

Traditional Fishing Crafts of the Bay of Bengal



Foreword

Preserving the diversity of fishing craft is as essential as preserving bio-diversity in nature. This publication, which records and describes traditional crafts of the Bay of Bengal, in words and pictures, is therefore invaluable.

The superb efficiency of traditional craft is highlighted by the fact that new and “modern” designs of fishing craft have sometimes been accepted by small-scale fishermen only when they incorporate some of the features of traditional craft.

I am impressed by several obvious characteristics of the traditional crafts — their simplicity, their beauty, their compactness. I can well believe that some of these crafts are “perfect” for their users, the artisanal fishermen who operate in the inshore waters of the Bay of Bengal.

The photographs in this publication — austere, yet beautiful in black and white — capture not merely the small-scale fishing craft but also the lives of small-scale fishermen: full of peril, full of challenge and adventure, full of meaning. Fish lovers in the Bay of Bengal and elsewhere owe a great deal to these doughty fishermen.

I would like to compliment the Bay of Bengal Programme — which over the years has achieved a remarkable impact in so many areas of technology and socio-economics in fisheries across a wide geographic area — for a splendid little but most meaningful publication.

M. S. Swaminathan

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Preface

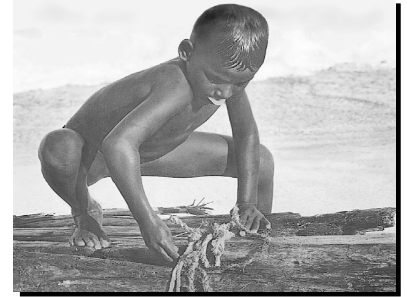
The traditional fishing crafts of the Bay of Bengal have always spelled for me both mystery and enchantment. I have often dreamt of riding the surf on a kattumaram, cutting across the choppy waters of the Bay and gliding over the high waves. However, it is too late in life for me to learn the tricks of lashing the logs together, hoisting the sails or braving the sea's perils on a tiny craft.

Evolved over centuries, these artisanal, low-cost, environment-friendly fishing crafts are next to perfect. They sustain millions of fisherfolk and their families in the region. I salute the intrepid fishermen who ride these crafts with aplomb even when the sea is rough, and come back with catch.

The Bay of Bengal Programme has extensively documented the traditional fishing crafts of the region, and this little publication has drawn profusely from the archives of the BOBP to inform posterity about the beauty and uniqueness of these traditional fishing crafts. I record my gratitude to all those whose work I have used in this compilation and hope that the world outside the Bay learns a little more about these exciting marvels of traditional wisdom and ingenuity.



Y S Yadava



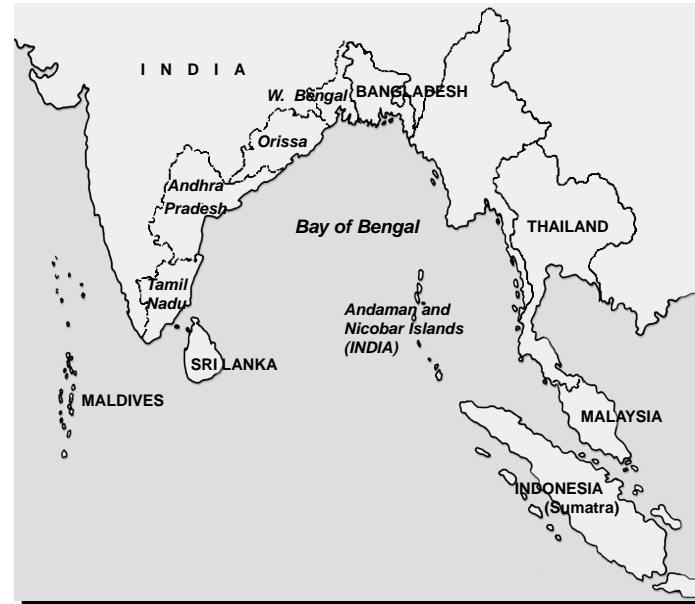
Traditional Fishing Crafts of the Bay of Bengal

I begin this compilation of the traditional crafts with the ubiquitous kattumaram, the most common traditional fishing craft of the Bay of Bengal.

The traditional Indian fishing fleet operating in the Bay of Bengal comprise some 128 400 traditional craft of which about 16 300 are motorised.

Kattumarams dominate these traditional crafts and are widely used on the east coast of India — from Puri in Orissa all the way south to Cape Comorin in Tamil Nadu, on India's southern tip.

Kattumarams support some half a million fisherfolk and account for a big chunk of the marine fish production from India's east coast.



*Lashing together the logs of a kattumaram
A unique feature of the raft kattumaram
that it can be transformed into bigger
smaller units, depending upon the number
logs and the type of fishing for which th
kattumaram is put into us*



The kattumarams range in length from 4.2 m to 8.5 m. There are two basic types of kattumarams in use — the raft kattumaram and the boat kattumaram. A raft kattumaram is formed by lashing together three to five logs or occasionally seven light logs. These logs are not of the same length, the end ones being distinctly shorter. Each log is individually shaped, with a definite fore and aft curvature in the vertical plane. The boat kattumarams of the extreme south of Tamil Nadu have three logs only, and generally fish in pairs.

*The two-section, four-logged teppa are boat kattumarams and are handled by three to four men, whereas the smaller ones are operated by only two. The solid legs are the only source of buoyancy; wood of low density such as *Albizzia stipulata* is preferred. In the theppam (3-5 m) all logs are of almost equal size with a slight shaping fore and aft.*



A 5- log kattumaram.

A 8- log kattumaram.



On the east coast of India, which is highly surf- beaten, only raft- type kattumarams can be operated. In the Gulf of Mannar area, boat kattumarams are in use. The Palk Bay and the Gulf of Mannar are sheltered areas from where the fishermen operate their indigenous canoes or vallams.

The kattumaram adapts itself to the harsh conditions of India's east coast — a high and dangerous surf, and lack of adequate landing facilities because of the constant movement of sand drifts. The kattumaram easily penetrates through the breakers, instead of riding over them, thus avoiding capsizes. It is, in fact, unsinkable. It requires little upkeep, since the hull does not have to be painted and caulked. However, if the logs are treated with chemical wood preservatives, they can be protected against fungus attack, and their working life increased.



A father and son duo — the art of sailing a kattumaram is passed on from generation to generation.

*Riding the surf on a kattumaram —
“that’s my life, that’s my Heaven,”
says Pichai, who first rode a
kattumaram at the age of four.*



The kattumaram is the craft best suited for heavy surf beach conditions. Attempts to replace these traditional beachlanding craft with competitively priced surf-landing boats have so far been unsuccessful. Even in the very long term, the kattumarams are likely to be active in the near-shore fishery of the east coast states of India and the northern parts of Sri Lanka.

Motorisation of kattumarams with outboard engines in some parts of the east coast of India has helped the fishermen to overcome the drudgery of long trips, go faster and further into the sea and navigate rough weather.



A boat kattumaram with outboard motor.

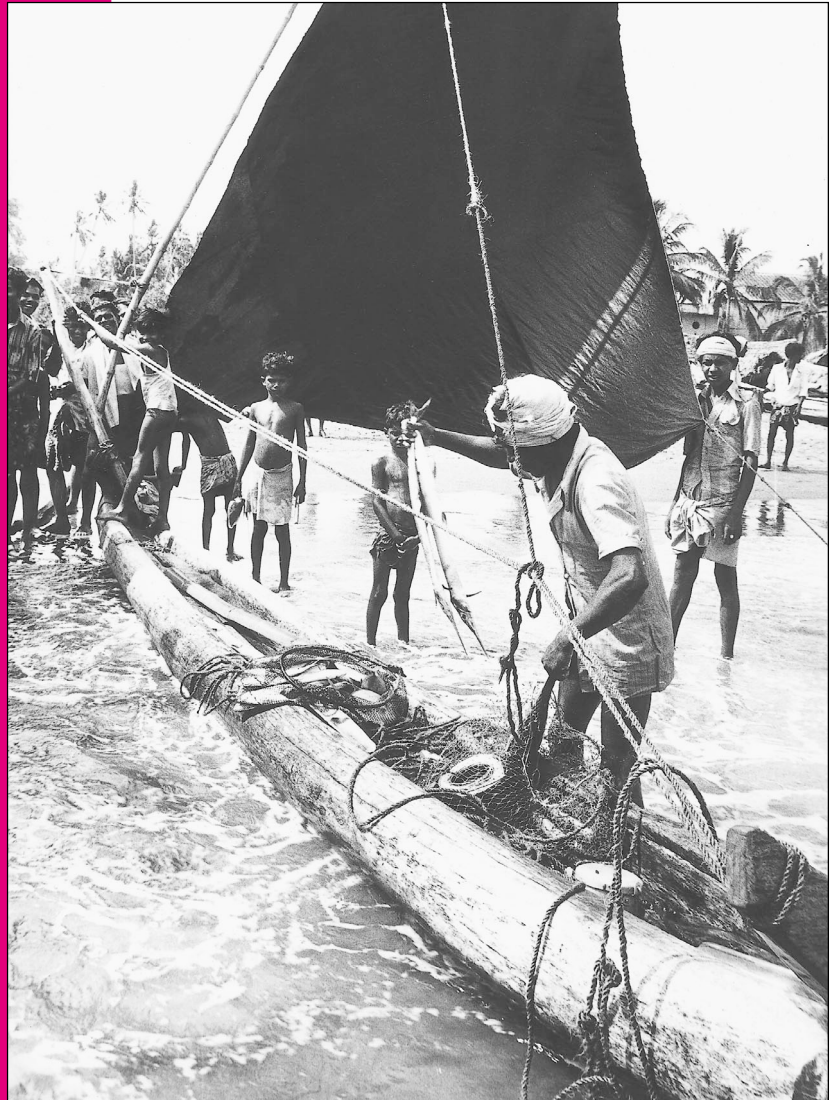
“How can we improve the kattumaram?”, a fisherman was asked. His response: “What’s wrong with it? Why should it be improved?”



The crab claw sail is an old idea from the shores of Bay of Bengal. For a long time experts have regarded this sail as 'primitive'. But current wisdom regards the crab claw sails of kattumarams and outrigger canoes as very effective for navigation and propulsion.

While kattumarams are common along the Tamil Nadu coast, teppas are used by fishermen in Orissa. The other popular traditional fishing crafts of the Bay of Bengal are navas, masula boats, dingies and dhonies.

The kattumaram rig appears to be an intelligent compromise between maximum efficiency and propulsion and manoeuvrability on the one hand, and on the other, the need to keep the limited area of 'deck' clear for the crew and for fishing operation, and use of oars.





The nava is made with teak wood planks and is an open craft, with only a small aft deck and a roof-like protection for its engine. It operates all year round, except during monsoon when the weather is rough. At night, the crew, numbering eight or nine, roll out a bamboo 'deck' over the sturdy midship, for sleeping.

Fishermen consider the nava to be suitable for the deep sea fishery. Over the years, nava fishermen have made long trips to distant fishing grounds. Today only the biggest navas (32'-36') are active in the longline fishery; the smaller navas stick to gillnets and hook-and-line fishing in inshore areas. Most of the larger nava are also motorised.



Sabada - a traditional fishing craft of Orissa

The Andhra Pradesh nava, which is capable of going offshore



The most remarkable traditional fishing craft anywhere are the “shoe-dhonis” of Kakinada in Andhra Pradesh. Shaped like shoes, they are both boats and homes. Each of these boats houses a fisherfolk family for almost eight months in a year. The shoe dhoni families make a living by collecting shells from the Kakinada bay and selling them to traders. They return to their villages only for festivals and during floods.

From or to their villages, they journey through mangrove swamps for 20 to 30 hours, using sails and long poles. Women and children tend the rudder and even help in punting.

“Shoe dhonis” of Andhra Pradesh – they are not just fishing boats, they are homes. Fishermen live in them.

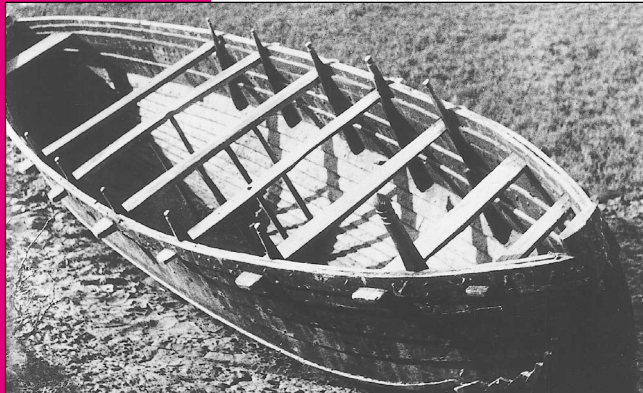




The women also do the cooking of course, none of the men can cook. Pregnant women continue life on the dhoni till the seventh month. Sometimes the children are born in the dhoni. These kids learn to swim before they can walk.

*Patias, dangas and dinghies are made of salwood (*Shorea robusta*), have a nearly vertical stem and stern and a full midship section. They are relatively seaworthy. They are between 6 m and 9 m long. The salti boats of Orissa too are made of salwood and have more rounded bilges with extended and raised ends, the length being 7 m to 10 m. These boats are less seaworthy, being used only in calm weather.*

The danga of Orissa. ▶



“Shoe dhoni” fishermen make themselves comfortable at home. ▶

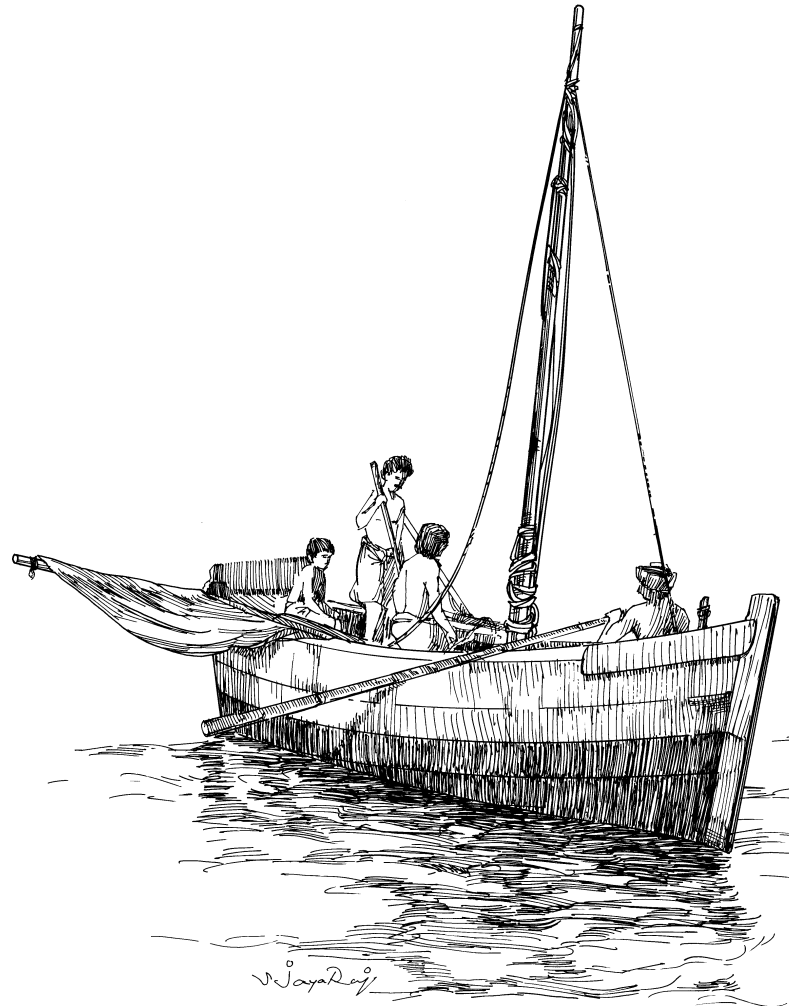




The chhoat, a carvel-built boat with raised stem and slightly over-hanging stern, has an average length of 10.4 m. This boat again, is constructed of salwood. The fishing gear used are driftnets and shore seines as well as encircling nets.

Other planked craft and dugout canoes such as vallams are narrow V-shaped sailing craft constructed with keel and frames, with an overall length up to about 10m. They are used for driftnetting, longlining and set-net fishing.

The traditional crafts mentioned above are driven by sail, oars or paddles and their range of operation is limited to a coastal belt up to a depth of 15 to 20 fathoms. Some crafts using gillnets in the north, and navas using gillnets in the south, usually operate overnight, leaving for the fishing grounds in the evening and returning the next morning. The others undertake day trips only.



The chhoat of Orissa



In Bangladesh there are an estimated 25 600 traditional boats which are propelled by sail and oar. The bulk of the marine catch is also landed by these traditional crafts.

The traditional boats of Bangladesh are either plank-built or dug out. Plank-built boats are mainly of two types - chandi and dinghi. The chandi is one of the most widely used traditional fishing boats in Bangladesh. A round bilge, carvel planked, open boat with a high sheer aft, it is usually built with a timber called Sundari and, occasionally, with Jarul or Gurjan.

The shell is constructed by stapling individually shaped planks, after which the framing is nailed into position. The boats are decked with split bamboo, and a thatched bamboo shelter is fixed slightly forward of amidships.



Chandi boat, Cox's Bazaar, Bangladesh





The chandi boat is narrow and keel-less and is equipped with a large steering oar. It is propelled by both oar and sail. The square sail that is usually used, however, permits only downward sailing and the craft is, thus, built essentially for rowing.

It carries a crew of between 7 and 15 and is mainly used in hilsa gillnetting. Traditional chandi boats have no engines. Poor wind conditions make sailing difficult most of the year.

Gillnetting is the only fishing method used by such boats. Different mesh sizes are used for hilsa and other fishes.

Fishermen on chandi boat. The large chandis spend up to a fortnight on one fishing trip.





In the Bhola area, the biggest island of the country, chandi boats are mostly 10 to 15m long. In other places, these are as short as 8m. The breadth varies from 1.4 to 1.8m, while the depth is around 1m.

The dinghi is a shallow boat with a pointed bow and a stem 5 to 7 m long. The hull is strengthened by ribs and cross beams and is made of sal, teak or jarul wood with decking of half-split bamboo. The boat is operated with small liftnets, cast nets or traps.

The balam is a dug-out. The bow and stern are slightly raised. The sides are built by fitting planks to the dug-out portion of the hull. A square sail is carried on a bamboo mast. The large balam is 15 to 20m long and operated by a crew of 20 to 30; the medium-sized balam is between 10 and 15m, and operated by a crew of 10 to 15. The balam fishes with gillnet, set bagnet or beach seine. More and more of the traditional boats are being mechanised now by using shallow pump engines.

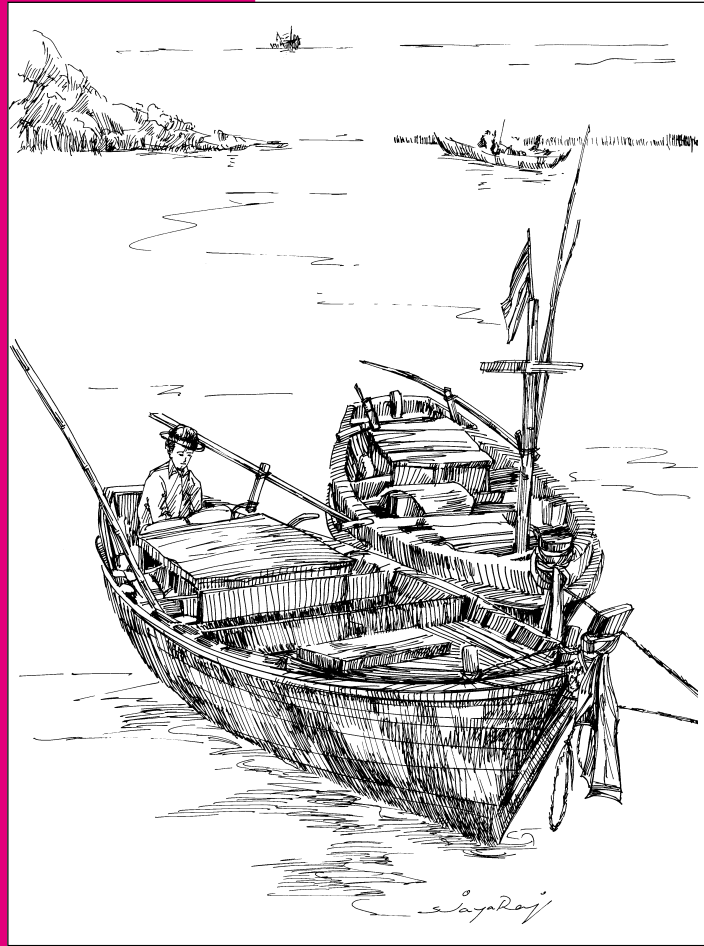
Chandi under construction at a yard in Bangladesh. ▶





Thailand has some 2 830 traditional boats (non-powered) which fish mainly with gill nets, entangling nets, lift nets, traps and hooks and lines. Besides, there are about 36 500 outboard-powered traditional boats, which also fish mostly with the same nets.

Traditional fishing boats in Thailand do not vary much in shape and structure. The long narrow shape of the boats gives a good speed with medium load.



Traditional fishing boats, Thailand. ►



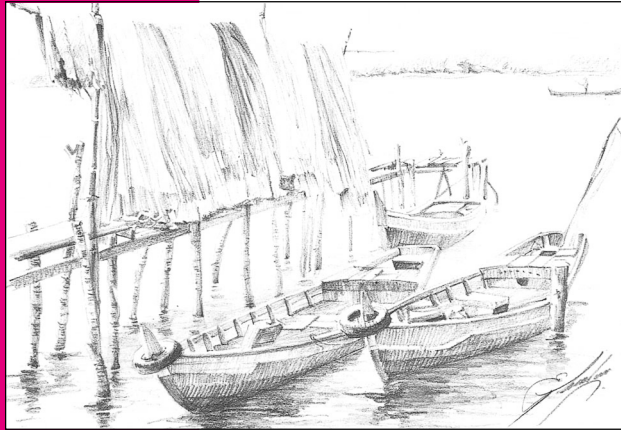
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The small-scale fisheries use the traditional craft for fishing in the shallow waters and the surrounding mangrove forests. The small-scale fishers are the main suppliers of fish for domestic market and local consumption.



The long-tail arrangement with a diesel engine has the advantage of the outboard being retractable for shallow water operations and for beaching.



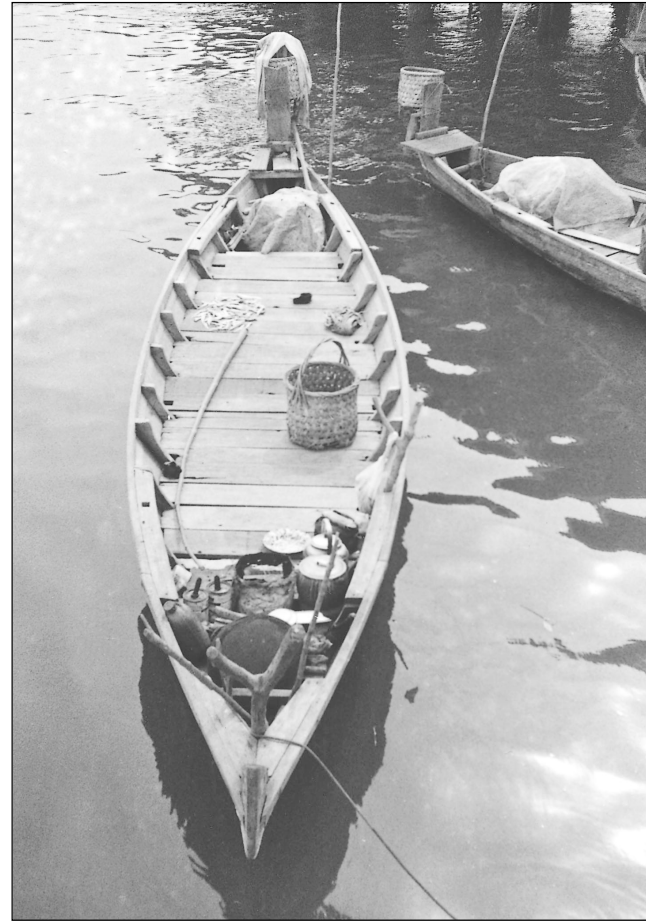


The traditional fishing fleet in Indonesia comprises some 223 490 non-powered traditional boats and 102 125 outboard- powered traditional boats. These boats are mostly dug-out and plank-built boats. The fishermen use a variety of fishing gear from these boats.

The double-outrigger canoe of 4-5 m length is used mainly in the traditional fishery. The main hull is a dugout and sail and paddles are used for propulsion.

The size of the outrigger canoes and the lack of a motor limits the range of fishing to close inshore areas and the gear is mainly hooks and line for small pelagics and demersal species, and gillnets for small pelagics.

There are larger dugout canoes with an overall length of 5-7 m with or without raised side strakes and outriggers attached to the hull.

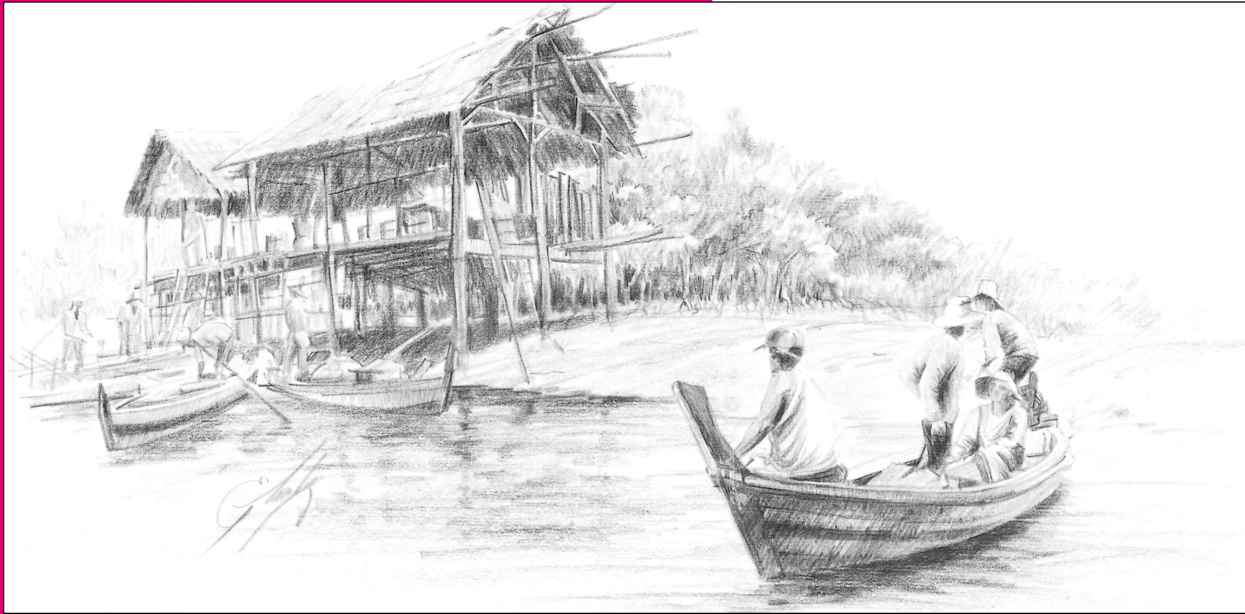


The canoe represents the lowest cost fishing craft for close inshore fishing.



Canoes without outrigger are mainly used for beach seining and transport.

The timber used for dug out canoes with double outrigger is light and lasts only about three years. The sail area of the canoes is very large in relation to the size and stability of the canoe.



The outrigger canoe of Nias Island, Indonesia. ▶





Sri Lanka's traditional crafts consist of dugouts with and without outriggers, log rafts and planked craft. It is estimated that the country has about 16 500 traditional fishing boats of which about 1 400 are motorised. The indigenous fishing crafts represent a large number of different building methods and designs. They are mainly utilised for coastal and lagoon fishing.

The planked craft are paru, pathai, padahu and vallam. The first three are beamy flat bottomed stitched planked boats of 30' to 40' used for beach seining within a distance of about a mile from the shore. The planked vallam is a rather narrow craft constructed like a conventional boat with keel and frames. Sizes may range from 25' to 40'. They are used for hand lining and drift gill netting within about 10 miles from the shore and also for stake net fishing.

The beautiful traditional
oru of Sri Lanka. ▶

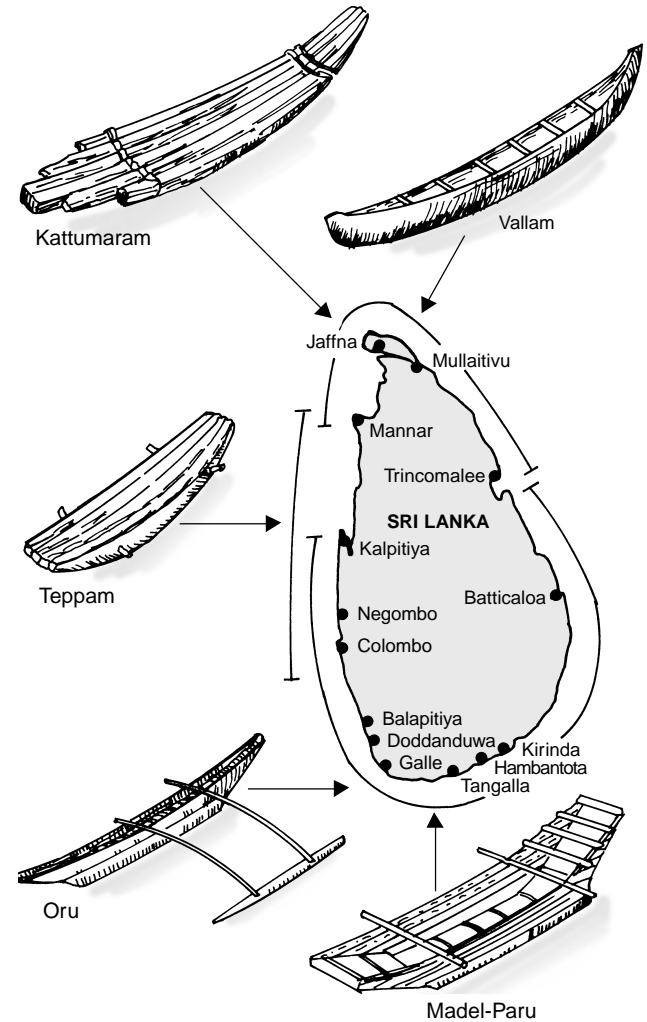




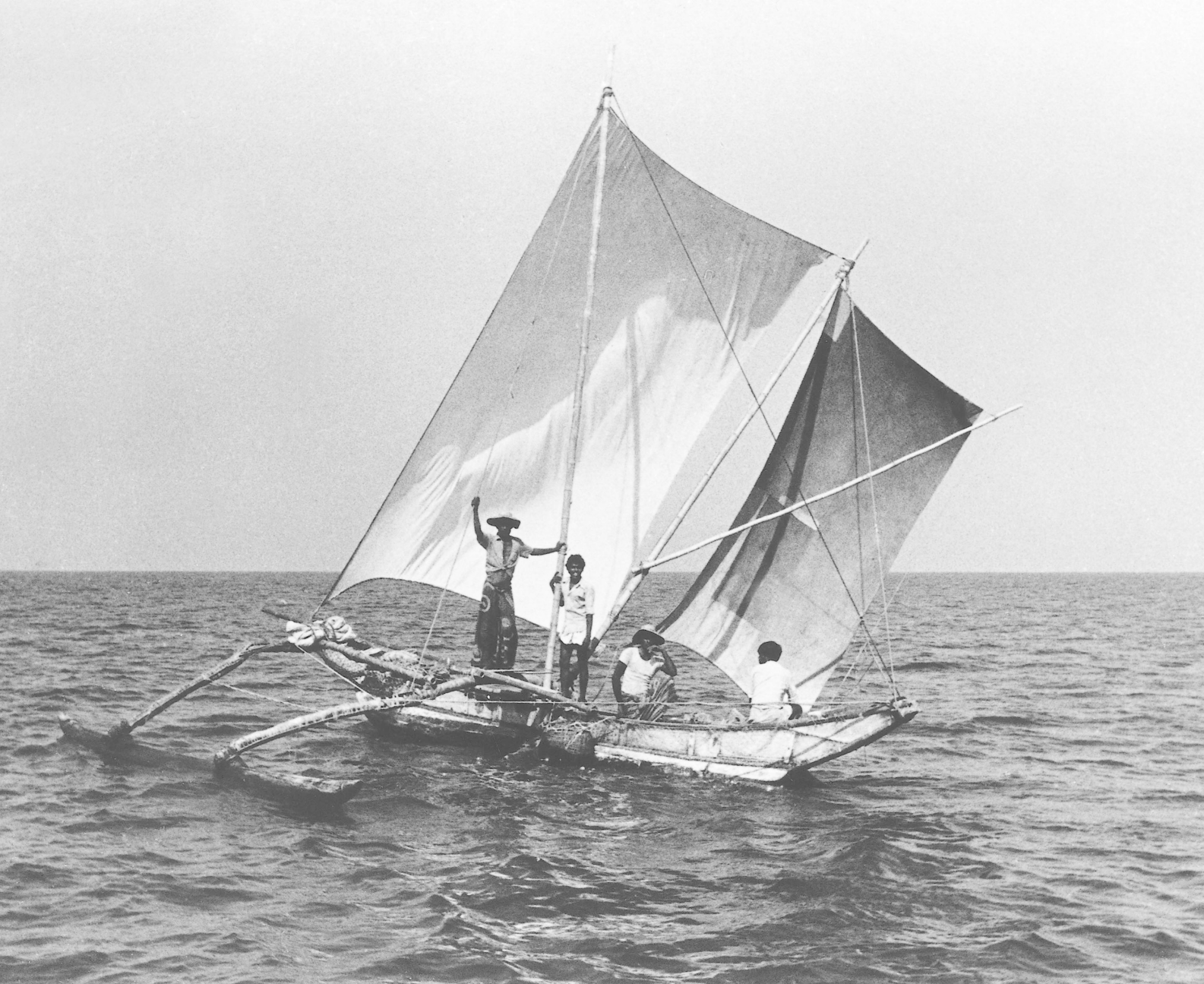
The log rafts (called *teppam* or *kattumaram*) are of various sizes, roughly 12-18' for the *teppam* and 14-30' for the *kattumaram*. In the *teppam* (3-5 m) all logs are of almost equal size with a slight shaping fore and aft. They generally operate within 10 miles from the shore and use small-mesh drift gill nets.

Vallams are narrow V-shaped sailing craft constructed with keel and frames with an overall length up to about 10 m. They are more commonly used in the northern parts of the Island.

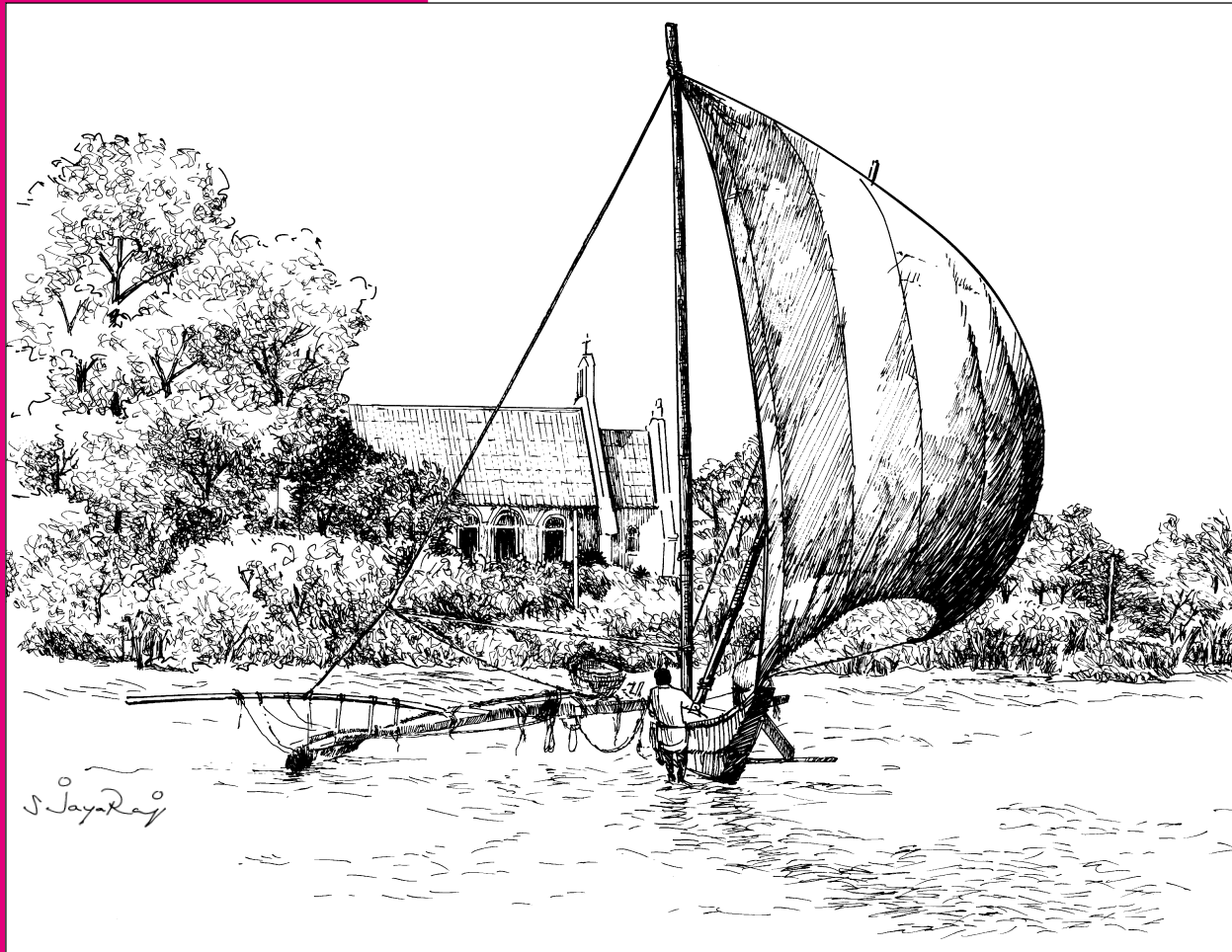
The *orus* are found along the western, southern and eastern coasts, from Negombo to Trincomalee. Some important types of *oru* are the paddled or poled *oru*, rowed *oru*, sailing/rowing *oru* with double sprit sail and sailing/rowing *oru* with dipping lug sail.



Sri Lanka's oru fishermen – a cheerful



The oru is a single outrigger craft of a type that can be found from Madagascar in the West to Indonesia in the east. In terms of numbers, the oru is the most important of the traditional fishing craft in Sri Lanka.



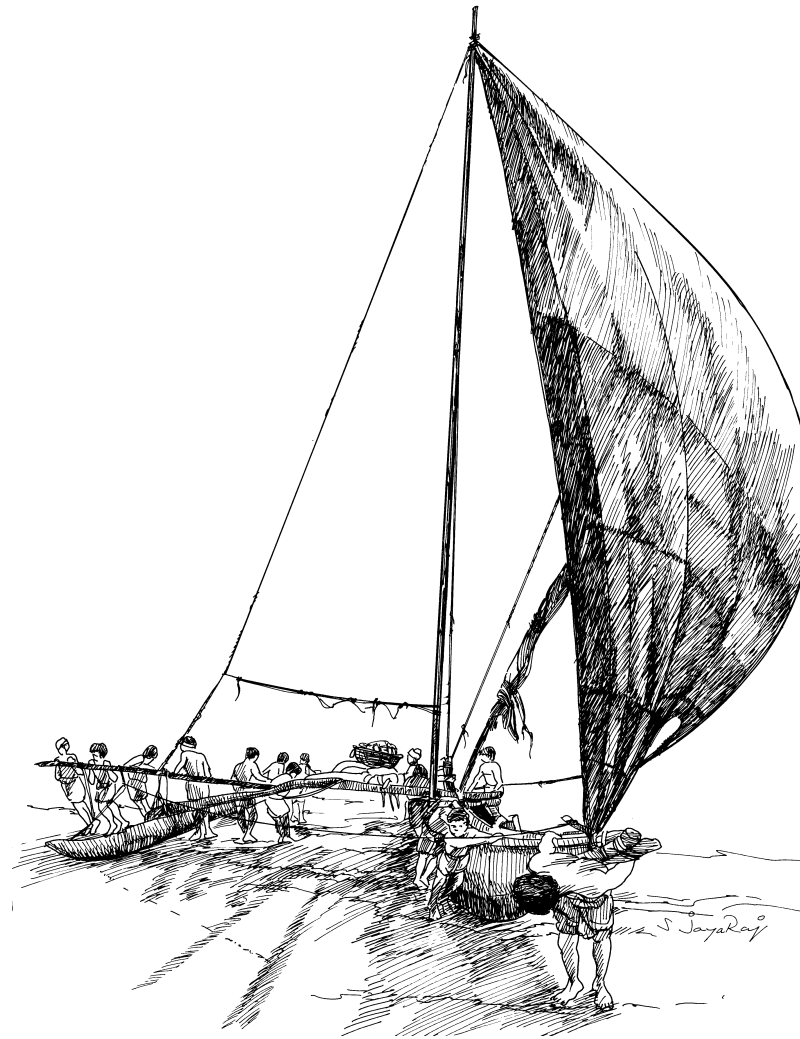
Launching of an oru, Sri Lanka



*The dugout hull of the oru is made from a single tree. Various species such as Jak wood (*Artocarpus heterophyllus*), Gandel (*Artocarpus nobilis*), Mara (*Albizzia odoratissima*), wild mango (*Mangifera zeylanica*), and mango (*Mangifera indica*) are used for making oru. The orus built with Jak or Mara wood have a life of 20 to 40 years. Orus made with other wood last for about 10 to 15 years.*

Larger orus are used for hand lining, drift gill netting, trolling, pole and line fishing and beach seining. They may – depending on size, season and fishing method – fish up to the edge of the continental shelf.

Dugouts without outriggers (called vallam or thoni) are mainly small craft used in lagoons or close inshore waters mainly for rod and line, cast net fishing and small driftnetting. In a few areas, larger dugouts without outriggers are used for beach seining.



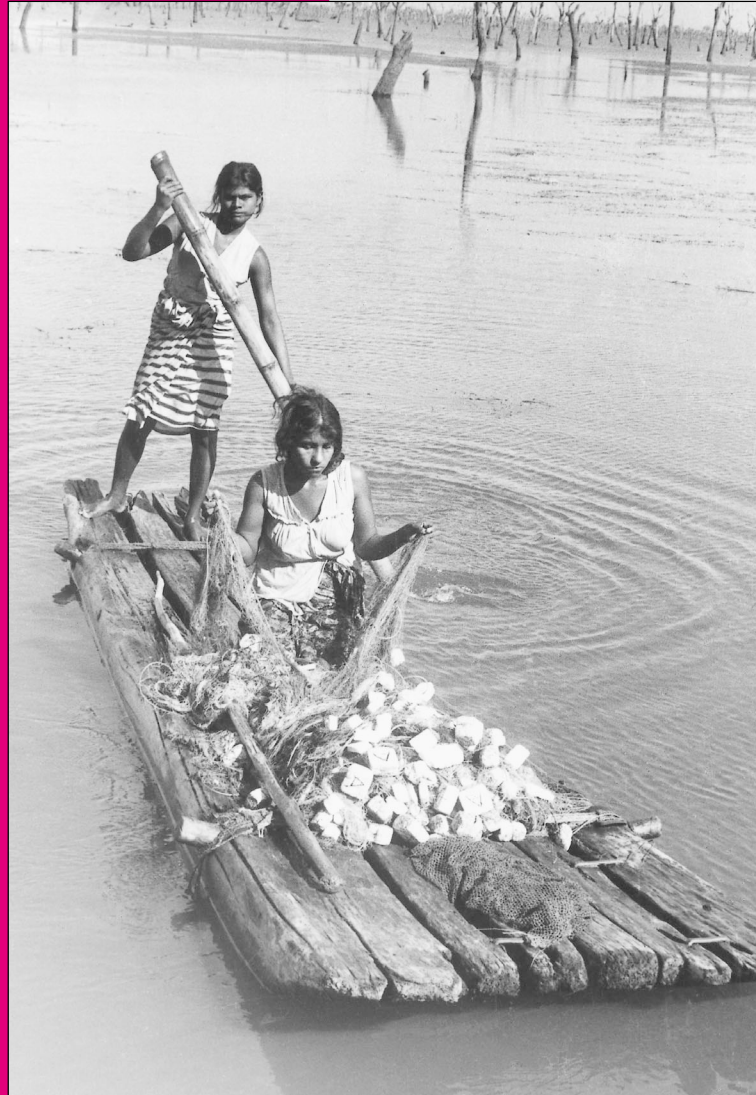
*Sri Lankan oru
being launched for fishing*



The dugouts with outriggers come in a variety of sizes within a range of 12-40 ft. The smallest craft fish in lagoons or close inshore: rod and line or cast nets being the fishing method.

The teppams are widely used in the lagoons and backwaters for catching small fishes and juveniles.

Backwaters of Negombo, Sri Lanka - women fishing ► on a teppam.





The oru-outrigger canoe has existed for centuries with almost no change. A recent advancement has been the attachment of the outrigger as a balancing device. In the early days the orus were propelled only by oars. The introduction of the sail was also a big achievement.

However, the oru has a major disadvantage. The main hull is hollowed out from a single log. The log therefore has to be straight and of a sufficient girth and length to fit the canoe. With the large-scale depletion of forests, it is now difficult to find good quality timber for oru at affordable price.

The orus are gradually giving way to fibre-reinforced plastic boats which fish in deeper waters and can make trips of 2 to 3 weeks.

The oru can carry a large sail because of the good stability provided by the outrigger.





The three main types of fishing boats in the Maldives are the masdhoni, vadhudhoni and bokkura. There are some 3 200 traditional dhonis and 2 000 mechanised dhonis. Masdhonis are about 10-15 m length overall (LOA), vadhudhonis are about 5-8 m LOA and bokkuras are about 2-3 m long.

Masdhonis and vadhudhonis were, traditionally, sailing craft. The masdhoni was a three-sail vessel – one big sail, two small sails. Motorisation of masdhonis started in 1974, and now almost all masdhonis have diesel engines installed on them. Motorisation of vadhudhonis started much later, but now most of them are also motorised.

A majority of the dhonis engage in pole and line fishing for tuna.



Dhonis are hauled up on to the beach every two weeks or so for their hulls to be cleaned and painted. The interiors of the dhonis are soaked with oil every few weeks. ▶



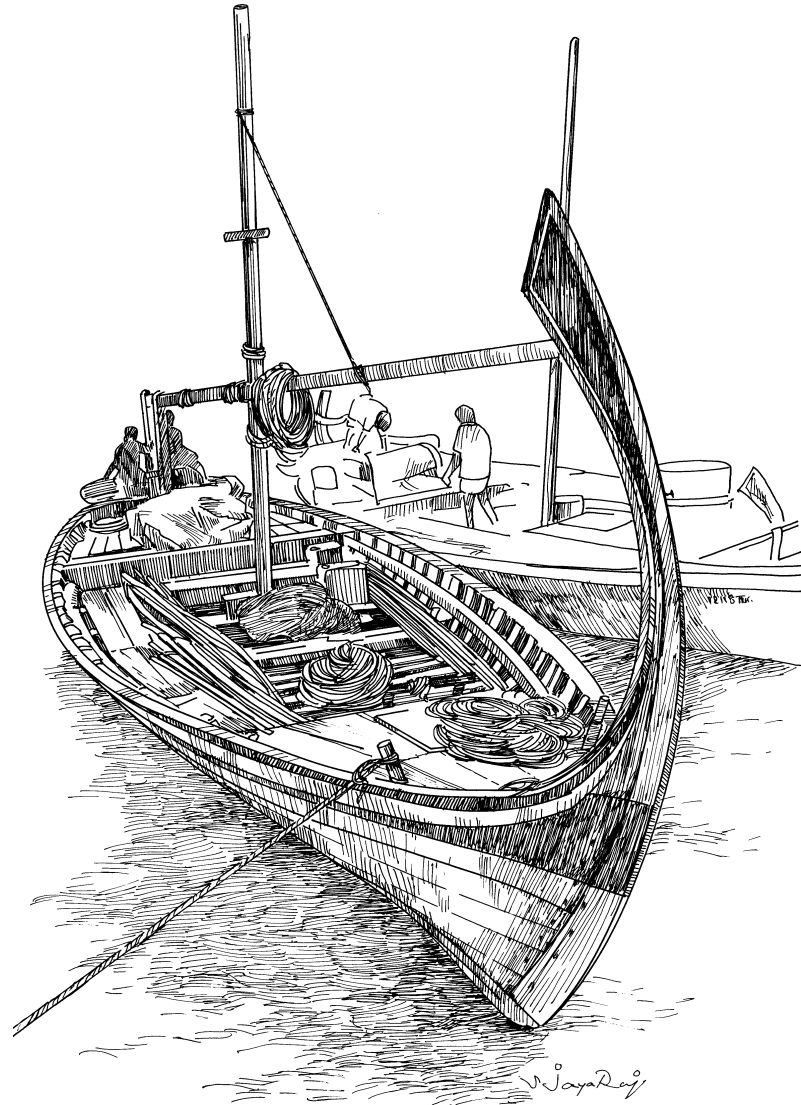


A dhoni is wide and flat forward with a short stem; it narrows a little to the aft and has a square transom stern. The fore and aft parts are decked in; about two-thirds of the length has tumble home-sides and the well is narrow and restricted.

Maldivian boats (dhonis) are made of wood, and naturally require regular maintenance to keep them in good condition.

The dhoni is sufficiently robust and stable in local sea conditions. It maintains watertight integrity. The seaworthiness and safety of traditional Maldivian fishing craft are well-known, and their craftsmanship has been hailed by boat-building experts.

The modernisation of the dhonis has brought about an increase in their over all length, and crafts upto 30 m size are now being constructed.



Maldivian dhoni on a fishing expedition



Safety at Sea

Fishing at sea is probably the most dangerous occupation in the world; more than 24 000 deaths are reported annually. The sea safety regimes are weakest for the artisanal and small-scale fishers of the developing countries. The worst sufferers are the surviving families.

Although the basic problems of safety at sea are common to all the countries of the Bay of Bengal, local conditions and complexities vary widely. Creating a safer working environment for artisanal and small-scale fishers is a huge challenge. It merits urgent and critical attention from all concerned.



Traditional fishermen – living on the edge



Acknowledgements

The traditional fisherfolk of the Bay of Bengal.

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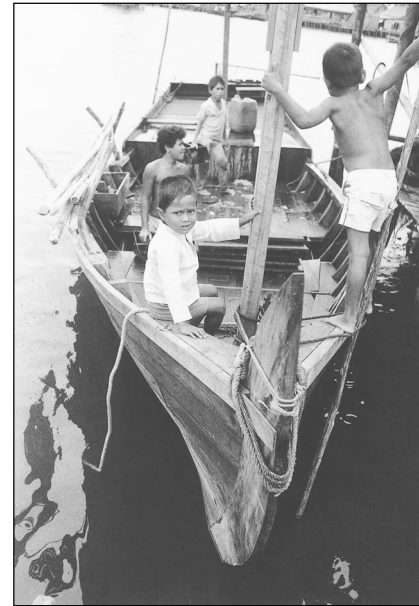
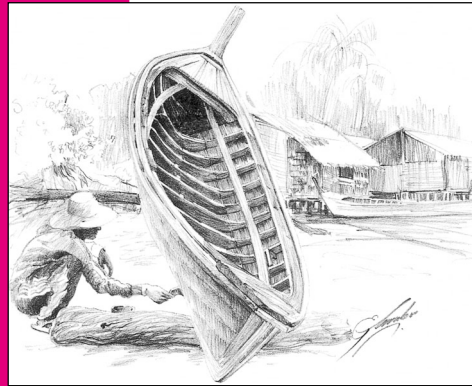
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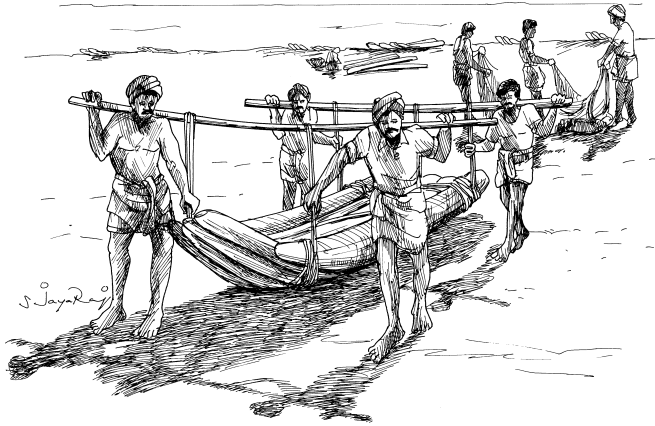
K Vijaykumar

Harry Miller





Several million small-scale fishermen in the Bay of Bengal fish with crafts that have seen little change from generation to generation. To many, these traditional crafts may seem primitive, dangerous and inefficient. But their worth is beyond question, so is their social, economic and cultural uniqueness. The kattumaram, the dhoni, the oru and the chandi – how long will they be around?



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