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7 Liminalities and Centralities of Early Historic Ports: The Gulf of Khambhat in Perspective

I Introduction: (Re)framing the frontier

The ports of the Gulf of Khambhat at the physical edge of the Indian subcontinent, where the land meets the sea, constitute the region discussed in this chapter. By virtue of being a physical edge, the coast and its ports are both an ecotone and a political, economic, and social frontier. Like other frontiers, the coast was also crossed, and ties to various commercial, religious, and diplomatic networks beyond the coast's physical edges were established. Such networks were not stagnant but dynamic, as can be seen in changes in technology, consumption habits, and also rituals. In this chapter, I examine the economic processes of the region by considering three broad variables: physical affordances and settlement scenarios, economic actors, and craft-specific networks of knowledge. Before I delve into a discussion of these variables, I will situate this research in its historiographical background.

I.1 Long-Distance Trade and Indian Ports

For more than a century, the long-distance trade networks in the Indian subcontinent have been presented in two narrative structures: in the context of Indo-Roman trade and as part of the Silk Road network between China and Rome. The theory that the Romans established Indo-Roman trade for the first time depended on the mistaken belief that the use of the monsoon wind for navigation was first discovered by a Greek sailor. This understanding has rightly been criticized for ignoring that the Arabs, Indians, and Phoenicians had been using the monsoon for navigation for centuries.[1] The Silk Road narrative, in contrast, placed Indian ports as the transit zone in the grand trade between China and Rome. This approach explained the steady growth of maritime trade between India and Rome as the result of the Romans trying to divert the land-based trade to the sea when it suffered from the hostilities of the Parthians that prohibited foreign trade through their realm.[2] The efforts of the Roman traders to establish trade contacts with the Indian littoral was highlighted as the main reason for the spread of urban character to the subcontinent. Barbarikon and Barygaza, as they are called in the Graeco-Roman literary tradition, were understood as the

1 Salles 1995. See also Krishnamurthy 2000, 85–90.

2 For example, Suresh (2007, 13–16) follows and explains this theoretical model.

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most important ports along the final leg of the Silk Road across the northwestern part of the Indian subcontinent.

The call to 'provincialize' Rome and look into economic processes in other parts of the Indian Ocean world has brought forth more adequate understandings of trade-related networks across the ocean.[3] The Roman impetus is no longer considered the dominant reason for the emergence of trade and urbanism in the subcontinent.[4] Moreover, since the important research in the 1980s and 1990s by Vimala Begley, who studied the port site of Arikamedu in its regional context, the Roman presence in Indian ports has been understood as only one part in the history of their development.[5] Following from this particular case, scholars have started studying ports and nearby spaces in their regional historical contexts. As the importance of regional factors came more strongly into focus, the economic development of the hinterland of a port came to be identified as the most important factor for their urban development. To mark this change of perspective, port cities came to be called 'forelands.'[6]

I.2 Ports in the Hinterland–Foreland Structure

Theories of long-distance connectivity at a global scale tend to rely on the idea of trickle-down effects of urban development as the explanation for an increase in trade. The understanding of ports in trade networks is an example in point. Owing to the *polis–chora* (city–hinterland) model of urban history in the Mediterranean, South Asian ports were understood as the *emporia* in a hierarchical relationship with their rural hinterland. Since much of the scholarship in recent years has moved away from Roman influence as the urbanizing factor of South Asian port cities, greater attention has been paid to preexisting networks in the hinterland. Yet the size and expanse of hinterlands affecting the development of port towns remains difficult to determine. Even those scholars who attempt to steer away from Romano-centric perspectives continue to rely on the Graeco-Roman *Periplus Maris Erythraei* (*PME*) for determining

3 For a stance on the former point, see Fitzpatrick 2011. For stances on the latter, see Salles 1995; Tchernia 1997.

4 For a short discussion on the historiographical survey on the role of trade in economic-history writing, see Dwivedi, vol. 1, ch. 15, 655–661.

5 Begley 1983; 1993.

6 The foreland–hinterland dichotomy, where every port has a defined hinterland, borrows a lot from our present-day understanding of the relationship between a commercial port and its surroundings. The 2005 report by Economic and Social Commission for Asia and the Pacific (UN) defines the port hinterland via various characteristics: as the area where a port has a monopolistic position; as the origin and destination area of a port; as the land-space where the port has clients and sells its services; as the market area for the port from where it sells and draws its cargo (Free trade zone and port hinterland development 2005).

the extent of hinterland connections.[7] Archaeologically, however, items traded through Barygaza and Muziris can be traced as far as the Ganga valley. Yet can such distant places be regarded as part of the 'hinterland' of the ports on the coast? Clearly this approach overlooks the role of various intermediaries – cities, monasteries, corporate bodies – that participated in the movement and distribution of goods in between distant economic centers.[8] Such intermediary organizations functioned because of multiple weak and strong network ties that facilitated the movement of goods between the two nodes. The foreland–hinterland approach has also been criticized for creating artificial distinctions between centers and peripheries.[9]

In light of these issues, this chapter positions itself in a scholarly context that investigates regional institutional and network structures as the background to economic changes in a port environment. It is in their regional contexts that the coastal sites of India grew as economic, political, and religious centers participating in long-distance maritime and inland networks of exchange. The two important ports of Barygaza and Astakapra, modern-day Bharuch and Hathab respectively, in the region around the Gulf of Khambhat have been chosen as the geographical focus for an approach that should be regarded as more generally valid.

While the regional development of the Gulf of Khambhat lies at the center of the present chapter, the larger networks connecting it to the sea and to other port cities need to be acknowledged. I do not propose a strict compartmentalization of the region's local and long-distance connections, which of course were intertwined, but I wish to pay due attention to regional developments as the preconditions for the development of the port cities. Although the temporal bracket of my analysis is focused on the period between ca. 300 BCE–300 CE. I have in some instances considered sources from outside the period under study in this volume. Some practices, such as the seasonal mobility of agropastoral groups, participation of forest dwellers in supplying forest products, textile production, and many religious practices, had long traditions going back even to the Bronze Age. The question of how these long-term traditions contributed to the accelerated urban development in the early centuries of the Common Era need to be kept in mind.

7 E.g., De Romanis 2012; S. Ghosh 2014; Chakravarti 2017. Ghosh classifies different kinds of hinterlands. Moreover, she distinguishes ports that have their own sustained supply of goods, of which Bharuch/Barygaza is an example, and those that seem to have served as ports of transit for the goods of the hinterland (e.g., Barbarikon). In addition, for a discussion on structures of political geographies of the port regions in the *PME*, see Seland 2010, 83–85.

8 Smith 2002, 139.

9 Bauer 2016; see also Brosseder and Miller, ch. 5, I; and von Reden, ch. 8, I, both this volume, with Granovetter 2005, esp. 33.

Map 1: Early historic sites around the Gulf of Khambhat. © Peter Palm.

II The Gulf of Khambhat: Topography and the Complexity of Port Sites

I start with a description of the physical features of the region and its navigational connections. A more analytical approach is taken in the later part of the section, where coastal sites are discussed in their regional context. With a more specialized microstudy of the settlements in two port regions, namely Hathab and Bharuch, I examine the intertwined possibilities of connections within the settlements in the respective urban clusters. Finally, I examine the viability of such case studies for better understanding the movement of goods and people in local contexts, the nature of change in consumption patterns, and the multidirectional movement of goods, whether locally produced or imported from elsewhere.

II.1 Topography of the Gulf of Khambhat

The Gulf of Khambhat, as a divider between the Saurashtra and Lāta regions in the present-day state of Gujarat, lies in the transitional zone between the tropical wet-littoral climate of Maharashtra in the south and the arid Rajasthan in the north. It has three types of physiographic formations that influenced how humans interacted with the landscape: the coastal lowlands, the plateaus, and the hilly regions.[10] Cutting through the coastal lowlands and the plateaus are various rivers and rivulets that form stretches of fertile alluvial zones.

The coastline in southern Gujarat is irregular, and the width of the coast varies between 5 and 30 km inland. The coastline areas also form geological creeks that provide natural habitats for a wide variety of reef flora and fauna, including finfish and shellfish.[11] It is characterized by fringes of saline wastes, mangrove swamps, tidal flats, and sand dunes at places in the north. The tidal flats also consist of coastal alluvia formed by the accumulation of fluvial silts at the mouth of rivers. The plateaued area of Saurashtra is the most extensive one, covering two-thirds of the peninsula. It includes areas with elevations between 150 and 500 m above mean sea level (msl).[12] Toward the center, the plateaus form hilly regions that are covered with timber-producing forest. The highest point at 1,117 m above msl is the Goraknath peak of the Girnar hills.

The soil profile varies according to three types of geological rock formations: (a) the fluviomarine deposits consisting of mainly brown soil, sand, and alluvium; (b) those

10 Pappu and Marathe 1982, 160.

11 For a detailed account of creeks in Saurashtra, their geological compositions, and their importance in fishery industry, see Kizhakudan et al. 2003.

12 Saha 2012, 65. Earlier writings, like Pappu and Marathe 1982, categorize plateaus as areas with elevation between 75 and 300 m.

from the Tertiary Period consisting of miliolite limestone and laterite; and (c) the Deccan lava traps from the Mesozoic Period. Even though the average annual rainfall of the Saurashtra region is 700 mm, which categorizes it as a semiarid climate, the geological constitution of the region created good aquifers and thus opportunities for shallow groundwater collection.[13] Aquifer-facilitated groundwater levels depend on the rainfall, especially the copious rainfall from the southwest monsoon that reaches the region. This geological feature allows us to contextualize the water-use strategies of the people of early historic Saurashtra in terms of their choices of crops they cultivated and their pastoral practice. It also explains their merit-based socioreligious practices around the funding of water reservoirs in this area, which will be discussed below.

II.2 Navigation in the Gulf

A long history of involvement in maritime activity is attested archaeologically in the region. The hydrodynamics of the gulf are greatly influenced by various river systems, forming an estuary along the coast, both perennial and seasonal.[14] At the mouth of these rivers, the gulf makes conditions favorable for various natural harbors on both its western and eastern coasts. In the Bronze Age (the Harappan period), the gulf harbored a commercial port town, Lothal, situated in the northern part of the gulf and upstream on the Bhogawo River. Various Bronze Age port sites have been identified along the rivers that drained into the gulf, some of which acquired the reputation of being important trade centers even later and most notably in the *PME*.

The presence of ports and their mooring points in long-term history has been established on the basis of stone anchors found in the waters around the Saurashtra region. For the early historic phase as well, stone anchors around multiperiod port sites in the Dwarka region, the Somnath-Prabhas area, and the Gulf of Khambhat indicate mooring sites that supported the traffic of sea-going vessels.[15] More than 150 surviving stone anchors have been discovered in waters around the Saurashtra region.[16] Underwater explorations have also yielded stone anchors off the sites of Miyani and Visawada located ca. 40 to 50 km away from Dwarka. The stone anchors can be divided into three types: composite, Indo-Arabian, and ring-stone. Although

13 Nair 2014. The rainfall in Saurashtra, however, is very erratic and ranges between 300 mm to approximately 1,200 mm annually (Hirapara et al. 2020, 165).

14 Bhatti et al. 2018, 2554. Of the most notable navigable rivers, the Shetrunji, Sabarmati, Mahi, Narmada, and Tapi will be mentioned most frequently.

15 Gaur, Sundaresh, and Tripati 2007, 428. These are the single-hole stone anchors that have also been reported from areas near other port sites in other states of the subcontinent, such as Tamil Nadu, Andhra Pradesh, and Odisha. See Athiyaman and Jayakumar 2004; Tripati and Patnaik 2008; Tripati et al. 2014; Tripati, Prabhaharan, and Behera 2020.

16 Sundaresh, Gaur, and Tripati 2011.

exact dating is difficult, the material of the anchors and comparative analysis have made at least a relative chronology possible.[17] The composite stone anchors, produced from local limestone, have been dated to the early historic period, while the Indo-Arabian style anchors, generally made of sandstone and basalt, have been dated to a later period.[18]

In the absence of evidence for any elaborate port structure, especially as wood and other organic material decayed and washed away, the stone anchors give us a tangible idea of anchorage points and their distance. Offshore mooring of sea-going vessels is also mentioned in the *PME*, which actually gives an astonishingly accurate description of the situation:

> [The] gulf which leads to Barygaza, since it is narrow, is hard for the vessels coming from seaward to manage ... On the right-hand side, at the very mouth of the gulf, there extends a rough and rock-strewn reef called Herone, near the village of Kammoni. Opposite it, on the left-hand side, is the promontory in front of the Astrakapra called Papike; mooring here is difficult because of the current around it and because the bottom, being rough and rocky, cuts the anchor cables. And, even if you manage the gulf itself, the very mouth of the river on which Barygaza stands is hard to find because the land is low and nothing is clearly visible even from nearby. And, even if you find the mouth, it is hard to negotiate because of the shoals in the river around it.
> For this reason local fishermen in the king's service come out with crews and long ships, the kind called *trappaga* and *kotymba*, to the entrance as far as Syrastrene to meet vessels and guide them up to Barygaza...[19]

In fact, elaborate port structures were often neither necessary nor sustainable at most of the natural harbors along the northwestern coast. As most the port towns were situated at estuaries, sedimentation and frequent flooding made large infrastructural work difficult to maintain. In addition, changes in the water level and the submerging of coastal areas are common phenomena in the littoral spaces.[20] As the majority of stone anchors have been found in the areas with a water depth of 5 to 15 m, offshore mooring of large vessels and then transfers in smaller boats were probably the most typical practice for landing on the coast for most of the early history of the Khambhat Gulf region.[21]

II.3 Settlements in Clusters

There is still no proper agreement on how to define an urban site in the archaeology of the subcontinent.[22] Identification of urban sites was long based on adaptations of

17 Sundaresh, Gaur, and Tripati 2011, 69.
18 Gaur, Sundaresh, and Tripati 2007, 438.
19 *PME* 44, trans. Casson 1989.
20 Gaur, Vora, and Sundaresh 2007.
21 Gaur, Sundaresh, and Tripati 2007, 429, 438. For a discussion on the use of smaller crafts for both sea and riverine navigation, see H. P. Ray 1995, 98.
22 Dwivedi, vol. 1, ch. 15, 653–655.

Childe's ten-point model, which was used as some sort of a checklist.[23] This approach may have helped to identify ports and political centers, as well as nodes of particular economic activity, such as centers of production, consumption, and distribution. But the typology fails to capture overlapping functions, or transformation over time, which do not surface in a typology. For example, Varma in one of her studies declared Kathiawar (Saurashtra) as one that had not gone through urbanization in the early historic phase.[24] She uses the convenient checklist, where she notes that the absence of a state-like structure there means the absence of secondary-state formation, which therefore is taken as a sign of lack of development of urban centers. She also states that the restricted craft specializations indicate very limited urban processes in this region. Her arguments at first seem clear and direct; however, this has a tendency to create bias against the study of this region. This approach neglects the region's role in various networks, e.g., religious and ceramic, that also act as knowledge networks supporting the mercantile movement. In a more recent study, in fact, Varma, along with Menon and Nair, has herself written against the labels 'rural' and 'urban' and argued for inclusion of social and archaeological aspects formerly considered invisible.[25]

In order to understand the economic processes in a region, it is more fruitful to identify ties of connectivity within and outside the region. Connections within a region can be imagined to have been maintained by local merchants, religious networks, or self-governing political bodies that were not necessarily integrated into an overarching administrative system or state, but which often shared the institutional structures. Such relatively resilient local networks likely operated between settlements in a region. In the archaeological profile, as will be discussed below, the radius of such local networks seems to have spanned about 50 km. Thus, the connected settlements may be understood as clusters.

Clustering of settlements is one of the noticeable phenomena in the region under study, and will be invoked by placing sites in their "settlement locality."[26] By the early historic period, most of the important cities had well-connected satellite settlements. An urban center was not marked only by a productive hinterland, but by being a part of well-connected clusters of sites as well. For example, within the modern-day district of Kanpur in Uttar Pradesh, 141 sites were identified as having experienced the early historic phase.[27] Similarly, in Bengal too complexes have been identified as

23 For the ten-point model, see Childe 1936. The adapted list of criteria for Indian contexts included markers such as fortification, varied crafts, luxury items of precious and semiprecious stones, the presence of script and forms of writing, sites falling on long-distance overseas trade routes, and coinage.

24 Varma 2008.

25 Varma, Menon, and Nair 2021.

26 This phenomenon was first explicitly observed by Chattopadhyaya 2003, 66–93.

27 Lal 1984.

settlement localities with a series of sites forming a composite urban microregion.[28] Other examples such as Sanchi, Anuradhapura, Tirunelveli, and Arikamedu also exhibit connected satellite settlements that formed urban clusters.[29] Arguably, this clustering of sites and their connectivity allowed the emergence and sustenance of villages with specialized craftsmen and servicemen. Villages specializing in one type of craft are also known from literary sources.[30] Below, I have examined the phenomenon of clustering in the area around the Gulf of Khambhat by considering the case of two port cities in the context of their neighboring settlements.

II.3.1 The Shetrunji River and Narmada River Settlement Clusters

Settlements used to be investigated in relation to their role within a political system, administrative hierarchy, or long-distance trade, or as agents of urban expansion and institutional change within state-formation processes.[31] Focused settlement studies, including those on the Gujarat region, are a more recent development. The scarcity of such studies is not just caused by particular disciplinary preoccupations, but also the fact that relevant sites are often beneath areas of continuous habitation. The size of modern cities is the result of gradual expansion and the incorporation of multiple neighboring settlements in their outskirts. So, for example, the modern city of Bharuch occupies 1,256 sq. km, with some parts under continued occupation for a long time in history.[32] Such expansions and incorporations in more recent times skew our understanding of settlement sizes, distances between them, and their relationship with each other.

Yet scholarship has taken a more positive turn in recent years. Ashit B. Paul, for example, has examined settlement data of surveyed and excavated sites in the Saurashtra region.[33] Atusha Bharucha has collated a list of early historic sites in different regions of Gujarat and studied settlement patterns in relation to material culture.[34] Bharucha observes that settlement sizes in Gujarat increased from west to east as one moves toward the Gulf of Khambhat. She associates this with the amount of annual rainfall and the presence of alluvial soils suitable for agriculture around the

28 Chattopadhyaya 2003, 68–69.

29 Rea 1904; Coningham 1999, fig. 120; Shaw and Sutcliffe 2003a; Chakrabarti 2010, 107, map 7; Basant 2012, 122, map 5.2.

30 For a short discussion, see Dwivedi, vol. 2, ch. 5, 225.

31 See, e.g., Seneviratne 1981. These ideas continue to influence the understanding of early historic studies: see, e.g., Basu Majumdar 2017.

32 A team of archaeologists planned to survey the occupied area of the city for signs of archaeological vestiges and laid trial trenches in the season of 2012–13. Indian Archaeology – A Review (IAR) covering years 2013–2014, 44.

33 Paul 2017.

34 Bharucha 2022.

river basins.[35] In comparison to other regions of Gujarat, the gulf region had a higher concentration of alluvial deposits allowing for more organized permanent settlement structures, whereas farther inland, the semiarid zones supported only less permanent structures.[36] Following on from these works, I examine two port sites that were part of riverine settlement clusters around the Gulf of Khambhat. One was located along the River Shetrunji on the eastern coast of the gulf near the city Hathab (known as Astakapra in the *PME* or Hastakavapra in Indic sources), the other clustered on the eastern bank of the gulf along the River Narmada around the city of Bharuch (Bharukaccha and Bhṛigukaccha in Indic sources).

Paul's detailed survey of early historic settlement in the lower Shertrunji River is a promising endeavor toward a better understanding of connections between settlements at a micro level.[37] The data indicate a clustering of sites that functioned as a unit of sites with varied specializations. The diffused form of different types of production, consumption, transportation, and other types of services suggests higher resilience to change in the face of changing political situations and transformation.

Two phenomena are worth noting: (a) the specialized single-craft industry per settlement, i.e., one or more settlements in the cluster seem to have specialized in one particular craft; and (b) their linear settlement pattern, i.e., most of the settlements and manufacturing sites were within easy reach along the river. Taken together, the settlements seem to have been part of networks fulfilling each other's needs and sustaining a network of economic activity facilitated by riverine travel.

The majority of the 22 settlements in the lower Shertrunji were located either in a linear pattern along the banks of the river or in the delta.[38] The most common type of settlement, nine in number, was a small agricultural site with an occupational area of 1–2 ha each. The settlements closer to the coast occupied a minimum of 6 ha each. The largest settlement in this cluster was Hathab, a port city, located on the coast with ca. 40 ha of occupied area and a possible population of ca. 8,000 residents.[39] Although much smaller in number, the five largest sites occupied 71 percent of the inhabited area with a total of about 22,800 residents, compared to an estimated 32,000 residents in the entire settlement cluster.

A typical urban center of the early historic period occupied between 50 and 300 ha.[40] The total area occupied by the Shetrunji River cluster extended over 160 ha. The maximum distance between the sites in the east–west orientation was ca. 45 km as the crow flies, and ca. 20 km in the north–south direction. The sites at the ends of

35 Bharucha 2022, 11.

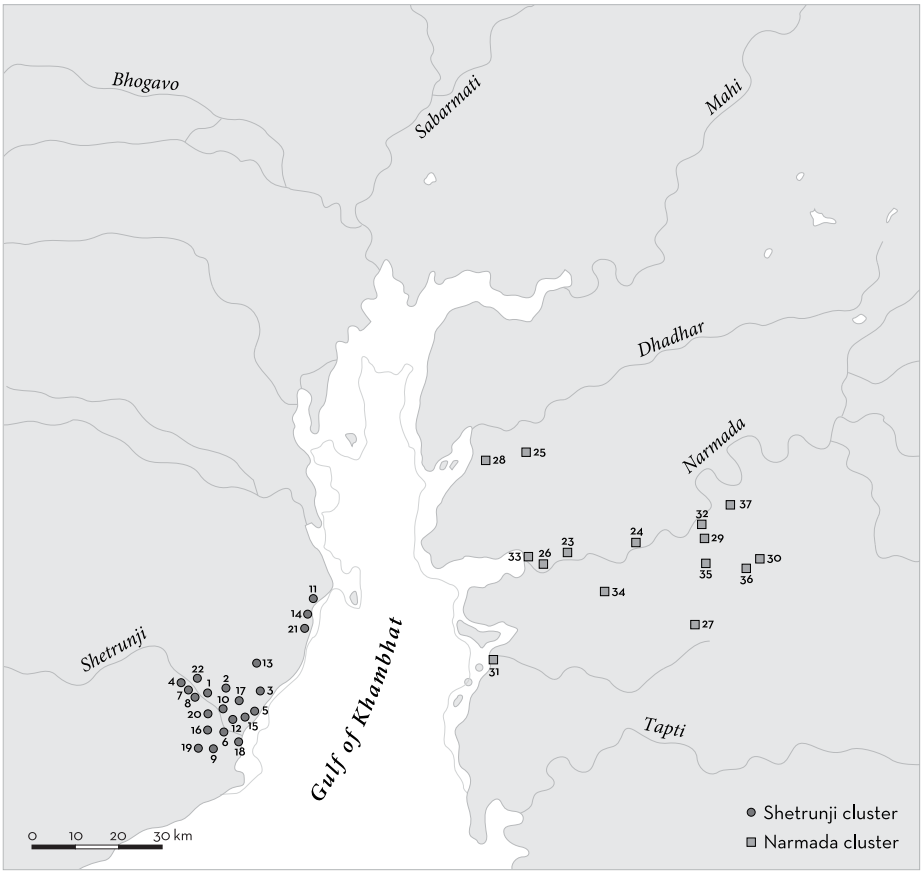
36 Bharucha 2022 has identified many semipermanent settlements that may have been used by mobile pastoralists practicing seasonal agriculture in northern Saurashtra and Kachchh.

37 Paul 2017. The Shetrunji inundates the Saurashtra peninsular, flowing 180 km in south-east orientation before discharging into the Gulf of Khambhat.

38 Paul 2017, 169–171. See also fig. 11 and table 13 in Paul 2017.

39 Paul 2017, 175–177 for the population estimates.

40 Smith 2006, 119.



Map 2: Sites in settlement clusters on the Shetrunji and Narmada rivers. In Shetrunji cluster: 1. Bandi Rohli, 2. Bhalar, 3. Bharapara, 4. Bhegali, 5. Chopara, 6. Dakana, 7. Dantrad, 8. Devila, 9. Phulsar, 10. Gorkhi, 11. Hathab, 12. Isora, 13. Katva, 14. Khadsaliya, 15. Padri, 16. Pavti, 17. Piparla, 18. Sartanpur, 19. Shevaldar, 20. Talaja, 21. Thalsar, 22. Timana. In Narmada cluster: 23. Bhadbhut, 24. Bharuch, 25. Chanchvel, 26. Chawaneshwar, 27. Dungri, 28. Gandhar, 29. Jhagadia, 30. Kadia Dungar, 31. Kantiyajal, 32. Limodara, 33. Mehgam, 34. Nagal, 35. Selod, 36. Shiyali, 37. Vanakpore, 38. Vejalpur. (For references, see n. 38 and n. 47). © Peter Palm.

the zone in east–west orientation were located along the coast, and those in north–south direction along the river. Their location near navigable waters must have reduced the travel time between them considerably. There were also settlements located in between, facilitating contact even further. Moreover, the economic zones of the settlements were not just limited to the physically occupied areas.[41] The settlements

41 Arguments in favor of links between spaces beyond the settlements and lifestyle of the settlers was already suggested in the 1990s (Ingold 1993; Roberts 1996, 12–13). This approach of integration of settlements in their respective landscape has been developed further in more specialized studies of

used the landscapes around them, such as fields, pastures, water bodies, forests, mountains, and so on. The residential areas, therefore, were part of larger economic zones with various types and rhythms of interaction. Considering different types of interactions, the distances between the settlements were much shorter in practice than seen in the surveys.

Hathab and Talaja are two settlements that seem to have filled specialized roles in the Shetrunji river system. Hathab, a port site, is not directly located at the bank of the Shetrunji, but its position at the coast connects it with other settlements.[42] Various seals with the city's name were found at the site, suggesting the presence of an organized port and/or storage space.[43] Talaja, by contrast, on the west bank of the Shetrunji, is famous for its rock-cut caves on a singular hill, which were associated with Buddhism. The caves are a cluster of 36 excavated chambers at different levels of the hill with various water reservoirs, of which about 20 have survived.[44] Possibly a pilgrim center, or habitation sites for Buddhist monks and followers, the site served a specialized religious role in the settlement cluster. The broader socioeconomic roles of these institutions have been discussed in volume 2 of this Handbook.[45]

About 70 km away from Hathab, ca. 30 km across the gulf and a further 40 km upstream on the Narmada River, lies Bharuch. The Narmada is the longest westward river of the subcontinent, flowing through the uneven terrain of the central Indian plateau until it reaches the south of Gujarat (the Lāṭa region). It is navigable only in certain sections, one of them being the last 150 km before flowing into the Gulf of Khambhat. The lower Narmada Basin has been of archaeological interest mostly due to the nearby location of pre- and protohistoric sites of the Harappan period.[46] However, for the early historic period the currently published data on the lower Narmada Basin are not comparable to those of the Shetrunji Basin. Nevertheless, based on previous surveys the profile of sites in this area also suggests the phenomenon of settlement clustering. Nineteen sites have been reported from the lower Narmada Basin/present-day Bharuch district since the 1950s, of which 15 are identifiable on the ground (map 2).[47] However, there may have been other early historic settlements located under the currently occupied areas, as in the case of the city of Bharuch.

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landscape, more prominently in the archaeology of rural settlements. This was also reemphasized in the South Asian context by Varma, Menon, and Nair 2021, 284–285.

42 Pramanik 2004, 134.

43 Pramanik 2005.

44 Fergusson and Burgess 1880. For images of the context and details of the Talaja caves, see in David S. Efurd's collection: https://www.jstor.org/stable/community.13410599.

45 Dwivedi, vol. 2, ch. 5, 228–232; ch. 10, 517–519.

46 Gaur 2000.

47 The 15 sites identifiable at present are Bharbhut/Bhadbhut, Bharuch, Chanehvel, Chavaneshwar, Gandhar, Jhagadiya, Kadiya Dungar, Kantiyajala, Limodra/Limbodra, Mehgam, Nagal/Nangal, Selot/Selod, Shiyali, Vanakpur/Vanakpore, and Vejalpur. Indian Archaeology – A Review (IAR) covering years 1957–1958; 1958–1959; 1959–1960; 1965–1966; 1966–1967; 1967–1968; 1968–1969; 2012–2013; 2013–2014. See also A. Ghosh 1990; Varma 1990; Gaur and Sundaresh 2016.

Of the 15 sites in the lower Narmada cluster, eight are on the bank of the river, three are at a distance from the main river, but on or closer to the coast, and four are further inland. Aligned along the river, they form a linear-patterned settlement cluster in which the maximum distance between the sites at the two extreme ends is approximately 50 km as the crow flies. At present, the limitations in our data do not allow us to satisfactorily discuss the functions of each settlement in this cluster. However, two of them allow us to attribute at least one functional specialty. One is Bharuch, one of the eight sites situated on the banks of the Narmada. Apart from Bharuch's mention in the *PME* as an important port of trade, we also get hints in Indic literature about merchants arriving at Bharukaccha for their journeys onward by sea. Sailors and captains originating from Bharukaccha also recorded their presence in inscriptions on the island of Socotra, close to the Horn of Africa.[48] In addition, the town has a long tradition of coinage, and this was likely a site of dynamic interactions and exchanges (for which see further below).

The other site in this cluster, Kadiya Dungar, is situated farther inland, 40 km southeast of Bharuch, and is known for a rock-cut cave complex with seven excavated chambers dating between the first and second centuries CE (fig. 1).[49] The rock surface above the entrance of one of the rock-cut chambers bears a carving of an apsidal top, with a seemingly similar structure reminiscent of a *stūpa* (fig. 2). In addition, one of the caves bears a donative inscription in Brāhmī by a Kṣatrapa named Vīradāman that has now weathered in parts.[50] It is possible, therefore, that the cave complex was a rendition of a Buddhist monastic complex with *vihāra* (residential spaces), *caitya* (prayer hall), and *stūpa* (resting place for relics). Such styles, at times on a bigger scale, are found at other rock-cut complexes at other sites in Gujarat and more frequently in the Deccan. With some caution, and the hope for additional research in the area, we may suggest that Kadiya Dungar was functionally a specialized site in its cluster as Talaja was in the Shetrunji settlement cluster.

The functional specialties of a port and a religious center, as discussed in the two examples in each cluster, make them points of convergence in their own clusters and beyond. The two clusters also have other settlements with other craft and functional specialization that determined the nature of social and exchange networks they participated in, both within the cluster and outside. For example, in the Shetrunji cluster, Padri has been noted for its salt manufacturing since the Harappan period.[51] The site also had one of the earliest reported shrines of a fertility goddess, Lajjā Gaurī, possibly associated with healthcare for women.[52] Another interesting example is of Jhagadiya in the Narmada cluster, which was the only place where agate was processed into

48 See Strauch 2012, 11:12, 11:17, 11:25, 14.02, 16:19, 17:01.

49 IAR covering years 1966–1967, 65.

50 Bharucha 2022, 111.

51 Shinde, Shirvalkar, and Rajaguru 2008.

52 See section III.2 for details.

Fig. 1: Rock-cut caves on the hill at Kadiya Dungar. Photo: © B. K. Venkatesha.

carnelian with a rich uniform color.[53] Therefore, the relationship between any two or more settlements was determined by their functional specialties and textured by the frequency of mobility as well as the types of actors involved. In that case, should these settlements within a cluster be organized in a fixed hierarchical order?

Scholars have abandoned the practice of arranging settlements within unchanging unidimensional hierarchical relationships. This is also applicable to the role(s) of various settlements in a cluster.[54] The rank of a settlement specializing in a certain function is not constant over time, but flavored by various specificities. The functional specificities, in particular, often strengthen and, at times, weaken the types of ties between and within two settlements. Furthermore, within these relationships of different scales there could be a power imbalance.[55] The networks, thus, cannot be explained and understood in pure, uniformly hierarchical and never-changing ties.[56]

One way to observe this is to take an example of certain commodities that circulated in these clusters. Various sites in the settlement clusters discussed in this section have yielded amphorae and other rare foreign-origin goods (sec. III.4.3). They have therefore been explained as intermediaries between the larger centers to which the commodities were moved.[57] However, this approach overlooks the consumption potential of the clustered sites themselves. Their consumption, though smaller in scale

53 Bharucha 2022, 111.

54 Crumley 1995, 2015 was the first to argue in favor of multi-point ranking potentiality. Since then, scholarship has furthered away from the 'central place' theory.

55 The term power, here, refers to the variety of social powers that have been discussed by Mann (1986).

56 Cumming (2016) explains the dynamic nature of social relations and how hierarchical and heterarchical relations are neither absolute nor constant.

57 Bharucha 2022, 128.

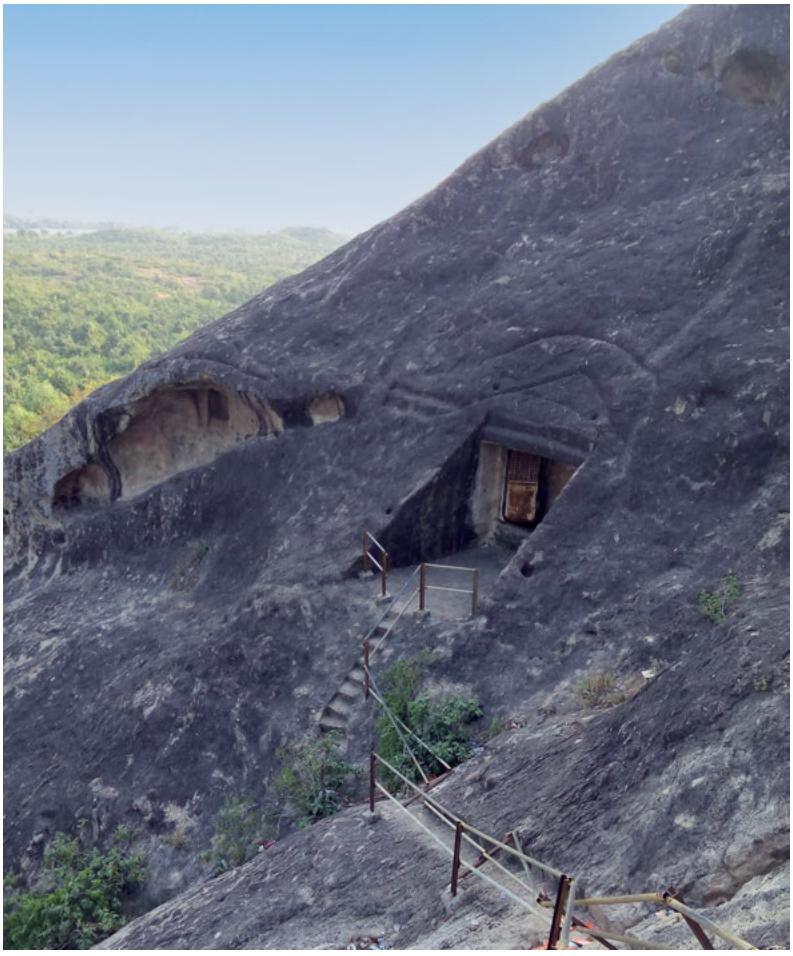


Fig. 2: Carving of an apsidal structure above the entrance of a rock-cut chamber at Kadiya Dungar. Photo: © B. K. Venkatesha.

in comparison to the demands in larger cities, was not negligible in sustaining the channels of demand and supply. It is likely that through their location they had privileged access to foreign and prestige goods, which improved their status in an urban hierarchy. The role of the smaller settlements and their close connection to larger settlements in the coastal clusters together may have determined the economic position of the cluster in the region.

While no more can be said with the current state of knowledge, dispersed consumption and production potentials in clustered settlements were probably typical for the economic structures of early South Asia more generally and should be taken as an economic factor especially in those regions where state-like institutions were not the primary players in economic processes.

III Actors and Their Networks of Connectivity

Zooming out from the microanalysis of two coastal settlement clusters, this section is dedicated to identifying various actors maintaining regional and long-distance networks. Here, I argue that these agents of connectivity, along with various strategies of connectivity, developed institutions that shaped ports as points of convergence.

III.1 Political Actors

Our knowledge of the polities in the early historic Saurashtra region is rudimentary. Saurashtra had come to be a part of the western province under the Mauryas (ca. 315–180 BCE).[58] After the Mauryas, the region may have been within the sphere of numismatic influence of the Indo-Greeks. The presence of local coins (sec. IV.4), however, indicates a degree of political autonomy until the Indo-Scythians or Śakas took over the region. Also called the Western Kṣatrapa, they ruled over the western and central parts of the subcontinent between the first and fourth centuries CE. It is likely that Bharuch was an independent city until it was captured by the Nahapāna from the Kṣaharata family of the Indo-Scythians. Regional Jaina texts refer to the capture of Bharukaccha by Nahapāna (Manbanos in Greek), one of the Kṣatrapa rulers who expanded into the south during the first century CE. From the Jaina texts too, it appears that the town was captured because of its status as a wealthy port.[59] Scholars also believe that Nahapāna's control over Bharuch led the Sātavāhanas to control the traffic at the mouth of the Gulf, diverting trade into Surat and other coastal ports nearby.[60]

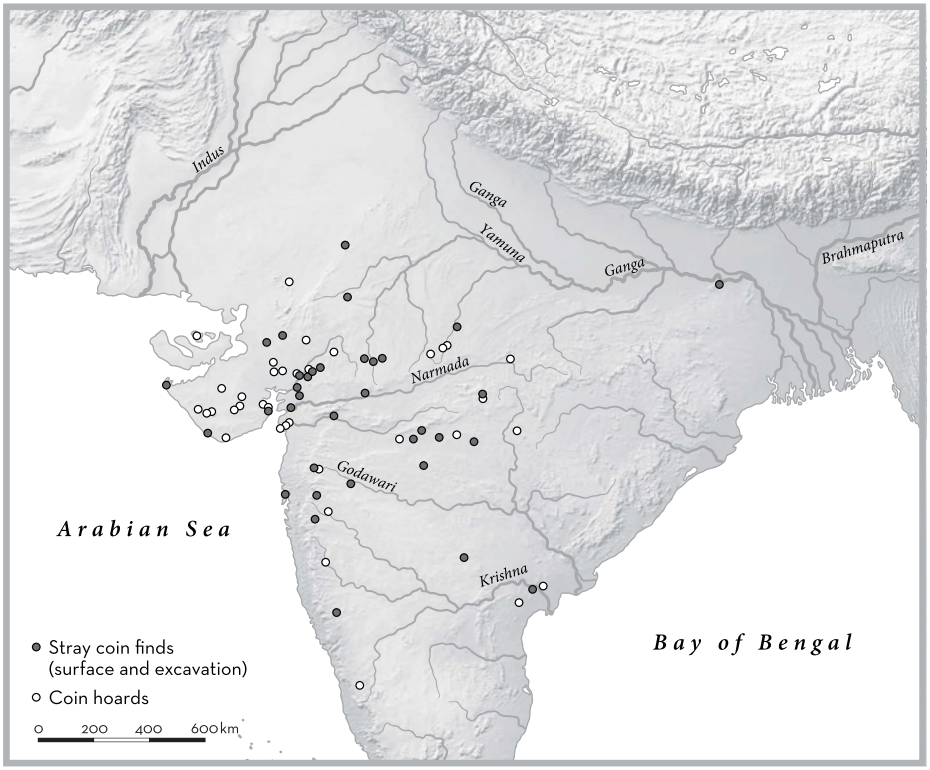
The power of the Kṣatrapas reached into the modern states of Rajasthan, Madhya Pradesh, and Maharashtra up to the northern Konkan region. However, the distribution of their coin finds shows that they were dominant above all in the region between Saurashtra and Ujjaini (map 3), while in areas south of Saurashtra, their coins are found along with those of the Sātavāhanas. Apart from the epigraphic evidence attesting political rivalry between the Kṣatrapas and the Sātavāhanas,[61] the victory of the latter is also expressed in the coins of the Sātavāhana king Gautamīputra Śātkarṇi (late first to early second century CE). Said coins were overstrikes on issues of Nahā-

58 Mauryan presence, or at least contact, is attested by the Aśokan rock edict at Junagarh from the second century BCE. In addition, a later inscription dated ca. 150 CE at the same location also bears a recollection of dam repairs by the respective governors under both Candragupta and Aśoka. Mirashi 1981, no. 51.

59 For the bibliography and references to the Jaina texts, see Bhandare 1999, 13.

60 Seland 2010, 54–55.

61 In addition to the Śātkarṇi–Nahapāna battle, the two dynasties clashed even later. Mirashi 1981, 35–36.



Map 3: Distribution of Kṣatrapa coins (after Jha and Rajgor 1994; IAR, various volumes from 1990 onward). © Peter Palm.

pana. An example here shows the *ujjaini* symbol overstruck on one side, and six arched hills with a crescent moon over the ruler's portrait on the other (fig. 3). It has often been suggested that the conflicts between the two powers raged over the port of Bharuch. However, even after the reported victory of the Sātavāhanas over the Kṣatrapa, the Sātavāhana either did not capture or could not retain the Saurashtran coast for long. Other than Śātkarṇi's overstruck issues, no other Sātavāhana issues have been reported from the Gujarat region so far.[62] More likely, the control of the Sātavāhanas continued to be concentrated along the west coast of Maharashtra and the central and eastern Deccan. This meant control over the routes in central India, for which the Sātavāhana king adopted the titles *dakṣiṇāpathapati* and *dakṣiṇāpatheśvara* (lord of the southward road).[63] The lack of integration of the Gulf of Khambhat into this wider sphere of connectivity under Sātavāhana control confirms regional

62 No undisputed and satisfactorily identified coinages of the Sātavāhanas have yet been found in the coastal parts of Saurashtra; see Dutta 1990; Bhandare 1999.

63 See the second-century CE cave inscription from Naneghat: Mirashi 1981, no. 3.

Fig. 3: Nahapāna coin overstruck by Gautamīputra Śātkarṇi, 119–126 CE (not to scale). ANS 1944.100.55902. © American Numismatic Society.

economic structures and networks influencing the gulf region.[64] Rulers were interested in the fiscal advantages of trade, but neither controlled nor initiated trade journeys.[65] Fiscal advantage from trade was also related to how the ports were administered.

III.1.1 Intraport Administration and Interport Relations

Despite the long history of Gujarat's participation in maritime networks, the absence of urban structures comparable to those of Mediterranean ports has made the archaeological identification of material infrastructure at ports rather difficult. Even though the creeks of the gulf made favorable conditions for natural harbors, they were affected by heavy silting at river mouths, rocky outcrops, and higher tidal range around creeks.[66] In such conditions, how could a port of Bharuch's reputation function?

In this section, I make some informed speculations about the possible functioning of the ports of the Gulf of Khambhat. I also point to certain collective choices and compulsions that were relevant in defining the institutional role of ports. To achieve that, first, I describe how the normative texts conceive the internal functioning and administration of a port. Second, by bringing into consideration the presence of multiple port sites within the relatively small area of the gulf,[67] I discuss the interport relationships in the gulf.

In the absence of specific evidence from this region, the instructions of the *Kauṭilīya Arthaśāstra* (*KA*) are useful for understanding the possible infrastructural and logistical functions at a port. Such functions were to be carried out by specific offi-

64 Ray 2019a.

65 Ray 2019a, 100.

66 Gaur, Sundaresh, and Tripati 2007, 429, 438. The authors point out that the tidal range in the gulf region is the highest in India and second highest in the world (Gaur and Sundaresh 2014).

67 The north–south indentation of the Gulf of Khambhat is ca. 140 km; Bhavsar et al. 2014, 1000.

cials, called superintendents of the port (*pattanādhyakṣa*), who levied fixed custom duties with a mention of different rates for the merchants sailing to the ports, were in charge of repairs, docking, and scheduling the arrivals and departures of ships, and assigned captains and crew to the ships protecting the waters against enemies and possibly pirates.[68] Noteworthy is the role of the superintendent of shipping (*nāvadhaykṣa*), who was in charge of managing the operations of seafaring vessels (*samudra samyāna*) as well as ferries at the mouths of rivers and other bodies of water further inland.[69] This situation described in the *KA*, regarding the operation of royal ferries and duties paid by the ferries to operate, is somewhat similar to what the *PME* describes: vessels had to wait for the fishermen with their boats to lead their way to Barygaza.[70] Likely, large seafaring vessels, which moored offshore, had to use the ferry services to alight both sailors and cargo. This kind of mediation by local ferry systems was perhaps also useful for keeping track of the goods and taxes, as unstamped cargo and cargo with excess load were to be confiscated.[71]

Seals (*mudrā*) could be used to stamp the cargo. Various terracotta seals found at Hathab help us to conjecture the administrative functioning of the port towns better by suggesting the presence of an official, ruler, or even a guild leader. Dated to the first century CE, one seal bears a name and identifies him as an official of Hathab.[72] However, a much larger number has been reported from the period between the third and fourth centuries. About 300 in number, these sealings bear remnants of personal names and sometimes city names (*hastakavapra*) inscribed in Brāhmī.[73] The usage of seals by cities, monasteries, and professional corporate bodies is mentioned quite commonly in literary sources, alongside which various sites in the region have yielded a number of terracotta seals and sealings bearing the names of cities that perhaps had the status of city-states or *naigama*, corporate bodies involved in administration, operating in the early centuries CE.[74]

Apart from the internal regulations of a port, the relationship between neighboring ports, situated closely together, is worth mentioning. These ports may have been commercially complementary, auxiliary, or competitive to each other at different points in time. Some archaeologists suggest that auxiliary ports in the Saurashtra region may have served as buffer trading zones when the main ports had suffered from seasonal silting.[75] Accordingly, offshore mooring might have allowed contact and exchange with more than one port at a time. Considering the locations of the ports,

68 *Kauṭilīya Arthaśāstra* (*KA*) 2. 28. 8–13.

69 *KA* 2. 28. 26.

70 *PME* 44.

71 *KA* 2. 28. 25.

72 She dates the seal in Pramanik 2004, 134. In a later publication, Pramanik (2005, 107) rereads the seal as "*swāmi sanghadamana hastapradhikari rajnīya.*"

73 Pramanik 2005.

74 For a discussion on cities as corporate entities, see Dwivedi, vol. 2, ch. 5, 226–228.

75 Gaur, Sundaresh, and Tripati 2013.

Hathab in the western coast of the gulf, Bharuch on the east, and Khambhat and Nagara on the north, mooring offshore provided an opportunity to access any of the four ports. Also, the fact that the approximate distance between any two of these ports is no more than ca. 75 km (as the crow flies) makes their relationship with each other more important.

Nagara is a good example of a relatively smaller port or perhaps even a feeder port. Though not mentioned in the *PME*, Nagara was also an important commercial center and the largest site in the Mahi and Sabarmati basin. The archaeological remains indicate that it may have been a manufacturing center for crafts related to lapidary skills, shell working, glass smelting, and even textile production.[76] The presence of amphorae sherds in the archaeological assemblage also indicate its connectivity with neighboring ports, with Nagara being the gateway to the inland northern route to Rajasthan via Vadnagar and Shamalji.[77] Similarly, within the Narmada cluster, Gandhar and Kantiyajal as the northern- and the southernmost coastal sites, respectively, may have also acted as smaller fishing settlements and feeder ports to Bharuch.

Alternatively, the prevailing practice of piracy that was still observed in more recent periods suggests the possibility of rivalry and competition between the ports. Remnants of fortifications of the port sites, especially Hathab and Bharuch, also attest to the possibility of precautionary measures adopted by the port cities.[78] Sātavāhana and Śakas are noted to have competed for trade by blockading passes, and they perhaps also solicited the cooperation of fishing communities to direct the ships toward their respective ports in present Maharashtra and Gujarat regions, respectively.[79] The adoption of such strategies indicates that not all ports were always complementing each other.

III.2 Mobile Pastoralists and Forest Communities

Gujarat neighbors the arid area of present-day Rajasthan in the north and shares its eastern border with forested areas of Madhya Pradesh and Maharashtra. The plateaus, though not very fertile, provide for a vast foraging ground, and the higher altitude areas, especially around the Narmada, support forested areas. From both these areas, frequent movement of people and goods to coastal settlements sustained regular channels of intraregional connectivity.[80] Both these groups – mobile pastoralists and forest dwellers – sustained different patterns of long-term interactions be-

76 Bharucha 2022, 120–121. Hawkes (2021) associates the presence spindle whorls with textile production.

77 Bharucha 2022, 118–121.

78 For evidence of defensive fortification at Hathab, see Pramanik 2004, 137; for Bharuch, see IAR covering years 1959–1960, 19 and Keller 2015, respectively.

79 Seland 2010, 54–55.

80 Stiles 1993; Agrawal 1999.

tween coastal settlements and inland areas. The actual literary and material evidence for understanding the role of actors involved in the process of production, procurement, and supply is scarce. Therefore, the following is based on the fuzzy evidence of our sources and interdisciplinary studies of long-term practices in these regions.

Anthropological studies show that after the monsoon rain in Gujarat, the agropastoral groups from Rajasthan move every year to the replenished pastures in Gujarat, especially in years of drought and crop failure.[81] Unlike the irrigated agriculture in Ganga and the Indus valleys, agriculture in the Gujarat region was dry farming, with pearl millet (*bajra*) and sorghum (*jowar*) as the subsistence crops in the region. These drought-resistant plants, which mature within a short period of 85–90 days and provide abundant fodder, were adopted as the main type of food grain in the region.[82] Animal rearing and herding was also practiced by the sedentary agrarian community. However, it is not unlikely that a large number of those tending animals were semi-sedentary pastoralists who were mobile only seasonally.

A study of the movement patterns of agropastoralist shepherds in this region has shown that they migrate seasonally from Rajasthan to the greener pastures of Gujarat and other neighboring states. Their migration period lasts for 7–10 months on average and covers between 750 and 1,500 km.[83] In modern ethnographic studies, these agropastoral mobile groups of Gujarat/Rajasthan have been found to be market agents. The mobile groups were familiar and up to date with changes in technology as a result of constant interaction with sedentary settlements. Even in modern times, their organizing principles of movement continue to be kinship based. During their movement, they would engage with settled communities by providing animal products, labor, and at times transport facility.[84] Even in the early historic phase, it was likely that the mobile pastoral groups acted as mediators of knowledge and technology transfer through their repeated patterns of movement. The close interaction between settled communities and the mobile agropastoralists can also be ascertained from the pottery remains found at the temporary dwelling sites, where the pottery culture was found to be similar to those used by the settled community for storage and transport purposes.[85] It would not be wrong to suggest that the mobile agropastoral groups were important actors in maintaining steady and repetitive exchange and transport networks in this region.

Forest products are most commonly cited as goods being exported from the west-coast ports. The relationship between forest-dwelling communities (*aṭavika*) and the state, for the acquisition of forest produce by the latter, was based on a long-term

81 Agrawal 1999, 82–84.

82 Sonawane 2000, 138.

83 The observations on these seasonally mobile herding groups are based mainly on the socioeconomic practices of the Raikas and Rabaris of Rajasthan and Gujarat, respectively; Casimir 1996, 155–156.

84 Agrawal 1999.

85 Bharucha 2022, 87–88.

and constant interference by state representatives through both conflict and cooperation.[86] South Gujarat, especially the Narmada-Tapti valley, is known for its forest cover in ancient sources. Identified as the *saurāṣṭraka vana*, this forest was one of the eight elephant forests of the subcontinent.[87] These forests were the local source of timber, arecanut, and ivory besides other plant and animal products.[88] The *vana* type of forest is a relatively tamed or cultivated form in comparison to *araṇya*, which is the wild form. Active intervention in forest areas for commercial production has already been explained well by Morrison and Lycett in the context of the Western Ghat forests.[89] They have also shown that acquisition of commercial forest products was a result of active intervention by foragers and gatherers, who practiced selective cultivation within the forest. They suggest that the forest-dwelling communities practiced unconventional methods of cultivation and plant care throughout the production process. Forest dwellers were involved in multiseasonal cycles of growing, caring, harvesting, drying, and finally shaping plant-based commodities in transport-friendly form. In addition, forests were zones for the capture of live wild animals as well as for their hides and fur.[90] Stiles also proposed that the hunting-gathering communities brought commodities to the city markets and traded them for grain, salt, metal tools, cloths, etc. River transport may also have allowed easy transport of forest products. For example, timber running on the Narmada was a viable method of transport from forest regions further inland. In the nineteenth century, vessels of up to 40 tons plied the last 100 km stretch of the Narmada River down to Bharuch, allowing for the possibility of substantial riverine transport in the early historic period too.[91]

III.3 Religious Networks

The region connects to the other parts of the subcontinent through its multireligion heritage. Buddhism, Jainism, Shaivism, and mother-goddess cults have been attested in archaeological assemblages during the early centuries CE.[92] It is not improbable that the sacred spaces in areas around the gulf were shared. Shared ritual sites and sacred spaces also relate to the sharing of resources, especially hydraulic infrastructure. In the early historic phase, when almost all of the surviving architectural remains of the subcontinent are of a religious nature, religions and their material ex-

86 See Parasher-Sen 1998 for a discussion on normative strategies of negotiation and interference by the state in forested regions.

87 Trautmann 2009. See also Stiles 1993 for the possible extent of the catchment area of the forest.

88 The floral profile of the region involves teak, *babul*, *semal*, and a variety of other semideciduous trees, and nearer the coast, coconut, arecanut, and others, see Paul 2017, 10.

89 Morrison and Lycett 2013. See also Morrison 2002.

90 Stiles (1993, 161) lists the wild animals in demand in the Mediterranean region.

91 Deloche 1996, 36.

92 Ray 2019a; Mishra and Ray 2019.

pressions were important vehicles of knowledge networks as well as material transfer. As will be discussed in detail below, the worship of some of these deities is associated with seafaring activities, and others with religious organizations, acting perhaps as trustees if not controllers of artificial water reservoirs.[93] But before we discuss religion as a network, I will briefly outline the religious milieu of the areas around the Gulf of Khambhat in the early historic period, which connects the region to larger networks of knowledge and ritual.

The coastal regions of Gujarat had a strong religious influence. While Buddhist, Jaina, and other elements of the compound Hindu traditions were very clear threads of interregional belief systems in the region, folk deities also had an important place in the material milieu. One example of a folk religion is that of fertility-goddess worship. The worship of Lajjā Gaurī, the goddess depicted in the squatting position of giving birth, has its roots in the protohistoric culture that spread within the subcontinent by the early medieval period.[94] Her worship may have been related to folk traditions of fertility medicines, maternal care for women at various stages of pregnancy, and childbirth assistance. A type of punch-marked coin with representations of the squatting goddess had circulated in this region between 200 and 50 BCE.[95] Also, one of the earliest known shrines (first century BCE) dedicated to her has been found at Padri, one of the sites in the Shetrunji cluster (map 2).[96] By the sixth century CE, 12 more sites in the southern part of Gujarat show evidence of her shrines.[97] A second example of the extra-local network of goddess worship is associated with the seafaring communities. At various sites around the coasts of Khambhat, shrines of a mother goddess for the seafaring community have been reported, and she is identified as Vahāṇvaṭī Mātā or Śīkotarī Mātā.[98] The fishing communities, such as Khavas and Kolis of the modern period, paid homage at the temple during the fishery season. This sea-goddess cult has also been associated with the cult on the island of Socotra in the western Arabian Sea.[99]

The sixth-century text *Skandapurāṇa*, which mentions the worship of the goddess in the area of the Gulf of Khambhat, also recalls that the sage named Bhṛgu, one of

93 For example, the networking role of Buddhism and Buddhist monasteries has been mentioned in Dwivedi, vol. 2, ch. 14, 749–751.

94 For the regional renditions of the cult and its expanse known from archaeological contexts, see Korisettar et al. 2010.

95 The coin type depicting the squatting goddess has been previously identified as Lakṣmī, see van't Haaff 2004, 24, 33–34. However, based on the region's close association with Lajjā Gaurī, I propose that the goddess depicted in squatting position could be Lajjā Gaurī.

96 Shinde 1994.

97 Shinde 1994, 484. See also Mishra and Ray 2019, table 3.3.

98 Gaur and Sundaresh 2016.

99 Strauch 2012, 390–403. One of the possible early dates for the textual record of the deity comes from the *Skandapurāṇa*, dated approximately between the sixth and seventh century CE. For the text's date, see Cecil 2020.

the seven primal sages in the Hindu tradition, had migrated to and settled on the banks of the Narmada. It is for this reason that the city was called Bhṛgukaccha, the coast (*kaccha*) being named after Bhṛgu.[100] Within the excavated area of Bharuch, a religious site dedicated to the sage Bhṛgu has been found. In addition, at Hathab, a spiral stepwell with the walls descending like the 'coil of a snake' is identified with the early worship of Viṣṇu.[101] At Prabhas Patan, the coastal site at the extreme west coast of the Saurashtra region, the Shaivite culture is attested in the archaeological remains. One of the Kṣatrapa inscriptions also identifies the city as a *tirtha*, a city of religious pilgrimage.[102]

Even though the presence of Buddhism and Jainism in the area is well attested in the early historic period, full-fledged *stūpa* structures have not been found within a 70-km radius of the coast so far. Instead, five rock-cut complexes have been found in the Saurashtra and Lāṭa areas (map 1). The identification of Jaina architecture and rock-cut caves has been difficult for the early historic period; however, the sculptural and textual traditions have shown the presence of Jainism.[103] Buddhist caves, however, have been identified more easily. These cave complexes were part of the larger Buddhist religious and route network that was shared with traveling mercantile groups. Established and maintained mostly by religious donations for merit, the rock-cut cave shelters in the plateaued areas were the result of both royal and private donations to the Buddhist *samghas*. These practices connect the Saurashtra region to the larger circuits of *dāna* (religious donation) in various parts of the subcontinent, which have been discussed in previous volumes of this Handbook.[104] The closest counterparts to these structures are the cave complexes in the western Deccan, for example, Kanheri, Junnar, Nashik, and the famed Ajanta-Elora cave complexes in Maharashtra.[105]

As discussed above (section II.3), the closest rock-cut cave shelters to the Gulf of Khambhat are located at Talaja and Kadia Dungar. Apart from functioning as a religious center, a special node of convergence, they may have also acted as anchor points for travelers, not only pilgrims, but traveling monks and merchants alike. Talaja is situated on the bank of the River Shetrunji, about 10 km inland on the western coast of the gulf.[106] Kadia Dungar, on the other hand, is situated on the land route between Kamrej and Bharuch, which went further eastward to Ujjain. A partially weathered inscription in one of the excavated chambers of the cave reads that the cave was

100 Desai 1993. For the date of the text, see Cecil 2020.

101 Pramanik 2004, 137.

102 See Ṛiṣabhadatta's Nashik cave inscription in Mirashi 1981, no. 43.

103 For a detailed discussion on the religious landscape of Gujarat, see Mishra and Ray 2019, 53, 102–157.

104 Dwivedi, vol. 1, ch. 10.A, 444–445; vol. 2, ch. 14, 749–751.

105 Ray in her various writings (e.g., 1986, 1994a) has discussed the importance of these cave complexes in the early historic networks of transportation for both goods and humans.

106 IAR covering years 1954–1955.

excavated for the good of humans and animals alike.[107] Therefore, like other rock-cut complexes of the Western Ghats, Kadia Dunger must have worked as a location marker for a resting place, water station, and mountain pass, helping those traversing the forested hilly regions.

The multiplicity of ancient shrines around Barygaza is also noted in the *PME*.[108] In addition, the author of the *PME* also mentions large wells as a notable feature of this region. The construction of cisterns and wells was a significant element in water-storage tradition in most of the early historic period. Also, the direct involvement of the religious organizations in the hydraulic landscaping of early historic South Asia has already been established by scholars.[109] In Gujarat too, the connection between monastic structures and water-storage methods is noted, even in the contexts of the rock-cut complexes. One example is that of Junagarh, which has the much-discussed Sudarshan Lake, constructed during Candragupta Maurya's reign and repaired once during his grandson Aśoka's reign and again under Rudradāman, a Kṣatrapa ruler.[110] This lake is situated at the foot of the Girnar hill, which has one of the most elaborate rock-cut structures bearing elaborate inscriptions in Gujarat. On the hill, the excavated chambers were found to be connected by water channels, which led to cisterns cut into rocks for water storage.[111]

Apart from epigraphic records of the involvement of monastic organizations in water-storage practices, archaeoanthropological studies have shown relationships between local fertility cults and cisterns and wells. An example of an early historic spiral stepwell from Hathab has already been mentioned above. Mishra and Ray draw from the longer tradition of practices that associate stepwells as subterranean centers of worship and respite.[112] These also served as landmarks and shelter for travelers during the scorching heat of the summer. Beside Lajjā Gaurī, terracotta images of other mother goddesses (*mātṛkā*) have also been reported. The votive tanks reported from excavations at Shamalji and Vallabhi from the third to fourth century CE were also related to water rituals.[113]

III.4 Travelers across the Ocean

As the movement across the Indian Ocean and through the subcontinent is ascertained, here I discuss the available evidence for visitors and nonlocal settlers, known

107 Bharucha 2022, 111.

108 *PME* 41.

109 For example at Sanchi, see Shaw and Sutcliffe 2003a; 2003b; Shaw 2013; 2018. For the Punjab region, see Ray 2010, 203–209.

110 This was recorded in Rudradāman's inscription dated ca. mid-second century CE.

111 Shaw and Sutcliffe 2003, 93–95.

112 Mishra and Ray 2019, 130–131.

113 Mishra and Ray 2019, 134. Also Patel 2007, 1386–1387.

to have been moving in and out of the western coast of South Asia. The sources for this assessment are both epigraphic and archaeological in nature. The section also contains a commentary on what identifying something as 'foreign,' be it a person or an artifact, means in the current understanding of long-distance networks.

III.4.1 Addressing the Yavanas

Two terms, *mleccha* and *yavana*,[114] were commonly used to denote the 'foreignness' of individuals or communities. Both terms denote linguistic and cultural differences. Semantically, the term *mleccha* refers to any 'non-Vedic' and 'non-*ārya*' group of people, who could be outcast or even foreigners. However, the terms *yona* and *yavana* were more specific and may have been the Sanskritized versions of the Old Persian term *yauna*, denoting the Ionian Greeks.[115] The commonly accepted understanding is that the term *yavana* in earlier texts denotes the Indo-Greeks or at least the Greek-speaking people of the northwest and of the western Deccan. From the fourth century onward, Indic religious texts mythologized the Indic origins and genealogies of the Yavanas as an ethnic group.[116] Their presence in the subcontinent and their involvement in the political space and social practices are well attested in the epigraphic records from the third century BCE onward. In terms of political presence, rulers in the West such as Antiochos of Syria, Ptolemy of Egypt, Antigonos of Macedonia, Megas of Cyrene, and Alexander of Epiros are mentioned as *yona-lāja* (Yona kings) in Aśokan rock edicts (RE II and XIII) of the third century BCE. In addition, the presence of the *yavanas* as subjects of the Mauryas in the northwest is also mentioned in Aśokan RE V and XIII. The post-Aśokan second-century BCE eulogical inscription of Khāravela from Odisha also mentions the presence of a certain *yavana* ruler in the Ganga-Yamuna region.[117] We also find references to the *yavana* as officials. An example comes from Besnagar, near Vidisha, where a *yona-dūta* (Greek ambassador), Helidoros, a resident of Taxila and a worshiper of Viṣṇu, raised a pillar in honor of Viṣṇu in 113 BCE.[118] Apart from being mentioned as political figures, the *yavanas* are also mentioned as lay donors at the Buddhist *stūpa* remains at Sanchi in central India and in rock-cut caves at Karle and Junnar in the western Deccan.[119] In the south as well,

114 When associated with an ethnic community, I write the term *yavana* as Yavana following the modern orthographic practice.

115 Ray 1988, 312; Selby 2008, 82.

116 For the mythical genealogies and lineages discussing origin of the Yavanas, see Karttunen 2015, 338–344.

117 Kant (2000) challenges the reading of the term as *yavana* and suggests that it should be read as *yamuna*, denoting the Yamuna River.

118 Karttunen 2015, 210; see also Lüders 1912, no. 669.

119 For a summarized collection of epigraphic evidence with the term *yavana* and related references, see Karttunen 2015, 213–216.

early historic Tamil texts have repeated mentions of the term *yavanar*, which is used to note the nonlocal merchants. The term *yavanar*, therefore, was triply imported, borrowed from Sanskrit *yavana*, which had been borrowed from the Old Persian term *yauna.*[120]

References to *yavanas* from Saurashtra are no different from those found in other regions. The epigraphic evidence records the presence of the *yavanas*, not just as visitors but also as inhabitants. Rūdradāman, a Western Kṣatrapa king ruling in the second century CE, records a historical incident in his inscription, in which Aśoka's governor Tuṣāspha, a *yavana-rāja* (Yavana king) had repaired and expanded the Sudarshana Lake near Mount Girnar.[121] It is noticeable that the region was inhabited by Greek/Greek-speaking people from Aśokan times. In fact, by the first and second centuries CE, communities of Greek origin may have settled and assimilated with the local population.[122] This is attested by the Sanskritic names of donors and travelers from different cities within the subcontinent identifying themselves with the title "*yavana*" in their epigraphic records, both within the subcontinent as well as across the Indian Ocean.[123] An example of the latter, i.e., an Indian resident, Candrabhūtimukha, identifying himself as a "*yavana*," comes from one of the various successfully deciphered inscriptions at Socotra Island in the Persian Gulf.[124] It is generally accepted that the *yavanas* as a linguistic- and ethnic-identity group were not just the Graeco-Roman communities and those of distant origins, but perhaps any community with Greek-speaking ancestors residing in the western or northwestern region of the subcontinent.[125]

III.4.2 Mobile Artifacts as Identifiers of Movers

Mobile artifacts are representations of the mobility of people. The notion of nonlocal artifacts refers here to items both of Indic origin or style found outside the of Indian subcontinent and those of Mediterranean origin or style found in the Gujarat region. There is no singular explanation for why nonlocal artifacts show up in distant regions. The possibilities include, but are not limited to, the presence of a steady trade, the

120 Ray 1988, 312.

121 Mirashi 1981, no. 51. It is interesting to note that this inscription, dated ca. 150 CE, was issued on the boulder that already bore the Aśokan edict. This boulder at Junagarh, which contains the third-century edicts of Aśoka in Prakrit, also bears a third inscription, attributed to the Gupta ruler Skandagupta and dated ca. the mid-fifth century CE.

122 Ray 1988, 315.

123 For a study of the use of the title of Yavana in donative records in the western Deccan, see Ray 1988; Karttunen 2015.

124 See case 14:17 in Strauch 2012, 183.

125 On the issue of 'Greek' and 'Greekness' in the northwestern part of the subcontinent, see Bhandare 2018.

settling of diasporic communities leading to transfer and adaptations of crafting knowledge, personal items lost or gifted by travelers, and/or local production as imitation of foreign artifacts. Coins, moreover, circulate and may end up in contexts very different from the original purpose of their arrival. Volume, frequency, and contexts of the finds are some important factors to consider when items are studied in their nonlocal context. Below, I discuss three types of nonlocal, or seemingly nonlocal, artifacts: singular objects of art, ceramics, and coins.

Finds of singular foreign-looking objects, such as terracotta plaques and remains of ornate bronze handles, from different parts of the subcontinent have often sparked debates about how these can be understood in broader discussions about Indic trade relations with the Mediterranean. For example, Suresh argues in favor of such items being gifts and dismisses the idea of a large-scale market for Roman art-based artifacts in India.[126] He explains that such finds are very small in number and are often found in Buddhist monastic contexts as part of special lavish donations, especially in the Gujarat-Maharashtra context. On the other hand, Cobb and Mitchell present an interesting discussion arguing in favor of local demand for such items.[127] They use the example of an alabaster piece found near Junnar (Maharashtra), which is identified as a representation of the god Eros in an egg. Rather than considering it as a possession of a nonlocal merchant staying temporarily, they propose its ownership by a local resident. Suggesting that such pieces should be understood in larger contexts, they argue in favor of Indian demand for Mediterranean goods. In either case, familiarity with and use of Mediterranean products are important pieces of evidence of connectivity.

Another commonly cited representation of Eros on a bronze handle comes from Gujarat. Most likely part of a wine pitcher, the remaining handle was reported from Akota, ca. 70 km north from Bharuch.[128] From the same site, two terracotta seals with depictions of prancing horses have also been reported, which are considered to be inspired by a Mediterranean style.[129] From inland Gujarat too, Roman or at least seemingly Roman items were reported. Another interesting case is that of a sealing found at a Buddhist monastic complex in Vadnagar (Gujarat).[130] The sealing bears an impression of a Roman coin issued under Valentinian I (321–375 CE) and has a Brāhmī legend on the opposite side. It was found along with an imitation of a Graeco-Roman terracotta plaque and an amphora-like handled jar and a torpedo jar. Such local imitations are also indicative of local demands.

Among the different types of material remains, ceramics are one of the most durable. Their importance in the study of the past is also critical, as they may be used

126 Suresh 2004, 131–132.
127 Cobb and Mitchell 2019.
128 Subbarao 1953, 6.
129 Subbarao 1953, 87.
130 Rawat 2018, 34.

to understand the patterns of production, transportation, and consumption of their users. Many archaeological excavations have yielded Mediterranean-style pottery. Roman amphorae are the most easily identified among the nonlocal pottery. Even though these have been reported in higher volumes more commonly from coastal sites in the Konkan and the Malabar coasts, amphora sherds, unsurprisingly, are by no means absent in Gujarat.[131] Amphora sherds were found not only around the famous port regions, Bharuch and Hathab, but their presence is also noted further inland. Of the 55 sites where fragments of Roman Dressel 2–4 amphorae have been found, 25 are in Gujarat, and 13 of these are clustered around Junagarh.[132] Their presence at sites such as Nagara, Amerli, Vadnagar, Akota, and others[133] also indicates their spread in a system of local connectivity. While it is possible that these sites saw consumption of imported Mediterranean goods, especially olive oil and wine, recycling and reuse of storage jars for transport of local products is also a possibility.[134] It should be emphasized, however, that absolute figures tell us little about their role in the circulation of goods and people more generally. In comparison to regional pottery, the numbers and extent of non-Indic pottery are very small. For example, in Gujarat at large, only 25 sites have yielded amphora remains, while more than 400 sites have been reported with the regional deluxe red polished ware.[135]

Roman coins are another noteworthy type of artifact defining our understanding of Indo-Mediterranean relations. Whether as valuable trinkets, ornaments, or as widely accepted currency, their role as valuable nonlocal items in Indic society has been a subject of discussion.[136] Roman coins have also been reported from Gujarat.[137] Their gold and copper versions are more common in comparison to silver issues. In fact, two of the largest hoards of Roman gold coins were reported from Gujarat, one of more than 2,000 coins found at Ahmedabad, and the other of 500 from Kera in the Kachchh district.

As in other regions of the subcontinent, modifications to the coins in the form of piercings and attachments of loops for ornamental purposes have also been reported from Gujarat.[138] Irrespective of the monetary or ornamental uses of Roman coins, these coins had their own market in the Indian subcontinent. The author of the *PME* mentions a profitable exchange of Roman gold and silver coins against local currency at Barygaza (*PME* 49). Such demands were also supplied by imitations. For example, molds found at Palanpur (Gujarat) were used to produce imitations of Roman coins

131 For the ongoing study of Roman pottery in India, see Tomber 2008; 2009; 2017.
132 Ray 2019a, 106.
133 Patel 2007, 1387–1388; Paul 2017, 181.
134 For a discussion on the reuse of amphorae, see Pecci et al. 2017.
135 Suresh 2004, 101. For the red polished ware, see sec. IV.3.
136 For foreign coins as money or just objects, see Dwivedi, vol. 1, ch. 10.A, 456–458. See sec. IV.4 for more on the monetary systems.
137 Rajgor 1997.
138 Rajgor 1997. A list of find sites has also been provided by Suresh 2004, 173–175.

as medals or pendants.[139] The Roman issues and their imitations can be best understood as evidence of local monetary practices as well as intraregional Indic monetary traditions (sec. IV.4).

IV Networks of Knowledge

The *PME* lists an array of items that were traded from Bharuch/Barygaza, which were either procured from distant areas or produced and crafted nearby. Archaeological and anthropological studies from the Saurashtra region are also not incompatible to the information of the literary texts. Activities that were directly related to the production of commodities exported to other regions included shell working, timber production, glass making, bead making from both glass and precious stones, metal working, cotton cultivation and textile production, specialized pottery, especially the red polished ware (RPW), and last but not least, owing to the region's coastal heritage and long-standing tradition of maritime activity, the craft of boatbuilding. Although all these craft activities were significant in shaping the long-distance trade of this region, I discuss in detail only those crafts that reveal the local character of production and distribution around the Gulf of Khambhat. The institutions and practices of production in return assumed an important cultural role in how the craftsmen defined and represented themselves. Certain crafts had ritual importance, and some became carriers of specialized knowledge that shaped their distribution and consumption. The crafts discussed here are boat construction, the cotton textile industry, and the special RPW of Gujarat region. In addition, the coinage system of this region also exhibits its own relation to different knowledge traditions that is worth exploring. All these crafts had various links in the networks of knowledge sharing on both vertical and horizontal axes, i.e., temporal and spatial, respectively.

IV.1 Boatbuilding

The material evidence for navigation and port development in the Gujarat region goes back to the Bronze Age, if not earlier.[140] Fair-weather sailing is mentioned as one of the characteristic features of Indian seafaring.[141] Seasonal winds were used

139 Suresh 2004, 79.

140 The excavation at Lothal, situated at the northern end of the Gulf of Khambhat, revealed a settlement of ca. 6.47 ha. A dockyard of 37 × 21.8 sq. m was also discovered during the excavation (Rao 1985). For terracotta seals depicting sea vessels and clay models of boats, see Rao 1965.

141 Observations on different kinds of tides and winds expressed in similes and metaphors in literary texts from 1500 BCE onward have been used to understand sailing knowledge in the subcontinent (Tripati 2017).

for both coastal and transoceanic voyages, and boats were hauled ashore for drying and repairs at the end of the sailing season.[142] One of the most commonly observed features of Indian seafaring vessels is that they drew little water and could enter into the estuaries of rivers. There are many references to dugouts, boats carved out from logs that plied the riverine streams. However, large seafaring vessels operated by merchants of Barygaza (Bharuch) are also known. They supplied bulk items, such as copper and timber, including saplings and logs of Indian sissoo, ebony, and teakwood, to the ports on the Arabian coast.[143]

Sailing habits therefore are to be seen in the context of vessel technology. Yet, although attested in a number of sources, actual material remains are limited. The only surviving boat discovered so far is a wooden dugout canoe preserved in a wharf at Pattanam.[144] However, visual representations of ships and boats give an idea of the construction and appearance of Indic boats.[145] Ethnographic studies, moreover, have revealed crafting traditions in terms of techniques and tools that were passed down across generations and still continue today.[146]

The vessels represented in Indian art have two or three main masts with no grid-pattern reinforcement, which was a common feature in Mediterranean-style vessels.[147] Most commonly discussed are representations of ship types on Sātavāhana coins in the first and second centuries CE.[148] Different coin types show different numbers of masts ranging between two and four. Fig. 4 is an example of a lead issue showing a double-masted ship. Apart from offering insights into the designs of ships, representations of ships on coins show the importance attached to the political and cultural self-representation of the Sātavāhanas, who may have aimed to declare their participation in maritime activities. Bhandare suggests that the ship-type coins of the Sātavāhanas were issued for circulation in particular regions focusing on maritime networks, most notably the eastern coast of the subcontinent.[149]

Also noticeable are the graffiti of ships in different contexts, including pottery sherds and cave walls even beyond the subcontinent. From Khor Rori, Sumhuran, a graffito of a double-mast ship dated to the pre-Islamic period seems identical to the ships represented on the Sātavāhana coins.[150] At Myos Hormos too, there are six rock

142 Ray 1995, 98.

143 *PME* 36 with Casson 1989, 73.

144 Although in decayed condition, paleobotanical studies show that the boat was made of a single log of Anjili (*Artocaprus hirsutus* Lamk.) dated to ca. 100 BCE. See Cherian et al. 2009.

145 Apart from representations of sea vessels on coins, they can be found on Buddhist relief sculptures, as well as graffiti on potsherds and cave walls. See Deloche 1996; Tripati 2011.

146 Varadarajan 1995, 168. See also Ray 2003, 59–63.

147 F. C. Wild and J. P. Wild 2001, 218.

148 The ship-type coins were issued by Vāsiṣṭhīputra Puḷumāvi (88–116 CE) and then continued by two later kings, Vāsiṣṭhīputra Śātkarṇi (116–145 CE) and Gautamtīputra Yajñaśrī Śātkarṇi (165–194 CE). See Reddy 2014, 69.

149 Bhandare 1999, 126–128.

150 See fig. 4 in Avanzini 2008.

Fig. 4: A Sātavāhana coin representing a double-masted ship (not to scale). BM 1905,1007.61.

engravings depicting ships. These carvings are found along with engravings of religious symbols, animals, human figurines, and a Greek inscription. While five of the representations are of single-mast ships, the sixth representation has three equidistant masts.[151] In the Hoq cave on the island of Socotra, inscriptions mention the arrivals of sailors and merchants from India from the first century CE onward.[152] Next to some of the Brāhmī inscriptions dating to the early centuries CE, there are three ship graffiti engraved on the cave walls along with other Indic symbols like *stūpas*, *triśūla* (trident), *cakra* (wheels), and lotus.[153] The only ship representation that is relatively clear shows three masts.[154] Similar representations of ships on cave walls are also present within the subcontinent. However, they have been dated to the sixth and the twelfth century CE from the Ajanta caves in Maharashtra and from a cave at Charmadi in Gujarat, respectively.[155]

Another special feature of Indian shipping was the sewn-boat tradition, instead of the use of nails for joining the planks. Though the *PME* mentions the sewn-boat-making technique, it is silent on whether this was practiced in India.[156] However, ethnographic study and evidence from a later period have been used to suggest that the sewn tradition was also followed in the Indian subcontinent.

Boatbuilding practices in the Indian subcontinent during the early centuries of the Common Era were mainly influenced by three technological traditions, though not entirely mutually exclusive. They are the coir-sewn tradition of the Arabian Sea including the east African coast, which is followed on the western coast of India; the

151 Whitewright 2011.
152 See also sec. II.3.1.
153 Strauch 2012, 100, 364.
154 Strauch 2012, 364.
155 Schlingloff 1976; Sonawane 2011.
156 For a discussion on the sewn-boat tradition and comparisons, see Pomey 2011.

jong tradition of Southeast Asia that had its bearing on the seafaring traditions of Bengal and Orissa; and outrigger-style boats of the Austronesian/Indonesian tradition that influence seafaring practices on the islands of Lakshadweep, where wooden-plank joinery approximates the coir-sewn tradition.[157] On the western coast of the subcontinent, plank joinery is divided into two sets of technique in the early medieval and medieval period, depending on the size of the boat: (a) coir stitching and (b) *vadhera*.[158]

The western Deccan was a producer and exporter of both timber and coir used in ship construction. The commercial farming of coconut trees – the most important source of coir for ropes, which are important for the construction of sail boats – can be noted from the epigraphic records.[159] These resources were used for manufacturing boats on the western coast but also were important export items across the Indian Ocean. Export of timber and cotton from the Indian subcontinent is also mentioned in the Graeco-Roman texts.[160] At Quseri al-Qadim, a port on the Red Sea coast in Egypt, wooden brail rings of the Mediterranean style have been found that are made of Indian teak and east African blackwood.[161] In addition, some sailcloth fragments datable to the late first or early second century CE from Myos Hormos and another Red Sea port, Berenike, were found to have been made of Indian cotton.[162] The use of Indian cotton in Mediterranean-style ships suggests two possibilities: either that the sails were made from imported cloth brought from India to Egypt or that the ships were repaired in India with Indian material.[163]

While boatbuilding technologies were a result of influences from different traditions, the craft also had regional characteristics. Representations of boats in local art, and art from across the sea – for example on the island of Socotra, at Khor Rori and at Myos Hormos – have been found, along with other religious symbols. Ray argues that sailing communities and religious organizations were connected at various levels.[164] The presence of shrines in coastal regions not only acted as points of orientation for sailing vessels but also were places where both inland and coastal communities came together. Places of cult and ritual thus became centers of knowledge sharing, about both markets and technologies such as boatbuilding. Over time, boat-making techniques developed through knowledge acquired from contacts across the sea. From the representation of sea-going vessels in the Charmadi cave in south Gujarat, we learn that seafaring communities were aware of an external rudder system. The

157 Varadarajan 1995, 168–173.

158 For boatbuilding techniques in the later period, see Varadarajan 1995.

159 Chakravarti 2017, 324–325.

160 *PME* 36; 48; Pliny *NH* 16. 80. 221.

161 The site has been identified as ancient port of Myos Hormos. Strabo (*Geography* 2. 5. 12) wrote that 120 ships sailed from Myos Hormos to India. For the evidence of ship remains, see Blue, Whitewright, and Thomas 2011, 196.

162 Blue, Whitewright, and Thomas 2011, 196. See also Whitewright 2018, 153–155.

163 F. C. Wild and J. P. Wild 2001, 217–218.

164 Ray 2019b.

image itself cannot be dated due to a lack of archaeological context, but the external rudder was developed in China in the second century CE.[165] The craft of boat making, therefore, did not remain unchanged. Special crafts were adopted and shaped the identities of groups who in return added to existing knowledge systems. The boat-making tradition is a particularly good example of this.

IV.2 The Cotton Industry

Cultivation of cotton in the Indian subcontinent has been traced back to the sixth millennium BCE. However, evidence of spun and woven cotton fabrics in archaeological contexts are known only from the third millennium BCE, during the Indus Valley Civilization and Chalcolithic Period.[166] By the fifth century CE, trade in cotton cloth across the seas was recognizably prominent, and as a result, Brancaccio suggests the presence of the 'Cotton Road' analogous to the 'Silk Road.'[167] With this, she highlights the development of a production and trade network in association with the Buddhist monastic-mercantile network that developed in the western Deccan, clearly visible in the presence of the rock-cut-cave circuits.[168] These rock-cut monastic caves are situated in the lava-trap land formations of the Deccan, recognized by the predominance of black or *regur*-type soil. Derivatives of trap lava and thus moisture retentive, the black soil is considered most suitable for the cultivation of cotton.[169] The modern state of Gujarat, along with parts of Maharashtra, Rajasthan, Madhya Pradesh, Andhra Pradesh, and Karnataka, falls in the black-soil belt of the subcontinent. Saurashtra and Lāṭa, therefore, emerged as an important center of cotton-textile production and experienced a long history and living tradition of cotton-cloth production, trade, and cultural identity. In this section, I discuss the production of the textile and its export and finally focus on how the presence of spindle whorls helps us understand the widespread nature of the weaving industry in the Saurashtra region.

Weaving and textile manufacturing was not only an economic activity, it also had social and cultural importance attached to it. In the Indic poetic imagination, cosmic

165 See Sonawane (2011) for the representation of the ship with an external rudder, and Cai et al. (2011) for the Chinese origin of the external rudder.

166 Fuller 2008, 3–6.

167 Brancaccio 2018.

168 The connection between the Buddhist monastic and mercantile networks in the western Deccan has also been often emphasized by Ray. See Ray 1986; 1994b; 1994a. For the relationship between Buddhist networks and trade routes in the northern part of the subcontinent, Neelis 2011.

169 However, black soil is not the only type of soil that supports cotton production. Various alluvial regions in southern and eastern parts of the subcontinent also produced cotton. Cotton from Madhurā, the Aparāntas, the Kalingas, Kāśī, the Vangas, the Vatsas, and the Mahiṣas are suggested to be the best in the *KA* (2. 11. 115). *PME* (62, 63) also mentions the production of fine cotton garments in the Ganga valley and in southwestern and southern India, which were exported from Muziris.

and celestial events have been explained with analogies of spinning and weaving. The *Atharvaveda* (ca. 1000–800 BCE) compares the day and night spreading light and darkness over the earth to the weaver throwing a shuttle over the loom.[170] At a more functional level, a treatise of statecraft recommended that government workshops employ destitute women in weaving workshops as a way to provide economic sustenance to them.[171] The list of destitute women included widows, abandoned women, crippled women, retired prostitutes, old servants of the king, and so on. The fourth-century CE treatise on *kāma* (desires), the *Kāmasūtra* of Vātsyāyana, also recommends spinning, dyeing, and tailoring as crafts that a woman can learn to sustain herself in times of adversity.[172] Apart from the state-owned weaving workshops and household-based independent weavers, weaving was also carried out by private professional associations, the *śreṇis*.

The presence of organized professional associations and corporate groups, *śreṇis*, that specialized in weaving is known from the epigraphic evidence from Mathura in Uttar Pradesh and Nashik in Maharashtra dated between ca. 100 BCE and 100 CE.[173] The weaver *śreṇis* were quite likely commercially successful. On multiple occasions, the *śreṇis* received a special kind of donations called "perpetual endowment" or "inexhaustible investment" (*akṣayanīvī*) on behalf of a religious organization. These endowments were donations of money, as capital, to be invested in the craft activities of a *śreṇi*. In return, a fixed part of the profit was to be paid as interest to the monastery for its expenses or maintenance.[174] The *śreṇis* were perhaps in an economic arrangement with the religious organizations, and the practice of special endowments as a strategy of mutual dependence may have ensured their sustenance even through the rise and fall of different polities. Professional associations indeed provided more security to both clients and members. The liability in the case of any monetary deposit and commission for a job taken as a member of a guild was to be borne by the guild.[175]

Even though there is no direct reference to weaver *śreṇi* in the region around the Gulf of Khambhat, a fifth-century inscription records the migration of a weaver's guild, specialized in the craft (*śilpa*) of silk weaving, from Lāṭa (the region around Bharuch) to the city of Daśapaura (Mandasor in Madhya Pradesh).[176] The members

170 *Atharvaveda* 10. 7. 42. See also Ramaswamy 2008, 2113; Verman 2013, 12–15.

171 *KA* 2. 23. 2, 11.

172 *Kāmasūtra* of Vātsyāyana (*KS*) 1. 3. 20.

173 Mirashi 1981, no. 38; Thakur 1987, 73.

174 From the epigraphic records that have survived, we find records of *akṣayanīvī*-type donations from Mathura, Kanheri, and Nashik in the early historic period and from the early medieval period at sites in Andhrapradesh. For further discussion and references, see Dwivedi, vol. 1, ch. 10.A, 445. For *śreṇis* as economic actors, see Dwivedi, vol. 2, ch. 5, 222–225.

175 *KA* 4. 1. 2–7.

176 The two Mandasor inscriptions by Kumāragupta I and Bandhuvarman dated to 493 and 530 CE, respectively. The first inscription talks about the weavers' guild moving to Mandasor and commission-

of this *śreṇi* are mentioned to have amassed stores of wealth with their craft; they commissioned a Sun temple and after a couple of decades also funded a renovation. It is not unlikely that Gujarat had other similar *śrenis* that were equally affluent.

Although clear textual references to the export of Indian cotton to both the Mediterranean and Southeast Asian regions become abundant only from the fifth and sixth century CE onward, steady commercial production of cotton in India and its export to the Mediterranean region is already known from archaeological and textual references in the early centuries BCE and CE.[177] Some of the earliest references are found in the writings of Greek historians, who refer to cotton as wool growing on trees that was used as cloth for various purposes.[178] Philological studies have suggested that cotton was introduced to the Mediterranean via Indian connections. The term for cotton in the Mediterranean languages was borrowed from the Sanskrit word *karpāsa*, adopted as *kárpasos* in Greek and *carbasus* in Latin.[179]

Apart from the familiarity of Indian cotton and the etymological link, Graeco-Roman texts also mention import of cotton from India. Arrian, a Roman historian, testifies about exported dyed cloth from various cities in South India and admires the fineness and the white color of the linen from India.[180] The *PME* also mentions the export of muslin and coarser cotton to Egypt from the port of Barygaza/Bharuch.[181] The admiration for Indian cotton is seen also in the archaeological finds across the Indian Ocean. Out of the surviving 400 textile fragments found during the excavations at Berenike, half of the textile remains were cotton.[182] Coarse cotton sailcloth of Indian origin was also found in the archaeological contexts at Berenike and Myos Hormos.[183]

Gujarat was a producer and exporter of cotton textiles. Although little can be said about the production process and workshops, terracotta spindle whorls help us to understand local textile production. Spindle whorls were part of the spinning process, one of the various multistage processes of textile productions, before the threads could be woven, dyed, and tailored. The spindle whorls could be made of bone, clay, faience, shell, or wood and were of varied sizes and shapes.[184] Of relevance here are

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ing the temple, while the second inscription mentions the funding of the restoration. See Chhabra and Gai 1981, no. 35.

177 For discussions on the cotton trade from the early medieval period and later, see Brancaccio 2018; Varadarajan 2018.

178 Herodotos (Hdt. 3. 106) writes about Indian cotton as wool that is grown that surpasses the beauty and excellence of that from sheep. Strabo (Strab. 15. 1. 20–21) cites Nearchos on the wool-bearing trees that had fiber combed like wool, which was used for mattress filling and padding of saddles.

179 Läw 1915, 247.

180 Arrian *Indica* 16. 1.

181 *PME* 48, 49, 41.

182 J. P. Wild and F. Wild 2005. Later, by the end of the excavations in 2001, 3,400 fragments of textile were discovered. Indian cotton in this lot has been identified based on its spinning technique, different from that in Egypt and Ethiopia. For details, see F. Wild and J. P. Wild 2018.

183 Blue, Whitewright, and Thomas 2011, 196.

184 Hawkes 2021, 274.

Fig. 5: Terracotta specimens from Nagara. MSU, Baroda, Gujarat. Photo: Author.

the terracotta spindle whorls of two types, the flat disc and globular arecanut or truncated-bicorn types (fig. 5).[185] Based on a study of around 100 whorls found at the site of Nagara, a site of just 8 ha, Hawkes suggests that the production of the whorls was itself a specialized industry. The manufacturing of whorls required clay products to be turned on a lathe and then fired in the kiln.[186] As Hawkes argues, the terracotta whorls indicate not only the presence of textile manufacturing in the Gulf of Khambhat but also a degree of specialization in other allied crafts that were required to sustain textile production. The region emerged as a hub of commercial cotton-cloth production both for local distribution and use, and for export across the Indian Ocean.

185 For identification of these mini-terracotta items as spindle whorls, see Hawkes 2021. However, the identification of terracotta arecanut beads as spindle whorls has been criticized by Sushmita Sen (MSU, Baroda). She suggests, the flatter terracotta discs are spindle whorls, but those that are globular (the arecanut types) were just ornamental beads. Sen, personal communication, May 2022.
186 Hawkes 2021, 287.

IV.3 Regional Ceramics: The Case of Red Polished Ware

The area around the Gulf of Khambhat has yielded a variety of foreign pottery types that show connections across the ocean. In addition, regional pottery types throw light on exchange practices and consumption. They include black and red ware (BRW) and red ware (RW) that date back to the Chalcolithic period in the Saurashtra region and beyond. Most significant, however, is the red polished ware (RPW) that is prevalent across the Gujarat region. There is an astonishing degree of uniformity in its shapes and styles without any identifiable indications of a centrally controlled, regulated production process or center of manufacture. The globular type of this pottery, *loṭā*, shows how regular-use, utilitarian-type storage and transport vessels become used in widespread contexts through regular mundane exchanges. The globular RPW, therefore, is a tangible sign of decentralized forms of knowledge-sharing and transfer networks.

RPW received its name because of its evenly fired and smooth-slipped surface. It holds a dominant place in the ceramic culture of the western Deccan but is concentrated in the Saurashtra region. It first appears in the first century BCE and continues until the fifth century CE. RPW was long considered an imitation of Roman pottery, thereby sustaining arguments of the cultural impact of the Romans on the region. Yet, as in the case of rouletted ware with the comparative study of the (northern) black polished ware, it was concluded that the technique and types were indigenous in nature and pre-Roman. There are nearly 400 sites that yield RPW from the modern state of Gujarat alone. Even though this type of ware has been reported from coastal and inland sites alike, Pinto-Orton points out that the quality of RPW deteriorates upon moving inland.[187] However, at this point, an argument for the coastal origins of RPW would be highly speculative.

Regardless of the question of the point of origin, RPW indicates multilateral movement of goods through multiple networks of weak ties, especially of everyday-use items. The pots may have been manufactured in the interior villages and used for the transport of agricultural and forestry goods to other areas by land or water via ports for shipment within and beyond Gujarat. As the finds indicate multiloci manufacturing sites of RPW, the structure of the networks within the Saurashtra region seems decentralized, in that it had a multidirectional exchange and transport system. As suggested by Pinto-Orton, a large entrepôt was perhaps not a prerequisite for a thriving export of items such as *ghee* (clarified butter), oil, rice, or other raw materials such as herbs or iron. The use of RPW in long-distance transport is ascertained by its discovery at various excavated sites along the Red Sea and the Arabian Sea.[188] The multiloci manufacturing and usage for storage and transport, therefore, may have

187 Pinto-Orton 1992, 46–47.

188 For further bibliographic details on the excavated sites, see Pinto-Orton 2013, 198.

been facilitated by the presence of various ports within a short distance, as discussed above.[189]

IV.4 Monetary System(s)

In this section, I suggest that the monetary profile of the Saurashtra region should also be considered as a system of knowledge. This system of knowledge was the result of varied practices of coin issuing and coin usage converging together. Such converging practices allowed monetary systems to maintain a certain regionality and autonomy while still being part of larger network standards.[190] The monetary profile of the region shows its participation in visual and weight standards of multiple monetary traditions, namely (a) punch-marked coins, (b) (semi)autonomous-city coins, and (c) monarchical coin issues under Kṣatrapas with Hellenistic influence. These coin types also had syncretic influences on each other, which are seen in the shared iconographies of some issues, but often these may have also circulated together even when their minting stopped. Below is a brief introduction to these coins, followed by a discussion of certain continuities – for example, iconography – as well as changes such as in the usage of script.

The use of coined money in Gujarat goes back to as early as the fifth century BCE.[191] Consistent with Indic monetary traditions in general, the first coin types were the punch-marked coins in both silver and copper issues. These coins are uninscribed and had multiple auspicious symbols and icons of animals and deities individually struck on to them. The coins followed the *kārṣāpaṇa* weight standard of 3.5 g, where most coins are found to be of multiple denomination issues, i.e., $^1/_4$th, $^1/_8$th, and $^1/_{16}$th of *kārṣāpaṇa*.[192] The Saurashtran finds have been reported to be minutely heavier than the Magadhan issues, perhaps because of regional causes, such as the availability of silver or a minting fee. The punch-marked coins continued to be issued until ca. 50 BCE,[193] perhaps until the Kṣatrapas captured Saurashtra and started issuing their own coins. However, the usage of punch-marked coins continued even in the early centuries CE. It is likely that imitations may have also kept them in circulation.

Other than the uninscribed coins, (semi)autonomous-city coins also may have also added to the monetary system of the region. From Bharuch, a coin with the city name *bharukachha* in Brāhmī has been reported.[194] Although this is a singular find,

189 See section III.1.1 for a discussion of the relationship between different port sites within the region.

190 Dwivedi, vol. 2, ch. 10, 501–505.

191 Van't Haaff 2004.

192 Van't Haaff 2004, 7–8.

193 Van't Haaff 2004, 22.

194 The singular Bharukaccha coin is in the collection of the Hinduja Foundation, India. https://www.facebook.com/watch/?v=366875811429108.

the neighboring areas are famous for their city issues. Ujjain and Eran, ca. 500 and 700 km east from Bharuch, respectively, are known for their coin issues with city names.[195] The cities were likely self-administering corporate bodies.[196] The seals with the city name at Hathab are also an indication of the similar corporate nature of the city.

The Saurashtra region was also under the numismatic influence of the Indo-Greek communities of the Indo-Yamuna divide. Their coins, like the punch-marked coins, also exhibit a long tradition of monetary circulation. The continued use of much older coins was also observed in the *PME*, which mentions the continued use of the coins of older Indo-Greek rulers, Apollodotos and Menander.[197] The composition of the coin hoard from Ghogha, 20 km north of Hathab, is also suggestive of the same phenomena.[198] It consisted of worn-out issues of Apollodotos II (ca. 80–75 BCE) and Dionysios (ca. 65–55 BCE) and seemingly less worn-out issues of Nahapāna (ca. 50 CE). Although Apollodotos II and Nahapāna reigned more than a century apart, Deyell considered that this hoard represents the circulation of their coins in parallel.[199] The discovery of a coin mold of Apollodotos II,[200] whose coins were otherwise die struck, also indicates imitation of his coins.

The rule of Indo-Greek kingdoms in the northwest of the subcontinent was brought to an end by the Indo-Scythians,[201] and perhaps also by the local polities identified as issuing the *janapada* coins commemorating their victory.[202] The Indo-Scythians, who expanded over Saurashtra, seem to have adopted the hybrid coinage style also visible in later Indo-Greek issues from the Indo-Yamuna divide. The Kṣatrapa coins exhibit regional adaptations over time, both in their appearance and their weight standards. In terms of appearance, they had remnants of Hellenistic coinage practices influenced by the Indo-Greek and Indo-Bactrian styles, such as the use of portrait of the kings and biscriptual inscriptions, namely Greek and Kharoṣṭhī. While the portrait style was maintained, Jha and Rajgor notice that the use of Greek and Kharoṣṭhī declined and was eventually replaced by Brāhmī.[203] By the time Rudradāman I ruled, ca. 150 CE, and after him, the use of Greek on coins had been reduced to a nominal ornamental function. On his silver issues, the Greek inscription was meaningless, and the use of Kharoshti was stopped. In addition, the patronymic device found on his grandfather Chaṣṭana's coin were now reintroduced in Brāhmī.

195 Allan 1936, cxxx, cxl.
196 Thakur 1987.
197 *PME* 47.
198 Deyell 1984.
199 Deyell 1984, 119.
200 'Pottery links Vadnagar to Gangetic plains.' *Times of India*, June 7, 2018 (accessed December 1, 2022): https://toi.in/py2uqb/a24gk.
201 Cribb 2020.
202 Bhandare 2020, 529–534.
203 Jha and Rajgor 1994, 31–33.

Regarding changes in their weight standards, the Kṣatrapas no longer used the original Attic-weight *drachm*. Their weight exhibits the use of a readjusted versions that matched the *kārṣāpaṇa* weight standards. This readjustment of the *drachm* weight was already used by the later Indo-Greeks and early Indo-Scythians.[204] The adjusted silver *drachm* standards were continued as *dramma* and *damma* in India up to the fifth and, in some regions, seventh centuries CE. Possibly, it was the readjusted weight that made the exchange of Kṣatrapa and Sātavāhana coins possible. Likely, the overstriking of the Kṣatrapa (Nahapāna) coins by the Sātavāhanas (Gautamīputa Śātkarṇi) in the first century CE declared the latter's victory without necessarily interrupting the monetary situation in Bharuch and its surroundings.[205]

In fact, Nahapāna's coins were neither the first nor the last to have been counterstruck. The pre-Kṣatrapa punch-marked coins also exhibit a practice of restriking, often of the same symbol. It is suggested that these restrikes were marks of control exercised by a coin examiner, who could have been a state agent, guild member, or moneylender.[206] Later, some of the Kṣatrapas are also known to have counterstruck the coins of their predecessors. An example is that of Rudradāman I (ca. 150 CE) overstriking his grandfather Caṣṭana's coins.[207]

Counterstriking may have been a cost-effective way of keeping older coins in circulation. In addition, imitations also supplemented the early monetary profile of Gujarat. Contrary to modern monetary systems, imitations and forgeries in the early historic period did not imply a failure of state systems to maintain a monopoly on coin issues.[208] Decentralized systems of coin production were present in the early historic period, where with a fixed fee coins could be issued by private bodies.[209] Many coins continued to be in circulation even after the decline of the issuing polities. The supply of such issues was maintained by imitations, which sustained the demand and the functioning of a monetary economy.

Often, the decentralization and forgeries also affected the quality of coins. One example is of the coins of Dāmasena (ca. 230 CE), whose coins show mistakes in Brāhmī letters. Jha and Rajgor explain this by suggesting the die cutters possibly lacked knowledge of Brāhmī, which led them to issue variously misspelled versions of the ruler's name when copying the legend from other coins. In addition, one of Dāmasena's silver issues went through a reduction in purity (from ca. 94 percent to ca. 58 percent purity). This abrupt reduction was perhaps a result of contemporary forgery.[210]

204 Cribb 2020, 667.

205 Bhandare (1999, 39, 74–76, 134–136) has explained Śātkarṇi's overstrikes as the fastest way of announcing political change to a money user, circumventing multiple time-consuming steps such as melting down, refining, and refabricating coins.

206 Van't Haaff 2004, 21–22.

207 Jha and Rajgor 1994, 30.

208 Ray 1986, 153–154.

209 See Dwivedi, vol. 2, ch. 10, 504–506.

210 The mistakes include the name Dāmasena misspelled to Damana, Sadaman, Madamanasa, and so on. Jha and Rajgor 1994, 35.

Although riddled with the complexities of imitations and forgeries, the monetary profile of Saurashtra in general depicts a system that was the result of different types of monies converging and cocirculating. Eventually, monarchical coins became dominant in the region. Yet even those coins had to adopt icons, scripts, and weight patterns that were compatible with the locally acceptable coinage practices.

V Conclusion

The selected variables discussed here are intended to serve as windows opening onto the early historic Gulf of Khambhat.[211] These variables allow us to catch glimpses of different economic processes. My emphasis here is on movement: of people, goods, and standards in the form of ideas and knowledge. These movements can be patterned on certain specific networks, which operated on different geographies (land and sea), at different scales (smaller quantities of nonlocal precious items and bulk utility goods), over different distances (intersettlement and intercontinental) and were maintained by different actors, both individuals and organizations. Generally, ports were the common convergence points for such networks. Very likely, it was the same for the ports around the Gulf of Khambhat. As discussed in section II.3, these ports were well situated in their locality. The ports were a part of settlement clusters, in which other settlements often had specialized craft, service, or religious functions. In addition, being a part of riverine-coastal clusters, these ports also had interactive relationships (both supportive and competitive) with other nearby ports. These localized relationships within clusters facilitated the majority, if not all, of the transport of travelers and commodities. The nonlocal items also moved along these locally familiar, existing channels.

Some actors also influenced and connected areas beyond the ca. 50-km radius of a particular settlement cluster. Political actors with expansive ambitions, agropastoral groups during their seasonal migrations, extraregional religious organizations, and merchants often acted as agents who maintained connections across wider parts of the subcontinent and even across the seas. In this process, knowledge and ideas, also visible in material culture, could be transferred over long distances. Two examples worth recalling here are red polished ware (RPW) and coinage. RPW was produced in a more dispersed and localized manner with a certain uniformity in pottery style. Such uniformity was perhaps the result of a knowledge network between potters residing and working in different places. It is not unlikely that such knowledge and skill transfers were common among the members of a *śreṇi* (bodies with professional specialization).[212] In this case, they were possibly a potter's guild, which are known

211 I am thankful to the BaSaR team, especially Lara Fabian, whose analogy of opening windows to the past has been useful here.

212 For *śreṇīs* as transterritorial actors, see Dwivedi, vol. 2. ch. 5, 222–223.

to have functioned across spaces. The second example is of coins, which show the continuity of certain resilient monetary practices. However, these long-term practices were not stagnant, and they also show changes as a result of Graeco-Bactrian influence over a period of time. A shift toward localized renditions of broader monetary systems reflects both autonomy and connectivity in this region, for our period as well as later.

An emphasis on regional economies, which indicate a degree of autonomy hand in hand with long-distance connectivity, is an important ingredient of global studies. Ports, as anchors of connectivity, can be useful in such case studies for connecting the local to the distant. In the context of early historic India, a degree of regional autonomy enabled ports to continue to function even through the rise and fall of different political dynasties. The autonomy and resiliencies of ports could be a result of their position in settlement clusters. However, with the present state of data availability, this argument is only an informed speculation. To confidently call the settlement clusters shock absorbers for their respective prominent cities, more detailed studies of intersettlement connections are required.

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