

Maritime Cultural Landscape, Indigenous Shipbuilding Technology, and Colonial Trade Dynamics in Early Modern Balasore, Odisha

Dr. Sikhasree Ray¹, Prof. Pabitra Mohan Nayak², Mrs. Jeenapriyanka Jethi³, Mr. Santigopal Jana⁴, Parshuram Mohanty⁵, Soumyashree Nayak⁶

¹Assistant Professor, Department of History & Archaeology, Fakir Mohan University

²Professor in Sociology, Department of Social Science, Fakir Mohan University

³Assistant Professor, Department of History & Archaeology, Fakir Mohan University

⁴Assistant Professor, Department of History & Archaeology, Fakir Mohan University

⁵Project Fellow, Department of History & Archaeology, Fakir Mohan University

⁶Project Fellow, Department of History & Archaeology, Fakir Mohan University

Abstract

This article examines the maritime cultural landscape of Balasore, Odisha, highlighting its role as a major shipbuilding and repair centre from the seventeenth to early nineteenth century. Drawing on archival records and maritime scholarship, it emphasizes the importance of the **Budhabalanga River** in sustaining dockyard activity and regional trade. European companies, including the **East India Company** and the **Danish East India Company**, relied heavily on indigenous shipbuilding expertise and riverine infrastructure. The study argues that Balasore's decline was not solely due to colonial domination but resulted from environmental changes, technological shifts such as steamship introduction, and the centralization of maritime administration in larger ports like **Calcutta**. Overall, the article repositions Balasore as an active participant in early modern Indian Ocean commerce rather than a peripheral colonial outpost.

Introduction

The eastern littoral of the Indian subcontinent has historically functioned as a dynamic interface between inland agrarian economies and the wider Indian Ocean world (Chaudhuri, 1985; Das Gupta, 2001). Within this coastal network, Balasore in present-day Odisha emerged during the early modern period as a significant maritime centre shaped by indigenous technological traditions, ecological adaptation, and expanding colonial trade interests (Nayak, 2014). The region's historical trajectory can best be understood through the analytical framework of the maritime cultural landscape, which conceptualizes coastal zones as integrated socio-ecological spaces where environment, technology, economy, and community interact over long durations (Westerdahl, 1992; Tripathi, 2017).

The concept of a maritime cultural landscape emphasizes that coastlines are historically constructed environments structured by navigation routes, port installations, craft production sites, and ritual practices linked to seafaring memory (Westerdahl,

1992). In the case of Balasore, riverine systems such as the **Budhabalanga River**, tidal inlets, sandbars, and monsoon-driven currents collectively shaped patterns of settlement, trade, and ship construction (Tripathi, 2017). These ecological features determined both the possibilities and limitations of maritime activity.

Indigenous shipbuilding technology in early modern Balasore represented a specialized knowledge system grounded in empirical observation and intergenerational transmission (Mishra, 1997). Artisanal communities developed construction techniques suited to the hydrodynamic conditions of the Bay of Bengal. Hull flexibility, shallow draft design, timber selection strategies, and organic waterproofing methods demonstrate technological responsiveness rather than stagnation (Nayak, 2014). Such vessels supported coastal trade, lighterage operations, fishing economies, and administrative logistics, linking Balasore to regional markets across eastern India and beyond.

The seventeenth century marked a decisive phase in the region's maritime transformation. European trading corporations, notably the British East India Company and the Danish East India Company, recognized Balasore's strategic importance as a repair and provisioning port along the Bay of Bengal corridor. Archival evidence suggests that local dockyards serviced damaged vessels, supplied timber, and facilitated cargo transfer through country boats operating between offshore ships and inland warehouses. Rather than replacing indigenous maritime systems, colonial trade networks initially depended upon existing artisanal expertise and environmental knowledge (Foster, 1906; Jani, 2012).

At the same time, colonial commercial expansion gradually restructured the maritime economy of eastern India. The concentration of capital investment in emerging metropolitan ports such as Kolkata Port reoriented long-distance trade routes and redirected maritime administration. Technological shifts, particularly the introduction of steam-powered navigation in the nineteenth century, altered patterns of coastal mobility and contributed to the decline of decentralized wooden shipyards like those of Balasore. Environmental factors—including riverine siltation and changing sediment flows—further compounded these transformations.

This study situates early modern Balasore within the broader historiography of Indian Ocean maritime history, arguing that its development cannot be explained solely through colonial modernization narratives. Instead, the region's maritime cultural landscape reveals a layered process of ecological adaptation, technological negotiation, and commercial restructuring. By examining indigenous shipbuilding technology alongside colonial trade dynamics, the article seeks to reconstruct Balasore as an active participant in the early modern maritime world rather than a peripheral site of imperial expansion.

Present Research Framework: Application in Balasore, Odisha

Historically, Balasore functioned as an important coastal trade and shipbuilding centre from the early medieval to colonial periods. Methodologically, the research integrates **historical analysis with**

ethnographic field interpretation. Historical records are examined alongside community memory, craft traditions, and material technological knowledge preserved among local artisan groups.

Primary data sources include archival colonial documentation, regional historical narratives, and archaeological reports, while secondary sources consist of scholarly publications on Indian maritime history.

The literature review undertaken for this study seeks to reconstruct the historical trajectory of shipbuilding, navigation, and maritime commerce in Balasore through a critical synthesis of archival, archaeological, cartographic, and ethnographic sources. Rather than treating Balasore merely as a peripheral coastal town, recent scholarship encourages understanding it as a dynamic maritime-industrial landscape embedded within the larger Indian Ocean trading system. The historiography reveals that Balasore functioned as an important coastal industrial zone specializing in ship construction, repair, lighterage services, and maritime logistics from the early modern period until the nineteenth century.

The documentary corpus examined includes East India Company factory records, Mughal administrative references, European travel narratives, port logs, and regional Odishan chronicles. Marine archaeological perspectives—especially those advanced by Sila Tripathi and researchers associated with the Archaeological Survey of India—provide an interpretative framework for situating Balasore within broader patterns of eastern Indian Ocean seafaring. Although systematic underwater excavations in Balasore remain limited, comparative evidence from Odisha's coastal sites strengthens the hypothesis that the region sustained complex maritime infrastructure. Historiographically, three dominant strands emerge:

1. **Colonial Commercial Narratives** – emphasizing Balasore's role as a subordinate feeder port to Bengal.
2. **Regional Maritime Agency Models** – highlighting indigenous shipwright skill and technological autonomy.
3. **Environmental Determinist Interpretations** – attributing rise and decline primarily to riverine geomorphology.

This study synthesizes these perspectives while arguing that Balasore's maritime prominence was the result of a negotiated interaction between ecological conditions, artisanal knowledge systems, and transnational commercial interests.

Maritime Route of the Budhabalanga River

Eighteenth-century archival references consistently highlight the Budhabalanga River as a principal maritime transport corridor. European trading companies—including the Danish, Dutch, French, Portuguese, and British—used this riverine channel as a gateway to inland markets and factory establishments. Rather than functioning merely as a passive waterway, the Budhabalanga operated as a structured maritime artery connecting anchorage points along the Bay of Bengal with hinterland production centres.

Factory correspondence of the British East India Company indicates that vessels approaching the Odisha coast often anchored offshore and relied on locally constructed "country boats" for cargo transshipment via the Budhabalanga. Such lighterage systems required precise tidal calculations and seasonal hydrological knowledge. Indigenous pilots and boatmen played a central role in navigating sandbars and estuarine shifts, suggesting a highly localized maritime skill ecology.

From a maritime archaeological standpoint, riverine ports such as those along the Budhabalanga complicate conventional blue-water maritime models. They represent hybrid fluvial-maritime landscapes where dockyards, timber yards, rope-making spaces, and repair workshops were embedded within shifting alluvial environments. Archaeological research across eastern India demonstrates that such ports were frequently ephemeral in their material footprint due to monsoonal erosion, cyclonic disturbances, and sediment deposition.

Cartographic evidence from eighteenth-century hydrographic charts further reveals fluctuating sandbanks near the Balasore bar, indicating geomorphological instability. Progressive silting reduced navigability, especially for larger-tonnage vessels. Environmental change thus directly affected industrial productivity. However, attributing the

decline of shipbuilding solely to silting oversimplifies the issue. The centralization of colonial maritime policy toward Calcutta, advances in steamship technology, and shifts in global shipping routes equally contributed to Balasore's gradual marginalization during the nineteenth century.

Therefore, the Budhabalanga River must be understood not only as a physical transport corridor but as a maritime cultural landscape shaped by ecological adaptation, commercial capitalism, and artisanal resilience.

Maritime Heritage of Chandipur Beach

The coastal zone of Chandipur represents another significant node in Balasore's maritime history. Historical documentation suggests that Chandipur functioned as an anchorage and repair centre where vessels damaged by storms or sandbar impact were serviced. Although substantial archaeological remains are not currently visible, archival descriptions point toward active dockyard operations during the seventeenth and eighteenth centuries.

The region's distinctive tidal regime—where the sea recedes dramatically during low tide—created natural dry-docking conditions. Such environmental characteristics likely facilitated hull maintenance and careening practices. Local craft communities exploited these tidal rhythms to undertake structural repairs, mast replacement, and hull sheathing.

Ethnographic parallels from contemporary fishing communities suggest continuity in boat-building techniques emphasizing flexible hull design suited for shallow, sediment-rich waters. Timber selection—often sal or teak—reflected both availability and resistance to marine borers. Rope-making traditions using natural fibers indicate an integrated supply chain embedded within local agrarian economies.

Historiographically, Chandipur has been understudied compared to larger Indian ports such as Surat or Calcutta. Yet microhistorical analysis reveals that medium-scale coastal repair hubs like Chandipur were critical to sustaining long-distance maritime trade. Ships navigating the Bay of Bengal frequently encountered cyclonic weather and sandbar hazards; decentralized repair centres minimized downtime and financial loss.

European archival references mention damaged ships being re-masted and re-rigged at Balasore before proceeding toward Hugli. Such evidence underscores the technical competence of local shipwrights. Rather than functioning merely as laborers under European supervision, indigenous craftsmen appear to have exercised significant technical authority in reconstruction and structural adaptation.

European Trading Settlements in Balasore

Balasore emerged in the seventeenth century as one of the most important maritime contact zones on the eastern seaboard of early modern India. Situated strategically along the northern coast of Odisha and connected to inland markets through riverine networks, the town developed into a nodal point linking the Bay of Bengal with Bengal, Bihar, and the Deccan hinterlands. Its maritime significance attracted multiple European trading companies seeking access to textiles, rice, salt, timber, and maritime services.

Danish Commercial Expansion and the Bengal Connection

Among the European powers active in Balasore, the Danish presence remains particularly intriguing. The Danish East India Company was established in 1616 under royal patronage and sought to challenge Dutch and English commercial dominance in the Indian Ocean. Its first major Indian settlement was founded at Tranquebar in 1620, which functioned as the company's principal base in South India. From this southern stronghold, Danish commercial networks gradually expanded toward the Bay of Bengal.

By the latter half of the seventeenth century, Danish merchants were actively probing the Bengal–Odisha maritime corridor. Historical documentation indicates that Danish ships were sighted near Balasore Road in 1673. This observation is corroborated in European factory correspondence and travel narratives. The English official Streynsham Master recorded Danish commercial presence during his visit to Balasore in 1676, confirming that the Danes were not merely passing traders but participants in structured commercial negotiation.

The Danish interest in Balasore was logical from a strategic perspective. The port provided access to

Bengal's textile-rich hinterland without the intense competition encountered at Hugli. Moreover, Balasore's established ship-repair facilities and availability of timber resources made it attractive for maintaining vessels operating along the eastern littoral.

However, reconstructing the full extent of Danish commercial activity in Balasore is challenging. Danish archival documentation relating to eastern India remains fragmented and dispersed across European repositories. Unlike the extensive English East India Company records, Danish sources are less systematic, resulting in historiographical gaps. Consequently, much of what is known about Danish activity in Balasore is derived from English, Persian, and occasionally Dutch references, which often reflect competitive bias.

English and Other European Engagements

The British East India Company recognized Balasore's potential as early as the 1630s. Factory records describe it as a "sea town where shipping was built," highlighting its industrial importance. English administrators such as Walter Clavel noted attempts by both English and Danish merchants to establish permanent commercial infrastructure in the region as early as 1633. By the mid-seventeenth century, Balasore had evolved into a recognized anchorage and repair centre for ships operating between Fort St. George, Bengal, and Southeast Asia.

The Dutch East India Company (VOC) and French traders also maintained commercial interests along the Odisha coast. Although their settlements in Balasore were comparatively smaller than those in Bengal proper, their presence intensified competition over textile procurement, salt trade, and rice export.

Portuguese merchants, though declining in imperial influence by the seventeenth century, retained commercial connections through private trade networks and Luso-Indian intermediaries. Their maritime experience and navigational expertise remained valuable in the Bay of Bengal context.

Thus, Balasore did not function under monopolistic European control; rather, it was a negotiated maritime zone where Asian merchants, Mughal officials, and

multiple European companies interacted within a fluid commercial ecology.

Timeline: Shipbuilding and Repairing in Seventeenth-Century Balasore

The seventeenth century represents the most dynamic phase of maritime industrial development in Balasore. During this period, the port functioned as a major shipbuilding, repair, and logistical service centre within the Bay of Bengal maritime system. Historical references from European travel accounts and factory correspondence confirm that Balasore possessed functional dockyard spaces capable of servicing medium-tonnage ocean-going vessels.

The earliest documentary description of Balasore's maritime character appears in the writings of Edward Bruton, who described the settlement in the 1630s as "Boliatorye, a sea town where shipping was built." This observation is significant because it indicates that organized ship construction was already operational prior to intensive European colonial consolidation.

During the 1630s, Balasore was widely recognized as a sea town associated with active ship construction. The English factor **William Bruton** described it as "Boliatorye, a sea town where shipping was built." This brief yet significant remark confirms that Balasore was already known to European traders for its dockyards and shipbuilding facilities. Such testimony reveals that the town possessed not only navigational access but also the skilled labour and material resources necessary for maritime construction (Foster, 1906).

By 1634, documentary evidence shows the Governor of Balasore selling a small unfinished vessel of about 100 tons to the servants of the **East India Company**. This transaction illustrates two important aspects: first, that shipbuilding was organized enough to produce sizable ocean-going vessels; and second, that local authorities were directly involved in commercial maritime enterprise. The sale also indicates cooperation between indigenous political elites and European merchants in developing maritime commerce (Foster, 1906)..

In 1638, further evidence of Balasore's maritime capabilities appears when the Musulipatnam factors of the East India Company instructed **Thomas Godfrey** to travel to Balasore for ship refitting. Such instructions suggest that Balasore had already earned a reputation as a reliable centre for maintenance and repair. The town's dockyards were evidently equipped to handle technical refitting operations essential for sustaining coastal and overseas trade (Foster, 1906)..

A notable example occurred in 1644 when the ship **Endeavour**, sailing from Fort St. George, suffered serious damage while crossing the Balasore bar, losing its anchor, rudder, and sheathing. Contemporary reports expressed confidence that these damages could be repaired locally at Balasore. This confidence highlights the advanced technical capacity of the port's shipwrights and carpenters. The ability to replace major structural components such as rudders and hull sheathing indicates a sophisticated maritime industry rather than a rudimentary coastal workshop.

Between 1650 and 1651, Captain Durson, in partnership with a Moor of Balasore, repaired a 200-ton ship intended for inter-port trade. This collaboration is particularly revealing. It reflects cross-cultural commercial partnerships between European captains and local Muslim merchants, illustrating how Balasore functioned as a shared commercial space where different communities cooperated in maritime enterprise. The size of the vessel further underscores the town's industrial capacity (Foster, 1906)..

In 1676, a storm severely damaged three English ships—Ere, Arrival, and Ganges. All three were brought to Balasore, where they were re-masted and newly rigged before being dispatched back to Hugli. The successful restoration of multiple vessels within a short period suggests the presence of well-organized dockyards and abundant skilled manpower. Re-masting and rigging were complex tasks requiring precision and experience, reinforcing Balasore's standing as a trusted repair hub in eastern India.

Thus Balasore's maritime infrastructure was robust long before the colonial port reforms of the late nineteenth century. The seventeenth-century evidence of ship construction, repair, refitting, and cross-cultural maritime partnerships demonstrates that

Balasore was deeply embedded in the Indian Ocean trading system. Thus, colonial port development must be understood not as the beginning of maritime modernization in Odisha, but as a reconfiguration of a much older and resilient nautical tradition.

Key Phases of Shipbuilding and Repairing in Balasore:

The maritime history of Balasore reflects a dynamic interplay of imperial ambition, environmental change, and technological transformation across three major phases—Mughal, European mercantile, and British colonial rule.

During the seventeenth century under Mughal authority, Balasore emerged as a prominent maritime-industrial centre. By the 1640s, the Mughal aristocracy had begun actively participating in overseas commerce, recognizing the economic opportunities offered by maritime trade in the Bay of Bengal. Investment in shipbuilding and ship-repairing activities formed part of this engagement. Balasore, owing to its strategic coastal position and access to inland markets, developed into a key centre for ship maintenance. Vessels from Southeast Asia and Sri Lanka reportedly arrived for repairs, indicating the town's regional reputation. Much of this activity was concentrated along the **Budhabalanga River**, whose navigable channels and riverine infrastructure supported dockyards and maritime workshops. The river served as the industrial backbone of Balasore's nautical economy.

In the late seventeenth and eighteenth centuries, European trading companies recognized Balasore's commercial promise. The **East India Company**, alongside the Dutch and Danish merchants, sought to establish factories and trading settlements in the region. Their interest stemmed not only from the port's connectivity to Bengal and Odisha's hinterland but also from its established shipbuilding tradition. However, environmental challenges soon began to undermine this prosperity. Increasing siltation in the Budhabalanga River gradually obstructed navigation, leading to the decline of ship-repairing operations in that zone. In response to these ecological constraints, Danish traders redirected maritime activity toward the **Subarnarekha River**, where conditions proved more

favourable. They established settlements near Frederiksnagore, close to present-day Chandipur, attempting to revive and sustain Balasore's maritime industry. This shift illustrates the adaptability of European commercial networks in negotiating environmental change.

The British colonial period marked another turning point. From the late eighteenth century onward, the British progressively centralized maritime trade in larger, better-equipped ports such as Calcutta, Madras, and Bombay. The rise of steamship technology further altered the geography of maritime commerce. Steam-powered vessels required deeper harbours, expanded dock facilities, and modern infrastructure—advantages that ports like Calcutta increasingly possessed. As a result, Balasore's relative importance declined. By the early to mid-nineteenth century, its once-flourishing shipbuilding and repair industry had significantly diminished (Mishra, 1997).

Taken together, the trajectory of Balasore's maritime economy spans roughly from the 1640s to the early nineteenth century, with decline setting in by the mid-nineteenth century. The causes were multiple: riverine siltation that hindered navigation, technological transformation with the advent of steamships, and the colonial strategy of concentrating maritime commerce in major metropolitan ports. Nevertheless, Balasore's earlier prominence as a shipbuilding and repair hub remains a testament to its integral role in the Indian Ocean trading system and the layered maritime history of coastal Odisha.

Decline

The decline of Balasore's maritime industry cannot be explained solely through colonial economic domination. Rather, it resulted from an interplay of environmental, technological, and administrative transformations (Nayak, 2014).

One of the most significant factors was the progressive siltation of riverine channels, particularly the **Budhabalanga River** and adjoining waterways. Over time, heavy sediment deposition reduced navigability, making it increasingly difficult for large vessels to access dockyards and repair centres. The shifting sandbars along the Odisha coast further complicated maritime movement, diminishing

Balasure's viability as a major shipbuilding hub. Environmental change thus directly affected industrial sustainability (Mishra, 1997).

Cyclonic disturbances in the Bay of Bengal constituted another persistent challenge. The eastern coast of India has historically been vulnerable to severe storms, and repeated cyclones not only damaged vessels but also disrupted port infrastructure, river mouths, and anchorage points. Such natural calamities created uncertainty in maritime operations, discouraging large-scale investment in shipbuilding and long-distance trade at smaller ports like Balasure (Das Gupta, 2001).

At the administrative level, the centralization of colonial maritime governance further marginalized regional ports. The **East India Company**, and later the British colonial state, concentrated customs operations, naval facilities, and commercial infrastructure in larger ports such as **Calcutta**, **Madras**, and **Bombay**. This administrative centralization redirected shipping routes and financial flows toward these metropolitan centres, gradually reducing Balasure's strategic relevance within the imperial maritime network.

Technological transformation compounded this decline. The nineteenth century witnessed the introduction of iron-hulled steamships, which began to replace traditional wooden sailing vessels. Steam-powered ships required deeper harbours, mechanized dockyards, and coaling stations—facilities that smaller riverine ports struggled to provide. Balasure's established expertise in wooden ship construction became less competitive in an era increasingly defined by industrial shipbuilding technologies.

Equally important was the reduction in indigenous patronage systems. During the Mughal and early European trading phases, local elites, merchants, and maritime communities actively supported shipbuilding enterprises. With the reorganization of trade under colonial rule and the decline of regional aristocratic influence, this traditional patronage network weakened. The erosion of local financial backing diminished the capacity of Balasure's shipyards to sustain large-scale operations.

Despite these setbacks, the maritime tradition of Balasure did not vanish entirely. Smaller-scale boat

production continued, particularly for coastal fishing and local riverine transport. Traditional craftsmen preserved indigenous techniques of wooden boat construction, adapting them to meet local needs rather than global commercial demands. This continuity demonstrates the resilience of maritime knowledge systems, even as large-scale industrial shipbuilding declined.

Thus, the decline of Balasure's maritime industry must be understood as the outcome of environmental degradation, climatic vulnerability, administrative restructuring, technological change, and socio-economic transformation. Yet beneath this broader downturn, the persistence of local boat-making traditions ensured that the region's maritime heritage survived in modified but meaningful forms.

Purpose of Shipbuilding Activities

Shipbuilding in Balasure historically served multiple overlapping functional domains:

1. Maritime Trade Across the Indian Ocean World

The primary purpose of vessel construction was to facilitate commercial exchange within the Indian Ocean maritime network. Ships built or repaired in Balasure were used for interregional trade connecting eastern India with:

- Southeast Asian polities
- Sri Lankan coastal markets
- Bengal deltaic ports
- Coromandel coastal settlements

The Bay of Bengal maritime corridor operated as a semi-enclosed ecological and commercial system characterized by monsoon-driven navigation. Vessel design therefore emphasized stability in turbulent seasonal weather rather than high-speed deep-water performance.

2. Coastal Transportation and Lighterage Operations

Balasure shipyards specialized in the production of country boats used for lighterage services. Since large European ships often anchored offshore due to sandbar limitations, smaller indigenous vessels

transported commodities between shore warehouses and ocean-going ships.

Historical records of the British East India Company indicate that locally constructed boats were extensively used for cargo handling operations. These country boats were particularly important for the movement of:

- Textile products
- Rice and agricultural surplus
- Timber and forest resources
- Saltpetre and minor trade commodities

The lighterage system reduced harbour infrastructure requirements and allowed commerce to function despite geomorphological instability.

3. Royal and Commercial Logistics

During the pre-colonial and early colonial periods, maritime vessels were also employed for administrative and military transportation. The dynastic regimes of coastal Odisha, particularly during the Ganga period, utilized naval craft for:

- Temple construction logistics
- Coastal surveillance
- Tribute transportation
- Pilgrimage mobility

The transport of stone blocks for temple architecture illustrates the integration of maritime technology with religious economy.

4. Fishing and Subsistence Navigation

Beyond commercial trade, shipbuilding supported subsistence economies. Fishing communities depended on locally manufactured boats for daily livelihood operations.

Coastal fishing practices were adapted to tidal rhythms, monsoon seasonality, and estuarine ecology. Vessel hull curvature and weight distribution were optimized for shallow-water maneuverability.

Material Technology and Construction Techniques

Balasore shipbuilding relied primarily on hardwood timber species such as:

- Sal wood
- Teak wood

Supplementary materials included bamboo reinforcement structures, natural fibre ropes, and iron

fastening nails. Waterproofing techniques involved organic resin applications and surface smoothing using hand planes. The hull construction process followed sequential stages:

1. Design conceptualization based on vessel purpose
2. Timber selection and seasoning
3. Structural cutting and joint carving
4. Hull assembly using fasteners and rope binding
5. Surface finishing and protective treatment
6. Floatation and stability testing

Water trial experiments were essential for verifying buoyancy and navigational control.

Traditional Boat Types and Hydrodynamic Adaptation

The traditional boat typology of coastal Odisha represents an advanced indigenous response to the ecological and hydrodynamic conditions of the Bay of Bengal maritime environment. Vessel morphology was primarily shaped by tidal amplitude variation, estuarine sediment load, monsoon wind circulation, and shallow coastal water depth.

The following traditional boat forms were historically dominant in coastal Odisha:

- **Bhela** – A lightweight floatation structure constructed from bundled reeds or plant materials, primarily used for short-distance river crossing and emergency mobility.
- **Chapa** – A small wooden craft designed for inland navigation and fishing operations.
- **Padhua or Kosala Danga** – A traditional coastal boat variant used for passenger and cargo transport.
- **Pota (Dugout Canoe)** – Carved from a single timber trunk, optimized for riverine stability.
- **Kattumaram or Teppa Catamaran** – A multi-log floating platform suited for high-wave coastal zones.
- **Nauka or Danga** – General-purpose navigation vessels used for trade and fishing.
- **Masula Boat (Padhua Variant)** – Flexible hull construction craft adapted to surf-zone landing conditions.
- **Patia** – Shallow draft fishing boat.

- **Dingi** – Small maneuverable craft used for inland transport and lighterage.

These vessels were specifically optimized for operation within the tidal estuary system associated with the Budhabalanga River and adjoining coastal waters.



Boita

Bhela



Danga

Photo Courtesy: Internet

Traditional Shipbuilding Tools and Craftsmanship

The technological sophistication of Balasore shipwrights is reflected in their specialized tool inventory:

Structural Shaping Instruments

- **Adze** – Used for internal hull hollowing and contour shaping.
- **Chisels** – Enabled precision carving and joint slot formation.
- **Saws (Karata)** – Hand-operated timber cutting tools for sectional wood preparation.

Surface Treatment and Assembly Instruments

- **Planes (Randha)** – Employed for hull surface smoothing and aerodynamic finishing.
- **Augers (Agada)** – Used for drilling fastening holes for nail or bolt insertion.
- **Mallets and Hammers** – Assisted in mechanical assembly and joint reinforcement.

The craftsmanship tradition emphasized manual skill continuity, with knowledge transmitted through apprenticeship lineages rather than institutional education systems.

Shipbuilding Process and Technical Knowledge System

The ship construction sequence followed a culturally embedded engineering protocol:

1. **Functional Design Planning** – Vessel dimensions were determined based on intended operational use such as fishing, cargo transport, or passenger movement.
2. **Raw Material Selection** – Timber and fibre materials were chosen according to buoyancy, elasticity, and corrosion resistance requirements.
3. **Structural Cutting and Shaping** – Major hull components were carved and prepared.
4. **Joinery and Fastening** – Hull segments were connected using mechanical and fibre-based binding systems.
5. **Surface Waterproofing** – Organic resin coatings were applied to reduce water penetration.
6. **Hydrodynamic Testing** – Newly constructed boats underwent water flotation trials to assess balance and manoeuvrability.
7. **Post-Testing Structural Adjustment** – Artisans performed corrective modifications based on trial feedback.

Successful ship construction required intimate knowledge of tidal rhythm, coastal wind circulation, and sediment transport behaviour along the maritime corridor connected with the Bay of Bengal.

Conclusion

Balasore occupies a significant position in the maritime history of eastern India. The region functioned as a technological, economic, and cultural interface between indigenous seafaring traditions and global maritime trade networks. The convergence of ethnographic craft knowledge, colonial archival records, and archaeological evidence demonstrates that Balasore was not merely a peripheral coastal settlement but an active participant in early modern Indian Ocean commerce. Systematic marine archaeological investigation is essential to preserve and reconstruct this submerged and endangered maritime heritage.

References (APA Style)

- Chaudhuri, K. N. (1985). *Trade and civilisation in the Indian Ocean: An economic history from the rise of Islam to 1750*. Cambridge University Press.
- Das Gupta, A. (2001). *The world of the Indian Ocean merchant, 1500–1800*. Oxford University Press.
- Foster, W. (Ed.). (1906). *The English factories in India, 1618–1621* (and subsequent volumes). Clarendon Press.
- Jani, S. M. (2012). Danish settlement of Balasore. *Proceedings of Odisha History Congress*.
- Mishra, P. P. (1997). Balasore as a fort town in the seventeenth century. *Orissa Historical Research Journal*.
- Nayak, G. (2014). Port development and maritime commerce in colonial Odisha (1866–1936). *Journal of Odisha Maritime Studies*.
- Tripati, S. (2017). *Maritime archaeology in India: Past, present and future*. Aryan Books International.
- Westerdahl, C. (1992). The maritime cultural landscape. *International Journal of Nautical Archaeology*, 21(1), 5–14.