

Recent Research at Harappan Settlements along the Ancient Hakra River

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Abstract

It is clear that the first urbanization occurred during 2600 to 1900 BCE. The people were living in spacious compound, double storied buildings, and bathrooms with covered drains to maintain the hygienic conditions. The cities were functioning with highly complex socioeconomic system. They had distant trade and a system to control over the technology and to assign value for exotic commodities pouring into core areas as well as the periphery.

This paper focuses on the settlements located in peripheral zone along a River named Hakra flowing parallel to the Mighty Indus. The Hakra, after crossing Cholistan entered into the Thar Desert and flowed along the western skirts desert. It is true that the Hakra River was not as mightier as was the Indus River but still carried sufficient water for the navigation of small boats. Within the catchment of this River at least 80 sites were recorded. Among which, a total of 24 sites were associated with the Mature Indus period. In this paper, the settlements named as the Moor Gachi, Ghob, Poongar Bhanbhro, Saran Waro and Deh Garher all located within catchments of Hakra River. These sites had interaction with settlements of Indus Plains; Cholistan and Harappa in North and settlements of Gujarat in South east and the settlements in Baluchistan and Persian Gulf As well.

Keywords: *Harappan Settlements, Hakra River, Indus Valley Civilization, Thar Desert, Moor Gachi, Ghob, Poongar Bhanbhro, Saran Waro and Deh Garher*

Introduction

Indus period of Indus civilization is an Era of prosperity, lavishness and living in hygienic conditions. Mega backed

brick cities appeared with highly complex socioeconomic interaction. The long carnelian beads, stoneware bangles, gold jewelry, bronze casting, double storied buildings, bathrooms,

covered drains, granaries, seals and writing; weight and measures and industries for manufacturing cultural objects were all in full swing. This is a time when communities were functioning as an integrated complex society using all modes of communication such as overland caravan; river boats and maritime ships roaring over the waters of Rivers and Ocean. They had courage to face every type of weather and road conditions to reach the given destiny(ies). Even the itinerants were engaged in the trade of various exotic commodities into cities, towns and villages of core area as well as the periphery. At least 15 generations enjoyed this prosperity over for 700 years starting from 2600 to 1900 BCE (Kenoyer 1998: 25). Not only big cities occurred but there were so many smaller towns and villages scattered all over the peripheral areas, for instance, the Thar Desert where recent research has shown that it was intensively occupied where numerous towns, villages and campsites existed (fig. 1 map) At present three towns, several villages and campsites were documented. The tremendous amount of burnt bricks complete or broken present on the surface of given mounded settlement(s) indicate that the

towns were built with burnt bricks as were in the cities. On the contrary, the surface scatter sites with dense scatter of cultural material show that the houses were entirely built with locally available wood and thatches. The test trenches were established on at least three sites named as Ghob, Moor Gachi and Saranwaro (Mallah 2010 in preparation). Very recently, the Poonger Bhanbthro site was documented thoroughly to understand the nature the site. For the better understanding, the geomorphology of the area and sites are discussed hereafter.

Geographical Setup of Research Area

The area under investigation contained three major geomorphological features i.e. (a) Sandy Desert(fig. 2) (b) Rohri Hills (c) Nara valley along with numerous micro niches.

Sandy Desert

This sandy desert is a “regular sea of Sands” in overall character and is divided into (a) the Pat and (b) The Thar (Pithawalla 1959 p-27, Panhwar 1969). Generally, the desert typify rolling surface, with high and low sand dunes

separated by sandy/ alluvial plains constitute a valley. The dunes have gentle slope on southern side and steep side on northern side. The majority of archaeological sites is found either on the top flat surface of sand dunes or on the southern slopes near the alluvial valleys. The dunes are scattered in nature and frequent in occurrence with different shapes and sizes. They are concavo-convex on southern sides and rectilinear on northern side's cross sections (Butzer 1994:60). Older dunes, however, are in a semi-stabilized or stabilized condition, and many rise to a height of almost 500 feet (150 m). Several playas (saline lakes), locally known as *Dhands*, are scattered throughout the region. These lakes when completely dries create an open alluvial valley. Such types of valleys are commonly scattered all over the Upper Thar region.

The sandy area lying on right banks of Nara Valley is actually extended part of the Upper Thar where all features like climate and vegetation and the geomorphological setup of the dunes are in similar fashion as in the main sandy land on other side of the valley. When and how this was originated requires

further research, however, the Old Stone Age i.e. Lower Paleolithic artifacts were found scattered on the top surface of sand dunes which suggests that the dunes were stabilized before the Stone Age.

The climate experiences two definite seasons as long and hot summers and cold winters. Temperatures frequently rise above 115° F (46° C) between May and August, and the average low temperature of 36° F (2° C) occurs in December and January. The annual rainfall averages about 7 inches (180 mm), or less falling mainly during July and August. Now days it has increased up to 50° C an extreme hot summer.

The desert vegetation is mostly herbaceous; or of undersized and small scrub; trees occasionally dot the landscape. The grasses form the main natural resources of the desert. The most frequent vegetation include the Khabar, *Salvadora oleoides* Kandi *Prosopis cineraria*; Phog *Calligonium polygonoides*, Ak *Calotropis procera*, Khip *Leptadenia pyrotechnica* and Booh *Avera javanica*; Lano *Haloxylon stocksii*. The herbs are: Chhapri *Neurada procumbens*, Ghorawal *Cassia italica*, and the grasses are: Katan *Cymbopogon*

jawarancusa, Lumb *Stipagrostis plumosa*, Boro *Saccharum bengalensis* and several other seasonal grasses of the desert area. They provide nutritive and appetizing pasturage, as well as medicines used locally by the inhabitants. After drying of the Hakra River, the drinking water has become very scarce and is found in the valleys where deep wells have been dug to acquire the water. During the seasonal monsoonal rains water is collected in tanks and reservoirs and is used for drinking and domestic purposes.

Nara Valley

Another important geographical feature is the Nara Valley where Nara canal flows. Nowadays, it is connected with Indus near the Rohri town and flow due south towards Jamraho Head. In antiquity, it had separate bed coming through the desert and turn into Nara alluvial Valley at south of Saleh Pat town. The Nara Valley somewhere is very narrow up to four kilometer in width and it extends to fifteen kilometer maximum. The Nara canal flows in zigzag pattern and prior to the barrage system it created numerous small courses. During monsoonal high flux, those channels flooded alluvial plains

and valleys in the sand dunes consequently several sweet water lakes were created. The Lakes on both sides of the Nara valley supplemented subsistence resources many archaeological sites have been documented in the vicinity of lakes. The Nara now receives water from Indus. It was experimentally connected in 1858–59 with the Indus at Rohri by a supply channel connected with old Nara (the Hakra) and later on in 1932 the irrigation barrage was built, which resulted the shift of mouth of Nara to the present location.

Previously, this canal was part of ancient river Hakra, which ran throughout the desert and discharged into the sea through the Rann of Kutch. When and how this river disappeared is still an enigma. The renowned engineer Dr. M. H. Panhwar very recently commented that “from 1300-1850 AD was a period of drought specially after 1430 AD it was very cold, there was less rain fall, less snow melt, less water in the Indus and its distributaries, no spill waters from the Indus and the Sutlej to the Hakra-Nara channel of summer and it dried up. Nara was re-commissioned as canal by giving it a mouth from the

Indus, north of Rohri. In 1932 AD Sukkur Barrage created a new mouth for it from head works” (Panhwar pers. comm. March 2007). These may be valuable comments however discussion does not end here and will continue until any concrete result is not achieved.

Nevertheless, the archaeology of area confirms that Hakra had full flow during prehistoric times; the population depending on this river had established permanent settlements and conducted multiple socioeconomic activities. Their economy was supported with pastoralist and semi-nomadic behavior. The remains of these communities occur in the shape of various types of archaeological sites. In the east of Saleh Pat several ancient courses were documented. These dried courses are somewhere at least two meters in depth and up to half kilometer in width (Fig3). Apparently, two types of features such as (a) white river sand and (b) fresh water shell/ mollusks (fig4) were recorded within the bed of those dried courses assuring the high water flow.

Several types of mollusks / shells are recorded, for instance, *Viviparus*, *Australorbis*, *Nugulana*, *Panopea* and perhaps *Rillyarex*(Fig 5). The habitat of

these mollusks is fresh water, slit and mud. They have limited mobility (Walker *et al.* n.d. pp 94) and are found deposited in layers. These species are found at the places where river course turn shallow by widening the bed area and becomes slow in flow.

The deep courses still contain water that has turned saline. These courses are locally called “*Dhoro*”and several of them fall into Nara at different places. However, one major course crossing through the Bhitai waro Takeo south of Saleh Pat town is still prominent and looks like a river flowing west and turning south(Fig 6).

As we move south there are numerous lakes which carry the story about this lost river. Majority of lakes were inundated each year through high flood and contained fresh water. After barrage system those lakes turned saline (Fig 7) and many of them dried. The lakes have been very essential micro unit where subsistence opportunities were ample for both human and animals. The documentation of archaeological sites around the lakes indicated when and how those lakes were exploited.

Besides subsistence, the raw material for construction huts and making mats, walls and roof cover may have been obtained. The lakes remained best game ground and pasture land. Different types of wild animals can be found along the banks of lakes. The presences of archaeological sites have suggested hunting behavior of ancient people. Some of the archaeological sites are described hereafter.

Archaeological Settlement Pattern

The archaeological surveys has illustrated a continuous presence of human from Old Stone Age to onwards in some parts of the Upper Thar Desert (Shaikh et al 2002). The recent research in Upper Thar has confirmed the reach of Mesolithic people towards east crossing the ancient Hakra River (Mallah 2010). The permanent settlements existed during Hakra period 3500-3000 BCE which were entirely made of thatches. Nevertheless, during Urban Period dated as 2600–1900 BCE, the larger settlement occurred and used brunt bricks for construction of the houses. To understand the local settlement pattern of the Upper Thar Desert during urban period; at least three tier settlement hierarchy i.e. towns, villages, and camp sites have been

recorded. All link together and were engaged in complex socioeconomic system (Hodder and Orton 1987: 53-97).

Town Settlements of the Upper Thar Desert

A cluster of three towns is recorded in Upper Thar Desert (fig.1 map). All towns are located in deep desert near the sand dune making very gentle slope where they had an open alluvial valley and a water channel in front. Two types of settlement remains were recorded at same area (a) mounded part and (b) surface scatter suggesting that there may have been two classes living together; one of them lived in burnt brick houses and others lived in thatch houses. Here are the abstract glimpses.

Poongar Bhanbhro

Location: The site is located approximately 2km South east of the government primary school Doonger Mangrio and north of the Miano Gas Field Taluka Saleh Pat, district Sukkur at 27, 20, 44 degrees North and 69, 19,35 degrees East. The site measured as 570 meters in length in North south direction and 300 meters in east west

having approximately 2 meters total height.

Description: The site was discovered by present author in early 90's and have been briefly reported at various places (Mallah 1994, 2000, 2010:56-57) The settlement of Poongar Bhanthro is situated on the right bank of the Hakra River (fig.8) At this place it is observed that Nadi makes wide bed, while the major flow might have been from other side where the traces of deep channel are still present. Now a day it is dried and the area left behind is as wide alluvial valley very suitable for cultivation purposes.

The artifacts are littered in approximately 171000 sq. meters. The main portion of the site is situated on the flat land; however, settlement extends towards the sand dunes in north south directions where a great difference in artifact concentration has been documented. On the basis of thin concentration of artifacts and absence of brunt brick pieces, it is assumed that people might have been living in the Kacha houses in the northern skirts of the settlement. Generally the brunt brick pieces and terracotta cake pieces were littered everywhere on the surface. The

brick measurement is 28x14x6 cm which makes the ratio of 1:2:4.

During previous documentation a remarkable discovery was made as a broken vessel was discovered some fifty meters north of the main structure; the vessel was filled with sandy clay which contained five pieces of broken shell bangles and a miniature pot. In the miniature pot (which was also filled with sandy clay) contained faience disc beads. Because of excessive sun heat and or the salty soil; most of the beads were in very fertile condition, almost in the powder form and cannot be put together. The vessel was broken and has no any paintings and/or decoration, just plain in nature. Was this particular vessel used for storage of exotic commodities such as disc beads and shell bangles? or this was an offering/ritual pot. These are some important and notable questions for future research.

A Jewelry hoard was also discovered from Allah Dino site (Fairservis 1976). Another pot has been discovered by J.M. Kenoyer from Harappa site that was filled with exotic material including various types of beads (Kenoyer 1998: 176). Kenoyer calls it as "bead pot" associated with late Harappan period but

still propose the tradition of keeping valuable in a pot. Most recently, a small broken pot was found from Kanmer site of Gujarat containing 11,707 steatite and faience beads (Kharakwal *et al* 2010: 16-17).

Another noteworthy object among the collection includes a broken tip of a T/C cone with hole. The cones discovered from Mohenjo-daro are generally solid with broken tip , this is, however, a first cone that has two incised lines around the neck and a through hole like drilled bead. The outer limit of its body thickness is 1.9 cm and the perforation measures as 9mm in total dia. The intention of these lines and hole may have been to tie a thread and secure the thread knots. One may now can assume that the function utilization of such type of cone and others as well was perhaps (a) ritual: used as a bead and (b) plumb bob: to verify the vertical alignment of the given wall.

Artifact Description

The artifact collection from this site consists of the various types of pottery, T/C beads and triangular cakes, bangles, various kinds of stone objects like blades, cores hammer stones and unfinished cubical weight, lime stone

piece; shell bangles, fresh water shell - disc faience beads; copper/bronze pieces; T/C vitrified slag's and a broken T/C cone with hole (fig 9).

The pottery consists of the plain and painted rim sherds, plain and painted body sherds, and various parts of Dish-on-Stand (DoS) and globular cooking pots with ledged and slipped shoulders (Dales and Kenoyer 1986).

A variety of the rim sherds have been collected from this site that includes as jar, pot, and bowls. The morphology and paintings i.e. black band around the neck correlates some of the sherds with earlier periods like Kot Dijian; otherwise collection mainly can be associated with the Harappan Indus period or the Integration era of the Indus Valley civilization.

Various types of the body sherds showing both plain and painted character of their nature. Parallel bands with zigzag lines underneath; and the cord mark design is observed. Other sherds are plain but may be decorated; their painting is vanished because of the exposure to the extreme heat of sun and blasting of sand particles which might have defaced the painting. Nevertheless,

the painting is done with black color on the red surface. Some cooking pots are part of the collection are also painted around the neck with black color.

Several parts of DoS have been gathered; those are plain - painted and incised into various designs. The painting is done with black color into parallel bands. The incised designs are created as parallel lines starting from the center of the plate; nail incised pattern bordered with two lines running parallel to each other. Another incised design is made with straight lines each band of horizontal strokes is bordered with a incised line. All these designs are identical with other settlements as Taloor-Je-Bhit, Lakhan-Jo-Daro, Kot Diji, Mohenjo-daro etc.

Among the above mentioned list of cultural objects discovered from this settlement includes Shell bangles, T/C bangles into different sizes, T/C beads, copper pieces and vitrified slag's. The T/C beads are worth mentioning here, because those are imitation of the long barrel type carnelian beads discovered from Chanho Daro and Mohenjo-daro. This carnelian imitation has been painted in red color as it may look like similar to its original counterpart. Another

halfway broken T/C bead big in the shape though, both tips are broken, and measures (as it is) length 3.5 cm and its thickness is 2.4 cm. and perforation 8mm.

The disc beads are very small and measure as 5mm, with circular perforation at center as 1.0 mm to half mm and thickness is half mm. The cut marks or sawing/cutting tool marks are visible on the beads through necked eye examination.

Shell bangle pieces, banded chert pieces, chert hammer stones pieces have been collected. Additionally, Copper/Bronze pieces; vitrified slag's, t/c bangles, t/c cakes, and broken chert blades are also part of collection from this site.

Ghob Bhir

Location: Site is located at 27, 20, 22.7 N and 69,09,42.9 E degrees in the north of modern village of the Ghob in Deh Mamro, Taluka Saleh Pat. The site measures as 160 meters E/W in length and 90 meters N/S in width (fig 10).

Description: The site was initially discovered by present author in 1994 and has been investigated since then. The present documentation was done in 2009.

The site is consisting of the mound some four meters high from the surrounding areas and is located the valley where Khabar plant is dominating. The burnt brick pieces are scattered all over the site suggesting about permanent structures in the settlement. However, no any structure like wall was recorded visible on the surface. The bricks were smaller in size as 28/26x14x7; thus maintaining the ratio of 1:2:4.

From eastern side of the site was heavy concentrations of the vitrified slags are present and cover almost entire length of the site and surface looked black. However, I was unable to locate any structure of the kiln. The raised spots were probably the working areas. What things/items were being manufactured; need future research. Nevertheless, after considering the viscosity of slag's and their occupied area, one might think about industrial scale of the Pyrotechnical activity.

From N/western side, chert flaking operation was noticed; at least thirteen secondary flakes and two bullet cores were collected within short period of time. A paste bead and a banded chert weight were discovered adjacent to the chert chipping area (Mallah 1994, 2000).

What was being manufactured at this particular spot, is not clear yet.

Some parts of this settlement were destroyed- peoples have started to dig-out the burnt bricks after which the sand is covering the hollow ditches. It is noticed that sooner or later this site will be covered (like many others) underneath moving sand coming from S/eastern high sand dunes.

The thick concentration of artifacts present on the surface showed diversity of cultural assemblage like pottery, T/c cakes, bangles, beads of various types, chert stone blades, polishers, grinding stones.

Excavation of site

Considering the rich diversity of cultural assemblage a total of two test trenches each measuring as 5x5 meters test were opened. One of them was on the top of mound called as 'Trench A' and other one designated as 'Trench B' was opened on the western slopes of the mound.

Trench A

Surface of the trench was cleared and all diagnostic artifacts were collected. After surface cleaning the cultural material

and burnt brick rubble was appeared. It followed the wall structure almost at the center of the trench. Some outlines of the Burnt brick structure appeared which narrow down the working space. After digging up to the meter and half; the walls continued deeper into ground and it became very difficult to excavate further unless the size of trench was expanded. Thus it was decided to stop the work.

The excavation revealed nice evidence of burnt brick structure of a room. The longest wall running N/E direction measured as 175cm in length, 27cm in width and 85 cm in depth which continued down and into the eastern section. The construction courses of wall also continued deep into the ground. The corner of the room was intact and measured as 155Lx45 Wx 80 cms depth(fig 11a&b).

Both walls depict as a corner of a house and from interior side not much rubble was found. The base part of a storage jar in broken condition was unearthed. On the outside of the room from northern part, some burnt bricks were lying making an irregular platform was unearthed on which a limestone doorsill was placed which was removed after

complete documentation. This could have been entrance of a room but no any other features justifying the characteristics of a floor were observed and thus digging continued. Soon after some architectural features appeared in a small square shape with interior space measuring 65x70cms was documented. The walls of this small room vary in measurement such as western sidewall measured as 65 cms in length; eastern sidewall 95 cms in length; and northern wall 32cms in length. All walls continue deeper in the ground. In this trench, along the northern side, a drain type 20 cms wide feature occurred with three courses of construction. Around this drain, rubble was unearthed.

For the construction of wall two types of bricks were used first type measured as 30x13x6cms and other measured as 28x12x6 cms which shows only two centimeter difference in length of the brick. This may be due to use of two different size mold of brick making.

As mentioned earlier that the occurrence of walls within trench narrowed the work space because as the trench was excavated deeper and walls continued further into ground the work space was limited up to two meters and

consequently work could not be continued further down.

The nature of deposition of cultural material in this trench was mixed together; the upper layer which was approximately ten to fifteen centimeters deep was of windblown sandy silt; after which the cultural material started appearing, the pottery, charcoal, burnt brick bats along with other assemblage appeared. From this trench highly interesting discoveries of assemblage was made. Lots of **Charred grains** were exposed along with **four small jars** and **clay burnt lumps having impressions of Kana from Boro Saccharum bengalensis** plant/grass. The traces of use of this grass have been found from Kot Diji site (Marco 1995: 93-108). The grains were probably placed in some kind of clay pot? But it was not recovered during excavation. Analysis shows that the grains are of wheat *tritium* specie. A complete jar having **geometrical and floral design** was exposed; another jar in broken condition was also found (fig 12). A **copper chisel complete** (fig 13) was found and lots T/C cakes, sand stone polishers, one **large faience bead** (fig

14) and doorsill are among the diagnostic cultural assemblage.

Artifact Description

The artifact repertoire from this site includes Chert blades, cores, flakes, hammer, lime stone pestle, grinding stones and polished sand and lime stones pottery, slag's, banded chert weight, paste bead, bangles, steatite stone (Fig. 12 - 17).

Pottery: For the collection of artifact, less emphases was placed on the pottery collection. Only few sherds were gathered from this settlement which are morphologically as similar as from other contemporary settlements of the area. Some sherds were also collected from slag area and those are highly vitrified and have yellowish lustrous and burnished slip from outside.

Stone: The stone objects include thirteen secondary chert flakes and two bullet cores, two broken hammer, two grinding/ polishing sand stones, one hammering and polishing lime stone and one pestle, Chert nodule.

The chert cores are small and thin, it measures as length 3.0cm and width is .9mm and other one measures as length

2.93 cm and width 1.12cm thickness 4.6mm . A metal tipped tool might be effective for flaking and blade production purposes. The flakes also measure as 3 to 3.5 cm in length and 7mm as width.

Three objects indicate the polishing and grinding activity. The grayish sand stone that is in cubical shape with flat surface and rounded end; its one side is smooth and dorsal end indicates hammering effects thus the object must have been used as hammer and polisher. A sand stone object in circular shape with flat surface; its one side is very smooth and has glassy shine thus asserting polishing activity. The limestone broken ball that has one flat side, shows hitting activity. This object can be measuring weight for which the flat side will perfectly settle on the scale.

A lime stone pestle in a shape of lingam is also discovered that measures as 15cm (6 inches); its one side is chipped off and entire object is effected by weathered thus nothing can be assumed regarding it function/ utilization. Cubical banded chert stone weight has been discovered from this settlement. Its dimensions are as length 2.6 cm, width 2.4cm and thickness is 1.7 cm . It is partially

damaged in condition. A small disk paste bead is also part of collection; it measures as external dia 6mm, thickness is 2mm and central perforation dia is 1mm.

A broken faience bangle have been discovered; it is flat in shape measuring as width 7mm and thickness 5mm and is decorated with three incised lines from outside. Was this manufactured at this site or have been traded from some elsewhere remains a question for future research. The slag's which are vitrified droplets and clay pieces, are abundant suggesting some kind of Pyrotechnical activity that involves high temperature, conducted at this settlement.

Trench B

After appearance of architectural features; the excavation work in trench-A was abandoned and another 5x5 meters trench on the western slopes of mound was opened where occurring of the architectural features was not expected. This trench was designated as 'Trench B'. After following routine excavation methodology of clearing trench surface; the actual digging work was resumed. The debris consisting of sandy and clay fill along with burnt

brick pieces and other cultural material was appeared. After removing 20-30 centimeters of debris; a wall started appearing almost at the center of trench which continued into eastern section. The wall was disproportionally made and seems the reuse of material. It was placed on another wall which was very intact and wider from the upper wall. A total of eleven courses were exposed and still it was continuing deeper into ground. Besides this wall another was appeared running north south directions and it also continued further into ground and narrowed the digging space. All these walls were in disturbed conditions may be the brick robbers disturbed them.

A total of three layers were exposed in this trench; the first layer consists of sandy clay, burnt bricks and potsherds. Somewhere the compact earth also appeared. The thin sandy sub-layers were also noted. The first wall is also related with this layer. In the second layer similar feature of deposition of cultural material appeared with pottery, ashy spots, brick rubble and compact clay commonly occurred. The wider and intact wall was associated with this layer as well. The last and third layer showed very compact clay on top of the burnt

brick wall; since the wall continued into ground, we abandoned the digging work.

The majority of cultural material was collected from all three layers include the pottery in both plain and painted shapes. The T/C cakes, T/C bangles, T/C weight, T/C rattle, stone weight in round shape, polishers, chert blades, chert hammers, and fiancé and shell bangles broken are among the diagnostic cultural items.

Moor Gachi

Location: The site is located two kilometers south of Deariro village in Deh Mamro, Taluka Saleh Pat at 27, 25, 15 North and 69,11, 05 E on the flat alluvial ground elevating almost five meters from surrounding area(fig.18, fig. 20).

Description: The site occupies southern side of the sand dunes and has open valley in front. The valley is dominated by Khaber plants. The site consists of a mound some two meters above the surrounding area. The burnt brick fragment is dispersed all over the site. Brick robbers have destroyed some portions of the site. There no any visible features were recorded. Thus the burnt

brick suggested some permanent structures constructed here in this settlement.

The cultural objects include pottery, chert stone, sand stone, shell bead, twisted copper rod and iron pieces. The discovery of iron pieces indicates re-habituate of the area during Iron Age as these people were settled just half kilometer away from this settlement.

The sand dunes are very closely located. The entire surface of the site is littered with artifacts sometimes the burnt brick were also observed on the ground. From surface various type of pottery, T/C cakes, Bangles, copper pieces, white disk beads, agate bead, chert stone blades, shell bangles were collected (fig 19). At some places burnt spots like hearths and/or kiln were also observed. The small dune like heaps on the surface of site made top surface uneven. After quick observation it was noticed that majority of cultural assemblage was associated with Mature Indus period, however, some potsherds showed affinity with earlier period i.e. Kot Dijian. Considering the material richness and temporal depth; three test trenches were established (a) just above the base

(B) at the mid portion of the site and on the top surface.

Trench A

This trench was established on the southern base of mound; artifacts on the surface were collected. After removing loose soil of surface, the compact clay like soil appeared. The water snails were mixed with clay and no any artifact was collected. It was observed that this might have been an artificial and/or intentional fill for making a platform – and the excavation in this trench was terminated.

Trench B

Another trench was opened at little upward to the top surface to understand and confirm the extension of artificial fill for platform. Similarly, all artifacts were collected and loose soil was removed from the surface. After scraping loose soil, the same hard compact clay appeared as was in trench - A. The excavation was continued up to one meter depth up to the level of Trench-A, but still the same hard clay continued. No any artifact was collected. The digging confirmed artificial fill for raising platform.

Trench C

This trench was established on the top of mound to resolve the confusion. Following similar method excavation continued. After one meter depth similar compact soil appeared and a few artifacts were also found along with presence of burnt bricks rubble. The complete bricks were measured the common measurement was 6x13x28 showing almost 1:2:4 ratios. Soon after a small burnt brick platform (fig 21) appeared along with other objects like small white disk beads and pottery were collected. Besides, this platform, few burnt bricks appeared and besides it a human skull discovered, since we were unable to deal with human remains- it was decided not to open it further and we reburied it.

After this excavation it was concluded that this was an artificial mound where cultural deposition was not more than meter and half and it is quite possible that this was a single period site occupied over and intentionally produced clay platform. The raised platform can be useful during high flood monsoon seasons or may have been a ritual place. Nevertheless, further large scale excavation might provide different results in future as well.

Artifact Description

The majority of artifact consists of the pottery in various kinds and types ranging from huge jars to small jar pots and plates of dish on stand and other body sherds. The yellow paste slip on one sherd shows similarity of the slip use as at the Lakhan-Jo-Daro site.

The artifact collection includes T/c bangle, twisted copper rod, a sand stone ball, chert flakes, nodules and one broken small blade its one edge is used and shows wear shine; while other edge is also damaged. The blade measures as 2.8 cm and width is 8mm. Additionally, one shell bead is also discovered which measures as the external dia 8mm, perforation dia one mm and thickness is 2mm. The shell bangles, T/c cakes, faience beads both disc and barrel type were also part of collection (fig 22, 23, 24).

Village Settlements of Upper Thar Desert

The numerous villages occurred in Upper Thar Desert during urban phase of 2600 to 1900 BCE. The absence of permanent construction material like burnt bricks or clay material suggests that all of them were built using thatches

available locally. And the viscosity of cultural material on the surface indicted that these villages continued throughout the entire length of urban period. Nonetheless, at only one settlement named as Saran Waro, the abode wall indications have been observed on the surface. It is quite possible that the small mud wall may have been built to avert the rain water from house. Moreover, what was intra-site setup at individual settlement is described here.

SARAN WARO (fig 26)

Location 27, 20, 32 North - 69, 12, 25 East

Description: The site is located in the valley on the small sand dune or the raised place covering a total of 170x65x2 meters area. The long axis is in the north/south direction. On the surface of site several hearths, vitrified slag, and thick concentration of pottery, T/C cakes and other cultural objects were noticed. The semiprecious beads, shell bangles and white disk beads were also found from surface (Fig 25). No any baked brick was noticed and/or recorded that have possibly suggested for the utilization of permanent material for residential structures.

Nevertheless, the density of cultural material scattered on the surface actually indicated that this was a permanent village entirely made of thatches; however, there might have been some mud wall at the base. During surface analysis of the site, traces of mud structures were observed for example, almost at the center of site the traces of mud wall in square shape were present (Fig28).

On the Northern side a small heap or mound like raised place with cultural material was selected for test trench and a small 5x5 meters test trench was demarketed. Within this trench one meter balk was left and four meters area was actually excavated. Before starting actual digging, cultural material from surface was collected. Just from the start of surface; the cultural material continued upto the one meter depth without any architectural evidence. No any compact clay like deposit and or layer was encountered. It was the sandy silt along with cultural deposit of pottery, T/C cakes, T/C bangles and chert stone blades etc. In the eastern section of trench was just natural soil and no any artifact appeared.

After almost one meter depth natural soil appeared (fig 27). The deposition of cultural material suggested that this was a single period site where the houses were made of thatches and the bases houses were made of mud locally available. There were no indications for manufacturing any item that required complex technology viz the semiprecious stone beads.

Nevertheless, considering the thick deposition of pottery, T/C cakes bangles and other material it can be hypothesised that the given spot was practically occupied for long time period and people must have engaged in the pastoralist activity. The cattle, goat, sheep are still favored and preferred domesticates which can adapt the desert environment.

During excavation several artifacts were collected majority was of pottery both plain and painted, Terracotta cakes and bangles, Sandstone polishers, shell bangles and chert blades were collected. Nevertheless, the surface showed more diversity of artifacts in which all above types along with white disk beads and copper pieces, T/C animal figurines were observed. The site needs further excavation and some more test trenches

to understand the actual function and length of occupancy/ inhabitancy.

Lani Waro

Location: 27°, 18', 21" North and 69°, 09', 04" East degrees.

Description: The site is located on the southern slopes of sand dune where it has an open valley. Thick concentration of artifacts was recorded over the huge area and it might have been a permanent **village**. The given place is rich in ecological resources; the valley might have been a lake and was permanent source of drinking water. People still live in this area.

Lundro Kalo Waro

Location: 27°, 19', 25" North and 69°, 10', 44" East degrees.

Description: The site is located just one kilometer of Khabri Waro Muquam where a thin concentration of cultural assemblage was evident over the surface. At just little distance in the east, the entire slope of sand dune is covered with potsherd over huge area which indicates that this was a huge **village** site entirely made of wood & thatch houses where people lived permanently.

Wari Jee

Location: 27°, 02', 53" North and 69°, 07', 17" East degrees.

Description: the site is located on the southern slopes where some Muslim graves are present in destroyed condition. Thick concentration of cultural material mainly the pottery suggests the longer occupation of the spot and may have been a permanent **village**. The thick concentration of pottery in sporadic clusters suggests an individual house (fig 29). The proper counting of each spot can provide an estimated idea about the total houses within this village.

Deh Garhar

Location 27°, 19', 58" North and 69°, 21', 34" East degrees.

Description: The site lies on the southern slopes of sand dunes and at two kilometers distance from Sawan village in Deh Garhar. The traces of ancient river channel were documented flowing at the base of dunes towards south and then turned west towards Miano which is located approximately five kilometers from this site. This channel is coming from Angiario village in east and this may have been branch of Wahinda/Reni River Channel. From Miano the channel

turn at 27, 19, 04N – 69, 14, 47 E to the southwest and west directions towards Nara canal.

The cultural material at this site is in good concentration and may have been a village where from pottery, T/C cakes, and some stone objects were collected(fig 30).

Ghob-B (fig 31)

Location: 27, 20, 24 North and 68, 09, 55 East degrees.

Description: Sit is located at about 150 meters east of Gob Mound near to the sand dunes. Blowing wind has created a small low-lying sand dune that covers this area of site. The surface of the site is covered with high density of artifacts. No architectural features and/or burnt brick pieces were found which suggests that people were living in wooden-thatch houses for which the construction material was easily and locally available. Somewhere the clusters of potsherd were present suggesting the places for individual houses. This part of Ghob also enjoyed similar ecological setup as the mounded part of the site. The site is actually located in the southern part of alluvial valley making a corridor for connection to another valley in the east.

The cultural assemblage from this site consists of pottery in various shapes, sizes and decoration, T/C cakes, bangles, bead, perforated pottery, chert blade etc(fig 32, 33). The site must have been connected with Ghob mound which is the Mound A indicating regular identity of Mature Indus period as Upper and lower mound. The upper mound situated in west and lower in east. The excavation is required to understand actual stratigraphical sequence of deposition of cultural material at site.

Campsites of Upper Thar Desert

The Thar Desert is vast open land having with floral diversity very suitable for goat, cattle, and sheep and large herds are still seen roaming over the rolling sand dunes and valleys. The land becomes green after first showers of the monsoonal rains. This supplementary diversity of grasses turns heydays for the herds and herders who take their animals far from villages and live there as long as grasses and water in the low-lying area is available. They take only few items like cooking pots and pans, glasses and cups, storage of food item and liquids like ghee, honey and the cutting tools. They construct temporary simple

huts and sleeping beds. Happy herder return at same spot each year.

This pattern was observed archaeologically as well. Far from towns and village sites, numerous spots were recorded with thinly scattered potsherds over small area. The objects were present in such manner that each potsherd can be counted and plotted on the map. During the survey along ancient Hakra River several such type sites have been recorded. At some sites, the artifacts associated with Hakra and Kot Dijian periods were also collected suggesting the repetitive occupation of the very same spot.

Beraroe

Location: 26°, 36', 20" North and 68°, 56', 12" East degrees.

Description: The site is located in the west of Beraroe Lake at least five to six kilometers of the Nara Canal flowing in the west direction. The cultural material is scattered in thin manner which suggest short stay and may have been a **campsite**. The lake provides best resource for animal grazing as it is utilized today as well. A variety of potsherd in different sizes and decorations was collected.

Kandan Waro- A

Location: 26, 28, 09, North and 68, 56, 54 East

Description: The site is located half kilometer south of village Dilmurad Aradin on low flat area. The cultural material scattered on the surface was in low concentration. Each artifact is present at considerable are because of the kicking of animals specially the goat. While surveying the area some geometric tools like flakes, trapeze, and potsherds associated with Hakra and Indus period were recorded. The surface soil was compact and rain water may have been collected in the southern side. This is the main attraction to find such thin concentration of artifacts as this spot could have been a hunt area and / or temporary **campsite**.

Summary

The knowledge about Indus archaeology is growing; the more sites are excavated or surveyed, the better understanding is established. Hence, the present research has added some more information that has increased the statistical data on the settlements and has thrown light on the socioeconomic patterns. Now it is certain that there was greater number of

settlements on the Hakra River flowing parallel to the Indus River. The survey of Cholistan has brought more than 300 settlements and survey along lower Hakra system has 80 sites this number will change as research still continues. The concentration of settlements grows in the Rajasthan and Gujarat of India. Within this huge geographical unit, large number of population was settled indicating that Indus valley was one of the densely populated region of the ancient world with very complex socioeconomic system.

The arrival of semiprecious stones like carnelian, steatite, lapis lazuli, agate, quartz and chert; some varieties of sea shells and copper suggest a scale of interaction network among the communities for utilization of resources within and beyond the Indus land. The raw material pieces and processing debris was seen only at the cities and towns; none of the village site situated either in Indus plain or on Hakra River has revealed manufacturing or processing exotic commodities. Only finished items have been recorded at the village settlements.

The priority of using items was also different among the cities, towns, and

village and camp sites. For example, the white disc beads and dish-on-stand were common items in the cities and towns, on the contrary both of these items are found rare and may have been precious in the villages and were totally absent at campsites. Copper was rare and T/C cones were absolutely absent in the villages. The exotic material was kept/stored securely into pots and was buried under the floor of house. This type of analysis may also help to understand aspects of including the socio-ritual life of the Indus people.

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Figures

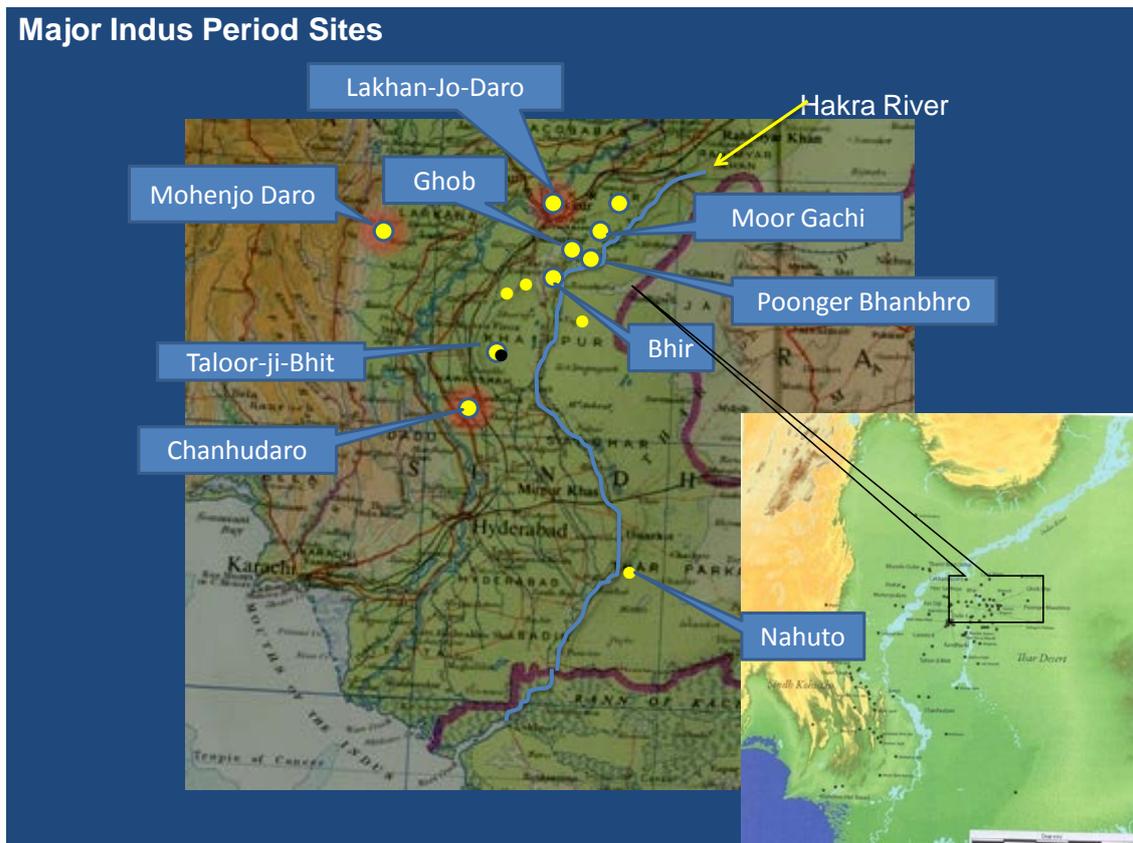


Figure 1: Map of the region showing location of the sites.



Figure 2. Sandy Desert with alluvial valley and various types of flora



Figure 3: Traces of dried river course running through the desert area.



Figure 4: Deposition of various types of Mollusks and white sand.



Figure 5: different type of Mollusks present on the surface.



Figure 6: Remains of the Hakra river in shape of Dhoro running through the desert region.



Figure 7: Lakes located within Desert region.



Figure 8: General view of the Poongar Bhanbhro site.



Figure 9: Some important object present in *in-situ* positions on the surface of site.



Figure 10: General view of the site

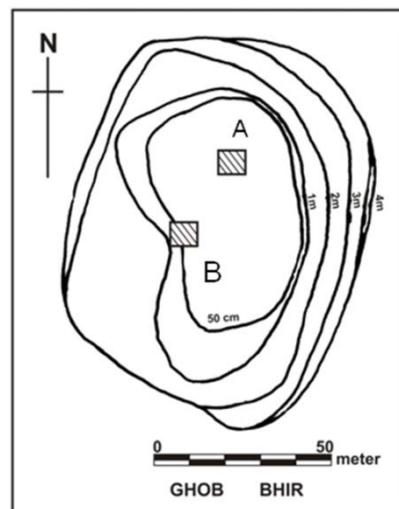


Figure: Topographic map of Ghob Bhir site



Figure 11a: Architectural features found at the site



Figure 11a: Architectural features found at the site



Figure 12: Medium size jar A *in situ* and B: Charred wheat grains



Fig 13: Copper object (chisel) *in situ* and *Ex situ*.



A.

B.

Figure 14: A: broken copper objects and a carnelian bead; B: Faience bangle pieces and bead.

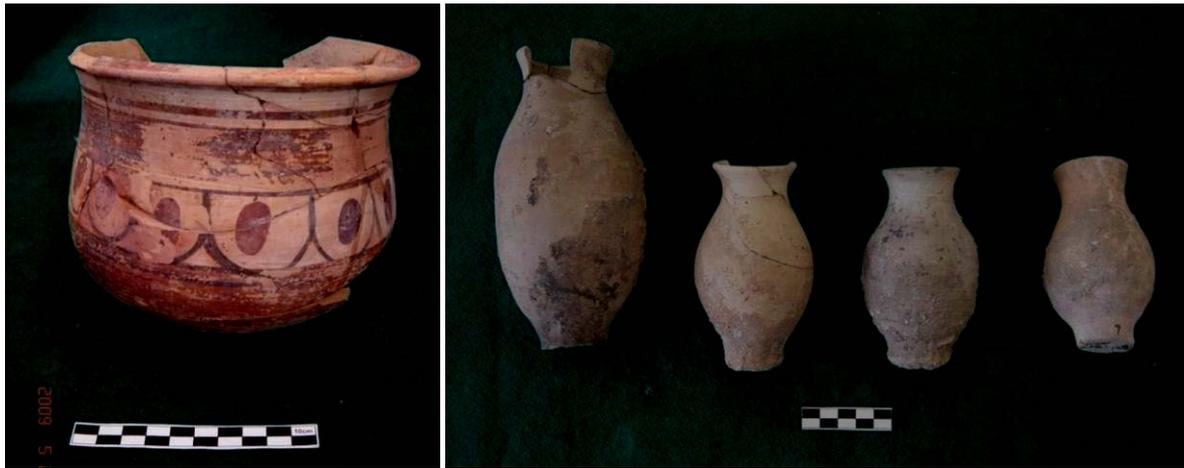


Figure 15: Pots in different shapes and sizes.

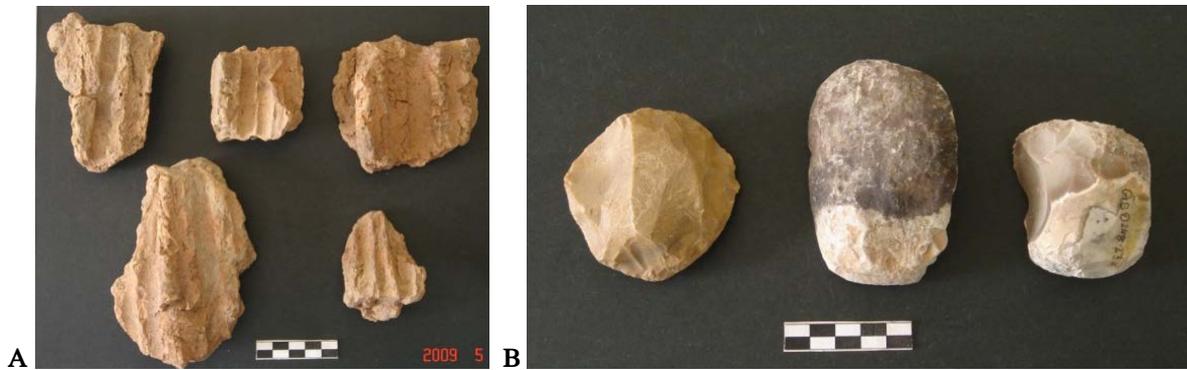


Figure 16: A: Burnt clay with impression of Kana and B: different chert stone hammers.



Figure 17: Various chert stone balls may have been used as weights.



Fig 18: General view of the Moor Gichi site.



Figure 19: Some important artifacts collected from site.

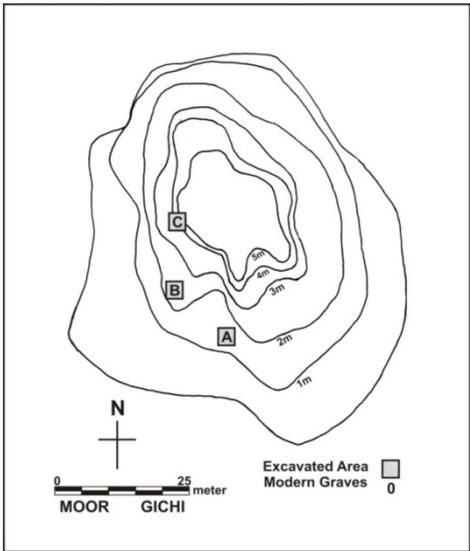


Figure 20: Contour map of the Site.



Figure 21: A disturbed burnt brick platform was exposed in trench C



Figure 22: Shell bangles in different dia and sizes. Figure23: Shell Bangles and white barrel shape bead and white disk beads



Figure 24: Different sizes of Terracotta cakes



Figure 25: Some artifacts present on the surface of site

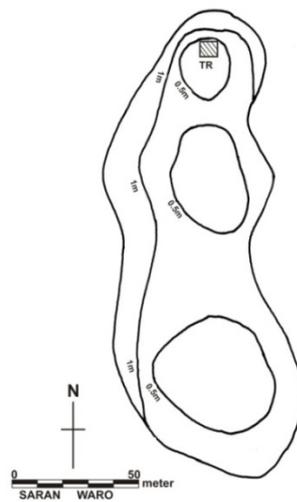


Fig26: Contour map of Site



Fig27: Thick deposition of cultural material in the section of the test trench.



Figure 28: Traces of the mudwall house



Fig29: General view of the site shows the concentration of artifacts on the surface.



Fig30: General view of site, shows the concentration of artifacts on the surface.

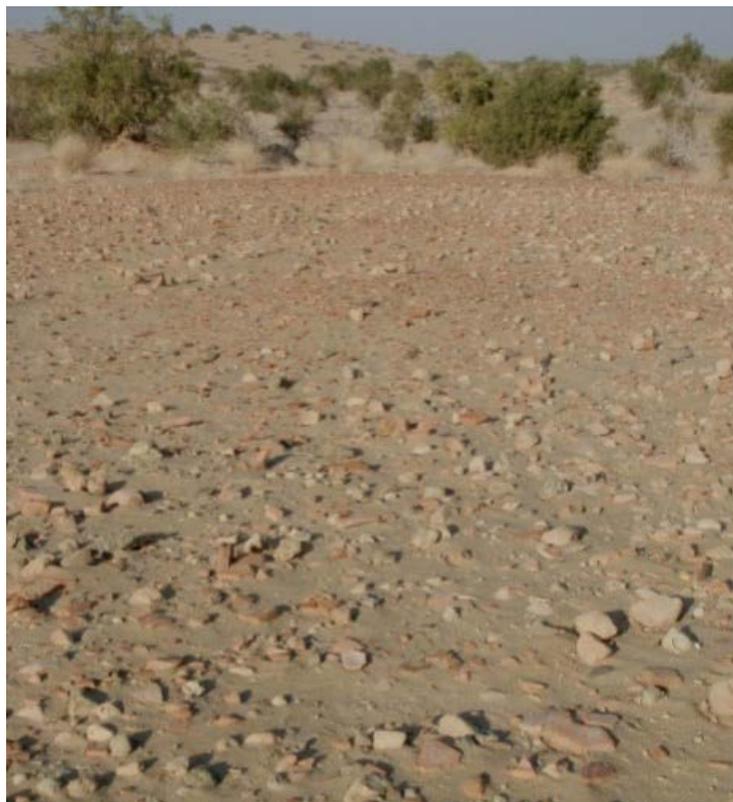


Fig31: General view of site shows the concentration of artifacts on the surface



Figure 32: Pottery collected from site.



Figure 33: Stone artifacts collected from site