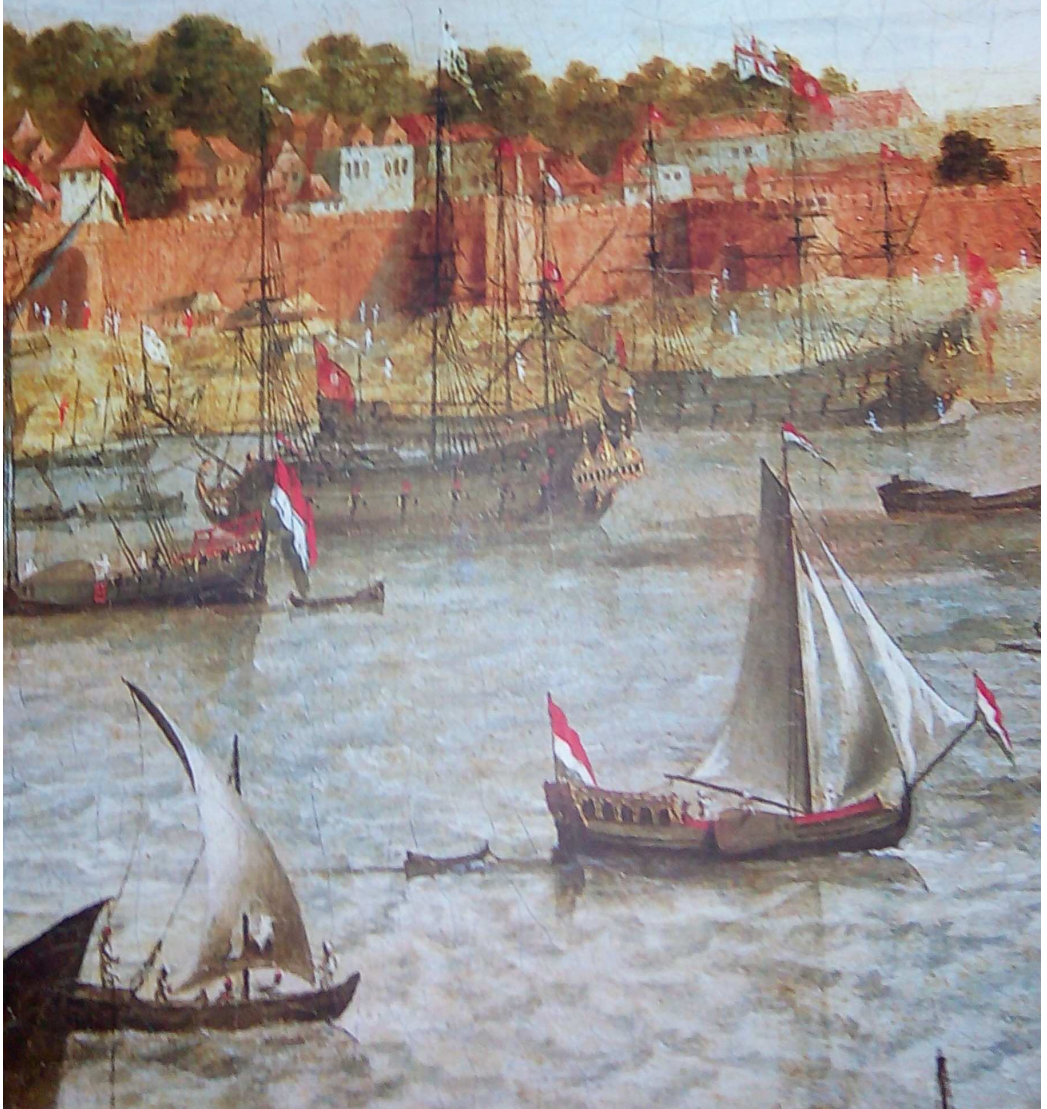


Port Towns of Gujarat

Edited by
Sara Keller and **Michael Pearson**



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Coastal Sites

Possible Port Towns of Harappan time in Gujarat

Y.S. RAWAT

From time immemorial, the Gujarat coast of the Arabian Sea has been an important threshold to India for voyagers, mariners and traders coming to the country. The discovery of a large number of Harappan settlements along this coast, and of significant quantities of standard Harappan objects in many sites of ancient Mesopotamia and the Oman coast, viewed against the finding of objects of West Asian origin at Harappan sites, firmly establishes that there was wellorganized trade contact between these two regions. However, the evidence shows that contacts with the western part of Iran and with Mesopotamia existed in the Early Harappan period, many centuries before the emergence of the Harappan cities (Mughal 1992).

Recent archaeological discoveries suggest that some of the mesolithic and early chalcolithic people who flourished in Gujarat in the beginning of the third millennium BCE could have contributed to the making of the Indus civilization and its vast geographical spread across an area of approximately over 1,000,000 sq. km in present-day north-western India, Pakistan and south-eastern Afghanistan. Initially, the civilization was believed to have a uniform identity all over this area, but new evidence shows that it had diverse regional characteristics.

After the first Harappan site was discovered in the early 1920s, continuous exploration and surveys have unearthed more than 2,000 sites of that civilization or its affiliates in the Indian sub-continent. Of these, Gujarat alone accounts for over 550. They have been found almost in all parts of the state except the eastern hilly regions and the coastal region south of the Tapi River (Fig. 1). Across the entire realm, these settlements apparently formed a

Many artefacts of Mesopotamian influence/origin have been found at sites like Mohenjodaro, Harappa, Lothal and Dholavira. Mohenjodaro was the first to yield three characteristic, cylindrical Sumerian seals (Mackay 1938, 7). Lothal yielded a circular Persian Gulf seal (Rao 1979, 41). Fragments of vessels of a greenish-grey stone (chlorite-schist) bearing engraved geometric patterns have been reported from some sites including Dholavira. The terracotta mummy-like figure from Lothal and the bull-grappling/bull-sacrifice scenes on Indus seals also suggest cultural contact. A large number of sites in Mesopotamia, such as Ur, Tell Asmar, Kish, Lagash, Umma, Nippur, Tepe Gawra, Tell Agrab and Ashur have yielded a variety of objects of Harappan origin. These objects include seals, beads, dice, terracotta figurines, and shell and ivory artefacts (Lal 1997, 182). Typical Harappan rectangular seals were found at Kish and Nippur. Two seals recovered from the island of Failaka, near the head of the Persian Gulf, also bear Harappan inscriptions. Similarly, a circular seal bearing the Indus script was recovered from Madinat Hamad in Oman by an Indian team during excavation in 1984-5 (Srivastava 1991). A large quantity of Harappan black-slipped jar pieces has been reported from many coastal sites in Oman (Ajithprasad 2006).

This evidence clearly indicates that during Harappan times, traders from both sides travelled across the sea to bring exotic items to their respective lands. However, although many sites have been excavated along the Gujarat coast, there is a dearth of archaeological remains to confirm the existence of a port at these locations. Lothal is the first site to provide evidence of a dock. Kuntasi on the Gulf of Kachchh and Saran (Dholavira) in the Great Rann are other sites which are suggestive of ports because of their geographical locations. It is therefore necessary to assess other coastal sites of Gujarat which may have been active as ports during the Harappan period.

About forty-four Harappan or Harappan-affined sites have been located so far along the Gujarat coast. Thirty of these belong to the Urban and the rest to the Late- or Post-Urban period. In terms of coastal locations, nineteen are in Kachchh (including the Rann) and twenty-five in Saurashtra and the mainland. Only nine fortified settlements have been recorded so far. Except Lothal, they are mainly on the coast of the Gulf of Kachchh or the Rann.

Lothal (22° 31' 25" N, 72° 14' 59" E)

Lothal, excavated during the period 1955-1962 by the Archaeological Survey of India (ASI), is the first Harappan site found associated with maritime activities. It has a structure identified as a dock and has yielded a sealing of Persian Gulf origin. The site is spread over an area measuring 7.5 ha. Excavations revealed 6 to 7 m. of cultural accumulation deposited

during seven successive phases of occupation. On the basis of archaeological findings, two cultural periods have been identified in this deposit. The first settlement at the site was established by an indigenous chalcolithic people using a distinct ceramic type termed as Micaceous Red Ware. The Harappans encountered this indigenous culture during this initial phase. The succeeding phases represent various developments at the site during the Urban Harappan period, while the last one represents the decadence phase of that civilization. The initial settlement at Lothal was a small village with a few mud-brick houses raised on a natural elevation. It was surrounded by an earthen bund to protect it from inundation. A devastating flood compelled the inhabitants to remodel and expand the settlement. It was planned in two parts: a carefully laid out Acropolis in the south-eastern sector and a Lower Town to the north and west of it (Fig. 2). The Acropolis consisted of two large buildings – the ruler’s mansion and the warehouse – while the Lower Town consisted of a

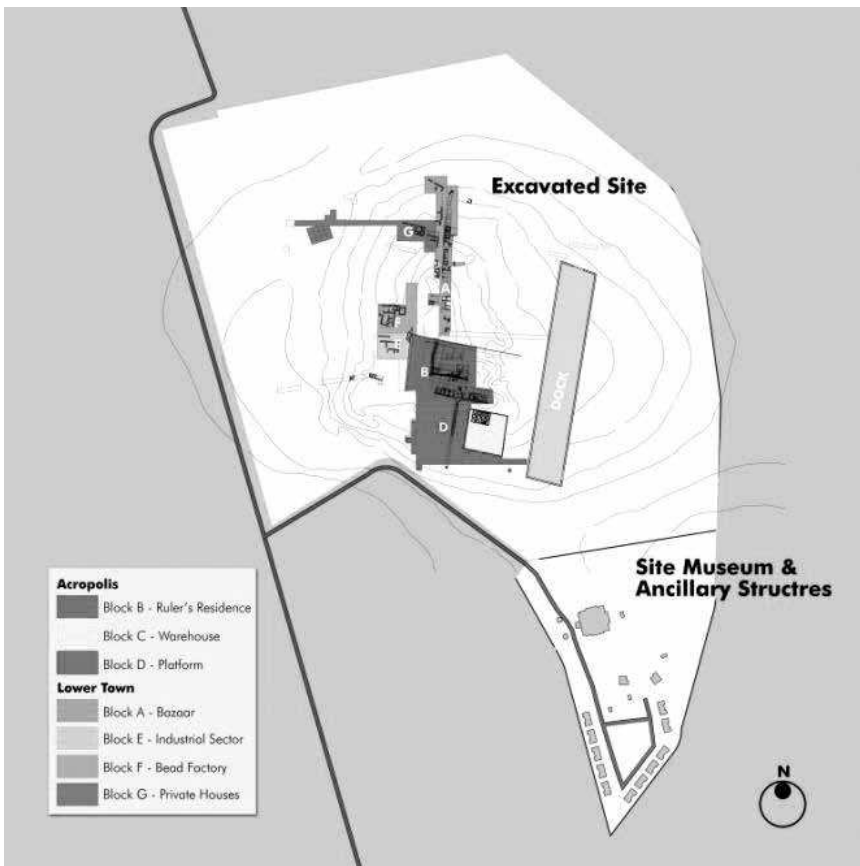


Fig. 2 Lothal Site Plan
After Abha Narain Lambah Associates 2004

domestic quarter, workshops and a market place. A dock was built along the eastern margin of the town. According to S R Rao, 'The town was planned in several rectangular blocks separated from each other by streets and lanes. The arterial streets divided the town into several grids in chess-board pattern.' (Rao 1979, 85). The site was linked to the sea through the Bhogavo-Sabarmati-Gulf of Cambay route.

The Lothal Dock

The dock mentioned reformed to is a large, brick-lined, rectangular tank-like structure, thus identified by S. R. Rao. He records that 'its western embankment wall is 716 ft., the eastern 705 ft. 6 in., the southern 117 ft., and the northern 123 ft. in length. The width of the wall is 6 ft. at the foundation level in the case of the western arm and 5 ft. in other cases. The extant height of the wall in the southwest corner of the basin is 11 ft, with 42 courses of bricks. It has been so designed as to meet the requirements of a dock'. The dock was designed to ensure berthing space for at least 20 to 30 boats of fairly large size (Fig. 3). It was built around 2350 BC and was destroyed around 1900 BC by a flood of great intensity.

Many scholars have argued against Rao's interpretation of this large trough-like structure and believe that it was a tank meant to store water for drinking and irrigation purposes (Shah 1960; Leshnik 1968; Pandya 1977). However, most scholars agree that Lothal was a commercial and trading centre (Possehl and Kennedy 1979). Therefore, whether the large brick structure was a dock or not, given its coastal location at the head of the Gulf of Khambhat, the possibility of Lothal being an important port cannot be denied.

Another characteristic feature of Lothal was its 'Warehouse' in the citadel area close to the wharf built along the western embankment of the dock



Fig. 3: Lothal Dock
Photograph: Y.S. Rawat



Fig. 4: Lothal Warehouse
Photograph: Y.S. Rawat

(Fig. 4). This was contemporaneous with the dock and was a place to examine and seal cargo. The warehouse consisted of 12 solid platforms, each measuring 12 sq.ft. built of partially-burnt mud bricks. These platforms were arranged in three rows of four each with a 4 ft. wide passage around each of them for easy movement of labourers. Interestingly, the cultural accumulation in one such passage in the south-eastern area yielded as many as 65 terracotta sealings, each bearing one or more impressions of seals.

Kuntasi (22° 50' 40" N, 70° 37' 30" E)

Kuntasi, on the southern shore of the Gulf of Kachchh, stands on the right bank of a seasonal river named Phulki in Rajkot district (Fig. 5). The Gulf is about 5 km. from the site and Navlakhi, a non-major port, is situated further north-west into the Gulf, about 8 km. away.

Excavation at the ancient site revealed the remains of a **fortified settlement** of the Harappan period with a 7 m. thick cultural accumulation. Two cultural periods, Mature Harappan (*c.* 2500-*c.* 1900B.*c.*) and Late Harappan (*c.* 1900-Ca. 1700 BC.) respectively have been identified at the site. However, stratigraphic evidence suggests that before the advent of the Harappans, the site was occupied by Mesolithic hunter-gatherers (Dhavalikar et al., 1996, 25). Period I yielded Harappan pottery, cubical chart weights, beads of semi-precious stone, beads of steatite and faience, gold beads, copper rings and



Fig. 5: Location of Harappan site Kuntasi on a meander of river Phulki

bangles, besides terracotta cart frames and a square faience seal without animal figure. Period II represents a general decline in the life of the settlement.

The settlement was fortified and the houses inside were arranged along four sides leaving an open area at the centre. Structures were built both in stone and mud brick (Fig. 6).

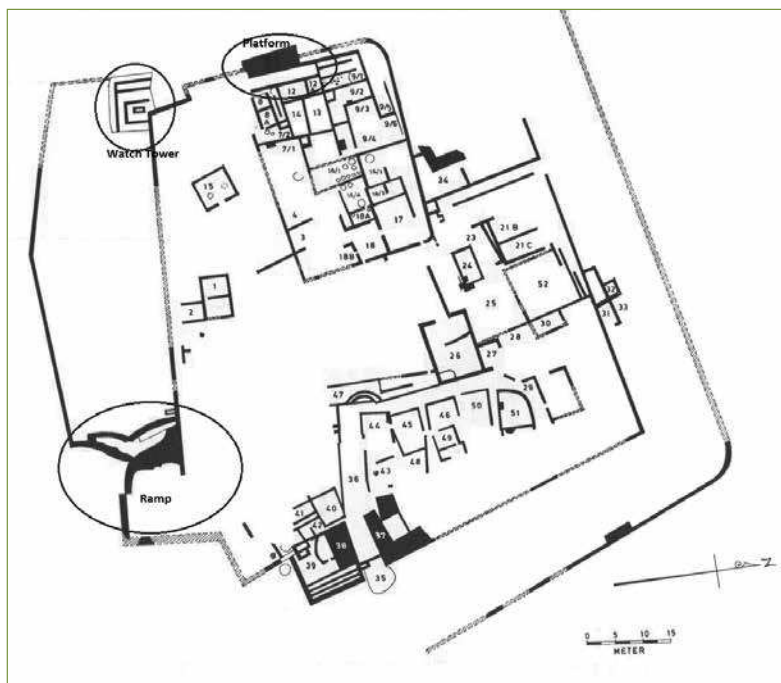


Fig. 6: Kuntasi layout Plan
After Dhavalikar et al. 1996

Remains of a Jetty at Kuntasi

Kuntasi has yielded a few interesting structures along its riverfront. These include a ramp leading to the river, a watchtower and a platform. The ramp was located at the south-eastern corner of the settlement between the eastern and the southern arms of the fortification. It was 4.10 m wide and 9.50 m long and was built of boulders set in mud mortar with large flat stones along the edge. According to the excavator, it was provided for facilitating the movement of goods from within the fortified area to the river. Another remarkable feature of the settlement was a squarish watchtower at the exterior of the south-western corner, near the river. It measured about 10.55 m × 8.50 m in dimension with an extant height of 0.80 m. According to the excavator 'originally it must have been at least 10-12 m high and could have been for keeping an eye on boats coming to Kuntasi through the Gulf of Kachchh; the possibility of it being some sort of lighthouse can also not be ruled out (Dhavalikar et al., 1996, 55)'. Further, to the north of the aforesaid tower, a 9.80 m. long and 4.10 m wide platform was exposed, built of roughly flattish stones in mud mortar. This may have been used as a landing platform for unloading raw materials which were brought by the ships through the creek and also for loading the finished goods from the workshops which were located to the north and north-east of it. All these structures belonged to the Urban Harappan period dated to circa 2200-1900 BC.

According to the excavator, during the Harappan times, the site was located just on the Sea coast which is presently 4 km. away. The discovery of stone anchors in excavation indicates that the site may have served as a port. This contention is supported by the fact that it was a port even in the mediaeval times (Dhavalikar et al., 1996, 3).

However, in the view of the excavator, the site doesnot seem to have been directly involved in foreign trade and was not a main trading centre:

Trading activity at Kuntasi, like any other early historical port site on the western coast, might be a seasonal phenomenon. Vessels might be plying with the help of tides and it is possible that even during normal high tide vessels could reach up to the site. The Little Rann of Kutch and the creeks were having less silt during the Harappan times. Tidal range must have been higher during that period. The present tidal range is 7.5 m, which is highest on the west coast of India (Dhavalikar et al., 1996,10).

Bagasra (23° 03' 30" N, 70° 37' 10" E)

The ancient site at Bagasra in Maliya taluka of Rajkot District is located on the south-eastern shore of Gulf of Kachchh. Excavations at the site revealed



Fig. 7: Bead factory at Bagasra
Courtesy MSU Baroda

a **fortified Harappan settlement** measuring 160×120 m in area and brought to light four distinct phases of Harappan settlement through a 7.75 m thick cultural deposit. Phases I to III represent events of the Urban period, while Phase IV belongs to the Post-Urban Harappan habitation.

The material remains unearthed from the site include typical Harappan steatite seals, terracotta sealings and many other objects made of a variety of stone, shell, bone, metal and clay. Objects such as bone-points and clay-lumps with reed impressions were also recovered. The site provided clear evidence of craft production and trade. Workshops for making shell objects, stone bead manufacturing (Fig. 7), faience-making and copper work have been found (IAR 1995-6; 1996-7; 1997-8; 1999-2000; Sonawane et al. 2003, 21-50).

The site is situated at a distance of about 500 m from the Gulf. The top of the mound is 14 m. above Mean Sea Level (MSL). The thickness of the cultural accumulation at the site is 7.75 m. Therefore, it can be assumed that the ancient ground level was about 6.25 m. above the sea level. Further, the MSL at present is hardly 2 m. below the base of the mound which indicates that the site could have been accessible through a wide depression which is still visible northeast of the site and south-west of Bagasra village.

Shikarpur (23° 14' 15" N, 70° 40' 39" E)

Excavation at the Harappan site at Shikarpur in Bhachau taluka of Kachchh revealed a **fortified settlement** with a 6.40 m cultural deposit representing three distinct phases of Harappan occupation. Apart from Harappan ceramics, the site yielded a good quantity of terracotta sealings, pendants, terracotta figurines of men, women and animals, cart frames, copper objects like bangles, rings, chisels and a celt; shell beads and bangles, semi-precious stone objects like pendants and beads, cubical weights, drill bits, chert blades and bone objects. (IAR 1987-8; 1988-9; 1989-90; Bhan and Ajithprasad 2008, 1-9; 2009,1-9).

Interestingly, the excavation of the central part of the settlement revealed existence of an open space possibly surrounded by residential blocks, similar to Kuntasi which has been identified as an emporium on the west coast. Shikarpur, on the other hand, has so far has yielded only terracotta sealings, indicating that the site was mainly receiving cargo/goods from elsewhere. The excavators feel it was most likely a market (Ajithprasad, personal communication).

The highest contour of the present mound of Shikarpur is about 16 m above MSL and the thickness of the occupation deposit is about 6.40 m. This shows that the ancient ground was about 9.60 m above MSL. The Gulf of Kachchh is about 2 km south of the site and is connected to it by a rivulet that passes through the western periphery of the site (Fig. 8). The locational geography and environment of the site suggest that it was an **active port during Harappan times. Further study is needed to ascertain this.**



Fig. 8: General View of the Shikarpur site
Courtesy MSU Baroda

Kanmer (23° 25' 4.6" N; 70° 51' 49.7" E)

The ancient site locally known as Bakarkot is situated about 200 m. north of Kanmer village in eastern Kachchh. Excavation here revealed a five-fold culture sequence beginning with the Harappan and ending with the mediaeval period. The Harappan deposit measuring about 6.50 m. in thickness represented the pre-fortification, Urban and other late phases of the Harappan culture. This was laid out as a small fort without any division. Roughly square in plan, it measured about 107 m. × 116 m. externally and about 72 m. × 79 m. internally. Found inside were multipurpose building complexes which yielded most of the typical Harappan material culture such as ceramics, steatite seals, terracotta sealings, a variety of beads made of semi-precious stones, terracotta, shell and paste; objects of shell, bones and copper/bronze; and a large number of drill bits and chert blades of both local and the Rohri variety. The most significant discovery – three terracotta sealings with identical impressions on the obverse but different incised signs on the reverse – suggests a system of identity tokens (Kharakwal et al., 2011). The site also yielded the remains of deep-sea fish and wood species like *Myristica malabarica* and *Wrightia tinctoria*. The latter suggests contact between the Konkan coast and the Kachchh region (Carla Lancelotti et al., 2011). These findings indicate regional contact, possibly by sea. Further, the Mardhak Bet (island), famous for its agate mines, is very close to Kanmer. The site also remained under occupation during Historic and Medieval times. Finding an almost complete torpedo jar of West Asian origin indicates that it had trade connection across the sea during the fourth-fifth century CE.

Geomorphological and soil sediment studies, carried out by Deo et al. (2010) around Kanmer, revealed that the ephemeral streamlets were holding surface water for a longer period due to the relatively wet climate prevalent in Kachchh during the mid-Holocene. The Little Rann was perhaps holding water 2-5 m. deep between 6000 and 2000 BP and the sea level too was higher than what it is today. The Little Rann turned dry during the Late Holocene, perhaps owing to environmental change, local tectonics and uplifts of mud flats during the last 4,000 to 2,000 years. (Kharakwal et. al., 2012, 830)

The site is situated about 5 km. north of the Little Rann, the shore of which is visible from the hillock just south of the site. However, topographical maps and satellite imagery clearly show that the Rann is easily approachable from an estuary, just about 1.5 km. south-east of the site.

Nagwada (23° 18N; 71° 42 30E)

Nagwada lies on the eastern shore of the Little Rann of Kachchh in Dasada Taluka of Surendranagar District in north Gujarat. Excavations by the M.S. University of Baroda from 1985 to 1989 revealed a single period occupation divisible into two sub-periods. The first, named IA, is represented by burials of two distinct types: extended human and 'symbolic' burials. This burial pottery is similar to the early Harappan pottery reported from many sites in Sindh and Baluchistan (Ajithprasad 2011). Sub-period IB belongs to the Urban Harappan era. Nagwada was an important shell-working site on the Little Rann and produced a wide variety of shell objects. According to Bhan, 'shells could have been obtained either from [the] northern coastal line of Jamnagar district or from through [*sic*] Greater [*sic*] Rann of Kachchh, which was part of sea during Harappan times' (Bhan et al., 2003). The site appears to have had direct access to the Rann through a water channel which is at present in the form of a nala (Khari Vokri).

Surkotada (23° 37'N; 70° 50'E)

Surkotada, situated in eastern Kachchh on the western shore of the Little Rann, was excavated by ASI in 1971-2. The Harappan settlement here was laid out in two parts of a rectangular shape. On the western side was located a well-fortified high citadel abutted by a low-lying residential annex on the east. Both of them were interconnected by a small passage. The fortification had rectangular bastions at corners. The main entrance to the citadel was from the south.

According to the the excavator, the site was 'most probably a garrison complex to control eastward movement of the Harappans' (IAR 1970-1; 1971-2; Joshi 1972, 98-144; Joshi 1990). But it seems to have most probably been a centre from which to exploit local mineral resources, especially the agate and clay deposits of the nearby Kandek area.

At present, a small rivulet passes through the southern side of the site which according to Jagatpati Joshi (1990), the excavator of the site, in the ancient days was 0.75 km. wide and emptied itself further down into the Little Rann of Kutch', which at present lies about 6.5 km. east of the site (Fig. 9). Joshi's observation is based on ground surveys and morphological examinations of the physical features of the area between Surkotada mound and Adesar (a nearby town). The possibility of this wide channel serving as an access to the site for boats and ships in the ancient past cannot be ruled out.

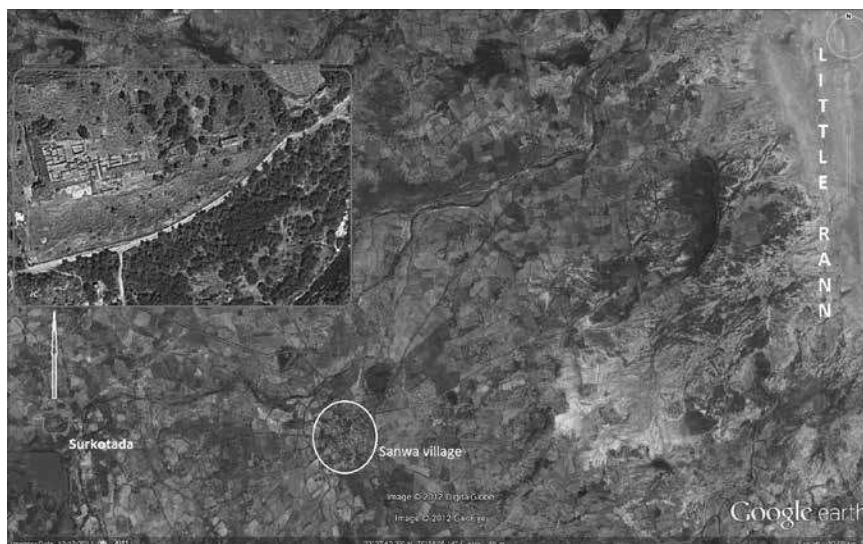


Fig. 9: Location of Surkotada site on Little Rann of Kachchh

Dholavira (23° 53' 10" N, 70° 13' 00" E)

The Harappan site of Dholavira is located on Khadir Island in the Great Rann of Kachchh. Spread over an area of about 100 ha., it is among the five largest-known Harappan cities in the Indian sub-continent. The ASI carried out excavations at the ancient mounds from the year 1990 to 2004. This author has also worked at the site from the year 1984 to 2000. It revealed a fortified town with three distinct divisions within. These divisions have been termed as Citadel, Middle Town and Lower Town respectively (Fig. 10). Dholavira has provided evidence of an amazing water-harvesting system of the Harappan period based on thoughtfully designed reservoirs interconnected with each other.

‘The site is remarkable for its exquisite planning, monumental structures, aesthetic architecture, efficient water harvesting system and funerary architecture’ (Bisht 1991, 1997).

Excavation through a deposit ranging from 6.30 m.–12 m. in thickness revealed a sequence that reflects seven stages of cultural development at the site. According to the excavator, the seven cultural stages of Dholavira can be dated between 3500 and 1700 BC.

A cemetery with a variety of funerary structures was found around a large ancient reservoir situated to the west of the ancient city. The most remarkable sepulchral structure type was in the form of large tumuli. These are circular spoke-wheel type plans with a central chamber which was being opened and

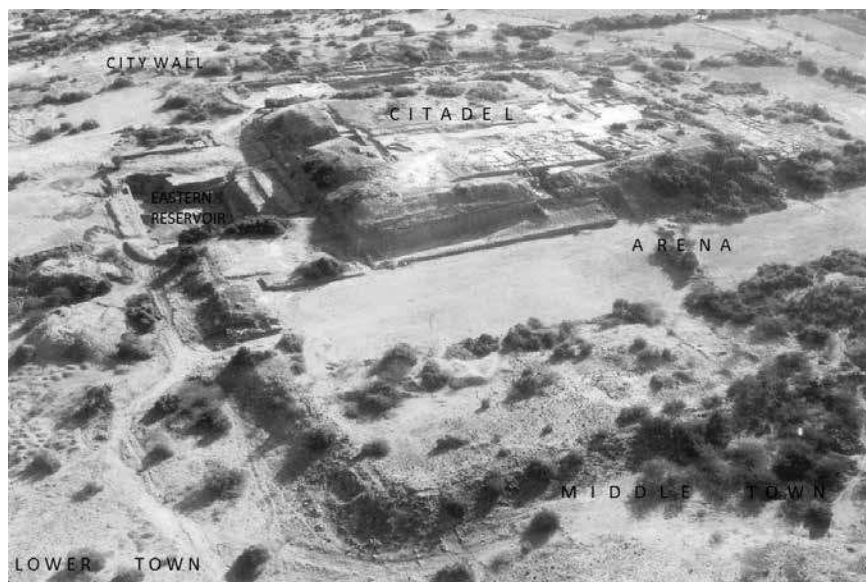


Fig. 10: General View of Dholavira
Courtesy Rohit Singh Negi

reused as and when required. Initially, these hemispherical structures were made of mud bricks but in subsequent phases, stone was also used.

Among other significant findings at the site is an inscription composed of ten large-sized signs in the Indus script. It has been identified as a signboard that may have been once hung on the façade of the north gate of the citadel. The site has also provided evidence of industrial activities. Workshops for manufacture of beads, shell objects, lapidary, etc., have been excavated.

Dholavira seems to have been a major trading centre covering the entire Gujarat region. As Gregory Possehl has designated Gujarat as a regional domain, Dholavira seems to have been its **capital city**. It may have been a great exporter of varieties of beads, architectural stones, drill bits, clay, minerals, and forest and sea produce to sites in the Indus and Sarasvati basins. Interestingly, some of the limestone pillar elements recovered from Mohenjodaro match the variety of limestone available at Dholavira. An ancient quarry and factory site, presently known by the name of *Varalpatta*, about 2.5 km north of Dholavira on the way to Saran port, has yielded many unfinished architectural elements (IAR 1989-0; 1990-1; 1991-2; 1992-3; 1993-4; 1996-7; 1997-8; 1998-9; 1999-2000). A fragment of a chlorite schist vessel seems to be the only artefact of foreign origin found at the site.

Port site Saran (Dholavira)

Saran, on the shore of the Great Rann of Kachchh, is about 3.5 km. north of Dholavira. This seems to be a small Harappan port catering the needs of the ancient metropolis. The site is located on the left bank of a rivulet. Its water is potable at the source for most of the year. Ancient marine engineers seem to have preferred a narrow creek between a small rocky outcrop and a hill for the jetty. On the flat top of the outcrop are the ruins of a large rectangular building oriented east-west (Fig. 11). This building may have been a **warehouse** for the temporary storage of goods. In plan, the building has a row of nine small rooms set along its northern wall, which were possibly fronted with large verandas. At the eastern end, the building had three small rooms. These yielded very few potsherds from the Late Urban Harappan assemblage (Bisht, personal communication). The extant height of its walls measures 0.53 m. to 0.80 m. with a width measuring 0.70 m. The lateral walls of the building on east and west were extended on the slope to the rivulet below, perhaps to create a large open enclosure. The western wall, traceable up to a length of 18m. may have terminated at a large platform of approximately 8 sq. m. located right on the bank of the river. The enclosed area also seems to be further partitioned into two divisions by a north-south wall. The platform on the bank of the estuary appears to be meant for loading and unloading cargo (Fig. 12).

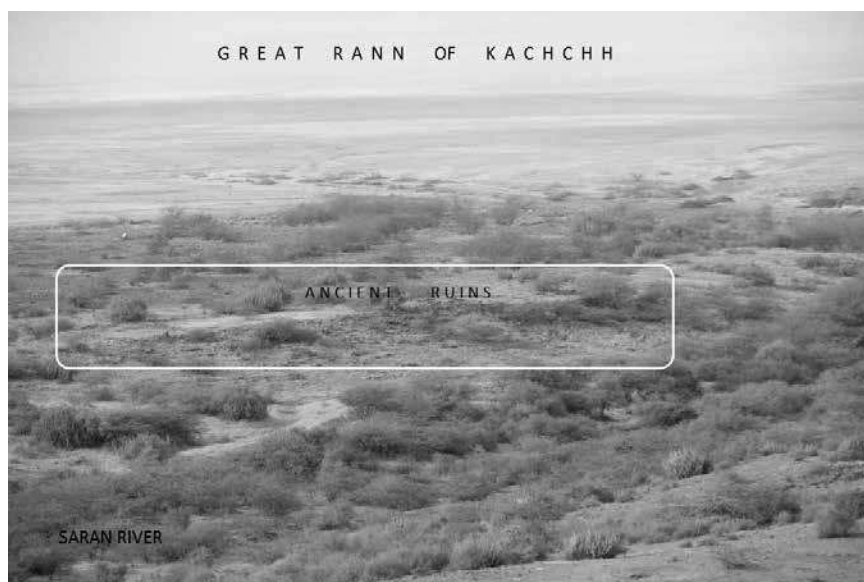


Fig. 11: Saran on the southern shore of the Great Rann of Kachchh

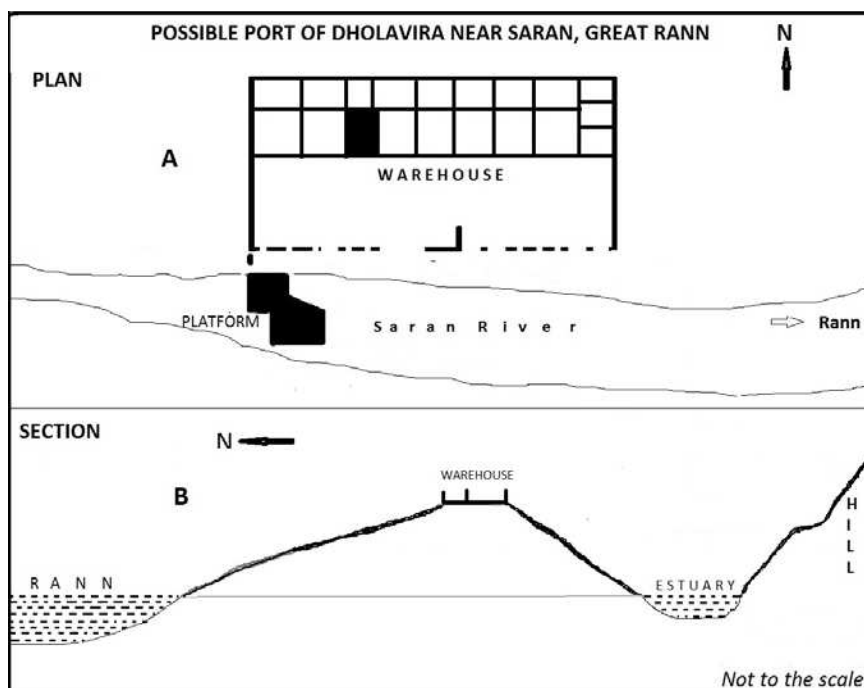


Fig. 12: Possible Port of Dholavira near Saran, Great Rann
Drawing: Y.S. Rawat

The building stood at an altitude of 8 m. above MSL. The present bed of the rivulet is about 6 m. below the base of the building and about 1.5 m. above the present surface of the Rann. If it is assumed that the Rann was an extension of the sea and was 4 m. deep during the Harappan era, and the sea-level was 1-2 m. higher than what is today, the 6 m. deep water could have been sufficient to bring the vessels to the platform through the estuary. Further, the estuary may have been preferred as a secure mooring place protected from sea storms.

The Harappans of Dholavira may have preferred this location because it was on the shortest route for boats/ship coming from the Gulf/Little Rann side and from Sind in the north across the Great Rann. A location south or west of Dholavira town would have made the journey slightly longer. Besides, such sheltered space is not available in those directions.

Pabu Math (23° 37'N; 70° 31'E)

Pabumath, near village Suvaion on the southern shore of the Great Rann of Kachchh in Rapar Taluka, was excavated by the Gujarat State Archaeology Department for three seasons from 1977-8 to 1980-1. The excavation

revealed a 5 m thick cultural deposit belonging to the Urban and Late Urban Harappan period. A large building complex consisting of a number of rooms and built-in stone was partially exposed. Besides Harappan ceramics, the finds included an inscribed seal bearing a unicorn motif; beads of paste, carnelian, agate, chert, shell; and bangles of shell. (IAR77-8, 78-9 and 1980-81). The location of the site is to the south-east of Dholavira, across the Great Rann.

Ner (23° 25' N; 70° 18' 30" E)

Ner is located on the shore of Great Rann, to the south of Dholavira, on the traditional land route that connected Khadir Bet and mainland Kachchh during the dry season. This site may have served as a halting station for the caravans before embarking on a boat or ship to cross the Rann. Mandriyara Mohra (23° 30' N; 70° 16' E) near Chobari, further north of Ner, is another site of similar nature (IAR1986-87).

Juni Kuran (23° 57' 76" N, 69° 45' 91" E)

The Harappan site Juni Kuran is located on the southern shore of the Great Rann of Kachchh in the north-eastern margin of the Pachcham Bet in Kachchh District (Fig. 13). The ancient mounds were excavated by ASI from 2003-4 to 2005-6. The settlement, roughly rectangular in plan, is spread over an area of 410 m. × 350 m. The highest mound contains about 7 m deposit from the Harappan period. The occupants of the site used mud-brick and stone in the building of their houses and settlement fortification.

The site yielded remains of the Mature and Late Harappan times. Excavations revealed that like Dholavira, this town also consisted of a citadel, a middle town and a lower town. However, unlike the former, the citadel, the middle town and the lower town here are located in the north-west, south and east respectively. The settlement was fortified and furnished with gateways and two enclosures which have been identified as stadiums. The site also yielded objects made of shell, terracotta, metals, semi-precious stones and bones. Steatite seal and fishhooks of copper were also recovered. Burials were unearthed from the site (Pramanik, 2004, 45-67).

Navinal, Tal. Mundra, Kachchh (23° 49' 17'.5" N; 69° 35' 49.9"E)

Known as Benap-no-Timbo, the site has yielded ceramic assemblage similar to Rangpur II-A, II-B and III. The amount of shell-waste found here indicates it was engaged in marine resource procurement. It is spread over an area



Fig. 14: Coastal sites and possible sea routes during Harappan times

measuring about 180 m. × 120 m. and contains a deposit of about 1 to 1.5 m. thickness (Ajithprasad, personal communication).

Todio Timbo, Tal. Abdasa, Kachchh (23° 08'N; 68° 58'E)

Known as Bhedi no Timbo near village Bhedi, it is located **on the right bank of the Nera River**. The site is spread over an area of about 95 m × 85 m. It is about 12 km north of the coast. It may have been an estuarine port of local importance (Rao 1963). The objects found were mainly ceramics of the Rangpur IIB and IIC period. Hence, it may have been active during the Urban and Late Urban Harappan times.

Bet Dwarka (22° 20' 00" N, 69° 05' 00" E)

Explorations (IAR 1969-70, 59) and excavations on this island (Rao 1990; Rao and Gaur 1992; Gaur and Sundaresh 2003) in Jamnagar district brought to light remains of Chalcolithic/Post Urban Harappan times. The excavator believes that the availability of marine shells made it an attractive place for

continuous habitation. It also served as a safe harbour in the ancient past (Gaur *et al.* 2005).

Nageshwar (22° 20' 00" N, 69° 03' 00" E)

Nageshwar is located in the neighbourhood of the Pindara and Poshitra Bay in Okhamandal taluka of Jamnagar district. These bays are rich in *Turbinella pyrum* and *Chicoreus ramosus* shells – the main raw materials for manufacturing bangles, ladles and various other objects. It is located near a large sweetwater lake in Nageshwar village. Unfortunately, the Harappan mound measuring 120 m × 100 m was destroyed in 1976 by local earthwork contractors who have removed almost the whole mound for earth-filling. The Maharaja Sayajirao University of Baroda conducted excavations at the site in 1983-4, which revealed evidence of a 2- 2.60 m. thick Harappan deposit divisible into two phases, Period IA and IB. The artefacts recorded include a few Harappan structures of stone slab and rubble, a fire altar (?) or pottery kiln, classical Harappan ceramics and a stud-handled bowl; stone weight, beads, blades and polishers; folded copper-sheet and terracotta triangular cakes, bangles and toy cart frames. It has been identified as a shell-object manufacturing settlement as large quantities of shell bangles, pendants, broken ladles, inlays, beads and debitage have been recovered. The site also yielded bone-remains of cow, goat, sheep, buffalo, blue bull, antelope, spotted deer, sambar and marine fish (Bhan *et al.*, 1984; Hegde *et al.*, 1990). In the opinion of the excavators 'the land all around the lake where the soil mantle above the local limestone bedrock is sufficiently thick and fertile for agricultural operation and the thick growth of tall, tubular, aquatic plants, locally known as *baru*, believed to be suitable for building small sea-going vessels, appear to have attracted an early Harappan community to Nageshwar' (IAR 1983-4).

Lakhabaval (22° 24'N; 70° 00'E) and Amara (22° 16'N; 69° 56'E)

Lakhabaval and Amara lie at the mouth of the Gulf of Kachchh, close to its southern shore, about 15 - 20 km. north-west of Jamnagar. These sites have yielded Harappan pottery and other materials, similar to the pottery reported from Period IIA and II B of Rangpur. According to Rao (1963, 1991) they were engaged in shell-fishing and manufacturing shell objects for export.

Prabhas Patan/Somnath (20° 53' 00" N, 70° 24' 00" E)

The first phase of excavation at Nagar mound in Prabhas Patan conducted by the Department of Archaeology, Saurashtra and Maharaja Sayajirao University

of Baroda in 1955-6 and 1956-7 revealed a six-fold cultural sequence starting from the Late Harappan and ending in the mediaeval period. However, the second-phase excavation, from 1971 to conducted by the previously-mentioned two Departments along with the Deccan College, Pune, pushed the antiquity of the site to 3000B C (IAR 1955-6, 1956-7, Nanavati et al., 1971; Dhavalikar and Possehl 1992).

Bhagatrav (21° 29' 00" N, 72° 42' 00" E)

Bhagatrav located in Bharuch District was excavated by S. R. Rao of the ASI in 1957-8. The site lies at the mouth of the Kim River, half a mile south of village Jetpur in Hansot Taluka. Excavations revealed a 2.25 m deposit of two cultural periods, Period I and II, assignable respectively to the Harappan and medieval times. Period I was further divided into two subperiods, I-A and I-B, representing respectively the Urban and Post Urban phases of Harappan culture (IAR 1957-8). Period I-A yielded ceramic types similar to those from Lothal and Rangpur II-A while I-B revealed Post Urban pottery forms like a dish with a short projected rim and a small jar with a slightly elongated neck. According to the excavator, **Bhagatrav seems to have been a port in contact with Harappan sites in Saurashtra.**

Mehgam (21° 42' 00" N, 72° 45' 00" E)

Mehgam, near Bharuch on the Narmada estuary, was excavated by S. R. Rao of the ASI in 1957- 8. This Chalcolithic site yielded the dish-on-stand, jar with short neck, dish with a slightly carinated shoulder of the Urban (Sorath) and Post Urban Harappan (Late Sorath) assemblage. A bi-conical bead of agate and a few copper fragments were found but no structures were noticed (IAR 1957-8).

Telod (21° 42' 00" N, 72° 46' 00" E)

Telod in Bharuch District on the Narmada estuary was excavated in 1957-8 by the ASI. The low-lying mound yielded ceramics of the late phase of Rangpur II-B type (IAR 1957-8).

Discussion

The excavation at Lothal in the 1960s brought to light a unique and huge basin-like brick structure which was identified as a 'dockyard'. This structure has created lot of curiosity among scholars as well as common visitors to the site. After Lothal, Kuntasi on the southern shore of the Gulf of Kachchh also

yielded some remains which have been identified as those of a jetty. Saran, near Dholavira, is another site on the shore of the Great Rann which provides the minimum parameters required for a normal jetty. It is an estuarine port located at a safe landing space between two hillocks. So far as other coastal sites are concerned, their geographical and environmental setting suggests their having been port sites. No evidence of any jetty or platform is available at any of these sites. However, they are very close to the shore and most of them are linked with the sea or Gulf by a river or an estuary. Further, it seems that functional need too was a factor for selecting the location. Chitalwala opines that:

most of the Harappan settlements in Kutch and Saurashtra were part of an extensive trading network and the communication was on three lines viz. overland communication between ... settlement[s] within Kutch and Saurashtra, interregional communication between Sind and Kutch/Saurashtra and international communication and overseas trade between Harappan sites in Kutch and Saurashtra and the Persian gulf (Chitalwala 1977 and 1982).

Therefore, there is sound reason to believe that most of the fortified settlements along the Gulf of Kachchh shore were linked by waterways and that they may have transported cargo to the nearest sites across the Gulf. Most of these settlements appear to be involved in the procurement of local resources and craft production for local consumption and supply to major regional centres. Interestingly, at most of the fortified settlements while initially the Urban Harappan elements are more prominent, but in the subsequent phase the regional chalcolithic ceramics, termed as Sorath Harappan, appear to increase. This may have been due to the increasing active participation of local folk in the growing economy.

According to Bowen (1951) 'the Gulf sailing route was kept to the coast, when sailors had no aids other than the position of the sun and stars. Such a route must have been more easy to navigate and more convenient for repairs and maintenance works which all ships constantly need'. However, Shereen Ratnagar (1981, 231) feels that sailing across the seas cannot be ruled out.

The Minoans of Crete were, in of the second millennium BC, able to some 700km across the Mediterranean with the prevailing north-westerly winds to Egypt, if not back, the Egyptians, likewise.

According to her: 'many of the sites of Harappan or latter periods on Gujarat coast were some kind of 'refuelling stations' or anchorages if not actual ports'.

This may be true for the fortified settlements situated on the shore, but the small rural settlements seem to have been occupied by the people subsisting on fishing and other such activities.

Nageshwar, Amara, Kuntasi and Bagasra on the Saurashtra coast and Navinal, Sevakiya, Shikarpur, Kanmer, Surkotada, Pabumath, Ner, and Juni Kuran all on the Kachchh/Rann coast seem to have functioned as small local ports involved in short-distance trade through both overland and sea routes. However, Lothal and Dholavira seem to have controlled the overall maritime trade supported by their sophisticated harbour facilities (Fig. 14). On the other hand, several sites on the Kachchh coast, mentioned here or listed in the table at the end of this section, may have been small rural settlements subsisting on agriculture, fishing activities and salt manufacturing. These sites do not seem to have been involved in maritime trade during Urban Harappan times but some of them could, as suggested by Ratnagar, have served as refuelling stations during Late Urban and Post Urban Harappan times. They may have contributed to Harappan resource management mechanisms through supplying agricultural, natural and sea resources to other hinterland sites or bigger centres of trade. Sites like Kuntasi, Bagasra on the southern shore of the Gulf of Kachchh, Sevakiya, Shikarpur on the northern shore of the same Gulf, Kanmer, Surkotada and Nagwada on the coast of the Little Rann and Dholavira, Pabumath, Ner and JuniKuran along the shore on the Great Rann and Lothal on the Gulf of Khambhat seem to have been associated with a greater chain of trade networks or resource management mechanisms in Gujarat. All these sites have some similarity in their town planning, environmental setting and subsistence systems. All of them were

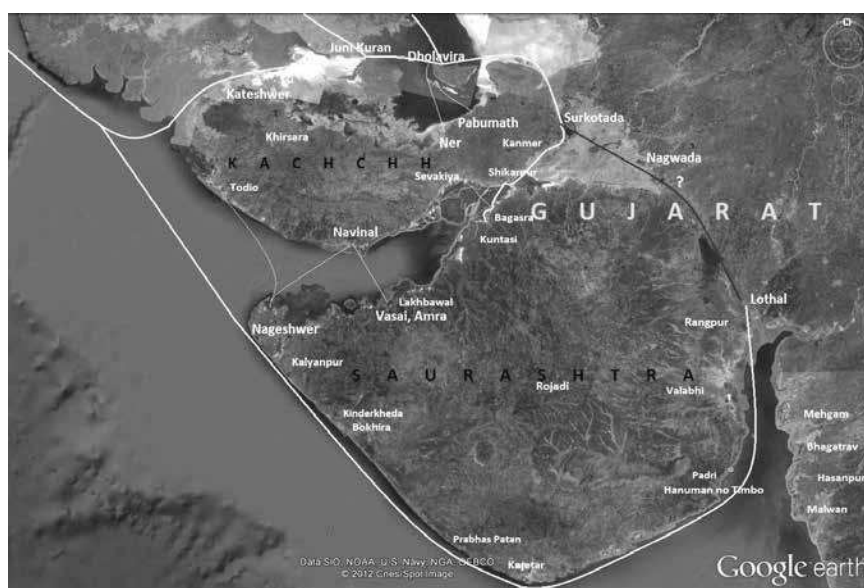


Fig. 14: Coastal sites and possible sea routes during Harappan times

fortified and connected to the Gulf/Sea through small rivulets. Antiquarian remains recovered from some of these sites suggest that they were involved in the production of different varieties of craft-objects.

The overall picture that emerges is that most of the sites of the Gujarat region, and those south of the Great Rann, worked as partners in an economy based on the exploitation of natural resources which were available in plenty in the Arabian Sea and in the forested regions of the north and the central Gujarat and Saurashtra. Dholavira, on the shoreline of the Great Rann in the extreme north and Lothal on the Arabian Sea in the south, were two major centres of this economy. Therefore, these two settlements could have been regulating international trade activity on behalf of the majority of these sites. This inference is also supported by the availability of items of foreign origin at both these sites.

Geological investigations in the Rann of Kachchh have revealed that the Little Rann had 4 m. deep water up till 2,000 years B P (Gupta 1977). Our excavation at Kanmer supported with GIS survey and simulation of the sea-level in Gujarat region suggests that a 1.0 m increase in the present sea-level makes the whole Gulf of Kachchh and the Rann navigable (Fig. 15). At

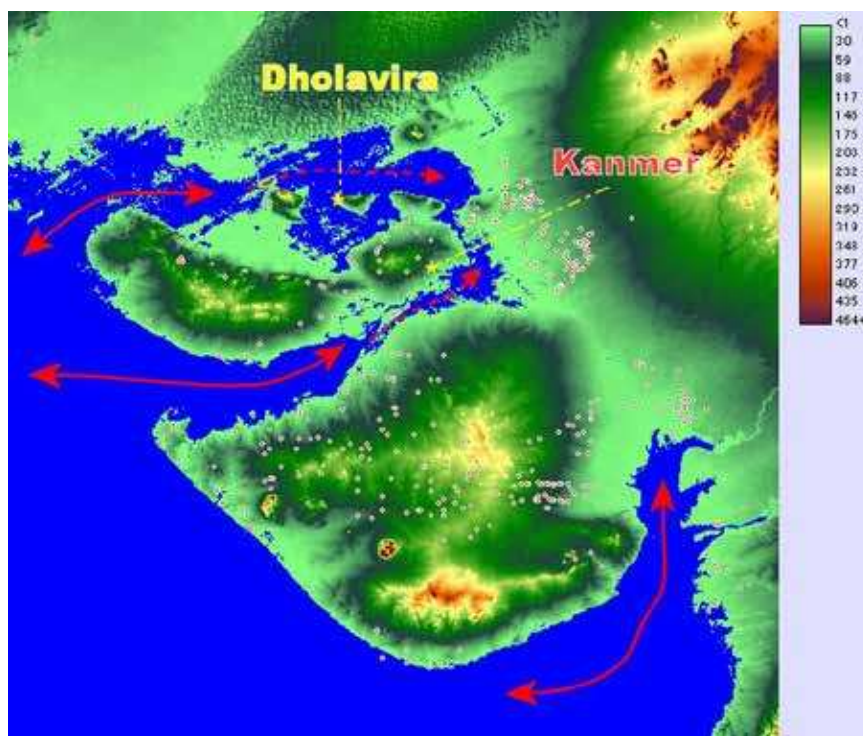


Fig. 15: Sea level simulation: +1m ASL.

After Indus Project, Research Institute for Humanity and Nature, Kyoto

this MSL, Kachchh could have been an island which was connected with Saurashtra on the south across the Gulf of Kachchh and the Indus region on the north across the Great Rann only through waterways. The location of many Harappan sites on opposite shores of the Gulf strongly supports this presumption. Therefore, at the local level, small settlements may have communicated and interacted with each other, exchanging their products to meet their requirements. But at the macro-level, large settlements were playing a bigger role to import from and export regional products to other countries of the Old World.

Table 1: List of Harappan sites located on Gujarat coast

<i>Sl. No.</i>	<i>Name of site</i>	<i>Geo-coordinate</i>	<i>Location</i>	<i>Period</i>
1	Kanmer, Rapar	23° 23'N;70° 40'E	Little Rann of Kachchh	Mature Harappan
2	Khandariya (Varnu), Rapar	23° 28'N; 70° 03'E	Little Rann of Kachchh	Late Harappan
3	Surkotada, Rapar	23° 37'N;70° 50'E	Little Rann of Kachchh	Mature Harappan
4	Nagwada 1 & 2, Dasada	23° 17'N;71° 52'E	Little Rann of Kachchh	Mature Harappan
5	Dholavira-Saran, Bhachau	23°53'N; 70°13'E	Great Rann of Kachchh	Mature Harappan
6	Pabumath, Rapar	23° 37'N;70° 31'E	Great Rann of Kachchh	Mature Harappan
7	Ner, Bhachau	23° 25'N; 70° 18'30"E	Great Rann of Kachchh	Mature Harappan
8	JuniKuran, Bhuj	23°57'76"N; 69°45'91"E	Great Rann of Kachchh	Mature Harappan
9	Katesar, Lakhpat	23°34'N;69°29'E	Great Rann of Kachchh	Mature Harappan
10	Todio (Bhedi no Timbo), Abdasa	23°05'N; 68°55'E	South-west Kachchh coast	Mature Harappan
11	Navinal, Mundr	22° 50'N; 69°35'E	South Kachchh coast	Mature Harappan
12	Mithi Rohar, Anjar	23° 06'N;70° 11'E	South-east Kachchh coast	Late Harappan
13	Shikarpur, Bhachau	23°14'N;70°40'E	Gulf of Kachchh	Mature Harappan
14	Sevakiya, Bhachau Mature Harappan	23° 16'N; 70°19'E	Gulf of Kachchh	Mature Harappan
15	Amara, Jamnagar	22° 16'N; 69° 56'E	Gulf of Kachchh	Mature Harappan
16	Lakhabaval, Jamnagar	22° 24'N; 70° 00'E	Gulf of Kachchh	Mature/Late Harappan
17	Vasai, Jamnagar	22° 24'N; 70° 00'E	Gulf of Kachchh	Late Harappan
18	Kuntasi, Morbi	22° 53'N; 70° 37'E	Gulf of Kachchh	Mature Harappan
19	Bagasra, Maliya Mature Harappan	23° 03'; 70° 37'E	Gulf of Kachchh	

20	Nageshwar, Okha	22° 24'N; 69° 05'E	West Saurashtra coast	Mature Harappan
21	Bet Dwarka, Okha	22° 28'N; 69° 06'E	West Saurashtra coast	Late Harappan
22	Kalianpur, Jamnagar	21° 50'N; 69° 25'E	South-west Saurashtra coast	Mature Harappan
23	Kindarkheda, Porbandar	22° 48'N; 69° 33'E	South-west Saurashtra coast	Late Harappan
24	Bokhira, Porbandar	22° 39'N; 69° 36'E	South-west Saurashtra coast	Late Harappan
25	Prabhas, Junagadh	20°53'00"N; 70°24'00" E	South Saurashtra coast	Chalcolithic
26	Kanjatar/Kaj, Kodinar	20° 44'N; 70° 40'E	South Saurashtra coast	Late Harappan
27	Padri, Talaja	22° 22'N; 72° 95'E	South-east Saurashtra coast	Chalcolithic/ Harappan
28	Hanumanno Timbo, Sartanpur near Talaja	21°18'53"N; 72°05'21"E	East Saurashtra coast	Harappan
29	Valabhi	22° 41'N; 71° 38'E	Gulf of Khambhat	Harappan
30	Lothal, Dholka	22° 31'N; 72° 15'E	Gulf of Khambhat	Mature/Late Harappan
31	Telod, Bharuch	21°42'00"N; 72°46'00"E	South Gujarat coast	Late Harappan
32	Mehgam, Bharuch	21°42'00"N; 72°45'00"E	South Gujarat coast	Late Harappan
33	Malwan, Surat Late Harappan	21° 71'N; 72° 42'E	South Gujarat coast	Late Harappan
34	Bhagatrav, Bharuch	21°29' 00"N; 72°42'00" E	South Gujarat coast	Late Harappan
35	Hasanpur, Bharuch	21° 15'N; 72° 45'E	South Gujarat coast	Late Harappan
36	Budhel, Bhavnagar	21°45'N;72°09'E	East Saurashtra coast	Late Harappan
37	Nava Ratanpur, Bhavnagar	21°39'12"N; 72°16'43"E	East Saurashtra coast	Harappan
38	Koliyak, Bhavnagar	21°36'01"N; 72°16'46"E	East Saurashtra coast	Harappan
39	Lonsapur, Bhavnagar	20°57'39"N; 71°24'82"E	East Saurashtra coast	Harappan
40	Kalsar, Bhavnagar	21°07'03"N; 71°53'66"E	East Saurashtra coast	Harappan
41	Satra, Bhavnagar	21°06'62"N; 71°50'24"E	East Saurashtra coast	Harappan
42	Dhakana, Bhavnagar	21°18'95"N; 72°04'33"E	East Saurashtra coast	Harappan
43	Lilivav, Bhavnagar	21°20'52"N; 72°03'22"E	East Saurashtra coast	Harappan
44	Shakhavadar, Bhavnagar	21°17'27"N; 72°03'83"E	East Saurashtra coast	Harappan

Bibliography

- Ajithprasad, P, 'The Harappan Black Slipped Jar from Bagasra, Gujarat and its Significance' (pre-print), paper presented in *the International Seminar on Magan and Indus Civilization*, organized by ASI and M S University of Baroda, 2006.
- Ajithprasad P, Tosiki Osada and Michael Witzel, eds., *Chalcolithic Cultural Patterns and the Early Harappan Interaction in Gujarat, Cultural Relations between the Indus and the Iranian Plateau during the Third Millennium BCE*, Harvard Oriental Series, Opera Minora, Vol.7. Cambridge, pp. 11-40.
- Annual Report Department of Archaeology*, Government of Gujarat, 1980-81, pp.4-5.
- Bhan, K. K. and J M Kenoyer, 'Nageshwar: A Mature Harappan Shell Working Site on the Gulf of Kachchh', in *Journal of the Oriental Institute*, 34 (1-2), 1984, pp.115-20.
- Bhan, K. K. and Dakshayani Gowda, 'Shell working at Nagwada (North Gujarat) with special Reference to Shell Industries of the Harappan Tradition in Gujarat', in *Man and Environment*, Vol. XXVIII No. 2 :51-80, 2003.
- Bhan, K. K. and P. Ajithprasad, 'Excavation at Shikarpur 2007-2008: A Coastal Port and Craft production Centre of the Indus Civilization in Kutch, India', 2008 browsed on net in December 2012: www.harappa.com.
- Bhan, K. V. H. Sonawane, P. Ajithprasad, S. Pratapchandra, 'A Harappan trading and craft production centre at Gola Dhoro (Bagasara)', in *Antiquity* 79 (304), 2005, pp. 1-7.
- Bisht, R. S. 'Dholavira: A New Horizon of the Indus Civilization', in *Puratattva*, 20, 1991, pp.71-82.
- , 'Dholavira Excavations: 1990-94', in Joshi, J.P. ed., *Facets of Indian Civilization: Recent Perspectives*, Aryan Books International, New Delhi, 1997, pp. 107-120.
- Bowen, 'The Dhow Sailor', Reprint from *American Neptune* XI.3, 1951, pp. 152-37.
- Chakrabarti, Dilip K., *The external trade of the Indus Civilization*, Munshiram Manoharlal Publishers Pvt Ltd., New Delhi. 1990.
- Chitalwala, Y. M., 'Harappan and Post-Harappan Settlement in Saurashtra', in Agrawal, D.P. and B.M. Pande (eds.), *Ecology and Archaeology of Western India*, 1977, pp 93-8.
- , 1982, 'Harappan Settlements in Kutch-Saurashtra Region: Patterns of Distribution and Routes of Communication', in Posshel, G. L. ed., *Harappa Civilization – A Contemporary Perspective*, Oxford IBH Publishing Co., New Delhi, pp. 197-202.
- Cleuziou, S., 1992, 'The Oman Peninsula and the Indus Civilization: A Reassessment', in *Man and Environment*, Vol. XVII No.2, 93-104.
- Deo, S.G., S. Ghate and S.N. Rajaguru, 'Holocene environmental changes and cultural patterns in coastal western India', in *Quaternary International*, 229 (2011), 2010, 132-9.

- Dhavalikar, M.K., M.R. Raval and Y.M. Chitalwala, *Kuntasi – A Harappan Emporium on West Coast*, Deccan College Research Institute, Pune, 1996.
- Gaur A. S., and Sundresh, 'Onshore excavation at Bet Dwarka Island, in the Gulf of Kachchh, Gujarat' in *Man and Environment*, XXVIII (1), 2003, 2003, 57-66.
- , 'A Late Harappan Port at Kindar Kheda on the Saurashtra Coast', in *Man and Environment*, XXX (2), 2005, 44-8.
- Gaur, A.S., Sundresh and P. P. Joglekar, 'Excavation at Bokhira (Porbandar) on Saurashtra Coast', in *Man and Environment*, XXXI (1), 2006, 33-9.
- Gaur A. S., Sundaresh, G.S. Abhayan, P. P. Joglekar, 'Excavation at Kanjetar and Kaj on the Saurashtra Coast, Gujarat', in *Man and Environment*, XXXVI (2), pp 51-57, Indian Society for Prehistoric and Quaternary Studies.
- Gaur, A. S., Sundresh and Sila Tripathi, 'Ancient Anchorage Systems in India with Reference to the Gujarat Coast', in Varadarajan, Lotika, ed., *Gujarat and the Sea*, Darshak Itihas Nidhi, Vadodara, 2011, pp.89-106.
- Gupta, S. K., 'Holocene Silting in the Little Rann of Kutch', in D. P. Agrawal and B. M. Pande, eds., *Ecology and Archaeology of Western India*, Concept Publishers, Delhi, 1977, pp. 200-5.
- Indian Archaeology – A Review (IAR)*, 1955-6:7; 1957-8:15; 1977-8:21; 1978-9:67-8; 1980-1:14 ; 1983-4:18-19; 1986-7:29; 1987-8:14-15; 1988-9:10; 1989-0:15-21; 1990-1:10-12; 1991-2:26-35; 1992-3:27-31; 1995-6:16-22; 1996-7:11-19; 1997-8: 19-22; 1998-9:6-7; 1999-2000:22-30, Archaeological Survey of India, New Delhi.
- Hegde, K.T.M., V. H. Sonwane, D.R.Shah, K.K. Bhan, P. Ajithprasad, K. Krishnan and S. Pratapchandran, 1988, 'Excavation at Nagwada 1986-1987: A Preliminary Report', in *Man and Environment*, XII, 55-65.
- Hegde, K.T.M., K.K. Bhan, V. H. Sonwane, K. Krishnan, and D.R.Shah, 1990, 'Excavation at Nageshwar, Gujarat: A Harappan Shell Working Site on the Gulf of Kutch', in Maharaja Sayajirao University Archaeology Series (18), Vadodara.
- Joshi, Jagat Pati, 'Exploration in Kachchh and Excavation at Surkotada and New Light on Harappan Migration', in *Journal of the Oriental Institute*, MSU Baroda 22, 1972, 98-144.
- , 1990, 'Excavation at Surkotada and Exploration in Kutch', in *Memoirs of the Archaeological Survey of India*, No.87.
- Lancelotti, Carla and Marco Madella, 'Preliminary anthracological analysis from Harappan Kanmer: Human-environment interactions as seen through fuel resources exploitation and use' in Osada, Toshiki and Akinori Uesugi eds., *Linguistics, Archaeology and the Human Past*, Occasional Paper 10, Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan, 2011, pp.129-42.
- Maekawa, Kazuya and Wakaha Mori, 'Dilmun, Magan, and Meluhha in Early Mesopotamian History: 2500-1600 BC', in Osada, Tosiki and Michael Witzel eds., *Cultural Relations between the Indus and the Iranian Plateau during the*

- Third Millennium BCE*, Harvard Oriental Series, Opera Minora, Vol.7, Cambridge, 2011, pp.245-69.
- Kenoyer, J. M., 'Ancient cities of The Indus Valley Civilization', in *American Institute of Pakistan Studies*, Oxford University Press, Karachi, 1998.
- Khadkikar, A.S., N. Basavaiah, T.K. Gundurao and C. Rajshekhar, 'Palaeoenvironments around the Harappan Port of Lothal, Gujarat, Western India', in *Journal of Indian Geophysical Union*, Vol.8, No.1, 2004, 49-53.
- Kharakwal, J.S., Y.S. Rawat and T. Osada, 'Annual report of the excavation at Kanmer 2007-08 and 2008-09' in Osada, Toshiki and Akinori Uesugi, eds., *Linguistics, Archaeology and the Human Past*, Occasional Paper 10, Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan, 2011 pp. 71-104.
- , eds., 'Excavation at Kanmer 205-06 – 2008-09', in *Indus Project*, Research Institute for Humanity and Nature, Kyoto, Japan, 2012.
- Kumaran, R.N., *Ports and Pots in Gujarat*, Manoo Pathippakam, Thanjavur, 2009.
- Lal, B. B., 'The chronological Horizon of the Mature Indus Civilization', in Kenoyer, Jonathan Mark, (ed.), *From Sumer to Meluhha: Contribution to the Archaeology of South and West Asia in Memory of George F. Dales, Jr.*, Wiscosin Archaeological Reports, Vol. 3, 1994, 15-25, 1994.
- , *The Earliest civilization of South Asia*, Aryan Books International, New Delhi, 1997, pp. 181-2.
- Leshnik, Lawrence S., 1968, 'The Harappan 'Port' at Lothal: Another View', *American Anthropologist*, 70, 911-22.
- Mackay, E. J. H., *Further Excavations at Mohenjodaro*, Government of India Press, New Delhi, 1938, p. 5 and 647.
- Kenoyer, Jonathan Mark, 'From Sumer to Dales, Jr', Wiscosin Archaeological Reports, vol 3: xx 1994.
- Mughal, M. Rafique, 'The Geographical Extent of the Indus Civilization during the Early, Mature and Late Harappan Times', in Possehl, G. ed., *South Asian Archaeology Studies*, New Delhi, Oxford & IBH Publishing Co., 1992, 123-43.
- Pandya, Suman, 1977, 'Lothal Dockyard hypothesis and Sea Level changes', in D.P. Agrawal and B.M. Pande, eds., *Ecology and Archaeology of Western India*, Delhi, pp. 99-103.
- Possehl, G.L. and K.A.R. Kennedy, 'Hunter-gatherer/agriculturalist exchange in prehistory: an Indian example', in *Current Anthropology*, 20(3), 1979, 592-3.
- Pramanik, S., *Excavation at Junikuran 2003-04: A Preliminary Report*, Puratattva (34), 2004, 45-67.
- Rao, S.R., 'Excavation at Rangpur and other Explorations in Gujarat, in *Ancient India*, 1963, 18 & 19, 183-4 and 207.
- , 'Shipping and Maritime Trade of the Indus People', in *Expedition*, 7 (3), 1965, 30-37.
- , 'Lothal: A Harappan Port Town, 1955-62', in *Memoirs of the Archaeological Survey of India*, No.78, Vol. I, 1979.
- , 'Lothal: A Harappan Port Town, (1955-62)', in *Memoirs of the Archaeological Survey of India*, No.78, Vol. II, 1985.

- , *Dawn and Devolution of the Indus Civilization*, Aditya Prakashan, New Delhi, 1991, p. 153.
- Rao, L.S., 'Harappan Ports in India', in Nayak, B. U. and Joshi, N. C. (eds.), *New Trends in Indian Art and Archaeology*, Delhi, 1992, pp. 89-100.
- Ratnagar, Shereen, *Encounters: The Westerly Trade of the Harappan Civilization*, New Delhi, Oxford Univ. Press, p.231.
- Shah, U. P., 'Lothal – a Port?' in *Journal of the Oriental Institute*, V, 9, 1960.
- Shinde, V., 'Excavations at Padri – 1990-91: A Preliminary Report', in *Man and Environment*, Vol. XVII (1), 1992, 79-86.
- Sonawane, V. H., et al., 'Excavation at Bagasara – 1996-2003: A Preliminary Report', in *Man and Environment*, Vol. XXVIII (2), 2003, 21-50.
- Srivastava, K. M., *Madinat Hamad Burial Mounds – 1984-85*, Bahrain National Museum, 1991.
- Tripathi, Alok, 'Harappan Ships and Maritime Spheres', Varadarajan, Lotika, ed., *Gujarat and the Sea*, Darshak Itihas Nidhi, 2011, pp. 265-280.