

A CASE FOR RIVERINE ARCHEOLOGY IN INDIA

Aniruddh Singh Gaur

Marine Archaeology Centre

National Institute of Oceanography, Goa.

Introduction

The study of ancient ports and boat-building on river banks and also inundated cities and sunken ships is termed as riverine archaeology which is the branch of underwater archaeology. The main objective is to study the river routes and excavate submerged river ports and boats and preserve them for posterity. It is rightly said, "rivers unite and hills divide" civilizations. It is cheaper to transport goods on water. According to Kautilya's *Arthashastra* transport by river yields more profits. River route as compared with the sea routes were much easier. According to Kautilya if any difficulty arose on the way it could be easily got rid of (Kangle, R.P.: 1960 II, p.45), as the banks could be reached and necessary help obtained.

Rivers are frequently changing their courses in the alluvial plains of North India and have left archaeological traces such as fords, ferries or bridges at the crossing points and provide particularly useful evidence for tracing the commercial development of a river port and interaction of cultures. Since rivers were also the sites of battle-fields, they sometimes preserve in their beds relics of these encounters.

The urbanization of Mesopotamia and the Indus Valley can be attributed not only to the high productivity of their respective regions but also to the ease with which the produce could be moved from one place to another through the river routes. It has been observed that Asian urbanization in the past and present

is mainly river oriented (Murphey: 1970, p.28). For instance at Harappa the granary was built not within the citadel but further out towards the former course of the Ravi. A possible explanation for this is that the bulk of the grain came to Harappa by boat. The twin cities of Harappa and Mohenjo-daro were easily approachable by the river Indus. In Lothal, vessels were coming to the dockyard through the river Bhogawa. Great cities came into existence in the first millennium B.C. on the banks of Ganga, Yamuna, Narmada, Godavari, Krishna and Kaveri. The *Ramayana* mentions that from a regular ferry at Srirangaverpura, Rama crossed the Ganga along with his wife and brother. Later Bharata also reached Srirangaverpura with his large retinue and at the same ferry he embarked the boats which were excellently decorated with gay flags and hanging bells (Roy, U.N. 1969, p.201).

From 6th century B.C. to 8th century A.D. the prosperity of Banaras (Varanasi or Kasi), Prayaga, Pratishthanapura (Jhusi) on the Bank of Ganga and Kausambi on the Yamuna was mainly due to the river trade. Often Paithan on Godavari bank in Maharashtra is identified as Pratishthanapura. Amaravati on the Krishna was a great river port and Buddhist centre. (Fig.1)

The location and expansion of a city on the sea coast, river banks and their confluences has always been favoured in India as well as in foreign countries mainly due to fa-

cilities for carrying the goods from the hinterland to the sea port. Pali text *Niddesa* (1st century A.D.) and *Mahajanaka Jataka* say that the people of Varanasi and Pataliputra used to go to Suvarnabhumi for earning money. We are further informed that pilgrims from China, Ceylon and Suvarnabhumi visited Varanasi, Prayaga, Pratihthanapura and Pataliputra. In this paper an attempt has been made to present the ancient cities situated on the bank of the river Ganga such as Varanasi, Pataliputra and Tamralipti which were famous not only as educational and religious centres but also as great centres of trade and industry and had excellent commercial and cultural relations with Burma, Java, Sumatra, Ceylon etc.

The river Ganga is formed of two tributaries, the Bhagirathi and the Alakananda. The actual source of Alakananda is the Gangotri glacier originating from Kedarnath at a point called Gomukha (Krishnan: 1982, p.24). After crossing the greater and the lesser Himalayas covering a distance of 250 km, it descends into the plains of Rishikesh. In its further downward course it receives Ramaganga, Gomti, Ghagra, Gandak and Kosi from the north and Yamuna, Tons, and Son from the south. Finally it joins the Brahmaputra and merges into the sea at the Bay of Bengal. The total length from the Gangotri to its outfall into the sea is 2525 km (Subramaniam: 1987, p.335). According to Megasthenese the mean breadth of Ganga is 100 stadia and its

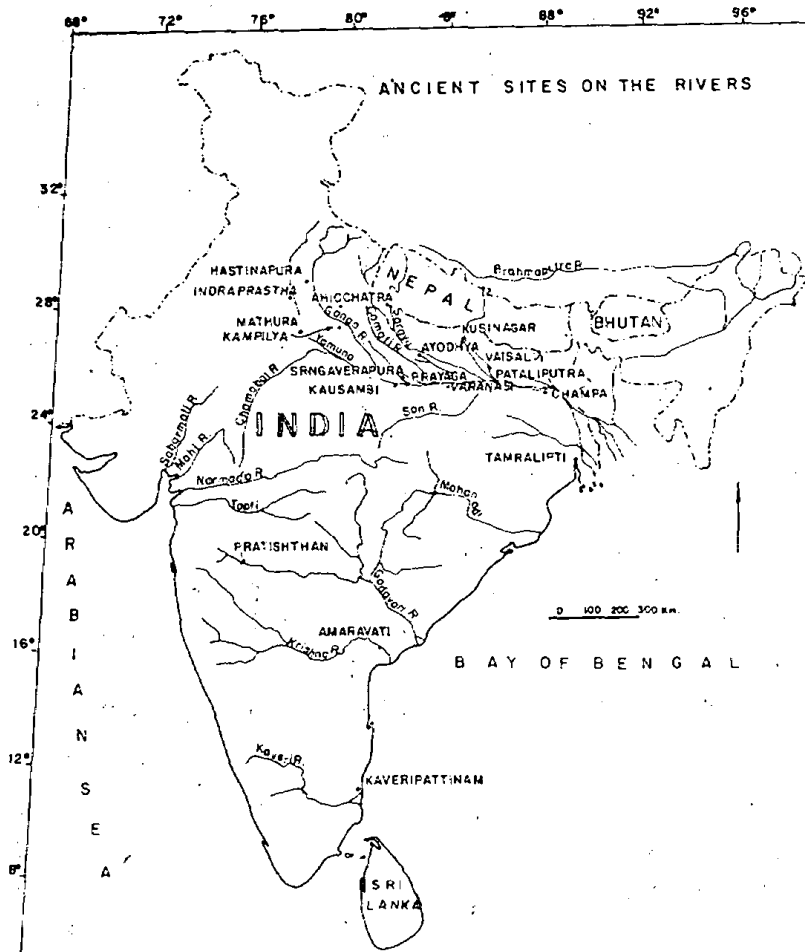


Fig 1: Ancient sites on the rivers.

least depth 20 fathoms. The present maximum depth near Allahabad is about 14m.

Strabo mentions that the whole of India is watered by rivers some of which unite with the two greatest, the Indus and Ganges, while others enter the sea through mouths of their own (Mc Crindle: 1877, p.19). Further he adds that the merchants of the present day who sail from Egypt to India by the Nile and the Arabian Gulf have seldom made a voyage as far as the Ganges. Arrian also mentions that two great rivers, the Ganges and the Indus are worthy for navigation. The tributaries of Ganges - *Kainas* (Kan) and *Solomatis* (Saraswati) are also navigable rivers. The author of the *Periplus of the Erythrean Sea* has mentioned that the largest river of India is the Ganges, it has an annual increase and decrease like the Nile and there is on it, a mart called Ganges through which passes considerable traffic consisting of betel, the Gangetic spikenard pearl and the finest of all muslins called the Gangetic (Mc Crindle: 1885, p.146).

Boat Building on River Banks

Megasthenes has mentioned that in India the people are divided into seven castes. The fourth category people were the ship-builders and sailors were employed in the navigation of rivers. The Greek writers Arrian and Curtius refer to the great ship-building industry of India during Alexander's time. According to Arrian, Alexander's fleet was built entirely in India by Indian craftsmen from Indian wood and consisted of 800 vessels of which 30 were warships and the rest were usually employed in the navigation of the rivers.

Sufficient material was available in India for ship-building. According to Panini, *Simsapa* (*Delbergia sisoo*), *Amra* (*Mangifera*), *Khadira* (*Acacia catechu*) were used for ship-

building. *Simsapa* and *Amra* were easily available in the Gangetic valley and are used now also for making boats. Strabo (60 B.C.-19 A.D.) says that Alexander constructed a fleet from fine cedar and other trees cut from the forest in the territory of King Poros. In the earlier period, the wooden planks of a ship were stitched together. The stitches are represented in the figurines of ships depicted in the sculptures of Bharhut and Sanchi, belonging to the second and first century B.C. Stitching remained the general practice with Indian sailors through the ages and even now survives in some areas (Gopal, L: 1970, p.108).

So far as the earliest types of boats are concerned, three types are recognisable in the terracotta models from Lothal. One of them is the light flat-bottomed craft without mast. It might have been used on rivers and creeks. The second type is a multi-oared boat and is depicted on potsherd (Rao, S.R.: 1987, p.8).

The sculptural art of India depicts ships and naval battles. On the Eastern Gateway of Sanchi Stupa, a river boat in fresh water indicated by lilies and lotuses is shown carrying an ascetic and manned by a man and a woman. On the shore are four devotees (Nalini Rao: 1988, p.94). A sculpture from Amaravati depicts another variety of boat which is oblong or rectangular in plan and slightly pointed with a flat-bottom. It has an empty throne in the centre. Facing the throne is a supplicant figure with folded hands. Devotees are shown on the river bank (Ramchandran: 1970, p.75). The Bodhgaya specimen is very interesting. The boat is seen floating in a pond full of lotus flowers. Three men, one each at the two ends and the third in the middle of the boat are seen (Cunningham: 1892, p.9).

Bag (1987: p.8) mentions that it is quite natural to presume that the river-going vessels

were mostly oval at the bottom since they require lesser depth of water for fast movement in a comparatively less disturbed water. Its shape is such that the upthrust owing to the weight of displaced water was very large and equal to the weight of the ship and its contents.

Cities on the Ganga

On the river Ganga a number of ancient cities were situated such as Prayaga, Varanasi, Pataliputra and Tamralipti which were very prosperous during the early centuries of the Christian era. The following is a brief description of these cities.

Varanasi (Kasi)

Varanasi was one of the flourishing centres of trade and industry. It was most populous and prosperous (*Dhammapada* III, p.445). The *Gurtila Jataka* (Vol.II, p.218) shows concerted action on the part of Varanasi traders. This city was connected with the port of Kaveripattinam. A defaulting woodwright is said to have reached the ocean islands from Varanasi (*Jataka* IV, p.159). *Mahajanaka Jataka* refers to the merchants taking ships from Varanasi or Champa, sailing down the river Ganga and steering the prow of the ship into open sea at *Tamralipti* (Tamluka), steering the course of voyage to Suvarnabhumi. Another *Jataka* (Vol.VI,

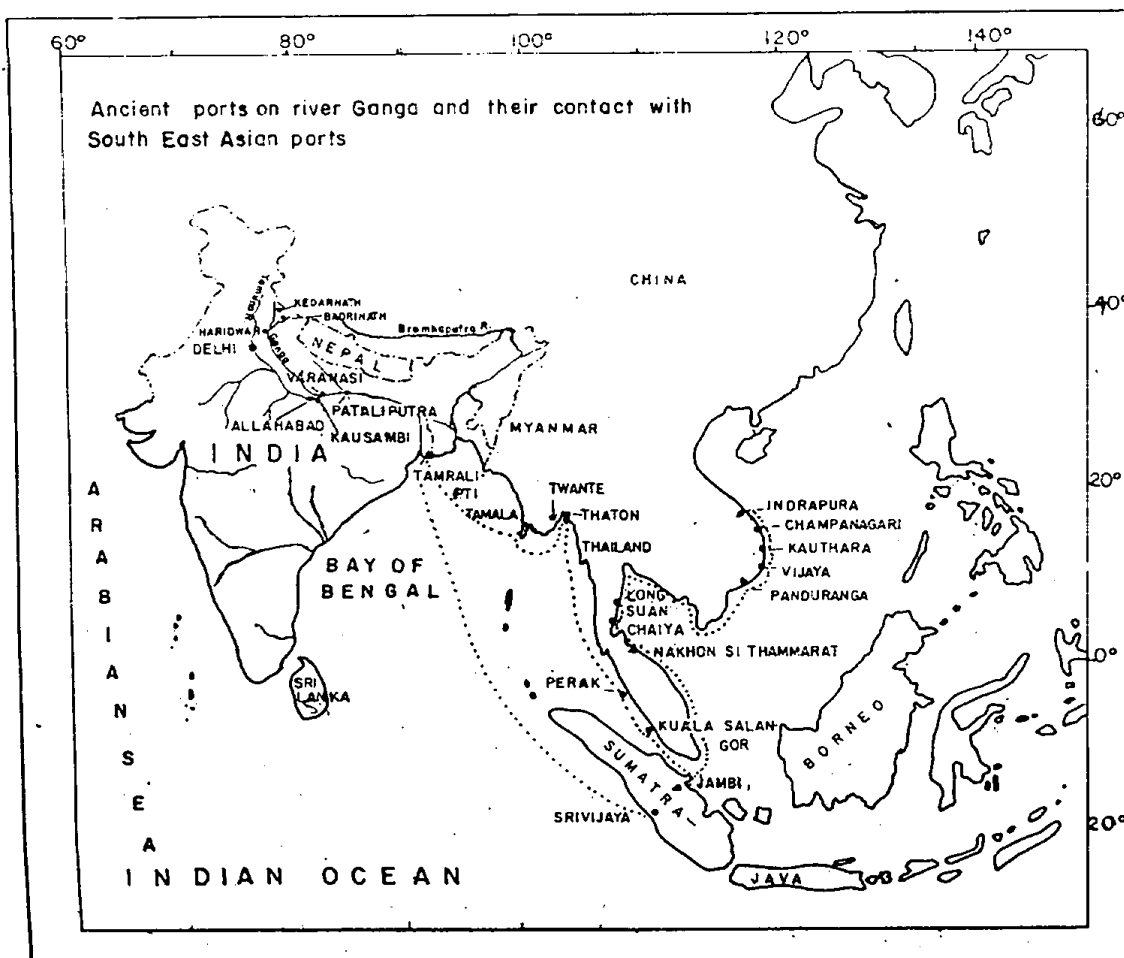


Fig. 2 : Ancient ports on river Ganga and their contact with South East Asian ports.

p.447) mentions that much of the merchandise from Varanasi was carried by boat plying in the Ganga. From Varanasi boats sailed to Prayaga and from there to Indraprastha sailing through the Yamuna. *Majjhima Nikaya* (II, p.29) mentions that Varanasi was connected with Kausambi by a river route. Rhys Davids in his *Buddhist India* (p.104) draws our attention to the trade route from Varanasi down the river to its mouth and thence on to Burma.

Varanasi became a centre of textile industry (*Mayhaka Jataka*: p.390) and famous for fine silk and muslin fabrics in those days (*Jataka* Vol.6 p.47; Vol.3 p.286).

There was a street (*Vithi*) of the ivory-workers (*Jataka I*, p.320) in Varanasi which bespeaks of the localisation of industries in those days. Kautilya (2.11.8) also mentions linen and cotton fabrics of Kasi as the best in quality. Sandalwood occupied an important place in the external and internal trade of India. Varanasi was famous for its sandalwood (*Jataka*, Vol.2 p.33; Vol.5 p.302; *Milindapanha* pp.243-44) and there was a great demand for sandalwood powder and oil (*Jataka* Vol.I pp.129-238; Vol.2 p.273). Kautilya (2.11.77) mentions various kinds of diamonds of which one is '*Kasmaka*' that is found in the country around Varanasi.

Pataliputra

Magasthanese speaks of Pataliputra as, "the largest city in India in the land of Prasii, the confluence of the river Son and the Ganges". It was also known by other names such as *Pushpapur*, *Pushpapuri* and *Kusamapura*. The Greek historians call it *Palibothra* (Mc Crindle: 1877, p.66) and the Chinese pilgrims *Pa-lin-tou*. Pataliputra was surrounded by a moat. This moat was full of water lasting throughout the year, because its

source was a river (Jolly: 1923, p.31). *Vayu Purana* also informs us that the entrance of the moat was connected to the nearest river streamlet in order to make its water durable and continuing forever (Ch.8, Vol.209).

Excavations carried out at Pataliputra in 1955 (Sinha and Narayan: 1970, p.10) extended from Kurahar to Dak-Bungalow. The habitation lasted here from the 6th century B.C. to the later part of 6th century A.D. Wooden architecture is indicated by post holes in house plans. Very recently a Mauryan site has been unearthed at Patna, while demolishing an old bungalow to construct a new one and a number of antiquities have been recovered.

The merchants of this city had established trade relations with the people of distant countries. *Bodhisattvadanakalpalata*, while recalling the former glory of Pataliputra says that its enterprising traders reached various islands with their goods for sale (Roy, U.N.: 1969, p.102). The life inside the city was marked by great commercial activities till the 6th century A.D. Dandin, the author of *Dasa-Kumarcharitam* (Kale: 1977, p.1) who is said to have flourished in this period, says that in the markets of Pataliputra, countless commodities and various articles such as gems were spread out at all times for sale.

After a long gap, the city was rehabited in the 15th century A.D. In 1574 A.D. Akbar's minister Khan-Khanan fought a naval war against Daud of Patna and Hajipur. He embarked with a huge fleet carrying "all his equipments and establishments - armour, drums, treasure, carpets, kitchen utensils, etc. Two large boats were specially prepared for his own accommodation. When he reached Patna, he gave order for the reduction of the Fort of Hajipur and Khan Alam was sent off with 3000 men in boats with the material re-

quired for a siege". After the fall of Hajipur, Daud fled in a boat and Patna fell into the hands of the emperor, who appointed Khan-Khanan the emperor of Bengal (Mookerjee: 1912, p.215).

Tamralipti (Tamluk)

This city is mentioned in the *Mahabharata* (*Bhishmaparva*, Ch.9; *Sabhaparva*, Ch.29 pp.1094- 1100), according to which Tamralipti and Suhma were two distinct countries. Tamralipti is called *Tamolites* by Ptolemy. It is recorded in Dudhapani rock inscription (Ep. Indica II, p.345) that three brothers went to Tamralipti from Ayodhya for trade and made plenty of riches. According to *Kathasaritsagara* (Ch.14) Tamralipti was a maritime port and an emporium of commerce from the 4th century A.D. According to *Vayu Purana* the Ganga passes through it. The temple of Bhagabhima mentioned in the *Brahma Purana* was an ancient vihara which still exists at Tamralipti. The *Mahavamsa* (XI-38, XIX-6) says that the mission of Asoka started from this port for Singhal-dvipa. Tamralipti known to the Chinese as *Tan-mo-liti*, was 14 or 15 hundred li in circuit.

The excavations carried out at the ancient site of Tamluka by the West Bengal Archeology Department revealed that in Period II (1st-2nd century A.D.) trade contacts were established with the Roman world as indicated by pottery especially the sprinkler. The rouletted ware; another distinct pottery believed to have originated from Rome, is also found here. A brick built stepped tank, a ring-well and a soak-pit are other structural remains of this period.

Niharranjan Roy is of the view that Tamralipti was probably abandoned in the eighth century A.D., because the combined flow of Bhagirathi and Saraswati rivers which used to

be the port's major artery into interior, went dry (Gupta: 1989, p.7).

Trade Relations with South Asia

Boats were frequently going from Varanasi, Pataliputra and Tamralipti to south east Asian countries including Burma, Java, Sumatra, Borneo and Malaya (Fig.2). Buddhist texts mention that during the migration of the Hindus towards south east Asia, about 2000 families of carpenters of Varanasi sailed in a boat through the Ganga to the sea port of Tamralipti from where they steered the prow of their ship towards Yavadvipa, which indicates that the services of such a large number of carpenters were required and they settled down there with their families. The *Sankha Jataka* mentions that a Brahmin named Sankha seeing his property diminishing on account of his munificent habits took a voyage to Suvarnadvipa. The ship was built by himself and loaded with cargo.

The modern town of Thaton in Burma was once a sea port where the first wave of Hindus coming in ships landed. Now Thaton is 20 km away from the sea coast. Between Thaton and Rangoon at Ayathema 12 miles from the sea coast were found remains of foreign ships buried eight feet below the surface of the ground (Kanchan: 1990, p.136). Another ancient port in Burma was Tvante which was situated on the river Tvante. It is now a small village, Khebeng by name, which also marks the site of an old city Kapungana-nagara.

Other important ports in south east Asia were Kedah, Kota Tingi, Takkola-Takuappa, Plaksha-Perak and Kuala Selinsing in Malaysia, Kamalanka or Lankasuka or Long Suan, Nakon Si Thammarat and Chaiya in Thailand. Another important port was Sri-Vijaya in the

2nd century A.D. The kingdom of Sri-Vijaya from the very beginning was a maritime state.

The name Suvarnabhumi connotes a Land of Gold, which is indicative of the prosperity of the south east Asian countries. India was exporting textiles, weapons, agricultural equipments and luxury articles to Suvarnabhumi and imported metals, minerals, camphor and spices, gold, diamond and precious commodities, etc. from there.

Conclusion

In conclusion it can be said that most of the ancient cities of India were situated on the banks of major rivers with access to the sea, and a few atleast were inundated and destroyed in floods and changes in river courses. For reconstruction of the history of these cities, riverine archaeology is a must. A selection of sites which are referred in ancient texts as having been inundated can be made and a programme of exploration on land and in water may be drawn up, giving priority to more important sites such as Jhusi, Hastinapur, Pataliputra, Varanasi, Sringaverpura on the Ganga, Indraprastha, Mathura, and Kausambi on the Yamuna, and Ayodhya on the Sarayu.

Acknowledgements

I am grateful to Dr. S.R. Rao for his encouragement and guidance during the course of this study. I also thank Shri S.B. Chitari for producing line drawings.

References

1. Bag A.K., 1987, Ships and Ship-building Technology in Ancient and Medieval India, in *Marine Archaeology of Indian Ocean Countries*, (ed) S.R. Rao, Madras.
2. Bharadwaj, O.P., 1986, *Studies in Historical Geography of Ancient India*, New Delhi.
3. Chakrabarti, H.P., 1966, *Trade and Commerce of Ancient India*, Calcutta.
4. Gopal, L., 1970, Indian Shipping in Early Medieval Period in *India's Contribution to World Thought and Culture*, (ed) Lokesh Chandra, Madras.
5. Gupta, A.D., 1989, "The Lower Ganga in History" in *Coast Zone Management of West Bengal* (ed) A.N. Bose.
6. *Indian Archaeology : A Review*, 1955-56 pp.22- 23.
7. Kanchan, R.K., 1990, *Hindu Kingdoms of South East Asia*, New Delhi.
8. Kangle, R.P., 1972, *Kautilya's Arthashastra*, Vol.II, New Delhi.
9. Krishnan, M.S., 1982, *Geology of India and Burma*, Delhi.
10. Majumdar, R.C., 1986, 'Suvarnadvipa' Ancient Indian Colonies in the Far East, Vol.II, Delhi.
11. Mc Crindle, J.W., 1877, *Ancient India as Described by Megasthenese and Arrian* (ed) R.C. Jain in 1984, New Delhi.
12. Mc Crindle, J.W., 1876, *Ancient India as Described in 'The Commerce and Navigation of the Erythrean Sea'*, Reprint in 1987, Patna, p.7.
13. Mc Crindle, J.W., 1885, *Ancient India as Described by Ptolemy*, (ed) R.C. Jain in 1985, New Delhi.
14. Mookerjee, R.K., 1912, *A History of Indian Shipping and Maritime Activity*, Calcutta.
15. Murphey, R., 1970, *Historical Comparative Urban Studies in A Geography of Urban Places*, (ed) R.G. Putnam Toronto.
16. Rao, N., 1988, Marine Art of India in *Marine Archeology of Indian Ocean Countries*, (ed) S.R. Rao, Madras.
17. Rao, S.R., 1970, Shipping in Ancient India in *India's Contribution to World Thought and Culture*, (ed) Lokesh Chandra, Madras.

18. Rao, S.R., 1987, *Progress and Prospects of Marine Archeology in India*, Goa.
19. Ranchandran, K.S., 1970, Ancient Indian Maritime Venture in *India's Contribution to World Thought and Culture*, (ed) Lokesh Chandra, Madras.
20. Roy, U.N., 1967, *Studies in Ancient Indian History and Culture*, Vol.I, Allahabad.
21. Shareen, R., 1981, 'Encounters' - *The Westerly Trade of the Harappan Civilization*, Delhi.
22. Subramaniam, V., 1987, Environmental Geology of the Ganga River Basin in *Journal of Geological Society of India*, Vol.30, 335.