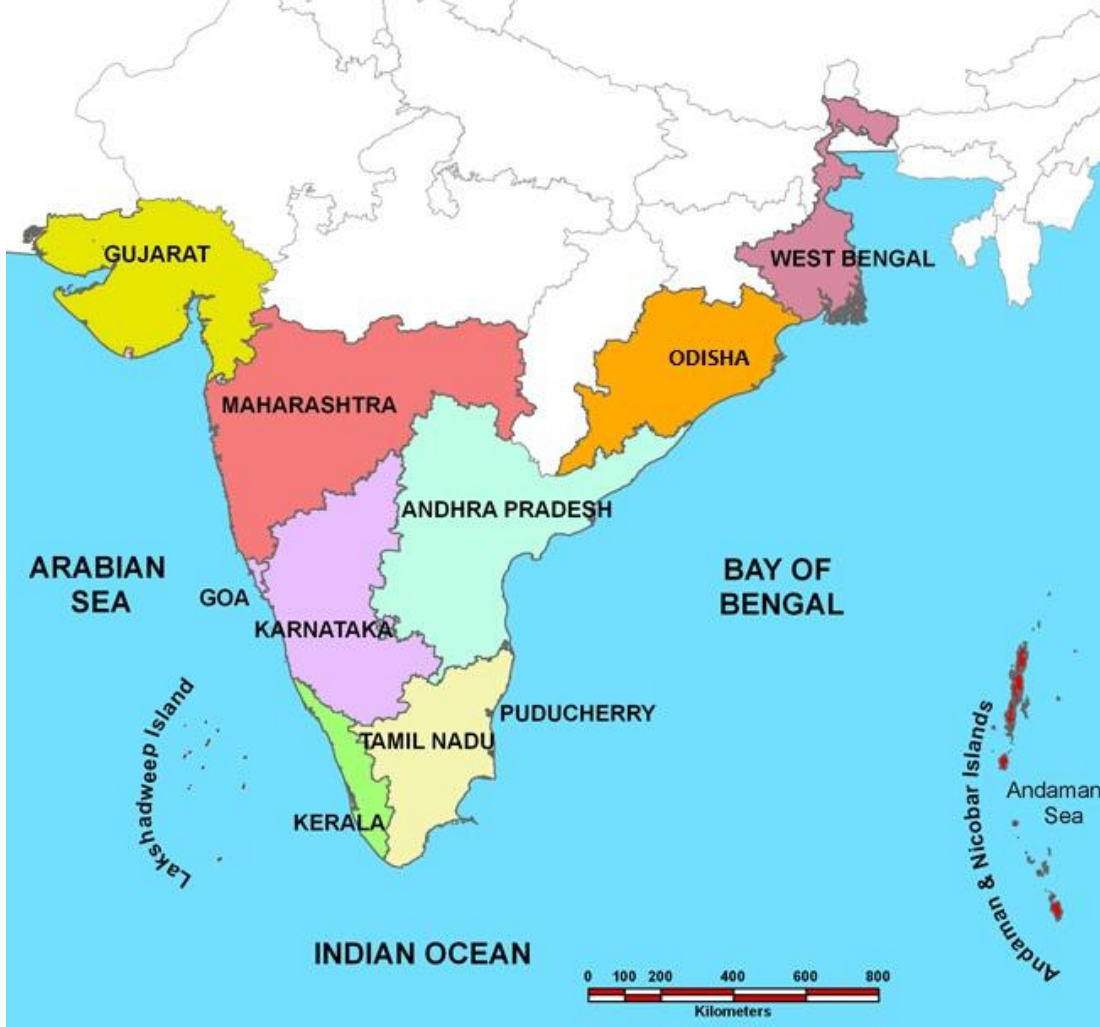


## Indian peninsula and nine coastal states



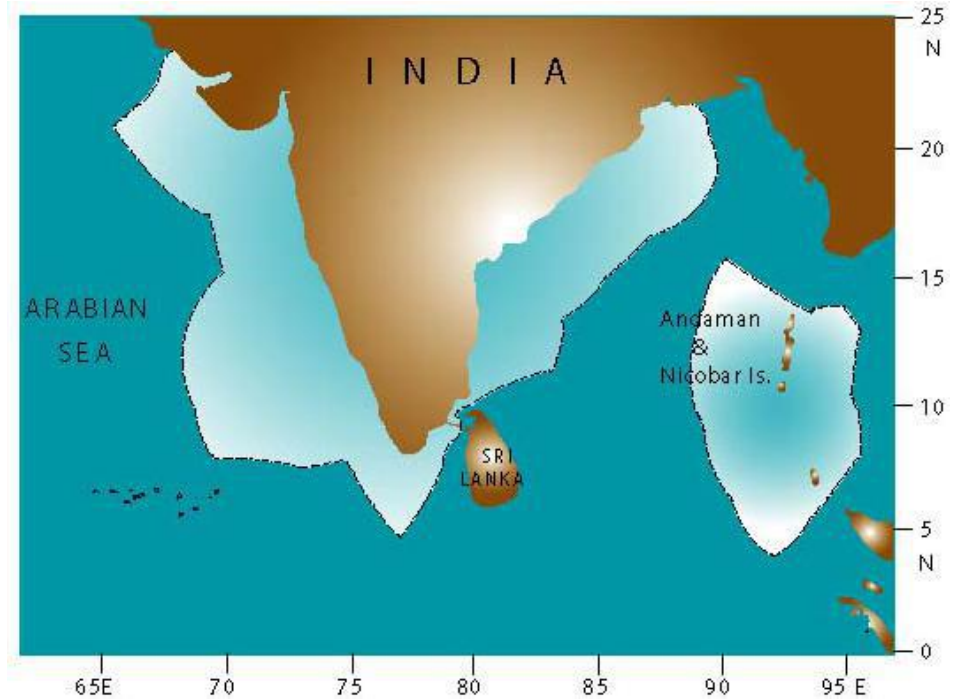
Nine Coastal states of India  
Source: iomenvis.nic.in

With a coastline spanning 7516.6 kilometres, India forms one of the **biggest peninsulas** in the world.

The ports and shipping industry in India play a vital role in sustaining growth in the country's trade and commerce.

Almost a 100 years ago, **India was one of the largest ship building countries in the world.**

Indian shipbuilding was centered along the Western Coast in Kalyan, Bhivandi and Mumbai, in South India at Narsapurpeta (near Masulipatnam) and in Bengal at Chittagong and Hooghly.



Countries with coastline have a fixed area earmarked exclusively for exploration and exploitation.

This area is called its **Exclusive Economic Zone (EEZ)**

Total Population of India : 1.28 billion

Total Population of coastal districts : 171 million

**Percentage of population in coastal districts of India: 14.2 %**

(Census 2014, Source: [www.indiaonlinepages.com](http://www.indiaonlinepages.com))



Kerala coastal community: Fishing Net repair



Maharashtra coastal community: Koli Dance



### Ancient Indian Maritime History: Vedic period

Vedas are large body of knowledge texts originating in the ancient Indian subcontinent composed in Vedic Sanskrit. The Rig Veda is the oldest book in the world dated at least **1700 BCE**.

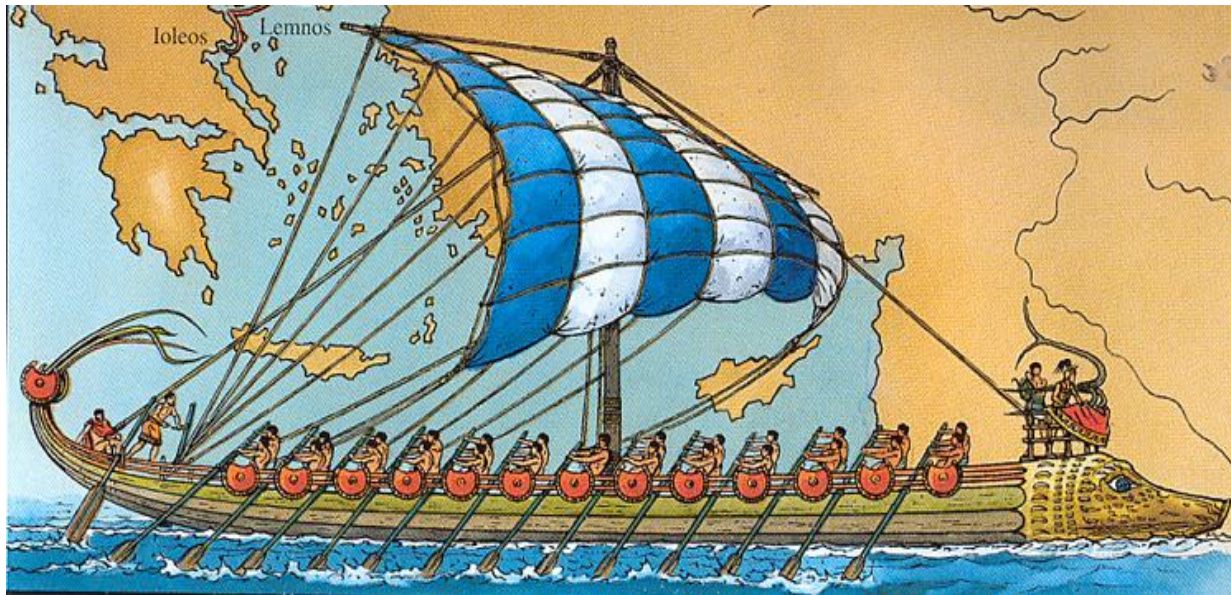
It is noted in these texts that Hindus of the Vedic period had big ships and went into distant lands and deep ocean for trade and other purposes.

Rig Veda mentions **Lord Varuna**, the God of the sea. It also mentions '**Sataritara**' or a galley with hundred oars. It describes commercial sea voyages and uses '**Samudra**' in classical Sanskrit language for 'Oceans'. The word **Navy is derived from the Sanskrit word Nau** -used for boat and ship. It is frequently mentioned in the RV and AV. The term nava is referring to a ship (RV 1-97-8)

Indian seamen of yore were at the forefront of developments in seamanship and navigation, such as invention of the '**matsya yantra**', an astrological device-a forerunner of the modern magnetic compass.



Matsya yantra



<http://swamiindology.blogspot.in/2015/04/ships-in-rig-veda.html>

Sataritara



Lord Varuna, the God of the sea



## Indian Maritime PreHistory : Trade Routes in 1st Century AD



## Indian Maritime PreHistory

Indian maritime history begins during the **3rd millennium BCE** when inhabitants of the **Indus Valley initiated maritime trading contact with Mesopotamia.**

As trade between India and the Greco-Roman world increased, spices became the main import from India to the Western world, bypassing silk and other commodities.

Before the Christian era, **Herodotus**, the celebrated Greek traveller visited India.

The Indian commercial connection with South East Asia proved vital to the merchants of Arabia and Persia during the 7th–8th century.

Some years after the time of Pytheas, about B.C. 326 a Greek traveller Nearchus, , one of Alexander's admirals, was charged to visit all the coast of Asia from the mouth of the Indus to that of the Euphrates.

**Alexander** furnished Nearchus with a fleet of thirty-three galleys, of some vessels with two decks, and a great number of transport ships, and 2000 men. Nearchus came down the Indus in about four months, escorted on either bank of the river by Alexander's armies.

After Ceylon, **Marco Polo** and his fleet came to Maabar, the Tamil Nadu province on the coast of India. This Maabar forms the southern part of the Coromandel coast, and is celebrated for its pearl fisheries.

**Marco Polo's voyage to India** - rich in date and spice trees, in grain, precious stones, silk and golden stuffs, and elephants' tusks, wine made from the date and other merchandise. These items were to be shipped in board ships with but one mast, which came in numbers to the port; but many were lost on the voyage to India, as they were only built with wooden pegs, not iron nails, to fasten them together.



Herodotus, 5 cent.BC



Marco Polo, 13 CE

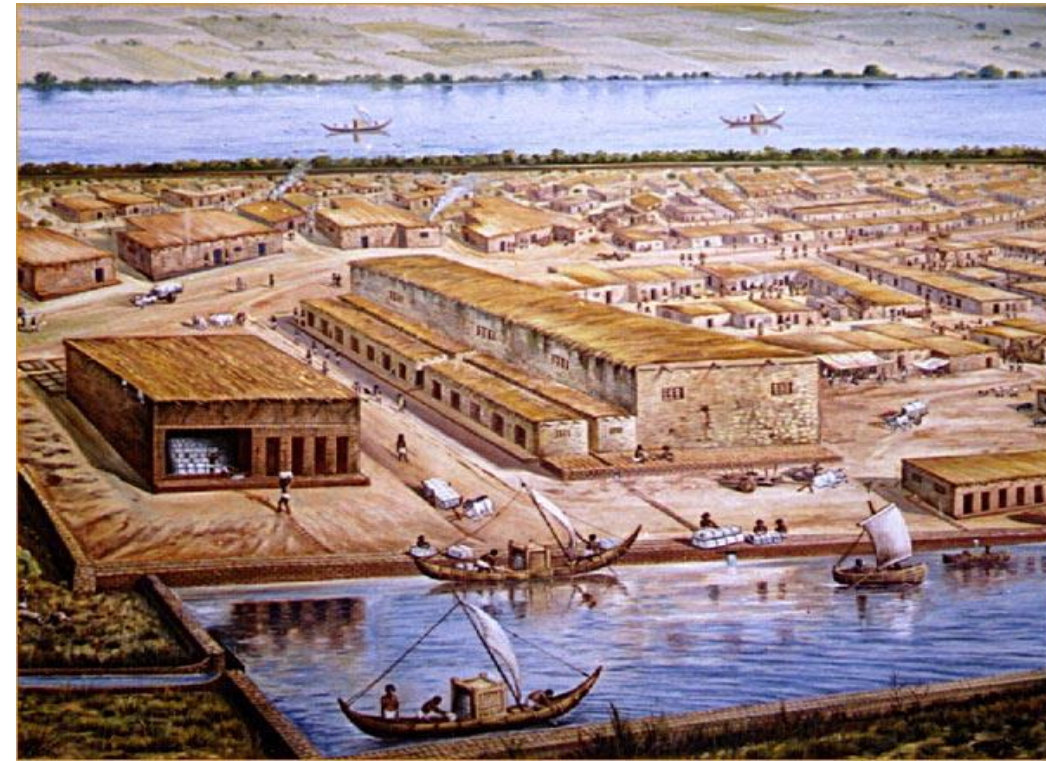


### ***PreHistory: Discovery of the port city of Lothal and Dwaraka***

Dating from **3700 BCE**, **Lothal**, in the Bhāl region of the modern state of Gujarāt is one of the most prominent cities of the ancient Indus valley civilization.

It was discovered in **1954**, by the Archaeological Survey of India (ASI), the official Indian government agency for the preservation of ancient monuments.

**Lothal's dock is the the world's earliest known**—connected the city to an ancient course of the Sabarmati river on the trade route between Harappan cities in Sindh and the peninsula of Saurashtra. It was a vital and **thriving trade centre in ancient times**, with its trade of beads, gems and valuable ornaments reaching the far corners of West Asia and Africa.



Between 1983 and 1990, the Marine Archaeology Unit of National Institute of Oceanography carried out a search in the coastal waters of Gujarat and discovered a well fortified township of **Dwaraka**. The general layout of the city agreed with the ancient texts of Vishnu Purana and Mahabharata.





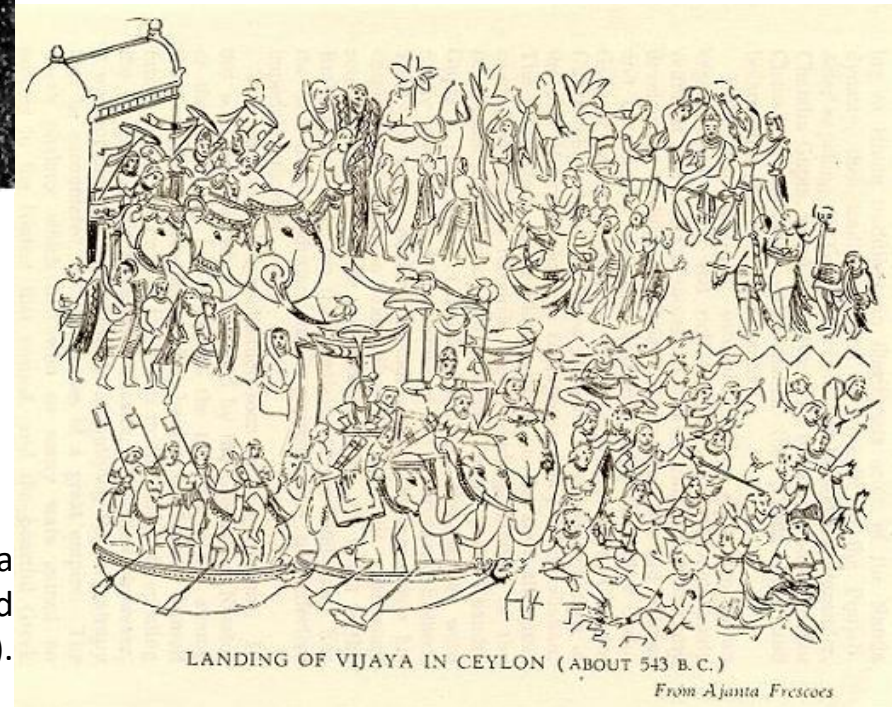
## PreHistory



From a **fresco** in a cave at Ajanta, the three square sails and oculus or eye painted at the bows.

(Ajanta, The colour and Monochrome reproductions, ed. G.Yazdani and Others, 1930).

Ships Landing of Prince Vijaya in Sri Lanka - 543 BC from **Ajanta Frescos**. Ajanta painting of a later date depict horses and elephants aboard the ship which carried Prince Vijaya to Sri Lanka. (India Through the ages - By K. M. Panikkar).



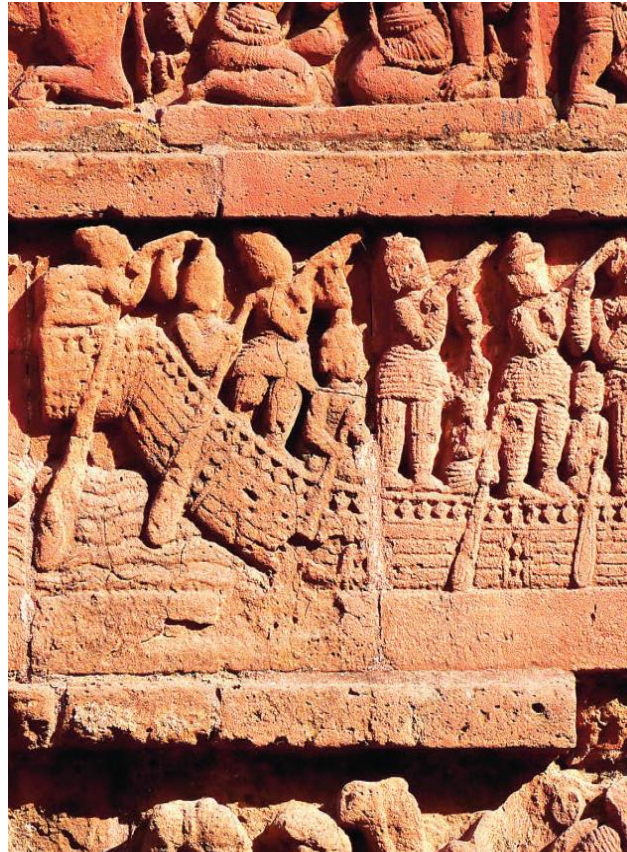


## ***Medieval Indian History***

The seafaring kingdoms of the **Kalingas, Cholas, Pandyas and Cheras** sailed to distant countries in the East, carrying goods and people across south-east Asia, establishing long lasting trade and continuing cultural links.



Boatmen near Hachappa  
Mantapa, Hampi- 14th Century

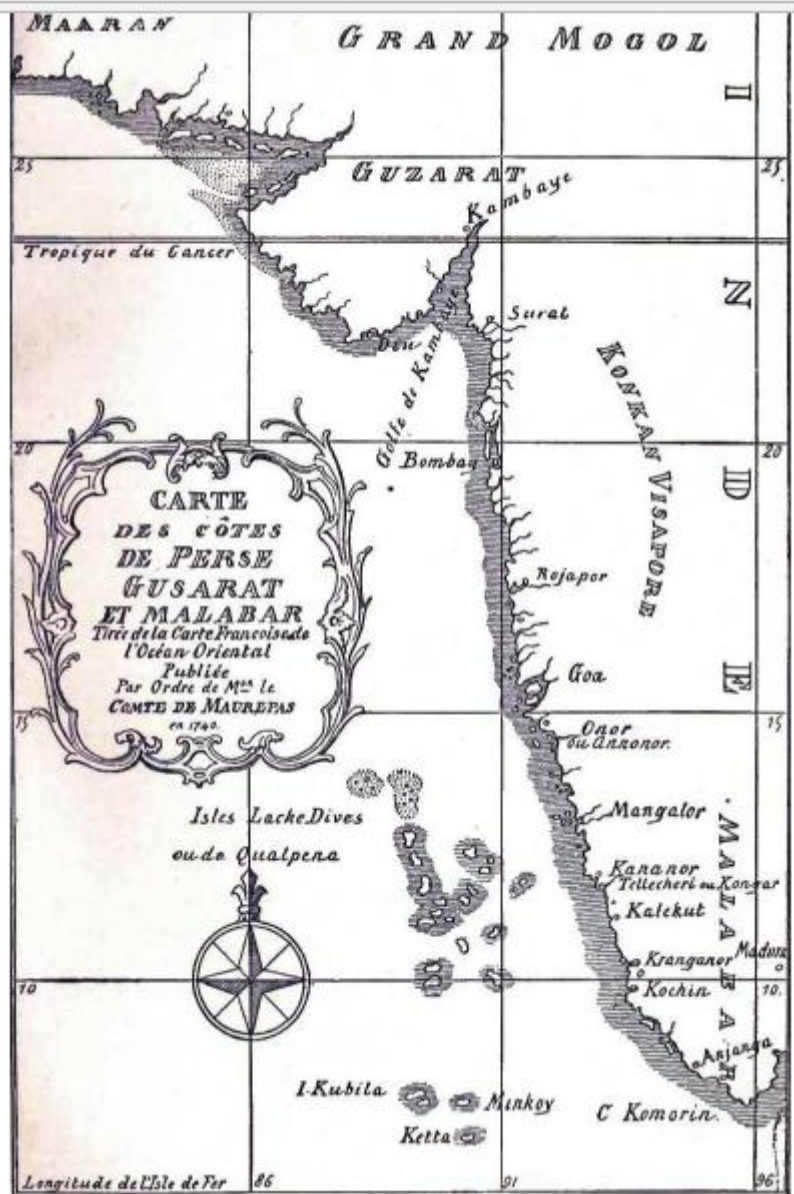


Sculpture depicting Ships and boats





## Portuguese in Indian history

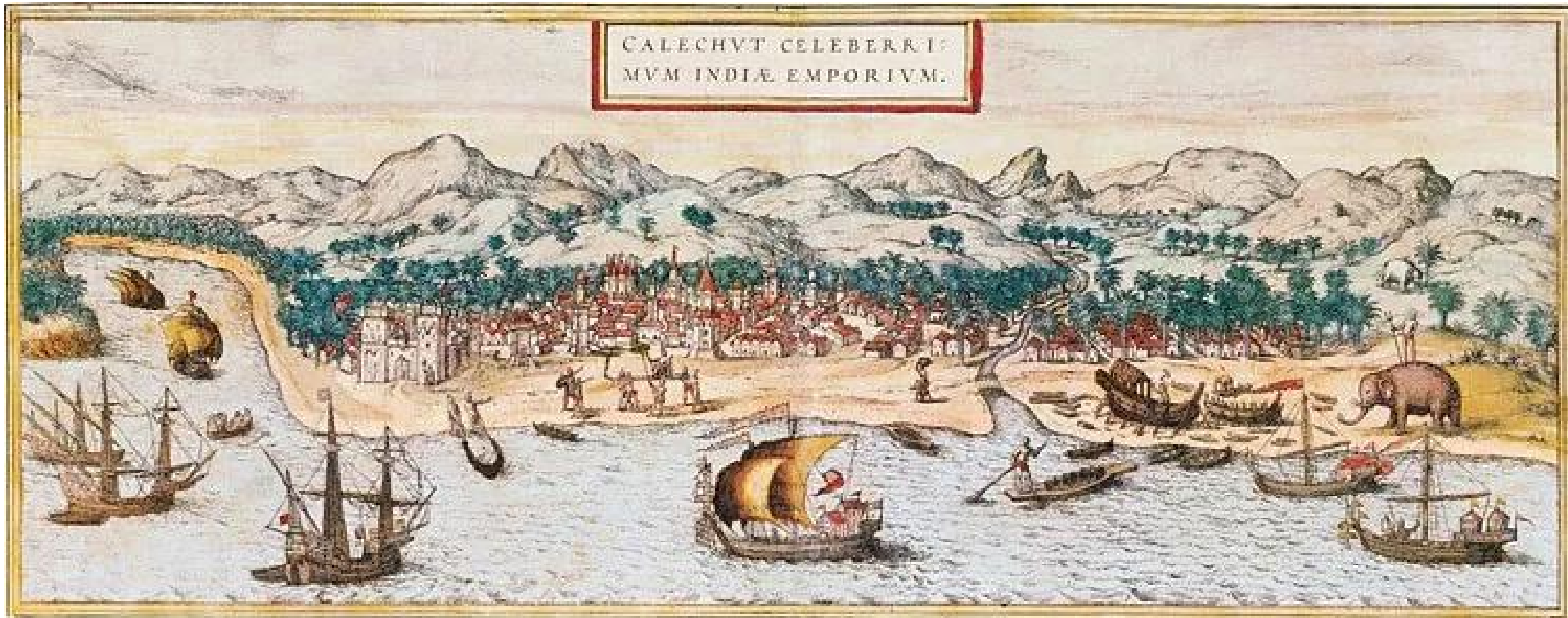


The principal object of **Portuguese maritime enterprise** in the fifteenth century was to search for a passage to India by the Ocean.

**In 1498, Vasco da Gama's ocean-going ship**, the Sao Gabriel came to India and arrived in Calicut. The Portuguese empire was founded six years after the discovery of the sea route and **Cochin, Goa and Daman** became important trade centres and developed vastly under Portuguese influence. They would build forts to claim control over the area.

The three- or four-masted ocean-going sailing ship of the 14th and 15th centuries in Europe were called carraca or **nau** in Portuguese, Spanish and Genoese, caraque or nef in French, and kraak in Dutch. Whether it is due to Indian inflence is questionable.





Sixteenth century painting of the **Calicut port** – showing shipbuilding yards.

(<http://www.saudiaramcoworld.com>;  
BRAUN AND HOGENBERG, CIVITATES ORBIS TERRARUM, 1572 (2))



*Portuguese Forts in India*



Vasai (Bassein) Fort, Mumbai



Fort of Daman



St. Thomas Fort, Kollam



Aguada Fort, Goa



## ***Mughals in Indian History : 13-15th century***

Merchants cargo ships were in significant demand during the Mughal period.

**Ma Huan**, the famous chronicler and interpreter of Zheng He (also called Cheng Ho) voyages, during the Ming dynasty, studied **boat building in Bengal** during the early 15th century (1400-1410).

Though Mughals did not show any inclination to fielding a navy or building ships, **Emperor Akbar** did build warships and large ocean going trading vessels, as can be gleaned from the '**Akbarnama**' and '**Ain-e-Akbari**', important books of that era.



Babur crossing a river using traditional boats. (Maritime Heritage of India: Indian Naval Academy)



## Marathas in Indian History : 1657-1818

During **Shivaji's** reign, as per estimates, more than **300 ships** of 300 tons capacity were launched.

While fighting the Siddis and observing the Portuguese naval power on the Konkan coast, Shivaji realised that for trade to flourish and his empire to prosper, he would need an efficient system of ports and an excellent navy.



Diorama showing maratha naval tactics,  
National Museum, New Delhi

**Kanhoji Angre**, a Maratha admiral remained focussed on building his fleet from ten ships to about 50 galbats and ten ghurabs. After many skirmishes that followed, the Portuguese eventually signed a peace treaty with the Marathas.

A great believer in forts, Shivaji built many coastal forts in the north-western part of the Deccan plateau.



## British in Indian History : 15-18 century

The East India Company was founded on 31 December **1600**. The British encountered resistance from the Portuguese, French, Marathas and many others smaller kings and rulers while trying to enter Ocean trade.

The **British East India Company** built and developed several ports - where a port, dockyard and a fort were usually the first three structures built. **Chennai was created in the 1640's, Mumbai in the 1660's and Kolkata in the 1690's.**

The East India Company shifted their shipbuilding base to **Mumbai** in 1735 CE .

For the next 100 years, the Parsi-led shipyard of the **Wadias** in Mumbai build around 115 warships, including 84 gunships and 144 merchant ships. About 1750: The modern era of ship building began with the building of a **dry dock at Mumbai** (then Bombay)., a second was erected in Kolkatta about 1780.

After the **Bombay Port Trust** was formed in **1870**, the shipbuilding on the Western Coast moved to Mumbai. In 1872, Jamshedji Wadia, from a Parsi ship-building family, constructed the "Cornwallis", a frigate with 50 guns, bought by the East India Company. This led to several orders from the British Navy.



Seven islands of Bombay (now Mumbai)



Lovji Nusserwanjee Wadia (1702–1774)



## Indian Ship building

Buyers preferred Indian ships, because of better **jointing technology** and **elimination of metal sheeting**.

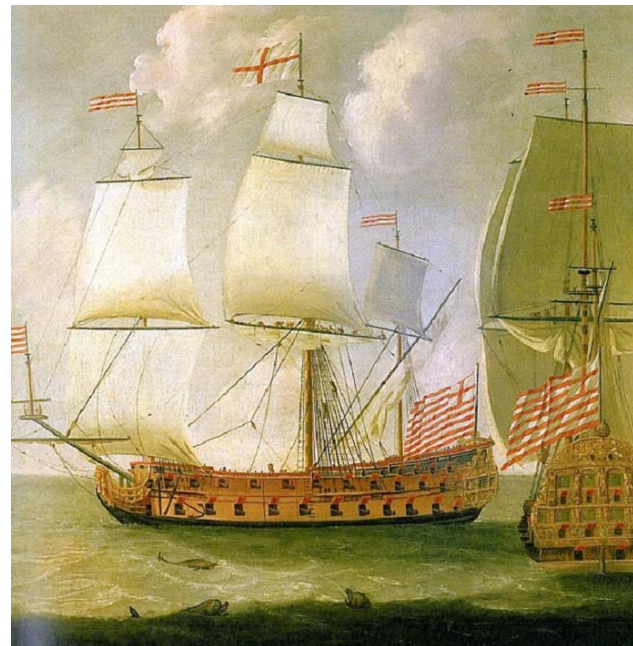
Indian shipbuilders had a special system where **wood was seasoned in partial vacuum, with oils** for timber improvement.

Indian ships were usually made of **Kerala Teak** , stitched together with coir yarn usually dipped in fish oil.



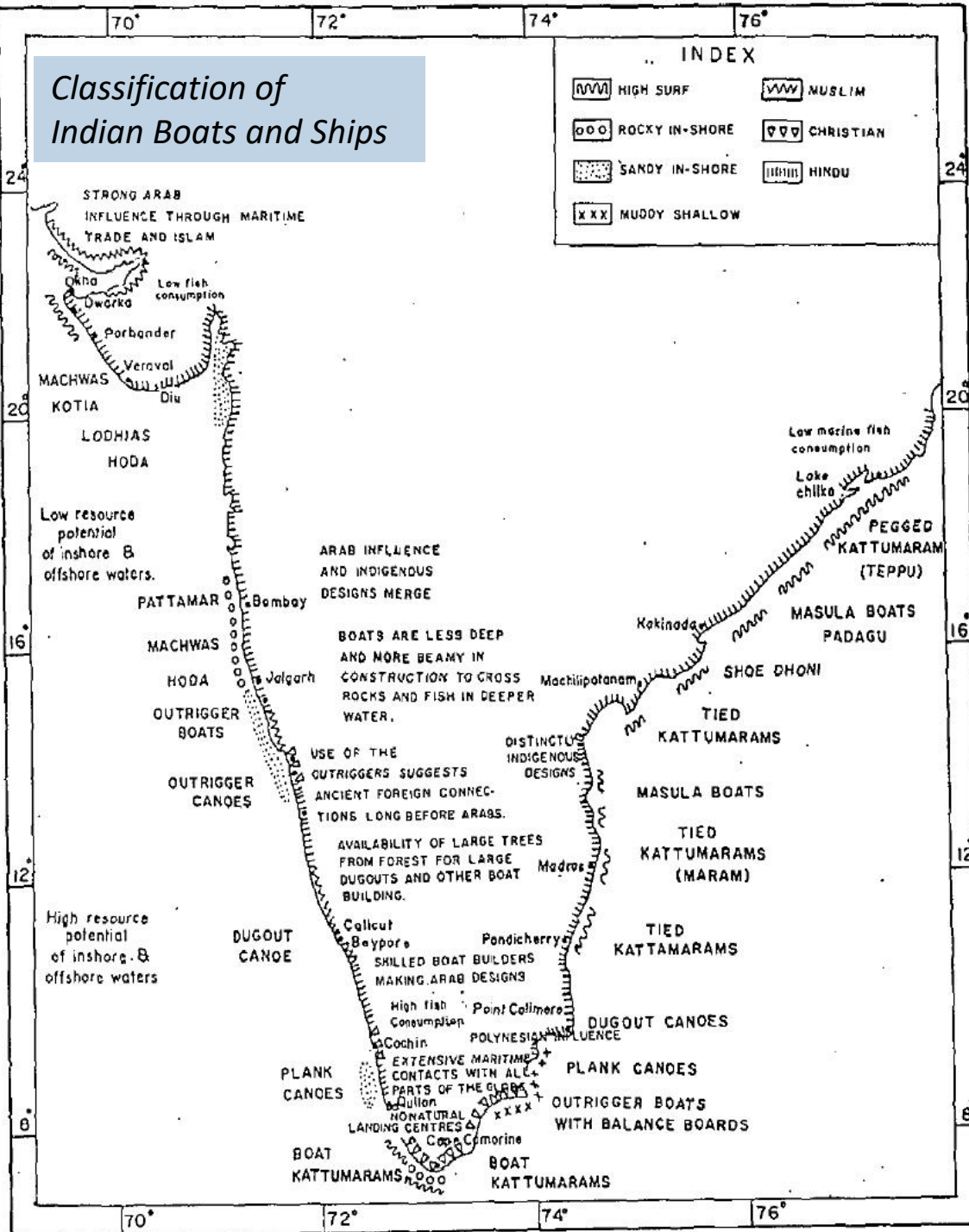
*"By the close of the Napoleonic Wars, the Royal Navy had come to rely heavily on the potential of India as a source for shipbuilding facilities and material, especially teak, a wood that is resistant to marine borers and seasons "*

*(from Warships of the world to 1900 By Lincoln P. Paine; page 13)*





## Classification of Indian Boats and Ships



**James Hornell (1865 -1949)** an English zoologist and seafaring ethnographer traveled extensively around the Indian Ocean world and in the 1930s became the principal authority on **traditional, indigenous watercraft** particular logboats, skin boats, canoes of all types, floats and even small ships.

His work is distinguished by careful observation and measurement and supported by drawings and photographs of seafaring life all but vanished over the second half of the twentieth century.

Alongside is a map with names of important **Boat Types and some Socio- Economic, Cultural and Ecological factors** which influence it, as mentioned by James Hornell in 1920.

The use of **crafts and gears in fishing technology** plays very important role and help enhancing the production commercial bases.



## Classification of Indian Boats and Ships

There are various types of gears and crafts used in different parts depending upon the **nature of water bodies, the age of fish and their species.**

### I. Crafts used on the East Coast:

- (1) **Catamaran** : Made by tying many wood logs in such a way that it takes the shape of a canoe.
- (2) **Masula Boat**: Keel less and frameless made by mango planks, which are stitched with palm leaf fibres.
- (3) **Nauka and Dinghi**: Well-designed large boats with carvings
- (4) **Tuticorin Boats or Fishing Luggers**: Operated in inshore waters and are used as cargo boats.

### II. Crafts used on West Coast:

- (1) **Dugout Canoes**: Constructed from large wood logs, hollowed by scooping inner part
- (2) **Plank-Built Canoes**: Dug-out canoes extended with planks on sides.
- (3) **Outrigger Canoes**: Narrow keel and single outrigger and extended out with planks
- (4) **Built-Up boats**: Highly specialized indigenous fishing craft.
  - (a) **Ratnagiri type boat**, Pointed bow, straight and narrow keel and low gunwale.
  - (b) **Machwa**: provided with broad hull, straight keel and pointed bow, called Bassien type.
  - (c) **Satpati or Galbati Type**: straight keel, high gunwale, medium pointed bow and broad beam. can be mechanized with a motor engine without any modification in design.
  - (d) **Broach Type**: Flat bottom and is widely used in inshore and estuarine water.
- (5) **Coracle**: Used in rivers, reservoirs and canals for fishing. One or two fishermen can operate this craft. It is made like a round basin and its frame is made with split bamboos. The outer surface is covered with leather.
- (6) **Shoe Dhonie**: shaped like a shoe. constructed by teak wood with planks grooved with ribs and frames fitted with nails.
- (7) **Kakinada Nava**: commonly used for inshore fishing. made by teak wood.

<http://www.yourarticlelibrary.com/fish/applied-fisheries/crafts-and-gears-used-for-fishing-with-diagram/88586>



## Classification of Indian Boats and Ships : East Coast

### Fishing boats of Tamil Nadu



Boat Catamaran



Tuticorin boat



Boat canoe (Vallam)



Adirampatnam fishing canoe



Masula boat



Botali

### Fishing boats of West Bengal



Batchari boat

Batchari boat



Chot boat

Chot boat

### Fishing boat of Odisha



## Classification of Indian Boats and Ships

### Fishing boats of Kerala



Dugout

### Fishing boats of Maharashtra



Bombay machwa

### Fishing boats of Gujarat



Porbandar machwa

### Karnataka



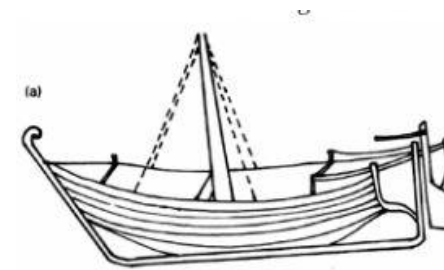
Coracle



Plank built canoes



Satpati type



Gujarat wahan



Raft catamaran



Versova boat



## Present Scenario

India is serviced by **12 major ports**, 200 notified minor and intermediate ports.



**Kandla Port- Gujarat:** First special economic zone in India as well as in Asia



**Mumbai Port:** Largest port in India, natural deep-water harbor



**Panambur Port- Karnataka:** Deep water all weather port, one of the largest ports in India.



**Nhava Sheva- Maharashtra:** Jawaharlal Nehru Port is the largest container port in India



**Marmagao port -Goa :** Best natural harbors of India



**Cochin Port- Kerala:** Largest container transshipment facility in India.



## Present Scenario

India is serviced by **12 major ports**, 200 notified minor and intermediate ports.



**Port Blair- Andaman:** Youngest sea port in India



**Chennai - Madras Port** is the one of the oldest port of India and largest port in the Bay of Bengal



**Paradip Port- Orissa:** major port in the east cost shore , has its own railway system,cold handling unit and anational highway



**Tuticorin Port- Tamil Nadu:** Artificial deep-sea harbour , best port for trade and pearl fishery on the bay of Bengal.



**Vizag Port- Andhra Pradesh:** one of the India's largest seaport and the oldest shipyard of country.



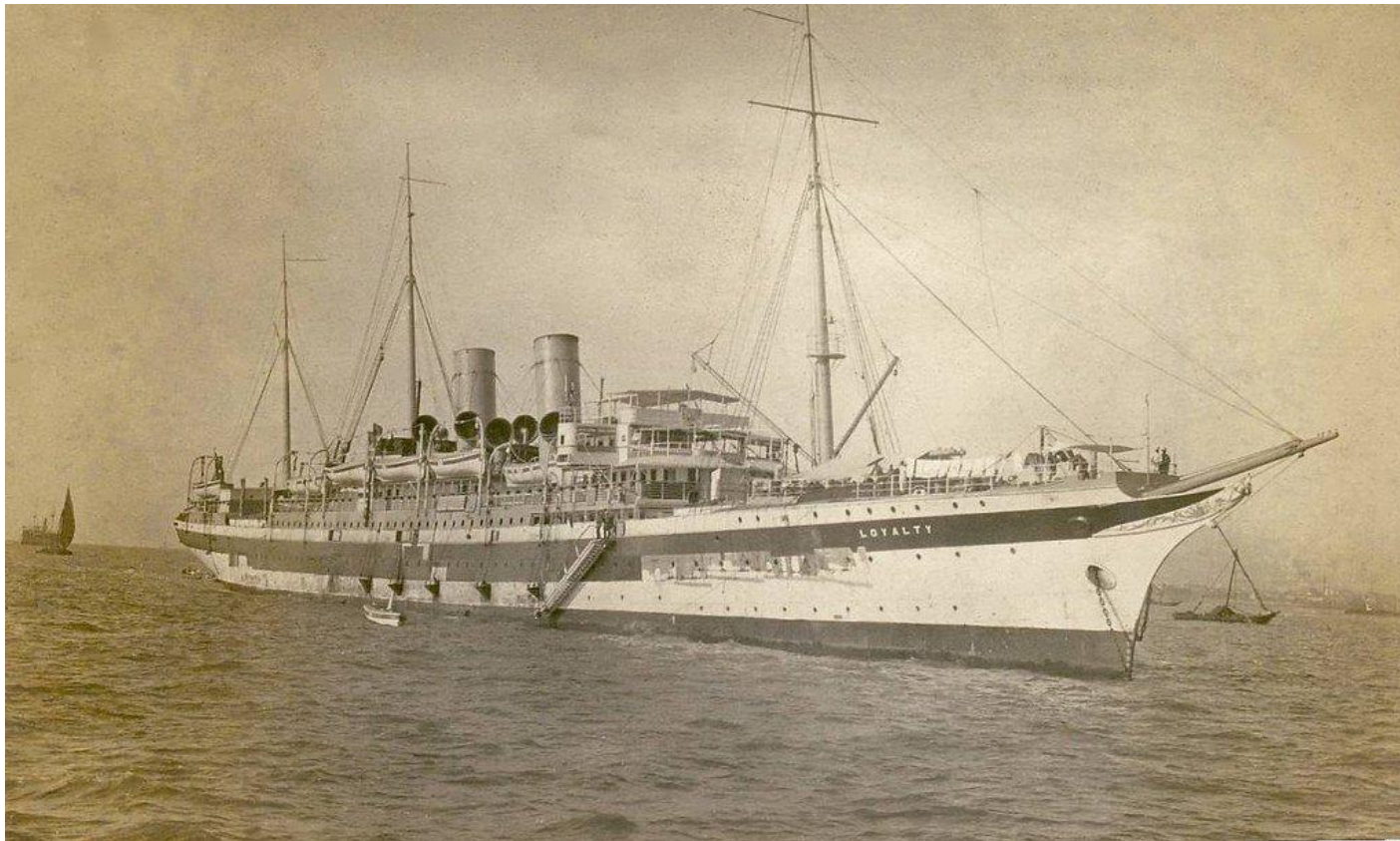
**Haldia Port- West Bengal:** Major trade center for Calcutta , base of Indian Coast Guard.



## ***Present Scenario***

### **5 April marks the National Maritime Day of India.**

On this day in 1919 navigation history was created when SS Loyalty, the first ship of **The Scindia Steam Navigation Company Ltd.**, journeyed to the United Kingdom, a crucial step for India shipping history when sea routes were controlled by the British.



Steam Ship (SS) Loyalty was the first ship to fly under a **Swadeshi banner**. Her voyage marked the entry of India into shipping. **Walchand Hirachand Doshi**, a Maharashtrian industrialist, gets the due credit for the successful voyage of the ship. Prior to this, there were almost 102 Indian shipping companies who had tried to set sail, however, had faced nothing but failure. SS Loyalty was launched in 1890 and named RMS Empress of India by Louise Edgerton.



## ***Present Scenario***

According to the Ministry of Shipping, around **95** per cent of India's **trading by volume** and **70** per cent by **value** is done through **maritime transport**.

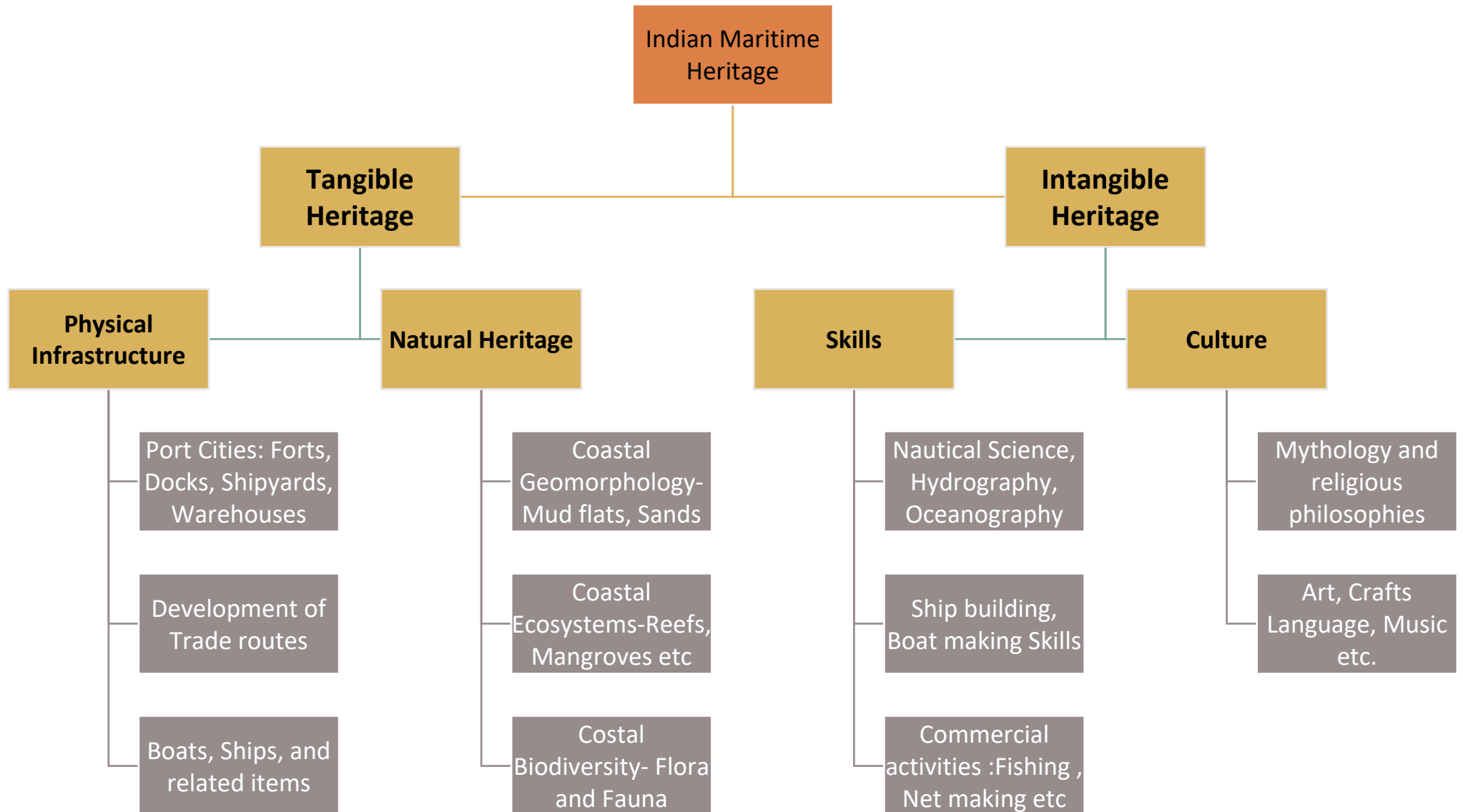
As of 2000, there were **102 shipping companies** operating in India, of which five were privately owned and based in India and one was owned by Shipping Corporation of India.

There were 639 government-owned ships, including 91 oil tankers, 79 dry cargo bulk carriers, and 10 cellular container vessels. Indian-flagged vessels carried about 15 percent of overseas cargo at Indian ports for financial year 2003.



**INS Vikrant** is the first aircraft carrier built in India and the first Vikrant-class aircraft carrier built by Cochin Shipyard (CSL) in Kochi, Kerala for the Indian Navy. To be commissioned in 2023.

## Classification of Indian Maritime Heritage





## Conservation of Heritage

...Preservation...  
...Restoration...  
...Adaptive Re-use...  
...Upgradation...

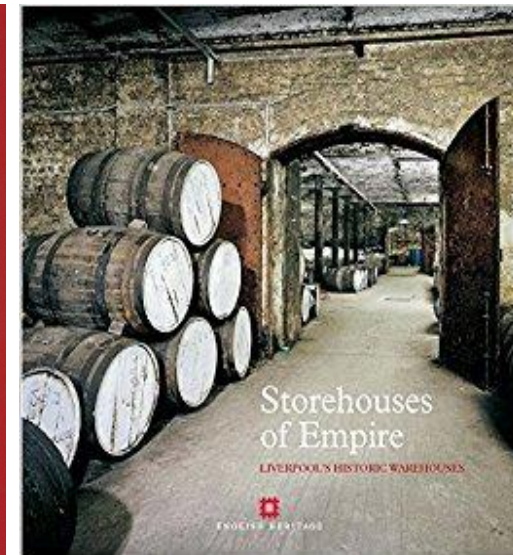
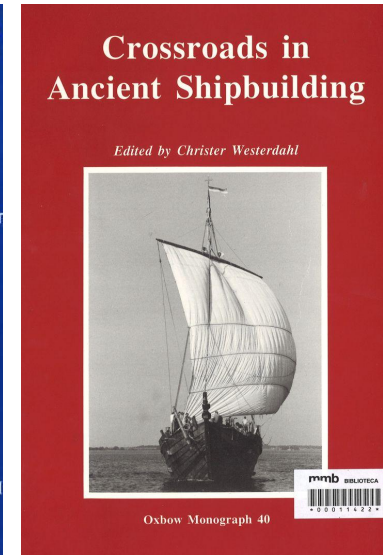
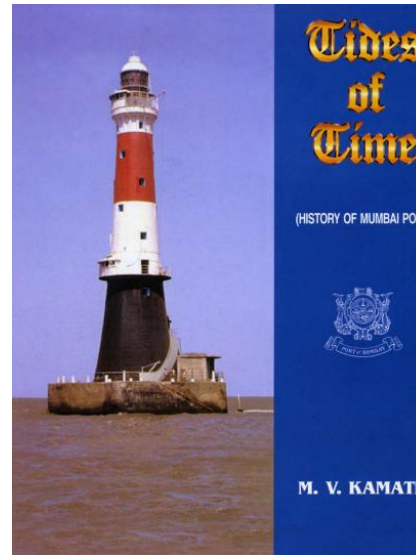
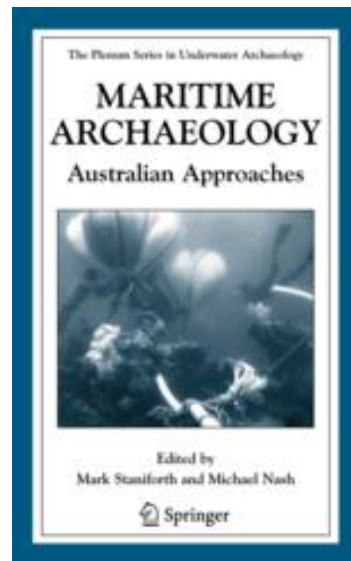
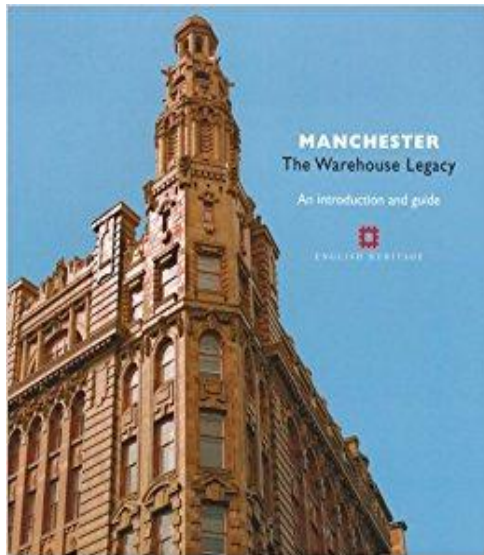
### Conservation Stages

1. **Study of Cultural Significance** : Archival Study, In site finding
2. **Documentation & Analysis** : As built drawings, condition mapping, structural analysis
3. **Conservation Management Plan** : Preparation of a holistic and sensitive proposal
4. **Project Budget & Funding Plan**: Government funding, Private funding, Public- Private Partnership
5. **Phasing of the project**
6. **Priority wise execution** with respect to funds available



## Conservation Efforts

## Publications across the World



## World Heritage Marine Programme

<http://whc.unesco.org/en/marine-programme/>



### Safeguarding

Our core task: ensuring the long-term conservation of World Heritage marine sites through state of conservation reporting.



### Network

Building a network of World Heritage marine site managers who share management solutions and best practices across 49 sites.



### Training

Training site managers to use ecosystem-based marine spatial planning as a tool to optimize marine World Heritage site conservation.



### Exploring

Exploring the potential of the 1972 World Heritage Convention in the High Seas, an area covering nearly 60% of our ocean.



## Conservation Efforts

## Creating Public Awareness and Inclusion

## Western Naval Command

- › Indian Navy Band Performance at Lakhota Lake, Jamnagar
- › Indian Navy Band Performance at Xavier College, Mumbai
- › Air Display at INS Shikra
- › Inter-School Painting Competition at INS Valsura
- › Ships Open for Visitors
- › Medical Camps
- › Public Band Performance
- › WNC Navy Half Marathon



**NAVY WEEK - 2014**  
EVENTS OPEN TO PUBLIC

| EVENT                                 | DAYS / DATE                        | TIME        | VENUE                                    |
|---------------------------------------|------------------------------------|-------------|--|
| Naval Band Public Performance         | Sat, 01 Nov 14                     | 1700 - 1800 | Joggers Park, Bandra                     |
|                                       | Mon, 03 Nov 14                     | 1730 - 1830 | Oberoi Mall, Goregaon                    |
|                                       | Wed, 05 Nov 14                     | 1700 - 1800 | Gateway of India                         |
|                                       | Fri, 07 Nov 14                     | 1700 - 1800 | Hanging Gardens                          |
|                                       | Sat, 08 Nov 14                     | 1700 - 1800 | Cooperage Band Stand                     |
|                                       | Sun, 09 Nov 14                     | 1700 - 1800 | Central Park, Kharghar                   |
|                                       | Sat, 15 Nov 14                     | 1730 - 1830 | Phoenix Mall, Parel                      |
| Free Medical Camps                    | Sun, 16 Nov 14                     | 1000 - 1600 | Karanja, Uran                            |
|                                       | Sun, 23 Nov 14                     | 1000 - 1600 | INS Tanaji, Mankhurd                     |
| Open Sea Swimming Competition         | Wed, 26 Nov 14                     | 0830 - 1230 | INWTC, Naval Sailing Club, Colaba        |
| Ships Open For Visitors               | 28, 29, 30 Nov 14<br>Fri, Sat, Sun | 0900 - 1800 | Tiger Gate, Ballard Estate               |
| Beating Retreat And Tattoo Ceremonies | 02, 03, 04 Dec 14<br>Tue, Wed, Thu | 1700 - 1900 | Gateway of India<br><i>By Invitation</i> |

**Indian Navy - Ensuring Secure Seas for a Resurgent Nation**

## Delhi Area

- › Blood Donation Camp at INS India
- › Navy Health Camp Organised At Aurangabad (Distt Palwal) As Part Of Navy Week 2017 Celebrations



Making wooden cargo boats at  
Cuddalore, Tamil Nadu, India.

The **Uru** is a boat still built in Kerala, India, traditionally used for transporting goods. One of the last shipyards is located in Beypore, a village south of Calicut, Kerala. The craftsmen grow up using their tools but only a few graduate to the level of master craftsmen. The hulls are built without technical plans. Only in the last few years have architects been designing cabins to be built on top of the ship, for which designs are printed up. Most of the Urus being built today are manufactured for and exported to Arab nations as luxury items.

Watch the full, unedited interview with Dr. Balagopal Prabhu: <http://youtu.be/31RIKVcCvxE>



<https://www.youtube.com/watch?v=bdKPETNuQbM>

# Thank you!

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Mumbai Port Trust  
UNESCO  
ICOMOS  
<https://www.youtube.com/watch?v=68ifp7NEiQw>