

Review of Prehistoric Cultures of Gujarat and Need to Develop Accurate Settlement Gazetteer

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Review of Prehistoric Cultures of Gujarat and Need to Develop Accurate Settlement Gazetteer

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The Environment of Gujarat

The modern state of Gujarat, India is made of four distinct regions: Kutch, Saurashtra, North and South Gujarat (Fig. 1).

The soils of Kutch is generally different than that of mainland Gujarat. The soils of Kutch are mixed as a result of the parent rock from which they formed. The outcrops of Kutch face the sea on the southwest, while on all other sides desolate salt flats, the Ranns, bound them. The Ranns of Kutch are alluvial deposit of clay and sand brought down by minor rivers of Rajasthan as well as the eastern Nara of Sindh. The Ranns of Kutch were originally shallow bays connecting with sea (Bombay Presidency 1884: p. 3; Patel 1977: p. 20; Gupta 1977: pp. 181–93). During monsoon season the Ranns get flooded

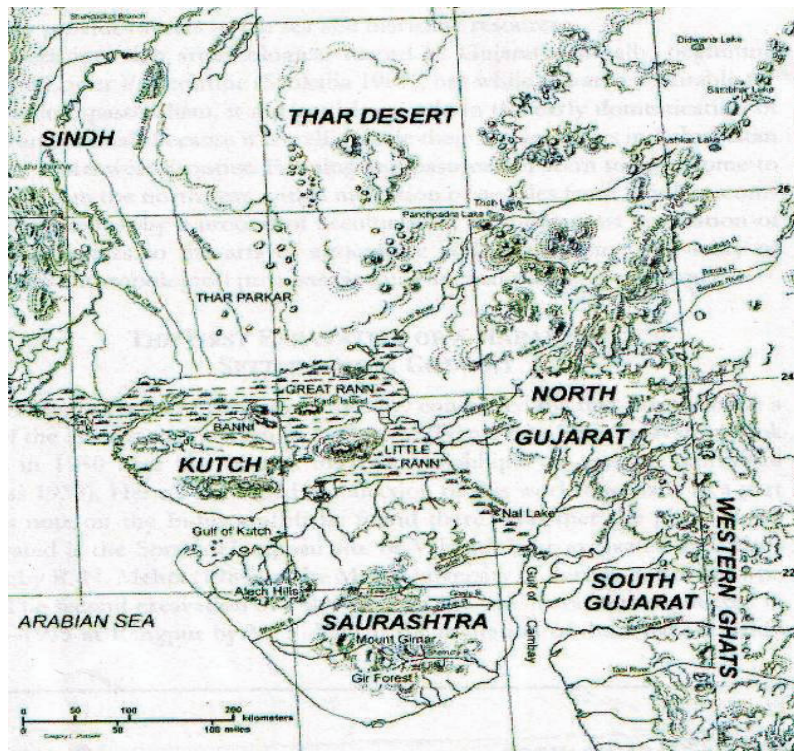


Fig. 1 Some geographical features of Gujarat.

with salt water to a depth of 1m, but when water recedes with the seasonal change a thick deposit of salt remains. The higher grounds are pasturelands especially a rich area known as Moti Banni and are much favored by the breeders (Bose 1975: p. 6). This Ranns supports a large population of flamingoes and wild ass. The climate of Kutch is most arid and rainfall ranges from 30 to 40 cm per year (Fig. 2).

Saurashtra is peninsular of basaltic, Deccan trap jutting into the Arabian Sea. Soils of Saurashtra are clayey black cotton soil derived form weathering of bedrock. The rainfall over Saurashtra ranges from 40–80 cm. Known as Kathiawar in British times, this is a land of many rivers disposed in radial pattern. The monsoon rainfall is enough for dry farming. Thus the vegetation of the peninsular is the same that of Acacia-Capparis series as found in north Gujarat plain. The rocky hills of the interior, the Gir and Barda hills and the northern coast of Saurashtra and vast stretches of ‘doabs’ between many rivers are studded with areas of pastures and are scenes of much pastoral activity. The pastoral of this area bread medium to heavy sized cattle, useful for agriculture work and the cows give good milk. This bread of cattle is locally known as Gir, Surati or Sorahti. Besides, they also breed sheep, goat, buffalo and camel. The long seacoast of Saurashtra has given people probably since early Holocene ready access to maritime resources.

Saurashtra may have been cut of from the mainland of Gujarat at several times in the past. The land bridge connecting it to Gujarat plain appears to have been flooded up to six months of the year until 1813, while the traveler’s report of 16th century state that a branch of Indus ran by the Khambhat town (Government of Gujarat 1969: p. 170). Silting by the rivers of the mainland and the peninsula has

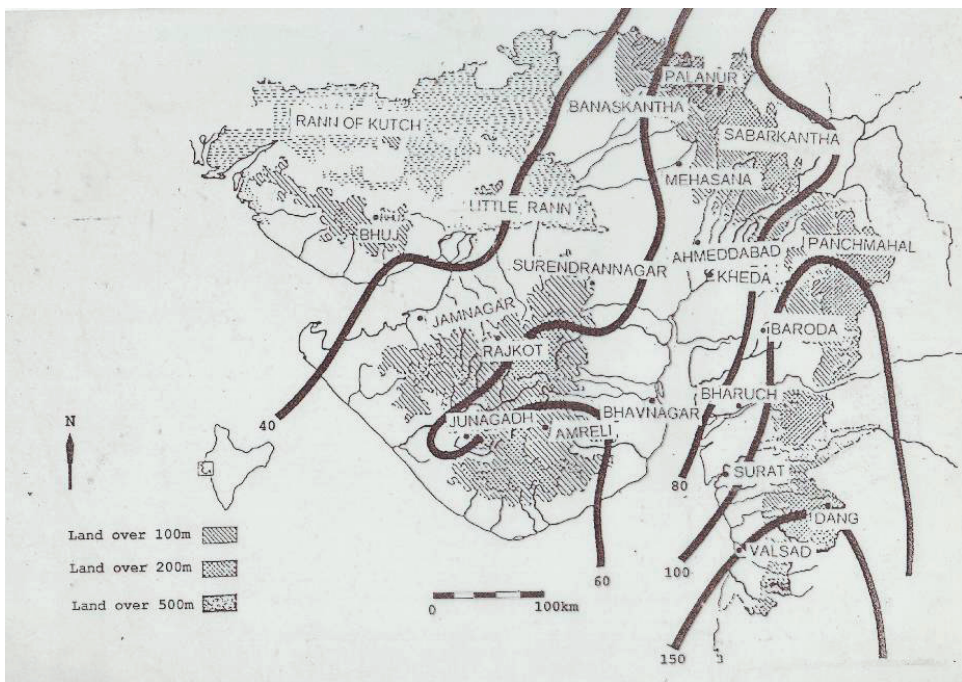


Fig. 2 Map showing the elevation and rainfall of Gujarat region.

connected the two wide swat of alluvial deposit known as the Nal depression (Rissman 1985: p. 57).

North Gujarat is a sandier and more arid plain. It is again bounded in the east by Satpura hills and on the northwest by the Aravallis, which rise up to 900m. North Gujarat is bordered on the west by salt desert and low-lying neck of the Saurashtra peninsula. The river following through this region includes Rupen, Banas, Sabrmati and Mahi. They are fed by monsoon rains and are ill suited for irrigation (Leshnik 1968: p. 298). The northern plain is drier, receiving 80 (Fig. 2) cm rain annually in the east grading down to 40 cm in the west. Soils are alluvium and have been derived from wind and water erosion of the Aravalli ranges. The percentage of silt and sand are higher, reaching up to 90% in the west. Much of the area is saline and alkaline treeless steppe that merges with the desert thus is not encouraging for agriculture activities. Besides, the landscape of north Gujarat is relieved by frequent occurrences of relict sand dunes, giving rise to numerous small lakes, near the inter dune depressions. These lakes retain monsoon run off for two to six months after the monsoon. The soils of north Gujarat are rich in chlorides, sulphates and carbonates of sodium. This is especially true with the areas, which are frequently flooded and have poor drainage system.

The extensive alkaline areas in this zone are known as usar lands and have characteristic grass vegetation. The tract is locally known as Nani-Banni and has some of the best grassland types in India, having very high protein content. This area is the breeding center of the world's best tropical breed known as Kankrej or Wadhial (George 1985) and Murrah or Mehsana buffaloes (Whyte 1957: p. 98). Besides, it also supports large population of sheep and goat and Asiatic wild ass.

South of Gujarat extends towards Mumbai and is bounded in the east granite hills of Sahyadri and Satpura ranges reaching up to 1000 m ASML (Patel 1977: p. 17). From these hills the Mahi, Dhadrar, Narmada, Kim and Tapti flow to the Gulf of Khambhat. On the west, the Gulf of Khambhat and Arabian Sea bound it. The boundaries of Gulf of Khambhat are locally known as bhal and bhalbaru area. Here soils are sandy and salty and the ground water brackish. The modern cultivators avoid this area due to heavy flooding. However, in some parts of the bhal tract wheat can be grown, when water withdraws around October. The residual humidity is sufficient to permit the maturation of wheat without any further moisture input. In the central zone soils are high quality but are saline to the west and thin on the western slopes. Sorghum is the most popular grain during rabi season as well. It is also most important fodder crop for the cattle (Patel 1977: p. 44). The South Gujarat is relatively wet; rainfall ranging from 60 to 150 cm (Fig. 2) is thickly vegetated region including the mountains of the Western Ghats and coastal plain fronting them.

Paleoenvironmental reconstruction portrays Saurashtra in Holocene as savannah grasslands, with thick deciduous forests, including teak, in the upper elevation of the hills. North Gujarat is most featureless sandy plain, crossed by important rivers which drain Little Rann of Kutch, or Gulf of Khambhat. Also like Saurashtra and Kutch this a vast pasture of good grass, especially during and following the monsoon (Bhan 2010 forthcoming).

There is a rich archaeological record in Gujarat, indicating that the region was inhabited by human communities since Paleolithic times. Until nearly three decades ago, North Gujarat was considered to be the backwaters of development human culture. Despite expectations that such settlements would be found the survey carried by Leshnik and Misra in 1967 found none, only adding a few more Mesolithic settlements (Leshnik 1968: pp. 295–309) to the list of such settlements previously reported by Foote (1916: p. 133) and Sankalia (Sankalia and Karve 1949). The absence of black cotton soil and unsuitability of North Gujarat Rivers for irrigation were that to have discouraged the Harappans from inhabiting this area (Leshnik 1968: p. 309).

Series of field surveys carried out from 1978–1992 by team of archaeologists from the Maharaja Sayajirao University of Baroda has revealed the region of North Gujarat has been a melting pot for the early food production. The survey has resulted in the location of large number of Prehistoric and Protohistoric settlements in the arid locale of the eastern border to little Rann of Kutch (IAR 1978–79; 1982–83; Hegde and Sonawane 1986: pp. 23–31). Initially, these settlements were thought to represent Late Harappan Phase (IIB–C, III) as represented at Rangpur, and were interpreted traditionally as rural settlements based on agricultural economy (Hegde and Sonawane 1986: p. 29). Even the site of Loteshwar was thought to represent Late Harappan Phase that we now know belong to the fourth millennium B. C and have revealed the earliest evidence of domestication of cattle that has prompted Meadow and Patel to suggest multiple centers of cattle domestication in South Asia (2003: p. 75). Unfortunately, the origin of these earliest food-producers is still very shadowy, who were the first to have come in contact with “aboriginal” hunter—gatherers in North Gujarat.

By now field surveys have located more than hundred settlements of Prehistoric and Protohistoric periods (Mesolithic, Chalcolithic, and Early through Late Harappan) in the region on North Gujarat. Out of which six sites have been excavated so far by the Department of Archaeology and Ancient History of the M. S. University. Though not much information is available on the plant remains from these sites but the preservation of faunal assemblages is excellent as compared to the rest of Gujarat providing an ample opportunity to study the animal exploitation from Mesolithic period to Late Harappan period in Gujarat.

Microlithic Settlements

Scores of sites that are characterized as ‘Mesolithic’ or ‘microlithic’ have been reported from Gujarat. Deposits at some sites contain ceramics and metals as well as microlithic, at other sites microlithics have been found below the component that is termed as ‘Chalcolithic’ Harappan or ‘Iron Age’ or even ‘Medieval’. However, microlithic component has also been reported along with Mature and Late Harappan deposits in Gujarat. This perhaps points towards a long continuity of microlithic tradition in Gujarat and Rajasthan.

Explorations have revealed very high concentration of microlithic using communities in the

North Gujarat (Bhan 1994: pp. 74–75) and the sites have excellent preservation of faunal remains as compared to contemporaneous sites in rest of Gujarat. Nearly 127 microlithic settlements have been reported from North Gujarat though major concentration was found in the eastern part along the estuary of Sabarmati River, and Langhnaj is the best known site in this group that has been fully reported. To reconstruct the chronology of these microlithic settlements is difficult in view of the small number of radiocarbon dates and the absence of methodology available with archaeologists to differentiate typologically between the tool types of various phases. Though, the presence of ‘crested ridge’ blades and cores in the assemblage helps to associate it either with the Harappan or Chalcolithic periods of Gujarat.

However, by now at least two microlithic sites: Loteshwar Period-I and Santhali Period-I (Fig. 3) has made it clear that by c. 7100–5600 B.C hunter—gatherers microlithic using communities inhabited sand dunes of north Gujarat, making it more or less contemporary to Period I at Mehrgarh. Period-I at Loteshwar and Santhali has revealed aceramic hunter—gatherers subsisting on the remains of wild water buffalo, blackbuck, chinkara, small and large deer, nilgai, boar, and khur/orager (Meadow and Patel 2003: pp. 73, 75). They have identified Loteshwar Period-I primarily with hunting station of blackbuck and Santhali Period-I primarily as kill station of wild buffalo.

Another excavated Mesolithic site in North Gujarat at Langhnaj has also revealed exploitation of wild animals that included *Rhinoceros unicornis* (rhinoceros), *Sus scrofa cristatus* (wild boar), *Axis axis* (spotted deer), *Axis porcinus*, (hog deer), *Cervus duvauceli* (barasingha or swamp deer), *Boselaphus tragocamelus* (nilgai), *Antelope cervicapra* (blackbuck) and *Canis* (Indian wolf) (Clutton-Brock 1965). Nevertheless, it should be noted that this site was perhaps contemporary with Harappan Period in Gujarat since here microliths here are associated with ‘chalcolithic—style’ pottery and copper implements. Also imperfectly understood are the nature and degree of use of domesticates by the inhabitants of Microlithic communities at Rathapur (Bhan 1994: p. 74; 1990) and especially the remains of sheep and goat in the faunal assemblage. This also brings in question faunal remains sheep/goat of site Bagor in southeastern Rajasthan (Meadow and Patel 2003: p.72).

Chalcolithic Settlements

Day by day it is now becoming clearer that by the fourth millennium, farmers, and/or herders had made their way in Saurashtra and North Gujarat. The origin of this cultural tradition is not clear as yet. Their earliest documented occurrence has been defined at Loteshwar Period II in North Gujarat. The site was perhaps a camp of people who used pottery and perhaps kept sheep/goats, cattle and also hunted wild animals (Sonawane and Ajithprasad 2010 forthcoming). However, Meadow and Patel have indicated marked increase of the wild cattle bones and proportionally decrease in bones of blackbuck, while rest the taxa remains the same as in microlithic levels. Given that the Chalcolithic pits were dug in Mesolithic levels, many perhaps most of the bones from wild animals found in pits could have come from the earlier component (2003: p. 75). Unlike Sonawane and Ajithprasad, Meadow and Patel have

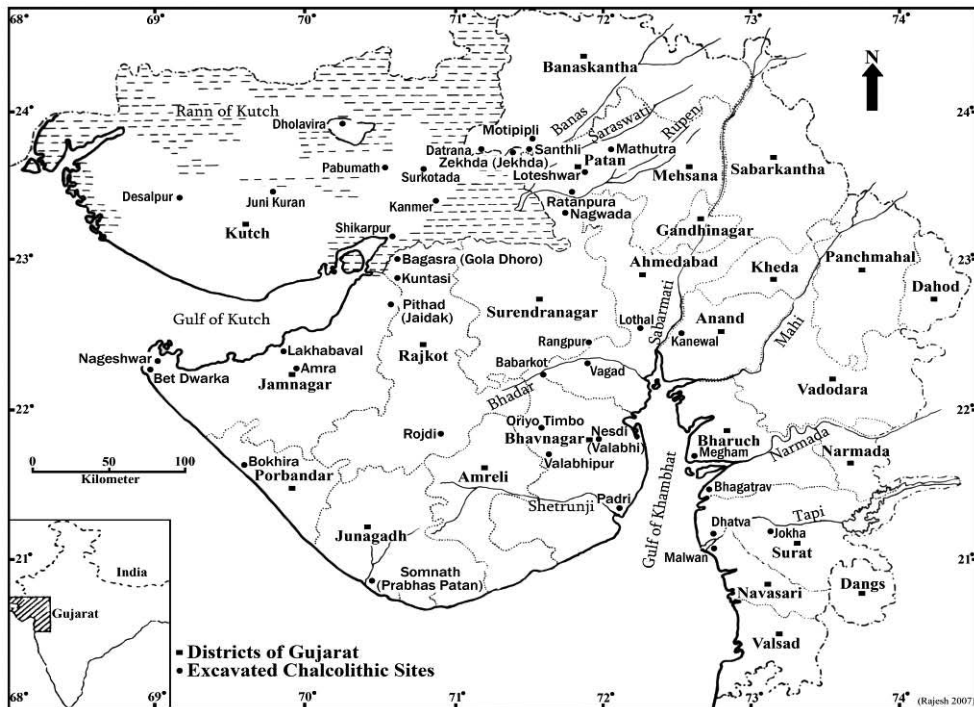


Fig. 3 Map showing important sites mentioned in the text.

not identified sheep and goat in the faunal assemblage, because of difficulties of identification Ovis (sheep) from Capra (goat) from Gazella (chinkra) from Antelope (blackbuck).

However, there are few explored sites in the region that has revealed only ‘Anarta’ Tradition component and the study of the faunal remains of these sites will be of great value and critical for future studies. The ephemeral nature of the settlements sites and absence of significant structural activity at Loteswar seems to indicate that the sites were very short lived perhaps seasonal and occupied repeatedly during that particular season (Bhan 1994: p. 77; Bhan 2009).

Recent excavations at Padri, located south of Bhavnagar City and on the eastern coast of the Gulf of Khambhat have uncovered what seems to be small village of the mid fourth millennium (Shinde 1992; Shinde and Kar 1992). There is as yet no subsistence information for this period at the site. The pottery recovered from the site show affinities with pottery of ‘Anarta’ Tradition. There are many things yet to learn from this important site.

Pottery of the ‘Anarta’ tradition has also been identified found at Nagwada, Surkotada, and Lothal, (Sonwane and Ajithprasad 1994: p. 135), Gola Dhoro and Shikarpur and perhaps formed a part of ceramic corpus from most of the Mature Harappan sites of Gujarat although this is not a prominent part of ceramic corpus at all the sites. Thus it is evident that this tradition had a long life, beginning in the fourth millennium and extending in time to at least second half of third millennium, where they are contemporary with the Mature and Late Harappan Phases.

Early Harappan Settlements

By the very late fourth millennium (ca. 3200 BC) or early third millennium, the people of 'Anarta' Tradition were joined by others who used the ceramics that can be associated with Early Harappan of Sindh: Amri-Nal and Kot Dijian. This has been documented at three sites: Moti Pipli, Nagwada and Surkotada (Fig. 3) and from the later two sites it is associated with pot burials. At Loteshwar the presence of confirmed presence domesticated cattle that are nearly at least millennium before the Harappan Period and perhaps suggesting multiple centers of cattle domestication in South Asia. Though no faunal remains of this period have been reported from Nagwada and Surkotada, but the faunal remains excavated from Moti Pipli will be extremely important for the present study in understanding when domestication especially of sheep/goat reached Gujarat, since it is far removed from 'Neolithic homeland' of Baluchistan in which the wild progenitors of sheep and goat were native, and consequently, the area within which the earliest food-producing communities of the subcontinent are found.

Harappan Settlements

For around seven hundred years, from 2600–1900 BC, the Harappan cities dominated the regions of what are now Pakistan and northwestern India covering an area of 680,000 square kilometers, an area twice the size of the Egypt and Mesopotamia. Harappan sites have been found throughout Gujarat and Kutch. These settlements include relatively small villages such as Nageshwar, Nagwada, Shikarpur and Gola Dhoro, which focus on the processing of local raw materials such as marine shell or agate and jasper for shipment to larger Indus centers, besides, small pastoral seasonal camp settlements, such as Jekhda, Kanewal, in north Gujarat. There are also larger regional centers such as Lothal, Rangpur, and Surkotada that may have been important trade centers. The most impressive site in Gujarat is the massive city of Dholavira, which was situated in an optimal location for controlling sea trade and possibly land trade between Kutch and the major cities to the north as well as to the far of cities in the Persian Gulf and Mesopotamia. The Harappan settlements in Gujarat have a wide range of ceramic styles that include classical Harappan forms as well as local forms and painted decorations ('Anarta' tradition). Sites such as Dholavira may have had a key role in the formation of the larger Harappan cultural tradition, while others may have been incorporated into this culture. This is one of the major questions that still need to be addressed by archaeologists.

General similarities in style and symbols over a vast area represent the shared ideologies of the Harappan cultures, while specific regional styles give us some insight into the many different communities that came to be integrated into these first cities of the subcontinent. Without the decipherment of the Indus text it is difficult to understand how these early cities and towns were functioning. However, by combining ethnographic and improved archaeological studies, archaeologists are now beginning to understand the Harappan people and provide meaning to the mute artifacts.

Though the discovery of Indus Civilization was made as early as the 1920's, it has not received

the attention it deserves because of lack of monumental stone architecture and buried gold treasures. However, ancient Indus cities were highly organized, with domestic areas, public areas, craft areas and markets. The settlements were surrounded by city walls. And gateways were carefully maintained to control access into the towns and as a means to collect revenue.

Their artisans produced an impressive array of artifacts, fine pottery wares, magnificent jewelry, copper and bronze objects, woven cotton goods, silk—these and other products met the needs of the Harappans and some of them found their way to distant markets of Mesopotamia and Oman. Diverse agricultural and pastoral subsistence produced enough surpluses to feed the cities. New technologies that developed in conjunction with trade and their ability to control access to essential resources, which include both food items and material goods that defined the status and power, were some of the pre-conditions for the rise of urban state-level society during Indus Period. Most of the Harappan trade was focused on supplying the cities with food, finished goods and a range of raw material. The Indus Valley itself had limited resources for metal, stone and other minerals and all varieties of raw materials were brought to the cities for manufacture or finishing. Many of the raw materials and finished goods were obtained from nearby and distant regions of central Asia, Oman and Peninsular India.

Mature Harappan Sites are most frequent in Kutch. Out of more than 60 Mature Harappan sites reported from Gujarat 54 are in Kutch (Possehl 2006: Table 9), Gola Dhoro and Nageshwar are situated on southern shore of Gulf of Kutch in Saurashtra.



Fig. 4 Dholavira mound.

Large Regional Harappan Centers

Dholavira (70° 12' E; 23° 58' N) (Fig. 4) is located on Kadir Island, in the Rann of Kutch, India. It is one of the four largest cities of the Indus civilization and is situated in a strategic position to control shipping through the Rann between Saurashtra and the delta of the Indus and Ghaggar—Hakra-Saraswati rivers. Discovered in 1967–68 by J. P. Joshi, the site has been excavated since 1990 by R. S. Bisht and his team from the Archaeological Survey of India (Bisht 1989a, b, 1991, 1994, 1997, 1999).

The site is located on a ridge between two seasonal streams and covers an area of approximately 100 hectares. The occupational debris is over 11.3 meters thick in the highest part of the site and represents seven stages of cultural development that can be associated to four distinct periods, Early Harappan, Harappan, Late Harappan and post-Harappan. Although no dates are available for the earliest levels, based on pottery comparisons, the site can be roughly dated from around 2800–1400 BCE.

The settlement was protected by a massive wall in the earliest levels (Stages 1–3), which are characterized by the presence of Kot Diji style pottery as well as local wares common in other parts of Gujarat. This indicates strong local foundation with connections to the southern Indus Valley. Major expansion of the site occurred during the Harappan period (stages 4 and 5). At its maximum extent the site had a very different structure and layout from Mohenjo Daro or Harappa. Most of the architecture is constructed with dressed stone and mud brick. The city had three nested rectangular walls, with the highest area located to the south, some 13 meters above the lower town. The outer wall was constructed entirely of mud brick, with large square bastions and two major gateways located at the center of the northern and southern walls. Stone walls with gateways surround the fortified middle town and the acropolis.

Numerous large open spaces are found within the different walled areas some of which were reservoirs filled by rainfall and elaborate catchment drains within the city. Approximately 16 reservoirs account for 17 hectares (36 percent) of the walled areas and an additional reservoir has been identified outside of the city wall. To the west, outside the walled city, are additional areas of habitation, and a cemetery. The houses and drains were made with sandstone blocks (dressed and undressed), clay mortar and combined with some mud brick super structures.

The excavations have produced the largest inscription of the Indus valley, 10 script signs made of gypsum inlay that were set in a sign board, some 37 cm high and around 3 m long. Other finds include inscribed seals, a seated stone sculpture like those found at Mohenjo Daro, craft workshops for agate beads and shell bangles as well as many different types of pottery. The cemetery revealed typical Harappan style burials, as well as stone vaulted burials, but most contained only burial pottery and little or no human remains.

Surkotada, the site at Surkotada (23° 37' N; 70° 50' E) discovered by Dr. J. P. Joshi in 1964 who subsequently excavated the settlement. The site situated at a distance of 12 Kilometers north east of Adesar and nearly 160kms from Bhuj (Joshi 1990).

The mound measuring 160×125 meters stands on landscape surrounded by undulating rising ground clustered by hillocks of banded sandstone, capped with a volcanic trap over which the red lateritic soil, giving a reddish to brownish color to the environment. The excavations at Surkotada revealed sequence of three cultural phases of Indus Civilization. In the beginning people raised a fortified citadel and annex that remained unaltered in subsequent phases.

However the thickness of the citadel rampart decreased from 7 meters to 4 meters in the last phase. Nevertheless the rampart of the residential complex remained more or less same i.e., 3.40m. Mud brick measuring 40×29×10 centimeters, were used in the earliest phase. While the last phase, the rampart have been made fully using rubble and chiseled stone. This phase also witnessed the elaboration of the gateway of the citadel.

The earliest settlers at the site appear to have practicing pot-burials as has been reported from another important of Nagwada in North Gujarat. The cemetery is located to the northwest of inhabitation. The practice of keeping a huge slab on the top of the burial pit or making stone cairns is rather unusual and represents an unprecedented feature in the Harappan burial tradition.

Unicorn steatite a seal was recovered from the earliest phase while in the last phase a crude steatite seal with Indus script but without the depiction of an animal was recovered. Besides certain pottery sherds with Indus script were recovered from the site.

Lothal (22° 31' N; 72° 14' E) is a small town east of the Sabarmati River at the mouth of the Gulf of Khambhat, Gujarat, India. Excavations were carried from 1955–1962 by S. R. Rao and his team from the Archaeological Survey of India (Rao 1962: pp. 73, 79 and 85). The mounded area of the site rises over 5.5 meters above the surrounding plain and covers approximately 6.5 hectares, but traces of wells and pottery scatters located up to 200 meters beyond the mound indicates that the actual habitation may extend over 16 hectares.

During heavy monsoon sheet flooding combined with high tides from the gulf of Khambhat, the site can become surrounded by water for up to three months of the year.

The overall cultural occupation has been divided into five phases with two major periods. In Period A, the earliest level represents a village with people using local styles of Micaceous Red Ware pottery distinctive of Gujarat. Harappan style pottery is found mixed with these local wares from the very beginning of the occupation, and increases over time. The Harappan occupation dates from around 2450–1900 BC, during which the site was probably an important regional center with links to the larger urban center of Dholavira to the northwest.

A well laid out town with surrounding mud brick wall encloses an area of 4.6 hectares. Houses made of mud brick and some fired brick are arranged in blocks along north south and east west oriented streets. Numerous episodes of flooding and rebuilding have been noted by the excavators. A higher mound (acropolis) raised on a large mud brick platform (180×180 meters) on the west that was dominated by a large building called the “warehouse.” Nearly 50 terracotta seal impressions were found

in the warehouse. All of these sealings were burned and had cord impressions on the interior surface indicating that they were once used to seal bales of goods. In addition to Harappan seals, Lothal also has examples of circular inscribed seals from the Persian Gulf region, indicating important international trade contacts.

To the north, the lower part of the site has evidence for agate bead workshops, pottery kilns, shell working and copper working areas. A large brick lined tank with inlets for water from the nearby river is located on the east of the settlement. Measuring approximately 219×36 meters and up to 3.3 meters deep this structure was originally thought to be a dock, but many scholars feel that it was probably used as a reservoir for the city and for irrigating nearby fields. Very few brick lined wells have been found at the site and they would not have been sufficient for supplying the inhabitants with potable water.

A cemetery from the Harappan period is located to the west of the site. North south burials contain single and some double interments (two examples of two males and one with a male and a female), with burial pottery, copper mirrors, shell bangles and some beads. A child's skull shows evidence for trephination, a form of surgery that removes parts of the skull to relieve pressure on the brain.

Period B (1900–1600 BCE) can be associated with the beginning of the Late Harappan phase. During this period some new ceramic types begin to appear that later (after the adornment of Lothal) evolve into the distinctive Lustrous Red Ware found at sites throughout Gujarat from 1600–1400 BCE. Most of the typical Harappan artifacts and pottery gradually disappear. However, a few inscribed Indus seals have been found in this period and cubical chert weights were replaced with different shapes of weights. Graffiti or a form of Late Indus script is found on pottery. Many important craft traditions, such as shell bangle making, agate bead making and faience ornament manufacture continue to be practiced throughout the final phases of occupation. The site appears to have been abandoned after serious flooding.

Rangpur, site is situated along the north bank of the Bhadar river, in Limdi Taluk, Surendranagar District of Gujarat (22° 26' E; 71° 55' N). A modern village covers one quarter of the ancient mound, which is made up of several scattered low mounds about 4 meters in height and 93 to 108 hectares in area. The site was first excavated in 1934 by M. S. Vats (Vats 1937: pp. 34–38), followed by G. S. Ghurye in 1939 (Ghurye 1939: 3–12). The most extensive excavations were carried out by S. R. Rao in 1953–54 to determine the cultural sequence (Rao 1963: pp. 4–207).

S. R. Rao defined three major cultural phases at the site. Period I (circa 3000 BCE) consists of microlithic occupation characterized by geometric microliths made of jasper and agate along with some arrow points, scrapers and borers. In two trenches the Period I deposits were sealed by approximately one meter of sterile silt, above which the Harappan culture occupation was established during Period II. Three sub phases were originally proposed by Rao, designated IIA (mature Harappan), IIB (late Harappan), and IIC (late Harappan-transitional) on the basis of pottery and other diagnostic artifacts.

Period IIA and IIB can be roughly dated from before 2000 BC to around 1900 BC. During the

later levels of Period IIA houses were constructed with mud bricks on platforms to raise the structures above floodwaters. Rao reports that houses were equipped with fired brick bathing floors and drains, but he does not consider the fact that larger walls may have been robbed by later inhabitants as has been clearly demonstrated at sites such as Harappa. No major streets or evidence for settlement planning was discernable due to the small scale of the excavations. Houses were not oriented according to the cardinal directions, but the mud bricks generally were made with a 1:2:4 ratio typical of Harappan sites. Cubical chert weights corresponding to the standardized Harappan weight system were found. Terra cotta animal figurines, toy carts and wheels, terra cotta bangles, chert blades, steatite disc beads, steatite microbeads were also recovered and represent diagnostic Harappan artifacts. Copper/bronze celts, rings, pins and bangles were also discovered. It is important to note that no seals or impressed sealings were discovered in the excavations. Furthermore, although single or double potter's marks and post firing graffiti are found on the pottery, examples of distinctive Indus script are noticeably absent. There are no pointed base Indus goblets (contrary to claims by Rao and others), though there are narrow based jars, perforated vessels and dish-on-stands similar to those found at sites such as Mohenjo Daro and Harappa. Local wares are found throughout Period IIA include stud handled bowls, black and red wares, grey wares and micaceous red wares. The pottery includes Harappan style wheel made vessels with red slip and black painted designs, local painted designs, as well as simple horizontal bands.

Period IIC represents the transitional phase followed by Period III which together are currently dated from 1900 to 1400 BCE. During this period a new ceramic type called Lustrous Red Ware becomes dominant, along with distinctive forms of Black and Red wares that have links to sites such as Navdatoli (Phase III) and Ahar (Phase IC). Mud brick walled houses, built on mud brick platforms, generally oriented in the cardinal directions were built along with houses made with wooden posts. Fired bricks are no longer being produced.

This final occupation represents the Rangpur Phase during which there is actually an increase in the number of settlements throughout Gujarat. Most of the typical Harappan Phase artifacts are no longer present, such as cubical weights, perforated vessels, terra-cotta cakes, and narrow based jars that have been incorrectly referred to as Indus goblets. Grey-brown Rohri chert tools were replaced by local agates and cherts, indicating a break in exchange networks with the central Indus and southern Sindh. Steatite beads are no longer very common, but amazonite, agate, carnelian are quite common and continue to be used for making beads with the same techniques that were being practiced in the Harappan Phase. Shell bangle manufacture continues along with the production of faience beads and ornaments. Graffiti continues to be inscribed on pottery, but there is a noticeable absence of square steatite intaglio seals from all sites.

Craft Production Centers

Gola Dhoro (Bagasra): Excavations of an important craft and trading center of this civilization was carried out at Gola Dhoro (23° 3' N; 70° 10' E) (Fig. 5) by a team archeologists of the Department of Archaeology and Ancient History of the Maharaja Sayajirao University of Baroda from 1996–2005 (Sonawane et. al. 2003: pp. 21–50; Bhan et. al. 2004a, 2005). The site situated half a Kilometer north-west of village of Bagasra.

The site measuring 1.92 hectares is about 7.50m high. Excavations of the site suggest that settlement perhaps started as a small farming village and subsequently, a massive fortification wall measuring 5.20m in width was built thrice in three successive stages, leaving surprising approximately 50X50m for the construction of residential and crafts workshops in side the rampart. However, there are indications that people not only lived inside the fortification in bud brick built houses but some of the population also seems to have lived outside the rampart in lower southern half of the settlement that has not revealed any fortification. The communication between the two segments of the settlement was maintained by a narrow entrance on the south of the rampart. However a very impressive gateway of the rampart was exposed in the east (Fig. 6).

The prosperity of the settlement during this phase is not only reflected in construction activities, but also in craft and trading activities. The unique geographical location of the site close to the Gulf of Kutch, North Gujarat and Saurashtra appears to have been closely linked to the economic and craft development of the settlement. Studies have revealed that the people of Gola Dhoro manufactured several



Fig. 5 Gola Dhoro (Bagasra) mound.



Fig. 6 Gola Dhoro(Bagasra): Eastern gateway.



Fig. 7 Gola Dhoro (Bagasra): Stone raw material stockpiling area.

amounts of variegated jasper and beautiful white banded black stone—opal. The area associated with these bins appears to be stockpiling area of merchant dealing with acquisition and distribution of this raw material. Most of the raw material seems to have brought to this settlement from region, approximately 70 kilometers southwest in Saurashtra.

Compared to its small size, the number of copper objects recovered is very high, which includes a copper vessel containing eight bangles and an axe warped in cloth perhaps stored for recycling. One of the important discoveries from the south outside the rampart was the recovery unique copper knives with bone handles (Fig. 9) and four copper ingots from the shell workshop. Though copper smelting was

craft items of shell, semi precious stone, faience and copper besides stockpiling (Fig. 7) and distribution of various raw materials like variegated jasper and shell to other Indus workshops.

One of the most important craft activity pursued with great vigor at the site was the production of shell bangles from *Turbinella pyrum*. One of the fascinating discoveries associated with this craft was the recovery of shell workshop (Fig. 8). It consists of a rectangular mud brick structure measuring 5.60×3.20 meters with a small adjoining chamber (Bhan and Gowda 2003 for details on shell workshop).

Another important craft activity carried out at the site is the stone bead production. Majority of the evidence of this craft came from the southern half of the settlement outside the rampart. Another important discovery associated with this industry is the recovery of stockpiles of raw material neatly kept in two clay-lined bins that contained large

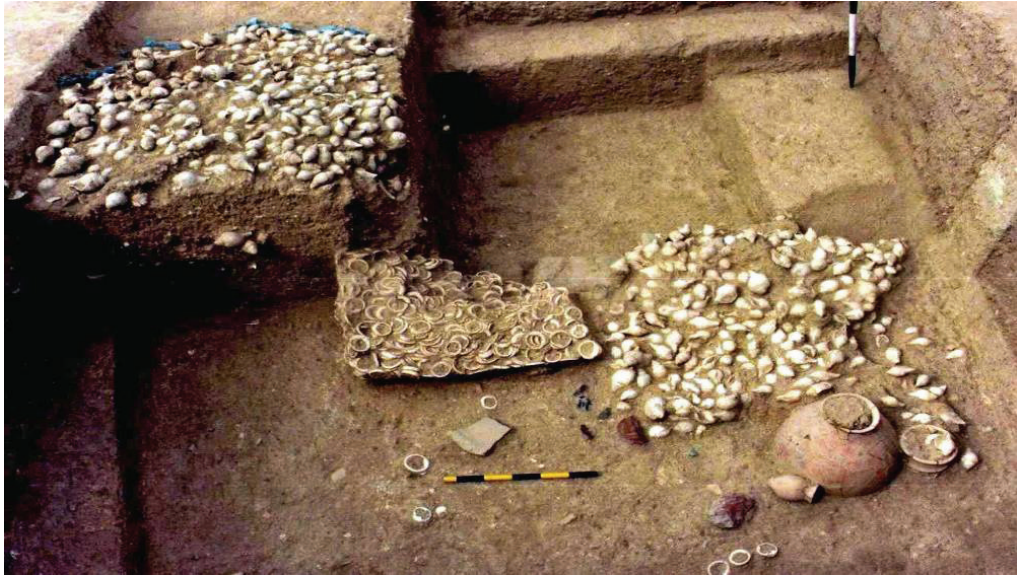


Fig. 8 Gola Dhoro (Bagasra): Shell workshop.

not carried out the site however, the recovery of certain sand tempered crucibles with copper adhering in them, point towards the fact that they were used in melting the copper. Many of the copper objects were perhaps fabricated at the site using sand moulds that would leave very little of no traces for the archeologists.



Fig. 9 Gola Dhoro (Bagasra): Copper knives with bone handles.

A large number of tubular beads and a few bangles of faience were recovered from the site. The evidence of local manufacture of faience at the site comes from the recovery of large number of chunks of white rock quartz that might have been source of silica powder used in the faience production.

The area associated with the production of silica powder and faience making are associated with intense burning and whitish powder and are confined within the fortification. One such area measuring 3.5×2 meters is situated close to the eastern periphery of the rampart. The X-ray diffraction of the whitish powder in this area indicates it as quartz powder. The recovery exceptionally large number of querns and pestles, kept upside down in near by area suggest that they were used in crushing quartz.

Being a very small settlement it is surprising that the site revealed five inscribed seals. All of them include the unicorn motif with Indus script above the animal motif. Seals of these types of are common in urban Indus sites and most probably they might have been used in trade and transactions by the Indus people.

Stamped impressions of such seals in clay/terracotta sealing have also been found in the excavations. One unique steatite seal discovered at Gola Dhoro has decorative linear patterns incised on three sides and a deep scooped out rectangular socket-like cavity on the fourth side, and originally it perhaps has a sliding lid to cover the socket. These are in addition to the usual engraved inscription and unicorn figure on the seal and therefore it appears a unique one, since only one such seal has been reported from Harappa.

Other sites excavated sites Mature Harappan trade and production centers are Nageshwar (Hegde et al. 1991) and Nagawda (Bhan and Gowda 2003: pp. 21–50) and recently being re-excavated the site of Shikarpur. The habitation at the site continued for another 200 years i.e., up to 1700 BC. In the last phase there are indications that the trade and craft production of various items, use of fortification, writing and making of steatite seals came to an abrupt end.

The excavations at the site have highlighted the importance of smaller settlements for removed from the core area situated near specific resource areas, in the economic development of the Indus civilization.

Seasonal Pastoral Camp Settlements

Jekhada (23° 40' E; 71° 20' N), is situated at the western edge of North Gujarat, nearly 50 kilometers east of Surkotada. The site measures 200×200 m with four areas of artifact concentration (Monin 1980–81: p. 120). Excavations revealed a occupational deposit of n 0.5 to 1.5m in depth. Surprisingly this thin deposit is represented by five structural phases of circular mud hut floors with post holes around the periphery (Fig. 10). Some of the huts have hearths and raised platforms to hold water pots and some of the huts have a porch in front. The site seems to have been occupied from Mature Harappan to Late Harappan Phases.

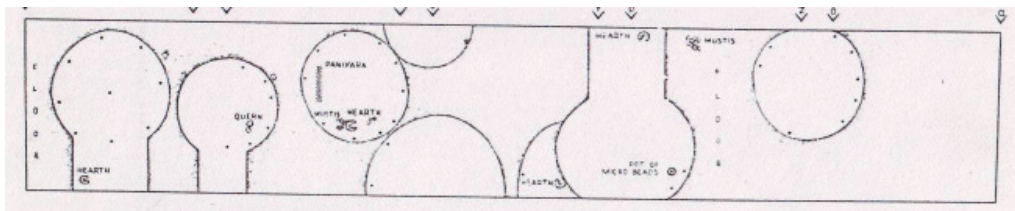


Fig. 10 Jekhada: Circular mud floors (courtesy Dept. of Archaeology, M. S. University of Baroda).

Rojdi: The Emergence of the 'Sorath Harappan'

Rojdi (21° 52' N; 70° 55' E) is a site measuring nearly 7.5 hectares and is situated in a terrace of the Bhadar River in Rajkot District of Saurashtra. In early 1950's P. P. Pandya undertook exploration and excavations in Gujarat and one such site he investigated was Rojdi, where he found a Red Ware sherd with for Indus characters inscribed on it.

In 1962–63 Mr. M. A. Dhaky excavated the site along the river side of the main mound. Dhaky described three phases of Indus occupation and a minor occupation of Early Historic Era (100–300 AD). Radiocarbon determination of the site yielded i.e., circa 2260 and 1925 BC.

Later, G. L. Possehl and C. M. Atri, than Director of the State Archaeology Department renewed the excavations between 1982–1986 and 1992–1995. Renewed excavations confirmed Dhaky's three phases. Besides, eighteen new radiocarbon dates in addition to earlier Dhaky analyzed have allowed estimating the absolute chronology of Rojdi as follows (Possehl and Rawal 1989).

Rojdi A: 2500–2200

Rojdi B: 2200–1900

Rojdi C: 1900–1700

Earlier archaeologists were conservative and many thought the abundance of sites in smaller and simpler sites of Gujarat could not be contemporary with Mature Indus sites, since most of the site in Gujarat lack 'classic' inventory of Indus Civilization: inscribed seals, beads and architecture as well as distinct Indus ceramics. The radiocarbon determinations from Rojdi reveal that though there are Late Indus sites in Gujarat, but many sites are earlier, going back to the beginning of Indus Civilization.

Most of the building activity appears the work of the people belonging Rojdi C. This is important since it coincides with the period when site like Mohenjo Daro was being abandoned. Most of the structures at Rojdi are made of stone, no bricks backed or mud, wells, bathing platforms, and at the associated drains were found at Rojdi, as at the places like Dholavira, Lothal, Surkotada etc. A unique structure was excavated in the eastern side of the settlement. This is house having two distinct parts, one for the people and the other for the animals.

The buildings excavated on the main mound are also of Rojdi C in date. There are several houses and courtyards. The Rojdi C also saw construction of a outer wall around the settlement marking the limit ancient Rojdi.

Craft activity and manufacturing debris are completely absent at Rojdi. Some the vessel forms show similarities with Indus sites, however, the elegant S-profiled flanged jars, goblets are absent. On the other hand many Saurashtraian forms like hemispherical Red ware bowls, sometimes with stud handle are quite common.

The subsistence system of Rojdi was based domestication of cattle and sheep/goat and cultiva-

tion of draught resistant millets, adapted to the semi arid monsoon climate of Saurashtra. This led to widespread double cropping system in the subcontinent, using the both rabi and kharif seasons.

On the basis of radiocarbon determinations, Possehl and Rawal have suggested that all the settlements with pottery comparable to Rojdi should be dated to “urban” Mature phase and not to the Late Harappan Phase (1989). Now the emerging picture from their research is that there are two categories of settlements during Mature Harappan phase in Gujarat. The first category of settlements, which Possehl and Rawal designated as “Sindhi” Harappan and share material inventory of Mature Harappan sites of Indus (1989) and the regional style ceramics (Bhan 1994). Large concentration of such settlements has been reported from Kutch and is represented by excavated sites of Desalpur, Surkotada and perhaps Dholavira in Kutch, Gola Dhoro (Bagasra), Lothal and Nageshwar in Saurashtra, and Nagwada and Jekhada in North Gujarat represents this group (Fig. 3). Besides sharing the classical Harappan material inventory most of the settlements are found associated with some craft activity – like shell bangle and ladle stone bead or faience production. The other category designated as “Sorath” Harappan sites by small rural agriculture or pastoral camp settlements and has more or less completely lacks evidence for substantial complex craft activity. These settlements were earlier thought to represent IIB-C of Rangpur sequence or Initial phase of Late Harappan or Post Urban Phase in Gujarat. Herman (1997: pp. 84, 88) questioned the Rangpur sequence on the basis of stratigraphy and radiocarbon determinations from Rojdi, relying heavily on the remarks made by Misra (1965) on the Rangpur sequence. Herman puts forward core/periphery model to explain the phenomenon. However, on the basis of ceramics and stratigraphic analysis of a Mature Harappan site at Gola Dhoro (Bagasara) in Saurashtra, Ajithprasad and his colleagues have indicated that though Rangpur sequence is not completely vertical, but pottery sequence and the stratigraphy at Gola Dhoro is fully in agreement with the Rangpur ceramic sequence. Like Rangpur, at Gola Dhoro also the Mature Harappan material inventory is followed by Rangpur II A, II B-C pottery forms (Ajithprasad et al. 1999). It is interesting to note here, that the excavations at Mature Harappan (Sindhi) sites in Gujarat have always revealed IIB-C ceramic types above the Mature Harappan deposits. However, it is not clear as yet if it is because that the people of IIB-C phase (Sorath) Harappan occupied these settlements after the Mature Harappan or it really has some chronological significance. The argument seems to have come about a full circle and what we need at present are set of consistent radiocarbon dates from Gola Dhoro (Bagasra) itself and many more sites so as to fix its proper chronological position in Harappan Tradition of Gujarat.

Nearly 94 percent of these settlements of this phase are located in Saurashtra, while 6 percent of the settlements are located on the eastern border of Little Rann of Kutch in North Gujarat. The average size of the settlements in Saurashtra is 5.3 hectares (Possehl 1980: p. 65). However, settlements at Lolai, Jaidak, and Rojdi approximately range between 4 to 7 hectares having structures with stone foundations and stone wall circling them. Another category of settlements of this phase has the remains of round hut floors as revealed at Jekhada (Momin 1983) and Kenewal (Mehta et al. 1980), in north Gujarat, Vagad

(Sonawane and Mehta 1985: 38–44) and Nesadi in Saurashtra (Mehta et. al. 1984: 27–30). The recently located settlements of this phase in north Gujarat are extremely small in size and have very thin and patchy occupational deposit. They fall into over similar settlement pattern as well as functional category of pastoral camp settlements as other prehistoric settlements of north Gujarat.

Late Harappan Phase

After the collapse of the Indus urban centers around 1900 BC the reason for decline though has not been understood as yet. Theories include loss of control of the over-extended trade networks, changes in the major river system and natural calamities such environmental changes and earthquakes and floods. However, Indus culture seems to have slowly fragmented into smaller regional cultures that continued to inhabit for another 700 years. In Gujarat also such changes have been observed and three-tired settlement pattern seems to have been established.

At Desalpur IB and Surkotada IC in Kutch and settlements such as Lothal B, Rojdi C, Prabhas Patan II, Jaidak, Rangpur IIC and perhaps Babar kot in Saurashtra appears to have witnessed a continuation of a short period of urban organization of the Mature Harappan Phase into the Late Harappan Phase. At Lothal and Surkotada also there is evidence of over-crowding and encroachment rather than abandonment and decline. Most of the “Sindhi” settlements except Rangpur were abandoned after this stage. As matter of fact some settlements Rojdi C show expansion, though Lustrous Red Ware was not reported from any of the above mentioned sites except at Rangpur IIC (Rao 1963). Herman (1995: p. 196; 1997: p. 100) is of the opinion that the presence of Lustrous Red Ware in this phase at Rangpur is debatable, because massive pits disturbed the layers. Now the question arises whether Lustrous Red Ware does really belong to IIC or III of Rangpur sequence. This perhaps represents traditional phase from Mature Harappan to Late Harappan. Traditionally, the appearance of Lustrous Red Ware and changes in certain ceramic forms has been used to distinguish between Mature Harappan and the Late Harappan Phases.

Another category of settlements, perhaps slightly later than the above mentioned sites, are represented by round hut floors with post holes along the periphery such as at Ratanpura (Bhan 1989), Kanewal (Mehta et. al. 1980) in north Gujarat, Vagad (Sonawane and Mehta 1985) and Nesadi (Mehta 1984: pp. 27–30) in Saurashtra and Dholavira in Kutch (Fig. 11). Except Kanewal none of the excavation reports are fully published as yet. However, reexamination of the pottery from Nesadi and Jekhada has indicated that some of the hut floors might belong to this phase. A preliminary analysis of the published pottery from Kanewal trench V laid at Kesarisingh's Khetra represents two phases of circular hut floors positively belong to this phase. A successive occupation from ‘Sorath’ Harappan Phase to Late Harappan Phase is represented at this site. At Oriyo Timbo in Saurashtra, Ratanpura and Datrana in Gujarat settlements of this phase are without any features, at times they only have irregular patches of rammed floor.



Fig. 11 Dholavira: Late Harappan circular hut.

In Gujarat radiocarbon dates are inconsistent. However, on the basis of the radiocarbon determinations (Table 1) available from Surkotada IC, Vagad IC, Rojdi C, Prabhas Patan III and Ratanpura in Gujarat and Ahar in Rajasthan, Chandali in Maharashtra and Navadatoli in Madhya Pradesh outside Gujarat provides a time bracket of C. 2000-1500 B.C. can be proposed for this phase in Gujarat (Table 1), if the late date of Malvan Phase I (TF-1084) and Rojdi C (PRL-1081) are not taken into consideration. The radiocarbon dates from Oriyo Timbo (PRL-1427) and Prabhas Patan (PRL-91) calibrated to the beginning of 3rd millennium B.C are too early. Although greater precision is desired, we will have to wait further excavations and more carbon—14 determinations.

Saurashtra witnessed dramatic decrease in the settlement count and average site size. Majority of the settlements are situated near river banks on alluvial, residual black cotton or black cotton soil famous for its moisture retaining capacity, the prime agricultural soil of Saurashtra. Approximately by now, 136 settlements of this phase have been reported from Gujarat, out of which nearly 31 percent (51) are located in Saurashtra, conversely large number of settlement 63 percent (87) have been located in north Gujarat (Fig. 12)

Table 1: Radiocarbon dates for late Harappan phase in Gujarat.

Site	Lab #	Date $5730 \frac{1}{2}$ life, B. C.	Mid range for corrected dates (after Ralph 1973)	Reference
Surkotada, IC	TF-1294	1780± 100	2170, 2110, 2050	Agrawal and Kusumgar 1973
	TF- 1297	1795± 100	2170, 2110–2130, 2050	Agrawal and Kusumgar 1973
Prabhas Patan, period III	RRL- 91	2020± 170	2620, 2340–2460, 2190–2290	Kusumgar, Lal and Sarna 1963
	PRL - 19	1245± 165	1600–1640, 1460, 1220–1260	Kusumgar, Lal and Sarna 1963
	PRL - 20	1485± 110	1780–1910, 1690, 1660, 1650	Kusumgar, Lal and Sarna 1963
Rojdi C	BETA-61767	1730± 60	2110–2130, 2080, 2040	Herman 1996
	BETA-61768	1675± 60	2080, 2040, 1920–1950	Herman 1996
	PRL-1084	1860±150	2340–2410, 2160, 2070	Herman 1996
	PRL-1081	1081±15	800, 400–570, 210–360	Herman 1996 Possehl 1992
Vagad	BM 2612	1810±50	2160, 2140	M. S. Uni.
Ratanpura	BM 2615	1800±50	2160, 2120–2140, 2110	M. S. Uni.
Malvan	TF-1081	800±95	940, 900, 800–900, 800	Herman 1996 Possehl 1992
Oriyo Timbo	PRL-1427	1385±115	1690–1730, 1570–1600	Possehl 1992
	PRL-1424	1910±135	2420–2480, 2180, 2110	Possehl 1992
Ahar	TF-31	1275±110	1570–1600, 1490, 1310–1380	Kusumgar, Lal and Sarna 1963
	TF-32	1550±100	2020–2040, 1770–1870, 1660	Kusumgar, Lal and Sarna 1963
Navdatoli	P-204	1600±130	2080, 1800, 1690	Stuckenrath 1963
Chandoli	P-472	1300±70	1570–1600, 1510–1400–1450	Stuckenrath 1963
	P-473	1330 ± 70	1600–1640, 1510, 1400–1450	Stuckenrath 1963
	P-474	1240±190	1650, 1460, 1170–1210	Stuckenrath 1963
	TF-42	1175±120	1600–1630, 1320–1370, 1220–1240	Kusumgar, Lal and Sarna 1963
	TF-43	1040±105	1300, 1170, 1020	Kusumgar, Lal and Sarna 1963

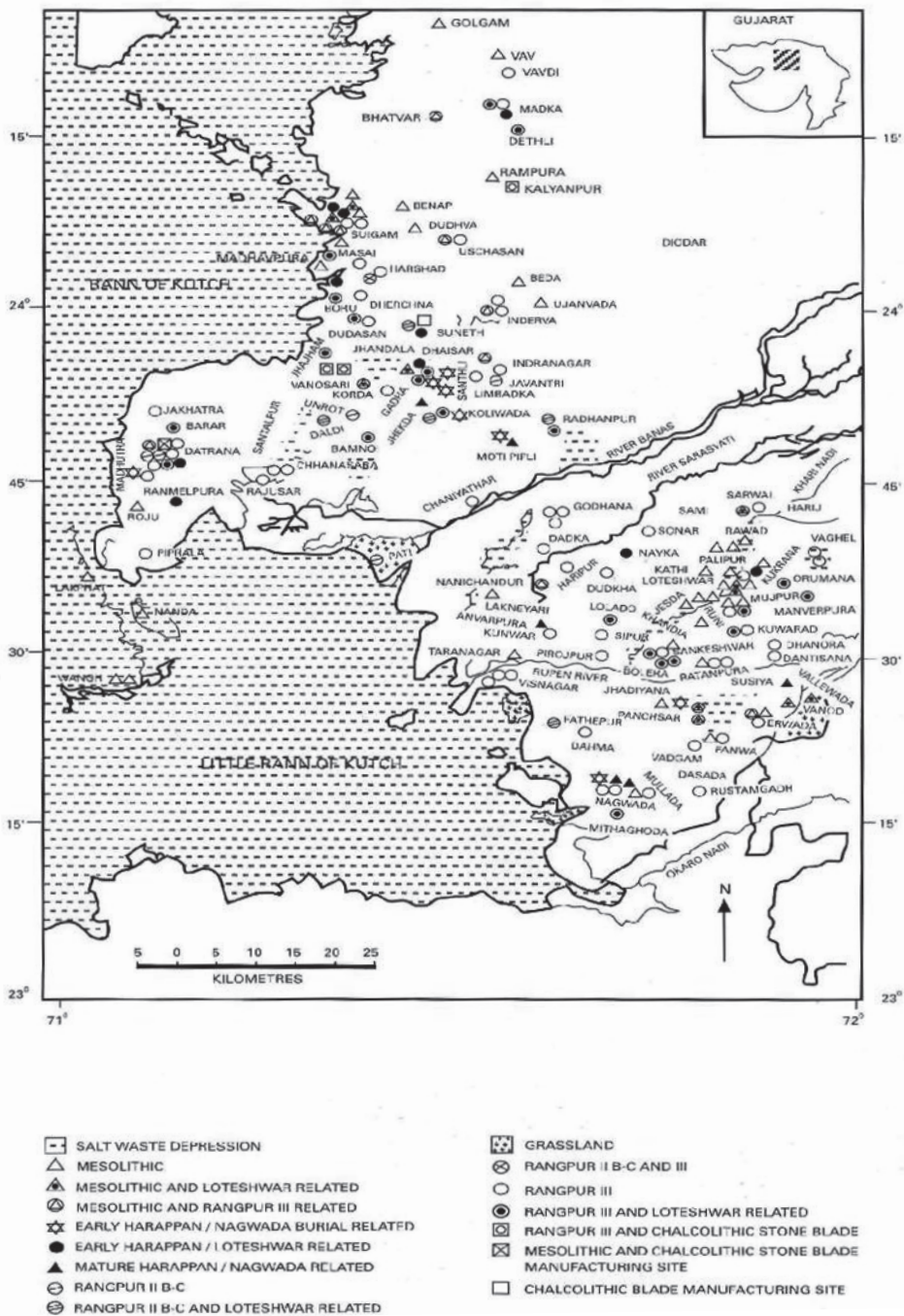


Fig. 12 Map showing distribution of prehistoric settlements in the western section of North Gujarat.

In north Gujarat, settlements of this phase are situated bordering the Little Rann of Kutch and in the wastelands close to Rupen River and its tributaries. Most of the sites are associated with relict sand dunes associated with inter dune depression, which retain water for three to four months after monsoon. Settlements are small having thin and patchy habitational deposit, with high density of animal bones and at times out numbering the other material relics of the site. As a matter of fact, all other Chalcolithic settlements reported from this region show close similarities in their location as well as in the nature of the settlement (Bhan 1994; 2001). Most of the settlements are less than 0.5 hectares. Some of the settlements like Chagda, Gudel, Khaksar and Popatpura in bhalbaru region of north Gujarat and Dhama, Mujpur, Nayka, Vanod and Valewada in north Gujarat are so small that only few potsherds and bones are recovered from these sites. Locating such sites is extremely difficult in any type of exploration and we suspect that number of settlements would have been missed in our explorations. This perhaps explains why Misra and Leshink (Leshnik 1968) could not locate the Sujinipur only a decade after Rao's survey (Rao 1963: p. 177).

Information on agriculture of this phase comes mostly from Saurashtra and to some extent from Kutch, is indicative of summer crop cultivation, mainly millets. The archaeobotanical remains from Rangpur (Gosh and Lal 1963), and Surkotada (Vishnu-Mittre and Savitri 1982) are only from one or two samples and therefore results are limited. However, rigorous method of recovery employed at Rojdi (Weber 1989), Oriya Timbo (Wagner 1989 and Reddy 1994) and Babarkot (Reddy 1994). The millet crops recovered from this phase include *Panicum miliare*, *Eleusine coracana*, *Steria italica*, *Sorghum* and *Echinochloa* sps.. Besides, the examination of charcoal sample from Rangpur have indicated tree types like *Acacia*, *Albizzia* sps., *Soymida febrifuga*, *Pterocarpus santalinus* (Ghosh and Lal 1963: pp. 161–175).

The analysis of archaeozoological remains from majority of the excavated sites of this phase show predominance of cattle over sheep, goat and buffalo continues. The faunal analysis carried out at Ratanpura revealed 67.68 percent of cattle, 13 percent sheep/goat and 3.06 percent buffalo, while the wild animals is as high as 16.04 percent that include chital 7.58 percent, sambar 2.97 percent, nilgai 1.44 percent, pig, blackbuck and gazelle together is represented by 1.35 percent. Besides, other rare forms include hare, dog, fowl and wild ass (Bhan and Shah 1990). The faunal analysis from north Gujarat is indicative of higher exploitation of wild animals from north Gujarat as compared to the settlements from Saurashtra.

The western section of north Gujarat, in which settlements are clustered together, has low rainfall (44–55 centimeters), alluvial soil with high salinity and very high percentage of silt and sand reaching up to 90 percent and rate crop failure is also comparatively very high. Therefore, this area has a low cropping intensity, smaller population potential and low-level of infrastructure. Conversely, the eastern section of the region with higher soil fertility had higher cropping intensity thus large settlements with greater potential and complex infrastructure (Deasi 1985: p. 103). This intensive explorations carried

out in eastern section of north Gujarat by Foote (1912), Sankalia and Karvel (1949) and Misra and Leshnik (Leshnik 1966: pp. 259–309) has revealed large number of microlithic using comminutes and absence of Bronze Age settlements, except one isolated settlement at Sujinipur. Though some interaction with the chalcolithic communities of Gujarat is reflected in the presence of some fragmentary pottery and copper tools recovered at the site of Langhnaj (Sankalia 1965). The absence of Bronze Age settlements in the western section of the north Gujarat and nature of the settlements indicate that the settlements were not located for harnessing the agricultural potential of the region as thought earlier (Hegde and Sonawane 1986), but for some other reasons. The presence of excellent nutritious grassland in the western section, that are supposed to be best grasslands types of India, and availability of water in the inter dune depressions, that retain water on average for five to six months after the monsoon season, perhaps were the primary determinants for the development of settlements in this region. Thus on the basis of location, their ephemeral nature, we can suggest that the settlements were temporary camp of the people involved in pastoral activities. The overall increase in the number of the settlements during this phase in north Gujarat perhaps suggests that the pastoralism increased significantly during this phase, although the area seems to have also attracted the Early, Mature and Sorath Harappan for similar reasons (Bhan 1994; 2009). A similar situation has been noticed by Mughal in Cholistan desert were 26 percent increase in pastoral camp settlements have been recorded in Late Harappan Phase (1997: p. 56)

Recent paleoethnobotanical studies carried out on the Late Harappan settlements at Oriya Timbo and Babar Kot in Saurashtra by Reddy (1994) have further substantiates and strengths this view. Reddy's investigations have suggested that Babar kot cultivation of millet crops by the occupants was primarily as food grains. The practice of sedentary agriculture was supplemented by sedentary animal husbandry. The greater emphasis on the cultivation of *Eleusine coracaona* (which has a limited use as a human food) compared to other millets – *Seteria italica* and *Panicum miliare* at Babar kot was perhaps because it was cultivated as green fodder for animals, She further suggests that the cultivation of millets was for use both as animal fodder as well as for human consumption at Babar-kot. It is suggestive of an economy more akin to sedentary agriculturists, with a minor pastoral component, that of sedentary animals (1994: pp. 381–382).

Reddy's paleobotanical analysis at Oriyo Timbo has indicated that millet was not cultivated at the site but instead was brought into the site as highly processed grain. She further suggests that these grains were either brought to this settlement through trade or exchange with farming groups in the area, or cultivated elsewhere (outside the range of settlement) by the occupants and brought along with them on their seasonal migration to the site (1994: p. 382). Reddy's observation finds additional support from Rissman's (1985) seasonality data from the annuli growth ring of cattle teeth that places the occupation of Oriyo Timbo from March through July. Reddy (1994: p. 383) also stresses that the economy of Oriyo Timbo was not exclusively based on animal husbandry, since wild plants and animal exploitation was significant component of their subsistence strategies.

The natural incentives of the environs of north Gujarat seems to have attracted various pastoral / hunter-gatherers and hunter – gatherers to north Gujarat as early as third millennium B.C (Bhan 2001). The pastoral activities also seems to have increased substantially during Late Harappan phase (Bhan 1986; 1994), which is reflected in increase in the number of settlements of this phase in arid locale of north Gujarat. This argument, though forwarded as early as 1986 (Bhan 1989), has been unable to gain confirmation either for against (refer Sonawane and Ajithprasad 1994–136 for a divergent view). This has highlighted the problem of accurately differentiating pastoral sites from hunter-gatherer and/or agriculturists. Ethnographic observations of the contemporary pastoral communities of Gujarat provides insight into pastoral economy and helps to further strengthen the proposed argument.

From the above discussion it clear that archaeological studies in Gujarat have passed through various phases, new aspects of are becoming apparent in the archaeological record. In the past settlements have not been adequately recorded either by their size, location, periodization to form a holistic picture about their contribution in the developmental history of cultures in this region. Therefore, a fresh and proper surface survey of all the known sites using handheld GPS and GIS programming will be of great importance, which the present author had a good fortune to learn at International Research Institute of Japanese studies, as a Visiting Research scholar under the able and gracious guidance of Prof. Tiako Uno of the institute. The present author is planning to use the methodology he learnt at the institute in the future research on the Prehistoric Cultures of Gujarat that will in turn help to develop scientific gazetteer of the Prehistoric settlements

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