottery painted with black-and-brown and black-and-red is not reported from Kot-Diji. But the bi-chrome vessels from Indus Valley are referred as influenced by Amrian Ware in Sindh coming from Turkmenistan through Balochistan. The author has linked the bi-chrome pottery coming the period II of Jalilpur with same ceramic traditions of Iran which penetrated into Indus plain through Gomal Pass (Mughal, 121-122).

Gumla

The Gumla site is located in Gomal Plain. It was first excavated by Ahmad Hassan Dani. Overall six periods have been recorded at the site. Period I was marked with the presence of microliths along with animal bones, community oven and without any structure, Period II presented wheel-made and negligible amount of handmade pottery, Period III is identical to the Kot-Diji ceramic and figurine traditions; Period IV is marked desertification and thick ashy layer along with reoccupation and mud brick houses with hearths and continued by Mature Harappan, Period V is burial traditions, horse bones like at Sarai Khola site and VI belongs to Iron Age (Dani, 1970-71: 35-40).

Hathala

Hathala is small and significant site located near a small village Kulachi-Hathala in Gomal Valley. It is a site with Kot Dijian Occupation with ceramics, bangles and tools. Unfortunately the site is illegally dug up and destroyed and no more available for excavation but there are many other important sites of Kot-Diji and Neolithic Period need dire attention i.e. Jhandi Babar I, II, Khadi Aman , etc. (Ali and Elstov, 2009).

Rehman Dheri

Rehman Dheri (31°50'N/71°54E) is located in northwestern part of Dera Ismael Khan Khyber-Pakhtunkhawa. The site is extremely important from the point of view of presenting a sequence from Regionalization Era to Integration Era. The first Period (3340-2850 B.C.) is marked with the presence of wheel made painted ceramics along with some handmade vessels and clay sables houses with multiple rooms. The red and buff ware pottery with some floral motifs and zoomorphic nature were also recorded. Grain seeds and animal bones were also recovered. Second period is characterized with Kot-Diji ceramics and cultural traditions which is defined as interaction period by F. A Durrani where urban trends starting appearing the city walls along with ceramics with more motifs and designs, some Kot-Diji and Sothi ceramics were reported, an ivory seal was found and ceramics from Period I also continued in shape of storage jars and animal remains and kilns. Third period (2850-2500B.C) is falling in Integration Era (2500-1900 B.C) and site rightly bore evidences of urban phase but astonishingly the site of Rehman Dheri manifested continued Kot-Dijian Tradition. Kot-Diji ceramics in slightly improved form with abundant use of motifs along with Harappan ceramics continued to be in use. Some evidences of barley and wheat were also found (Durrani et al.: 1994-95).

Girawad

Girawad is one of the three sites belongs to Hakra Phase discovered by and studied by Vasant Shinde and located in Haryana at (28°58'41"N & 76°28'47"E) and it covers 8 hectares and single culture spread over. It was discovered by Dangi who reported a sequence of Hakra, Early Harappan and Harappan but excavations rather salvage excavation by Shinde revealed it is only Hakra site (Shinde et al., 2010: 95-96).

Farmana

Farmana is another important site in Haryana India closer to Rakhigarhi largest Harappan site that has been excavated and studied in detail. It was discovered by Suraj Bhan (1974) and he reported Early Siswal comparable to Early Harappan then it was explored by Surinder Singh who reported

Early, Mature and Late Harappan levels. In 2006 Vivke Dangi measured the site and estimated it around 18 hectares, he collected Bi-chrome, Chocolate Slipped and Early Harappan pottery with graffiti marks, Mature, Late Harappan, Painted Grey Ware and historical ceramics too (Shinde et al. 2010).

Hakra Culture Period I

Mature Harappan Period II

Layers 7, 7a and 8 with a thickness of 50 cm have been recorded with Hakra Ware, layer 6 is said to be transition from Hakra to Mature and 5 layers have been recorded with Mature Harappan ceramics (Shinde et al. 2010:135). This site was marked with the presence of Hakra Regional Culture, a variation in the Hakra style ceramics was noted here also the Hakra Ware found from the site is clearly comparable to the Hakra Ware from Girawad site (Shinde et al. 2010).

Bharrana

The site of Bharrana (29° 33' N; 75° 33' E) in the Fatehabad district of Haryana is another important site. It overlooks the now dried up Ghaggar (Hakra) Sarasvati River. The site was excavated by L.S Rao and team and two periods of habitation were brought to light after excavation. The site has been marked with sequences of Hakra Ware leading to Early Harappan and transition to Mature Harappan. Period IA is credited as Hakra Ware. The site yielded Hakra Ware along with bi-chrome Ware with black line and white paint. The Hakra Ware at Bharrana corresponds to the Kunal site. The Bharrana site has more domination of Hakra than other sites at Bharrana "Hakra Ware exclusively dominated the lower cultural deposit inside the dwelling pit" (L.S. Rao et al. 2005-06:61). Here Hakra Ware has been found in lower levels as well as bi-chrome Ware has been found in upper levels and it continued by Early and Mature Harappan Culture (Khatri and Acharya 1995). L. S. Rao and his team has given a clear sequence of chronology of the site after two complete seasons of excavation i.e.

Period I	Early Harappan	Period I A Hakra Ware Culture
		Period I B Early Harappan
Period II	Transitional Phase	Period II A Early Mature Harappan
Period III	Mature Harappan	Period IIB Mature Harappan

Source: (L.S. Rao et al. 2005-06: 60).

Kunal

Kunal site is located on the bank of Gagghar-Hakra River and was excavated by J. S Khatri and M. Acharya. The site is an example of successive cultures and presenting the complete picture. The excavators recorded pit-dwelling on an artificially raised platform and every pit has hearth inside. The post holes are of varying depths shallow and deep. There are four pit-dwelling documented along with refused pits and ceramics are mainly of Hakra Ware and similar to Jalilpur as well. The site bore evidences of significant nature from hand-made to wheel-made pottery and pit-dwelling to mud brick houses along with continuous Early Harappan Cultural traditions (Khatri and Acharya, 1995).

Kalibangan

In context of the Hakra Culture Kalibangan is one of the most important sites of Indus Civilization. It is located on the left bank of Ghaggar River in Hanumangarh District of Rajasthan. It is similar to Mohenjo-Daro with two mounds named KBL-I and KBL-2 it measures less than Mohenjo-Daro and Harappa but presents a complete sequence of preceding culture of Matura Harappan Period (Lal, 997). The site was excavated by B.B Lal and B. K. Thapar since 1961 and divided into two cultural periods Kalibanagan I and Kalibangan II and Radiocarbon dates have been done for both periods (Agarwal and Kusumgar: 1968). Period I is representing Early Harappan Culture and on the basis of

fabric, ceramics have been divided into six groups, the fabric D has been identical with Kot-Diji and Hakra Ware (Shaffer, 1992).

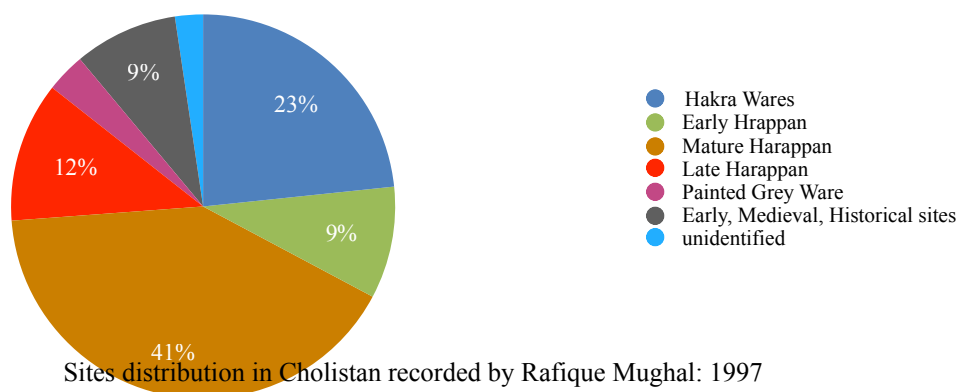
Survey in Cholistan Desert

The surveys in Cholistan desert were taken up by many scholars for many years. First survey along the Gagghar-Hakra was carried out by Italian Indologist Dr. L.P.Tessitori during 1916-1918 as In charge of the Bardic and Historical Survey of Rajputana. He recorded many sites and protohistoric mounds, conducted trial trenches also but his account was never published neither accessed by the scholars coming after him. After him Sir Aurel Stein undertook a detailed survey and documented 100 hundred sites between Fort Abbas and Fort Derawar in Cholistan. After Sir Stein A. Gosh started survey in 1951-1953 and recorded more than hundred sites. And all these three survey reports remained unpublished. Hanna Rydh excavated the site of Rang Mahal near Suratgarh from 1952-1954(Mughal, 1997). The Rang Mahal pottery dated back to Kushana Period Gosh also started surveying considering early historic but ended up discovering protohistoric sites. He surveyed along the Ghaggar River following the discovery of Harappan sites on Pakistani side and recoded 20 Harappan and 25 Painted Grey Ware sites (Thakran, 2006-2007: 900-1000). N.K. Dikshit followed A. Gosh and surveyed the same area already explored (Thakran,2006-2007: 992) he explored the Chanel of the Sutlej River once a tributary of the Gagghar-Hakra River and reported many sited on its banks (Mughal, 1997).

Then site of Kalibangan was excavated for 9 years by B.B. Lal and B.K Thapar. Suraj Bhan explored the Haryana and dug up trial trenches at the sites of Mitathal and Siswal in context of the chronological sequence of Kalibangan. Later Suraj Bhan and Jim G. Shaffer explored the same region in 1978 Mughal,1997:27).

Survey in the Cholistan Desert started in 1974 by Department of Archaeology and Museums to document the archaeological profile of the desert area with a focus on the dry bed of the Hakra River (Mughal, 1981). Mughal and his team followed the route of Sir Aurel Stein from Fort Abbas to

Derawar Fort during first season. For second Season the team moved around Derawar Fort locating



multiple channels of Hakra River. First season ended on discovering 120 sites, second season marked with 80 sites, third season concluded on finding 161 sites and fourth season was concluded by adding 63 sites reaching a total of 424 sites. Among all the sites he declared 99 with distinctive features and termed the Hakra Cultural Horizon. He also did trial trench at one site Niwaniwala to determine the stratigraphical position of the ceramics where Hakra Ware was succeeded by Mature Harappan occupation whereas two other sites Kuchanwala and Nahranwala where sequence is similar to Jalilpur where Hakra is followed by Kot-Diji (Mughal,1997:33).

Proposed Chronological Sequence on the basis of Comparative Archaeology

Mughal extensively surveys the desert and reported sites from Early, Mature and Late Harappan among which Hakra Ware he found predating Kot-Diji Phase. Keeping into view the chronology of Kot-Diji occupation coming from the sites of Gumla, Kalibangan as first quarter of the third millennium B.C. Mughal predicted Hakra Ware to be dated middle of the fourth millennium B.C. (Mughal, 1997). A recent development in the same area was made by Kenoyer where he challenged the previous data and interpretation and termed the culture as Ravi Phase rather than Hakra. It is said that both of the investigators are at loggerheads.

(So called) Ravi Phase

Kenoyer (2011) at Harappa documented so-called Ravi Phase along with Kot-Diji and labelled it as level IA and IB. He elaborated the existence of handmade ceramics at level IA aka Ravi Phase, also documented a typical Mud Appliqué Ware of Mughal's Hakra Ware pottery assemblage from the same level with many potsherds in red, black and brown painted in some floral and animal motifs (Kenoyer: 2011). He further affirmed that the mobile communities were always there and influx of the foreigners is out of question. This cultural sequence Early Harappan / Kot-Diji was continued without any distraction and dated between 3700-2800 BC. The existence of geometric tools similar to Mehrgarh was evidence supporting continuous development (Kenoyer, 1969). Mughal has given a rebuttal to Kenoyer's interpretation and called out Ravi Phase as 'misleading' and 'invalid' pretending to find something new whereas this culture was already discovered at Jalilpur 30 years before and defined as Hakra spreading across Cholistan, Balochistan and Sindh. He further noted there was nothing new in Hakra material from Harappa to be named new also the Kot-Diji material discovered at Harappa by Mortimer Wheeler in 1946 was defined in 1970 as Early Indus Civilization in an effort to construct the beginning of the Civilization and connect it to the subsequent developmental phases whereas the said research lacks any such clarity to afford it to link directly to Neolithic Cultures in Balochistan and Khyber Pakhtunkhwa (Mughal, 2012:1).

Since it is internationally acknowledged historical norm to name the ancient past from their current name as it is done in archaeological research under the pretext of type site i.e. Kot-Diji, Harappan, etc. So in the given research term Hakra would suffice the need better than Ravi Phase. Also the Early Harappan Phase has been spread over a vast vicinity and involving regional diversities it was divided into different phases and zones. The Hakra Culture is a huge phenomenon and regional diversity in the material culture is also observed hence the Ravi Phase definition is just an altercation to the sequence making it vague and questionable. Kenoyer and Meadow (1997) termed these finds from Harappa as "Ravi aspect of Hakra Culture" and then deliberated it to Ravi Phase on the basis of expected efforts to be done in future unknown (Kenoyer and Meadow, 1997:59). This postulation

has not brought anything since three decades both of the interpretations stand still hence it does not make sense at all to the researcher with an independent mind. Again in 2011 Kenoyer adjusted the Ravi Phase in Shaffer's Regionalization Era (Shaffer, 1992) and drawn the difference between Hakra and Ravi Phase on the basis of drainage system and its geographical distinction (Kenoyer, 2011:5) which does not make it comprehensible to understand because cultural traditions travel with people like commodities. He documented the Mud Appliqué Ware of Hakra, put it in general category of the ceramics widely spread across greater Indus Region and Balochistan and hinted about further studies to trace regional variations. Again it seems absurd because Mughal has given around eight different styles of ceramics from Hakra Ware comprising regional variations (Mughal: 1997). The Hakra Ware sites in India have been classified under same groups (Rao et al. 2005-06).

Ceramics (Hakra Ware) (Plate:V-VI)

The survey of the Cholistan revealed a distinctive ceramics assemblage which was classified and named by the principal investigator. Dr. Mughal divided the ceramics into eight types on the basis of texture, color, appliqué, treatment, making techniques, shape and material , etc. (Mughal, 1997). Same pattern is followed by Indian scholars L.S Rao et al. divided Hakra Ware ceramics into 8 groups (Rao et al. 2005:60).

Hakra Incised

The incised ware is characterized by the lines drawn on the vessels in horizontal, diagonal and wavy manner. The big vessels were slow wheel turned, well fired and thick. Lines are the only decoration appeared on these vessels. Thin bodied vessels with incised lines have also been reported. The lines drawn on Hakra Ware are deeply incised are grouped under the term of “comb incised” pottery by the investigator, used for the ceramics found in Indus Valley, Balochistan and Iran. There are two types of incised ware recorded and bifurcated on the basis of deep and light incised lines (Mughal:1997). Rao has documented two more categories in Incised as light and deep incised.

Deep Incised Ware is red to bright red with deep incisions before firing and without any slip. Incisions Made with reed are coupled with black bands at the neck or belly of the pots in usual patterns of rows of chevron or crisscrosses. Category includes small and handled vases also ewer like pots (Plate-V, c-d ; Plate-VI, d).

Light Incised Ware includes wavy lines incisions directly on the surface at the belly or neck of the pot without slip and with comb like object. Two or three lines of incisions bordered wavy lines at either side, ceramics include small vases, jugs and ewer shaped vessels (Rao et al. 2005). The incised ware from Farmana in superficially incised or deeply incised haphazardly decorations, linear or curvilinear patterns are made on outer surface and rarely inside (Shinde et al. 1998).

Hakra Appliqué

Hakra Appliqué Ware is marked by the coating of vessels with the bits and pieces of pottery on the outer surface of ceramics. This ware mostly includes storage jars of big and elaborated sizes with well-formed rims moulded outward or vertically straight. The pottery type is not well fired and color varies from dull red to grey. The appliqué ware consists of thick pots completely handmade(Plate-V, f, Plate VI, a). But there are also thin bodied, well fired and well coloured in light-red shade is recorded. The investigator has linked the type with Kot-Diji and Sarai Khola (Mughal, 1997). This ware is identified as Red Ware in India and documented at Girawad site and it's not preceded or superseded by Early or Mature Harappan marking hence proved early dated. Shinde notes that the mud appliqué ware used for utilitarian and aesthetic purposes have also been recorded at Bhirrana (Rao et al.) and Farmana. He furthers traces of the usage in contemporary times near Girawad. At Farmana Mud Appliqué Ware is represented by medium size storage jars and small globular pots with slightly flared out or averted rims (Shinde et al. 2010).

Black Burnished Hakra Ware

The Black Burnished Ware is characterized by wheel made carinated vases of thin fabric with red body painted of black glossy slip on the external surface. Vases with sharp rims and carination above base is distinctive feature also large vessels with high necks painted with non-glossy black color all over the external surface is similar to finds from a site in India located on Gagghar (Dalal, 1980; Mughal:1997). Mughal has also traced similarity of Black Burnished Ware with vessels from Anjira site in Balochistan. Shinde has found similar pottery from Girawad Chocolate/Black Slipped Ware. Sometimes core appears greyish, vessels treated with black slip reflecting different shades according to solution and its properties. Slip used varies from thin polish to thick layer giving dark and glossy appearance to the vessel (Shinde et al. 2010:125). Rao has documented few sherds of Black Burnished Ware from the site of Bhirrana pots with shapes of concave sided bowls, squash pots, straight sided bowls with featureless, slightly averted/slightly out turned/rounded or tapering rims (Rao et al. 2005-006).

Cups, Bowls and Dishes

This group includes handmade and wheel made utensils of daily use. Bowls have wide splayed out spread. Bowls with basket impressions at the bases are usually plain and without any decoration, few are red slipped inside similar to burnishing. Another type is painted designs in black on the surface or with a cream slip. Cups are carinated above the base with red and chocolate slip. Dishes are plain or red slipped with thick and outwardly spread rims (Mughal, 1997:66).

Painted Buff Pottery

This group of ceramics is marked with a small group of buff or buff-slipped pottery with black painting on it. It includes small potsherds with distinctive black painting and rarely any big vessel but it has nothing to do with Indus Valley Proper or Balochistan. The tradition seems foreign and borrowed from Southern Iran (Mughal, 1997:66). Rao documented one sherd of buff ware in brown color painted with horizontal five bands and a festoon around the neck (Rao et al. 1997).

Painted Pottery

The Hakra Ware with painted designs of simple nature are rare, mostly wavy or horizontal lines, triangular designs in black color on a red or cream slip or on the unfinished surface of vessels(Pp. 66).

Saucer-Shaped Lids

Mughal has documented a group of sherds of lids of saucers with a knob in centre. The knob was made at the same time with lid on the wheel (Pp.67).

Grey Pottery

Grey pottery sherds in limited number were also documented typically resembling to red ware type mainly bowls. Grey pottery is treated with black slip.

Pedestaled Pottery

Mughal also found stems and fragments of pedestaled incomplete pots.

Graffiti on Hakra Ware Ceramics

Hakra Ware is identified with graffiti marks which is believed to be the nascent stage of Indus Script.

Miscellaneous Artefacts

Mughal documented various other artefacts and commented about abundance of microliths found from the sites depicting continuity of Mesolithic and Neolithic traditions in the region. Tools also have similarity to Jalilpur-I and Sarai Khola-I Neolithic period. Parallel sided blades, scrapers, long blades with retouched edges, scrapers, cores and tools made of flakes. The stone tools were made of different stone materials like agate indicating foreign sources of material however presence of cores tell about local manufacturing. Also pieces of gypsum, grinding stones and balls were recovered. Other finds include terracotta figurines, humped bull figurines with short legs from the site of Valwali which also yielded 32 figurines along with copper bits, Badalwala-V yielded hind quarters of figurine with four udders hinting most probably cows, balls, bangles with triangular and rectangular section, shell bangles and cylindrical beads painted in red and grey colors, long cylindrical

pestles with rubbed sides also occur (Mughal, 1982, 1997: 67-68). Similar finds have been recorded from the Hakra Period sites in India. Excavations at Bhirrana exposed disc shaped steatite beads, lapis lazuli beads, jasper beads, carnelian, copper fragments, sling balls of terracotta and sandstone, pestle of sand stone and quern, terracotta bangles with circular and cross sections, crucible, hop-scotch fashioned on pottery, a solitary piece of chert blade and bone point (L.S. Rao et al. 2005-2006:63). The site of Kunal yielded bone tools, micro beads made of chalcedony, fish-hooks and arrowheads made of copper were recovered from the pit dwellings (Acharya:2008). The site of Girawad provided similar information regarding antiquities terracotta beads globular in shape, querns and stone sling balls, terracotta beads and bangles (Shinde et al. 2008). Dangi also collected couple of gold beads, bangles, chisels, tweet steatite beads and unidentified copper objects (Dangi, 2006).

Hakra Period Architecture

The sites of Hakra period reported by Mughal are mostly single occupations Periods (Shaffer, 2012) yet there has not been any detailed excavation done to expose the architectural scheme. However in India lot of work has been done and considerable settlement pattern has been exposed and documented. The Hakra sites in India yielded enough information to determine architectural and structural features during said period. First architectural features were exposed at Kunal site in Haryana excavated by (Acharya & Khatri,1986-1995).

Pit Dwelling:

The excavation brought to light dwelling pattern on artificially raised platforms made of red *kankri* mud. The pit-dwellings were excavated along with post holes most probably to use for wattle and dub like structures. The pits at the site of Kunal are of two types, living pits adjacent to refusal pits. These varying sizes pits are measuring 2 meters in diameter and 1.10 meter depth in general. The walls inside the pits were thatched with mud and few pits were documented with hearths inside providing evidence for cooking inside the pits. A developmental stage recorded the use of mud

bricks and increased thickness of the thatching on the walls indicating increase in the sizes of the huts (Acharya, 2008).

The excavations at Bhirrana by L. S. Rao brought to light the structural remains similar to that of Kunal IA Period. He recorded total nine pits and numbered them 1-9 among which 2, 3, 4 number pits were residential and 5, 7 and 8 were used for sacrificial or industrial pit where charred bones and skull of animal was found, whereas pit number 9 is refuse pit of Mature Harappan Period. Rao documented varying sizes of pit dwellings with a depth of 34-58 cm and diameter of 230 to 340 cm a sufficient room for 3 to 4 people, without any post holes in sight. He also recorded thatching inside the walls similar to Kunal and a brick lining with usage of bricks of irregular sizes were recorded. He also found reed impression on chunk of earth giving impression of wattle and daub superstructure. He also found a mud platform and hearth outside of the dwelling pits suggesting cooking was not done inside. He also found fragments of crucibles with specks of molten copper indicating their industrial use (Rao et al. 2004: 61).

Girawad is another important site of Hakra Period in Haryana excavated by Shinde and Kumar in 2007. They exposed a big number of circular or irregular pits of varying sizes and for different purposes built on the mud platform measuring 50x 30 meters with mud brick structures. They divided the pits into five categories accommodation pits i.e. pit-dwelling, storage pits, refuse pits, pot stand pits and dirty water pits which formed complexes total 13 in number, and each complex has an accommodation pit, a garbage pit and a storage pit. The dwelling pits at Girawad are comparatively bigger than pits at Bhirrana and Kunal sites. Post holes were located on the edges and margin lines at irregular distances, walls of the pits were plastered smooth from inside also use of mud bricks with a ratio of 1:2:3 similar to Early Harappan Period has been recorded by Shinde et al. while surveying the adjacent area found mud brick structures and proposed that these mud bricks houses in the region contemporary to the Hakra Period show residences of the people of higher social status

whereas craftsmen and working class lived in pit-dwellings. They recorded 60 features of the structures including pottery kilns , etc. With thick walls and mud used has impressions of wheat and barley husk (Shinde et al. 2008) which is a common practice for thatching in contemporary times too.

Farmana is another site of Hakra and Early Harappan Period excavated by Shinde and Kumar who conducted total 11 seasons. The pit-dwellings at occupation level of Period I at Farmana site are similar to that of Bhirrana, Kunal and Girawad. Farmana is famous for Regional Hakra Ware and dwelling pits also associated with storage pits, layer number 8 represent Hakra Culture and post holes on margin lines have been documented. Walls and floors were thatched plastered (Shinde et al. 2006-2008). The site of Farmana also yielded Hakra Period micro disc shaped steatite beads, terra cotta bangle, terra cotta beads and shell (Shinde et al., 2006-2008).

Geographical expansion of Hakra Period Sites

The geographical expansion of the Hakra Period is marked by Mughal in the catchment area of the now dried up River Hakra known as Cholistan in Pakistan which is continued on the Indian side known as Sarasvati River and called Saraswati Basin or Drisdhavatti Plain. Mughal divided Hakra Ware Culture as eastern Hakra, Cholistan Hakra and Nara Hakra which is also termed as Wahinda stretch of Hakra River flowing in Sindh, Mallah reported many still unexplored single culture sites i.e. Wakri Baro, Char Baro south 3, Dubi 2, 4, Jamal Shah south 2 and other (Mallah, 2008). The exploration in Indian side is underway and brought to light many new sights which is to affirm the phenomena started by Mughal in Pakistan. In Pakistan expansion of Hakra is observed in Gomal Valley and site of Rehman Dheri and sherds of Hakra Ware were found at the site of Harappa also (Kenoyer & Meadow: 2000). Mughal (1997) has given detailed expansion of the sites in Bahawalpur falling in Punjab, Pakistan. As Cholistan is extended in India as Rajasthan Desert and it is under exploration for many decades the sites bearing similarities to Hakra Ware Culture were ex-

plored and excavated for example Anupgarh (Dalal, 1980), Kalibangan-I (Lal et al. 2003) Baror (Sant et al. 2004). Recent wave of exploration and excavation in Haryana brought to light the most important data about the early settlers in the region and among hundreds of sites the sites of Farmana (Shinde et al. 2008), Bhirrana (Rao et al. 2005-06), Girawad, Kunal, Rakhigarhi, etc., has yielded most important data. Though area is still under explorations and bears huge potential to yield more valuable information in future. In Pakistan new data came out after publication of the book of Zubair Shafi Ghauri who explored the central Punjab and brought to light many new sites from Hakra Period among which five have been chosen for current research. Hassokay, Manawala, Noulan, Panj Peer and area around Derawar Fort in Cholistan were explored by Mughal first.

Spatial Distribution of Hakra Ware Sites

Mughal has given a cursory look of the settlement arrangements of the sites of Hakra Ware in Cholistan and established that Hakra Ware Culture developed here and continued as Early Harappan and Mature Harappan periods of Indus Civilisation. He measured the sizes of the sites in roughly manner as without excavation it is not possible to determine. He recorded 99 Hakra Ware sites along the 300 Km length and 30-35 K width at the both sides of the river. Most of the sites are formed on stabilized sand dunes and few on mudflat, majority is reported as single culture sites. Mughal divided as i.e. camp sites and Settlement sites. 52 sites are camp sites (comprise 52.2%), 47 settlement (consist 45.45%) only 2 sites mentioned with kilns for craft related activities which increased gradually and evident from Early Harappan and a four tiered hierarchal settlement pattern has been identified by Mughal which continued until Late Harappan Period which is evident from the existence of Ganweriwala in Cholistan measuring more than 80 hectares and said to be the third major urban centre after Mohenjo-Daro and Harappa. The 52% camp sites covered around 5 hectare around 14% sites fall into 10-15 hectares and, four sites cover 15-20 hectares whereas three sites spread over 25 hectare. Largest Hakra site he noted is Lathwala-II which is covering 26.3 hectares. Mughal identified a major drop in the size of sites from nomadic life to Hakra Period and estab-

lished that population was well settled in Cholistan by the beginning of first Millennium and they were producing their products locally (Mughal: 1990:8, 1997). On the other side of the border no proper study on the settlement pattern has been done so far. Though the work being undertaken is very precise and efficient still it entails a huge vacuum in terms of settlement pattern. The information coming through antiquities and publications is helpful to mark a gradual pattern of dwelling and settled life in Rajasthan and Haryana.

Subsistence Pattern of Hakra Period

Since Hakra Period is preceding the Early Harappan Period the economic pattern of the era would play a major role to understand the development sarges. The people of Hakra Period were mainly surviving on herding which is the developmental stage of domestication of plants and animal husbandry. Mughal has established the fact that large number of camp sites indicate the nomadic style of living. People were moving places according to the weather conditions and locating water resources available in the vicinities. The settlement pattern according to given whether conditions was introduced by Possehl and he explained that pastoralists from Hakra Period came down to find seasonal abode for their domesticated animals (Possehl, 2002). The broken figurines of cow and bull found by Mughal are said to be the evidence of importance of animals in the economic system. Hence the early village settled communities from highlands of Balochistan moved down to the plain areas and ultimately settled down along the Indus River. Since Hakra was a mighty river flowing parallel to Indus River it became the pivotal point of settled life (Mughal, 1997, 1982, 1990). The water resources gave birth to agriculture given evidences of barley husk recorded at Bhirrana (Rao et al.2005-6). Thus Cholistan also became centre of human settlement in the nascent stage of Indus Civilization. Possehl estimated that the presence of abundant water resources indicates that the area

could have been cultivated with wild wheat and barley. In the beginning of Regionalism when farmers and herders left Neolithic homeland Balochistan and settled in the eastern fringes of That Desert during Killi Gul Muhammad Phase at the same time large number of farmers and herders at the western drainage of Sarasvati River (Possehl,2002) Mughal already affirmed about the local production of commodities (Mughal, 1992). As the primitive societies were based on barter system and economy was orbiting around agriculture; the exchange of goods and commodities could have played big role in the expansion and interaction of people. Would have triggered trade on local and inter-regional level. The presence of copper in the Hakra Period shows the exploitation of the natural resources and trade of raw materials. Copper was being imported from Balochistan and Rajasthan, agate and ammonites from Rajasthan and Gujarat and lapis lazuli from Balochistan and Afghanistan and the settlement spread was covering Kachi Plain like Mehrgarh, and Killi Gul Muhammad, Sheri Khan Tarakai and Jhandi Babar in Gomal Plain, Harappa and huge concentration of sites in Cholistan (Mallah, 2010: 46-47) and the stone tools hint the nearby resources of stone like Rohri hills and Kirana hills (Law, 2011). To exploit such resources a skilled manpower and wisdom of generations is required. The presence of beads and copper objects from Mehrgarh lends support to the notion of gradual regional development as well as indigenous origin of the Indus Civilization.

Sequence of Hakra Period

The Hakra Period came to fore in the recent past after Mughal's exploration and since then new questions arose. When did it start and how did it contribute to the development of the Indus Civilization and when did it end? How long it existed? Mughal suggested the Hakra Period preceding to Kot-Diji and Early Harappan Period when he found both occupation levels at Kachanwala and Nahranwala sites in Cholistan. The micro lithic tools he associated with the Neolithic Traditions which suggests that the Neolithic Period continued till Hakra Period. He dated it around the middle of the fourth millennium B.C on probability and comparative analysis (Mughal, 1997). Possehl

putting into context has written that roots of Hakra Period lying in Mehrgarh in Kachi Plain and Sheri Khan Tarakai in Bannu Basin. He sought support from the ceramic evidences of Anjira, Kot-Diji and Sheri Khan Tarakai bearing similarities to the Hakra Ware (Possehl: 2002:35). New information is coming from the sites of Hakra Period in India among which the site of Bhirrana has almost revolutionized the chronology of the early phases of Indus Civilization. The Radiocarbon dating of the site dates back to 7000-6000 BC which is representing early Harappan Period and is contemporary to Mehrgarh Period. Thus it should be proposed that Cholistan and Sarasvati Basin was the centre of human settlement since Neolithic times (Dikshit, 2012).

Chapter: 06

Pottery Studies and Archaeological Perspectives

Pottery studies in archaeology are imperative and very common practice. It is the most abundantly available material at any archaeological site which stood test of the times. The study of pottery brings out valuable data related to socio-economic and technological developments happened in the given circumstances. Also it throws light on the aesthetic and utilitarian trends of the time immemorial. Reconstruction of ancient past through potsherds is largely based on the interpretation of methods used, material and techniques adopted to make them. Resources used and utility served by the pots and ceramics explains social and economic traditions and expansion of them.

Origin of the scientific Studies of Pottery

The origin of the Pottery Studies has been divided into phases by Orton and Hughes (1993) i.e.

- i). The Art Historical Phase
- ii). The Typological Phase
- iii). The Contextual Phase

Art historical phase is recognized with the introduction of written evidence the excavated pottery in 15th century when (Orton & Hughes reported, Ebendorfer 1446) found pots and described them man-made instead of magic-crock or works of gnomes, Petrus Albinus (1587) excavated man-made vessels and published first proper excavation report in prehistoric archaeology. In 1603 John Stow wrote about pots he found in Roman Cemetery from 17th century attention remained focused on burial urns and 18th century witnessed collections comprising Etruscan, Greek and Roman vases. Publications and on individual vessels and collections with focus on artistry and techniques became popular. By the beginning of the 19th century the interest shifted from sepulchral to broader aspects. Efforts were made to draw a clear picture of the development through history taking into account fine ware preceded by coarse wares (Orton & Hughes, 1993:5-6).

Typological phase drew attention to the growing interest into classification and started in 1880s very early example is Smith's 'embryonic Samian and figure type series'. Classification of material from Lezoux, Plique 1887 set a classificatory system for the classification of the corpus of Samian Ware type. This phase also saw the appearance of relationship between pottery and stratigraphic sequence in parallel in Flinders Petrie's work at Lachish Palestine where he observed Phoenician, Jewish, Greek, Seleucid and Roman Pottery in successive strata. Such phase started in United States was started with Kidder's Excavations at Pecos and model was developed. The focus on vertical and spatial distribution of pottery to take it as source of dating evidence where horizontal studies were carried out to form master chronological plans of the sites and to find out Childe's cultural group or culture where pottery dominates all other antiquities. This phase was the age of "type" and many discourses were built on the idea of type defining its purpose and developmental process involved mostly meaning form and shape of the pots (Orton & Hughes, 1993:7-11).

The Contextual Phase was initiated by Shepard (1956) who focused onto study the identification of materials, technological development and trade distribution. Her work laid foundation for fu-

ture ceramic studies practically and theoretically. Her work was reaffirmed by holding international conferences, first evaluated the contribution of ceramic studies to archaeological and ethnological research second was followed up conference. The period marked increase in the ethnographic studies, technological aspects and scientific techniques in the pottery studies (Orton and Hughes, 1993:12-13). In Western Asia in 19th century Loftus was the pioneer of recognizing pottery as significant dating material in archaeology. Meanwhile pottery became essential part of the archaeological excavations and methods devised to record all the pottery items coming from the sites. These developments laid foundation to recognize pottery as a potent medium of research (Delougaz, 1952).

Pottery tends to arouse strong emotions in archaeologists; they either love it or hate it (Orton and Hughes, 1993:3). Archaeologists believe that man left his footprints in clayey soil which was subsequently dried and hardened by the sun which ultimately led to making of pot even painted one (Halim & Baig, 1995). Clay began to be manipulated by men tens of thousands of years ago to make prestige objects such as figurines and adornments. Sun-dried, low fired, sub ceramic objects of this early “software horizon” may have been used for thousands of years (Rice, 1999:44). In modern times with new and wider concepts of history and while archaeology emerged as a science humble remains like potsherds attracted the attention of scholars and excavators hence became fundamental part of research (Delougaz,1952:1). With growing interest in anthropology and material culture, the origin and spread of early pottery have reemerged as legitimate research foci (Rice, 1999:2). Though questions about origin of pottery production and its usage for domestic purposes which have been linked to different mythological theories too. For example creation of man from clay is believed in almost all the cultures which depicts importance of clay.

Later on, technological advancements in the in the pottery making have emerged in human history. Certain theories about the origin of pottery are widely believed among which theory of architecture and culinary theory (Foster, 1959) are most common. The architectural parallels hold

weight compared to the Neolithic Age dwellings when man first started building mud houses and hearths and formed village farming communities. The culinary theory is conventional and said to be influenced by the idea of sun-dried clay or hardened clay earlier used for fire-pits (Foster, 1959). Vandiver believes that pottery technology most probably developed alongside Pre-Pottery Neolithic plaster or architecture (Vandiver, 1987). Early Neolithic provides sufficient insight when clay was used as raw material without any additives which gradually improved with the addition of minerals and pottery pastes prepared artificially using temper, chaff, sand and mica and silts, etc. The Bronze Age offers wheel made pottery which is well fired and fashioned beautifully but the stages of development in the process and improvement in the fabric is not as simple as it is believed.

Foster (1959) reported that Chappel & Coon assumed the handmade pottery was women's job who made it out of necessity for household purposes mainly, with the invention of potter's wheel the pot making as housewife's job was ended. Potter's wheel would help to produce ten to twenty vessels in a time formerly required to produce one hence mass production started. Foster reported Childe states that with wheel a professional potter would shape one pot in ten minutes which would take ten hours of a housewife by hand. The wheel invention not only led to better shaped and refined production of pots but also drove industrialization (Foster, 1959:101).

Wheel Invention

The earliest inventions in human history and their spread over time and space has been focus of archaeological studies since long. The technology of ancient world has been paid much attention by the archaeologists since it adds up to the national pride as well. The idea or invention of potter's wheel is usually taken for granted by the anthropologists as "a potter's wheel is potter's wheel" (Foster, 1959:102). Invention of wheel in the history of mankind is major discovery as it introduced new techniques of ceramic fashioning with the help of kinetic energy though origin is unknown yet (Roux And Pierre, 2009) most of the scholars assumed it inspired by the cart wheel.

Laufer (1917) the principal of the cart wheel theory believes that wheel shifted the pottery making job from women to men, wheel is representing men whether for cart or pots and Indian spoked wheel is similar to that of cart wheel, Harrison (1928) Spier (1956) and Herskovits (1948) seconded him. The essence of invention is not only the wheel in material form but idea of its exploitation and use of centrifugal force (Foster, 1959). The wheel production would have taken multiple shapes and passed stages as is evident from wall paintings in Egyptian tombs where potters used turn tables made of wood and stone. The principle of wheel was discovered in Mesopotamia which ultimately led to ceramics production by men leaving women behind, earliest records of the potter's wheel were found in Egypt around 2500 B.C (Bryant, 2001). Earliest wheel-thrown opposing wheel built pottery came into use in Mesopotamia in 2250 BC (Henderson, 2000). The technique of wheel throwing pottery was being commonly practiced in Mesopotamia, Indus Valley Civilization and Central Asia by second half of the 3rd millennium BC (Courty and Roux, 1994). The primary stages of pottery making in Subcontinent could be traced back at Mehrgarh where Mehrgarh II yielded basket-ware pottery which is said to be the first pottery in South Asia (Vandiver, 1995, Franke-Vogt, U., 2008, Jarriage, 1998). Which is subsequent in Killi Gul Muhammad, Togau Ware and Kechi Beg, Emir and Nal Pottery made by coil building technique on slow turn-table or non-rotating anvil followed by Quetta Pottery and Kulli Pottery made on fast turn-table or potter's wheel (Shudai et al., 2013) and the Bronze Age pottery could be perceived the culminated version of above mentioned development stages. Pottery of Indus Civilization is studied extensively and used as a medium of reconstruction of the socio-cultural and economic pattern of the society.

Pottery Studies

Word pottery is originated from French word '*poterie*' from '*potier*' which means potter (Wikipedia). According to American Society for Testing Materials (ASTM) Pottery is defined as "all fired ceramic wares that contain clay when formed, except technical, structural and refractory

products” (Wikipedia). Though words ceramics and pottery are used alternatively but ceramics refers to all the clay and art objects including vessels, pots and figurines whereas pottery refers to refractory items (Wikipedia). In archaeology pottery studies corresponds to the importance of social anthropology after the introduction of Processual archaeology also known as New Archaeology. New Archaeology stressed upon scientific methods of analysis and techniques which were not in common before when archeology was not being taken as a science. The pottery in human history is generally considered as second most important art expression after cave paintings. Ceramics technology not only refers to the use of clay but also fire and its application for ceramics technology.

The manipulation of fire and clay might have led to increase in surplus food production given that the storage facility was available. The material science approach used to study the ceramics provides deep insight into the selection of material, chemical properties, preparation and molding of the material into the vessels , etc. The process of making and finishing off the pots and vessels entails context to the stages passed from selection of material to completion of items. Understanding the difficulties faced by the potters to collect suitable material and developed an industrial horizon could have been achieved with the help and under the patronage of a system. The choices of shapes, clay, colors and painted motifs everything provide a context to the process. The cultural framework under which the concept travelled to the other parts highlights the adoption of techniques and acceptance of trends. The refined version of the ceramics refers to the introduction and utilization of technology travelled through generations. The skillset of the potters and the usage of ceramics provides insights for the cultural and environmental influences in the social life of the people living in the certain regions. The technology and expansion reflects social and economic prospects of the pottery given the fact that pottery is the first synthetic material made by humans on earth and used as an industrial product since ancient past. The material science approaches have been used to gauge the influence of potter’s skill set and standards set by different communi-

ties for the acquisition of social, archaeological and anthropological studies. In archeological studies the evolution of pottery is seen in linear trajectory from coarse and rough handmade pottery to refined and well-fashioned with elaborated motifs and designs.

The archaeological studies are mostly based on the foundational data provided by the pottery studies on the basis of four questions:

i). When was it made?

ii). Where and how was it made?

iii). What was it made for?

(Orton and Hughes,1993:25).

Above discussion determines that the domains under which pottery studies is conducted include archaeological, anthropological, technical, cultural and behavioral aspects of the ancient societies.

In archaeology the pottery helps to ascertain chronology, cultural groups and trade links among societies. Though introduction of absolute dating methods like Radiocarbon date and numismatic evidences have shadowed the importance of pottery but still the ethnographic aspect of pottery studies is imperative to chronological sequence. Ethno archaeology helps to understand the processes laying between the excavated finds and people who used them (Orton and Hughes, 1993).

The technological aspect of the pottery studies is also influenced by the ethnographic studies where technology reflects social progress and application of human genius. The technological development throws light on the modes and scale of production, the expertise of the potters and artists to finish the product and export to the target client. The scientific study also focused on the manufacturing techniques of pottery from handmade to wheel thrown and thick to thin fabrics, all that details entail important information.

Pottery Manufacturing, Finishing and Decorating

In order to understand the process involved and the nature of the materials used to reach an accomplished vessel needs detailed study. Knowledge about pottery making have been supported by

various material sciences to understand the composition of raw materials and manufacturing techniques adopted by the people to deal with clay and ceramics making involving water, fire and use of technology. Among many textbook materials written on pottery (Shepard, 1956; Orton and Hughes, 1993; Rice, 1987) one by Rice has identified six techniques of pottery making ranging from pinching/Drawing, slab modelling, and molding, coiling, casting and throwing. A division formed stage to stage from handmade pre-Industrial to wheel thrown (Rice, 1987:110-124). The ethnographic descriptions have brought to light many aspects of manufacturing and production system. Earlier there was less focus on detailed analysis of the ceramics in archaeological context and mostly it was descriptive (Orton and Hughes, 1993) but new directions i.e. ethnography and material sciences have changed the scenario to a greater extent.

Another thorough textbook by Orton and Hughes has made distinction between handmade and wheel thrown pottery and discussed pinching, slab-forming, turn-table, moulding/molding and wheel thrown techniques. The above book also illustrates simplest posture by pinching a hollow in the centre of the clay lump and forming the shape of the pot between fingers and thumb. Slab-building technique includes flat sheets of clay joined together by squeezing or pinching them together at the edges mostly suited for rectangular pots but circular ones can also be made, technique applied as series of coils forming rings or continuous spirals. Turntable technique involves a platform supported on a central spindle and capable of rotary motion (Orton & Hughes, 1993, Henderson, 2000) turntable serves only as platform where vessels are built, it turns slow by potter's hand or foot not in complete revolution (Rye & Evans, 1976).

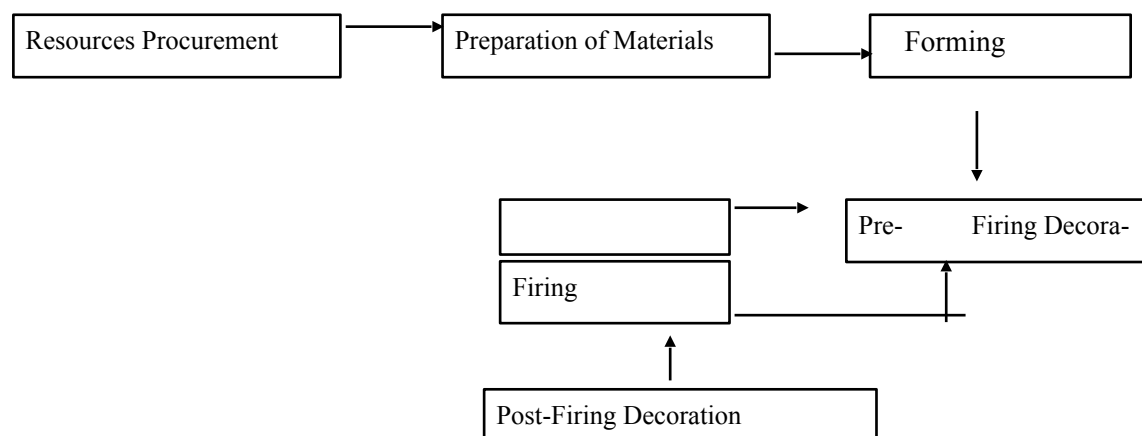
Moulding or molding includes various techniques for simple pots a hollow object commonly basket, base of another pot or leather mould can be used to hold and shape pots by hands. More sophisticated mould includes incised designs on their inner face and imprinted on the vessels made inside them. The wheel throwing techniques is very famous in modern cultural and pottery making techniques but archaeological evidences are not clearly interpreting the recovered spindles

and sockets , etc., to reconstruct mostly reconstruction is drawn out of ethnographic accounts and contemporary practices (Orton and Hughes,1993:125-128).

Coil building techniques requires more times and clay to make vessels and procedure is rather simple than wheel throwing. Already prepared clay is rolled in the palms of the hands by losing grip of the palms coils becomes bigger and perpetual activity brings it into a certain shape as per movements of the hands. After ethnographic and anthropological analysis, experimental archaeology is another aspect which has provided sound foundation to the understanding of the ceramics. Experimental archaeology helps to reproduce ancient products by experimenting ancient techniques and analyses the thorough process from selection of clay till a finished vessel. The process is performed in order to understand how was the certain job done hence it helps to describe the complete process and enhances understanding of the students to visualize past in practical manner. Experimental archaeology is being taken seriously in the classrooms and in the field not only for students but also for local communities.

Rye and Evans' work on the pottery traditions in Pakistan has given detailed analysis of the technique being used in Pakistan and India and discussed the skill and grip of the potters over the wheel. In Pakistan the basic tool of any potter is potter's wheel but in Northern part of Pakistan there are still few nomadic potters who use molds or broken bases as molds, build the walls of the vessels by coiling, beater and anvil techniques. He documented one example of turntable technique being used in Chitral in Northern Pakistan. The true potter's wheel is single wheel by Sarasvati and Behura which is used to build vessels at a speed of 100-150 rpm by the pressure of potter's hand while throwing this wheel is very common in India with for subtypes but not in Pakistan. In Pakistan the efficiency of the wheel and evolution of the techniques involves regional influences from Punjab to Sindh etc. (Rye & Evans, 1976:116). In modern times single wheel is specified with India but kick wheel is spread over Europe and Asia and both wheels were employed by Greeks and Romans (Orton & Hughes, 1993).

Rye and Evans (1976) believe that single wheel was associated with Hindu potters in Subcontinent therefore the absence of it in modern Pakistan is justified. Though he found one single wheel potter's workshop in Gujrat, Punjab in central Pakistan which was introduced in recent times (Rye & Evans, 1976). Shepard (1956) has described almost similar analysis of the stages of development from (pre-wheel) hand-made to wheel thrown pottery. Modelling, coiling and molding and paddling techniques were replaced by the speedy production through wheel which accelerated mass production. Primitive potters were well aware of the two most distinctive qualities of clay 'elasticity' and 'unctuous' which they manipulated to shape a fine and well textured vessel. Now with help of modern and material sciences the interesting information about the effects attained by the potters with simple trial are being understood properly. Simplest of the potters are aware of the varying properties of clays coming from different origins and knows how it would come out in color and hardness after firing (Shepard, 1956).



Vessel Production Flow Chart, (Rye, 1987:113-167)

Classification

Classification in pottery studies has largely and traditionally been conducted on the basis of typology and forms.

Fabric

Term fabric in pottery studies refers to the characteristics of the clay body, the minerals call contains, the fire results and changes happened to it and the inclusions added to the clay to make it meet the standard.



Fabric Analysis

Fabric analysis is conducted to understand the methods adopted to make and decorate the vessel and its usage. Usually magnifying glass and binoculars are used for analysis of the sherds. In many cases the group is identical and could be examined with naked eye. The classification of clay requires diagnosis of inclusions which is why such equipment are used to observe minute details of the sherds.

Microstructures

Fire plays vital role in pottery making hence analysis depends upon the function of fire also. Fire lends color, hardness and causes fractures.

To analyses the ocular of the potsherds Munsell chart has been developed owing to the inability of the general terms to define the color accurately. For example pottery cannot be described as plain red, black light red or light green, Munsell has a proper notation and description of every shade and color. In mussel they are referred in such manner

R Red YR Yellow-Red

Y Yellow GY Green-Yellow (Orton and Hughes,1993:156).

Pots color could be divided into five zone. Core is the area least exposed to the extreme temperature, black cores contain carbon from incomplete burning of the organic materials in the fabric.

Oxygen leads to the oxidizing of the core producing red and brown color. Margins of the pot between core and the surfaces to see the difference between them and the core no difference indi-

cates that the fire was kept longer to reach an equilibrium or very short firing, difference in color of inner and outer margins indicate the mouth of the pot was covered perhaps due to the position inside the kiln or in the stack. Finally difference between surface and margin suggests a short-lived change in firing conditions for example opening of the firing kiln while pottery was still hot and Oxygen made it easy to the pots. Sometimes different materials are added deliberately at the end of firing to give desired color to the pots for example green timber (Orton and Hughes, 1993: 73).

Hardness

Hardness of the fabric is determined to get an idea of the length and duration of firing temperature, porosity, grain-size distribution, post-depositional environment and mineral composition all contribute to the hardness of the fabric but hardness should not be taken as a precise indicator (Orton & Hughes, 1993:158, Shepard, 1956). The idea of scratching the surface is to understand how well a pot can stand abrasion.

Cracks/Fracture

The fractures in the fabric provide information about the temperature because they occur due to the thermal pressure. Non-plastic inclusions also became source of cracks mostly when they are inhomogeneous. Low temperature and more inclusions produce rough surface which is termed as haphy surface similar to the hackles on a dog's back. Another fracture type is laminated fracture which is visible in layers. Orton and Hughes suggest that study of inclusions is very important but a delicate work also if it's not possible to find an accurate answer it is better to just right color and appearance rather making misleading identification (Orton and Hughes, 1993:74-159).

Feel

Many archaeologists use the method of feel by touching the pot and trying to figure out the function of composition elements. The terms used for very purpose are smooth, harsh, rough, soapy and powdery (Orton and Hughes, 1993:75).

Slip and Glaze

Modern research includes slip and glaze into the category of fabric analysis. Orton and Hughes suggest that glaze analysis should be described on the same pattern as fabric analysis is done for example patch, internal and external cover, thickness, the surface appearance (smooth and pitted) and use of colorants should be distinguished from accidental colours caused by impurities (Orton and Hughes,1993).

Ware

Provenance studies correspond to group the assemblages of the sherds under one identity which is often termed as ware entailing their origin and sources. Ware is generally recognised with ‘type-variety’ an analytical approach used for the classification of Mayan pottery which groups attributes of the pottery in definable unit called variety. Surface finish has been given primary focus given ware as broader classificatory unit which was further subdivided into vessel shape (Smith et al. 1960). Rice describes ware as classificatory unit of the type-variety system dealing with the technological attributes of the pots i.e. composition and surface finish which include texture, temper, hardness, thickness, colour, slip sand smoothing, lustre feel of the surface whether slipped or unclipped. He further established the fact that hurdle in implementing the ware concept is that the composition of paste and surface treatment are two individual things and should not be grouped in single category (Rice, 1976:538-539).

Form

Classification in archaeology is largely dependent on the vessel forms. The classification of group of vessels could be done in different ways depending upon the orientation of the research or scholar. The general classification may include rim forms, presence of handles and spouts and overall shape of the pots. Shepard has supported the geometric approach of classification of form given by Birkhoff (1933) for example end points of base and lips, curvature etc. (Shepard, 1956).

Materials and Pottery Studies

Material is the basic unit of production and pottery production needs simply clay with natural nutrients sufficient to produce fine vessels and other items. Essential material for pottery making requires clay and water. No-plastic or (temper or opener) can be added to clay mix and slips, paints and glaze to finish products and fuel to fire the vessels (Orton & Hughes, 1993:122).

Steps in pottery manufacturing

1. Procurement of Raw Materials
2. Preparation of Raw Materials
3. Forming of vessels
4. Pre-firing treatments
5. Drying
6. Firing
7. Post-firing treatments (Orton and Hughes, 1993:122).

Clay is complex material containing natural minerals in abundance derived out of weathering and igneous rocks. Naturally occurring clays are divided into two groups, underlying bed-rock by decomposition and other type carried over by rivers, glaciers, wind or sea known as primary and secondary. Mostly pot making industry is dependent upon the secondary type (Orton and Hughes, 1993) probably considering it more suitable to turn the pots into perfect shapes and designs. Rye reported the potter Noor Khan in Bhoombert Valley Chitral in Northern Pakistan who believed that the any outcrops where slate is extensively weathered us best suitable, he also crushes stones from pebbles in the bed of the river Bombert to use as non-plastic inclusion (Rye & Evans, 1976:9). The clay's ability to absorb water is often taken for granted but actually critical to makes it more plastic (Henderson, 2000). The non-plastic inclusions are decomposed fragments of bedrock and sometimes get into the clay during transportation and secondly potters include themselves. Most of the inclusions are granular (Shepard,1956) more inclusions make it difficult to deal with clay since it reduces plasticity of the clay and thin fabric pot is not possible to be made

with more non-plastic inclusions especially on the fast wheel. Tempers especially the organic material of agricultural origin like burnt bone, shell, dung and husk and horse hair help to turn wet or plastic clays into workable pastes after addition of dry organic material (Orton and Hughes, 1993:124; Henderson, 2000). Clay with water turns into plastic to make it efficient shaping and design the pot. In some cases common salts are added into the mixture by using sea water or dipping vessels into sea water before firing which creates a white surface layer often confused with a slip (Orton and Hughes, 1993).

Fuel plays a big role in the pottery firing since it dries out moisture. The quantity and quality of fuel is mainly important to understand the function of heat and how it is appropriate to provide reasonable fuel. Fuel plays a major role to change the colour of the vessels for example in winter damp fuel facilitates an olive-green glaze which is turned into khaki buff in summer (Orton and Hughes, 1993). Wood is a favorite fuel of any potter, dung is also very popular especially in Pakistan and India. With changing trends and modern innovations the gas kilns have replaced the kilns fuel by wood or dung. In order to understand the kiln technology the environment of the area, weather conditions and fuels species should also be monitored because pottery firing requires perfect temperature means equal presence of the gases i.e. oxygen, carbon monoxide and carbon dioxide

Next step clay preparation is needed to purify the clay by removing impurities and unwanted inclusions. In order to produce a smooth, uniform paste keeping in the view the requirements of the complete process from forming to baking and polishing. The kneaded clay has to be efficiently prepared contains strength for thermal and mechanical process (Orton & Hughes, 1993:125). Forming is the final stage of the clay getting into shape. Forming process is divided into two groups primary and secondary. Primary group includes handmade forming and secondary is technically advanced stage where wheel is the basic tool. Surface treatment is second stage of firing where irregularities are removed and necessary trimming is done to give a perfectly smooth surface to the pot. Sometimes surface treatment is done after drying and sometimes when

the pot is still plastic. The peddle and anvil technique is applied to beat the pot from outside with a stick and a stone or clay anvil is held in the other hand. This helps to compact the clay, thin the walls of the pot and smooth the surface after removing the marks left by coiling. This technique has a long history in Chinese pottery making (Henderson, 2000:122). The leather hard pot surface treatment is called burnishing. Burnishing helps to smooth the surface and is performed with pebbles in case of hard dried pots which gives lustre effect, other tools are flint and recycled sherds to trim the body of the vessel (Orton & Hughes,1993:133) sometimes damp cloth is put on the pots or wetted the pots before burnishing with smooth pebbles.

Scrapping technique is applied to remove imperfections from leather hard surfaces with the help knife mostly (Henderson, 2000). The surface treatments are also done by penetrating or combing sharp edged or pointed tool (Orton et al.,1993) to decorate the surface by impressing, stamping, combing, striating and rouletting, the pot surface can also be carve, incised or perforated (Henderson, 2000).

Finally the slip or glaze application to design and decorate the pot could be done (Orton and Hughes, 1993). Slip is mostly comprised of liquid suspension of clay particles of different colour in order to give a fine base for glazed decoration. Slips can be done by dipping the pot into the liquid or pouring or wiping it on the surface of the pot (Henderson, 2000).

Glazes are mostly similar in characteristics with many glasses. Pots with glaze are fired twice one at a temperature 900 °C -1100 °C also known as biscuit firing which helps to make the pot stronger and also supports its shrinkage to make an interaction between glaze and the pot surface making it porous to absorb the glaze second firing is done when pot is cooled down and glaze is applied this firing temperature varies according to the type of pot and glaze (Henderson, 2000:123).

Drying

Drying is the essential part before firing, the mechanical removal of water seeped into the clay particles. Vessel shrinks and which sometimes results in cracks the S-shaped crack in the base of the wheel made is one example. Drying process could be done in open air or closed heating spaces. (Orton and Hughes,1993).

Firing is the transforming stage where clay gets into new material, ceramic. At a degree of 550-600 chemical and physical changes take place for a perfectly baked pot. Less temperature firing produces weaker or half-baked pottery (Orton and Hughes,1993). Plasticity is finished while firing and porosity is increased (Shepard,1956). Different wares can be distinguished following temperature on which they have been fired for example earthenware, stoneware and porcelain (Henderson, 2000). Two ways are commonly adopted to fire pottery;

Open Firing

is very common and traditionally potters prefer to fire the pottery in open spaces. Fuel is spread on the ground and pots are stacked over it, then more fuel is added to cover the stack and make a thick layer of the mixture of fuel and waste sherds to keep the heat intact for some time in order to maintain even temperature. The fire is lit below the stack and burns through the in few minutes and process is complete but in some cases it takes one to two hours and fired pottery is not opened for 7-8 hours (Orton & Hughes, 1993:135). Terra cotta in open firing is fired at below 1000 °C, earthenware between 900 °C to 1200 °C and stone ware between 1200 °C to 1350 °C, Porcelain is fired at highest 1400 °C (Henderson, 2000:131).

Kiln Firing

is done by building specialized kilns on the ground. The pottery is stacked inside the kiln and after completion of the process kiln is demolished to take out the fired vessels.

Post-Firing Treatment

Post-firing treatments are mostly applied to make vessels more impermeable or give luster effect (Shepard, 1956).

Stages of Clay

To reach final stage of a vessel a long, full of hassle process takes place.

1. **Green Ware:** Clay not yet fired, at this stage it could be recycled and could be shaped again.
 - i) **Wet Clay:** This is versatile stage where different techniques could be applied to shape the vessel i.e. wheel throwing, soft slab, pinch potting , etc.
 - ii) **Leather-Hard Clay:** Slightly dried and shrink and pliable to some extent also known as “cheese hard”, suitable for trimming and ideal for handle attachment.
 - iii) **Bone-Dry Clay:**
2. **Bisque Ware:**
3. **Glaze Ware:**

Quantification

Simplest definition of pottery quantification is “how much pottery is there?”(Orton and Hughes, 1993:203) in any assemblage. First step is to understand the quantity of the sherds (Orton et al., 1993:203) which should be done on sound grounds either it's worth quantifying, either the size is enough to yield reliable information, nature of assemblage, time span. In order to understand the method of quantifying, sherd count, weight, vessel represented and vessel equivalent techniques have been used (Orton,1989:94-97).Third step is the comparisons of the sherds to determine life span of the assemblages and relativities for example if a storage jar lasts ten times as long as drinking vessels for any other assemblage this ratio would be used since knowing about the actual life span is not necessary and also it's the best possible methodology (Orton and Hughes,1993:204).

Taxonomy

Taxonomy in ceramics is reference to the typological studies. It refers to the typical and widely accepted aspect of typological studies. Taxonomy reflects human influence on the shapes, designs and traditions

Type	Description
Body	Body is where all the decoration is performed
Bottom	Inside area of the lower part of base of the pot/vessel
Base	Outside of the lower part of pot/vessel
Neck	An area stretched outward between body and mouth
Shoulder	Down the neck where the pot widens below
Edge	Edges of sherds help to measure and extract geometrically
Lip	Indented part of the neck of the pot
Flenges	Protruding rim, edge or corner to hold the pot in a place
Ridges	Any part of the pot or sherd flared outwards disturbing symmetry and perfection of the shape
Appendages	Lips, handles and spouts added to the pots when it is dried and trimmed before firing or decoration

Chapter :07

Sites Explored for Current Study

Type Site of Hakra, Jalilpur

As mentioned before the type site for Hakra Phase is Jalilpur (Plate-VII). Jalilpur pottery has been studied by Mughal. He has given the general description of the pottery. The pottery from Jalilpur has been compared with the pottery from Amri IA. Thick, handmade and under fired sherds in light red colour recovered Jalilpur I were compared to Amri IA. The sherds were coated with pottery bits with thick mud mixed surface and in case of Amri IA they were dated as second half of the fourth millennium B.C (Mughal,1974). Mughal also reported fragments of cups and large jars from Period I at Jalilpur where no structural or architectural remains were reported but net sinkers, chert blades with retouched edges, beads with gold sheets, terracotta beads and bone pointers indicating relying upon hunting of animals. Also at Gumla-I pottery was missing but chert blades and animal bones were found similar to Killi Gul Muhammad-I, Rana Gundai-I and Anjira-I-II in Balochistan; all these are contemporary fourth millennium B.C sites hence a common level of technological ad-

vancement and interaction among people from different locations is evident. Also Period I at Jalilpur at low levels overlapped with Period II where introduction of wheel and wheel made pottery started appearing (Mughal, 1974).

Period II reported more advanced and stylistically different pottery and clearly comparable to many Early Harappan sites in Indus Valley as well as Ghaggar-Hakra Valley in Balochistan (Mughal, 1974). Mughal has divided plain and painted red ware from Jalilpur II into five subgroups:

- I. Globular vessel with a short rim, normally painted neck with black or red band, having a plain or grooved surface (Mughal, 1974).
- II. Flanged vessels with knobbed lids were recognised with KotDiji, Amrian and Quetta, Sothi and Zhob pottery (Mughal, 1974).
- III. Black and Brown and Chocolate on red wares reported at Serai Khola-II, Gumla II-III and Perioano Gundai (Mughal, 1974).
- IV. Black and white on red wares comparable to Sothi Ware of Kalibangan I, Surkutoda I, Siswal A and the painted horned deity from KotDiji (Mughal, 1974).
- V. Rare pieces decorated in black and brown

Mostly pottery designs are consisting of bands and zigzag patterns painted on red surface in black which was one of the signature traits recognised by the principal author i.e. Rafique Mughal. He described it as pale-red surface painted in black with very soft texture and compared it with Ochre-coloured pottery (OCP) which is linked to late Harappans in Ganga and Yumna Doab often termed as “Degenerate Harappans” (Nair, 2012:1163).

7) Hassokay (31°08'01.87"N-73°21'38.06"E)

8) Rajanpur (31°09'07.41"N-73°22'52.71"E)

9) Noulaan 31°25.53"N, 73°35.32E

10) Pairaan Wali` 31°25'57.50"N, 73°35'36.38"E (Altitude m 193) N-S 90m

11) Panj Peer , 31°25'57.50"N-73°35'36.38"E

12) MalloMand, 31.15.21N,73.29.48"E

After visiting different mounds and sites near Derawar Fort and others in Cholistan the expedition was carried out in other areas of Punjab. We were guided towards sites which were already surveyed briefly by an independent researcher Mr. Zubair Shafi Ghauri (late) in his private capacity. All the five sites marked in satellite map are located in alignment and alongside a water source, the old Ravi river bed. The site of Jarranwala indicated with "J" in the Google Map image is located near Motorway between Lahore to Faisalabad and is richer than others in material culture. Location of the sites is very interesting indicating a vigorous expansion of the civilisation(Plate-).

Water Course along the newly explored Hakra sites

Documented sites are discovered in an alignment alongside a water sources (Plate-IX,a). The water source is an old bed of River Ravi. Ravi is an assistant to Indus River and its importance can be highlighted by the existence of Harappa, Sahiwal and Jalilpur, Multan, on its bank in Pakistan.

Riverty defined Ravi River as " The Ravi, called by the old historians the *Rawah* of *Lahor* or *Lohawar* and *Irawati* by the Hindus, issues from the mountain Range of *Chanbah* (Riverty, 1979:206).

Now the river enters in Pakistan near Shakargarh, flowing a smooth course though Sheikhpura District it engulfs a wallah named *Basantar* near Jammu Kashmir. It passes through Lahore, Sheikhpura, Faisalabad, Sahiwal, Toba Tek Singh and Khanewal districts. Near Sarai Sadhu it merges into River Chenab. The sites documented below are located at a distance of 30-35 miles approximately. It was not same in the past since Ravi is notorious for changing its course in the past frequently. Riverty has explained it like " it has always been remarkable for its erratic course, especially below Lahore, and from thence to its junction with the Chinab..... It is so irregular and uncertain, that it is impossible to tell one year where its channel may be the next (Riverty, 1979:206).

Such account helps to reconstruct that in the past these mounds could have been adjacent to the river and located on the its banks maybe. Presently, Nallah Deg is assisting Ravi River in southwest. Montgomery Gazetteer describes it as “Deg is supposed to rise at Parmandal, in the Jammoo hills and after flowing through Sialkot, a small portion of Gujranwala and Lahore, it enters the Montgomery district (now Sahiwal) at Thatha Suratana near Bucheke. After a course of 30-35miles it falls into Ravi at Ghatta Pakhni Hithar” (1995:5).

Above discussion supports the notion that the under discussion sites were benefitting from the waters of Ravi and its assistant nallah Deg. Deg is perennial and has a deep course with fertile silt helping to cultivate seasonal crops at a smaller scale. Its water is not sufficient to support bigger population but as an assistant to Ravi it could have helped bigger populations inhabited during Hakra Period. Continuity of the inhabitation indicates that people who settled here during Hakra Period continued living till Kot-Diji and Harappa Period (Ghauri, 2005). A general overview of the sites and surface collection reveals that during Late Harappan times these sites were already abandoned or perhaps partially inhabited by pastoralists. As Ravi changed its courses frequently in the past, water scarcity could have triggered migration from these sites. This is quite common in Cholistan in contemporary times as well. People leave their houses in the summer and move down to central Punjab along with their animals chasing water sources and grazing fields, during summer. They come back to their houses during winters when water is sufficiently available locally.

Hassokay RajanPur, Punjab, Pakistan

Hassokay: (31°08'01.87"N-73°21'38.06"E)

Rajanpur : (31°09'07.41"N-73°22'52.71"E)

Altitude m 181

Altitude m 182

Max ext N-S m 92

Probable ring structures m 57 N-S

Hassokay (Plate-X,c; Plate-XIII) is a remote village located in Rajanpur district in Southern Punjab, Pakistan. Rajanpur district is lying on the west of the Indus River, where river touches it on the eastern edge and Sulaiman Mountain range is abutting at western side (Plate-III-b). The site was reached with the help of locals and the mound is surrounded by cultivated lands. The nearby water source for agriculture is nallah Deg which passes through Rajanpur and ends up in Sialkot City in the central Punjab. The mound is covering almost one acre of the area and surrounded by cultivated fields. The terraces in the already cultivated fields are sufficiently observable marking and exposing the existence of any water source sometimes in the past. The terraces pattern could be examined from naked eye. The Deg nallah is around 1.5 Kilometres and Ravi River is at a distance of 10 Kilometres old bed of Ravi passes by the North-west of the site. Nallah falls into Ravi near a village named Jhamra(Plate-IX, a). The site is located at a point closer to the confluence of the nallah and river. As the above map indicated the alignment of the sites, earlier explorations in the region and comparative analysis of the findings strongly suggests that the area was most probably occupied by the people before and from KotDiji Period to onwards. Though no considerate scientific exploration was done by any responsible institution, researcher or agency. Only privately conducted surveys brought to light the comparative analysis of the site and links it with early periods of the Indus civilization (Ghauri, 2005). The estimated height of the mound in 2005 was recorded around 15 feet (14.2ft.) and was covering around 5 acres of land. Human intervention was rare since it was far from populated areas and surface collection was clearly defined as Hakra and Kot-Diji respectively (Ghauri, 2005).

Yet the height of the mound has now gone down to considerable extent. It should be more or less 10 feet in height, illegal encroachment and expansion of agriculture land is subtly and meticulously taking up the mound. For given research the topmost layer of the site was excavated as the fragile soil was already eroded and rain had made the antiquity throughly visible. Taking benefit of the loose soil after rain and exposed antiquity, a hole of 50 cm deep was dug up to collect potsherds and

charcoal samples for radiocarbon dating. Sample for dating was collected from a depth of 30-40cm along with potsherds since we hit activity platform at a point of 10 meters south west of the mound.

Radiocarbon Dates of Hassokay

SSK-1: 4479+/-26 BP (GrM-21855) d13C -25.79, calibrated at 1 sigma 3011-2912 BC

Since there is lot of noise in the archaeology and chronology of Pakistan after the revolutionary discovery Hakra Ware Culture/Phase/Period in Indus Valley Civilization. Principal investigator Dr. Mughal suggested it preceding KotDiji Phase in Indus Civilization on the basis of comparative analysis corresponding to Radiocarbon dates coming from different sites. Now one of the authentic sources of information regarding Hakra Culture is coming from India where extensive research has been conducted in Haryana and Rajasthan which is proved by Radiocarbon dates. Main objective of given research is to establish absolute and accurate chronology of the Hakra Culture which is said to be of decisive importance in the chronology of Indus Civilization yet poorly defined. The effort to establish the chronology and absolute dating of the period has been resulted in above shown results. The results of the charcoal samples have been up to the expectations of the researchers.

AMS Radiocarbon Date of Hassokay

The charcoal samples from Hassokay site were sent to Groningen Radiocarbon Laboratory (NL) for AMS dating. Charcoal samples from Hassokay site in Rajanpur is falling in fourth millennium BP. The dates (Plate-XI,a) suggest that site was occupied between 4800BC to 3000 BC. The mentioned time period is a classic example of pre and protohistoric inhabitation of the site. On the basis of the artefacts it is safely and happily recommended that the site bears strong evidences to be related to Hakra Culture in Indus Civilization. And in the absence of the absolute chronology the given dates are enough to set a chronological sequence for the period of Hakra Culture in the archaeology and anthropology of Pakistan. In fact this research has the honour to present first ever Radiocarbon dates done for the Hakra Culture in Pakistan which was made possible by Prof. Paolo Biagi has

been solely working on the absolute chronology of Sindh and Balochistan also (Biagi and Nisbet, 2009).

Hakra Pottery from Hassokay (Plate-XIV)

a	Featherless rim of small pot with thin texture and dusted with mica.
	Rim fragment of bowl with black band having thin texture. It is light red ware
b	
c	Fragment of a pot having black band in centre and dusting with mica.
	Fragment of a pot with black band.
d	Rim fragment of small pot of light red ware ,mud wash on external surface.
	Slightly out curved rim of small pot with thick black band. It is slow wheel made.
e	Rim fragment with thin texture of dull red ware. The external surface is coated with sand striate.
	Featherless rim of small pot coated with sand appliqué.

RajanPur

(31.09.16N, 73.22.49E)

Rajanpur (Plate-X, a ; Plate-XV) is another importance site, located at a close distance of 5 to 6 kilometres from Hassokay (Plate-IX, b). The recorded length and breadth of the mound in 2005 was 210 meters and 125 meters respectively. The height of the mound recorded was 4.5 meters in 2000s (Ghauri, 2005). It was visited by team of Punjab Department of Archaeology multiple times. Dr. Rafique Mughal along with Mr Muhammad Hassan paid a visit to the site in 1994. Professor Dr .Mark Kenoyer also visited the site along with team members of Harappa Museum. Now most of the mound has been covered by the land owners and used as a platform for their animals i.e. buffaloes. Pottery from Rajanpur represents appliqué ware of Hakra Period made with hands without wheel and pottery bits were reused on the same pattern as Jalilpur and other Hakra Period sites. The thick textured, handmade vessels treated with thick coating of mud mixed pottery bits are identical

to Hakra Appliqué pottery and gradually disappeared in Kot-Diji Period replaced with new and advanced decoration methods. Black Burnished pottery of Hakra origin is also found at Rajanpur whereas Kot-Diji Phase is represented by simple vessels and jars painted in red slip and decorative motifs in black and rim and neck is painted in black bands and lines.

AMS Radiocarbon Date of Rajanpur

Soil samples containing rich concentration of charcoal were obtained from the residential complex of the site. Radiocarbon date from Rajanpur (Plate-XI,b) is 4520+/-30 BP. It is pre-Indus date and safely falls in the ambit of Hakra Ware (Culture) Period. Dr. Rafique Mughal proposed a date for Rajanpur 4500-4000 BC on the basis of comparative archaeology. Current Radiocarbon result has confirmed the bracket in which the chronology of the site fits in.

Rajanpur Pottery Catalogued (Plate-XV,e)

1.	Terracotta small pot with short rim and round base
2.	Out curved rim with black line on neck and treated with mica
3.	Fragment of featureless rim decorated with parallel horizontal black lines on inner side
4.	Fragment of featureless rim with smooth surface
5.	Thin texture of rim fragment with red polish on the outer surface
6.	fragment of short rim and smooth surface treated with black polish
7.	Rim fragment with rough surface
8.	Featureless rim with smooth surface
9.	Rim fragment of bowl with smooth surface
10.	Rim fragment of small pot having net design on the outer surface

Rajanpur Pottery Drawn (Plate-XVI)

a	Collared rim of water pitcher of dull red ware.
	Out curved rim of pot with rough surface and light red ware.
b	Featherlessrim of pot with rough surface and dull red ware.

	Fragment of pot ,sand appliqué on the external surface.
c	Fragment of a pot, mud coated on the external surface.
	Featherless rim of small pot with two parallel black bands on neck and rim. It is red ware and smooth surface.
d	Fragment of a pot with ridge(may be <i>handi</i> / typical curry cooking pot) and having black band.
	Fragment of a pot mud coat on the external surface. It is dull red ware.

Noulaan (31.25.53N, 73.35.32E)

Noulaan (Plate-X,b) is another site of Hakra Period located in district Sheikhpura near world famous Sikh pilgrimage site of Nankana Sahib. It is also known as Darbar Kot an adjacent reputable village, mound itself is known as Noulaan. The area recorded by principal investigator was around 12 acres and more or less 15 meters in height. The author has credited the mound as a continuous inhabitation centre from Hakra Period to the Kot-Diji and Harappan Period. Among which he ranked Hakra period potsherds the most ancient (Ghauri,2005). Oldest pottery sherds coming from Noulaan belong to Hakra Period. They were made without wheel but refined outlook and shape of the pottery sherds is amazingly perfect. One gets the feel and idea of the Hakra pottery after touching the surface and examination of the sections of the sherds. Hakra Period pottery from Noulaan is in simple reddish shade without any decorative paint. Appliqué pottery pieces were documented by Ghauri and perceived as pots were used for keeping water also appliqué on the surface of the pots were used to hide the deformities and unevenness left because of being made with hand. Pottery bits and pebbles used for appliqué application on the pots were similar to that of Jalilpur but slightly smaller in size. Pots made at Noulaan have neck part separately made which was connected later

with the help of a ring and fired. Few of the sherds showed a crude way of making while many pieces showed perfection. This technique is still common in Pakistan where middle and lower parts are made separately and neck part is connected later with the help of a ring before firing.

Black burnished pottery (Plate-XXII,c) from Hakra Period is documented at Noulaan. Rim part is painted in black from outside and around 1 cm line is extended towards inside. The pot was rubbed with a hard surface object to provide shine after firing, same technique was followed at Hassokay and Rajanpur. The pots were mostly drinking glasses, mugs and pitcher shaped jars for daily household use and for storage purposes too. Though jars and pitchers were deprived of any decorations yet there are pieces with narrow bands of black paint and burnished surface. There are pots which were provided black or brown bands or lines around the outer surface of the rim and neck of the pot (plate.....) that is closer to Kot-Diji tradition of the pottery paint clearly indicating a continuity of the art and tradition and reflecting "Diagnostic Kot-Diji" pottery. Noulaan is surrounded by Panj Pir and Pairaan Wali which are representative of Kot-Diji Period on the basis of surface collection. Noulaan is representing Hakra Culture which extends from Hassokay and Rajanpur around 50 miles towards Noulaan and forms a density of the culture.

Noulaan Pottery (Plate-XXII)

a.	Featureless sherd with thick texture and smooth surface painted with black band on red. It is red ware.
	Ring Base of dish on stand with red slip and red ware
	Potsherd of small pot with thin texture, coated externally and dusted with mica
b.	Feature less thick sherd with perforations
c.	Disc base of pot with thin texture and it is black burnished
	Base of an out curved bowl. It's black burnished ware and having smooth surface.

Pairaan Wali

31°28'37.06"N-73°37'48.09E

Pairaanwali (Plate-X,d) is located ash the edge of the main road and easier to approach. It is located in world renowned city of Nankana Sahib where Sikh Guru Nanak is is buried and is a pilgrimage site in contemporary times. Currently mound is almost fully covered with graves and serving the purpose of graveyard. The extension of the mound can be observed expanding over 5-6 acres of land but surrounding agricultural lands are eating up this mound and reaches unto to a height of 13-14ft and top of it is consumed by graves. The potsherds coming out of the mound are belonging to Hakra, KotDiji and Harappan Periods (Ghauri, 2005).

Pairaanwali Pottery

a.	Ring Base of dish on stand with red slip and red ware
b.	Fragment of pot with two parallel black lines in centre and triangular black design on red slip. It is red ware and smooth surface
c.	Out curved rim of bowl with parallel two incised lines and series of nail cut mark on body. It's red ware and having smooth surface.
d.	Fragment of pot black parallel lines and motif on red slip. It has smooth surface and red ware

Panj Peer

31°25'57.50"N-73°35'36.38"E

Panj Peer (Plate-X,e) is recognised as fully flourished Harappan Period site, almost adjacent to Pairaan wali but due to the absence of proper passage leading to the site it takes bit longer to reach the mound. Mound was recorded as 30ft in height by the first investigator in 2005 and it stands almost same even today. Most of the mound is now covered by the graveyard and surrounding agri-

cultural lands are also expanding . Mound was standing at the edge of the once river bank. The site is located in surroundings of early Harappan sites i.e. Hassokay and Rajanpur and has been recognised as a KotDiji and transitional phase of Harappan period site.

Grooved sherds of Kot-Diji phase are abundantly scattered across the site, well fired and in many cases over fired and always painted in light or dark red slip. Pottery made of refined clay , well shaped and perfectly fired painted in red slip and decorated motifs and patterns are painted in black paint. Decorated motifs are mostly lines, zigzag and wavy or curvy, peepul leaf , etc., pots of different sizes from daily use bowls, plates to bigger jars were in use. Dish on stand and perforated potsherds are true representation of Kot-Diji and Harappan period occupation at the site of Panj Pir.

Panj Peer Pottery (Plate-XXIII)

a.	Disc base of pot with thin texture and dull red ware
b.	Out curved rim of bowl with parallel two incised lines and series of nail cut mark on body. It's red ware and having smooth surface.
	Beaked rim
c.	Fragment of water pitcher with out curved rim and long neck globular body and dull red ware.

MalloMand

(31.15.21N,73.29.48E)

Mallomand(Plate-X,f) is located in Tehsil Jarranwala, alongside newly built Motorway between Faisalabad and Lahore. It is located on the left side of the road leading to Jarranwala and Sayyadwala. The site (Plat-XVIII) was already deeply dug up by the contractors for motorway construction. Taking advantage of that already excavated area the charcoal samples were collected from a

depth 50 cm overall depth at the mound recorded was 80CM. Surface collection and slightly scratching at the site yielded interesting results. The site is dotted with terracotta bangles and terracotta ceramics. Mallomand was reported by the same author (Ghauri,2005) who recognised the site continuity of the early Harappan Cultures from Hakra to Kot-Diji occupation was recorded by him. According to him the mound remained inhabited till Kot-Diji Period and then disappeared (Ghauri, 2005) though it has not been proved scientifically and only discontinuity of the artefacts is sole reason of his explanation that too without any detailed excavation and Radiocarbon dating. Author has described the favourable landscape which helps to observe even the virgin soil levels without any deep digging because mound is located in the centre of agricultural lands and has been pathway of flooded or irrigated waters. He seems to link the discontinuity after Kot-Diji Period to diversion of the course of River Ravi which is notorious of chasing its course more often, though he himself was perplexed over the abandonment of the site (Ghauri,2005). Moreover, he has pondered over the point of Mallomand being a bigger site and if the population of the bigger settlement sites had had to move, what to speak of the people from smaller sites (Ghauri,2005). These questions need serious answers and rigorous research is needed for cultural mapping and scientific formulation of chronological sequence as well. Ghauri has mentioned pottery from the site similar to Hakra Culture and Jalilpur pottery traditions but predominantly Kot-Diji pottery is found scattered across the mound, which is mostly wheel made and there is huge possibility that the site could be initial stage of Kot-Diji Period settlement where partial usage of wheel started (Ghauri,2005).

Mallomand Pottery (Plate-XIX)

a.	Rim fragment of pot with smooth surface light red ware.
b.	Fragment of water pitcher with out curved rim and long neck globular body and dull red ware.
c.	A thick potsherd of pot treated with sand applique and fingers groove on surface.
d.	Rim fragment of pot with smooth surface light red ware.

AMS Radiocarbon date of Mallomand

MLM-1: 4352+/- 26 BP (GrM-21856) d13C -27.51, calibrated at 1 sigma 3328-3098 BC

Radiocarbon date of Mallomand (Plate-XI,c) falls between 4600 BC-2900BC which is closer to Early Harappan/Indus and Kot-Diji Period. It shows continued occupation of the site. The date puts the site into bracket of Hakra (Early Harappan) to Kot-Diji respectively. Ghauri has rightly speculated in his book about the transitional phase of Kot-Diji at this very site (Ghauri,2005). Also he has reported pottery from the site being in the middle of the Kot-Diji and Indus Civilization Period and termed it as a transitional phase.

Results of Radiocarbon Dating of three sites (Plate-XI)

Site	Radiocarbon Date	Period
a. Hassokay	4479+/-26 BP (plate-XI,a)	Hakra
b. RajanPur	4520+/-30 BP (Plate-XI,b)	Hakra
c. Mallomand	4352+/- 26 BP (Plate-XI,c)	Hakra

The dates clearly show that the sampled part of two of the sites are roughly contemporaneous (Hassokay and Rajanpur, GrM-21855 and GrM-25334) and that the long time span is due only to the fact that the calibration curve is flat at that point. Mallomand is some one century earlier (GrM-21856), though it is also clearly framed into the same picture.

The important fact is that these are the only three available Hakra Culture dates sequence that help understand the chronology of the Chalcolithic in the area of which absolutely nothing was known until last year.

Conclusion

The sites documented along in central part of Punjab displaying characteristics of the Hakra Period which started developing around fourth millennium BC. The Radiocarbon dating has confirmed the notion and theory of continuity of the Hakra Ware Culture and advancement into Kot-Diji and Harappan Culture. The pottery traditions were continued which were work of hundreds of years and credit goes to the Hakra people who had inherited the techniques from their predecessors from Mehrgarh. Though the linkage between Mehrgarh and Hakra still has vacuum, detailed study of subsistence patterns adopted by the people can help to reconstruct the past, agricultural revolution and tendency of the people towards adoption of advance methods. Jalilpur has strong evidences of animal hunting which could have triggered and accelerated the process animal husbandry and domestication. The given study has tried to bring forth some major sites in the central part of the Punjab since principal investigation was carried out in Southern Punjab and mainly Cholistan. The proposed chronological sequence by the principal investigator suggested the appearance of the Hakra people around 4th millennium B.C and the Radiocarbon dating done for the given research has confirmed it. The continuity of the cultures from Hakra to Mature Indus Period on these sites, scattered around the major city of Harappa but one astonishing fact is that there is no Late Harappan cultural remains, whereas Harappa itself has the sequence from Hakra to Late Harappan times. Did they

abandon their cities before that time or population was concentrated to only Harappa by that time?

Seeking answer to such questions can also help to know the actual reasons of decline.

This research is first work of its nature to date the less studied and known part of the Early Indus Civilisation Period. Though there is still gaps and little is known about the time span and socio-economic and political conditions, exploration of resources, interaction among people from different parts yet the research has set a trajectory for future work to be undertaken with the idea of scientific dates drawn for the Hakra Ware Culture.

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