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 B.C. 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 of investigations, tentative dates and the management of ports.

Introduction
The Orissa and Andhra coast had a glorious maritime past with adventurous sailors who traversed countries and islands situated in distant seas and oceans. Different coastal regions connected to hinterlands are favourable to sea traffic. The ports of Orissa and Andhra served as export and import centres but also spread Indian culture in foreign lands. The mariners of this region established colonies in Rome and in Arabian, African and Southeast Asian countries, which are attested through archaeological findings, art objects, and epigraphic, numismatic and literary sources.

Sources for the Study of Marine Trade and Ports of Orissa and Andhra
Archaeological exploration and excavation finds such as rouletted wares, knobbed ware, Northern Black Polished ware (NBP), celadon ware, Chinese ceramics, silver punch-marked coins, Roman coins, Kharosthi inscriptions, and semi-precious stone beads, along the Bengal, Orissa, Andhra and Tamil Nadu coast indicate that a network of internal trade existed about 2000 years ago. Archaeological excavations at Sisupalgarh, Manikapatna and Radhanagar in Orissa, Tamralipti and Chandraketugarh in West Bengal, Amaravati, Dantapur, Salihundam, Dharanikota and Kalingapatnam in Andhra Pradesh have yielded Rouletted ware (Fig. 1). Knobbed ware has also been reported from Jaugada (Fig. 2). Lalitagiri, Manikapatna, Kalahandi and Radhanagar. Similarly, rouletted ware and knobbed ware have been reported from Bali, Bangladesh, Java, Malaysia, Sri Lanka, Thailand and Vietnam (Glover 1996, Schenk 2006). 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 (Tripathi 2002). Semi-precious stone beads have even been reported from Thailand, Indonesia, Burma, Malaysia and the Philippines. It appears that carnelian and glass were exported from India to Southeast Asian countries, through marine trade (Glover 1996). Single mast ship motif punch marked coins reported from the Bengal coast, belonging to the 3rd and 2nd centuries B.C., indicate the existence of maritime trade (IAR 1987-88:111). The evidence of oceanic trade in the Andhra region can be referred from the coins with single and double mast ship motifs issued by the Satavahanas (Fig. 3) and the Salankayanas (Sarma 1980). The finding of Roman coins at many sites in Andhra, Orissa and West Bengal show evidence of trade with the Roman world. Chinese and Sri Lankan copper coins reported
from Khalkatapatna, Manikapatna and Kochina in Orissa, Indonesia and Sri Lanka (Behera 1999).

The 1st and 2nd centuries inscriptions from Andhra Pradesh mention that master mariners resided at Mahanagarpurata and Ghantasala. Some early Sanskrit inscriptions have been recorded in western Java. According to Burnell (1878) and Rawlinson (1916) the script of these inscriptions resembles the ancient Telugu or Vengi script datable to the middle of the 5th century A.D. The Telaga Batu inscription of Indonesia mentions Puhawang (ship’s captain), Vaniyaga (long distance or seafaring merchants) and sthapaka (sculptors) as skilled people engaged in special tasks. The Kaladi inscription of A.D. 909 mentions Kalingas, Aryas, Sinhalese, Dravidians and Pandikiras as wagga kilalan, i.e. a group of foreigners. The Indonesian inscriptions mention the Kalingas, Sinhalese, Dravidians, Aryas, as banyaga i.e. 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 new ideas, which can be gleaned from art objects of Orissa and Andhra. Cultural and religious contacts of Orissa and Andhra with Indonesia can be traced from the early historical period onwards in which Buddhism played a significant role. The images of Buddha found at Pong Tuk in Siam (Thailand), Bangoen (Borneo), Palembang (Sumatra) and the bronze images of Buddha found at Pong Tuk and Bangoen resemble the Amaravati style. Buddhist images of Amaravati style have also been found at Jambor in eastern Java. The Burmese traditions indicate that the Salankayanas of Vengi were responsible for the spread of Buddhism to Burma (Ayyer 1987). Similarly, the Buddha and Bodhisattava images of Borobudur, Indonesia and Orissa have common features (S. Tripati 2000). The depiction of a giraffe on the wall of the Konark temple (Fig. 4) shows contact of Orissa with Arab merchants who were responsible for bringing this animal from Africa to the east coast of India and to China.

**Maritime Trade and Trade Routes**

Maritime trade can be classified under 3 categories: (a) inland water (b) coastal and (c) overseas transport. All three are interrelated. Similarly, the maritime trade of Orissa and Andhra depended upon networking with other trade routes and ports of India. The surplus agrarian and industrial products were exported to Southeast Asian countries. Jewels, elephants, ivory and textiles exported from the ports of Orissa and Andhra were highly appreciated in foreign countries (Warington 1974). Silver, woollen clothes and spices were imported by Orissa and Andhra from other countries. Since the role of the state in trade and commerce is not known, it is presumed that this was under private enterprise. Several terms related to trade are found in ancient Indian texts: guilds (sreni), nigama or nikama (exchange centres), (sahtya) association; trading communities (vanijas and setthis) have been derived from grhapatis who were rich households of land owners and banigrama (merchant guild) (Thapar 2002 and Ray 2003). Due to different political systems in ancient India it is presumed that the trade
and other related aspects were owned by private enterprise under the overall control of the state.

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 ports on the east coast of India (Fig. 6). Further, these ships took a course to the northeast from Java to reach Canton (Prasad 1977).

Ports and Harbours

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, could seek refuge during 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 but every harbour is not a port.

Geomorphological Features of the Orissa and Andhra Coast

Geomorphological features in different regions of India favoured maritime trade. For example on the east coast, the large and fertile plain of Orissa arches towards the Bay of Bengal. The coastal plain of Orissa is narrow in the north and south, but wide in the middle. The coastal region of Orissa and Andhra is characterised by wide deltas (Ahmad 1972). The monsoons are a great force in shaping shoreline features. The ports of Orissa and Andhra owe their existence to the projection afforded by sand bars and spits. The beach works as a natural breakwater providing relatively sheltered anchorage to ports.

Types of Ports

In ancient times, ports existed on the sea front and mouths of rivers and the lagoons and functioned as outlets to the sea. On the basis of their location and geographical features ports of India have been divided into littoral, estuary and tidal ports. Archaeological explorations and excavations have yielded evidence that the maximum number of ancient ports were situated at locations where cargo could be handled easily and vessels anchored safely.
Almost all littoral ports are exposed to the surf and sea breeze. Along the Orissa and Andhra coast there were several littoral ports. It was difficult for large ships to sail directly to ports, owing to sandbars and spits. Sometimes bigger ships anchored far out at sea and the cargo was hauled to the port by smaller vessels. Ports were established in river estuaries despite issues related to depth and shifting of sand banks, which obstructed navigation channels. The possibilities of developing ports on the littoral zone or estuary areas depended on the range of tides. The magnitude of high tides in the east coast region is 1.5 to 3 m. For this reason larger vessels had limited access to ports.

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

**Ports of Orissa**

Ptolemy (A.D. 150) in his *Geography*, mentions 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 (McCrimble 1985). Ptolemy does not refer to the other ports of Orissa such as Tamralipti, Manikapatna, Palur, Che-li-ta-lo and Khalkhatapatna (Fig. 7), which also played a dominant role in maritime trade. Similarly, the ports of Andhra such as Kalingapatnam, Dantapura, Pithunda, Dharanikota, Kottapattam, Masupatnam and Motupalli (Fig. 8) played a significant role in diffusing Indian culture overseas from the first millennium B.C. onwards. Some of these ports were active from very ancient times and continued to be so for long periods. Some ports became prominent during a particular period.
but perished or lost their significance subsequently. A few ports of Andhra and Orissa have been identified with corroborating archaeological evidence. Those mentioned in literature cannot be identified due to lack of substantial evidence.

Tamralipti (Tamluk) was a Dronimukha port located at the confluence of the sea and the Rupnarayan River. Vessels sailed from Tamralipti regularly to Burma, Sri Lanka, Malaya Peninsula and other Southeast Asian countries. In the days of Asoka (273-232 B.C.), Indian missions to and from Sri Lanka passed through Tamralipti. Archaeological excavations have unearthed copper coins and terracotta figurines datable to the Sunga period (2nd century B.C.), Rouleled ware and objects like sprinklers indicate the overseas contact of Tamralipti with the Roman world. 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 Rupnarayana (Tripathi and Rao 1994).

Khalkatapatna is situated on the left bank of the river Kushabhadora and was a port town of the Ganga dynasty (12th and 14th centuries A.D.). The excavations at Khalkatapatna (IAR 1984-85: 56-60) brought to light a brick jetty floor, which might have served as a loading and unloading platform. Chinese Celadon ware, Chinese porcelain with blue floral designs on a white background and egg-white glazed ware, besides glazed chocolate ware of Arabian
Fig. 6: Sea routes between the ports of the east coast of India and Southeast Asian countries

origin and dark grey and red slipped ware of indigenous origin were recovered from the excavations. The shapes include bowls, basins, vases and miniature pots; all are wheel turned. The other antiquities include areca nut-shaped beads of terracotta, fragments of bangles 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 A.D. The circular copper coin has a square perforation in the centre and legend in Chinese characters. The finds belong to a single cultural period which can be dated between the 12th and 14th centuries A.D. and the period falls under the Imperial Gangas of Orissa. No structural remains have been encountered in the habitation area (Sinha 1992).

Manikapatna was a flourishing port situated along the Chilika Lake. The excavations (1989-1993) brought to light Indian Rolettured 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 quantities. 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, Sri Lanka, China and Rome from ancient times. The discovery of Shasamalla’s coins from Manikapatna in Orissa, Polonnaruwa in Sri Lanka and Kothina in Indonesia, indicate a maritime network linking coastal Orissa, Sri Lanka and Sumatra. Manikapatna continued as a port till the 18th century. Recent explorations have brought to light terracotta ringwells on the shore of Chilika lake at Manikapatna which were submerged during high tide and exposed in low tide (S. Tripathi and Vora 2005). Large 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 storeys. Ships sailed to Java, Malaya and Sri Lanka 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
Fig. 7: Ports and excavated sites along the coast of Orissa

of Kalinga country and a ‘point of departure’ (apheterion) for ships bound for Sumatra, Java, Pegu, Burma and some parts of the 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 in the adjacent areas have yielded red ware bowls with flaring rim and a ledge on the exterior, and a fragmentary terracotta dabberv datable to 12th-14th century A.D. 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 Vamsadvara. 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 have 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 with dimensions of 44 x 22 x 8 cm, a stupa and habitational mounds occur at Kalingapatnam and Nagarlapet (IAR 1976-77: 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; a number of Gupta period gold coins (Rao 2002). Pre-stupa occupation of Kalingapatnam has been dated to 300 B.C.
Scholars are of the opinion that the sea washed away Kalingapatnam and some remains can be noticed in the nearshore region while the rest have been silted 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 vessels were bound for the Malay Peninsula. Levi mentions that Dantapura was a trade centre having contacts with Tamralipti and other ports of India, Persia, Burma, Sri Lanka and the Far East (Law 1967). Excavations at Dantavakruntinikota 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 includes NBP, Rouletted ware, grey ware, dull red ware, red slipped ware and knobbed ware spread over an area of 500 ha (Subrahmanyam 1994).

Pithunda was another flourishing port of Andhra. The Hathigumpha Inscription of Kharavela (1st century B.C.) states that Kharavela invaded the coastal belt of Andhra and captured Pithunda and renovated the port (Jayaswal 1983). 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 5 m depth and 20-25 m 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 the Dharamikota was an inland port of the early centuries of the Christian era (Raghavachary 1972-73). The findings include earrings, bangles, and other objects of glass, 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 and coins, Satavahana coins and double mast ship motif, testifies to its contacts with other parts of the world (Sarma 1980). Several excavations, which were carried out at Dharamikota, suggest that the site was an inland port and Buddhist centre which flourished from the 4th century B.C. to the 14th century A.D.

Archaeological and inscriptive evidence indicates that Motupalli, also known as Desuya Konda Pattana, served as a port during the rule of the Satavahanas, Kakatiyas, Reddys and Vijayanagaras. 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). An inscription of Ganapatideva, the Kakatiya ruler, on a pillar in the premises of Motupalli temple (Fig. 9) states that the lives of both foreign and Indian mariners are treated as being as valuable as that of the ruler. Further, it provides a long list of import and export trade items which highlight the importance of this port. Motupalli had trade contacts with Japan, China, Sri Lanka, Burma, Sumatra, Java and Borneo. Large ships having a capacity of 200 to 300 passengers were plying from Motupalli. Chinese ships such as Jongu, Zu and Kakam visited Motupalli port frequently (Sree Padma 1992).

Ptolemy mentions Kottapatnam port as Kottis. At present, it is a small village in Nellore district of Andhra and the ancient port site is 500 m inland; an irregular shaped creek passes through this village. It appears that the creek was an artificial channel, which was dug to enable ships to berth. Findings include Rouletted ware, stamped ware or kaolin pottery, porcelain, Chinese ceramics and glazed ware, Roman glass pieces and a Ming dynasty coin with Chinese script, and a square hole (Rao 1994). The ancient habitational remains in the region are scattered over more than one kilometre. Archaeological evidence indicates that Kottapatnam continued as a port from the 3rd century B.C. to the 15th century A.D. (Rao 2001). In ancient times, Machilipatnam was known as Masulipatnam and Ptolemy refers to it as Maisolia. Masulipatnam was a point of departure for vessels bound for Southeast Asian and West Asian countries. The inland trade route, which started from Masulipatnam was connected to Broach and passed through Ter, Paithan and Ajanta. The Indo-Roman trade continued along this route connecting the east and west coasts of India. Ships laden with a variety of cotton cloth, yarn, silk, cowries, semi-precious stones, glazed ware, etc. sailed to Burma, Sri Lanka, 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**

During the historical period there was a system for management of ports and trade, but not much written evidence is available. Based on present and available historical data, past management systems can be reconstructed. It appears that the king controlled all operational activities of port and trade. Various kinds of taxes were levied and collected from the merchants; securities were 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.

**Structures for Establishment of Port and Hinterland Connections**

Boat building yards, warehouses, landing places, boat shelters, causeways, channels, wharves, jetties, embankments, breakwaters and moorings, played a vital role in maritime activities (McGrail 1983). Recent archaeological explorations and excavations on the east coast of India have brought to light the existence of wharves, warehouses, jetties and lighthouses at Dharamikota (Raghavachary 1972-73), Arikamedu (Wheeler et al. 1946), Kaveripattinam (Soundara Rajan 1994), Ganjam, Mahabalipuram and Chilika (S. Tripati and Vora 2005). At Kaveripattinam, a brick platform (18.28 and 07.62 m) was found during excavations dated to the 3rd century B.C., which might have served as a wharf. Brick walls, which are the remnants of a warehouse have been noticed on the bank of river Ariyankuppam.
at Arikamedu. The area adjoining the warehouse also served as a dock.

Excavations at Dharanikota brought to light a rock-cut navigation channel of 5 m depth at mid centre (width at top 28 m and 23 m at bottom). The channel was 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 (Raghabachary 1972-73). Almost all seaports of India seem to have had some kind of a dockyard or wharf for anchoring ships and hauling cargo.

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

It is essential that ports should be located at places which can be approached either by riverine or land routes which ships of various sizes can reach without any hindrance; and storage and transport facilities of cargo should be available. Most of the major ports of ancient India had these facilities. Historical records indicate that 165 ports existed along the coast of India in different periods of history. A few were major ones, others were minor. The major ports of Orissa and Andhra were Palur, Kalingapatnam, Dharanikota, Masalipatnam and Manikpatna. They were networked 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. Ships plied between the ports not only for trade and commerce but also for transporting people. During voyages, sailors and traders faced different kinds of problems in mid sea, which included storm, cyclone, hidden rocks, sea animals and piracy. To stop piracy, Asoka issued a copper plate edict known as the *Marine Edict* for the Naga rulers, which was however, contemptuously ignored by those for whom it was meant (Mookerji 1912). Similarly, Kautilya’s *Arthasastra*, (4th-3rd century B.C.) lays down the functions of the *navadhyanaksha* or Superintendent of Ships. For instance, he was required to maintain records called *panyapatna-caritra abdhi pattanadhyaksa nibanda*; and to show ‘fatherly consideration’ to vessels in distress and allow half toll (*shulka*), or to exempt them from toll altogether, merchandise damaged by water (Shamasantra 1967).

In later period, the famous ‘*abhaya sasana*’ (charter of security) issued by king Ganapatideva A.D. 1244-45, throws welcome light on the care taken by the rulers of Andhra to encourage maritime trade (Hultzsch 1982). The inscription assures safety to traders (*abhaya sasana*) arriving from all continents (*Svadesi* and *Paradesi*) risking the sea voyage and its hazards like storm attacks and shipwrecks. The merchants traded in goods like...
foreign merchants.

The *Arthasastra* of Kautilya and some inscriptions mention the collection of taxes from traders. The *Arthasastra* mentions different departments and officers concerned with navigation, distribution of 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 ships. Fisheries and passengers also had to pay taxes. The text also codifies certain regulations to be followed in naval and mercantile marine affairs (Shamasasty 1967). In the context of maritime trade, the Nanaghat inscription of the Satavahana dynasty is very important. From the inscription it is understood that traders passed through Nanaghat to reach the Godavari valley. Similarly, traders crossed the Junnar pass to reach the 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 A.D.) inscription refers to *Samudrakara bandha* (sea tax gate) on the banks of the 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, which might have served as a lighthouse for seafarers from the historical period onwards is present (Fig. 10). The Bay of Bengal can be seen from the southern side of the stone pillar. Bavikonda and Thotlakonda, (near Visakhapatnam), 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 Olakkanaṭ (means ‘flame eye’) temple is situated on a hilltop in

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**Fig. 10: Monolithic stone pillar lighthouse on the hilltop of the Chilika Lake**

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 in 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 Annapotti Reddi A.D. 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 in shore towns. The merchants could move freely in any part of Motupalli. The levy (*aputra k dandiam*) was not applicable to foreigners, who could sell their merchandise to whomever they liked and buy articles of their choice. Cloth for women was not to be taxed. This was the procedure followed in the *anjinapugalidam* or place for security to persons in distress (Srinivasan 1990).

**Collection of Taxes, Piloting and Lighthouses**

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 as per merchandise. It is also not known whether there was a variation in collection of taxes from local and
Mahabalipuram. On the roof of the temple there is a shallow depression where a 45 cm high pot was kept with oil. Every evening the lamp was ignited and the light served as a guide to mariners. This system prevailed till the construction of lighthouses on the roof of the same temple (Fig. 11).

Discussion
Orissa and Andhra Pradesh had several ports, trade centres and a long maritime history because of their navigable rivers and convenient anchoring and landing facilities. 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 sailed over the open sea. Moreover, they were aware of the direction of monsoon winds and currents which aided them in their journey to Southeast Asia and back. Later, mariners changed the size and carrying capacity of ships. Subsequently, people moved from one country to another and market places developed. Weak successors, poor economy, transfer of power, trade monopoly, attacks by neighbouring kingdoms, etc. contributed to the decline of ports and maritime activities of the region. Geological and climatic processes such as coastal erosion, sea level changes, sedimentation, formation of sand bars and spits, tectonic activities, cyclones and storms contributed to its decline.

Ports developed at locations which were connected to the hinterlands. The existence and distribution of small ports along the coastline provided affordable facilities to overland connections in regional areas. Geographical factors played an important role in the emergence of a number of maritime settlements and ports. For example, the ports Manikapatna, Kalingapatnam, Palur and Masulipatnam, which served for centuries have left only sparse traces, and it is difficult to locate the original sites.

Several remnants of maritime structures were noticed along the Orissa and Andhra coast. The revival of ports at the confluences and the use of riverine routes would provide easy transportation and better communication facilities with hinterlands as in earlier days. A number of new ports have arisen at ancient ports sites or in adjoining areas. It would be useful if present ports adopt the example of ancient ports. Industrial houses should report traces of ancient structures encountered in the course of underwater surveys. Maritime structures and archaeological sites are a part of our cultural heritage. Rapid industrialisation in the coastal region is likely to destroy evidence of past cultures forever. Evidence once lost can never be recovered. It is thus imperative to undertake coastal surveys to locate, study, and preserve the remains which should be protected for coming generations.

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