

ORIGINAL RESEARCH REPORT

Seafaring Archaeology of the East Coast of India and Southeast Asia during the Early Historical Period

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The concept of trade in ancient India was quite different from modern times. In olden day's mariners, artisans, traders, Buddhist monks and religious leaders used to set sail together and this trend continued till the advent of modern shipping. The representation of art on the walls of the caves, stupas and temples enlighten us regarding their joint ventures, experiences and problems faced during the sea voyages. The finding of varieties of pottery, punch marked and Roman coins, Brahmi and Kharoshti inscriptions along the ports, trade centres and Buddhist settlements suggest the role played by them in maritime trade during the early historical period and later. Mariners of India were aware of the monsoon wind and currents for more than two thousand years if not earlier. Furthermore, the study shows that the maritime contact with Southeast Asian countries was seasonal and no changes of Southwest and Northeast monsoon have been noticed since then. This paper details the types of pottery, beads, cargo found at ports, trade routes and Buddhist settlements along the east coast of India and the role of monsoons in maritime trade. The impact of Buddhism on trade and society of the region are also discussed.

Keywords: Maritime trade; Buddhism; Ports; Southeast Asia; Monsoon wind and currents

Introduction

The seafarers of India had the knowledge of the sea pertaining to wind, currents, tides, weather conditions and shipbuilding since the 3rd millennium BC. The geographical setting of Indian Peninsula has supported the development of seaports all along its coastline from the early times (Deloche, 1994). Majority of the rivers of India and their distributaries are suitable for navigation and ports developed along the estuarine mouths. The origin of lagoons, lakes and other sheltered bodies along the Indian coast favoured for the development of many ports, provided sheltered anchorages and moreover facilitated the plying of various types of boats.

With the varied physical features of the coastline, the ports of India (**Fig. 1**) have been classified under the following headings: littoral ports, estuary ports and tidal ports. Most of the ancient ports were located at the mouth of rivers and in the case of lagoons, at the outlets to the sea, where vessels could find refuge. The *Silpasastra*, the ancient Indian text refers two types of seaports namely *Pattana* and *Dronimukha* (Roy, 1994: 33–36). Further, *Pattana* was also divided into two types viz. *Samudrapattana* (port on the coast of the sea) and *Jalapattana* (on the bank of a navigable river). Even today the place names ending with *Pattana* indicate a port name

e.g. Visakhapatnam, Masulipattinam and Nagapattinam. *Dronimukha* refers to a port situated near the confluence of the river and the sea and is associated with upstream routes and was a market place, which received cargo coming by river and sea routes. Interestingly the ports such as Tondi and Puhar (Poompuhar or Kaveripattinam) in Tamil Nadu and Dwarka in Gujarat also had the same meaning. Even, Kautilya's *Arthashastra* also refers to *Pattana* (port town) which were under the control of Superintending of towns (Shamashastri, 1915). In addition to the geographical considerations in location of ports, maritime structures such as boatbuilding yards, landing places, boat shelters, causeways, wharves, jetties, breakwaters and moorings on the sea front also played a vital role in the maritime activities of the country (McGrail, 1983: 33–46). The excavations along the coast of India have brought to light the remains of docks, wharfs, jetties, warehouses and lighthouses (Tripati, 2009: 695–703). It seems that every seaport had some kind of a dock and wharf for handling cargo and ships anchorage. Some of them have been located and excavated and others might have been destroyed, submerged or buried which need a comprehensive research to locate them.

Archaeological sources

The stratigraphical evidence of Anuradhapura excavation shows that Brahmi script was introduced in Sri Lanka by the traders of India, probably in 5th–4th century BC, much before the introduction of Buddhism by Emperor Asoka (Allchin, 1995). Furthermore Ramesh (2006) has opined

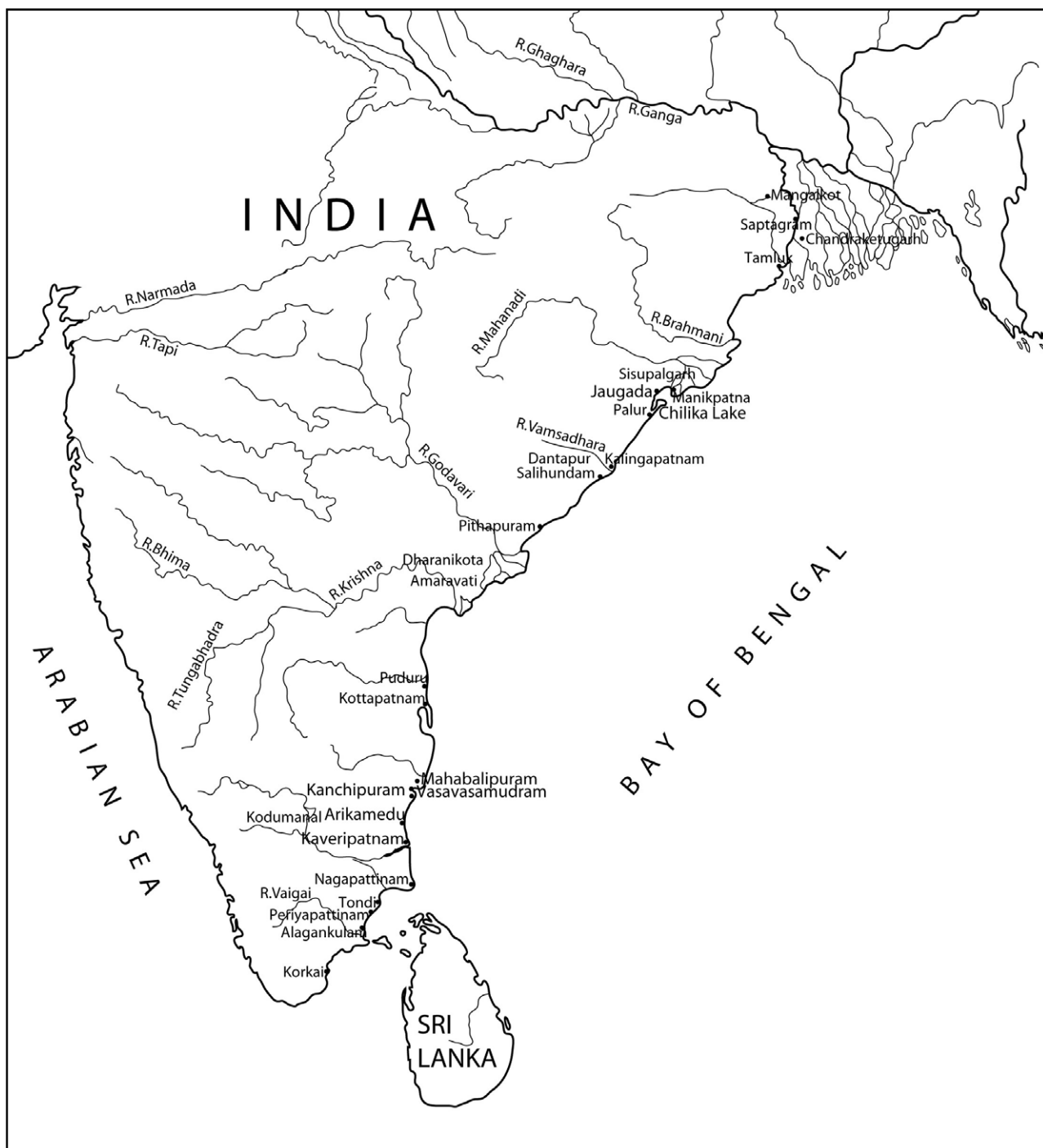


Figure 1: Ports and trade centres of east coast of India.

that the *Polindas* or the boat people of northern Sri Lanka had used ‘Damili’ script which is datable to pre-Asokan period and they were originally migrated from Bengal-Bihar and Odisha region. The *Polindas* must have been used this script for writing the Sanskrit texts and a single graffito on a potsherd have been found at 5th–4th century BC levels of Anuradhapura. The Brahmi inscription (2nd century BC) discovered at Anuradhapura mentions that the traders of Tamil Nadu engaged joint trade with ‘*navika karava*’ and the captain of the ship acted as the chief of the guild. Two more Brahmi inscriptions found at Periyapuliyaankulam in Northern Sri Lanka refer that Tamil traders were known as *Visake* and an identical name

Visaki has found on a Russet Coated Painted ware recovered from the burial of Kodumal (Rajan, 2015; Rajan, 2002: 83–98).

Several Brahmi and Kharoshti inscriptions (1st–5th century AD) have been discovered on the pots, seals and plaques in Ataghara, Bengarh, Chandraketugarh, Deulpos, Hadipur and Tamralipti region of West Bengal indicating that Bengal had trade contacts with northwest region of India (Mukherjee, 1996: 181–192; Sarma, 1991: 38–40; Chakravarti, 2002). The traders were involved in horse and corn trade and horses were brought from Central Asia via northwestern India to Bengal, afterwards exported to South Asia and Southeast Asian countries (Mukherjee,

1996: 181–192; Datta and Datta, 2008: 45–56). Even the traders from Gandhara and Oxus regions came to Mathura and Gangetic valley on inland route then voyaged to Southeast Asian countries. In later period the traders of northwestern region met with Buddhist people who were using local Brahmi, subsequently mixed Brahmi-Kharoshti writing developed (Bajpai, 1989: 45–58). The findings of Kharoshti-Brahmi and Kharoshti inscriptions in Bengal, Odisha, Thailand, Vietnam, Bali and Funan shows that the script and language might have migrated to overseas countries along with horse trade. The coastal and overseas trade of Bengal and adjoining region was boosted with the advent of Kharoshti using people from north-west region to the Indian subcontinent. The terracotta seals from Bangarh and Chandraketugarh depict seagoing vessels containing corn flanked by symbols like conch and *taurine*. Such vessel types are known as *Sasyadidhrta Sthali*, a bowl shaped vessel filled with com. Another such seal has legend in Kharoshti-Brahmi script referring to *Tridesayatra*, meaning a voyage to three countries or directions. The other seal from Chandraketugarh reveals a type of vessel called *Trapyaka* belonging to the wealth earning *Tasvadaja* family (Chakravarti, 2002). It may be noted that *Trapyaka* type of ship has been mentioned by *Periplus*. The above types of vessels and flanking symbols recall the Satavahana ships (Sarma, 1991: 38–40).

In addition to the Kharoshti-Brahmi and Kharoshti inscriptions, explorations at the temple Museum of Wat Khlong Thom in Thailand has brought to light an inscribed small flat touchstone with eight letters of Tamil-Brahmi inscription datable to the early historical period (3rd–4th centuries AD). The inscription reads '*perumpatankal*' meaning 'stone of Perumpatan'. 'Perum' denotes big and *patan* meaning goldsmith; this could be the

name of the goldsmith who owned the touchstone. This is the first Tamil inscription reported from Southeast Asia (Shanmugam, 1996: 100–103; Srisuchat, 1996: 237–274; Karashima, 2002: 10–18). The inscriptions of Indonesia refer to foreign traders as *banyaga* which includes the Kalingas, Aryas, Singhalese, Dravidians, etc and merchant guild as *banigrama* (Ardika, 1999: 80–89; Tripati, 2002: 117–126). The Kaladi (AD 909) inscription mentions *wagga kilalan*, meaning a group of foreigners consisting of Kalingas, Aryas, Sinhalese, Dravidians and Pandikiras. The term *banigrama* means a merchant guild, which has been frequently mentioned in several east and central Javanese and Balinese inscriptions (Ray, 2003). The reference to *banigrama* has also been found in the old Balinese inscriptions of Semibiran B (AD 915) and Sembiran A II (AD 975) (Ardika, 1999: 80–89). Even the Pallava period coins with double masted ship on reverse and bull on obverse have also been reported from Southeast Asia (Shanmugam, 2010: 208–226; Rajan, 2011: 177–196).

Ceramic trade

Ceramic evidence is the best example to draw the outline of contacts between the people and routes followed by them. Different types of earthen ware were transported in boats and ships for maritime trade. In India the first evidence of carrying pots on ship comes from Ajanta paintings (Fig. 2). The shapes and sizes of the pottery have changed over the period of time. Pottery were not only used for transporting water but also used for liquids, solids and a wide variety of other commodities. These have been confirmed from various sites both from underwater and inland explorations and excavations. The finding of varieties of ceramic such as Northern Black Polished ware (NBPW), Rouletted ware (RW), Knobbed ware (KW), Russet



Figure 2: Ajanta painting shows boat carrying pots onboard.

Coated Painted ware (RCP) and Red Polished ware (RPW) at ports, trade centres and hinterland sites suggest the existence of regional and overseas trade and ceramic played a significant role in the maritime trade.

Black Northern Polished ware

In maritime trade of the Indian Ocean region, NBPW has played a major role. The occurrence of NBPW (Fig. 3) along with RW over 415 sites along the coast of West

Bengal, Odisha, Andhra Pradesh, Maharashtra and Tamil Nadu and other inland sites of India; Udegram, Taxila, Charsade in Pakistan; Ramsahar, Govinda Bhita, Arola Dshap, Kachu Bil, Tarer Bila, Naudapara, Wari Bateshwar, Mahasthangarh in Bangladesh and Gedige and Anuradhapura in Sri Lanka. The recent archaeological excavations in Kalahandi region of western Odisha and Radhanagar in central Odisha have yielded NBPW, KW, RPW and Black and Red ware which are worth mentioning in terms of

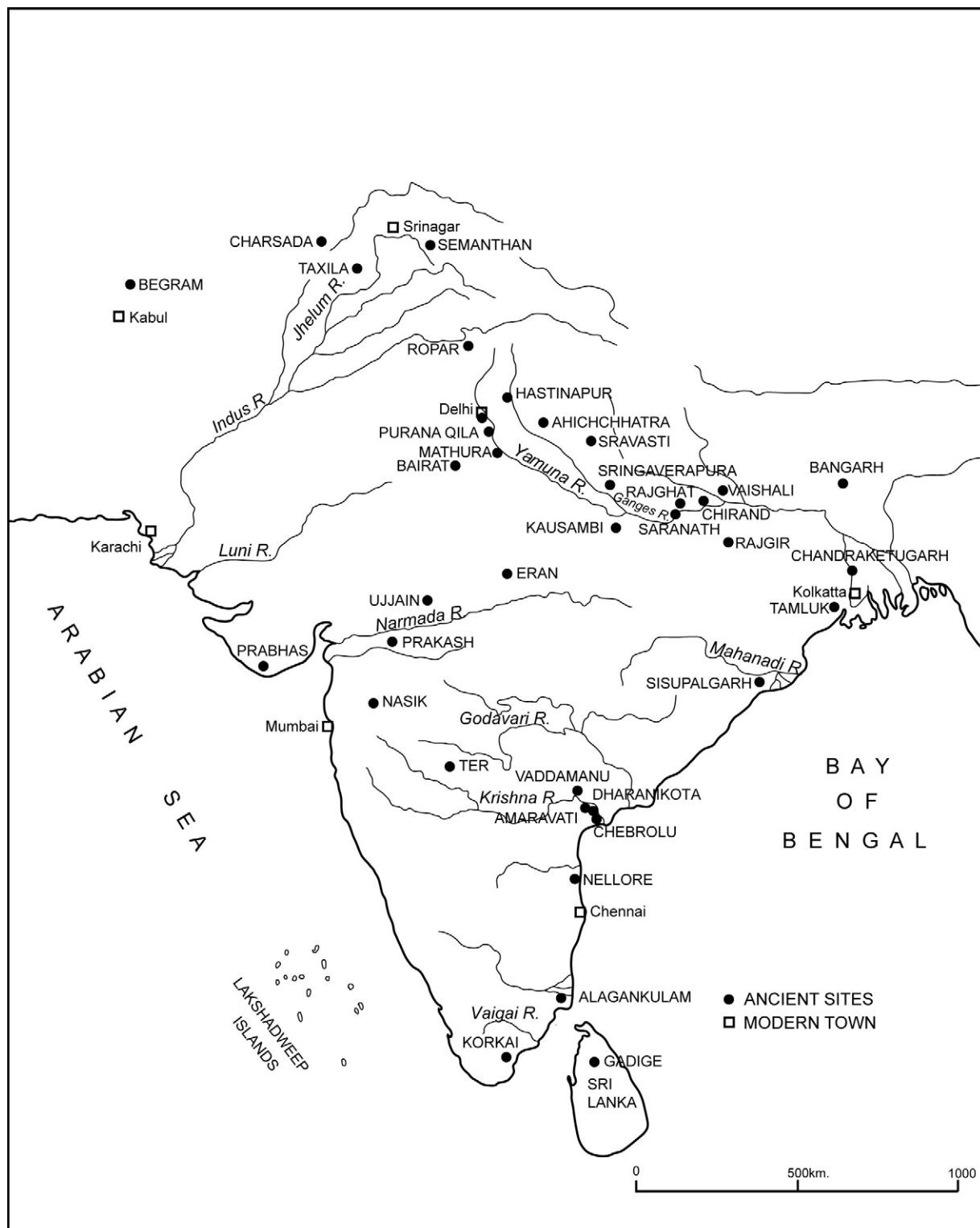


Figure 3: Northern Black Polished ware sites in India.



Figure 4: Northern Black Polished ware and Knobbed ware from Kalahandi region of Odisha.

trade contacts of western and central Odisha with ports and trade centres of India (Mohanty and Mishra, 2001: 17–26; Patnaik, 2014) (**Fig. 4**). The occurrence of NBPW from Korkai and Alagankulam in association with silver punch marked coins show the evidence of contact during the Mauryan period (Sridhar, 2005; Ramachandran, 1996–97: 19–24). The other significant aspect is that NBPW and punch marked coins have been reported from excavations in the citadel of Anuradhapura and other Buddhist sites of Sri Lanka (Sarma, 1997: 95–101). The recent finding of NBPW in the Nellore region of Andhra Pradesh indicates the existence of a trade route from northern India to eastern India then to southern India reaching Sri Lanka across the sea (Suresh, 2004). The distribution of NBPW in South Asia is datable from 700 BC to 100 BC and its finding along coastal and hinterland Buddhist establishments suggests the involvement of Buddhism in maritime trade network and linkages with traders. This shows the spread of Buddhism along with trade. This could be very well attested to from the recent excavations at Langudi in 2005–06 and Radhanagar in 2010–11 (Patnaik, 2014). The discovery of punch marked coins along with NBPW in India indicates the money based economy. The NBPW is a deluxe ware used by the monks and royal houses because of its excellence and endurance. It is made of fine clay of the Gangetic valley, well fired, thin in fabric, grey to reddish coloured with a mirror-like thin film polish. Its main shapes are bowls, dishes with carinated handles, rarely cups and lids and it originated in the Gangetic valley and is reported from the earliest phase of the Buddhist centres of northern and eastern India and is therefore associated with Buddhism (Sarma, 1990–91: 37–42). During the NBPW period a considerable progress has been observed in the development of cities; in technology a variety of

tools, weapons, ornaments, materials and metals such as copper, iron, gold, silver, bone, stone, semiprecious stones, shell, clay, glass were used with high technological skill. Further, a remarkable progress has also been noticed in the fields of trade and commerce. Different metals such as copper, silver, iron and semiprecious stone and glass beads were items of trade. Introduction of punch marked coins and cast copper and silver coins, seals and sealings are a clear sign of established trade. From the above stated evidence it appears that trade was not only confined to the Indian subcontinent but also crossed the margins and reached up to Southeast Asia and the Mediterranean regions (Roy, 1986 and Ghosh, 1989).

Rouletted ware

RW is fine textured with rouletted designs such as parallelograms or diamonds, dots, triangles and wedges at the base of the pottery. This pottery has been distributed throughout the east coast of India and across the Bay of Bengal and shows the continuity of cultural trends in the entire region. Until 1950 RW was reported from very few sites of India. The subsequent explorations and excavations have yielded RW from 124 sites in India (**Fig. 5**). RW is concentrated more in peninsular India, particularly along the coasts of Andhra Pradesh, Odisha, Pondicherry, Tamil Nadu and West Bengal and on the banks of the Rivers Godavari, Kaveri and Krishna. The recent excavations at Pattanam along the coast of Kerala have also yielded RW (Cherian, 2015; Selvakumar et al. 2009: 29–41; Shajan et al. 2004: 312–320). However, this ceramic has only been reported from Rajghat and Ayodhya in northern India (Suresh, 2004). Moreover, RW is also reported from Anuradhapura (Coningham et al. 2015: 31–52), Godavaya, Kantarodai, Kelaniya, Mantai and Tissamaharama in Sri Lanka



Figure 5: Rouletted ware sites in India.

(Schenk 2000: 653–677); Govinda Bhita, Mahasthangarh, Ramsahar and Wari Bateshwar in Bangladesh; Beikthano in Myanmar; Kobak Kendal (Buni Complex) and Cibutak in Java; Sembiran and Pacung in Bali; Tra Kieu, Go Cam in Vietnam; Palembang in Sumatra; Bukit Tengku Lembu in Malaysia; Qana in Yemen and Khor Rori in Oman (Schenk, 2015: 143–181; Schenk, 2006: 123–152; Pavan and Schenk, 2012: 191–202; Seland 2014: 367–402) and Myos Hormos, Berenike and Coptos in Egypt (Tomber, 2008; and Tomber, 2002: 25–31) (Fig. 6). The excavations at Sembiran and Pacung on the northeastern coast of Bali have yielded a number of RW sherds, a sherd with graffito

and semiprecious stone beads which resemble the findings of Arikamedu. Prof. B. N. Mukherjee has deciphered the graffito as Kharoshti script and read as *'te sra vi'* where as Dr. I. Mahadevan has suggested that the script is Brahmi in Prakrit language and read as *'m(a) la sa'*. Rouletted ware sherds with Tamil-Brahmi, Brahmi, Sri Lankan Brahmi, Kharoshti inscriptions and graffito marks have been recovered from sites of India, Red Sea coast and Southeast Asia. Those could be the names of the traders or pot makers. As only partial names are found in some sherds, it is very difficult to draw any substantial conclusions and the inscriptions are very short (Ardika, 1994: 139–145). The presence

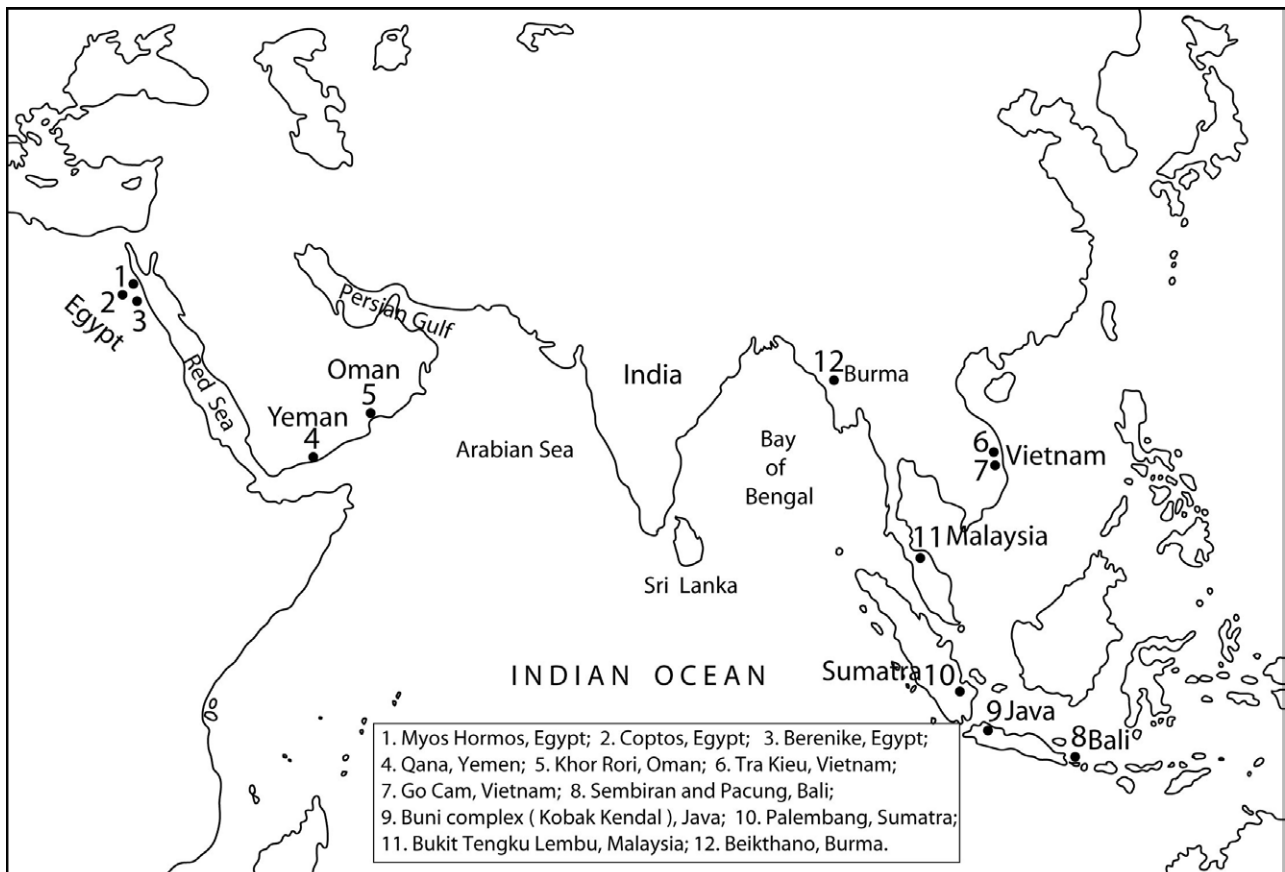


Figure 6: Distribution of Rouletted ware sites in the Red Sea region and Southeast Asia.

of RW and glass beads in Bali indicates that the contacts between India and Bali existed before early centuries of the Christian era. As Sembiran is located on a major trade route it served as a transit stop between India and Southeast Asia. The excavations at Kantarodai, Ibbankatuwa, Gedige (Anuradhapura) have brought to light RW and Megalithic Black and Red ware which were similar to south Indian findings (Bopearachchi, 1998: 133–178), similarly, the port of Mahagama has also yielded RW, Brahmi graffiti, Indo-Roman and punch marked coins (Parker, 1984).

Knobbed ware

KW (knobbed vessels with a boss or a projection at the centre of the base with concentric circles) has been reported for the first time from the excavations at Sisupalgarh (Lal, 1984) and subsequently from Jaugada. The explorations and excavations at Lalitagiri (Patnaik, 2000: 456–472), Manikapatna (Pradhan et al. 2000: 473–494), Asurgarh – Manamunda, Asurgarh – Narla and Budigarh (Yule, 2006; Mishra, 2008–09) and Taraporegarh (Behera et al. 2015: 178–196) have yielded KW datable to the early historic period. The recent explorations and excavations have brought to light KW from Radhanagar (Patnaik, 2014), Talapada (Mohanty et al. 2014: 53–63), Nariso (Pradhan, 2011: 1–5), and Gaurangapatna along Odisha coast (Fig. 7). KW has been reported from Kalingapatnam and Dantapur (Subrahmanyam, and Reddy, 2002) in northern Andhra Pradesh and Bengal and Bangladesh (Jahan, 2010: 135–146) belonging to the early centuries of the Christian era and this pottery could have been associated with Buddhist

rituals (Glover, 1990: 1–45). KW occurs in different fabrics such as fine grey ware, Red and Black ware. Knobbed bowls made of high tin bronze similar to KW with a boss at the centre along with concentric circles have been reported from Taxila and Nilgiri hills. This ware has a wide distribution in the Deccan as well as the Ganga valley (Ray, 1994). The excavations at Ban Don Ta Phet, the earliest Indianised site of Kanchanaburi province of west central Thailand has also yielded KW. Further Glover (1998a: 21–49) believed that the presence of knob and concentric circles on this pottery probably could be understood as a *mandala* or a schematic cosmological symbol signifying mount Meru surrounded by oceans. Similar KW and high tin bronze Knobbed vessels have been recovered from Wari-Bateshwar in Bangladesh (Jahan, 2012: 206–228) and Than Hoa province of Vietnam (Janse, 1962: 280–292) which resemble the findings of Ban Don Ta Phet and Glover (1996: 57–94) has suggested that the Knobbed vessel of Vietnam might have been imported from Thailand.

Red Polished ware

RPW is another type of ceramic which has been reported from ports, trade centres, Buddhist sites and monasteries of India. Red Polished ware has spread over 500 sites from Punjab and Haryana in the north to Andhra and Tamil Nadu in the south, but a maximum number of RPW sites have been reported from Gujarat (Schenk, 2015: 143–181; Pavan and Schenk, 2012: 191–202) (Fig. 8). The common shape of this pottery is sprinkler and those were used in Buddhist ceremonies. This is wheel turned fine fabric and

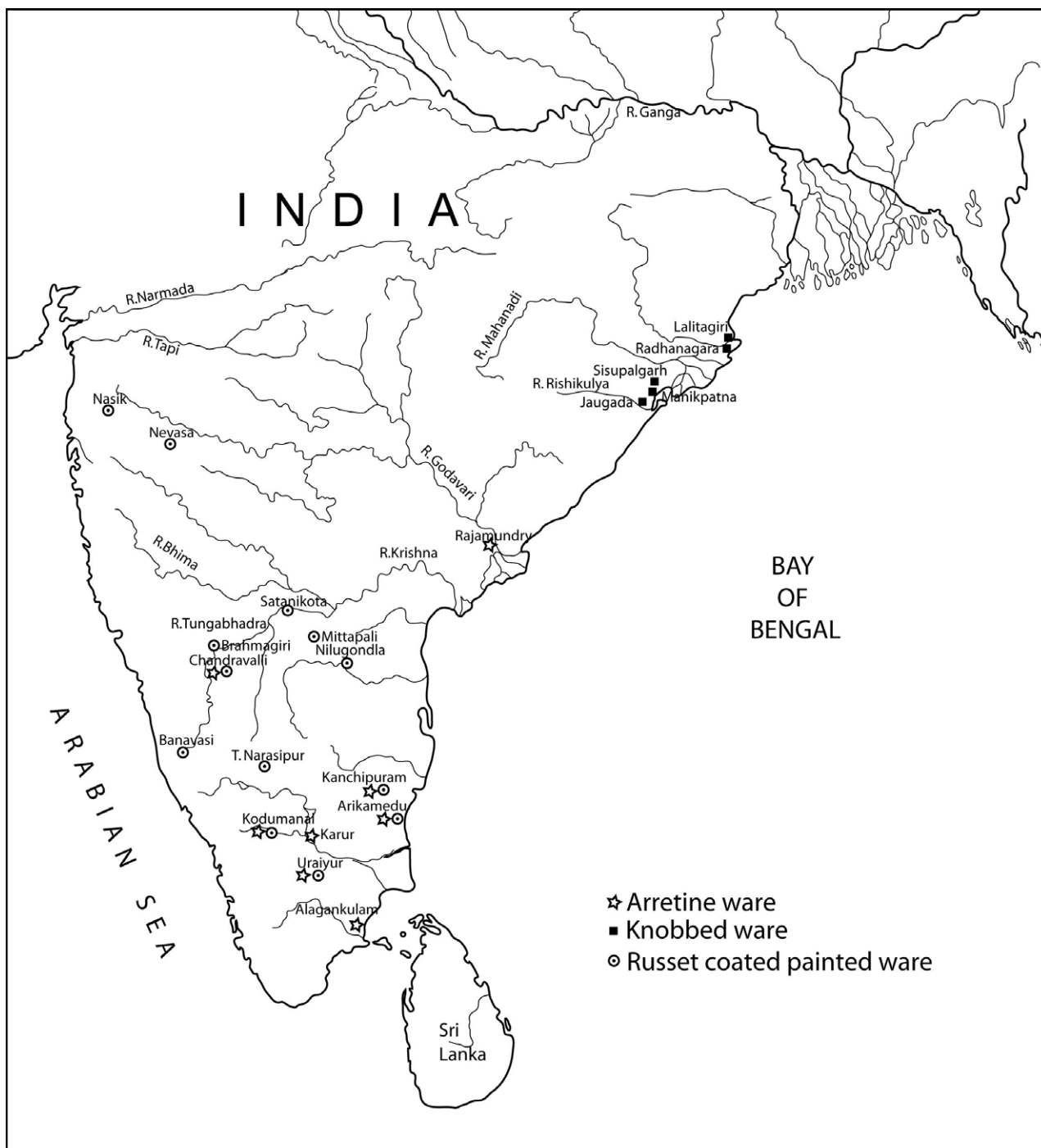


Figure 7: Distribution of Arretine ware, Knobbed ware and Russet coated painted ware sites in India.

made of well levigated clay. RPW has been recovered along with RW, amphorae and Arretine ware. As this pottery is associated with Buddhist monks and traders who travelled long distances, Begley (1991: 157–196) suggested that RPW spread from Maharashtra to southern and eastern India and from Gujarat to northern and northeastern India.

Russet Coated Painted ware

This is the distinct type of pottery of the early historic period found in the lower Deccan and southern India. Along with RW, RCPW has been reported from Satanikota, Mittapalli, Nilugondla in Andhra Pradesh; Banavasi, Brahmagiri,

Chandravalli, T. Narsipur in Karnataka; Nasik and Nevasa in Maharashtra; Kodumanal, Kanchi and Urayyur in Tamil Nadu and Arikamedu (Suresh, 2004) (Fig. 7). Earlier this pottery was termed as ‘Andhra ware’ by Wheeler and dated between 300 BC and 300 AD. Considering its technical characteristics Thapar named it as Russet Coated Painted ware (Ghosh, 1989). This pottery has a limited distribution and is confined to Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu and Pondicherry region. This ware has been reported from the earliest layers of Kodumanal excavations; hence scholars are of the opinion that it might have originated in the Coimbatore region of Tamil Nadu (Rajan, 1991: 241–246).

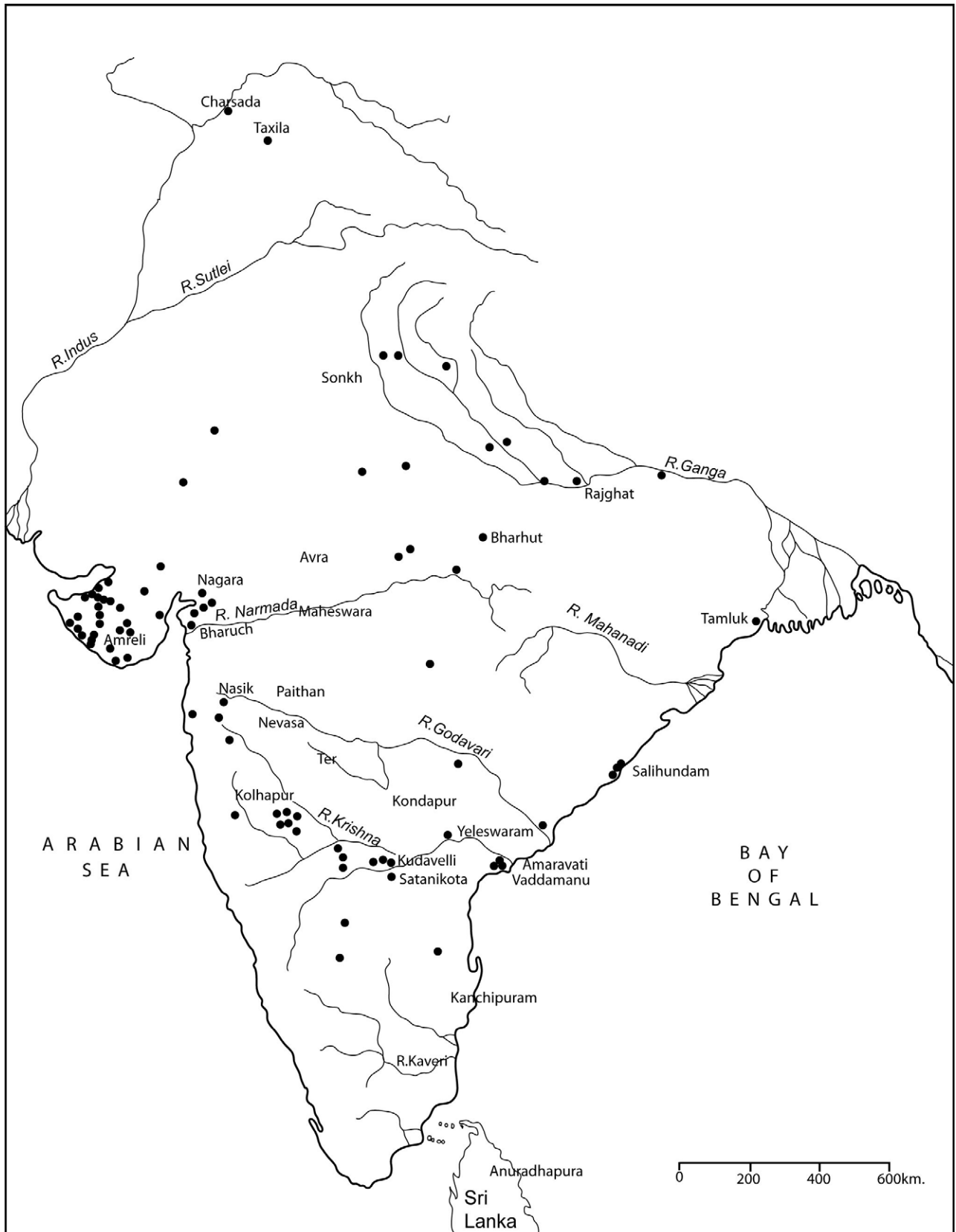


Figure 8: Distribution of Red Polished ware sites in India.

Arretine ware

The other type of ceramic which has been reported from trade centres and port sites of southern India is known as *Terra Sigillata*. *Terra Sigillata* is the stamped pottery, because its decoration was being made by pressing into

a stamped mould and originated in the Mediterranean region (Ghosh, 1989). The popular term of this pottery is 'Arretine ware', which was used by Wheeler in Arikamedu excavation report (Wheeler et al. 1946: 17–124). Probably, in the 2nd century BC this pottery began and continued

up to AD 50. Arretine ware has been reported in the same level along with RW and Amphorae in Arikamedu excavations (Magee, 2010: 1043–1054). This ware has only been reported from Arikamedu, Alagankulam and Pattanam (Gurumurthy, 1981). The *Terra Sigillata* has limited distribution in India and was found along with RW, amphorae at Arikamedu. Though the pottery is originated from the Roman world but it was a regular item of Indo-Roman trade. In recent past scholars are of the opinion that the Roman traders brought this ceramic to India as their personal belongings (Suresh, 2004; Gurumurthy, 1981).

Trade of Beads

The mercantile exchange between the ports of India and Southeast Asia can further be corroborated with the finding of numerous other Indian artefacts for instance, semiprecious stone beads, glass beads, etc. Apart from Indian pottery, a huge quantity of glass and semiprecious stone beads has been discovered from the excavations at Sembiran (Ardika, 1991). The particular types of red glass bead which were known as *mutisalah* (Bellina and Glover, 2004: 68–89) were found in north-eastern Bali and other regions of Southeast Asia and these beads are more common in the excavations of Arikamedu. The *mutisalah* beads appear to be imported from outside including Arikamedu (Basa, 1994–95: 357–375). Further, glass and stone beads have also been reported from Gilimanuk and burials of Bali. These beads are similar in colour and shape to the beads of Indonesia. The analysis of some glass beads of Sembiran shows that the raw material resembles south Indian samples and was manufactured in Arikamedu (Ardika, 1994: 139–145). The Indo-Pacific beads which are monochromatic of different colours and majority of

them belong to opaque orange red and brownish red. Arikamedu was the main centre for these beads. Indo-Pacific beads have been reported from Ridiyagama and Mantai in Sri Lanka; Khuan Luk Pat in Thailand; Oc-Eo in Vietnam and Kuala Selinsing in Malaysia (Francis, 1996: 139–160; Francis, 1990:1–23). Higham (1989) has stated that these beads are datable from 3rd to 2nd century BC and introduced from India. Moreover, Francis (1996: 139–160) has opined that original manufacturers were from Arikamedu region who might have migrated to Sri Lanka then to Thailand, Vietnam and Malaysia.

About 180 beads of carnelian, agate, chalcedony, glass and terracotta have been recovered from Sisupalgarh (Lal, 1984: 62–105). Evidences of manufacturing of beads have also been reported from Jaugada, Asurgada and Kalahandi region of Odisha (Mohanty and Mishra, 2001: 17–26; Mohapatra, 1986). The finding of a diversity of beads made of carnelian, agate, glass, quartz, jasper, stone and terracotta from Kalahandi region show that this region played a significant role in the network trade of India (Fig. 9). The findings of agate and carnelian beads from the excavations of Ban Don Ta Phet indicate the earliest maritime contacts between India and Southeast Asia datable to 4th century BC. India has a considerable source of carnelian (Glover, 1996: 57–94) and the semiprecious stone and glass were exported to Southeast Asia from India in order to manufacture beads and final products were brought again to India. More than 3000 beads have been reported from Ban Don Ta Phet, out of which 600 are made of agate, carnelian and other semiprecious stones (Glover, 1998a: 21–49). The discovery of carnelian lion pendants at Ban Don Ta Phet is the representation of Buddha as *Sakyasimha* (lion of the Sakya clan) (Glover and Bellina, 2011: 17–46). These lion



Figure 9: Semiprecious stone beads from Kalahandi region of Odisha.

pendants were represented as Buddha before his human representation and several such types of pendants have been excavated from the Gandhara civilisation. The lion pendants of Ban Don Ta Phet not only signify Buddha but also the righteous ruler, the *Dhammaraja* (Glover, 1996: 57–94). In addition to carnelian lion pendants at Ban Don Ta Phet, a crouching-lion pendant made of rock crystal was also found at Phu Khao Thong and a carnelian lion pendant has been reported from Tha Chana, Surat Thani Province of Thailand (Chaisuwan, 2015: 124–142). The finding of tortoise (turtle) made of quartz from the excavation of Kodumanal is similar to the finds of Sriksheetra in Thailand (Rajan, 2002: 83–98).

Textile

Textile features significantly in the overseas trade of India and the earliest written accounts corroborate this statement. A wide range of coarse to fine cotton textiles, silks, painted and printed cottons, carpets, cushions were traded in vast quantities to Southeast Asia in exchange for spices and aromatics. Even fine Bengali muslin (praised as 'woven air') was in great demand in the Roman world and other regions. *Periplus* has mentioned the best quality of cotton clothing was produced in the Gangetic country (Wild and Wild, 2005: 11–16). Textiles, shell products, stone and glass beads were manufactured at Bengal, Karaikadu, Kaveripattinam and Alagankulam and their hinterland regions and those were exported to Southeast Asia (Rajan, 2011: 177–196; Glover and Bellina, 2011: 17–46). It would be reasonable to assume that the products of Arikamedu and other regions were not intended only for regional market, they must have been for domestic use and long distance trade. The burial site excavations at Ban Don Ta Phet have yielded cotton fragments and thread (Glover, 1998b: 93–121). The analysis of cotton shows that it was made of *cannabis sativa* fibre which might have originated from cotton plants found in South Asia (Jahan, 2002: 127–138). Similarly, remains of textiles have been found at Ban Chiang in Thailand (Srisuchat, 1996: 237–274). Moreover, the 'door-knob' spindle whorls with traces of iron remaining inside the central perforations of ThaKae, central Thailand are similar to Kodumanal, Tamil Nadu; probably this shows the transfer of technology from India to Thailand along with fibre and iron during the early centuries of the Christian era (Cameron, 2015: 198–207).

Exchange of cargo

The archaeological findings indicate that various types of Indian pottery, beads and textiles were traded to Southeast Asian countries. The other items that were exported to Southeast Asia include varieties of glass, etched agate and carnelian beads, shell bangles, wasters, RW and Roman products (Ray, 2003; Begley et al. 1996). Even, pearls, gems, ivory, ivory products, dyes, ornaments, metals, plants and forest products were the items of trade. It is believed that sandal, aromatic wood, spices, cloves, tin, were imported to India. The spice trade was responsible for the Indianization of the whole of Southeast Asia, among the trade cloves and pepper was significant. Even

cinnamon and cassia were brought from the mainland of Southeast Asia and China and sandalwood from Eastern Indonesia (Miller, 1969). The clove buds (*Eugenia aromatica Kuntze*) were grown in the limited region of the islands of Ternate, Todore, Motir, Makyan and Bachan in Moluccas. The mariners of India transhipped the spices, exotic and luxury items from Southeast Asia to the Mediterranean world through the south Indian ports namely Arikamedu, Kaveripattinam and Pattanam/Muziris.

The finding of terracotta seals at Chandraketugarh depicting a horse on a boat with an inscription datable to the 3rd century AD confirms that horses were transhipped to Southeast Asian countries along with textiles and grains. Further research by Prof. Mukherjee (1996: 181–192) on horse trade shows that the 'Yuch-chih' merchants continuously imported horses to the Ko-ying country by sea. Ko-ying is a region located in Malay Peninsula. Yuch-chih were either Kushana merchants or dealers involved in horse trade in the Kushana Empire. The availability of Kharoshti and Kharoshti-Brahmi inscriptions in Oc-Eo, U-thong, Sembiran and Bengal show existence of maritime trade contacts between these regions associated with horse trade (Chakravarti, 2002). *Periplus* has mentioned that Gangetic nard (spikenard), malabathrum and fine quality muslin was exported from ports of Bengal. It is not only finished products or manufactured stuff such as glassware, metals, pottery and textiles that were exported to Southeast Asia but also everyday items such as food formed part of the export (Glover, 1998a: 21–49).

A great deal of evidence is available on the items of trade and commerce but not much information is obtainable on the types and sizes of vessels that were involved in the transoceanic maritime trade. On the basis of the representation of boats on the walls of monuments, graffiti on pottery and description in contemporary literature their sizes can be speculated, however it may be they were small in size. From the archaeological findings it could be assumed that prior to early historical period trading of these items was in small quantity. Probably, trade became more hectic between India, Southeast Asia and Rome once demands for spices and other articles increased.

Role of Buddhism in Maritime trade

Since ancient times a range of communities were involved in maritime trade. Among them, Buddhism played a significant role and this can be gleaned from Buddhist accounts, paintings, stupas and Jataka stories. The earliest illustration of Buddhism involved in maritime trade can be seen on a medallion from Bharhut which shows an enormous sea monster threatening to swallow a boat (Cunningham, 1879). The other evidence of depiction comes from Mathura where the Boddhisattva in a form of a horse saved the sailors of a wrecked ship from demoneses. The Buddhist monk Purna flying down to save his brother Darukarnin, the owner of the wrecked ship has been depicted in the paintings of Ajanta cave No. 2 (Schlingloff, 1988). The association of Buddhism with maritime trade is known from the Buddhist caves of Ajanta, Aurangabad, Ellora and Kanheri where Boddhisattva Avalokitesvara has been depicted as a

saviour of mariners in distress conditions (Ray, 1994). The role of Avalokitesvara as the saviour or rescuer from the eight perils is delegated to goddess Tara (Ray, 2014: 1–18 and 2003). Numerous images of Tara have been found in Odisha. In one of the standing images of *ashtamahabhayas* Tara found at Ratnagiri eight perils are shown in two vertical rows and one among them is a scene of a shipwreck (*jalarnava-bhaya*) carved in relief (Fig. 10). The adventurous tradesmen tossed their cargo into the waves of the sea in times of danger and promised their Gods and Goddesses to make a donation if He or She brought them safely out of the peril. The Buddhist Goddess Tara is the protectress from such distress (Mitra, 1983; Tripathi, 2000; Mishra, 2009). In addition to sculptural evidences, the distribution of Buddhist sites along ports and trade routes of India (Fig. 11) such as Kuruma, Brahmavana, Vajragiri, Kayama, Langudi, Lalitgiri, Ratnagiri along the coast of Odisha; Kalingapatnam, Dantapur, Salihundam,

Bavikonda, Nagarjunakonda, Amaravati along Andhra coast, Pondicherry, Poompuhar, Nagapattinam along Tamil Nadu coast. The excavation findings from Buddhist sites of Odisha clearly reveal that Buddhism was flourished up to 10th century in Odisha. The archaeological excavation findings of Dharanikota and Amaravati show that Buddhism had a strong hold in this region between fourth-third century BC and thirteenth and fourteenth century AD. Similarly, thirty monastic complexes datable to 3rd–4th century AD have been found at Nagarjunakonda (Ghosh, 1989; Subrahmanyam and Reddy, 2011).

The recent archaeological excavations along the coast of Visakhapatnam, Andhra Pradesh have brought to light Buddhist sites on the hillocks of Bavikonda, Bimunipatnam, Gudiwada, Pavurallakonda and Thotlakonda. These hillocks are locally known as *Risi Kondulu* (hills for monks). The excavations at Bavikonda yielded stupas, Buddhist viharas (monastery), 64 pillared hall, kitchen complex, store



Figure 10: Buddhist Goddess Tara found at Ratnagiri showing eight perils, one scene depicts a shipwreck scene.

rooms and a refectory, relic caskets which are datable to 3rd–1st century BC. The other finds include various types of pottery, Satavahana and Roman coins from these sites (Subrahmanyam, 1999). It is not the case that Buddhism was concentrated only in one part of India and lived for a short span. The excavations at Dharanikota show that Buddhism flourished from 4th century BC to 14th century AD and the *mahacaitya* of Amaravati, the largest stupa

was built over there. The donative inscriptions found at various Buddhist caves of western India confirm the claim made by the Roman traders that they were residents of Dhanyakataka (Dharanikota). The art which flourished in the region was known as the Amaravati School of art and spread to many regions of Southeast Asian countries. Many Buddhist establishments were flourished in Tamil Nadu, among them Nagapattinam was important



Figure 11: Buddhist sites in India.

centre from where a rich hoard of Buddhist bronzes were reported.

Trade routes and Traditions

During the ancient period overseas trade was not practicable without making a halt at intermediary places for replenishment. Ships voyaging from ports of east coast of India to Southeast Asian countries used Nicobar Islands as halting stations. I-Tsing (AD 635–713) the Chinese traveller has stated that from Tamralipti to Nicobar Islands was thirty days sail and from Sri Vijaya to China was twenty days sail. Vessels sailing regularly from ports of Bengal, Odisha and Andhra proceeded towards the Burma coast then sailed along the coast of Andaman sea and reached Malacca Strait, subsequently making a direct voyage to the Malaya Peninsula and then to the East Indies, China and beyond (Tripati, 2002: 117–126). The *Vinaya* texts and *Jataka* stories mention that the merchants of northern India namely from Sahajati, Kausambi, Varanasi, Pataliputra and Champa brought their cargo to Tamralipti for trade with Southeast Asian countries. The traders along with Buddhist monks visited the ports namely Kanthi, Kainapara, Dosarene, Kalingapatnam and Maisolia then sailed farther beyond Sri Lanka (Sarma, 1990–91: 37–42).

Coedes (1968) has proposed two probable overseas routes to Southeast Asia from the Indian subcontinent. The first route could start from south India either through the 10° channel crossing Andaman and Nicobar Islands leading to Takuapa in Thailand or south of 10° channel crossing Nicobar Islands heading towards the headland of Aceh and reaching Kedah in Malaysia. From these places mariners sailed to other regions of Southeast Asia. In the second route ships could be sailing along the coast of Martaban and Tavoy in Burma from there on caravan route crossing the three Pogoda and other passes reaching the Menam Chao Phraya delta by way of Kanchanaburi and Ratchaburi.

There were regular coastal voyages from the mouth of the River Ganges to Sri Lanka. The ports of embarkation were Tamralipti, Palur, Kalingapatnam, Dharanikota, Masulipatnam, Arikamedu, Poompuhar and Sopatma from where ships sailed a more southerly course to the north end of Sri Lanka then they crossed the Bay of Bengal into the 10° degree channel aided by favourable wind and currents. Afterwards they sailed towards the east of Sumatra and reached Java, Bali Island and other Southeast Asian countries by crossing Malacca Strait (Fig. 12) (Arunachalam, 1993: 59–66). The traders of India had landed at Srikshetra in Burma; Takkola, Kokkonagara, Kataha Kadharam in

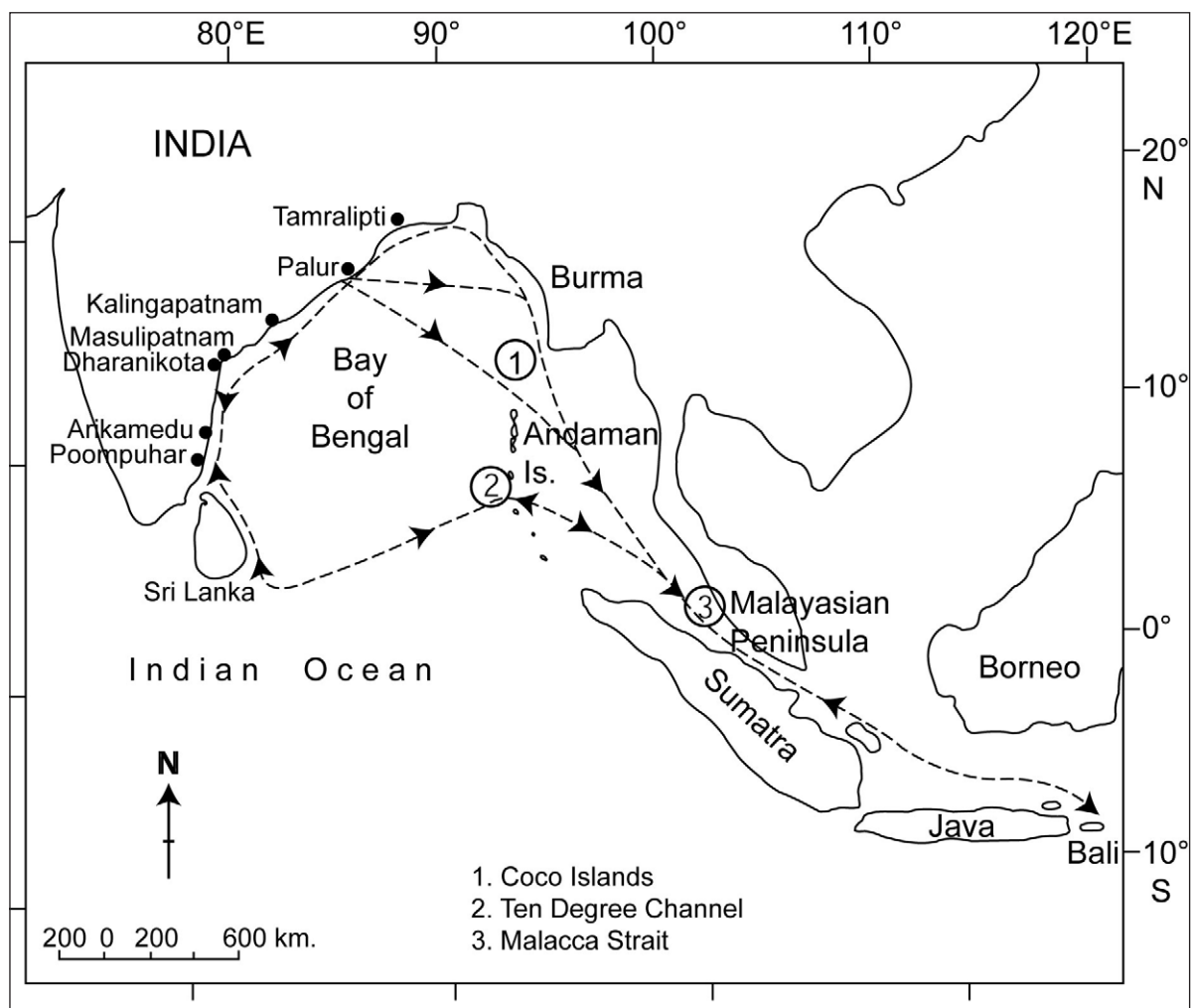


Figure 12: Sea routes from India to Southeast Asian countries.

Malaya Peninsula; Sri Vijaya in Sumatra; Purva Kalinga in Java; Tonking in Cambodia and Kwang-fu in China for maritime trade. Ships set sail to Bali, Java and Sumatra from the ports of the east coast of India (Tripati, 2002: 117–126) and on return they sailed directly to Sri Lanka then to other ports of India. The merchants first went to Sri Lanka then to Southeast Asian countries and returned through the same route because of direction of flow of wind and currents during their journey. During the period from November to February, the monsoon winds blowing from the Northeast helped the ships to sail from the east coast of India to Sri Lanka and other Southeast Asian countries. Similarly from June to September, the Southwest monsoon wind blowing from southwest naturally helped a ship to return from Southeast Asian countries via Sri Lanka to Tamil Nadu, Andhra, Odisha and Bengal. Mantai being located in the Mannar Gulf opposite Alagankulam and Korkai helped ships to sail from Tamil Nadu to Mantai then to proceed to Southeast Asia. Mariners of east coast were aware that it was a risk to sail between May and July–August in the Bay of Bengal particularly on a southward voyage. At the outset of Northeast monsoon from the month of October–November it is safe for southward voyage. It is also possible to take more easterly route through central Bay as far as Andaman in the month of December. Sailing in February and March from Andhra coast through the Andaman or more southerly route through the 10° degree channel is preferred. Between November and April it is safer to run close to Nicobar than to sail for Southeast Asian countries. In case of foul weather or gale and requirement of replenishment mariners searched for safe shelter in the nearby coast.

The journey during the Northeast monsoon can be corroborated with the regional festivals like *Kartika Purnima*, (full moon day of Kartika in the month of October–November) which is celebrated by the people of Odisha. For a long time this day was observed as the day of the commencement of their sea voyages to Southeast Asia. The *Kartika Purnima* is celebrated as a remembrance even today by the people of Odisha who go to the nearby river bank, sea shore, pond and tank with votive boats made of banana tree barks and pieces of light wood and place lighted lamps, etc in it and float it symbolising a safe journey for traders. This day is celebrated as *Bali Yatra* (voyage to Bali Island) throughout Odisha. In the year 1992 the Government of Odisha and the Indian Navy had organised a voyage to Bali Island in a sailing boat as a remembrance day. This voyage was organised in the same manner as it was followed in ancient times (Tripati and Raut, 2006: 864–871). This celebration marks the adventurous spirit manifested in transoceanic voyages for trade, commerce and exchange of culture with Bali, Java, Sumatra, Thailand and other regions of Southeast Asia. Though the ancient ports and trade centres declined and became extinct, the memory of past traditions is still preserved as a frozen frame through annual celebrations of *Bali Yatra* at the outset of Northeast monsoon. Similarly, a festival is celebrated in Thailand named '*Loykrathong*' or '*Loy brah Prahdip*' in which ritualistic boats are floated in the month of

December which is similar to those celebrated in Odisha and other parts of India (Tripati, 2011: 1076–1086).

The return voyage towards India started in the month of April or later and mariners followed the currents of Malacca Strait along with wind blowing from east, which took boats into the mainstream of the west-flowing equatorial current through the 10° degree channel to reach Sri Lanka and east coast of India. Turning round on the east coast of Sri Lanka the mariners follow the sailing course towards north or northeast ward of Tamil Nadu, Andhra, Odisha and Bengal in coastal waters with the help of favourable wind and currents. After the month of April, the voyages towards the east coast of India from Southeast Asian countries use to be better, safer and uneventful. Similarly, *Khudurukuni Osha* is celebrated in the month of September by unmarried girls of Odisha who used to wait for their brothers to return with wealth and gifts. This festival anticipates the return journey. Data of the social and religious festivals as well as wind and currents corroborate that the mariners of Odisha and east coast of India probably commenced their journey between October–November and February and returned between June and September (Tripati and Raut, 2006: 864–871). The sailing routes between east coast of India and Southeast Asia were largely dependent on wind, currents and sea conditions. In the absence of coastal landmarks throughout the coastline the sailing course depended on the aid of a few stars. The Ursa Major (*Sapt Rshi*) in northern horizon and Bado Daul Chukka (Suhali, Agastya and Canopus) in southern horizon were used during coastal sailing and *Kalapurush* (Orion) and *Bail Mars* (Alpha Tauri) which rise and set due east and west respectively were used during crossing the open sea by the mariners of Odisha. Whereas other mariners of east coast used Pole star (Dhruva) and Constellations of southern hemisphere like the *Ottai Velli* (Agastya or Canopus) for crossing the sea. In those days a set of stars from different parts of the horizon were used varying from maximum to minimum numbers respectively for navigational purpose (Arunachalam, 1988: 93–106).

Role of Monsoons in maritime trade

Harappans, the first mariners of the Indian subcontinent might have used monsoon winds for maritime trade. It is a fact that the seafarers were not able to see the flow of wind and currents but they felt that there is a force which assists in driving the ship faster than the regular speed. Probably, the knowledge of use of monsoon wind and currents for maritime trade was only confined to the mariners. The later Vedic period text, the *Satapatha Brahmana* (9th–8th century BC), provides some information on the circulation of oceanic water. The *Satapatha Brahmana* mentions 'The Ocean flows round this world on all sides' which according to Eggeling's commentary refers to turning to the right i.e.; from east to south following the course of the Sun. The review of the passage indicates that it refers to the Southwest monsoon, which lasts from May to September (Eggeling, 1894). During this period the general flow of current is from east to south. In the *Jatakamala* (4th century AD) Aryasura differentiates waves from currents and calls

the latter *salila*. Three physical phenomenon of the ocean namely tides, currents and waves were known to the seafarers. By observing fishes, colour of water, birds, rocks and islands the mariners knew in which area of sea they were sailing. Sometimes they threw a handful of sand or shell and feathers into the calm sea. Sinking of sand or shell and drifting of feathers on the sea indicate the speed and flow of current and assisted them in deciding their anchorage off the coast. Such early practices still survive along the east coast of India. On the basis of prevailing sea conditions and velocity of wind mariners were able to estimate the average speed and the position of the ship. Some of the ships kept tamed birds as land finders (Mookerji, 1912).

The other early Indian literature widely mentions varieties of winds and differentiates them from one another. The ancient texts specifically the *Bhargaviya* (4th–5th century AD) and the *Mayuracitraka* describe types of clouds, their hues in relation with wind and rainfall. More interestingly, the text *Avasyakacurni* furnishes details of sixteen types of winds which have been classified on the basis of direction. Another early medieval text *Abhidhanaratnamala* (11th century AD) provides information on waves, tides, sea, shores and aquatic animals (Gopal, 1999: 90–106). The author of *Periplus Maris Erithrei* (AD 60–100) mentions the ports, harbours, anchorages, name of the coasts, approaches to the ports along the Arabian Sea and Bay of Bengal, prevailing winds, rulers and people of the regions, sailing conditions, export, imports, etc. Pliny has also mentioned the Southwest monsoon in the *Natural History* (Warmington, 1974). Soon after Fa-Hien's return to China in AD 414, he wrote the book '*Record of Buddhistic Kingdoms*', where he made an indirect reference to the winter monsoon in connection with his voyage along the east coast of India, but currents are not mentioned in the text. Omission of currents in the text is not significant

because Fa-Hien's knowledge of the sea was inadequate (Giles, 1923). Kalidas has described elaborately the arrival of monsoon in India in the *Meghdoot* (4th century AD) (Majumdar, 1970).

The *Buddhist Jatakas* and the *Jain Canonical* mention ships moving by force of wind *Pavanabalasamahaya* (Jain, 1984). The Sangam period texts namely *Purananuru*, *Ahananuru* and *Madurraikanchi* describe types of seagoing vessels and those vessels move in the seas with the help of wind and sails were unfurled to move with the wind (Raghava Varier, 1988: 51–62). The Satavahana (2nd century BC to 3rd century AD), Salankayanas (AD 300–440) and Pallava period (6th to 9th century AD) coins (Figs. 13 and 14) depict ships with masts (Sarma, 1980) which provide evidence of use of wind in open sea navigation. Ships of earlier period could set sail during the favourable wind and currents hence ancient voyages were necessarily seasonal. The seasonally reversing winds are almost consistent during the monsoon period. The force of wind in the Bay of Bengal is a foremost factor. Occasionally weather disturbances occur during the pre-monsoon, monsoon and post-monsoon periods and under such circumstances sailors avoid sailing in the sea. The problem of studies related to the circulation is whether the large scale mean wind field remains as the factor controlling the circulation or the local dynamics control and affect the whole system during such weather disturbances (Leetmaa and Bunker, 1978: 311–322).

Discussion

On the basis of archaeological evidence it appears to be certain that during the early centuries of the Christian era there was a strong interlink among the mariners of India, Southeast Asia, Red Sea, Persian Gulf and Mediterranean Sea. The system of trade, exchange of culture and knowledge can be termed as 'world trade'. The



Figure 13: Satavahana coins showing ship with masts.



Figure 14: Pallava coin depicting ship with masts.

excavation findings of Ban Don Ta Phet suggest that the maritime contact between India and Southeast Asia is datable to the 4th century BC on the basis of five radiocarbon dates in the range of 390–360 BC, if not earlier. Similarly, Khao Sam Kaeo which lies on the upper part of Thai-Malay Peninsula has yielded evidence of early Indian contact assignable to much before the beginning of the Christian era. Scholars are of the opinion that the liberal principles of Buddhism, development of shipping technology, state control of trade, industry and agriculture were equally accountable for the beginning of maritime trade between India and Southeast Asia. The other issues such as obtaining gold from Malaya and Sumatra region because the incoming gold from the Roman Empire to India was stopped; importing high bronze tin which is yellow in colour resembles gold and was required for coinage and other usages and its main source was Thailand and importing spices which fetched high profits from Eastern Indonesian Islands were also equally responsible for commencement of maritime trade between India and Southeast Asia.

In addition to the above, there are some other evidences which were not discussed in the past but could also be responsible for the mariners of east coast of India undertaking maritime trade with Southeast Asian countries. These are: (1) water transport was easier, safer and could carry more than land transport. The frequent disturbances on the silk route might have caused a decline in the organised trade and compelled the traders of the Roman world to take the sea route through the Indian Ocean up to the South China sea, (2) during this period the mariners of India were aware of the monsoon winds which aided them in setting sail to Southeast Asian countries. The only way

for the traders, monks and mariners of peninsular India to contact the people of Southeast Asia and China was through sea route which subsequently became popular, (3) coastal shipping existed along the east coast during this period, mariners of India were aware of the trade centres, ports and products of Southeast Asia and they might have thought to venture into the open sea to expand the marine trade instead of inland trade, (4) the endurance of ports and trade centres depend upon the availability of commodities, market and transport facilities, craftsmanship, etc. Trade was the indicator of existence of states and in ancient times state territories were expanded for acquiring natural resources for the sake of trade. The contact between India and Southeast Asia was not merely for trade but some of the Indian traders settled in Southeast Asia permanently and spread Indian culture and religion, whereas no such evidence has come to light of permanent settlement of Indian traders on the Red Sea, Persian Gulf and Roman Empire. In earlier days trade was not only confined to exchange of goods but along with trade other non-material aspects such as language, script, philosophy, food habits, human behaviour, attitude, etc were spread on the foreign soil. Traders and monks also played a great role in introducing Indian script, language, art and culture to foreign lands.

Distribution and discovery of varieties of archaeological artefacts from ports and hinterland trade centres of India show the existence of well organised network of both inland and overseas trade with Southeast Asia, Red Sea, Roman world and countries adjoining the Indian Ocean. From the distribution of Indian pottery it appears that NBPW originated in the Gangetic valley along with Buddhism and its circulation extended towards peninsular

India, then to Sri Lanka and Maldives (?), so far there is no evidence of NBPW in Southeast Asian countries. Similarly, RW probably originated in Peninsular India then spread over eastern, western and northern India along with other types of pottery, Roman gold coins, amphorae and other artefacts then to Southeast Asian countries, Persian Gulf and Red Sea. Buddhist monks, traders and merchant guilds of eastern and northern India acknowledged the introduction of Roman coins, amphorae and other objects by the traders of southern India. After reaching the Indian coast the Roman and Greek mariners took advantage of prevailing trade routes and moved towards northern India. The chronology and circulation of RW signify the close interactions between India, Southeast Asia and west Asia in terms of trade and exchange of products. RW had become a valuable source for understanding the trade and exchange network across the Indian Ocean during the early historical period. In recent past the study of early historic trade network across the Indian Ocean region has gained importance because of the availability of new information from archaeological explorations and excavations.

In ancient days sewn plank boats were the seagoing vessels and appear to be suitable because they can ride the swells and waves in a better way than the larger ones. As these were sewn plank, they were good for surf riding and had good resilience while other types of boats may not resist the sea conditions of the east coast of India. Even the regional literature mentions types of seagoing vessels. Square and quadrangular sails were used in those days. Sailing against the wind was also helpful in keeping course. Practical experience of sailing would have aided the early seamen in evolving a safe route. Mariners preferred to sail during the fine weather and clear sky, in case of stormy weather, gale wind associated with rough sea was avoided.

Conclusion

The trade contacts of India with Southeast Asian countries contributed to the growth of socio-economic conditions of both the regions. Indian art, culture and religion spread over Southeast Asia and in a later period local king's embraced Indian religion and constructed Hindu and Buddhist religious complexes. Earlier there was a concept among the scholars that the art and sculpture of Southeast Asia was apparently similar to that of Indian art and was borrowed by them. Now it has been conceived that the art of Southeast Asia developed simultaneously with Indian art. There could be two factors responsible for this. One could be that the sculptors of Southeast Asia visited Indian centres to learn Indian sculpture or Indian sculptors might have visited Southeast Asia to impart training to the sculptors of Southeast Asia. Without knowledge of the art of a particular region it is not easy to make similar kind of sculptures. Even Indian writing such as Brahmi and Kharoshti and languages like Sanskrit and Prakrit were patronised by the kings and people of Southeast Asia. In addition to this, other Indian influences can also be noticed in Southeast Asia.

The exploration and excavation findings of both the regions substantiate the fact that maritime contact

of India with Southeast Asia started between 5th and 4th century BC. The trade contact of India with Sri Lanka existed before the spread of Buddhism in Sri Lanka. The maritime trade was multi dimensional because monks, traders, sculptors and envoys were travelling together. Further, the study shows that the maritime trade was seasonal and they set sail at a particular time for both ongoing and return journey. During the rest of the year they were busy in collection of cargo, maintenance of vessels, etc. Initially the sailing was coast hugging and subsequently direct overseas routes were followed.

The archaeological, literary and historical evidences indicate that Indian mariners were aware of the use of monsoon wind and currents for maritime trade with Southeast Asian countries for more than 2000 years. Further, Indians were the first to use monsoon wind and currents for maritime trade and the literary evidence embodies this fact. The sailors of India set sail for Southeast Asian countries during the Northeast monsoon and returned during the Southwest monsoon. Both the wind and currents were favourable during their voyages and mariners scheduled their journeys accordingly. The study shows that there has been no change of seasons of monsoon over the past 2000 years and the social festivals celebrated along the east coast of India during the Northeast and the Southwest monsoons indicating past maritime glory are centuries old.

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The author has no competing interests to declare.

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