

Ancient maritime trade of the eastern Indian littoral

Sila Tripathi*

Marine Archaeology Centre, National Institute of Oceanography (CSIR), Dona Paula, Goa 403 004, India

Before the discovery of the monsoon winds by Hippalus in AD 45–47, the mariners of the east coast of India were aware of the monsoon wind and currents and used them for maritime trade. The maritime trade from India to Southeast Asia was a seasonal phenomenon. The distribution of Buddhist settlements, discovery of varieties of pottery, beads and inscriptions along the ports and trade centres point to active maritime trade between India and Southeast Asia. Further, the representation of art on the walls of the caves, stupas and temples indicate that Buddhist monks, saints, traders and craftsmen used to set sail together. Over a period of time, ancient methods of maritime trade disappeared, and are now only remembered and celebrated as rituals and social events along the east coast of India. This communication details how the monsoon wind and currents favoured mariners during their onward and return voyages to Southeast Asia. In order to understand the past monsoon wind and current patterns, the prevailing wind pattern and ocean circulations have been taken into account because for centuries no major changes have been observed in the southwest and northeast monsoons. The findings of varieties in pottery, beads, etc. along the ports and Buddhist settlements show that all these played a significant role in disseminating Indian culture in overseas lands.

Keywords: Buddhism, coins, inscriptions, maritime trade, monsoon wind and currents, pottery.

THE eastern coastline of the Indian Peninsula is well known for its several seaports (Figure 1) located at river mouths or outlets to the sea. These include the Gangetic delta which has openings into the sea through the many outlets along the large fertile plain arching towards the Bay of Bengal; the Krishna and Godavari deltas of Andhra Pradesh; the Coromandel Coast with its prosperous lands around Thanjavur, etc¹. The region between the rivers Godavari and Mahanadi is marked by several spits. The inlets under the influence of the southwest monsoon encourage a long shore drift from southwest to northeast directions. The river deltas of India are favourable for navigation and the distributaries associated with estuarine mouths naturally led to the development of many ports. The large lagoons, lakes, etc. provided sheltered water bodies in which a large number of ports developed. For instance, the ports of Palur, Kalingapatnam, Tuticorin,

etc. on the east coast are protected by spits². On the other hand, ports along the west coast are protected by bars and spits providing the much desired natural break waters for safe anchorages. The lakes and lagoons along the coastline facilitated the plying of various types of boats.

The discovery of various types of pottery, beads and coins at ports and trade centres indicated an interrelationship between them. Typical stupas, monasteries and viharas that existed in close proximity to ports and trade centres indicated that Buddhism had played a significant role in maritime trade since the beginning of the Christian era to a later period. Mariners of the east coast might have felt the force of wind and currents which assisted in driving the ships faster than the regular speed. This knowledge was probably confined to the mariners, hence no reference is available prior to the 6th century BC. In this communication an attempt has been made to describe the maritime trade of the east coast of India and the importance of the archaeological finds from port and trade centres. How the monsoon wind and currents aided the plying of ships and past maritime trade activities has been reflected in the traditional festivals in the present day society.

Although there is no direct reference to the use of monsoon winds as an aid for sailing ships in early literature, the *Buddhist Jataka* stories and *Jain Canonicals* mention ships moving by force of wind *Pavanabala-samahaya*³. The Sangam period texts, viz. *Purananuru*, *Ahananuru* and *Madurraikanchi* delineated different types of seagoing ships as they moved in the seas with the help of wind sails⁴. The author of *Periplus Maris Erythraei* (AD 60–100) mentions the ports, anchorages, direction of winds, sailing conditions of east coast of India⁵. Pliny mentions the southwest monsoon in the *Natural History*⁶. Fa-Hien (AD 414) has described the winter monsoon in the *Record of Buddhist Kingdoms*, in connection with his return voyage along the east coast of India to China⁷. The punch-marked coins (PMC) (Figure 2) of 6th to 5th century BC, coins used during Satavahana (2nd century BC to 3rd century AD), Salankayanas (AD 300–440) and Pallava periods (6th to 9th century AD) depict ships with masts⁸ indicate that the ships sailed with the help of winds in the open sea. Perhaps in the early days, monsoon winds were not known to mariners but they could set sail during favourable winds, hence the voyages were necessarily seasonal. The seasonally reversing winds are almost consistent during the monsoon period. During weather disturbances and any other such conditions sailors abstained from sailing.

The ports of embarkation on the east coast were Tamralipti, Palur, Kalingapatnam, Dharanikota, Arikamedu, Poompuhar, etc. from where ships sailed to the northern coast of Sri Lanka before crossing the Bay of Bengal into the 10° channel aided by favourable winds and currents. From here, ships sailed towards the east of Sumatra and reached Java, Bali Island and crossed the Malacca Strait.

*e-mail: sila@nio.org



Figure 1. Ports and trade centres of east coast of India.



Figure 2. Punch-marked, Satavahana and Pallava coins showing ship with masts.

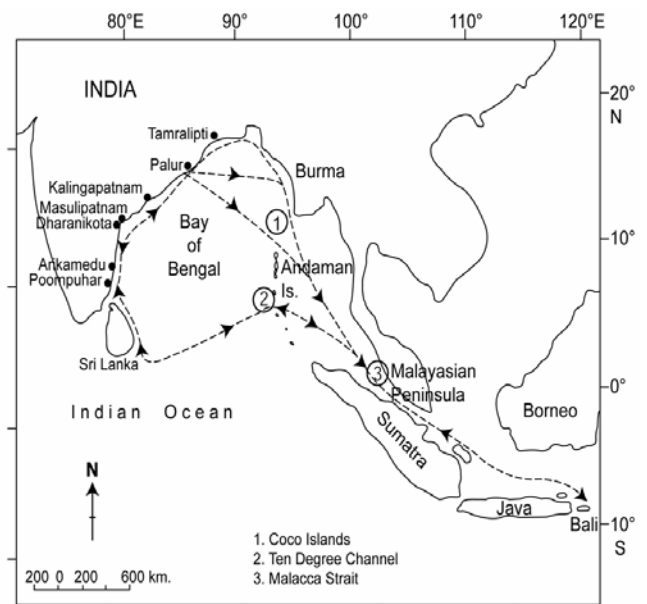


Figure 3. Sea routes from India to Southeast Asian countries.

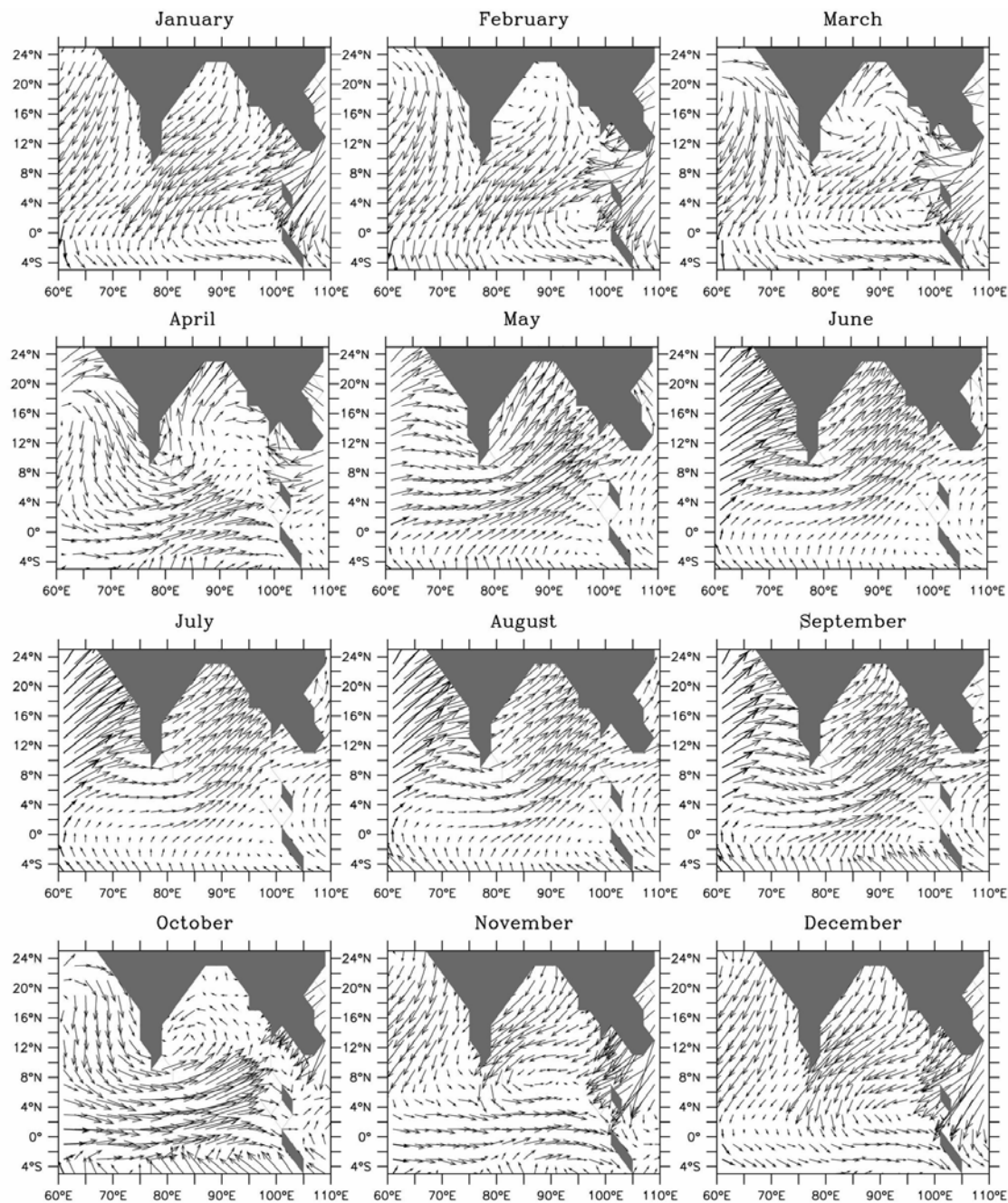


Figure 4. Present climatological wind pattern over the Indian Ocean region.

During the return journey they sailed directly to Sri Lanka and then to ports along the east coast⁹ (Figure 3). The alternative route to Southeast Asia from ports of Bengal, Orissa and Andhra was to reach the Burmese coast, then proceed along the Andaman Sea to Malacca Strait and beyond. Some ships made a direct voyage to Malaya Peninsula, other parts of Southeast Asia and China¹⁰. However, Coedes¹¹ has proposed two probable overseas routes from India to Southeast Asia. The first route could start from the south of India either through the 10° channel crossing the Andaman and Nicobar

Islands and leading to Takuapa in Thailand or south of the 10° channel crossing Nicobar Islands heading towards the headland of Aceh and reaching Kedah in Malaysia. On the second route, ships sailed along the coast of Martaban and Tavoy in Burma then took the caravan route crossing three Pagodas and other passes reaching Menam Chao Phraya delta by way of Kanchanaburi and Ratchaburi.

The northeast monsoon winds (trade winds) blow between October–November and February helping ships to sail from the east coast of India to Sri Lanka and

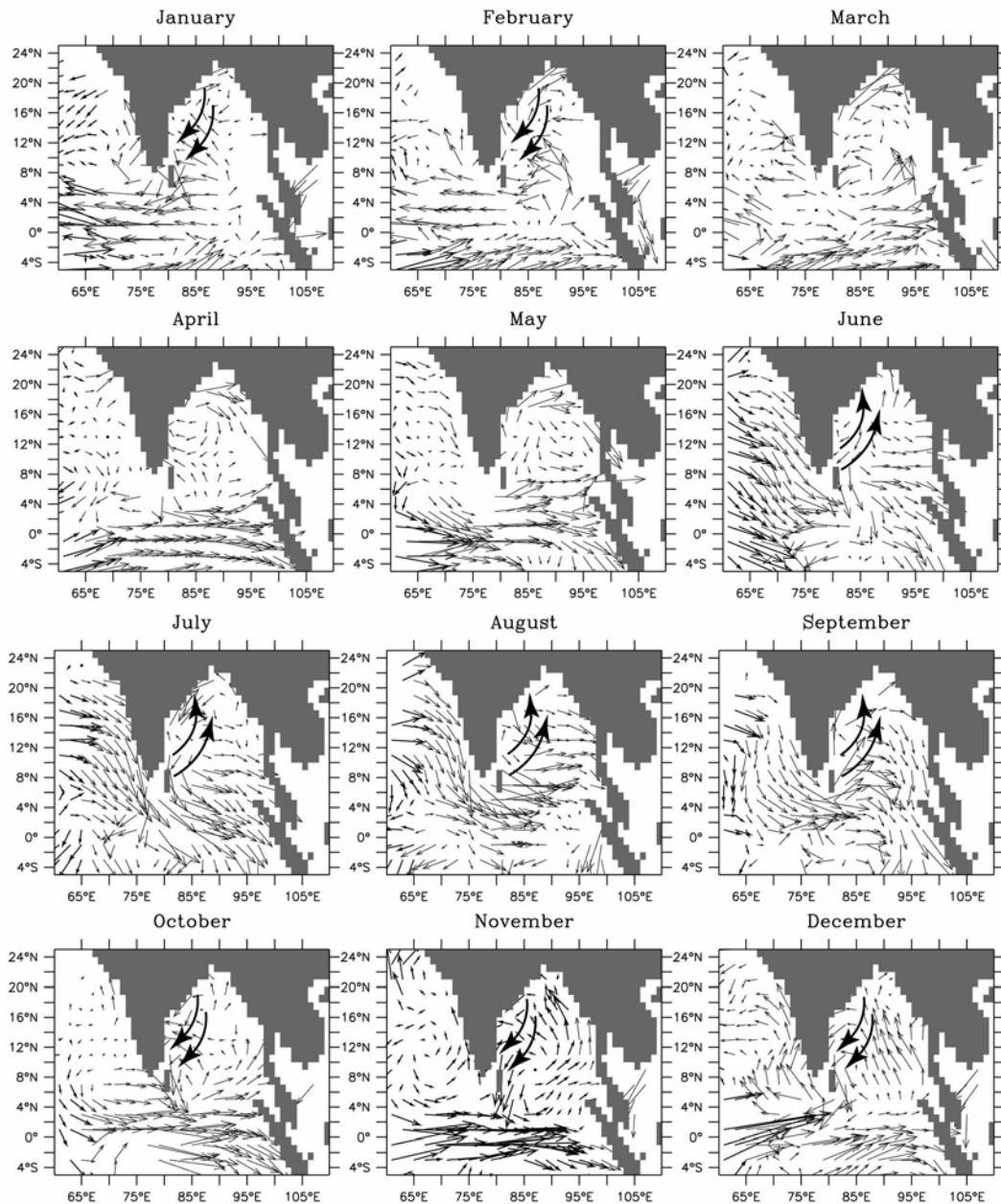


Figure 5. Present climatological current pattern over the Indian Ocean region.

further to Southeast Asian countries. Similarly from May–June to September, the southwest monsoon wind blows from southwest helping ships to return from Southeast Asia via Sri Lanka to the east coast of India. They were aware of the risk of sailing southward during May and July–August in the Bay of Bengal. In case of storms and cyclones, mariners used to anchor ships at safe harbour. It was practical to sail farther east through the central bay as far as Andaman during December. Sailing from Andhra coast to Andaman or following a more southerly route through the 10° channel was preferred in January–February and March. The available literary sources indicate that mariners were aware of the wind and

current directions for the last two thousand years or more though no documentary evidence exists to prove this. In the absence of the above, present wind patterns and ocean circulations have been taken into account which indicate whether any changes may have taken place in wind patterns and ocean circulations or not.

The annual cycle of the winds¹² over the Bay of Bengal on a climatological basis is shown in Figure 4. Wind data recorded over many years averaged for each month are used for calculating the monthly mean wind field. During January, the northeast monsoon winds also known as northeast trade winds prevail all over the bay. During February, winds turn clockwise over the northern part of

the bay. In March, the development of an anticyclone wind field over the Bay of Bengal, particularly in the central region is quite conspicuous. During April, the winds are relatively strong in the northwestern bay. In May, the wind system becomes almost southwesterly indicating the 'burst' of the southwest monsoon in the southern bay; which become fully established over the Bay of Bengal in June. The high wind speed direction in the central bay remains consistent throughout July and August with the maximum wind speed reaching up to 9 m/s. During the monsoon period, the central Bay is subjected to a maximum wind force and the magnitudes reduce towards land-bound regions. During September, the winds are still southwesterly almost all over the bay, but with the southwest monsoon withdrawal from the north bay, its magnitude decreases considerably¹³. The wind field is quite irregular and becomes weak by October. This forms the transition period between the southwest and northeast monsoons. The northeast trade winds set in by October–November through the eastern half of the bay and prevail with high magnitudes all over the bay during December. The wind replaced by lighter northeasterlies from the bay during October and November heads southwards. By November, the equatorial westerly light winds prevail over south of Sri Lanka, whereas in December the northeasterlies gain moderate strength all over the bay.

The information on the wind drift currents in the Indian Ocean is well documented¹⁴ and the monthly distribution of ship drift current vectors obtained by averaging data of several years has been shown in Figure 5. In January, an equatorward current is present along the east coast of India. The coastal current along the east coast reverses swiftly northward whereas the equatorial current still continues towards the west. This circulation pattern prevails up to March or April. The northward flowing coastal current along the east coast of India still persists up to May with simultaneous strengthening of the eastward current in the eastern equatorial Indian Ocean.

At the beginning of the southwest monsoon, the northward coastal current along the east coast of India is weakened whereas the eastward flowing monsoon current becomes broader and intensified (Figure 5c). As the southwest monsoon intensifies, the northward coastal current and eastward monsoon current are intensified in the southern Bay of Bengal. As the southwest monsoon withdraws from the Bay of Bengal, the coastal currents along the east coast of India swiftly reverse direction and flow equatorwards from October to December (Figure 5d and e). From April to September, the east coast is dominated by a strong northward flowing current, whereas from November to March the circulation is reversed southward. The sailors of the east coast of India considered the northeast monsoon fine weather for sailing. This continued as long as sailing ships were engaged in undertaking maritime trade. The bay becomes favourable as compared to the turbulent sea conditions during the

southwest monsoon, with the currents generally following the wind pattern. It has been observed that the currents during January and February are strongly set towards south.

The Jataka stories as well as Buddhist accounts and paintings show that Buddhists were involved in maritime trade. The representation on the medallion of Bharhut shows a sea monster threatening to swallow a boat is clear evidence of the involvement of Buddhism in maritime trade¹⁵. The caves of Ajanta, Aurangabad and Ellora depict Boddhisattva Avalokitesvara as a saviour of mariners in distressful conditions. Eight perils are depicted in two vertical rows, among them a shipwreck scene is carved in relief along with Avalokitesvara in these caves. The role of Avalokitesvara as the saviour from the eight perils is delegated to goddess Tara. Numerous images of Tara have been noticed in Ratnagiri, Orissa. Even in one of the *ashtamahabhayas* Tara image, eight perils are depicted and the shipwreck (*jalarnava-bhaya*) scene is also carved in relief (Figure 6). The Buddhist goddess Tara is the protectress from such distress^{16,17}. Besides sculptural evidence, the distribution of Buddhist settlements such as stupas, monasteries and chaityas along ports and trade routes (Figure 7) show the involvement of Buddhism in



Figure 6. Buddhist Goddess Tara found at Ratnagiri, Orissa showing eight perils, one scene depicts a shipwreck scene.

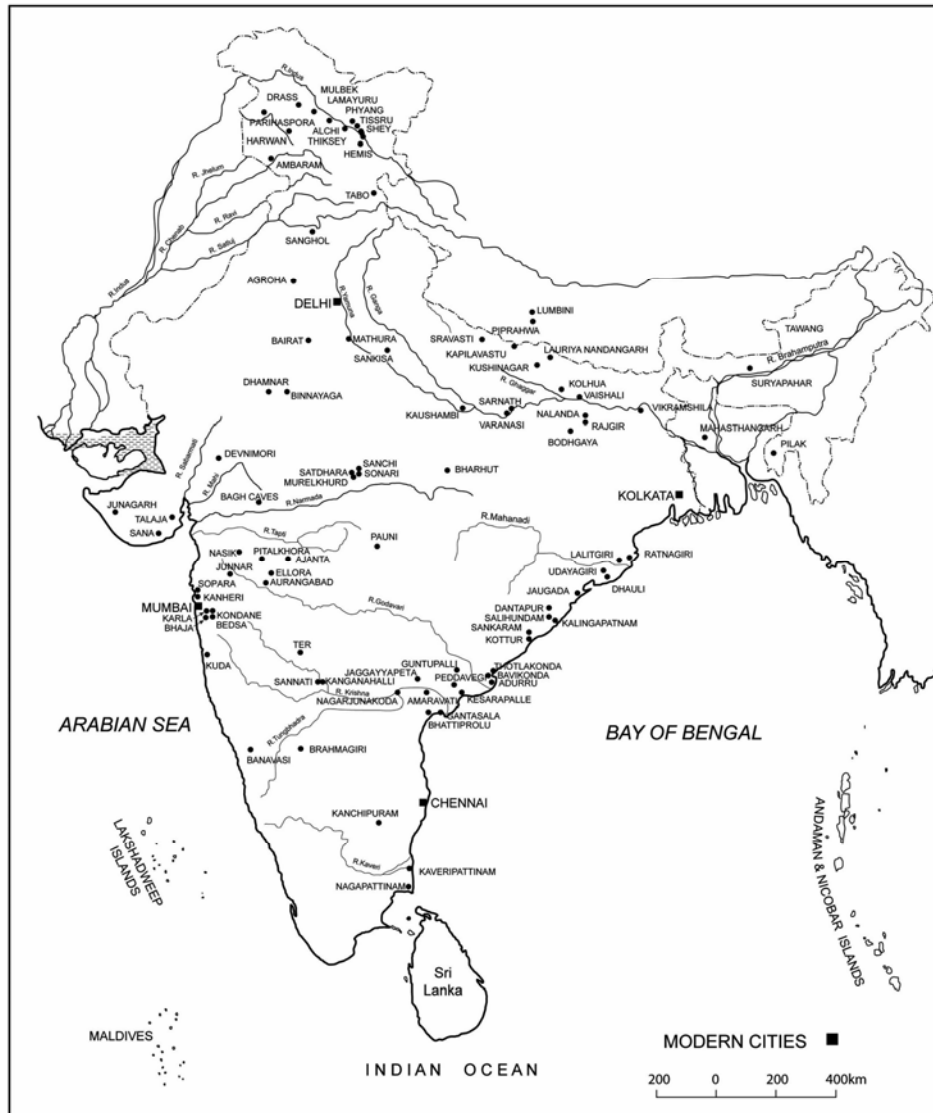


Figure 7. Buddhist sites in India.

maritime trade. For instance, Dharanikota and Amaravati show the strong hold of Buddhism between the 4th and 3rd century BC and 13th and 14th century AD. Buddhist monks, traders and local residents gifted money for construction of monasteries at trade centres which is evident from the inscriptions at Kanheri and Junnar¹⁸. Buddhism might have disseminated in the eastern and peninsular India during the Mauryan and probably the Satavahana periods spreading to western India and then Karnataka.

Since ancient days, varieties of pottery were carried in ships for transporting both solid and liquid. This is evident from pottery found both underwater and during inland explorations and excavations. In India the first evidence of carrying pots on ships comes from Ajanta paintings (6th century AD). However, the shapes and sizes of pots changed over a period of time. Different pottery, viz. a northern black polished (NBP) ware, rouletted ware, knobbed ware, russet coated painted (RCP) ware

and red polished ware (RPW) found at ports, trade centres and hinterland sites suggest their widespread use in regional and overseas trade.

The distribution of NBP ware (700–100 BC) from 415 sites of India (Figure 8) along coastal and hinterland Buddhist establishments suggest the involvement of Buddhism in maritime trade network. Recently NBP ware, knobbed ware, RPW, and black and red ware were found in the Kalahandi region of Orissa¹⁹. The finding of NBP ware in Nellore, Korkai and Alagankulam along with silver PMC indicates the existence of a trade route from northern India to eastern India then to southern India reaching Sri Lanka across the sea²⁰. Further, NBP ware and PMC have been recovered from the citadel of Anuradhapura²¹. Considerable progress has been observed during the NBP period in terms of development of cities, technology, trade and commerce. During this period, trade contact of the Indian subcontinent reached up to

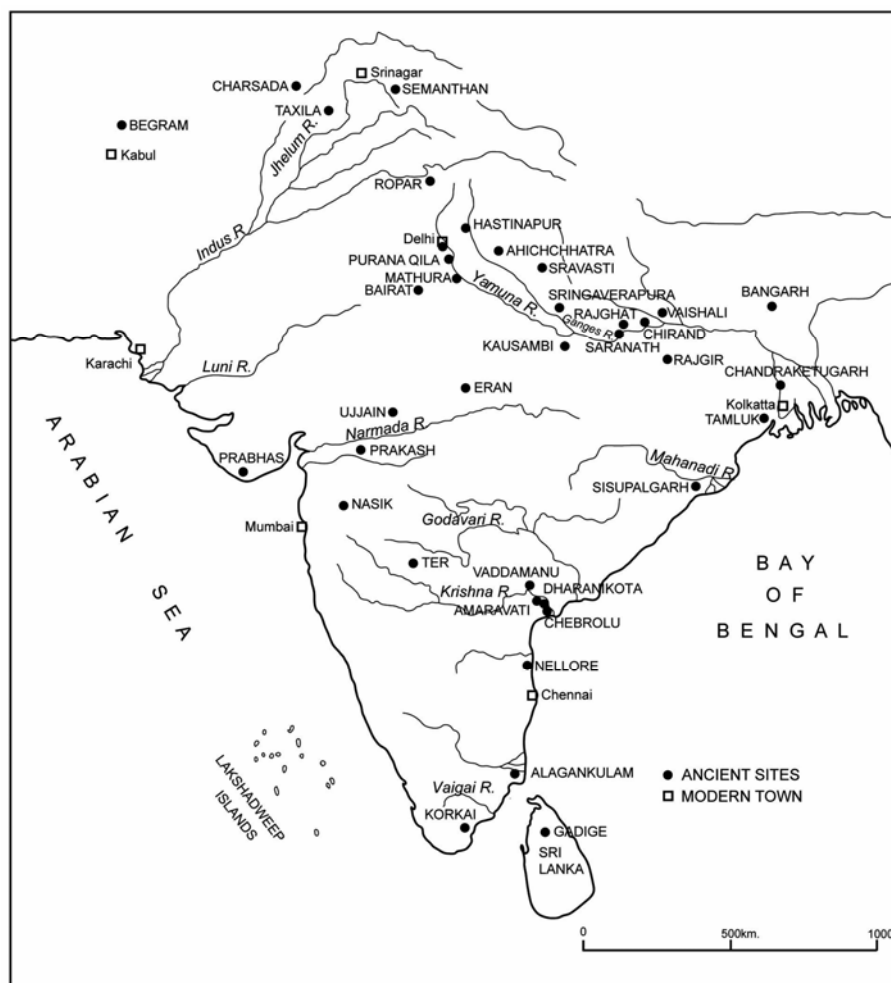


Figure 8. Northern black-polished ware sites in India.

Southeast Asia and the Mediterranean regions^{22,23}. Introduction of PMC and cast copper, and silver coins, seals and sealings clearly indicate the existence of an established trade and money-based economy.

Rouletted ware has been reported from 124 sites across the Bay of Bengal and Arabian Sea (Figure 9). The recent excavations at Pattanam along the Kerala coast have yielded rouletted ware²⁴. Rouletted ware has also been reported from Sri Lanka, Bangladesh, Java, Bali, Vietnam, Sumatra, Malaysia, Oman²⁵ as well as Myos Hormos, Berenike and Coptos in Egypt²⁶ (Figure 10). Rouletted sherds with Tamil-Brahmi, Brahmi, Sri Lankan Brahmi, Kharoshti inscriptions and graffiti which are either names of traders or pot makers have been recovered. As partial names or short inscriptions are found on these sherds, it is difficult to draw any substantial conclusions²⁷.

Knobbed ware was first reported from Sisupalgarh and Jaugada of Orissa. Subsequently, this pottery has been reported from northern Andhra Pradesh, Bengal and Assam. The recent excavations at Lalitagiri, Manikapatna, Radhanagar and Kalahandi have yielded knobbed ware²⁸. Excavations of Ban Don Ta Phet have yielded

knobbed ware. Knobbed bowls made of high tin bronze similar to knobbed ware have been reported from Taxila, Nilgiri hills, Wari-Bateshwar in Bangladesh and Than Hoa province of Vietnam. These bowls resemble the finds of Ban Don Ta Phet²⁹, but Glover³⁰ has suggested that the knobbed vessel of Vietnam might have been imported from Thailand and this pottery was associated with Buddhist rituals.

The RPW has been reported from over 500 sites in India along with rouletted ware, amphorae and arretine ware particularly from ports, trade centres and Buddhist sites. The RPW is associated with Buddhist monks and traders who travelled long distances. Similarly, arretine ware has been reported from Arikamedu, Alagankulam, Kodumanal, Uraiyur, Rajamundry, Chandravalli and Karur³¹. Scholars have opined that arretine ware originated in the Roman world and was brought by the Roman traders to India as part of their personal belongings²⁰. RCP ware known as 'Andhra ware' (400 BC and 400 AD) has been reported from Satanikota, Mittapalli, Nilugondla in Andhra Pradesh; Banavasi, Brahmagiri, Chandravalli, T. Narsipur in Karnataka; Nasik and Nevasa in Maharashtra;



Figure 9. Rouletted ware sites in India.



Figure 10. Distribution of rouletted ware sites in the Red Sea region and Southeast Asia.

Kodumanal, Kanchi and Uraiyur in Tamil Nadu and Arikamedu along with rouletted ware.

The excavation finds of Anuradhapura indicate that Brahmi script was introduced in Sri Lanka by Indian traders in the 5th–4th century BC prior to the introduction of Buddhism³². Further, Ramesh³³ has opined that the Damili script used by *Polindas* (boat people of northern Sri Lanka) is originally from Bengal and Orissa datable to the pre-Asokan period. The Brahmi inscriptions on a RCP sherd recovered in a burial at Kodumanal³⁴ of Periyapuliyanankulam mention Tamil traders known as *Visake* and *Visaki*.

The Brahmi and Kharoshti inscriptions found on pots, seals and plaques in Bengal indicate that traders were involved in horse trade and that the horses were brought from Central Asia via north-western India to Bengal. Then horses were exported to Southeast Asia by boat³⁵. Later on, traders of this region got acquainted with Buddhist people who were using local Brahmi and consequently a mixed Brahmi–Kharoshti writing developed. The finding of Kharoshti–Brahmi and Kharoshti inscriptions in Bengal, Orissa, Thailand, Vietnam, Bali and Fu-nan show that Kharoshti might have migrated to Southeast Asia along with horse trade. The terracotta seals from Bangarh and Chandraketugarh depict seafaring vessels with Kharoshti–Brahmi inscriptions referring to *Tridesayatra*, meaning a voyage to three countries or directions³⁶. Similarly, the Telaga Batu (AD 686) inscription of Indonesia mentions the special skilled people such as *Puhawang* (ships captain), *Vaniyaga* (long distance or seafaring merchants) and *sthapaka* (sculptors). Other Indonesian inscriptions refer to foreign traders as *banyaga*, which include the Kalingas, Singhalese, Dravidians, etc. and merchant guild as *banigrama*³⁷.

Apart from Indian pottery, glass and semiprecious stone beads have also been discovered from Sembiran and Ban Don Ta Phet excavations. The glass beads of Sembiran resemble south Indian samples, manufactured in Arikamedu²⁶. Beads were also manufactured at Jaugada, Asurgada and Kalahandi regions of Orissa³⁸. Similarly, the beads reported from Ridiyagama and Mantai in Sri Lanka; Khuan Luk Pat in Thailand; Oc-Eo in Vietnam and Kuala Selinsing in Malaysia appear to be imported from India³⁹. Francis⁴⁰ has opined that original bead makers from Arikamedu region might have migrated to Sri Lanka and then to Thailand, Vietnam and Malaysia. The finding of agate and carnelian beads at Ban Don Ta Phet indicates the earliest maritime contacts between India and Southeast Asia during 4th century BC. India was a considerable source of semiprecious stones which were exported to Southeast Asia to make beads and the final products were remitted back to India⁴¹. The finding of a quartz tortoise (turtle) from the excavations of Kodumanal is similar to the finds of Srikshetra in Thailand³⁴.

A wide range of fine to coarse cotton textiles and silks were bartered to Southeast Asia in exchange for aromat-

ics and spices. The burial site excavations at Ban Don Ta Phet have yielded cotton fragments and thread. Its analysis shows that it was made of *Cannabis sativa* fibre of the cotton plant found in South Asia. Remnants of textiles have even been reported from Ban Chiang in south-eastern Thailand²⁹. The author of the *Periplus Maris Erythrei* (AD 60–100) has mentioned that the best quality of cotton clothing was produced in the Gangetic country⁴².

Ancient sea voyages are now days remembered and celebrated as social functions in India. For instance, the full moon day (*Kartika Purnima*) of October–November is celebrated by the people of Orissa as *Bali Yatra* (voyage to Bali Island). On this day, the people of Orissa go to the nearby river banks, sea shores and lakes with votive boats and place lighted lamps and float them symbolizing a safe journey for traders to Bali (Figure 11). This celebration marks the adventurous spirit manifested in transoceanic voyages for trade, commerce and exchange of culture with Bali, Java, Malay, Sumatra and Thailand. Ancient ports are extinct but the memory of past traditions is still preserved through these annual celebrations. Festivals of similar kind are being celebrated in Bali, Malaysia and Thailand, for example at the festival named *Loykrathong* or *Loy brah Prah dip* in Thailand ritualistic boats are floated in December.

The return voyage towards India began in April or later and mariners followed the currents of Malacca Strait along with the wind blowing from east, which took boats into the mainstream of the west-flowing equatorial current through the 10° channel to reach Sri Lanka then towards the east in the coastal waters with the help of favourable wind and currents. During April and May the voyages from Southeast Asia towards the east coast of India used to be easier due to the onset of the southwest monsoon. The return voyage festival *Khudurukuni Osha* is celebrated in September by the unmarried girls of



Figure 11. People of Orissa float votive boats in lakes on *Kartika Purnima* day.

Orissa who used to wait for their brothers to return with wealth and gifts from Southeast Asia. Further, it shows that sailing between these regions was largely dependent on favourable wind and ocean currents conditions. The social festivals and data on wind and ocean currents corroborate that the mariners of the east coast of India probably set out on their journey between October–November and February and returned between April–May and September⁴³.

Research based on recent archaeological finds from ports and trade centres show the existence of a well-organized overseas network between Southeast Asia, Red Sea and the Roman world. Initially NBP ware, originally from the Gangetic valley moved along with Buddhism towards peninsular India then to Sri Lanka. During this period, the contacts between India and Sri Lanka developed, hence NBP ware is not reported beyond Sri Lanka. However, during the rouletted ware period, contact of mariners with the Roman world, Southeast Asia, Persian Gulf and Red Sea probably developed. Around the same period, RPW and RCP ware also came into circulation. Along with Indian pottery and beads, the circulation of PMC, Roman gold coins, amphorae, etc. came into vogue and Buddhism spread both in India and abroad. Monks, traders and sculptors played a significant role in maritime trade and carried Indian scripts and languages to Southeast Asia. On their arrival at an Indian coast, the Roman and Greek mariners took advantage of prevailing trade routes and moved towards other regions from peninsular India. The chronology and circulation of types of pottery, beads and inscriptions indicate the interactions between mariners of India, Southeast Asia and West Asia in ancient times.

Some scholars hold the view that gold and spices are the major reasons for maritime trade between India and Southeast Asia. In addition, the fact that water transport was easier, safer and could carry more merchandise as compared to land transport, also contributed here. The frequent disturbances on the silk route caused a decline of caravan trade and might have compelled the Roman and Indian traders to take the sea route through the Indian Ocean up to the South China Sea. During this period, Indian mariners now aware of the trade centres, ports and products of Southeast Asia would have ventured into the open sea to expand trade; further, mariners also understood the direction of monsoon winds and currents which aided them in travelling to Southeast Asia and back. Afterwards mariners increased the size and carrying capacity of the ships.

Periplus and Pliny have stated at several instances that Hippalus discovered the monsoon wind and learned the art of direct ocean sailing from Arabia to India. These events are not recorded in any other sources earlier than this. But Periplus and Pliny have not mentioned what voyages Hippalus made and his date⁶. But it is well attested from the excavation finds of Berenike and Myos

Hormos on the Red Sea coast that ships of south Indian origin crossed the Indian Ocean and reached the Red Sea much before Hippalus's voyage and that the mariners of the east coast of India must have had knowledge of the monsoon. It appears that Hippalus did not discover the monsoon winds; he must have merely observed and suggested the nature of these winds which were already known to the mariners of the east coast of India.

On the findings of Ban Don Ta Phet and Khao Sam Kaeo, the maritime contacts between India and Southeast Asia could be dated as far back as to the 4th–3rd century BC, if not earlier. Initially trade was confined to exchange of goods, then Buddhist monks and traders introduced Indian culture, script, language, religion, etc. onto foreign soil and some of them were followed by the people of Southeast Asia. For instance, the boat floating festival of Southeast Asia might have been influenced by festivals of Orissa. Once trade became frequent, Indian traders began to settle permanently in Southeast Asia and spread Indian culture and religion; whereas no such evidence of permanent settlement of Indian traders occurred in the Red Sea, Persian Gulf and Roman Empire. It could be possible that a large number of Indian mariners would have frequented the Southeast Asian region for trade than vice versa. Similarly, more Roman mariners might have come to India than Indian mariners visiting the Roman world for trade. Probably this could be the reason why Buddhist monks were not involved in maritime trade or the spread of Buddhism in the Roman world.

The archaeological finds substantiate the fact that maritime contacts with Southeast Asia started somewhere between 4th and 3rd century BC and were multi-dimensional involving monks, traders, sculptors and envoys travelling together. Buddhism had a great impact on trade and society in the whole of South Asia. The ancient Indian mariners were aware of the monsoon winds and currents and used them to their advantage during maritime trade with Southeast Asian countries for a period of more than 2000 years; probably they were the first to use monsoon winds and currents in maritime trade. It was thought that Hippalus discovered the monsoon winds, but now it is suggested that Hippalus was actually the name of the wind⁴⁴. The southwest monsoon came to be known as Hippalus in the western world. It appears that the Mediterranean sailors had collected information about the monsoon navigation from older sailors of the Arabian Sea. Several scholars have expressed doubts about Hippalus's date^{45,46}.

Further, the voyage to Southeast Asia was seasonal and coast hugging because ships were visiting different ports during their voyage and exchanging cargo. The study shows that there have been no changes in seasons of monsoon over the past 2000 years except in their present intensity and velocity. Today, the maritime trade and sailing ships may no longer exist but the traditional method of voyages and customs are celebrated in the form of

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festivals along the east coast of India highlighting the significance of the glorious maritime trade.

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