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Beyond the Fortified Town: Preliminary Insights on Land Use and Occupation Strategies at Banbhore (Sindh, Pakistan)

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The site of Banbhore is located in the western delta of the Indus river (Sindh, Pakistan), identified as the harbor town of Daybul mentioned in pre-Islamic and Early Islamic written sources. The archaeological activities conducted here since the beginning of the past century revealed a long and uninterrupted occupation and complex urban planning (1st century BCE-early 13th century CE). A systematic field survey was carried out for the first time around Banbhore within the Italian-Pakistani archaeological expedition. Investigation revealed the presence of a densely settled hinterland, with a clear strategy in land use and occupation. Surface artefacts suggest a very long period of frequentation, from at least the Sasanian period to the Modern era. Results find an interesting comparison with both the information available in written texts and the materials from the excavation of the fortified town.

Keywords: Banbhore; Sindh; archaeological survey; bridge; land use

Introduction

Located in the western delta of the Indus River, Banbhore is one of the largest archaeological sites of Sindh (Figure 1).¹

Research on site was carried out intermittently since the beginning of the past century until the systematic investigations directed by the Pakistani archaeologist F.

A. Khan.² Since 1958 and for eight seasons, his work inside the massive 14-ha fortified town provided evidence of a long occupation history (1st BCE-early 13th century CE) and well-defined urban planning. Excavations conducted inside the fortification unearthed a palatial complex, a mosque and the adjacent madrasa, a Hindu temple, several houses, wells and manufacturing areas. Outside the fortifications, the so-called “industrial area”, which comprises a wide expanse of earthenware containers,³ and an outer town equipped with wells, developed to the West and to the South of an artificial freshwater lake respectively. As a conclusion, Khan⁴ “firmly established the identification of the site with Debal”,⁵ also known as Daybul in Arabic and Debol in Persian,⁶ which was a harbour town and market largely attested in Islamic literary sources as the major outlet to the sea of the Abbasid province of Sindh and its capital al-Manşūrah.⁷

Though the origin of the site goes much further back in time, the city flourished in the Islamic period under the direct control of the Abbasids, in connection with a period of political stability, especially under Hārūn al-Rashīd (786–809) and the Caliphal Governors. Despite their peripheral location within the caliphate, Sindh and the Indus deltaic region, in fact, represented one of the most fruitful sources of revenues and incomes for the caliphate, with Manşūrah and Daybul being the core of affairs, as well as renowned centres of religious learning, sciences, arts and literature. Later, in the 9th-early 11th centuries, with the disruption of the Great Sindh Province, Sindh experienced a period of progress and political and economic growth under the rule of the Habbarid Emirs, characterised by great commercial activity, lively external relations and firmly established long-distance land and sea trade links.⁸ After the decline of the Habbarids, Lower Sindh, though now *de facto* independent, was a less extensive area compared to the past and by the end of the 11th century the waning of Manşūrah and the interruption of Silk Road trade deprived Daybul of its hinterland and probably also caused the weakening of its economic role.⁹ After its sudden abandonment in the early 13th century, the causes of which are still a matter of discussion, Daybul was no longer the chief harbour of the region so that the correct identification of the toponyms Diu/Diul/ Diul Sind/Dobil/Deval appearing in later sources has been very much debated among scholars.¹⁰

Recently, the site was the subject of systematic research thanks to a French-Italian-Pakistani joint

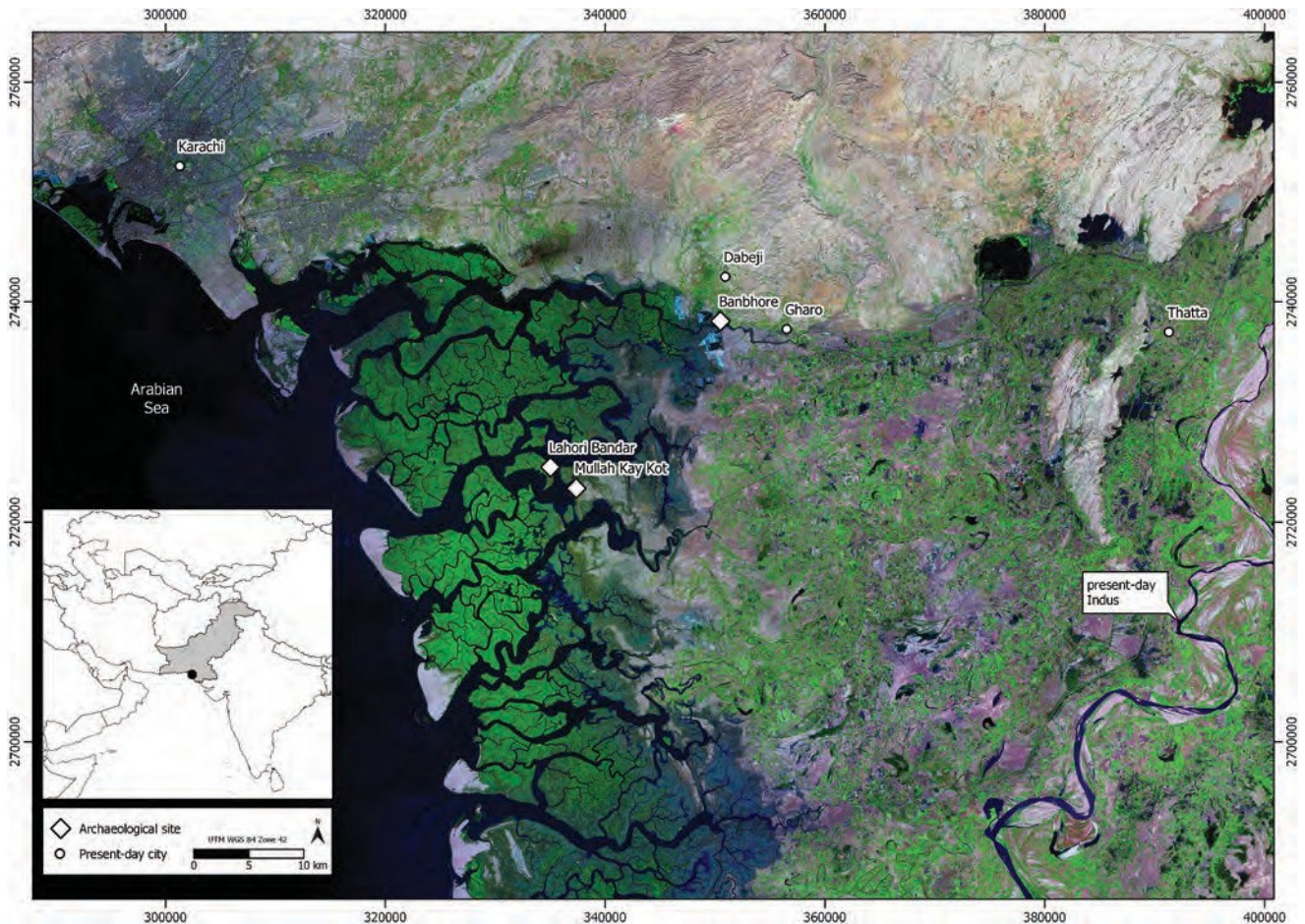


Figure 1. The western Indus delta with the main places mentioned in this article; 2001 Landsat ETM Plus Pan Sharpened Mosaic, ID MEN-42-20_UL_2000, courtesy U.S. Geological Survey, EROS Center (data processing: S. Mantellini).

expedition in 2011–2015.¹¹ Since 2017 the work is continued by an Italian-Pakistani team as a formal collaboration between the Università Cattolica del Sacro Cuore, Milano (Italy), and the Directorate General of Antiquities and Archaeology – Culture, Tourism, Antiquities & Archives Department, Government of Sindh – (Pakistan) under the sponsorship of the Italian Ministry for Foreign Affairs.¹² The main attention was addressed to the understanding of the urban development of the fortified town, with a special focus on the excavation of Trench 9, where three buildings shaped an important urban crossroad and where an intense ivory production is attested in the late occupation of the site (12th-early 13th centuries CE).¹³ A 10 × 10 m sounding (Trench 12) was also opened during the 2019 campaign in the so-called “industrial area” and the material was also used as a comparison in this study.

Despite the historical importance of Banbhore/Daybul, scholars have been always attracted by the walled town, and even F.A. Khan limited his *extra-moenia* research to a brief description of the outer city and an ancient graveyard located farther East.¹⁴ A preliminary, unpublished, investigation outside the fortified settlement was conducted also by M. Kervran in 2010–2012.¹⁵ An extensive field survey aimed at investigating the territory of Banbhore was therefore carried out in 2018 aimed at providing a first assessment of the anthropic evidence in the territory of Banbhore. Activities were therefore conceived as a first identification and positioning of the archaeological remains, and a preliminary selection of artefacts for a first chronological evaluation. More in-depth research, such as the accurate topographical documentation of the site with UAV-based photogrammetry and GPS, the systematic collection of ceramic sherds, and quantitative analysis have been postponed to a second phase.

This paper presents the results of this research and the first interpretation in relation to both the

information available in the written sources and data from the excavation inside the town. Some further comparisons include the materials collected in the nearby sites of Lahori Bandar and Mullah Kay Kot.

Landscape

The territory of Banbhore is characterised by typical low vegetation with sparse acacia trees, bushes, and mangroves along the Gharo creek and its minor incisions that run right East and West of the fortified town (Figure 2). A similar picture appears in Islamic written sources, describing the landscape of Daybul as an open plain with a spontaneous growth of only a few plants, as sesame and palm trees.¹⁶

An outcropping limestone bedrock, having a characteristic white to yellow color, is visible where vegetation is absent. The monotonous flat landscape is interrupted by the ruins of Banbhore fortification and, to the West, by a system of consolidated dunes with a South-North and Southeast-Northwest orientation. The KDA Naali water pipeline constructed in the early 60s interrupted the course of intermittent surface run-offs that descended from the North and once drained into the Gharo creek and the artificial lake. Except for the large village named after its founder

M. Hashim Mandhro located North-West of Banbhore, human settlement is characterised by clusters of small huts dispersed in the territory. A network of small rough paths among acacias connects the villages together and with the Gharo creek. The local economy is based on the salt factory, buffalo breeding, and horticulture and fishing in the creek to a lesser extent. Traditional works include coal production in typical charcoal kilns, some of them also located along the road approaching the site of Banbhore from Dabeji village, and handmade pottery.

Research Area

The research area covers ca 115 ha (1.15 km²) enclosed by the Gharo creek to the South, the salt



Figure 2. The landscape of Banbhore, with buffaloes breeding near the modern abandoned bridge (Wpt-37), the lake, and the fortified town and the Gharo creek in the background; 2020 drone picture, from North (operator: A. Tilia).

factories to the West, the asphalt road to the North, while East the investigation stopped in proximity to the villages (Figure 3).¹⁷ Sub-areas were then identified according to the following ecological and geographical features:

- (1) Area 1 (30 ha): encompassed by the water stream (East), the Gharo creek (South), the salt factory (West), and the southern edge of the sand dune (North);
- (2) Area 2 (38 ha): encompassed by the natural run-off draining into the lake (East), the fortification (South), the water stream (West), and the asphalt road (North). In its southeastern part, it corresponds to the so-called "industrial area" already partially investigated by Khan;¹⁸
- (3) Area 3 (9 ha): encompassed by the natural run-offs (East and West) – the former draining into the Gharo creek, the latter draining into the lake – the lake (South-West), and the asphalt road (North);
- (4) Area 4 (6.5 ha): encompassed by the natural run-off draining into the Gharo creek (West), the Gharo creek itself (South), the S-N sand dune foot (East), and the asphalt road (North);
- (5) Area 5 (8 ha): encompassed by the SE-NW sand dune (South) and the asphalt road (North);
- (6) Area 6 (9 ha): corresponding to the S-N sand dune;
- (7) Area 7 (5.5 ha): at the foot of both sand dunes;
- (8) Area 8 (7 ha): corresponding to the SE-NW sand dune.

The territory under investigation falls almost entirely inside the archaeological area of Banbhore under the legislation of the Sindh Government (Areas 1–3, 77 ha), and partially within the SZABIST University lands (Areas 4–8, 36 ha). Outside the research area, investigation was limited to a few evidence (BBS-23, Wpt-70) identified on the satellite image and two modern bridges (Wpt-84 and Wpt-85) near the Gharo village useful as an ethnographic comparison.

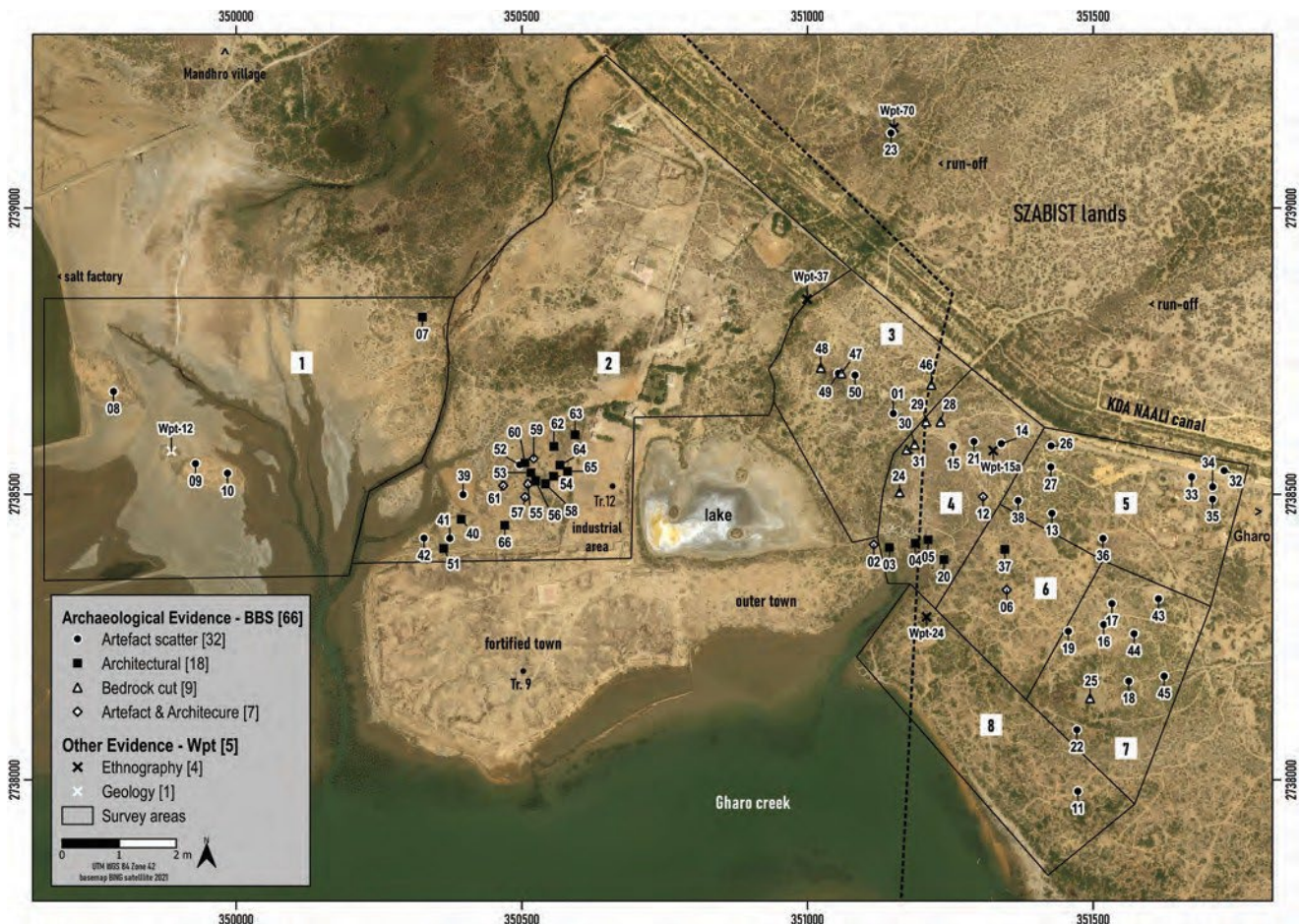


Figure 3. The survey of Banbhore: research area and main evidence classified by type; 2022 Bing satellite image (data processing: S. Mantellini).

The possibility to carry out a preliminary survey also in the small fortified sites of Lahori Bandar in January 2018 and Mullah Kay Kot in December 2018, both located inside the delta ca. 20 km South of Banbhore (see [Figure 1](#)), allowed the collection of some artefacts useful for the comparison with the ceramic material from the survey around Banbhore.

Fieldwork

The archaeological landscape of Banbhore is basically made of flat sites, while settlements on mounds are often associated with natural consolidated sand dunes or architectural remains. Observations on satellite imagery were therefore limited to the identification of the most pronounced mounds and some hydrographic evidence. Recent BING and GOOGLE satellite images were used as base map during fieldwork, while historical CORONA datasets (ID DS1025-2119DA058a, 13 October 1965) gave important hints in the general interpretation of the ancient settlement pattern.

After a first exploration in January 2018, a systematic field-walking was carried out between the end of November and mid-December of the same year, partially integrated in December 2021. Survey was based on an intensive field-walking over the entire research area, involving an average team of three archaeologists and three workers placed at a regular interval of 3–5 metres according to the topography of the terrain. This distance made possible the identification of any archaeological remains in the investigated territory, except for those buried by dense vegetation. Many ceramics were found scattered along dirt paths obtained by cutting off shrubs and bushes, so it is arguable that the identification of further anthropic remains in this area is prevented by the dense vegetation. At the moment, the material collection included only a selection of diagnostic ceramic sherds made directly on the field and the most significant artefacts (coins, metal and glass objects, etc.). Evidence was recorded by means of a handheld GPS and an Android smartphone, the latter also used to acquire geotagged pictures. A field code (*Wpt-*, waypoint) followed by a progressive number was assigned to each feature located on the field, including geological samples or ethnographic points of interest. During the data processing, the code *BBS* (Banbhore survey) followed by a progressive number has been assigned to the archaeological sites only. Photographic documentation was done by a digital camera, in some cases mounted

over a rod, and a drone. Pottery and other findings, when available, were collected and then drawn and photographed for a thorough classification and analysis. A specific task concerned the cleaning of the stone structures interpreted as an ancient bridge (BBSs- 02-05).

The survey resulted in 90 waypoints, 85 of which considered in the present work and classified into three major classes according to their nature: archaeology (66), geology (13), ethnography (6). Each waypoint was further classified in terms of type, function, morphology and location ([Table 1](#), see [Figure 3](#)).

Archaeological Evidence

Archaeological evidence is largely represented by artefact scatters (32), architectural elements (18), a combination of artefacts and architecture (7), and artificial cuts in the natural outcropping bedrock (9). They have been grouped together according to their spatial proximity and their functional relationship as described below.

Area 1. All the four archaeological sites are located on natural small sand dunes and belong to different types: a graveyard (BBS-07) with a dozen of burials delimited by stones; a settlement (BBS-08), 0.85 ha in size, with several ceramic sherds on the surface that was partially damaged by the modern salt factory on its western side; two mounds (BBS-09 West, BBS-10 East), ca 2 m high and covering an area of 0.45 ha, characterised by many fragments of fired bricks, some of which were overfired and badly fired, and ceramic slags, that suggest the presence of one or more kilns. The small dune to the West (Wpt-12) also looks connected with this productive area; nonetheless, there was no material around it.¹⁹

Area 2. The largest number of sites (20) has been identified in this area and they are all located just North of the fortified town. Evidence includes a low mound (BBS-39), 0.35 ha and 1 m high, which provided a large amount of artefacts, such as pottery, glass, metal, and ten bronze/copper alloy coins.²⁰ A similar concentration and variety of materials over a smaller area was found also in the two small low mounds (BBS-41) and the flat area (BBS-42) to the South. Numerous architectural remains have been identified over the whole area. They refer to stone alignments, likely walls, rising for a few centimetres on the ground and largely covered by sand, with abundant archaeological materials scattered among them (BBS-40, BBSs-51-66).

Area 3. It mainly consists of three small artefact scatters (BBS-01, BBS-49, BBS-50) and three cuts in the natural bedrock (BBSs-46-48). One site (BBS-01) deserves a special mention due to the presence of many ceramic slags indicating a possible kiln.

Area 4. Archaeological elements (14) from Area 4 include different types of evidence.²¹ The most relevant one consists of a series of stone structures (BBSs-02-05) with an East-West orientation just outside the eastern outer town where the natural run-off drains into the Gharo creek. Their location and architectural features suggest that they formed an ancient bridge²² (see detail below). Another structure having a hydraulic function is a small shallow well (BBS-20), 1 m in diameter, with water inside, located 50 m SE of the bridge. Remains of human settlements come from a low mound (BBS-12), about 1 ha and 1.5 m high, which provided a concentration of pottery sherds and remains of three stone walls (Figure 4), and from two dispersions of artefacts (BBSs-15, 21) ca. 100 m Northeast of BBS-12. In the north-eastern corner of Area 4 there is a large funerary area with small stone cairns belonging to individual burials. Only the northern side of the graveyard (BBS-14) is ancient, with stones collapsed on the ground and many ceramic sherds scattered around. Other evidence includes five quarries (BBS-24, BBSs- 28-31), in the form of bedrock cuts on the left of the natural run-off at West.

Area 5. All the archaeological evidence (nine) in Area 5 refers to artefact scatters. Four of them are material dispersions in a primary context. Three are located at the northern foot of the sand dune (BBSs-13, 36, 38), while the fourth (BBS-27) was discovered

near a shallow pit along a track. On the contrary, five sherds concentrations were found either flat (BBS-32 top of the canal's levee, BBS-33 and BBS-34 beside the road) or as a low mound (BBSs-26, 35). They are all dumps in a secondary context due to recent anthropic activities, such as the construction of the asphalt road and the canal. BBS-26 and BBS-35 are especially remarkable for the huge amount of pottery (Figure 5).

Area 6. The top of the dune in Area 6 is dominated by a settlement (BBS-06) that provided many ceramic sherds, as well as architectural remains of a stone wall and stones arranged with a circular shape likely belonging to a well. On the northwest corner and slope of the dune is a large burial ground (BBS-37) formed by both individual and double tombs delimited by stones (Figure 6). Rectangular shape prevails with a few ovoid ones, and some rectangular slabs still in situ suggest that some burials had a small platform at their base. As already seen in the ancient graveyard BBS-14 in Area 4, the entire area is scattered by small- and medium-sized limestone stones and pottery.

Area 7. It is characterised by eight flat sites. Three of them (BBSs-17, 43, 45) can be interpreted as settlement according to the extension of ceramic scattering. Four others (BBSs-16, 18, 19, 44) had fewer sherds and they might refer to marginal occupation, possibly connected with the major concentration in the nearby BBS-17 (BBSs-16, 19, 44) and BBS-45 (BBS-18). A material dispersion (BBS-22) at the foot of the SE-NW dune was instead an isolated artefact scatter. In the open area between BBS-18 and BBS-22 there is a bedrock cut (BBS-25).



Figure 4. The settlement BBS-12; 2018 aerial picture, from SE (operator: A. Tilia).



Figure 5. The dump BBS-35; 2018 picture from NW, archaeologist standing as scale (S. Mantellini).



Figure 6. Stone burials in the graveyard BBS-37; 2018 aerial picture, from South (operator: A. Tilia).

Area 8. The top of the SE-NW dune gave only a small dispersion of few pottery sherds (BBS-11).

Geological and Ethnographic Evidence

Some geological and ethnographic features acquired during the fieldwork were also used for a general interpretation of the ancient settlement and land use patterns.

Except for a small sand dune (Wpt-12) potentially of archaeological interest (see Area 1 above), 11 points refer to natural outcropping bedrock without evidence of quarrying. They are located in the flat plain in the northern part of the investigated area, especially inside and along water streams and natural run-offs, and near the asphalt road.

A modern graveyard (Wpt-15a) in Area 4, having well-preserved burials, is part of the same large necropolis including the ancient cemetery BBS-14. Burials consist of masses of unworked stones grouped together in a roughly rectangular shape. Its modern chronology has been attested by local people. Another graveyard (Wpt-24) is located on the top at northern edge of the SE-NW sand dune. Eight very well-preserved burials made of local squared limestone blocks are presently venerated by local people. Except for modern pots left near the tombs, the chronology of this sacred place is unknown.

An abandoned 15 m long double-arched bridge (Wpt-37, between Areas 2 and 3) along the ancient road connecting the village of Gharo to the salt factory is located on the water stream flowing into the lake of

Banbhore. The information obtained from local people that it was in use already in the early 19th century seems to be confirmed by a plaster fragment bearing the inscription “18[. .]” found at its foot. Its abandonment occurred in the mid-60s when the modern asphalt road and the KDA Naali canal were built. Outside the area of investigation, an arc-shaped feature (Wpt-70) was detected on the 1965 CORONA satellite image. The field inspection discovered an earthen barrage, used to retain water and irrigate the surrounding fields. According to the people living in the neighboring villages, it was constructed in the early ‘60s of the past century. Today it is highly damaged and no longer functioning. Some ceramic sherds found around it (BBS-23) range from the middle-late Islamic period to the modern era, thus partially confirming the information given by local villagers. Another 30 m long double-arched bridge (Wpt-84) located on a stream outside the village of Gharo was reported to our team at the end of the 2020 season. According to local people, it was located on the same old road of the bridge Wpt-37 near Banbhore, and their construction period and abandonment should also correspond.

Cleaning of the Ancient Bridge (BBSs-02-05)

A cleaning from bushes and vegetation has been done at the BBSs-02-05, the former being the eastern limit of the outer town, aimed at exposing better the layout and building technique of the stone structure and to validate the hypothesis of a bridge. Works were carried out in the first week of December 2018 and involved an average of eight local workers each day. The removal of vegetation was done by using small traditional axes and sickles, being careful to leave roots in place.

Main results can be summarised as follows:

- (i) The structure has almost entirely collapsed, with the stones scattered on the ground surface or reused elsewhere. Where preserved, the building technique employed shows a combination of stepped walls, especially preserved on the northern side of BBS-05, and rubble masonry. Either squared or unworked large stones of local limestone were used for the outer border, while small and medium stones filled the space in between main walls. The lower course of the stone pillars is well preserved at the north-western foot of BBS-02, where two large squared stones were found still arranged directly on the natural bedrock.
- (ii) The cleaning confirmed the presence of many ceramics from the side structures BBS-02

West and BBS-05 East, while BBS-03 gave less pottery and BBS-04 no sherds at all. Material was recovered especially at the top of the mounds and on its northern slopes, mixed with the debris of the collapsed structure.

- (iii) The lowest course of worked stones in the northwestern corner of BBS-03 lies right on the bedrock. This indicated the lack of any underground foundation, and a minimal (basically absent) archaeological stratigraphy associated with this structure.
- (iv) Two very small mounds made of sand and stones, ca. 1 m in diameter and rising for 0.5 m or even less, were found between BBS-04 and BBS-05. They apparently have an anthropic origin but their function is unclear.

The size and architectural features exposed confirm that they belong to an ancient bridge connecting the town with its hinterland to the East (Figure 7). Interesting observations on this matter come from the ethnographic comparisons with the two modern bridges Wpt-37 and Wpt-84 (see Discussion below).

Pottery and other Findings

The abundance and the variety of findings collected during the survey are extremely remarkable; they belong to different classes, such as pottery, metal, glass, worked stones, etc. Ceramics are the most represented artefacts, whereas other finds are less attested and worse preserved. For this reason, at the moment only pottery has been subjected to classification and analysis, while the study of the rest of the finds is either in progress or scheduled in the near future. Nonetheless, the latter are mentioned herein to validate the interpretation or the chronological attribution of some sites. The brief description proposed for the ceramic assemblages of each area mainly focuses on the chronological markers for proposing reliable dating for the occupation of single sites or groups of sites.

Pottery: Comparative Analysis and Periodisation

The comparison with the assemblages from the investigations at Banbhore, Lahori Bandar, and Mullah Kay Kot made possible framing the pottery collected during the survey in a chronological range from the Pre-Islamic period (at least from the 2nd-3rd until the 7th-8th centuries CE) to the Modern Era (19th-early 20th



Figure 7. The ancient bridge after its cleaning; 2018 aerial picture, from West (operator: A. Tilia).

centuries). The majority of the pottery findings from the survey are attributed to the early Islamic period (8th-12th centuries). The most important chronological markers comprise ceramic imports from distant lands, such as unglazed fine buff eggshell jugs, Sasanian-Islamic monochrome turquoise glazed jars, and opaque white glazed wares coming from Iraqi and Iranian regions, splashed *sgraffiato* and hatched *sgraffiato* wares from Iran, and even two specimens of Dusun jars and a unique porcellaneous stoneware sherd from China.²³ The associated local unglazed productions are the red ware and the grey ware, labelled according to the color of the vessel ceramic body.²⁴ The amount of each ware recovered in the survey reflects the proportion observed in the stratigraphic excavations inside the walled town, being the red ware much more abundant than the grey ware.²⁵

Some vessels recovered during the survey of Banbhore are dated to the middle-late Islamic period on the basis of their close technological, morphological and stylistic resemblance with materials collected by Kervran²⁶ at Lahori Bandar (13th-14th to the 17th-18th centuries) and Mullah Kay Kot (16th-17th centuries). The most common unglazed types of this period circulating also in Banbhore include pots, also carinated, rare jars and bottles/jugs, large dishes and bowls, and a few convex lids. Many specimens are characterised by a red slip and/or black painted decoration (Figure 8(f-l)). A few glazed items with the same chronology have also been recognised, such as turquoise monochrome bowls and jugs/bottles, and several underglaze painted open vessels. Another typical object from Lahori Bandar and Mullah Kay Kot that is widely attested in the Banbhore surveyed

area is a handmade coarse terracotta ring (diameter about 40–45 cm), probably used to grind or clean the rice from the husk (Figure 9).

There were also recovered a very few examples of ceramics produced in the modern era (19th-20th centuries), consisting of refined white earthenware cups, either sponge-printed or more frequently underglaze hand-painted, imported from North-Western Europe.²⁷ On the basis of this preliminary analysis, it is possible to suggest the following periodisation for the sites discovered in the survey around Banbhore:

- (i) Pre-Islamic period (before early 8th century CE)²⁸
- (ii) Early Islamic period 1 (8th-10th centuries)²⁹
- (iii) Early Islamic period 2 (10th-11th centuries)
- (iv) Early Islamic period 3 (11th-12th/early 13th centuries)
- (v) Middle-Late Islamic period (14th-17th/18th centuries)
- (vi) Modern Era (19th-20th centuries)

Materials Analysis and Sites Chronology

Area 1. Ceramics from BBS-08 and BBS-09 mainly belong to the early Islamic period (8th-12th centuries), with evidence of a sporadic frequentation during the pre-Islamic period, at least since the Sasanian era. Differently, unglazed specimens from BBS-07 indicate a dating for the site to the middle-late Islamic period. In BBS-08, surely occupied at least until the 10th century, it is worth mentioning the presence of large imported jars, recognised as the so-called torpedo jars, circulating in the Indian Ocean both during the pre-Islamic and the very early Islamic period. These jars are characterised by large mouth and tapering pointed base; two such sherds found in BBS-08 show the remains of a black substance, possibly bitumen, covering the inner surface (Figure 10(c)). The pottery collected in BBS-09 and BBS-10 mostly belongs to the local unglazed ware, the forms identified are those typical of the late phase of occupation of the fortified town of Banbhore. Therefore, these ceramic assemblages suggest that the kilns identified in this area were mainly active in the 11th-12th century.

Area 2. The whole area is characterised by the abundance and variety of archaeological materials which comprise fragments of glass and bronze objects, glass and metal slags, 78 unreadable coins, and worked shells. This evidence possibly indicates on-spot artisanal activities. Ceramic vessels dated to the 9th-10th century are the best represented; important

chronological markers are four opaque white glazed vessels, including one small fragment of Abbasid monochrome lustre-painted earthenware from Iraq, but also four porcellaneous stoneware fragments, one Changsha bowl sherd, and two pieces of Dusun jars imported from China.

Area 3. BBS-01 is characterized by the presence of ceramic slags, testifying to another important manufacturing area associated with pottery or bricks. The ceramic material is varied and confirms a long and continuous occupation of this site. There are local unglazed red pots with splayed neck, one of them with white slip and black painting, possibly dated to the pre-Islamic or the very early Islamic period. Most of the ceramic findings date between the 8th and the 12th centuries, but there is also material, pots and jars, also red slipped and/or decorated (Figure 8(k)), lids/bowls and one convex lid, which can be attributed to the 14th-18th centuries. The two sherd scatters BBS-49 and BBS-50, although close to each other, can be attributed to two completely different and well-defined chronological periods. BBS-49 can be dated to the 9th-10th century, with one unglazed red pot with well-everted neck and black painted decoration that is possibly earlier (Sasanian period). On the contrary, unglazed productions of the middle-late Islamic period were found at BBS-50, especially two dishes with red burnished slip and black painting (Figure 8(h)), but there is also an underglaze black painted refined white earthenware cup related to the modern era.

Area 4. The pottery collected from the ancient graveyard BBS-14 mainly comprises items dated to the 14th-18th centuries.³⁰ The varied ceramic wares from BBS-15 point to an occupation throughout the whole Islamic period and up until very recent times. Remarkable findings are: a thick handle of a large unglazed buff jar imported from Iraqi or Iranian regions (8th-10th century); two glazed turquoise monochrome jugs/bottles with incised decoration of the same type found in BBS-14 and unglazed items (also one shallow bowl, Figure 8(g)) of the middle-late Islamic period (14th-18th centuries); modern glazed green-decorated refined white earthenware cups imported from Europe. Conversely, the ceramic assemblage from BBS-21 refers almost exclusively to a more limited chronological period (8th-10th centuries). It is especially worth mentioning an imported torpedo jar, possibly containing bitumen, from the Gulf regions. The ceramic material from BBS-12 indicates a significant early Islamic occupation (8th-12th centuries), with a better-attested phase mostly during the 8th-10th centuries: high- and medium-necked ovoid jars, probably water jars, of the local unglazed red ware; fragments of Sasanian-Islamic turquoise monochrome glazed jars; opaque white glazed vessels. The presence of middle-



Figure 8. Unglazed ovoid jars of the local red ware found during the survey, dated to the 9th-10th centuries: (a) BBS-35.01; (b) BBS-35.02; (c) BBS-17.01; (d) BBS-26.04; (e) BBS-26.03. Unglazed vessels of the red ware found during the survey, dated to the middle-late Islamic period: (f) BBS-06.01, (g) BBS-21.01, (h) BBS-50.01, (i) BBS-16.01, (j) BBSs-02/03.02, (k) BBS-01.04, (l) BBS-16.02 (Drawings and photos: A. Fusaro).

late Islamic productions, especially a terracotta grinder, suggests a later but limited frequentation.

Area 5. The ceramic assemblages from the dumps BBSs-26, 27, 32, 34, 35 along the modern asphalt road share similar features with that of BBS-12 in Area 4.

These sites provided homogeneous and almost identical material mainly dated to the 9th-10th centuries, especially unglazed red ovoid jars (Figures 8(a,b,d,e)). At least part of this area continued to be frequented until the 11th-12th centuries, as suggested by the pottery

from BBS-34. Further South, at the foot of the N-S dune, the ceramic material from BBSs-13, 36, and 38 in Area 5 has strong resemblance with the pottery assemblage from BBS-37, at the top of the same consolidated dune (see below).

Area 6. The pottery from BBS-06 also shows many common features with the material from the burial ground BBS-37. For the sites in areas 5 and 6 (BBSs-13, 36, 37, 38, 06), characterised by similar assemblages, a long period of occupation mainly between the 8th and the 17th-18th centuries is attested; a main attribution to the early Islamic period (9th-12th century) can be proposed for BBSs-06 and 37. This might be further evidence that the cemetery coeval to the fortified town was the one recognized as BBS-37 (see above Area 6). Among the ceramic productions from these assemblages that can be considered important chronological markers, there are: Sasanian-Islamic turquoise monochrome glazed jars confirming an occupation of this area since at least the 8th century; a fragment of Dusun jar (8th-10th century) imported from China from BBS-38; large shallow dishes with red slip and black painting (Figure 8(f)) and several handmade terracotta grinders (Figure 9(a)) of the middle-late Islamic period. The modern era is scarcely represented by a few glazed painted refined white earthenware cups from BBSs-13, 36, 37, and 38.

Area 7. The ceramic assemblages found in all the sites are homogeneous. With the only exception of a very few ceramic findings from BBS-17 belonging to the pre-Islamic period, including a small unglazed high flared ring base similar to those of the Indian red polished ware, the pottery from this area points to a long occupation throughout the Islamic period until the modern age. The very early Islamic period (8th-10th centuries) is mainly represented by: a fragment of Dusun jar (BBS-17); a fragment of torpedo jar with bitumen traces (BBS-16); local unglazed red ovoid jars (Figure 8(c)); an interesting local unglazed red pot with short square-section neck and rouletted triangles. Specimens of splashed *sgraffiato* and hatched *sgraffiato* wares, and local unglazed grey ware, especially pots with 8-shaped impressed or comb impressed motifs, testify to a 10th-12th centuries phase. Among the latest vessels dated to the time span 14th-18th centuries, some are worth mentioning: an unglazed red slipped bottle (Figures 8(i-1)); a turquoise monochrome basin/bowl with *sgraffiato* decoration³¹; a porcelain ring base covered with colorless glaze; several underglaze painted open vessels, such as one bowl painted in white over a dark red slip,³² one with buff fabric painted in blue over white slip,³³ one with a polychrome red-brown-white-green painting.³⁴ A handmade terracotta coarse grinder of the middle-late Islamic period has been found in BBS-44. The southernmost site of Area 7, BBS-22, at the foot of the SE-NW

consolidated dune, and BBS-11 just on the slope of this dune, in **Area 8**, have very similar ceramic assemblages exclusively attributed to the middle-late Islamic period. This chronology is confirmed especially by the finding in BBS-22 of a unique Chinese imported white earthenware bowl of the 17th-18th century, characterised by a circle reserved in the glaze covering the cavetto and an underglaze pale blue painting.³⁵

Materials from the Ancient Bridge (Area 4)

The study of the materials from the bridge (BBSs-03-05) did also include the easternmost portion of the outer town (BBS-02). The latter can be considered part of the same hydraulic structure from an architectural point of view; moreover, the pottery from BBS-02 interestingly gives a chronology identical to that of the ceramic assemblages from the bridge itself (from the pre-Islamic period until the 9th-10th centuries).

The pottery assemblages collected at BBS-02 and BBS-05 appear homogeneous, with a clear predominance of items dated to the 9th-10th century. There are also vessels, mostly collected in BBS-02, pointing to an earlier dating: a conical basin with slightly thickened rounded rim dated to the Sasanian period; a pot characterised by splayed neck; one very small fragment of closed vessel belonging to the fine red slip polished ware circulating from the 2nd century CE.

The most common imported items recovered at the bridge area come from Iraqi and Iranian regions and comprise unglazed fine eggshell jugs, Sasanian-Islamic monochrome turquoise glazed jars, and opaque white glazed wares, all circulating during the 8th-10th centuries (Figure 10(a)). A large jar with black slip and incised and carved decoration, imported from the Gulf area, was discovered at BBS-03 (Figure 10(b)). As for the local red ware, lids/bowls with inner carination and wide everted rim spread more during the 10th-11th centuries were also found in BBS-02. The chronology proposed above is confirmed by a limestone vessel with a dot-in-circle motif from BBS-02, which is very similar to a soft stone object found in Trench 8, SU 10 dated to the 10th-11th centuries (Felici et al. 2016: fig. 37).

The finding of two middle-late Islamic unglazed red pots South of the bridge, between BBS-02 and BBS-03, can be explained as secondary deposition due to the presence of the creek (Figure 8(j)). It is also worth mentioning the discovery in the same spot of two peculiar flat triangular-shaped stone objects, made from local limestone (Figure 11): the larger one, inv. no. BB.17-18.O.964, has a drop shape and weighs 900 gr.; the smaller one, inv. no. BB.17-18.O.965, is characterised by saw-toothed sides and weighs 300 gr.

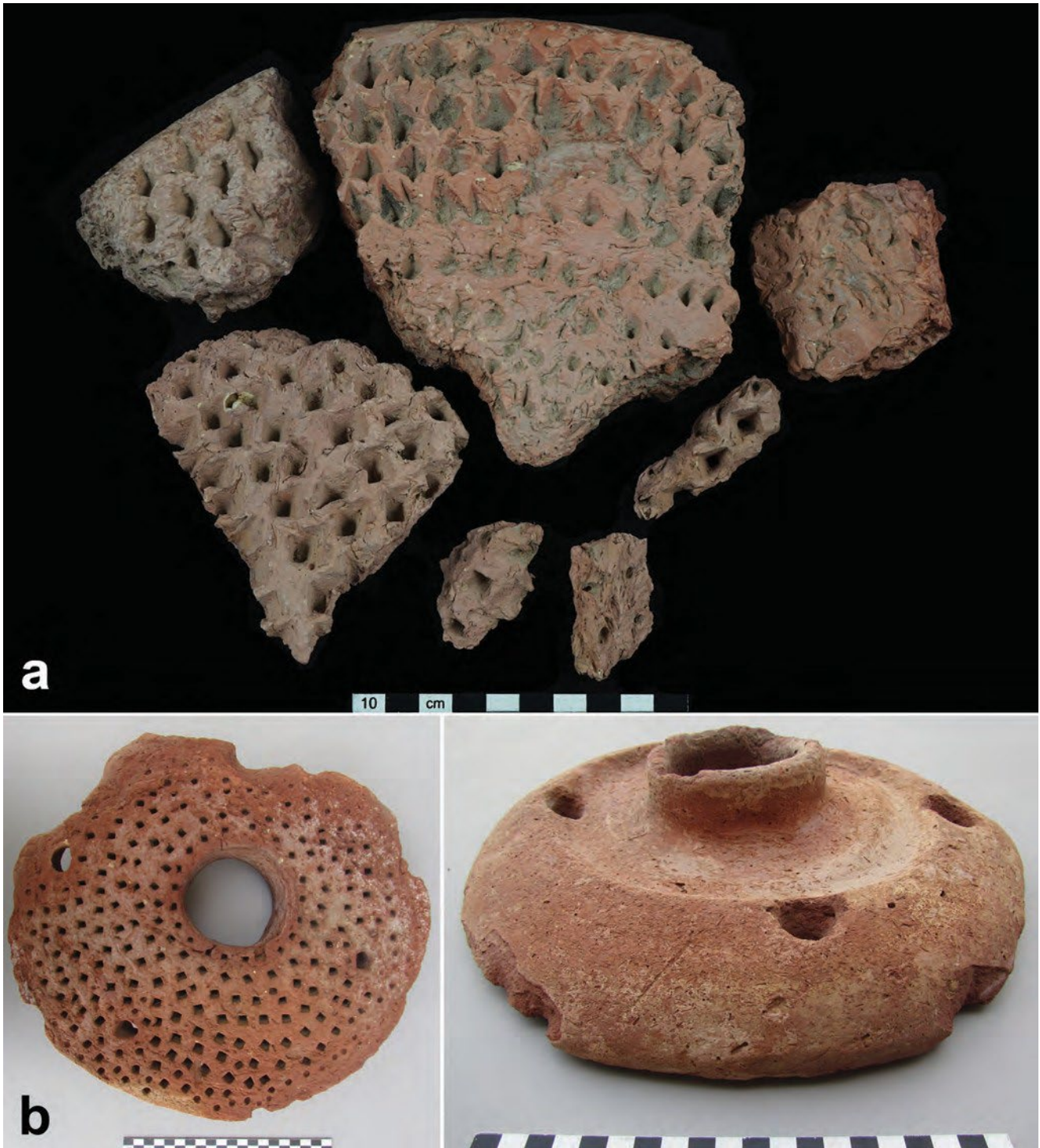


Figure 9. Terracotta grinders: (a) Inv. no. BB.17–18.O.1046 from BBS-13, Banbhore (Photo: D. Redamante); (b) Inv. no. LB.18.SS.36 from Lahori Bandar (Photo: A. Fusaro).

Discussion

The following discussion will analyse the results of the survey around Banbhore with the aim of better understanding

the relationships between the fortified town and its surroundings, with a specific attention to settlement strategies and land use. When possible, information from historical written sources was used to integrate archaeological data.



Figure 10. (a) Specimens of Sasanian-Islamic turquoise glazed jars, unglazed egg-shell jugs, and opaque white glazed vessels from BBS-05; (b) Fragment of an unglazed coarse jar with incised decoration and black slip from BBS-03; (c) Fragments of torpedo jars with traces of bitumen on the interior from BBS-08 (Photos: A. Fusaro).



Figure 11. Two worked stone objects from the area between BBS-02 and BBS-03: (a) Inv. no. BB.17–18.O.964; (b) Inv. no. BB.17–18.O.965 (Photos: D. Redamantie).

Habitation areas (HA) refer to any place where material culture and architecture suggest a prevailing living function. They are all located East of the fortified town and they are marked by: i) concentrations of pottery scattered over a large surface, sometimes associated with architectural evidence, which indicate a permanent and long-term occupation (settlement); ii) pottery dispersion without any architectural evidence, referring to a temporary or dispersed frequentation (off-site). Given their proximity to main settlements, off-sites were possibly connected with, or even part of, them. Five major settlements resulted at the end of the survey:

- (i) HA-1 includes BBS-06 in Area 6, with the main phase between the 9th and the 12th centuries. It covered the top of the S-N dune and includes a stone wall and a likely well for water supply, both discovered at the eastern edge of the site.
- (ii) HA-2 was located in the flat area West of the S-N dune in Area 7, and included the artefacts concentration BBS-17 and the material dispersions around it (BBSs-16, 19, 43, 44)

for a total area of ca 1.3 ha. The sherds scattered over a vast area and the homogeneous ceramic assemblages indicate the presence of a large anthropic area, with a significant occupation during the whole Islamic period and sporadic frequentation even in the modern era.

- (iii) HA-3 is also in Area 7, 70 m south of HA-2, and it is shaped by the pottery found along the track between BBS-18 and BBS-45 over a surface of 0.5 ha. Although HA-3 is smaller than the second settlement, the similar chronology of their ceramic assemblages, ranging from the Sasanian period to the modern era, suggests that they formed a unique large residential area extending for ca. 5 ha in the plain at the foot of both sand dunes. The off-sites BBS-11 in the mid-slope of the SE-NW dune and BBS-22 on the top of the same dune have been interpreted as dispersed settlements with a very limited extension (ca. 10 square metres) and chronology (late Islamic period).
- (iv) HA-4 refers to a systematic long-term occupation spot throughout the Islamic period,

from the 8th-10th to the 14th-18th centuries, located Northwest of the S-N dune. Evidence is clustered around the site BBS-12, which manual cleaning from vegetation revealed a large amount of pottery and three stone structures/walls (see Figure 4). This site is also remarkable because it is the only one in the depression between the two natural run-offs. The off-site BBS-38 (Area 5), 60 m East of it, shares the same ceramic assemblage, so it was possibly connected with it.

- (v) A fifth potential habitation area (HA-5) may be inferred by the large amount of ceramic material found along the asphalt road in the dumps BBSs-26, 32–35 and especially by the presence of one site (BBS-27) still in a primary context, and the homogeneous ceramic assemblages collected in these sites, which suggest an occupation coinciding with the early Islamic phase at the fortified town of Banbhore (8th-12th centuries). Between this area and the settlement on the top of the S-N dune, the materials from the two off-sites BBS-13 and BBS-36 are less comparable with those from the neighbouring sites, hence indicating a sporadic occasional occupation.

The discovery of this large settled area East of the fortified town fits well with the information given by the Arab geographer al-Muqaddasī in the 10th century, who mentions the presence of hundred villages/settlements (*qaryat*) surrounding the fortress of Daybul.³⁶ Although the real geographic extent considered by al-Muqaddasī is not clear, it is worth noting that in 11 sites so far recorded (BBSs-13, 16–20, 36, 37, 39, 43–45), including the large settled area East of the S-N dune, the most represented ceramic assemblage belongs to the 8th-10th century, i.e. the time of al-Muqaddasī's record. Two centuries later, the Muslim author al-Idrīsī (ca 1099–1165) reported that the dwellings were built of earth and wood,³⁷ matching the technique still used today for building the huts in the very small villages around Banbhore. If we consider continuity in the use of such traditional materials and techniques, this would explain the lack of significant architectural evidence and stone structures outside the walled town, except for the major settlements BBS-06 and BBS-12.

Funerary areas are also mainly attested East of Banbhore. The largest ancient graveyard (BBS-37) was located on the top of the S-N dune. It extends over 1 ha at least and its chronology started from the 9th-10th centuries, with a main phase until the 12th century, hence making it reasonable that many

inhabitants of Banbhore were buried there. A second graveyard (BBS-14), on the outcropping bedrock South of the asphalt road in Area 4, is smaller and yielded less material (mostly dated to the 14th-18th centuries), therefore suggesting a later chronology than BBS-37. West of Banbhore, there is only one small burial ground (BBS-07) also probably dating to the middle-late Islamic period (14th-18th centuries) and located on the top of a low and isolated sand dune. Ethnographic evidence from the modern graveyards Wpt-15a, next to the ancient one BBS-14, and Wpt-24 on the top of the SE-NW dune, are useful to confirm the persistence of funerary practices in contemporary local communities, such as the choice of raised location, the use of stones as building material, and the tradition to bring offerings and leave water pots. In this regard, it is difficult to establish a chronology for the graveyards of Wpt-24. Its location, on the westernmost edge of the dune looking to the fortified town of Banbhore, and the present veneration by local people claim for its antiquity. However, no archaeological material has been found there.

Hydraulic management. The wells discovered at some settlements (BBS-06, BBS-12) confirmed Khan's words on the importance of this solution in the water supply of the inhabitants of Banbhore.³⁸ One of the most important discoveries from the survey is the bridge (BBSs-02-05). Establishing the period of construction of the ancient bridge is a hard task. The pottery around and over the ruins of the stone pillars indicates a use of the structure and the area from the pre-Islamic era to the 9th-10th centuries. However, being this bridge the most important terrestrial connection of the fortified town to its hinterland, an earlier origin is more than plausible. Built at the point where the run-off drains into the Gharo creek, at the end of a funnel-shaped lowland subject to flooding, especially after the monsoon rainfalls, this structure was essential to link the fortified and the outer towns to their suburbs and hinterland, including the large settled areas and the graveyards to the East. An interesting observation comes from the present day. The rain that fell for a few hours in the night between the 9th and 10th of December 2018, at the time of our survey, was enough to transform this area into a muddy ground not accessible for a couple of days. The bridge also certainly allowed the passage when the water of the Gharo creek rose due to the high tide. The two modern bridges at Banbhore (Wpt-37) and Gharo (Wpt-84) are a good comparison to figure out the original architecture of the ancient bridge of Banbhore (Figure 12). The three bridges share a similar topographical situation, with water stagnating over the outcropping bedrock after rain or due to the run-off from upstream. The double-

arched structure made of local squared limestone blocks should also recall the same construction technique. The two stepped ends of the bridge Wpt-84 in Gharo, which served as a ramp to access the structure from the flat plain around it, recall those of the ancient bridge in Banbhore, especially the eastern end (BBS-05), as evident on the CORONA satellite image dated 1965. Two peculiarities of the ancient bridge of Banbhore are instead the stepped walls, still partially visible on the northern side, and the central pillar (BBS-03 and BBS-04) built between the two water incisions. Both solutions were possibly adopted to strengthen the structure. The marked incision in the bedrock between BBS-02 and BBS-03 looks like an anthropic operation made to facilitate the drainage of water into the creek to avoid failure to the structure.

In this regard, it must also be noted that the location chosen for the artificial lake, which drains one of the runoff streams from the North, may have served not only to provide the inhabitants of Banbhore with an almost permanent source of freshwater,³⁹ but also to prevent flooding and damage to the fortification and the outer town.

Land use and economic activities. An important matter concerns the identification of agricultural

practices and areas that had necessarily supported the basic food needs of the inhabitants of Banbhore. Historical sources mention a hard climate and low fertility of this land,⁴⁰ which probably made it necessary to integrate the local farming economy with other activities, such as breeding and fishing. Nonetheless, in the 10th century Ibn Hawqal (in Elliot)⁴¹ reports the significant cereal production of Daybul, which was still remarkable four centuries later if we can take into consideration the “great store of wheat and barley” (sic) described by Duarte Barbosa.⁴² The observation of recent and historical CORONA satellite imagery, and the field survey in the immediate vicinity of Banbhore did not reveal any anthropic evidence of agricultural activities or artificial canals, which are traditionally used in this region to irrigate cultivated fields.⁴³ It was initially suggested that the 9 ha delimited by the run-off East of the lake (Area 3 in the present survey) was exploited for farming. Indeed, the short rain in December 2018 evidenced how this area turns easily into a useless wet area due to the presence of a waterproofing clay above the natural bedrock.

On the contrary, the impressive growth of vegetation after rain and the shallow water puddles make this area suitable for cattle breeding. Buffalo is today



Figure 12. The ancient bridge: (a) inside the black box on the 1965 Corona satellite image (ID DS1025-2119DA058a, 13 October 1965, courtesy U.S. Geological Survey, EROS Center); (b) the stepped wall of BBS-05 with archaeologists standing as scale, 2018 picture from West (photo: S. Mantellini). The modern abandoned bridge of Banbhore, Wpt-37: (c) 2020 drone picture (operator: A. Tilia); (d) 2018 picture from NE (photo: S. Mantellini). The modern abandoned bridge in Gharo, Wpt-84: (e) 2021 drone picture from North (operator: A. Tilia); (f) 2021 drone picture from North (operator: A. Tilia).

a primary resource in the economy of many rural areas of Sindh and its historical importance in the area of Banbhore is largely attested since ancient times. In the earliest report available for Daybul for the Islamic period, the historian al-Balādhurī (9th century) makes a geographical digression on the territory of Daybul and mentions a spring called “the water of the buffaloes” where these animals took refuge from the insects of the river Mihrān (Indus).⁴⁴ According to historical sources, fishing was certainly another important economic activity for the inhabitants of Daybul, as also arguable from the thorough description of the very prosperous river aquatic fauna provided by the Arab geographer al-Dimashqī (1256–1327),⁴⁵ entailing that that the community could have counted on abundant fishes. In this regard, it is worth mentioning the account of Barbosa in the 16th century, recording long shores where people carried on fine fisheries (?) and took fish of great size, which they dried and that could be consumed upcountry or conveyed to many other lands.⁴⁶ Also in this case, although Banbhore/Daybul was certainly equipped with an important harbor, it is hard to find conclusive archaeological evidence. The harbor may have been located along the Gharo creek, possibly in the inlet approaching the ancient bridge and South-East of the walled town.⁴⁷ The two worked stone objects discovered South of the ancient bridge, between BBS-02 and BBS-03 (see Figure 11), were possibly associated with maritime/fluvial activities, but their function is still unclear. A first interpretation for the object BB.17–18.O.964 concerns a sounding stone for measuring water depth. This was an important instrument in coastal navigation, the Gharo creek in this case, for assessing the bathymetry of unfamiliar or very unstable waters affected by the tide.⁴⁸ Another possibility is balance weights for suspension scale,⁴⁹ (Figure 5), widely used in activities such as selling and unloading fish to the dock. Finally, the hypothesis of weights for fishing nets,⁵⁰ (Figure 8) is less probable due to their big size.

Artificial cuts into the natural bedrock have been recorded in several places.⁵¹ Their sharp and regular shape indicates an anthropic origin, although a chronology is impossible to establish.⁵² Stone quarries served for the extraction of the limestone blocks largely used as building material inside and outside the fortified town. Bedrock cuts, mostly attested within the run-off area, likely facilitated the water discharge into the creek during rainy seasons.

Craft areas refer to those sites characterised by concentrations of residues or wasters derived from craft activities, according to the classification theorised by Tosi.⁵³ They included workshops/manufacturing

areas, and possibly kilns, even if no structures were brought to light. If habitation areas were mostly located East of the bridge, production areas were found North and North-West of the walled town. Along with the so-called “industrial area” characterised by abundant large containers scattered just North of the fortified town and discovered by Khan, many other artisanal places were identified during the survey. The most important one is related to the production of fired bricks on the crest of two small dunes (BBS-09 and BBS-10) extending over 0.4 ha Northwest of the fortified town. According to pottery, this kiln was mainly active in the 11th-12th centuries. Another potential kiln (BBS-01), either for pottery or bricks, was the only significant site in Area 3 and its chronology covers all the Islamic periods. Just outside the fortification, on its northwestern side, Area 2 provided an impressive amount of materials, including slags, coins, and fragments of finished glass and metal items, as well as several remains of stone structures. The latter possibly refer to storehouses, workshops, and other facilities associated with artisanal activities, which form a unique craft quarter together with the “industrial area” already known outside the fortified settlement.

The discovery of many metal fragments and slags during the survey, combined with the large amount of the same materials found -inside secondary fillings- in the excavation of Trench 9/Building 1 in the fortified town,⁵⁴ indicates an important metal production activity somewhere in Banbhore. The 11th century Arab geographer Ibn Ḥawqal, for example, mentioned Daybul as a famous center in the manufacture of swords.⁵⁵ On this matter, it is also worth recalling the presence of iron deposits in the lower Indus Valley, near Banbhore and Thatta.⁵⁶ The ceramic findings collected in the surveyed sites BBSs-39, 41–42 suggest that this area was intensively occupied during the early Islamic period, especially in the 9th-10th centuries. A similar chronology has been proposed for the Trench 12, excavated by the Pakistani-Italian team in the 2019 season. Trench 12 and the earthenware containers found in the “industrial area” were first interpreted in connection with dyeing activities; this hypothesis finds some confirmation in two sources.⁵⁷ Reporting Ibn Ḥawqal, whose lifetime corresponds to the same period of the workshop mentioned above, the Syrian historian and geographer Abū'l-Fidā (late 13th-early 14th centuries) remarked on the regular production and export of typical textiles known as “Daybul fabric”.⁵⁸ According to Barbosa⁵⁹ and Nīmdihī (secretary of the *wizīr* of the *malik* of Hormuz), still in the 15th-16th century Daybul was famous for exporting clothes. The latter particularly writes about the merchandise of velvet, brocades and dyes such as indigo.⁶⁰

Trading activity. The presence of several imported ceramic items scattered in most of the surveyed areas, as well as those found in abundance inside the fortified settlement, testifies to the intense trading activity of Banbhore with the Iraqi and Iranian regions, Arabian Peninsula, Indian subcontinent, Central Asia, China, and the Far East.⁶¹ The great majority of the imported material collected during the survey is attributed to the early Islamic period. On this matter it is worth noting the presence in the westernmost site BBS-08 of many torpedo jars, typical storage and transport containers widely circulating in the Indian Ocean and the Gulf from the 2nd-3rd to the 9th-10th centuries. The importance of Daybul as the major harbor and big mercantile centre of ancient Sindh is stressed by all the sources considered here, which emphasize the huge amount of goods coming into Daybul and traded inland and via the sea. Most of its inhabitants were engaged in commerce and al-Idrīsī left an interesting description of their affairs, affirming that the inhabitants of Dibal, who were generally very rich, bought goods in bulk and traded in the whole country, placing funds at interest or at their convenience.⁶² The Muslim traveler Ibn al-Mujāwir confirms that the city was a popular harbor still in the early 13th century, the time he visited the city.⁶³ Just afterwards, Banbhore/Daybul possibly stopped functioning as the most important port of Sindh and the walled town was dramatically abandoned, as evidenced by the archaeological excavations in the fortified site.⁶⁴ After the 13th century, Banbhore was probably replaced by Lahori Bandar⁶⁵ as the chief harbor of the western lower Indus delta.⁶⁶

Conclusions

This investigation conducted around Banbhore gives a new perspective on the history of the site, its relationship with the surrounding environment and its socio-economic implications. Evidence so far collected refers to a clear and well-planned spatial organization and land use around the site since the pre-Islamic period, where residential and major funerary areas were located to the East, and manufacturing areas North and West of the fortified town of Banbhore. If, on one hand, the bridge was extremely important to link the fortified town and the outer town with its *extra-moenia* territory, on the other hand it marked a clear distinction between the urban space and suburbs (*rabad*). The space in between was exploited for other activities, certainly as a quarry for the extraction of limestone blocks and possibly for buffalo husbandry, as also witnessed today. Regardless of the type and function of the site identified during the survey around Banbhore, there was a general preference to settle on places safe from seasonal floods or waterlogging. Settlements and

productive areas are especially located in more or less elevated places, such as the top of the dune (12 sites) or where the outcropping bedrock was higher. The large settled area behind the consolidated sand dune, to the East of it, is an exception to this rule because it is outside the principal natural drainage systems.

The pottery assemblages from the survey allowed the identification of the chronology of each site surveyed and the analysis of each of them in relation to other evidence in this territory. It is remarkable that the bedrock in the surveyed area is very high and there is no complex stratigraphy, as also evidenced after the cleaning of the ancient bridge BBSs-02-05, so the pottery scattered on the surface can be highly indicative of the main occupation phase(s) of each site. The results of this survey find an appropriate comparison with the information available in the written sources, especially for the early Islamic period (9th-12th centuries). It is of course very difficult to establish the areal extent the historical sources refer to, as well as its identification on the present-day territory. However, the most important historical sources on Daybul date to the 10th-11th centuries, such as Ibn Ḥawqal's "Kitāb al-masālik wa al-mamālik" and al-Muqaddasī's "Aḥsan al-taqāsīm fī ma'rifat al-aqālīm", match very well with the chronology indicated by most ceramic materials (9th-11th centuries) collected during the survey. As already remarked, the 9th-11th centuries corresponded to the maximum apogee of Banbhore/Daybul during its Islamic stage.

Another relevant evidence arising from the survey is that the hinterland of Banbhore continued instead to be settled and exploited for a long time, even after the abandonment of the walled town at the end of the 12th-early 13th centuries. Indeed, ceramics of the middle-late Islamic period (14th-18th centuries) are abundantly attested in the surveyed area, particularly in the large settlement of Area 7. A minor quantity of materials dated to the same chronological range and even to the 19th-20th centuries indicates the sporadic presence of human communities in the whole surveyed area in later periods, possibly due to seasonal movements and occasional activities such as breeding and farming.

Although further results can be achieved by enlarging the area of investigation, as well as establishing a more precise typological attribution of the sites through a quantitative assessment of the pottery and stratigraphic excavation, this preliminary survey evidenced the richness of Banbhore/Daybul in anthropic evidence around the fortified town.

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NOTES

1. Simone Mantellini wrote §§ Landscape and Fieldwork; Agnese Fusaro wrote §§ Pottery and Other Findings; Federica Duva wrote §§ Cleaning of the Ancient Bridge and Materials from the Ancient Bridge; Zahida Quadri wrote § Introduction; the other paragraphs were written jointly.
2. Khan, F.A. 1958. 'Excavations at Bhambhore', *Annual Bibliography of Indian Archaeology* vol. XVI, 1948-1953: 50-52. Khan, F.A. 1964. 'Excavations at Banbhore', *Pakistan Archaeology* 1: 48-55. Khan, F.A. 1976. *Banbhore. A Preliminary Report on the Recent Archaeological Excavations at Banbhore* (Karachi: Department of Archaeology and Museum, Government of Pakistan, 1976).
3. Khan, *Banbhore*, pp. 22-24.
4. Khan, *Banbhore*, p. 52.
5. See also Mughal, M. R. 1992. 'Early Muslim Cities in Sindh and Patterns of International Trade', *Islamic Studies* 31(3): 267-286; V. Piacentini

Fiorani, *Beyond Ibn Hawqal's Bahr al-Fārs. 10th-13th Centuries AD: Sindh and the Kij-u-Makran Region, Hinge of An International Network of Religious, Political, Institutional and Economic Affairs*, BAR International Series n. 2651 (Oxford: Archaeopress, 2014), p. 35ff; V. Piacentini Fiorani, 'The Site of Banbhore on the Indus Delta: A Major Stage along the Silk Route of the Past Mansūrah and its Outlet to the Sea, Daybul (8th-10th Centuries CE)', *Sindh Antiquities*, 5.2 (2019), 17-45; N. Manassero and V. Piacentini Fiorani, 'The Site of Banbhore (Sindh - Pakistan): A Joint Pakistani-French-Italian Project. Current Research in Archaeology and History (2010-2014)', *The Silk Road* 12 (2014), 82-88; Piacentini Fiorani, *Beyond Ibn Hawqal's Bahr al-Fārs*, p. 84; A. C. Felici, A. Fusaro, A. Ibrahim, K. Lashari, N. Manassero, M. Piacentini, V. Piacentini Fiorani, and A. Tilia, 'Archaeological Excavations at Banbhore, Sindh. Preliminary Report of the Pakistani-Italian 2014 and 2015 Field Seasons', *Parthica*, 18 (2016), 125-173 (p. 125). doi:10.19272/201603501008.

6. The toponym already appears in pre-Islamic sources as Dib, Dyb, Deb, Depuhl/Debuhl (S. Q. Fatimi, 'The Twin Port or Daybul, A Study in the Early Maritime History of Sind', in *Sind through the Centuries: Proceedings of an International Seminar Held in Karachi in Spring 1975*, ed. by Hamida Khusro (Karachi: Oxford University Press, 1981), pp. 97-105; M. Tardieu, *Le Manichéisme* (Paris: Presses Universitaires de France, 1981); M. Tardieu, 'L'Arabie du nord-est d'après les documents manichéens', *Studia Iranica*, 23.1 (1994), 59-75.
7. Currently Brahmanabad, ca 70 km NE of Hyderabad.
8. V. Piacentini Fiorani, *Beyond Ibn Hawqal's Bahr al-Fārs*, pp. 35-70, 83-97.9. Piacentini Fiorani, *Beyond*; Piacentini Fiorani, 'The Site of Banbhore in The Indus Delta'.
9. Piacentini Fiorani, *Beyond Ibn Hawqal's Bahr al-Fārs*, pp. 99-144, 168-174.
10. Any mention of Daybul in later historical sources may therefore refer to other sites than Banbhore, such as Lahori Bandar identified with Diul (M. Kervran, 'Multiple Ports at the Mouth of the River Indus: Barbarike, Deb, Daybul, Lahori Bandar, Diul Sinde', in *Archaeology of Seafaring: The Indian Ocean in the Ancient Period*, ed. by Himanshu Prabha Ray (Delhi: Pragati Publications, 1999a), pp. 70-153; M. Kervran, 'Caravansérails du delta de l'Indus. Réflexions sur l'origine du caravansérail islamique', *Archéologie islamique* 8-9 (1999b), 143-176, if not even with the entire deltaic area

- (see also M. R. Haig, *The Indus Delta country. A Memoir Chiefly on Its Ancient Geography, History and Topography* (London: Trübner & co., 1887), p. 48, Note 68; Piacentini Fiorani, *Beyond Ibn Hawqal's Bahr al-Fārs*, pp.170–174.
11. Piacentini Fiorani, *Beyond Ibn Hawqal's Bahr al-Fārs*.
 12. An updated state-of-art on Banbhore and the scientific activities conducted on site have been recently published in a special issue of the [Sindh Antiquities Journal, Vol. 5 No. 2](#).
 13. Felici et al., 'Archaeological Excavations at Banbhore, Sindh'; A. C. Felici, A. Fusaro, A. Ibrahim, K. Lashari, N. Manassero, M. Piacentini, V. Piacentini Fiorani, and A. Tilia, 'Banbhore: Notes on the Pakistani-Italian Excavations and Research Work on a Major Trade Centre on the Indus' Delta', in *Proceedings of the 10th International Congress on the Archaeology of the Ancient Near East 25–29 April 2016, Vienna*, edited by Barbara Horejs, Christoph Schwall, Vera Müller, Marta Luciani, Markus Ritter, Mattia Guidetti, Roderick B. Salisbury, Felix Höflmayer, and Teresa Bürge – *Volume 2: Economy & Society*, ed. by Felix Höflmayer (Wiesbaden: Harrassowitz Verlag, 2018), pp. 315–328; A. C. Felici, A. Fusaro, A. Ibrahim, Kh. Lashari, N. Manassero, M. Piacentini, V. Piacentini Fiorani, and A. Tilia, 'Banbhore: Notes on the Pakistani- Italian Excavations and Research Work on a Major Trade Centre on the Indus' Delta', in *Religion, Society, Trade and Kingship: Archaeology and Art in South Asia and along the Silk Road 5500 BCE – 5th Century CE. Research Presented at the Twenty-third Conference of the European Association of South Asian Archaeology and Art, Cardiff, 2016*, ed. by Laxshmi Rose Greaves and Adam Hardy (New Delhi: Dev Publishers & Distributors, 2020), pp. 117–132; Affanni, G. 2019 "The Ivories of Banbhore: A Preliminary Paleo-technological Report" *Sindh Antiquities* 5(2): 104–108; S. Mantellini, 'Investigating the Core of the Urban Asset of the Site: Excavation of Trench 9', *Sindh Antiquities*, 5.2 (2019a), 70–87.
 14. Khan, *Banbhore*, pp. 7,22–24.15.
 15. V. Piacentini Fiorani, 'The Site of Banbhore on the Indus Delta'. The site of Banbhore was included in the survey of southern Sindh conducted by M. Sharif in 1972 (M. R. Mughal, 'Explorations in Southern Sind', *Pakistan Archaeology* 8 (1972), 133–137).
 16. Ibn Ḥawqal in H. M. Elliot, *The History of India, as Told by Its Own Historians. The Muhammadan Period*, vol. 1, ed. by J. Dowson (New York: Cambridge University Press, 2013), p. 37. Elliot translated a very rare manuscript, the *Ashkalūl-Bilād*, found in one of the Royal Libraries of Lucknow and dated 1193 which is an almost *verbatim* copy of Ibn Ḥawqal's work under a different name. Abū'l-Fidā, *Taqwīm al-buldān*. Translated by M. Reinaud, *Géographie de Abulfeda*, 2 vols (Paris: Imprimerie Nationale, 1848), 2.2, p. 111 [349]; al-Idrīsī, *Kitāb Rūgiār, Géographie d'Édrisi*, vol. 1, Translated by P.A. Jaubert (Paris: Imprimerie royale, 1836), p. 161 [41].
 17. Both the northern and eastern outer towns, only partially explored by Khan, *Banbhore*, pp.21–22, was the subject of a much more intensive survey and field collection, whose data and materials are still under study.
 18. Khan, *Banbhore*, pp. 22–24.
 19. The raised shape of BBSs-09-10 is possibly the result of debris and sediments after their abandonment; however, the small dune Wpt-12 nearby suggests the sites settled on a natural low relief.
 20. The large amount of material and the loosen fabric of the soil make reasonable the identification of this mound with the dump from Khan's excavation. However, this hypothesis cannot be easily validated as Khan's archaeological notes got lost.
 21. The site BBS-02, although being physically part of the outer eastern town, has been described here, due to its connection with the ancient bridge.
 22. S. Mantellini, 'Survey Report Around Banbhore', *Sindh Antiquities* 5.2 (2019b), 65–69 (p. 67).
 23. Felici et al., 'Archaeological Excavations at Banbhore, Sindh', pp. 164–167; Felici et al., 'Banbhore', p. 321.
 24. Felici et al., 'Archaeological Excavations at Banbhore, Sindh', pp. 163–164; Felici et al. 'Banbhore', pp. 124–129.
 25. A. Fusaro, 'Investigating the Core of the Urban Asset of the Site: Study of the Pottery from the 2017-2018 and 2019 Excavations', *Sindh Antiquities*, 5.2 (2019), 88–101 (pp. 93, 96).
 26. Kervran, 'Multiple Ports at the Mouth of the River Indus', pp. 88–89; M. Kervran, 'Caravansérails du delta de l'Indus. Réflexions sur l'origine du

- caravansérail islamique' *Archéologie islamique*, 8–9 (1999b), 143–176 (pp. 150–153).
27. R.A. Carter, *Ceramics of the Qatar National Museum. A Report and Catalogue. With a contribution by T. Sundblad* (Oxford Brookes Archaeology and Heritage (OBAH), 2011), p. 39, https://www.academia.edu/700174/Ceramics_of_the_Qatar_National_Museum; A. Grey, 'Late Trade Wares on Arabian Shores: 18th- to 20th-Century Imported Fineware Ceramics from Excavated Sites on the Southern Persian (Arabian) Gulf Coast', *Post-Medieval Archaeology*, 45.2 (2011), 350–373 (pp. 351–353); T. Power, 'A First Ceramic Chronology for the Late Islamic Arabian Gulf', *Journal of Islamic Archaeology*, 2.1 (2015), 1–33 (pp. 14–15).
 28. With the generic definition of Pre-Islamic period we refer to the phase preceding the conquest of Sindh by the Muslim Army and the Caliphate's new political-administrative organization of the conquered lands. Some ceramic findings have been attributed to this period thanks to their resemblance with pottery found in the deepest layers of the fortified town (Felici et al., 'Archaeological Excavations at Banbhore, Sindh', pp. 137–141, 155–160). A more precise chronological attribution for the pre-Islamic items is often difficult to be suggested due to their poor state of preservation.
 29. The division of the Early Islamic period into three sub-periods is specific for Banbhore and it has been done on the basis of the stratigraphy investigated and documented in Trenches 7, 8 and 9 inside the fortified town (Felici et al., 'Archaeological Excavations at Banbhore, Sindh').
 30. According to Piacentini Fiorani (personal communication), the chronological attribution of ceramics found in BBS-14 relates to the "pious frequentation" of this funerary area through the entire Islamic period: people visit tombs and leave objects as acts of devotion, such as stones, clothes, but also pottery.
 31. It recalls the so-called Persian Blue Speckled Ware (D. Kennet, *Sasanian and Islamic Pottery from Ras al-Khaimah: Classification, Chronology and Analysis of Trade in the Western Indian Ocean*, Society for Arabian Studies Monographs, 1 (Oxford: Archaeopress, 2004), pp. 53–54, 15th–16th centuries; S.M.N. Priestman, 'Settlement & Ceramics in Southern Iran: An Analysis of the Sasanian & Islamic periods in the Williamson collection' (MA thesis, Durham University, 2005), pp. 270–271, 14th–17th centuries). See also the findings at Manda (N. Chittick, *Manda: Excavations at an Island Port on the Kenya Coast*, British Institute in Eastern Africa Memoir, 9 (Nairobi: British Institute in Eastern Africa, Thames and Hudson, 1984), p. 81, pl. 35e) and Kilwa (Chittick, N. 1974. *Kilwa: An Islamic Trading City on the East African Coast*, British Institute in Eastern Africa Memoir Number 5. Nairobi: Thames & Hudson, p. 304, standard monochrome, mid-15th–16th century).
 32. For the polychromy and the slip-painting, it recalls the Red Yellow Ware, but especially the fabric and also partially the decorative technique are different; it could be an imitation of this production (Priestman, pp. 271–272, 17th–20th centuries; Power, pp. 1–33; [Figure 7](#)).
 33. Buff earthenware vessels characterized by an underglaze blue decoration on a white background are quite common in the Safavid period from the 15th–16th centuries (Priestman, p. 266; Kennet, p. 58, UNDERGL, 15th–16th centuries).
 34. It can be possibly recognised as the Late Splashed Glazed Ware (Priestman, p. 272, SPL. L, 17th–20th centuries).
 35. A good comparison for this item is the Chinese imports found in the uppermost layers of the "Husn" (castle) of the port al-Balid, southern Oman. Items with similar painting style have been found by A. Fusaro in SU 1, dated to the 17th–18th century; items with the characteristic circle reserved in the glaze have been also found at the sites of al-'Ain (Power, pp. 1–33) ([Figure 9](#), picture in the square on the low-left corner, 18th century) and Sharma (A. Rougeulle and B. Zhao, 'IV. Les reoccupations tardives', in *Sharma. Un entrepôt de commerce médiéval sur la côte du Ḥaḍramawt (Yémen, ca 980-1180)*, British Foundation for the Study of Arabia Monographs No. 17, ed. by A. Rougeulle (Oxford: Archaeopress, 2015), pp. 427–446 (p. 443), fig. 280/4, 19th century, see also fig. 280/5, 7, end of the 18th-beginning of the 19th century).
 36. al-Muqaddasī, *Aḥsan al-taqāsīm fī ma'rifat al-aqālīm*. Translated by B.A. Collins, *The Best Divisions for Knowledge of the Regions* (Garnet: Garnet Publishing, 1994), p. 420 [479].
 37. *khashab*; al-Idrīsī, p. 161 [41].
 38. Khan, *Banbhore*, p. 22.
 39. In the past its water was sweet and its salinization occurred in a later period (Khan, *Banbhore*, p. 21).
 40. Ibn Ḥawqal in Elliot, p. 37; Abū'l-Fidā, 2.2, p. 111 [349]; al-Idrīsī, p. 161 [41]; D. Barbosa, *The Book of Duarte Barbosa: An Account of the Countries Bordering on the Indian Ocean and*

- Their Inhabitants*, 2 vols, Translated by M. Longworth Dames (London: Hakluyt Soc, 1918), pp. 1, 107. In this passage Barbosa generally depicts the region and not only the city.
41. Ibn Ḥawqal in Elliot, p. 37.
 42. Barbosa, pp. 1, 107.
 43. Lambrick, H.T. 1986. *Sind. A General Introduction*, Hyderabad/Jamshoro: Sindhi Adabi Board, pp. 15–16; In the same work (p. 181) see a specific reference to the irrigation of Manṣūrah in the Muslim period.
 44. al-Balādhurī, *Kitāb Futūḥ al-Buldān*. Translated by P.K. Ḥitti, *The Origins of the Islamic State*, 2 vols (New York: Columbia University Press, 1916), (pp. 2, 227–228 [443]); Piacentini Fiorani, ‘The Site of Banbhore on the Indus Delta’, p. 19.
 45. al-Dimashqī, *Nukhbat al-Dahr fi Aja’ib al-Barr wa’l-Bahr*, *Manuel de la cosmographie du moyen âge* (Copenhagen: A.F Mehren (ed.), 1874), p.121.
 46. Barbosa, pp. 1, 107.
 47. Khan, *Banbhore*, p. 20; Piacentini Fiorani, *Beyond Ibn Hawqal’s Bahr al-Fārs*, p. 43. Evidence recalling some structures is visible on images acquired with drone during the low tide in January 2019. A specific project of archaeological maritime investigation inside the Gharo creek has been planned for future seasons in collaboration with the Bahria University, Karachi Campus.
 48. D. A. Agius, *Seafaring in the Arabian Gulf and Oman. The People of the Dhow* (London, New York, Bahrain: Kegan Paul, 2005), p. 178; A. Salimi and E. Staples, *A Maritime Lexicon. Arabic Nautical Terminology in the Indian Ocean* (Hildesheim, Zürich, New York: Georg Olms Verlag, 2019), pp. 377–378.
 49. W. B. Hafford, ‘Mesopotamian Mensuration Balance Pan Weights from Nippur’, *Journal of the Economic and Social History of the Orient*, 48.3 (2005), 345–387 (p. 352).
 50. M. Mierzejewska, ‘Pottery, Fishermen, and the Gulf trade. Preliminary Results of Four Seasons of Kuwaiti-Polish Excavations on Failaka Island’, in *Archaeology of Failaka and Kuwaiti Coast - Current Research*, ed. by Matej Ruttkay, Branislav Kovár, and Karol Pieta (Kuwait City: Nitra, 2019), 169–180 (p.177).
 51. BBSs-24, 28–31, 47, 48. The survey was not targeted to the identification of quarries and outcropping natural bedrock, so only some of them have been positioned but it is arguable that many other similar cuts are available in this area.
 52. This hypothesis was confirmed by Luigi Cantelli (University of Bologna) during his preliminary geological survey at Banbhore in December 2018.
 53. M. Tosi, ‘The Notion of Craft Specialization and Its Representation in the Archaeological Record of Early States in the Turanian Basin’, in *Marxist Perspectives in Archaeology*, *New Directions in Archaeology*, ed. by M. Spriggs (Cambridge: Cambridge University Press, 1984), 22–52 (p. 24).
 54. Mantellini, *Excavation*, p. 85, Table 2.
 55. Ibn Ḥawqal in Elliot, p. 37.
 56. Kervran, ‘Multiple Ports at the Mouth of the River Indus’, p. 122, note 67.
 57. Two containers (SUs 651 and 663) discovered in Trench 12 were excavated in January 2019. The soil coming from the inside of both jars and some samplings just outside was sifted and floated. In 2020 a few samples were exported to Italy for future archaeometric analysis.
 58. Abū’l-Fidā, 2.2, p. 111 [349].
 59. Barbosa, p. 1, 107.
 60. Piacentini Fiorani, *Beyond Ibn Hawqal’s Bahr al-Fārs*, p. 169.
 61. Felici et al., ‘Banbhore’, p. 320–322; Fusaro, p.100.
 62. al-Idrīsī, p. 161 [41].
 63. Ibn al-Mujāwir in Rex Smith (Ibn al-Mujāwir, *Tārīkh al-mustabṣīr*. Translated by O. Löfgren, *A Traveller in Thirteenth-Century Arabia*, ed. by G. Rex Smith (London: Taylor and Francis, 2008), pp. 153 and 160.
 64. Khan, *Banbhore*, p. 33; Fusaro, pp. 96–97.
 65. See note 10.
 66. Kervran, ‘Multiple Ports at the Mouth of the River Indus’.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Geolocation Information

The site of Banbhore is located in the Lower Indus Valley, Sindh, Pakistan. Coordinates measured at the center of the fortified town are:

UTM – WGS 84, Zone 42 R: 350486.04 m E, 2738249.02 m N; 24.751581° Lat E, 67.521406° Long N.

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