

## **Management of Ports and Maritime Trade of Orissa and Andhra Pradesh during the Historical Period**

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### **Abstract**

Along the 7516 km long coastline of India, several ports and trade centres have existed from ancient times. Among them the ports and trade centres of Orissa and Andhra Pradesh played a significant role in diffusing Indian culture to overseas countries from the mid first millennium BC. The coastal geomorphology of Orissa and Andhra favoured the establishment of a number of ports and trade centres, as evidenced by archaeological, literary and other sources. The ports of this region had hinterland connections by riverine and caravan trade routes. Several types of minerals and metals, raw materials and finished artefacts were exported and imported from these ports. This paper details the ports, trade routes and maritime contacts of Orissa and Andhra with other parts of the world in relation to the maritime history of India, findings, tentative dates and their management.

**Keywords:** Management, ports, maritime trade, Orissa, Andhra Pradesh.

## **Introduction**

Orissa and Andhra coast had a glorious maritime past and adventurous sailors who traversed countries and islands situated beyond seas and oceans. On the great maritime facades, there are different regions connected to hinterlands which are favourable to sea traffic. The ports of Orissa and Andhra not only served for export and import of merchandise but also spread of Indian culture in foreign lands. The mariners of this region had established colonies in Rome, Arabian, African and Southeast Asian countries which are attested through archaeological findings, art objects, epigraphical and numismatic as well as literary sources.

## **Sources for study of marine trade and ports of Orissa and Andhra**

The archaeological exploration and excavation finds such as Rouletted ware, Knobbed ware, Northern Black Polished ware (NBP), silver punch marked coins, Roman coins, Kharosthi scripts, semi-precious stone beads, Celadon ware, Chinese ceramic, etc. along the Bengal, Orissa, Andhra and Tamil Nadu coast indicate that a network of internal trade existed about 2000 years ago. The archaeological excavations at Sisupalgarh, Manikapatna and Radhanagar of Orissa, Tamralipti and Chandraketurgarh of Bengal, Amaravati, Dantapur, Salihundam, Dharanikota, Kalingapatnam of Andhra Pradesh have yielded Rouletted ware (Fig. 1). Knobbed ware has also been reported from Jaugada (Fig. 2), Lalitagiri, Manikapatna, Kalahandi and Radhanagar of Orissa, northern Andhra and coastal Bengal as well as Assam. Similarly, Rouletted ware and Knobbed ware have been reported from Bali, Bangladesh, Java, Malaysia, Sri Lanka, Thailand and Vietnam (Schenk 2006 and Glover 1996). The occurrence of Northern Black Polished ware and silver punch marked coins along the port and coastal sites of the east coast of India indicate the existence of coastal trade (Sila Tripathi 2002). Semi-precious stone beads have even been reported from Thailand, Indonesia, Burma, Malaysia and Philippines. It appears that carnelian and glass were imported from India to Southeast Asian countries and the finished products were exported to India again through marine trade (Glover 1996). Single mast ship motif punch marked coins reported from the Bengal coast belonging to the 3rd and 2nd centuries BC indicate the existence of maritime trade (IAR 1987-88:111). The evidence of oceanic trade of Andhra region can be recalled from the ship motif coins with single and double mast ships issued by the Satavahanas (Fig. 3) and the Salankayanas (Sarma 1980). The finding of Roman coins at many sites of Andhra, Bengal and Orissa show evidence of trade contact with the Romans. Further, Chinese and Sri Lankan copper coins reported from

Khalkatapatna, Manikapatna and Kotchina in Indonesia prove the maritime trade contacts between Orissa, Indonesia and Sri Lanka (Behera 1999).

The inscriptions of the 1st and 2nd centuries AD of Andhra Pradesh mention that master mariners resided at Mahanagaparvata and Ghantasala. Some early Sanskrit inscriptions have been recorded in western Java. According to Burnell (1878) and Rawlinson (1916) the script resembles the ancient Telugu or Vengi script datable to the middle of the 5th century AD. The Telaga Batu (AD 686) inscription of Indonesia mentions *Puhawang* (ships captain), *Vaniyaga* (long distance or seafaring merchants) and *sthapaka* (sculptors) as skilled people engaged in special tasks. The Kaladi (AD 909) inscription denotes Kalingas, Aryas, Sinhalese, Dravidians and Pandikiras as *wagga kilalan*, meaning a group of foreigners. The Indonesian inscriptions mention the Kalingas, Sinhalese, Dravidians, Aryas, as *banyaga* meaning foreign traders and a merchant guild called *banigrama* (Ardika 1999). The East Javanese and Balinese inscriptions frequently use the term *banigrama* (Sanskrit Vanigrama) meaning a merchant guild.

The artists and sculptors carried their ideas and innovations to other places and in return they brought some new ideas, which can be gleaned from the art evidences of Orissa and Andhra. The cultural and religious contacts of Orissa and Andhra with Java and Indonesia can be traced from the early historical period onwards in which Buddhism played a significant role. Traces of early Buddhism having the influence of Andhra and Orissa have been found in various places of Southeast Asia. The images of Buddha found at Pong Tuk of Siam (Thailand), Bangoen (Borneo), Palembang (Sumatra) and the bronze images of Buddha found at Pong Tuk and Bangoen resemble the Amaravati style. Buddha images of Amaravati style have also been found at Jamber in Eastern Java. The Burmese traditions indicate that the Salankayanas of Vengi were responsible for the spread of Buddhism in Burma (Ayyer 1987). Similarly, the Buddha and Boddhisattava images of Borobudur, Indonesia and Orissa have common features (Sila Tripathi 2000). The depiction of a giraffe on the wall of Konark temple of Orissa (Fig. 4) shows the contact of Orissa with Arab merchants who were responsible for bringing this animal from Africa to the east coast of India as well to China.

### **Maritime trade and trade routes**

The maritime trade can be classified under 3 categories: (a) inland water transport (b) coastal transport (c) overseas transport. All these three are interrelated. Similarly, the maritime trade of Orissa and Andhra depended upon the networking

facilities linked with other trade routes and ports of India. The surplus agrarian and industrial products were exported to Southeast Asian countries and beyond. The jewels, elephants, ivory and textiles exported from the ports of Orissa and Andhra were highly appreciated in foreign countries (Warmington 1974). Silver, woollen clothes and spices used to be imported by Orissa and Andhra from other countries. As it is not known whether trade and commerce was under any state policy, however, it is presumed that trade and commerce was under private enterprise. Several terms related to trade are found in ancient Indian texts: guilds (*sreni*), *nigama* or *nikama* were exchange centres, (*sahaya*) association; the trading communities are known as *vanijas* and *setthis* which have been derived from *grhapatis* who were rich households of land owners and *banigrama* meaning a merchant guild (Thapar 2002 and Ray 2003). Definitely, there would have been regional variation in organisation of trade. Due to divergent political systems in ancient India it is presumed that the trade and other related aspects were owned by private enterprise but overall controlled by the king.

In olden days, overseas trade was not possible without halting at intermediate places for replenishment of water and food. Sailors sailing from the east coast of India to Southeast Asian countries used the Nicobar Island as a halting station. Sailors, merchants, artists, sculptors and missionaries came from different parts to the nearest port and sailed to Southeast Asia and other countries following different sea routes (Fig. 5). The ports of embarkation were Palur, Kalingapatnam, Tamralipti, Masulipatnam and Poompuhar from where ships sailed across the Bay of Bengal to the coasts of Southeast Asia and the Far East. Ships going to Java from the ports of Orissa and Andhra returned directly to Sri Lanka and other ports on the east coast of India (Fig. 6). Further, these ships took a course to the northeast from Java to reach Canton. This trade route was generally followed by the merchants who traded with the countries of the West and the East (Prasad 1977).

### **Port and Harbour**

The word 'port' has been derived from the Latin word '*Portus*' meaning gateway. Thus a port can be defined as a gate or entrance from the sea to land or land to sea, a place where one form of transport is changed to another constituting a link in the chain of transport. A 'harbour' can be defined as a sheltered area of the sea in which vessels could be launched, built or taken for repair or could seek refuge at the time of storm or to provide facilities for loading and unloading of cargo and passengers. Thus, the term port is used to indicate a harbour where facilities such as stores, landing of passengers and

cargo etc. are added. In general it can be stated that a port includes a harbour or in other words every port is a harbour but the reverse is not true.

### **Ports of Orissa**

Ptolemy (AD 150) in his *Geography of Ancient India*, mentions vividly the ports of ancient Orissa namely Nanigaina (Puri), Katikardama (Kataka or Cuttack), Kannagara (Konark), mouths of the rivers Manada (Mahanadi), Tyndis (Brahmani), Dosaron (Baitarani?), Adams (Subarnarekha?), Minagara (Jajpur?) and Kosamba (Pipili or Balasore), which had overseas trade relations with other countries (Mc Crindle 1985). But Ptolemy did not refer to the other ports of Orissa such as Tamralipti, Manikapatna, Palur, Che-li-ta-lo and Khalkatapatna (Fig. 7), which also played a dominant role in the maritime history of Orissa. Similarly, the ports of Andhra such as Kalingapatnam, Dantapura, Pithunda, Dharanikota, Kottapatnam, Masulipatnam, Motupalli (Fig. 8) etc. played a significant role in diffusing Indian culture to the overseas countries from first millennium BC onwards. Of all these ports, some were active from very ancient times and continued to be so for long periods. Some ports became prominent during a particular period and perished or lost their significance subsequently, whereas other ports were meant for internal trade. Some of the ports of Andhra and Orissa have been identified with corroborating archaeological evidence whereas some ports mentioned in literature cannot be identified due to a lack of substantial evidence.

Tamralipti (Tamluk) was a *Dronimukha* port located at the confluence of the sea and the Rupanarayana River. Vessels sailed regularly to Burma, Ceylon, Malaya Peninsula and other Southeast Asian countries from Tamralipti. In the days of Asoka (273-232 BC), Indian Missions to and from Ceylon passed through Tamralipti port. Archaeological excavations have unearthed copper coins and terracotta figurines datable to the Sunga period (3rd century BC), Rouletted ware and other objects like sprinklers indicate the overseas contact of Tamralipti with the Romans. A considerable number of silver and copper coins bearing Buddhist symbols have recently been discovered in the midst of debris from the crumbling banks of the river Rupanarayana (Sila Tripathi and Rao 1994).

Khalkatapatna is situated on the left bank of the river Kushabhadra and was a port town of the Ganga dynasty (12th and 14th centuries AD). The excavations at Khalkatapatna (*IAR 1984-85: 56-60*) brought to light a brick jelly floor, which might have served as a loading and unloading platform. Chinese Celadon ware, Chinese porcelain with blue floral design on white background and egg-white glazed ware, besides glazed

chocolate ware of Arabian origin and dark grey and red slipped ware of indigenous origin pottery were recovered from the excavations. The shapes include bowls, basins, vases and miniature pots and all are wheel turned. The other antiquities include arecanut-shaped beads of terracotta, fragments of bangle of glass and copper, terracotta animal figurines, a miniature copper bowl and one complete and one fragment of Chinese copper coin datable to the 14th century AD (Fig. 9). The circular copper coin has a square perforation in the centre and legend in Chinese characters. The finds belong to a single culture period which can be dated between the 12th and 14th centuries AD and the period falls under the Imperial Gangas of Orissa. No structural remains have been encountered in the habitational area (Sinha 1992).

Manikapatna was a flourishing port situated along the Chilika Lake. The excavations (1989-1993) brought to light Indian Rouletted ware, fragments of amphora, red-glazed ware, Puri-Kushana coins and a Kharosthi inscription on a potsherd belonging to the Early Historical Period. In the upper levels, Chinese Celadon ware made of jade green celadon occurred in huge quantity. Other finds are a damaged Chinese copper coin with a square perforation in the centre (Nigam 1993). These findings signify that Manikapatna had trade contacts with Arabia, Ceylon, China and Rome from ancient times. The discovery of Shasamalla's coins from Manikapatna in Orissa, Polonnaruwa in Sri Lanka and Kotchina in Indonesia, prove a maritime network linking coastal Orissa, Sri Lanka and Sumatra. Manikapatna continued as a port till the 18th century. Recent explorations brought to light terracotta ringwells on the shore of Chilika at Manikapatna which were submerged during high tide and exposed in low tide (Sila Tripathi and Vora 2005). Huge quantities of Chinese ceramics are also encountered at the same site. The *Brahmanda Purana* describes Chilika as an important centre of trade and commerce. Thousands of ships having a number of masts and sails were sheltered in the lake. Some of the ships had curvilinear towers with three to five stories. Ships used to go to Java, Malaya and Ceylon from the Chilika port (Singh 1982). The lake was very deep and was connected to the sea through a wide mouth, which provided easy berthing for the sea going boats and ships. Ptolemy refers to Paloura as an important port of Kalinga country and a 'point of departure' (apheterion) for ships bound for Sumatra, Java, Pegu, Burma and some parts of Malay Peninsula and Indonesia. Paloura or Palur is identified with modern Palur in the Ganjam district of Orissa and was located at the southern tip of Chilika Lake. The archaeological explorations in 1984-85 at Palur and the adjacent areas have yielded red ware bowls with flaring rim having a ledge

on the exterior and a fragmentary terracotta dabber datable to 12th-14th century AD in an area of half a square kilometre in sand dunes (*IAR 1984-85*: 56-60).

### **Ports of Andhra Pradesh**

Kalingapatnam, the ancient port city of Kalinga, is situated at the mouth of the river Vamsadhara. The Chicacole grant (Fleet 1984) of King Indravarman and Narasingapalli plates (Majumdar 1984) of King Hastivarman of the Eastern Ganga dynasty refer to Kalinganagara, the capital city situated near the seashore. Explorations at Kalingapatnam revealed megalithic Black and red ware along with black and grey ware treated in kaolin paint under a black slip, red slipped ware, Rouletted ware, bricks of 44x22x8 cm, a stupa and habitational mounds at Kalingapatnam and Nagarlaket (*IAR1976-77*: 10). The excavations in the stupa mound between 1977-78 and 1979-80 brought to light a wheel plan stupa, megalithic black and red ware, micaceous black ware etc; and also included a number of Gupta period gold coins (Rao 2002). Pre-stupa occupation of Kalingapatnam has been dated to 300 BC. Scholars are of the opinion that the sea washed out Kalingapatnam and some remains can be noticed in the nearshore region while the rest has been silted up over the years (Rao 1971-72). The Korni Plates of Anantavarma Chodaganga (Sitapati 1926) refer to Dantapura, situated on the southern banks of river Vamsadhara approximately 6 km from Srikakulam Road Railway station. Ptolemy refers to the apheterion immediately to the South of Palur, where the vessels were bound for the Malay Peninsula. S. Levi mentions that Dantapura was a trade centre having contacts with the other ports of India and Persia during the 6th century BC. Dantapura had trade contact with Tamralipti, Burma, Ceylon and Far East countries (Law 1967). The excavations at Dantavaktrunikota by the Department of Archaeology, Andhra Pradesh in 1994 revealed a row of Buddhist stupas and ruins of brick structures as well an earthen rampart surrounding the site. The pottery include Northern Black Polished ware (NBP), Rouletted ware, grey ware, dull red ware, red slipped ware and knobbed ware spread over an area of 500 hectares of land (Subrahmanyam 1994) showing the trade contacts of Dantapura with other parts of India.

Pithunda was another flourishing port of Andhra. The Hathigumpha Inscription of Kharavela (1st century BC) states that Kharavela invaded the coastal belt of Andhra and captured Pithunda and renovated the port (Jayaswal 1983). The explorations at Pithapuram (identified as Pithunda), 20 km north of Kakinada yielded brick structures, sherds of Rouletted ware and Black and red ware from a mound datable to the Early Historic Period. Bhattiprolu of Krishna district has also been identified with Pithunda of

the Hathigumpha inscription of Kharavela. Levi (1926) mentions that Pithunda was a centre of textile industry in the region of Maisolia. The Jaina text *Uttaradhyayanasutra* mentions that Pithunda had trade relations with Champa (modern Kampuchea) even in the days of Mahavira and was a seat of Jainism (Sarma 1990).

The excavations at Dharanikota brought to light a rock-cut navigation channel of 15 feet depth and 70-85 feet width, connected with the river Krishna. The wooden wharf was constructed at right angles to the navigational channel, which extended to a height of 3.36 m. A brick structure was constructed close to the wooden wharf all along the channel on its inner side and an earthen embankment was raised at the back. The presence of a warehouse on the bank of River Krishna indicates Dharanikota as an inland port of the early centuries of the Christian era (Raghavachary 1972-73). The findings include glass earrings, glass bangles, glass objects, copper and lead coins, black and red ware, NBP ware and sherds with Brahmi inscriptions (Ghosh 1989). The presence of Rouletted ware, arretine ware, Roman amphorae, Roman coins and double mast ship motif Satavahana coins testifies to its contacts with other parts of the world (Sarma 1980). Several excavations, which were carried out at Dharanikota suggest that Dharanikota was an inland port and Buddhist centre which flourished from 4th century BC to 14th century AD.

Archaeological and inscriptional evidences testify that Motupalli, also known as Desuya Konda Pattana, served as a port during the rule of the Satavahanas, Kakatiyas, Reddys and Vijayanagars. It is situated near Bapatla in Prakasam district. The discovery of Rouletted ware and stamped ware suggests that Motupalli served as a port during the Early Historical Period (Reddy 1999). The inscription on a pillar in the premises of Motupalli temple (Fig. 10) of Ganapatideva, the Kakatiya ruler, states that the lives of both foreign and Indian mariners are treated as being as valuable as that of the ruler Ganapatideva himself. Further, it provides a long list of import and export trade items which invariably show the busy activities of this port. Motupalli had trade contacts with Japan, China, Sri Lanka, Burma, Sumatra, Java and Borneo. Large ships were plying from Motupalli having capacity of 200 to 300 passengers. Chinese ships such as Jongu, Zu and Kakam visited Motupalli port frequently (Sree Padma 1992).

Ptolemy mentioned Kottapatnam port as Kottis. Presently it is a small village in Nellore district of Andhra. Presently, the ancient port site is 500 meters away from the seashore and an irregular shaped creek passes through this village. It appears that the creek could be an artificial channel, which was dug probably for berthing of ships. The



findings include Rouletted ware, Roman glass pieces, stamped ware, Caolin pottery, Porcelain, Chinese ceramics and glazed ware and the Ming dynasty coin (Fig. 12) having Chinese script with a square hole (Rao 1994). The ancient habitational remains in the region have been scattered over more than one kilometre. The archaeological evidences indicate that Kottapatnam continued as a port from 3rd century BC to 15th century AD (Rao 2001). In ancient times Machilipatnam was known as Masulipatnam and Ptolemy refers to it as Maisolia. Masulipatnam was a point of departure of vessels bound for Southeast Asian and West Asian countries. The inland trade route which started from Masulipatnam, connected to Broach passed through Ter, Paithan and Ajanta. The Indo-Roman trade activities continued through this route connecting the east and west coasts of India. Ships laden with varieties of cotton cloth, yarn, silk, cowries, semi precious stone, glazed ware, etc. sailed to Burma, Ceylon, Indonesia and other countries. The port declined because of formation of sandbars, narrowness and shallow water, which did not allow movement of bigger ships for handling the cargo.

#### **Management of ports and trade**

The concept of port of ancient times is the same as it is in the present century. During the historical period there was a system for management of ports and trade but not much written evidence is available which can be broadly discussed. However, some changes have been made and guidelines laid down in the management of ports and trade which were not prevailing in olden days. Based on the present guidelines, olden day management system can be reconstructed with available historical data. It appears that the king controlled all operational activities of port and trade. Various kinds of taxes were levied and collected from the merchants; safety and security was also provided to them. Ports were established at strategic locations and connected with hinterlands. The available information on this aspect has been compiled and discussed below:

#### **Geomorphological features for the establishment of ports on Orissa and Andhra coast**

The geomorphological features of different regions of India and their connection with hinterlands favoured maritime trade. For example on the east coast, the large and fertile plain of Orissa has arches towards the Bay of Bengal. The coastal plains of Orissa are narrow in the north, wide in the middle and narrow in the south. The coastal region of Andhra and Orissa is characterised by wide deltas. The monsoons are a great force in shaping the shoreline features of Orissa and Andhra. The ports of Orissa and Andhra owe their existence to the projection afforded by sand bars and pits. The beach features

work as natural breakwaters providing relatively sheltered anchorage to these ports. The rivers of Orissa have created large deltas at their confluence with the Bay of Bengal. Further, the flourishing deltas of Andhra coast have natural outlets, the valleys of the rivers Krishna and Godavari (Ahmad 1972).

### **Types of ports**

In ancient times port establishments were found either on the sea front; mouth of riverbanks and in case of lagoons, at the outlets to the sea. On the basis of their location and geographical features the ports of India have been divided into various groups such as littoral ports, estuary ports and tidal ports. The archaeological explorations and excavations have yielded evidence that maximum numbers of ancient ports were located at such locations where cargo can be handled easily and vessels can be anchored safely.

Almost all littoral ports are exposed to the surf and the sea breeze. Along the Orissa and Andhra coast there were several littoral ports. It was difficult for bigger ships to come close to the ports because of their draught, sandbars and spits. Sometimes bigger ships anchor far out at sea. In these ports small vessels were used for hauling cargo. Estuary ports were established in river estuaries though there were problems of depth and shifting of sand bank. The shifting of sand bank obstructs the navigation channels. However, these ports provided proper shelter to vessels and handling of cargo. Moreover, these ports facilitate the linking of both land and river routes. The possibilities of developing ports on the littoral zone or estuary area depended on the range of tides of the region. The magnitude of high tide in Andhra and Orissa region is 1.5 to 3 m. Under these circumstances bigger vessels control their movement in the port area during high tide.

Further, to corroborate facts about the above type of ports, the ancient Indian text, the *Silpasastra* mentions two types of seaports namely *Pattana* and *Dronimukha*. *Pattana* were situated on the seacoast where cargo was loaded and unloaded. Even today the place names ending with *Pattana* indicate a port name e.g. Manikapatna, Visakhapatnam, Masulipatnam and Nagapatnam. On the other hand, *Dronimukha* refers to a port situated near the confluence of the river and the sea. *Dronimukha* was also a market place. Interestingly, the names of ports such as Dwarka, Tamralipti, Tondi and Puhar also had the same meaning and these port towns had well-established markets and hinterland connections (Roy 1994).

### **Structures for establishment of port and hinterland connections**

Besides the geographical considerations in installation of harbours and ports, maritime structures play a vital role in maritime activities of the country. These include boatbuilding yards, warehouses, landing places, boat shelters, causeways, channels, wharves, jetties, embankments, breakwaters and moorings on the sea front (McGrail 1983). The recent archaeological explorations and excavations on the east coast of India have brought to light the existence of wharves, warehouses, jetties and lighthouses at Dharanikota (Raghavachary 1972-73), Arikamedu (Wheeler *et al.* 1946), Kaveripattinam (Soundar Rajan 1994), Ganjam, Mahabalipuram and Chilika (Sila Tripathi and Vora 2005). At Kaveripattinam, a brick platform (18.28 and 07.62 m) was found during excavations datable to 3rd century BC, which might have served as a wharf. Brick walls have been noticed on the bank of the river Ariyankuppam at Arikamedu, which are the remnants of a warehouse. Probably the area adjoining the warehouse also served as a dock.

The excavations at Dharanikota brought to light a rock-cut navigation channel of 15 feet depth at mid centre and the width at top is 85 feet and 70 feet at bottom, connected with the river Krishna for loading and unloading of cargo. During high tide ships were berthed at the wharf alongside the embankment. The wharf appears to have been built of wooden planks and cross beams resting on huge posts. (Raghavachary 1972-73). It seems that almost all the seaports of India had some kind of a dockyard or wharf for anchoring ships and hauling the cargo and merchandise.

In addition to the maritime structures, information is also available on the ancient landing places of India both on the seacoast and riverbanks. The author of the *Periplus Maris Erithrei* (AD 60-100) mentions that there were thirteen landing places along the coast of India (Schoff 1974). The important landing places on the east coast of India were *Komar* (Cape Comorin), *Kolkhai* (Korkai on the river Tambraparni in Tirunelveli), *Kamara* (probably Puhar or Poompuhar), *Poduke* (probably Arikamedu near Pondicherry), *Sopatma* (near Chennai) and *Masalia* (Masulipatnam) in Andhra Pradesh.

It is essential that ports should be located at places which can be approached either by river or land routes which ships of various sizes can reach without any hindrance; and storage as well as transport facilities of cargo should be available, etc. Most of the major ports of ancient India had these facilities. The historical records indicate that 165 ports existed along the coast of India in different periods of history. Among them some were major whereas others were minor ports. The major ports of

Orissa and Andhra were Palur, Kalingapatnam, Dharanikota, Masulipatnam and Manikapatna. These ports had network with riverine and minor ports along with hinterland trade centres. Minor ports facilitated control of traffic on the coastal plains and contacts with agrarian and other production centres in the local region.

### **Safety and protection of trade and traders**

The overall responsibility for efficient management of port and trade was vested in the king. Several ships plied between the ports not only for trade and commerce but also carried people and there was constant traffic. During voyages sailors and traders faced different kinds of problems in mid sea, which included storm, cyclone, danger of hidden rocks, sea animals and piracy. To overcome these problems and for safe and secure maritime trade, rulers had taken measures which are evident from various sources. For instance, to get rid of the piracy problem Asoka had issued a copper plate edict known as *Marine Edict* for the Naga rulers, which was however, contemptuously set at naught by those for whom it was meant (Mookerji 1912). Similarly, Kautilya's *Arthashastra*, (4th-3rd century BC) lays down the functions of the *navadhyaksha* or Superintendent of ships, who has manifold duties to perform. For instance, he was required to maintain records called *panyapatna-caritra abdhi pattanadhyaksa nibandha*; he was also enjoined to show 'fatherly consideration' to vessels in distress and allow half toll (*shulka*), or exempt from toll altogether, merchandise damaged by water (Shamasastri 1967).

Further, in later period, the famous '*abhaya sasana*' (charter of security) (Hultzsch 1982) issued by king Ganapatideva AD 1244-45, throws a welcome light on the care taken by the rulers of Andhra to encourage maritime trade. The inscription assures safety to traders (*abhaya Sasana*) arriving from all continents (*Svadesi* and *Paradesis*) risking the sea voyage and its hazards like storm attacks and shipwrecks. The merchants traded in goods like camphor, rose water, ivory, pearls, silk and arecanuts from Motupalli port. The levies (usually 1:30) on the items of import and export have also been listed with great detail and speak of the flourishing international trade from Motupalli port, which was provided with warehouses. The inscription mentions several continents, islands, foreign countries and cities but specific mention of Chini (China) is noteworthy.

The other inscription issued by Annapottu Reddi AD 1358 at Motupalli encourages free trade with places all over the world. The inscription mentions that the law of the state is applicable to the merchants on the sea and shore towns. The merchants could move freely in any part of Motupalli. The levy (*aputrika dendam*) was

not applicable to foreigners. Foreigners could sell their merchandise to whomsoever they liked and buy articles of their choice. The cloth for women was not to be levied. But for other items of merchandise the duty was to be levied as before. This was the procedure followed in the *anjinanpugalidam* or place for security to persons in distress (Srinivasan 1990).

### **Collection of taxes, Piloting and lighthouses**

It is evident that in ancient times the rulers collected revenue from the people by way of various types of taxes for the benefit of the state; collection of tax from traders was among them. Taxes were collected from sailors and traders at various places: namely at the entrance of towns and markets, passes, ghats, river banks and ports. The levying of taxes was not uniform. It varied from merchandise to merchandise. It is also not known whether there was a variation in collection of taxes from local and foreign merchants.

The *Arthashastra* of Kautilya and some inscriptions mention the collection of taxes from the traders. The *Arthashastra* mentions different departments and officers concerned with navigation, distribution of the duties and responsibilities of *Navadhyaksha*, who exercised the duty of the superintendent of ships to inspect the accounts concerning navigation on the sea, estuaries, lakes and rivers. Varying duties were levied on different articles transported on board the ships. Fisheries and passengers had also to pay taxes. The text also codifies certain regulations to be followed in naval and mercantile marine affairs (Shamasastri 1967). Among the inscriptions, the Nanaghat inscription of the Satavahana dynasty is most important. From the inscription it can be understood that traders passed through Nanaghat to reach Godavari valley. Similarly, traders crossed the Junnar pass to reach Konkan coast and at these locations taxes were collected from traders. Orissa evidently derived considerable revenue from sea trade. The Bhaumakara period (8th to 10th centuries AD) inscription refers to *Samudrakara bandha* (sea tax gate) on the bank of Chilika Lake, where taxes were collected from the sea traders (Sila Tripathi 2000).

References to pilotage are available in ancient Indian texts. The *Supparaka Jataka* mentions that after the perilous adventures on the sea off the port town of Bharukaccha the vessels reached the port under the pilotage of a blind mariner. There are no references to the difficulties of approach to the ports on the east coast of India. However, evidence of lighthouses is available on the coast of Orissa, Andhra Pradesh and Tamil Nadu. The hillock on the shore of Chilika is referred to as *Deepa-Adia Pahada*

(Hill of Light), where a 2 m high monolithic stone pillar is present, which might have served as a lighthouse for seafarers from the historical period onwards (Fig. 11). The Bay of Bengal can be seen from the southern side of the stone pillar. Bavikonda and Thotlakonda, (near to Visakhapatnam), the Buddhist sites located on the hillocks which lay very close to the seashore, might have served as a landmark for navigation. The Olakkaneswar temple near the modern lighthouse of Mahabalipuram in Tamil Nadu is the earliest representative of structural temples of the region. The Olakkaneswar or Olakkanath (means 'flame eye') temple is situated on a hilltop in Mahabalipuram. On the roof of the temple there is a shallow depression where a pot 1.5 feet high was kept with oil. Every evening the oil was set on fire, the light of the fire used to guide the mariners during night navigation. This system prevailed till the construction of lighthouses on the same roof of the temple (Fig. 12).

### **Discussion and Conclusion**

The development and progress of a nation depends upon the use of available natural resources, networking and management system. The management of water resources is responsible for economic development. India is endowed with a 7516 km long coastline connected with several rivers, creeks and inlets, which are suitable for water transport system and development of ports. In olden days there were several ports along the coastline of India among them some were major and others were minor.

Orissa and Andhra Pradesh had several ports, trade centres and a long maritime history because of their navigable rivers, convenient anchoring and landing facilities, which served sailors for better oceanic trade through the ages. Maritime trade facilitated the transport of commodities and exchange of culture and religion. During the early historical period mariners of the east coast of India were aware of the ports and trade centres of Southeast Asia and they ventured into the open sea to reach Southeast Asia. Moreover, they were aware of the direction of monsoon winds and currents which aided them on their journey to Southeast Asia and back. Afterwards mariners changed the size and carrying capacity of the ships and used bigger vessels. Subsequently, people moved from one country to another, market places grew up and the economy of the country progressed. Weak successors, poor economy, transfer of power, trade monopoly, attack by neighbouring kingdoms etc. contributed to the decline of ports and maritime activities of the region. Geological processes such as coastal erosion, sea level changes, sedimentation, formation of sand bars and spits, cyclones, storms and tectonic activities also seem to have been responsible for their decline.

It shows that in olden days ports developed at locations which were connected to the hinterlands. It may be mentioned that the existence and distribution of small ports along the coastline provided affordable facilities to overland connections in regional areas and were a main hub for a nearby major port. Geographical factors played an important role in setting up a number of maritime settlements and ports, which flourished once but cannot be seen today. For example, the ports Manikapatna, Kalingapatnam, Palur and Masulipatnam, which served for centuries together, have left only some traces but it is difficult to locate the original port sites.

Several remnants of maritime structures have been noticed along the Orissa and Andhra coast. These structures had been constructed in relation to the geomorphology of the region. These maritime structures suggest how long a port or a trade centre was in use and when it was abandoned. Sometimes scientific studies indicate the causes of abandonment of sites and structures. The revival of ports at the confluences and the use of riverine routes would provide easy transportation and better communication facilities with hinterlands of India as in earlier days. A number of new ports have come up either in the ancient port sites or in adjoining areas. It would be highly appreciable if the present ports adopt the example of ancient port sites for posterity. Various kinds of studies and explorations are conducted either in coastal or offshore regions for industries. Some times explorations may bring archaeological findings or anomalies which should be reported to the concerned authority for in-depth study and preservation. Maritime structures and archaeological sites are our cultural heritage. The rapid industrialisation activity along the coastal region may destroy the evidence of bygone civilisation forever. Once the evidence is lost it can never be recovered. In view of this, it is imperative to undertake extensive coastal surveys to locate and study the remains which should be protected for coming generations.

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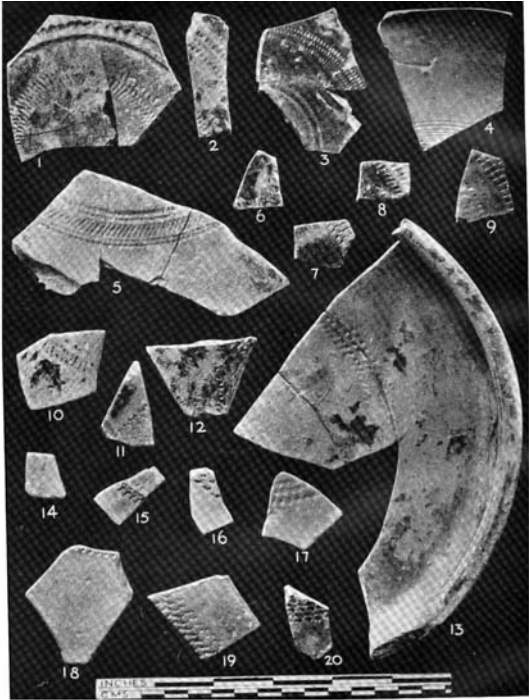


Fig. 1. Rouletted ware collected during excavations at Sisupalgarh

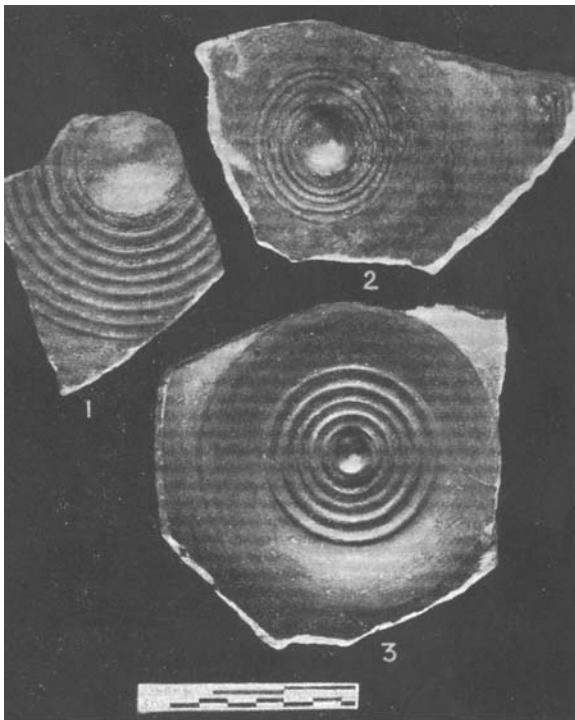


Fig. 2. Knobbed ware recovered from Jaugada



Fig. 3. Satavahana coins showing sailing vessels with two masts.

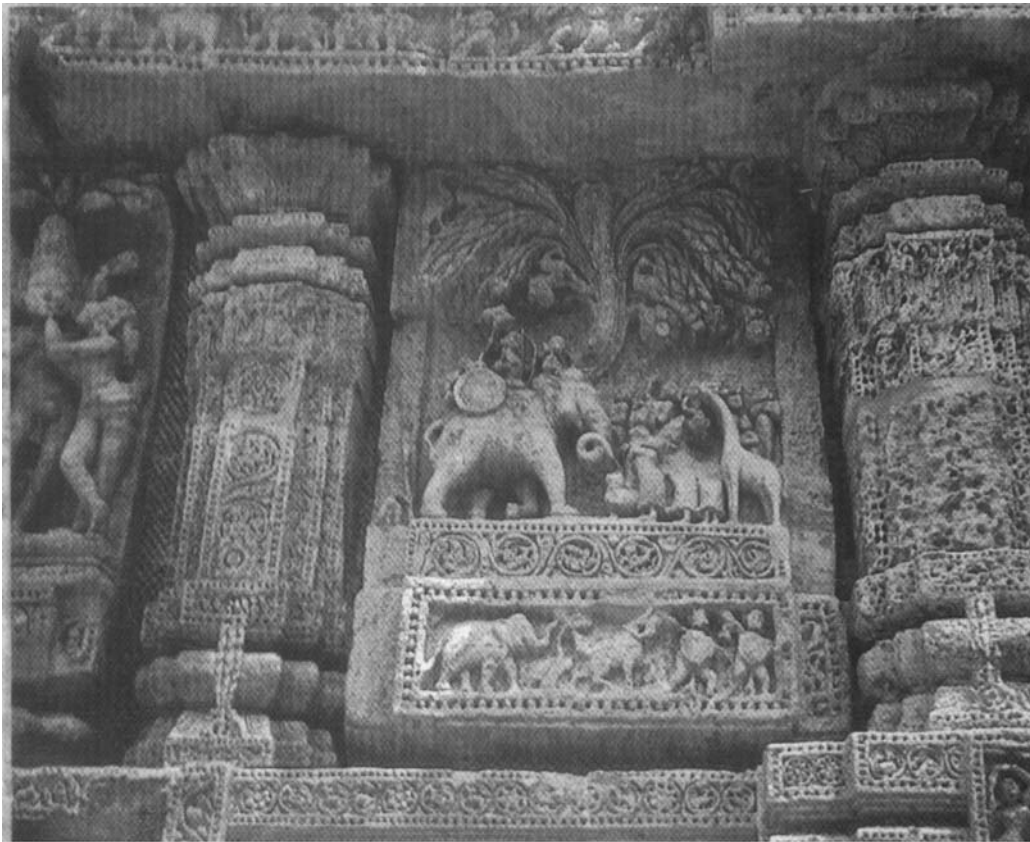


Fig. 4. African animal giraffe carved on Konark temple.

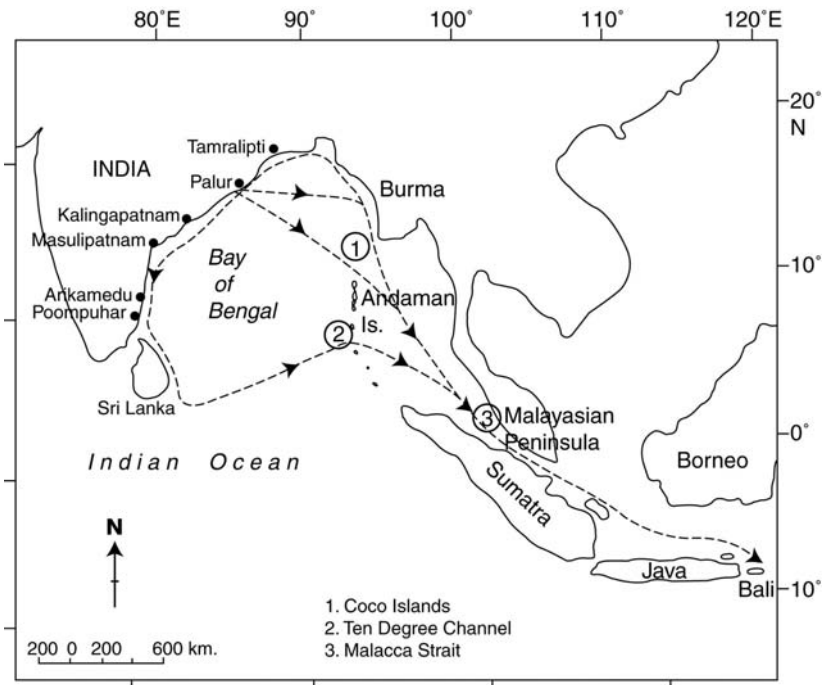


Fig.5. Sea routes from Orissa to Southeast Asian countries

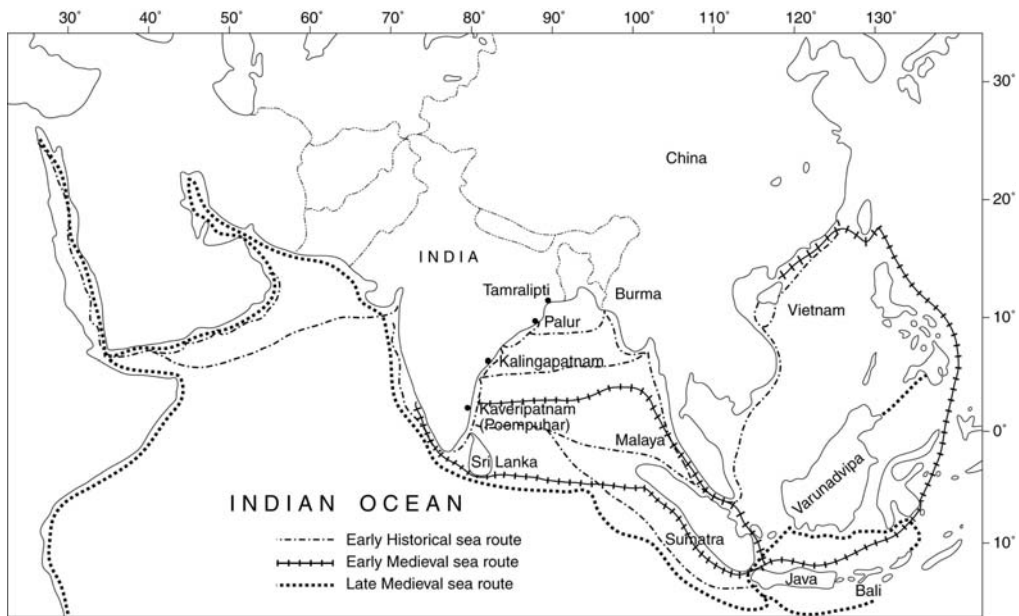


Fig. 6. Sea routes between the ports of the east coast of India and Southeast Asian countries.

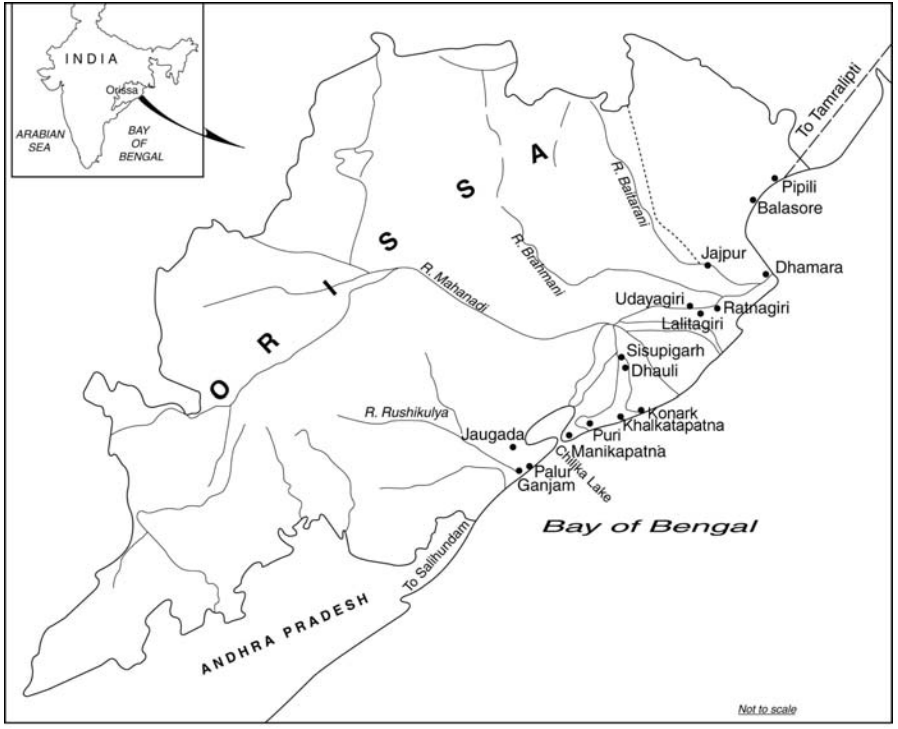


Fig. 7. Ports and excavated sites along the coast of Orissa

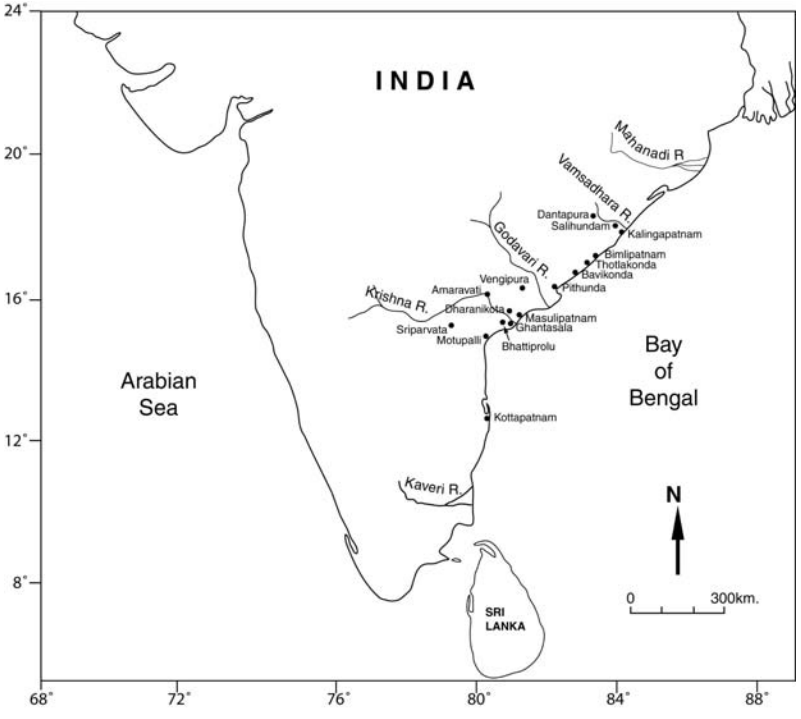


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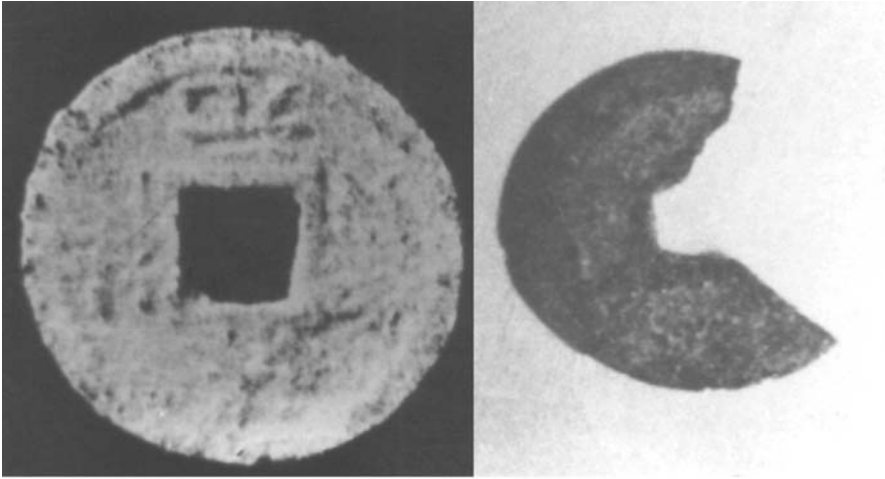


Fig. 9. Chinese copper coin found during excavations at Khalkatapatna.



Fig. 10. Motupalli pillar stone inscription.





Fig. 11. Monolithic stone pillar lighthouse on the hilltop of the Chilika Lake.

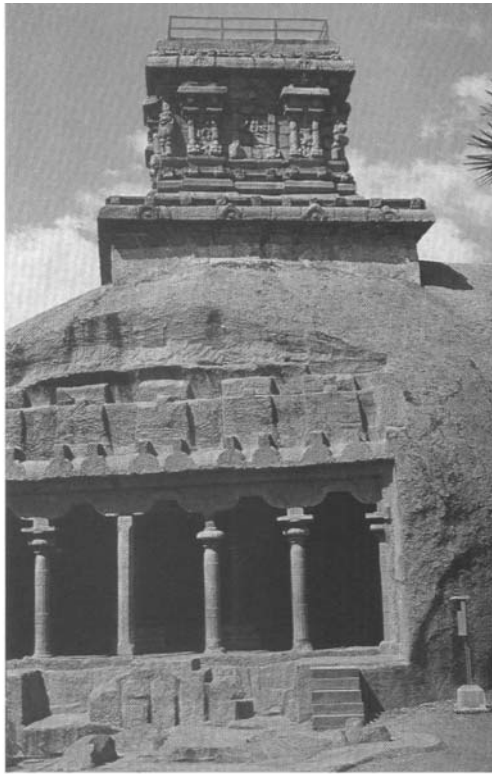


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