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Paper : **Principles and Methods of Archaeology**  
Module : **Shipwreck Archaeology of India :  
Progress and Prospects**

  
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### Component-I (B) – Description of module:

Subject Name	Indian Culture
Paper Name	Principles and Methods of Archaeology
Module Name/Title	Shipwreck Archaeology of India : Progress and Prospects
Module Id	IC / APM / 27
Pre requisites	
Objectives	To know about the progress and prospects in the Shipwreck Archaeology of India
Keywords	Maritime Archaeology / Underwater Archaeology / Shipwreck Archaeology

### E-Text (Quadrant-I) :

#### 1. Introduction

It is believed that there were seafarers before there were farmers and shepherds. 40,000 years ago people crossed seas by watercrafts and settled on the Australian continent. Similarly, cave dwellers of Greek mainland made round trips to the island of Melos; without seafarers, there would have been no Minoan civilization, just as without crafts the pyramids of Egypt could not have been built, and without ships, Vasco da Gama and Columbus could not have reached their destinations. The study of shipwrecks involves fishing boats, merchant vessels, and warships and provides information on the ships, construction pattern and other accomplishment made before the accident. Therefore, there is every reason to study watercrafts (shipwrecks) from earliest time onwards and essential to understanding shipwrecks and site formation processes in details.

Shipwreck means either sinking or destruction of a ship by any accident either natural or manmade. Shipwrecks occupy a unique niche in archaeology. In general terms 'shipwreck' means 'material remains of the ship.' The archaeology of ships called nautical archaeology (from the ancient Greek word for ship '*naus*'), also reveals design and construction details of various types of watercraft, including merchant vessels, warships, and fishing boats. Shipwreck study helps us understand the technical achievements and interactions of people in the past. Shipwreck Archaeology is a field of historical archaeology as a whole and contains clues to maritime heritage. Shipwreck exploration provides information on maritime history, the age of the wreck, cargo, destination, flag of the ship, etc. A shipwreck is a storehouse of knowledge of the history of shipping and navigation.

Numerous factors influence in the formation of shipwreck sites. It should be remembered that shipwreck site formation is different from site to site. The important aspects are the underwater environment of the surrounding areas, impact of biology, sedimentation in the region; materials used in the construction of the ship, and the chemical and physical properties of water of the area, reactions with the metals which cause corrosion and degradation; natural factors like tsunami, cyclones and storms and the last but not the least is the human interference including fishing; all these aspects attribute to shipwreck sites.

The history of shipwrecks of the Indian subcontinent could be as old as the maritime history of India. But concerning the length of maritime history of India, available evidence on

shipwrecks in Indian waters is very minimal. Some Indian epics, Buddhist Jataka stories, and the historical period texts refer to shipwrecks in India, but their details are obscure. Moreover, the inscriptions of King Guhalladeva-I of the Kadamba Dynasty (980-1005 AD) of Goa, King Ganapatideva of the Kakatiya Dynasty (1244-45 AD) and Annapottu Reddi (1358 AD) of the Reddy Dynasty of Andhra Pradesh refer to shipwrecks of the medieval period. The disadvantage with the literary and inscriptional evidence is that no information found about the location and other details of the shipwrecks. The documentation of shipwrecks in Indian waters started with the arrival of the Portuguese in Goa, and before this, no documented history of shipwrecks is available in Indian waters.

## **2. Shipwreck Explorations in Indian waters**

Marine records and other related archival documents housed in the archives and libraries of India and abroad mention shipwrecks in Indian waters. Some records also refer to Indian ships wrecked in international waters. Information of more than two hundred shipwrecks has been collected from various archives of India. Though attempts have been made to locate and explore some of the shipwrecks from the collected data, we are yet to locate other shipwrecks. Furthermore, a map showing shipwrecks of India has been prepared based on the data collected from marine records, fishermen, local divers and other published sources (Fig. 1). Over the years, the UNESCO has estimated that over 3 million shipwrecks are lying on the ocean floor unexplored. Several institutes and universities all over the world have explored and undertaken studies on shipwrecks both in marine and fresh waters. And India is not far behind in this study; since initiation of maritime archaeological studies in India, shipwrecks have been explored off Goa, Lakshadweep, Tamil Nadu and Odisha.

## **3. Shipwrecks in Goa waters**

In India, the first shipwreck exploration commenced in Goa waters. The earliest reference to shipwrecks in Goa waters comes from the inscription of the Kadamba King Guhalladeva-I (980-1005 AD). While he was sailing from Chandrapura (Chandore) to Somnath, the mast of the ship broke off at Gopakapatana port, and Mohammed, the chief of the Arab traders, gave shelter to the stranded king. Besides the inscriptional source, the marine records housed in the India House, Lisbon and Goa State Archives, Panaji, denote hundreds of Portuguese ships have been wrecked both in Goa and Portugal waters and information of Portuguese shipwrecks both in India and Portugal waters, and related information has been collected from archival and archaeological sources.

The exploration of Sunchi Reef shipwreck was carried out in 3 to 6 m water depths around 2 km away from Mormugoa Port (Fig. 2). Martaban pottery (stoneware), a copper vessel, brass barrel of a handgun, Chinese ceramics, eight elephant tusks and six hippopotamus teeth of different sizes, lead pipe and sheets, copper strap, metal handle, 2 m long four iron guns datable to the 17th-18th century, a 1.218 kg cast iron gunshot, an Admiralty type of iron anchor, stone and clay bricks, a number of well-dressed granite blocks and bases of glass bottles recorded at the site (Fig. 3). All the findings were encrusted with marine growth.

Some of the stoneware sherds have dark brown glaze coat but mostly washed out owing to exposure to the marine environment. Stoneware storage jars consist of rims with and without loop handles, bases, and lids. A brass barrel of a handgun was found which is 56 cm long and weighs 2.200 kg. There is the provision of the screw thread on the rear side for fixing the wooden part of the gun to the barrel. The wooden parts of the handgun are missing. Among the elephant tusks, one tooth is engraved with three English letters 'ICM', 'I' has been worn out whereas 'CM' is visible clearly. These letters could be an acronym of the company or of a businessman who was dealing with the tusks, whereas, no such marks are noticed on any hippopotamus teeth. These tusks and hippopotamus teeth are highly degraded and brittle because of lengthy burial underwater. The records suggest that large quantities of

hippopotamus teeth and elephant tusk were imported from Mozambique to Goa and other parts of India. It appears that Mozambique could be the source of these findings. Square and round glass bottle bases of dark green colour were recovered from the shipwreck site, and the presence of marine growth is noticed on them. Besides, Chinese ceramic sherds with blue on white design have also been recovered from the site. Chinese characters are found on the base of two Chinese sherds, one reads as 'lucky jade,' and the other is illegible. The thermoluminescence dating of pottery shows that the stone ware sherds (Martaban pottery) are  $360 \pm 40$  years old. The measured Carbon 14 age of the elephant tusks is  $740 \pm 130$  years; the calibrated age range is 740 - 560 years BP. The Martaban pottery which has been collected from Sunchi Reef is similar to those found in *Nossa Senhora dos Martires* 1606 off Lisbon and *Santo Antonio de Tanna* 1697 off Mombasa. The evidence suggests that the Sunchi Reef wreck could be datable to the early seventeenth century AD and belongs to the Portuguese Period. The shipwreck findings in Sunchi Reef complete the picture regarding Indo-Portuguese trade and commerce.

The other shipwreck was explored in 15 m water depth off St George's Reef which lies on the eastern side of the Grande Island (Fig. 2). This shipwreck contains various types of terracotta artefacts such as Corinthian column capital, hollow column drum, earthenware, drainage pipes, vases, ridge, roof and floor tiles and chimney bricks, which were intended for house construction (Fig. 4). Basel Mission Tile Works 1865 is impressed on chimney bricks and tiles. All these artefacts are well fired and made of well levigated clay, whereas, chimney bricks are made of white clay, moulded, and the obverse is inscribed while the reverse is plain. The Corinthian type of capital is partly hollow, and four cross supports were provided inside to afford additional strength to the capital. It is closed on one side. The column drum is fluted, hollow and partly broken. Besides these findings, a timber piece of the ship found near the reef, and one end of the timber is affected by wood borers. On the other end of the timber, a worked scarf with cuts from a chisel and nail holes can be seen. The lower side of the timber was plain with a 'U' shape and groove is noticed on the upper side. This timber survived since it was buried in sediment. The Radiocarbon dating of the timber suggests that the wreck could be  $(114.3 \pm 1.5\%)$  115 years old. The anatomical analysis of timber shows that it belongs to *Lagerstroemia Lanceolata* species, for which the trade name is benteak.

The study shows that the Basel Mission Company had come to India in 1834. Subsequently, the mission had converted local residents to Christianity, and for their livelihood, small scale industries were set up including the tile industry. The first tile factory had established at Jeppo, Mangalore in 1865 and those was exported to Africa, Australia, Borneo, and Sumatra. The date of the timber and findings suggest that the St George's Reef shipwreck is assignable to the Nineteenth century AD. This is the first Basel Mission Company shipwreck located and explored to date.

Ameo Shoals lies on the southern side of Sunchi Reef and close to the Marmagao Bay (Fig. 2). The explorations off Ameo Shoals brought to light the remains of a steam engine shipwreck in 9 m water depth. Ameo Shoals shipwreck is the first discovery of a steam engine shipwreck in Goa waters. During exploration three boilers, boiler (furnace) bricks, flanges and engine parts of the wrecked ship were noticed and some of the furnace bricks and flanges were collected for study (Fig. 5). Three boilers were lying in a north-south direction, close to each other, and are made of wrought iron with single riveted lap joint. From the study, it appears that the wreck could be of a single ended Scotch boiler, steel hulled, triple expansion steam driven vessel. The safety valves and manholes of the boilers are undamaged. Each boiler has three furnaces and a row of heat exchanger tubes and stay tubes are fitted. The fire tubes are at the end of the boiler, while the combustion chamber is on the other end. Bricks of different sizes, made of silica and alumina, are arranged in different directions in many layers inside the furnaces to control high heat and provide insulation so that cracks would not develop in the furnace. Moreover, placing of bricks in the furnace would reduce the diameter of the opening, and a metal flange fixed on the opening

of the furnace. Some boiler bricks have stamp marks as 'FURNA....' and other words are illegible and 'B 84' has been stamped in the second line. The other side of the bricks is blank. The hatch door, furnace boiler flange, and water tank were noticed nearer to the boilers, and those documented. The flywheel of the ship is found on the northern side of the boilers. The water tank is reinforced with a steel frame. The water of the tank was used for recirculation of water from the condenser. The ill-fated ship could be a cargo vessel. Based on the shape and size of these boilers the shipwreck could be dated 1880 AD or of the mid 1900s.

The Sail Rock shipwreck lies in 14 m water depth on the southern side of Sail Rock and is also marked in the Hydrographic Chart No: 2020 (Fig. 2). The front portion of the ill-fated ship is entirely damaged whereas the rear portion is intact. The major part of the shipwreck remains lies on the western side of the site and is scattered over a large area. In the course of exploration propeller, rudder, engine parts, mast, cabins, winches, and manholes were noticed. The propeller has probably four blades, out of which three are clearly visible, and the other one is either missing or buried in the seabed. The length of each propeller blade is approximately 2 m. Propeller shaft can be seen clearly. One winch was noticed near the propeller. A small flooring tile piece was also collected from the site. In addition to these finds a cast iron cannon ball weighing 9.2 kg was found lying below the cabin and it was documented. A stock-less iron anchor was found between the rudder shafts and mast. A little portion of the anchor can be seen, and frames of the ship cover the remaining portion of the anchor. No further information on the anchor can be estimated without a proper study. It appears that the ship might have hit so forcefully against the submerged reef that the front portion is entirely missing. Marine growth can be seen on the shipwreck remains. Some stone boulders of various sizes were noticed in the adjoining area of the shipwreck.

#### 4. Shipwrecks in Lakshadweep waters

Before the opening of the Suez Canal, Lakshadweep Islands served as most important landmark in the shipping; therefore several ships have been wrecked due to human error and natural factors off Lakshadweep Islands. Moreover, the lack of lighthouses at these islands caused several shipwrecks because many of the reefs are shallow, low lying and some, which were hazardous for navigation, were permanently submerged. The RV *Gaveshani* cruise No. 242 was undertaken in Lakshadweep waters to carry out onshore explorations for archaeological remains and to explore shipwrecks.

Three steam engine shipwrecks were found in Minicoy waters and one in Suheli Par. However, two shipwrecks of Minicoy waters were explored. In one shipwreck, the propeller and the shaft attached to the flywheel were noticed which were overgrown with corals. The anchor chain is lying on the seabed, connected with the anchor; probably the anchor is lying in the deep water. The J bolt with wing nut of the porthole, square and round flanges, hinges, stiffener, porthole, doorframe hinge and door latch were retrieved from the site for study (Fig. 6). However, remains of timber are found on the doorframe hinge, and door latch and anatomical analyses show that *tectona grandis* timber was used in the construction of the ship.

The other wreck which was explored is lying perpendicular to the shore, about 200 m north of the preceding one. The propeller shaft is broken; the larger part of the shaft is attached to the propeller whereas the smaller part is fastened to the engine. The boilers, flywheel and engine parts of this shipwreck are well preserved. Two boilers of the ship were found near the wreck site (Fig. 7). The astern portion of the ill-fated ship is lying in the deeper water. On the basis of the findings and size of the artefacts, it could be presumed that the maximum length of the ship could be 100 m. Profuse coral growth can be seen on these remains. The Suheli Par shipwreck contains many armoured vehicles, cars, and guns which belong to a Greek ship. The ship was carrying the Second World War surplus stores from Burma and

grounded at night in December 1955. The hull of the ship is lying on the reef. The remains of the ship can be seen during low water. The preliminary exploration of the Lakshadweep Islands has revealed the presence of several steam engine shipwrecks.

In addition to the NIO's exploration of shipwrecks in Lakshadweep waters, the Archaeological Survey of India (ASI) and the Indian Navy (IN) jointly undertook an exploration of shipwrecks between 9 and 54 m of water depths off Bangaram Island. During the survey, four iron guns of 2 m long, an iron anchor, a copper vessel, nails and copper sheet from the hull, storage jars, bowls, dishes and Chinese porcelain of the Ming Dynasty were recorded. The major portion of the shipwreck is lying in 24-36 m water depth. The findings from the shipwreck are datable to the 18th century and possibly belong to the *Princes Royal*. The shipwrecks off Minicoy waters belong to the 19th century. This period is the transition phase between wood and iron and sail to steam.

## 5. Shipwrecks in Tamil Nadu waters

An 18th century shipwreck was explored in 19 m water depth about 3.5 km off Poompuhar, Tamil Nadu. The wreck was separated into two parts, and some remains of the shipwreck buried under the sediment; therefore to estimate how much is buried in the seabed a metal detector survey was carried out and airlift operations established that it was a wooden hulled ship. The timber of the ship has been profoundly affected by Teredo (wood borers). Different sizes of copper nails are used in the construction of the ship. During exploration, several lead ingots, a gun, and timber of the ship were recorded at the site. Copper rudder gudgeon and various sizes of copper nails and eighteen lead ingots were retrieved from the shipwreck. The rudder gudgeon and copper nails were found a small distance away from the shipwreck. The gun is encrusted with marine growth and fixed on an iron platform. The lead ingots have been categorised into four groups on the basis of their physical features, shapes, and markings. All these four groups differ in their weight which ranges from 73.2 (161.4 lb) to 63.8 kg (140.36 lb). Some ingots have the distinct inscription 'W: BLACKETT, VECI' and merchant marks with 1791 and 1792 (Fig. 8). The records of W: Blackett Company shows that this company was a well-known lead exporting company of England since 1694. The isotopic and trace metal analyses indicate that W: Blackett company was manufacturing lead ingots and the primary source for the lead ingots were the North Pennine ore fields of Britain. Similar types of W: Blackett ingots have been reported from Australia, the Netherlands, and Sumatra. Further, the composition of ingots shows that the lead used to manufacture the ingots was of very high purity (~ 93%). The wreck off Poompuhar may be a local cargo ship carrying the then traded lead ingots of different manufacturers.

## 6. Shipwrecks in Odisha waters

Information on eight shipwrecks off Odisha coast has been collected from the Archival records. These ships have been wrecked because of cyclones and storms. The *Asiatic Journal and Monthly Register* (1821) mentioned that the H. M. Late ship *Carron* was wrecked 4 miles north of Konark in July 1820 AD and cargo could not be saved. Of late, preliminary exploration of a shipwreck has been carried out in 6 to 8 m water depth off the Konark coast of Odisha. The shipwreck is covered with fishing nets and rope and over grown with mussels, seaweeds, and other suspended material. As this wreck lies in a high energy zone, documentation becomes difficult because of low visibility and movement of suspended materials. The exploration brought to light three boilers, cabin and frames of the ship. A winch was found near the boilers. A bronze seawater injection valve of the main boiler feed along with a Screw Lift Valve and the U-shaped collar was found from the site. All the boilers are *in situ* and partly buried in the seabed because of high energy zone. The frames and the cabin of the ship are corroded (Fig. 9). It is believed that these boilers could be similar in size to the boilers of the shipwreck off Ameer Shoals, Goa. The finding of the shipwreck in such a shallow depth suggests that the ship might have drifted towards the shore either because of

failure of the engine or in a storm when it wrecked. Further exploration would shed more light on this shipwreck.

## 7. Progress and Prospects of shipwreck studies in Indian waters

Both maritime and shipwreck history of India are ancient and are two sides of a coin which cannot be looked at separately. Very limited evidence is available on early period shipwrecks, but recorded history of shipwrecks in Indian waters starts from the colonial period onwards. Since the inception of maritime archaeological studies in India, several submerged ports, habitational sites, and shipwrecks have been explored and recorded.

The progress of shipwreck studies in India should be determined by the achievements and outcomes achieved over the decades. Shipwrecks have been explored along both east and west coasts of India ranging from the early 17th century to the 19th centuries AD and they belong to wooden to steel hulled and steam engine to diesel engine. It is observed that if shipwrecks are associated with individuals and events, then their importance increases. The finding of shipwrecks authenticates the maritime trade contacts between countries as recorded in the documents. The shipwreck study made known the maritime trade contacts, the involvement of traders and trade centres and ports and type and quality of cargo imported and exported between Portugal, England and India and their colonies. Similarly, the first shipwreck of the Basel Mission company has been explored in St George Reef which revealed the history of the company. The finding of W: Blackett and other types of ingots from Poompuhar shipwreck show the network trading of the W: Blackett Company from the UK to the Netherlands and from Australia to Sumatra and India since 1694 onwards. Moreover, there are some notable shipwrecks which await exploration and documentation; that would reveal the unknown history of trade and cultural contacts, shipping, and naval warfare. It is not only the number of shipwrecks that have been explored in Indian waters but the progress made in shipwreck studies that are outstanding. In addition to this, information of new shipwrecks have been collected now and then and added to the existing list. More information on significant shipwrecks may come to light when the archives and museums of foreign countries are studied.

With regard to the prospects of shipwreck studies in Indian waters, it is very well known that several ships have been wrecked in Indian waters. Among others, the significant shipwrecks of the East India Company in the east coast of India are such as the *Dart Mouth* carrying treasure and sank off Masulipatnam in 1719. The *Governor Keating* taking Kings Stores sank in a storm in 1812 near Nellore, Andhra Pradesh, as well as the Dutch ship carrying treasure sank near Kovalam near Madras (Chennai) coast need to be explored in detail. The Byramgore and Cherbaniani reefs of the Lakshadweep islands took a heavy toll and ships carrying valuable cargo has wrecked in these waters and attempts can be made to locate them. The most significant shipwreck is the *P&O Liner Indus* (3,462 ton), which carried the Buddhist sculptures of Bharhut stupa (3rd century BCE) of Madhya Pradesh and sank in 1885, 50 miles north of Trincomalee in Sri Lankan waters. The *Indus* was sailing south from Madras to Colombo and went aground at full speed on account of gross error in navigation. In the recent past, the Maritime Archaeology Unit, Central Cultural Fund, Galle, Sri Lanka has attempted to trace the remains of the *Indus* off Mullative (Mullaittivu) shoals, Sri Lanka. Taking into account the importance of the *Indus* shipwreck, a joint collaborative programme can be formulated between the governments of both countries and explorations can be taken up. One of the shipwrecks off Great Basses Reef of southern Sri Lanka has brought to light silver coins of the Mughal Empire Muhammad Aurangzeb (1658-1707 AD), minted in Surat, Gujarat, along with a British bronze cannon and flintlock pistols. There might be much more Indian origin shipwrecks lying in Sri Lankan waters which can be jointly explored. Besides, exploration of shipwrecks, maritime and nautical archaeology can be introduced in the curriculum of college and higher institutes, students should be encouraged in this discipline, and they can undergo training in explorations.

CSIR-NIO has made the beginning of shipwreck studies in Indian waters and exploration of shipwrecks continuously proceeds year after year. Shipwrecks should be preserved for posterity to understand the past and they are a part of the underwater cultural heritage of our country. On the other hand, there is a constant threat of the looting of wrecks by treasure hunters, India is no exception, and no country has ever benefited much from treasure hunting rather than from real maritime or shipwreck archaeology. The important outcome from shipwreck study is not to account wrecks, remains found from sites, type of vessel explored, it is virtually the history of what was made by humans.

In this regard, the UNESCO is greatly concerned over the growing threat of the UCH and emphasises the need to save them for posterity and support the protection of underwater cultural heritage through ratification and compliance with the 2001 UNESCO Convention on the protection of the underwater cultural heritage. The saying of the UNESCO is: What will we see tomorrow? Unless we protect and preserve them.

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