This research has adopted an in-depth analytical approach for scientific study of ancient Indian ships in order to generate a better understanding of ancient Indian shipping and shipbuilding technology.

To understand about the ancient Indian shipping and shipbuilding technology detailed information about the ancient ships and seafaring activities, as wide as a range possible, has been gathered. To generate information from these data on the development of shipping and shipbuilding technology several aspects i.e. local factors, environmental conditions, availability of building material, state of technology etc. were taken into account. Further discussed were the aspects like the purpose for which a ship was used, the distance she had to travel and nature of the coast on which they
were used. Attempts are made to correlate archaeological and literary evidences to broaden and extend our knowledge of ancient shipping. This approach brought us closer to a comprehensive reconstruction of the past.

The present research was based on that, much can be learned from scientific study of ancient ships. It can also shed fresh light on the great role-played by them in the development of ancient societies and civilizations, through trade and contacts. A careful and systematic study of all archaeological data and evidences in ancient art and literature, from a nautical archaeological point of view, and their comparison with the excavated ancient ships or traditional vessels generated valuable information about the ships of the past.

This research studied a wide range of areas that have long been neglected in Indian archaeology. It generated a wealth of information for better understanding of the ancient Indian ships. This in turn tells about the achievements and aspiration of the ancient Indian shipbuilders. The techno-analytical study of ancient Indian ships addressed some of the important unanswered questions related to ancient Indian shipping and shipbuilding technology in particular and maritime archaeology in general.
The thesis thus makes original contributions to the study in several ways:

1. Present work traces the antiquity of Indian shipping to Upper palaeolithic / Mesolithic period, based on the archaeological evidence of the use of boats in prehistoric rock art.

2. This work systematically documented representations of ancient ships in various forms of art such as prehistoric rock art, Harappan seals, emulate, terracotta models, graffito and paintings on pottery, historic seals, coins, sculptural reliefs, stucco, decorations on monuments, terracotta, mural paintings etc.

3. It scientifically examines the reliability of pictorial evidences and artist’s knowledge of maritime technology.

4. Systematic study of a wide range of technological information embodied in ship representations, i.e. design and construction, building technology, ships ancillary fittings, rigging, propulsion and steering arrangements, anchor and
equipment connected generally with the maintenance and running of the vessel.

5 This study helped to trace more reliable development of ancient ships and changes in shipbuilding technology.

6 The data available in literary records were carefully analyzed for scientific interpretation and generation of information. Comparison of these literary descriptions with other contemporary evidence proved very effective to throw fresh light on the shipping of that period.

7 Study of traditional crafts formed an important part of the study. Traditional vessels were examined to make a detailed study of wide range of technological process involved in shipbuilding, selection of raw materials and their sources, nature of wood, shape and size, navigational instruments, steering gears, method of propulsion, building technology, decorations etc. For cross-examination of the survival of ancient traditions these old vessels were compared with the evidence in art and literature. This comparative approach
helped to a great extent in better understanding of ancient technology and its development.

The best source to provide undoubted, rich information of ancient ships and their building technology are ancient shipwrecks. Comparative study of the evidences found in India with those of contemporary ships excavated in other parts of the world gives a clear picture of the state of shipbuilding technology in India.
Statement II

(Statement including the sources of information and extent to which the thesis is based on the works of others and portion of the claimed as original)

The chief sources of information for the present study, which helped to form concepts and provided literary as well as archaeological data are:


Chandra, Moti (1977) Trade and Trade Routes in Ancient India, New Delhi


Hourani, George Fadlo (1975) *Arab Seafaring*, New York

Jenkins, Nancy (1980) *Boats Beneath the Pyramid – King Cheop’s Royal Ship*, London


Prasad, Prakash Charan (1977) *Foreign Trade and Commerce in Ancient India*, New Delhi


*Yuktikalpataru*, Gaekwad Oriental Series, Baroda

In addition to these, several research papers pertaining to ancient Indian shipping and shipbuilding technology, traditional shipbuilding etc. were also consulted. Some of them are listed below –


Gopal, Lallanji (1962) Art of Shipbuilding and Navigation in Ancient India, *Journal of Indian History*, 60


Hornell, J. (1920) The Origins and Ethnological Significance of Indian Boat Designs, *Memories of the Asiatic Society of Bengal*, 3.3

Hornell, J. (1926) Edye’s Account of Indian and Ceylon Vessels in 1833, *Mariner’s Mirror*, 12


Besides these, several other articles by A.K. Bag, S.K. Bhowmik, R.S. Bisht, Jean Deloche, Somasiri Devendra, M.C. Joshi, K. Rajan, Nalini N. Rao, Srinivas Ritti, U.N. Roy, I. K. Sarma, P. Venkateshan, etc. and excavation reports such as those of Mohen-jo-daro, Harappa, Arikamedu, Lothal, Inamgaon, Navdatoli, etc. were also referred for the detailed and authentic information.

Extensive field studies were also carried out and the researcher personally examined most of the ship representations in Indian art. Several of the ships studied here were not studied by other scholars in this context earlier. On the other hand, several representations which were mistaken for ancient ships by various scholars were identified. This work presents extensive data on the ancient Indian ships in art along with descriptions in ancient literature and also details of traditional shipbuilding technology. This multifarious and comparative study is also an original contribution of the work.