

REPRESENTATIONS OF MARITIME INTERACTIONS.

Interpretative Mapping of Hormuz and Chennai During Early Modern Asian-European Encounters

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Indian Ocean, historical GIS, pre-modern maps

Introduction

The Indian Ocean is currently a significant centre of geopolitical tensions, crude oil transportation, and evolving alliances. In the context of port cluster studies, we investigate when maritime trade in this region first emerged as a global phenomenon. Early modern port cities in this part of the world attracted the interest of European powers, starting with the Portuguese, followed by the Dutch, British, and French. This historical context highlights the significance of ports as sites for cultural exchange and colonial enterprise.

This text summarises our work on the PORTofCALL research project (see Acknowledgments), which examines the impact of encounters among African, Asian, and European cultures during the early modern period. We emphasise how these interactions influenced the cultural heritage of the port settlements in the Indian Ocean where there was a Portuguese presence. The project explores how cultural exchanges and negotiations shaped the built environments and landscapes of the Estado da Índia's network of port settlements and their respective hinterlands.

By considering factors such as indigenous agency, settlement patterns, building technologies, spatial traditions, arts, and agrarian customs, for a selection of five examples, PORTofCALL experiments with innovative methods for mapping cultural landscapes. To explore this dimension, we propose case studies of the island of Hormuz in Iran and São Tomé de Meliapor, now a neighbourhood in Chennai,

India. The former was a thriving port that controlled the Persian Gulf and had natural connections to the nearby islands of Qeshm and Larak, as well as the mainland town of Bandar Abbas. At present, it has declined into a small village without a functioning port. The latter was a place where various imperial powers (Portuguese, Dutch, British, and French) competed for influence, negotiating their presence with local rulers through varying degrees of conflict. Today, Chennai is a city with a population of six million and boasts the largest port in southern India.

In delineating the evolution of historical clusters of ports, the aim is threefold: to study the relations between global and regional trade in the early modern Indian Ocean; to compare port clusters vis-à-vis political shifts and their hinterlands; and to visualise the evolving urban morphology of ports up to the present day.

Global and Regional Trade: Curating Digital Assets

Cartographic representation influences our understanding of material reality; however, much like written discourse, it offers a biased portrayal that is intentionally filtered. Travellers in the sixteenth and seventeenth centuries used advanced tools to navigate land and sea, combining images and texts through itineraries, bird's-eye views, and symbolic representation systems (Resta and Göl 2024). The spatialisation of knowledge from distant territories in early modern Europe was closely linked to the process of nation-state formation (Buisseret 1992), but also to long-distance travelling after maritime culture shifted from the Mediterranean to the oceanic context (Sánchez 2018). Beyond the issue of truthful representations, Harley (2001) suggested that historical maps should be interpreted as perspectives on reality, which can only be fully understood by contextualising the ideological framework that produced them. Even the apparent objectivity of contemporary representations, enhanced by the potential for infinite detailing in digital tools like GIS and AutoCAD, carries implicit and structural ideologies (Atteneder and Rodríguez-Amat 2024).

The route known as *Carreira da Índia* connected Lisbon to the main ports of India and stopped at several ports of call on the way (Boxer 1969). Concurrently, a dense ramification of maritime connections provided a more regional scope, encompassing everything from the transshipment of goods to unofficial trade.

Mapping the historical Portuguese trade networks presents challenges due to inconsistent information, lost records, secrecy, and various biases.

To address these issues, we have developed a methodology for classifying digital assets that includes primary sources and recent studies. Primary sources are of three types: chronicles produced within the *Estado da Índia*, the Portuguese administration of overseas territories, including João de Barros, Gaspar Correia, and Fernão Lopes de Castanheda, among others. However, the archival material is vast and contains all kinds of documents, such as letters and revenue books. Another narrative of the encounters between the Portuguese and other cultures can be obtained from the perspective of the local ruling elite. These sources are few, sometimes rich in detail, as is the case with the Vijayanagara (Krishnaswami Aiyangar 1919) or Sinhala (De Silva 2016) writings, sometimes indirect and quantitatively scarce, as in the case of the Hormuzian kingdom (Aubin 1966). Accounts from travellers who visited, lived in, or worked in various ports offer valuable insights. Travellers often provided a more balanced perspective on the political actors involved, sometimes recounting experiences where they met with rulers from opposing factions during their journeys. Authors include Ibn Battuta, Pietro Della Valle, and García de Silva y Figueroa. Most importantly, for the understanding of the spatial organisation of the port settlements, we can analyse a collection of early modern visual documents. These maps were typically created as compilations of knowledge gathered by pilots and local sources, combined with the conventions that governed European mapmaking.

A pre-modern map and a modern one are ontologically different. The hybrid nature of the former warrants studies that examine these artefacts as rhetorical devices. Indeed, labelling complex graphic notation systems as “maps” simplifies earlier artefacts that combined narratives and images (Wood 2010). They can be seen as cultural texts that invite interpretation and reimagining, often intertwined with myths and fiction (Harley 1989). One line of research is to experiment with a critical use of GIS for studies with a historical perspective. This approach is loosely addressed in literature as HGIS (Historical GIS), in which the artistic component of maps, their hybridity, subverts standardised mapmaking procedures.

To visualise the global trade network in the Indian Ocean, we established a database of maps collected through a systematic literature review of the sources mentioned above. Each map was classified with

tags and geographical coverage. Selected data from the visual documents was then transferred to a GIS map, designed to function as a “map of maps”, in which the global information and the regional trade coexist. One can zoom in for specific information or zoom out for a broader view of trade connections. This output served as a crucial first step in linking the subsequent phases of the project.

Port Clusters vis-à-vis Political Shifts and Their Hinterlands

The global and regional dimensions converged within port clusters, where the size of a port settlement did not always reflect its significance. In the sixteenth century, the diversity of functions and specialised urban infrastructures often played a more critical role than the population size (Biedermann 2009). Pre-capitalist economies required relatively few individuals to manage bureaucracy and organise the economy, especially given the stability of the labour market (Smith 1990). This efficiency was essential for colonial settlements. Mendiratta (2024) identified three conditions that made Indian ports thrive: connectivity (water-water, water-land, and land-land), financial liquidity, and increased tolerance between different communities brought into contact by trade.

Each port was a node in a network, with its social topography composed of human and non-human actors. In Hormuz and São Tomé de Meliapor, the built environment was shaped by phenomena such as the lack of fresh water, spice trade, smuggling, heat, religious practices, the presence of the tomb of a saint, and the visibility of landmarks. The port of Hormuz was located at the northern tip of the island, while the town was situated in an adjacent area to the south. It served primarily as a transshipment port, connecting maritime routes with overland caravans to the Middle East and the Mediterranean. Historical records from the early sixteenth century indicate a clear pattern of inter-Asian commerce, as evidenced by the significant customs duties collected in Hormuz. Most of this trade was comprised of re-exports, meaning that the majority of goods entering Hormuz were subsequently shipped out again (Subrahmanyam 2012). An examination of various representations of Hormuz reveals that the port itself was situated on an esplanade, a clear space between the fort of Nossa Senhora da Conceição and the town. Boats docked along both the western and eastern shorelines, known as Porto de Ponente and Porto de Levante, respectively.

This esplanade was cleared during the fort's expansion in 1539–40, which involved the demolition of the local king's adjacent palatine complex (Aubin 1973). Furthermore, the esplanade offered a broad vantage point for overseeing trade activities and collecting taxes (Resta 2025).

São Tomé became a significant port on the Coromandel coast, the eastern littoral of India from Ganjam to Nagapattinam. In this region, short-range trade was conducted using many small crafts. Also, coastal trade changed slowly in comparison to the volatile overseas trade from large ports. Each year, maritime trade along the Coromandel coast paused from October to January due to the monsoon and agricultural cycles. Over an eight- to nine-month period, ports were busy with ships loading and unloading goods during two time windows, each lasting thirty to fifty days (Subrahmanyam 1990; Arasaratnam 1994). São Tomé was not in a geographically convenient spot. Instead, the alleged discovery of the tomb of the Apostle St. Thomas attracted the Portuguese who were already active in Nagapattinam and Pulicat. The Coromandel coastline has few rivers, requiring cargo ships to unload offshore into smaller boats. Cesare Federici (1587) and other travellers described this dangerous procedure as it happened despite violent surf. This indicates that practical aspects like accessibility and ease of loading were not always critical in determining the location of a port settlement, as other factors such as connections to inland markets, political regimes, production, and religious motives may have taken precedence.

The fortunes of Hormuz and São Tomé shifted rapidly, in tandem with the changing political dynamics in the region and the diplomatic strategies developed in Portugal. We created parallel timelines for each case study, along with a general timeline of Portuguese overseas possessions, to compare the growth and decline of specific areas. Only then could we dissect the evolution of port clusters as networks of nodes that redistributed internal hierarchies over time.

The structure of the network is based on traditional models, including William Skinner's market hierarchy, then distorted by sub-regional specialisations and natural conditions (Subrahmanyam 1990). Referring to hinterland-port relations highlighted in Mizushima et al. (2015), along with the "colonial" component of port city organisation (Banga 1992), and the local differences in coastal trade (Arasaratnam 1994), we can see that the port cluster involving São Tomé was much more resilient to political changes. Madras, Pulicat, and Nagapattinam took over the gravitational focus of the cluster

at different stages. In contrast, the Hormuzian cluster was centred around the insular port. Once the Portuguese capitulated in 1622, its role in transshipment could not be replicated within the same network. While the Coromandel cluster was supported by a densely populated hinterland of agricultural and weaving villages, Hormuz primarily served as a port for redistribution to distant markets (McPherson 1993). The former developed as a linear formation of ports with a long-established tradition of trade, whereas Hormuz emerged as an isolated port of call in the global strategy of the Carreira.

Visualising the Evolving Urban Morphology of Ports

The reconstitution of historical port spaces is essential for understanding the daily lives of their communities. To achieve this, we employ a qualitative approach using GIS for studies with a historical perspective. Historical GIS is a common ground for interdisciplinary studies across history, architecture, geography, and archaeology (Knowles 2008). Cartographic archival sources are scanned, georeferenced, and vectorised to obtain digital assets that we can combine with descriptive archival sources (Affek 2013). This integration allows us to analyse visual materials, review narratives, and incorporate fieldwork data within a single environment.

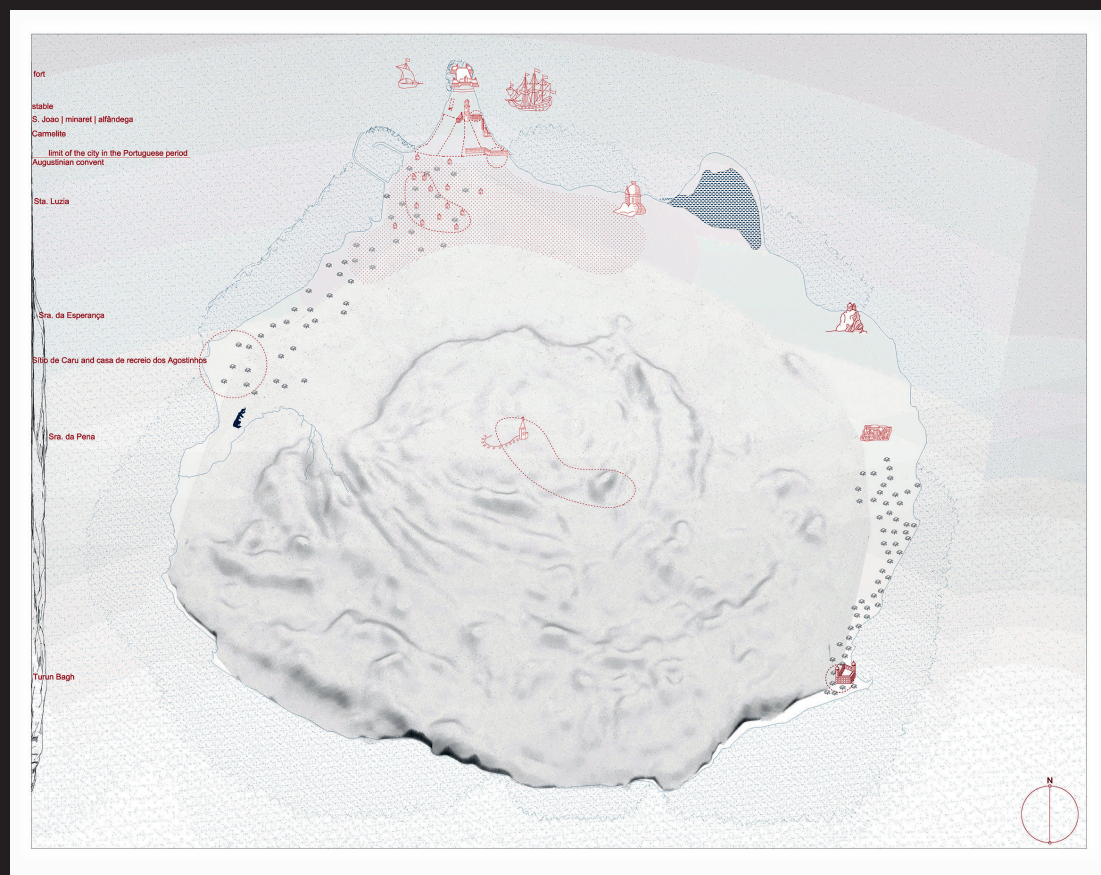
The pursuit of a qualitative approach is situated in the context of the seventeenth century, when maps became accessible to many people, but before they were standardised through scientific models. Early modern Portuguese cartography of overseas territories mainly produced two typologies of representations: views from the sea, especially useful for navigation, and maps of the city/fortress where they established their presence. It was important to visualise the quality of the landscape, the consistency of the ground, and the relevance of architectural landmarks, often resulting in the combination of different viewpoints. The coastline is seen in plan; buildings are depicted in an oblique view from an elevated vantage point, akin to a military axonometric view; and the natural features are seen in elevation from a close distance, similar to the perspective of an observer on site (Alegria et al. 2007). As mentioned above, these hybrid artworks are themselves manifestations of how port networks functioned across situated knowledge and standardised conventions. To test historical hypotheses about ports, we georeferenced archival

visual documents using surveyed control points. This method helps identify new relations between the contemporary city and its historical layers. We then reconstitute a specific spatial condition, such as the use of the minaret tower as a lighthouse in Hormuz, to visualise the port space as described in travellers' accounts (Resta 2025).

Conclusions

The analysis of port clusters in the early modern Indian Ocean reveals the profound impact of maritime trade on cultural exchange and colonial dynamics. With Hormuz and São Tomé, we have observed that a strong connection with the hinterland and an active regional network made early modern clusters more resilient than those engaged in long-distance commerce. Moreover, their evolution does not conform to contemporary quantitative models, but rather to a qualitative cross-examination of diplomatic tensions, development of specialised infrastructures, coastal geography, and travel narratives.

All these elements require ad hoc mapping techniques to visualise how early modern clusters worked. We have experimented with forms of interpretative mapping, within the framework of the HGIS methodology, appropriate to the hybridity of non-standardised visual documents available in historical archives. The scientific, the artistic, and the narrative are condensed into representations that provide much more than geographical information. In our attempt to chart immaterial agencies and reconstitute lost environments of historical port clusters, HGIS has proven an effective way to integrate various ontologies and epistemological frameworks, enabling us to spatialise port dynamics and distant connections. Ultimately, the study of port clusters not only enhances our comprehension of past trade relationships but also informs contemporary discussions about cultural heritage and regional identities within the Indian Ocean.



Interpretative map of the island of Hormuz, Iran

Source: Authors

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