

Traditional fishing crafts of India

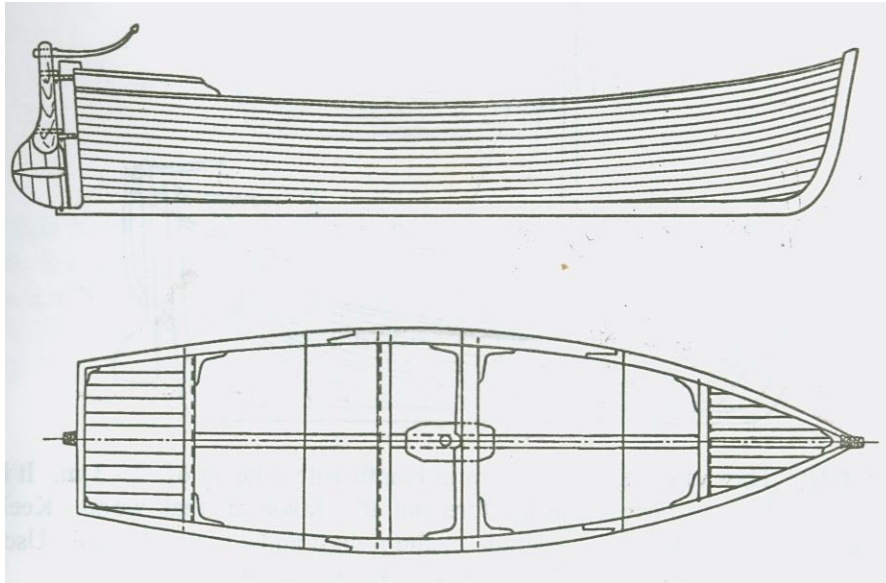
Fishing boats of Gujarat

There is marked difference in the geographical and physical features of northern and southern regions of Gujarat. Whereas the northern region is arid and stony, the southern region is distinguished by sandy bottom.

The following types of boat with their broad features gives along side are found in Gujarat.

1) Haler machwa:

- Length varies from 8-10 m
- Broad beam and square stern
- Open boat except for short decking in the fore and aft.
- Carvel planking with unusually large and heavy frames
- Tall mast carries on large lateen sail of Arab pattern
- It is used for gillnet fishing.

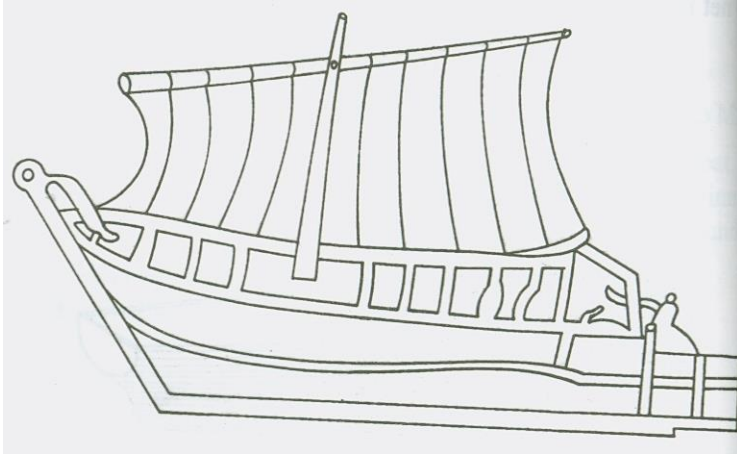


2) Porbandar machwa

- Length varies from 6-8 m
- Square stern and raked stem
- Used for gill net fishing

3) Cambay machwa

- Raked stem
- Undecked except for short length at stern
- Truncated stern with a slight rake

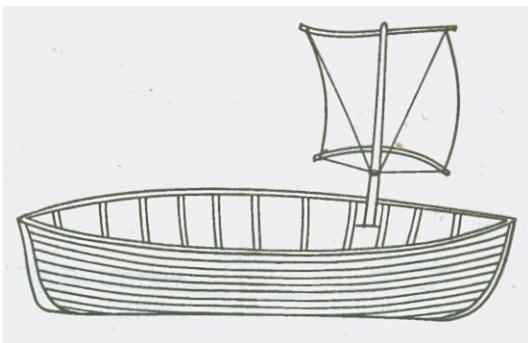


4) Navalaki hodi

- Length 5-6 m, breadth 1-1.5 m and draft of 90-105 cm
- Square stern and overhang bow
- Decked only fore and aft
- Single mast carries lateen sail

5) Malia boat

- Flat bottom boat which measure about 6-7 m in length, breadth 1.5 m with 65cm draft.
- Ends are pointed and there is small rudder
- Carvel planking
- Mast carries a lateen sail
- Small decking fore and aft
- Used in tidal waters for prawn fishery



6) Dugout canoe

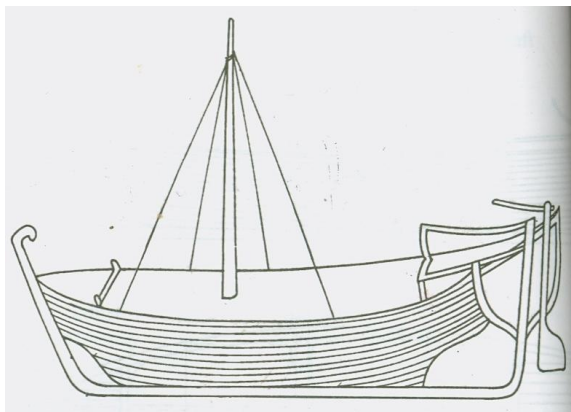
- Double – ended round bottom boat
- Length varies from 5-9 m, breadth 60-90 cm and depth 60-68 cm
- Small sail raised on a wooden mast
- Used for gill netting

7) Ludhia

- The boat measures 9-10 m in length and 1.5 to 2 m breadth
- Short decking at the fore and aft
- Slightly raked stem and stern
- Two masts with small lateen sails
- Carved planking and has strong keel and heavy frames

8) Madhwad type wahan

- Length 10-13 m and breadth 2-3 m
- Raked stem and square stern
- Decked at the fore and aft
- Large heavy rudder
- Mast with lateen sail
- Used for operation of gill nets and dol nets



Fishing boats of Maharashtra

The physical and geographical features of northern Maharashtra up to Mumbai are similar to those of southern Gujarat. Southern Maharashtra has a rocky coast with sheltered bays, creeks and harbours. The following types of fishing boats are found in Maharashtra.

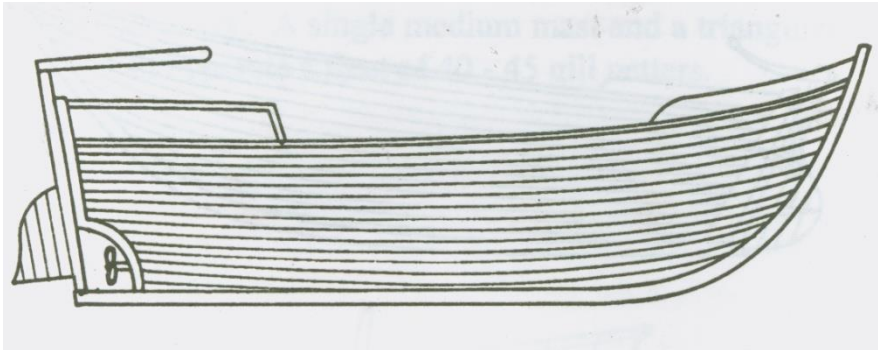
1) Bombay machwa (Karanja boat)

- Length 15 m, breadth 3-5 m and depth 1 m
- Long raking bow with great over hang and sheer. The actual keel is short in relation to the overall length.
- There are two masts, sails are of lateen type.

2) Satpati type (Gal boat)

- Length ranges from 10-15 m

- Carvel planking
- Medium pointed bow, broad stem, straight keel, high gunwale, and transom stern
- Used for gill netting

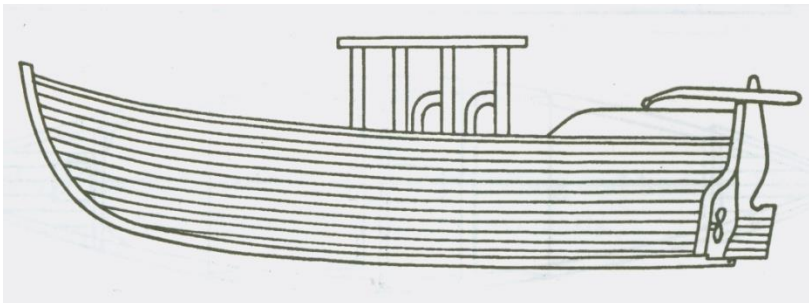


3) Bassein boat

- Long, straight, pointed fine entry bow with abrupt round stern
- Carvel planking
- Broad hull straight keel and average gunwale

4) Versova boat (Hoda)

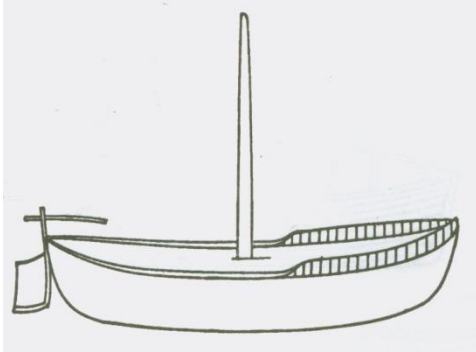
- Arched keel, round stern and deep fore foot
- Stem less raked than Bassein boat, it resembles Bassein boat in other respects
- Aft deck is present but no fore deck
- Used for operation of dol nets.



5) Hodi (Toni)

- It is widened replicate of ordinary dugout, but built by planks
- Length varies from 7-10 m and breadth 0.75-3 m
- Single mast with lateen sail
- Stem and stern are curved like dugout
- A weather board about 30 cm high is fitted along the gunwale from the stem to just abaft the

- mast to keep out sea and spray.



6) Rathnagiri machwa

- Length 10 m, breadth 3 m and depth 1.15 m
- Broad beam, long over hanging bow, round stern and raked stem post
- Open boat with low free board, single mast lateen sail
- Used for deep sea gill net fishing

7) Rampini boat

- Length about 16 m
- Narrow keel, stem and stern
- No mast is carried as the boat is rowed
- Fitted with out riggers to give stability
- Used for operation of Rampini nets.

The Indian teak is commonly used for the construction of fishing boats in Maharashtra. The vessels are very sturdy. One of the distinguishing features of these boats is their long overhanging bow which gives these undecked boats a reserve buoyancy and spray deflection in rough water. The planks are joined by tongues and groove fitting.

Bombay machwas are operated from north of Mumbai as far as Jaigarh in the south. Satpati type is used up to Ratnagiri. Hodi is operated from Mumbai to Jaigarh, Ratnagiri machwas from Jaigarh to Karnataka border and Rampini boats in Southern Maharashtra and Northern Karnataka.

Fishing boats of Goa, Karnataka and Kerala

Fishing boats of Goa

The traditional fishing craft of Goa are dugout canoes and planked boats with large out riggers. There is a rudimentary keel in the dugouts. The size of the boat varies from 7-8 m

Fishing boats of Karnataka

Rampini boats are popular in Northern Karnataka and dugout in Southern Karnataka.

Fishing boats of Kerala

- Dugout
- Plank built canoe
- Raft Catamaran

1) Dugout:

- Single logs of trees like mango and aini are scooped for its construction.
- Three types of dugouts are found to be in operation. They are
- Large ones known as Odam – 11.6 m length.
- Medium ones known as Thonies – 8 m length
- Smaller ones known as Bepu thoni – 7.5 m length
- They are propelled by paddles and sails. Sails are either square or sprit type. No rudder is used. Steering is by means of big paddle one quarter side.
- Larger ones operate boat seines and smaller ones gill nets and lines.

2) Plank built canoes (Tonga Vallam / Chemboke)

- Built with planks which are sewn with coir ropes
- Propelled by means of paddles and occasionally sails.
- Two types are distinguished i.e. A larger one– 12 x 1.5 x 0.8 m, B – Smaller one 7 x 1 x 0.6 m
- Used for operation of shore seines and gill nets

3) Raft catamaran (Chalatadi)

- It is constructed by tying 3-5 logs of soft wood with coir ropes
- Propelled by split bamboo oars and sails
- Used in pairs to operate boat seines and individually to operate gill nets and long lines.

Fishing boats of Tamil Nadu

Four regions can be distinguished along the coast of Tamil Nadu, each region having fishing craft with specific features Colachel to Cape Comorin

1) Boat catamaran

- It is made of three logs, the centre one fitted at a lower level than the other two giving it a boat shape.
- The logs are held by means of two blocks of wood on either end and secured by coir ropes passing through the grooves on the side of the logs.
- Size varies from 6.5 – 7.5 m
- Small triangular sail is used

- Normally operated in pairs for boat seiners

2) Boat canoe (Vallam)

- Similar to Malabar dugout but spread by wedges and heightened by flared 22-25 cm wash
- strakes.
- Length varies from 9-13 m
- Single mast at amidships with lug sail. In larger ones, mizzen mast is also carried.
- Large rudder is fitted which descends much below the round bottom.
- Used for operation of gill nets and long lines.

3) Tuticorin boat

- It measures 9.6 x 2.0 x 0.9 m
- Long, relatively narrow with nearly vertical stem and stern
- Sheer line is almost straight.
- Single mast with lug sail
- Frames are not carried up to the gunwale but cut away at the sheer plank. The upper most
- planks are framed with a separate short piece not fastened to the main frame.

4) Kilakaral boat

- It is similar to Malabar dugout with additional vertical stakes.
- Provided with either one or two out riggers for stability
- Single mast with lug sail
- Use temporary rudder fixed at the sharp curved stern by orthodox pintle and gudgeon

5) Fishing Canoe

- Hull is either a dugout or plank built canoe
- Single mast with square headed lug

6) Adirampatnam fishing canoe

- Hull is a dugout canoe with wash strakes
- There is a pair of quarter steering boards instead of fixed rudder.
- Single mast, occasionally three masts are used
- For steering the boat, quarter boards are manipulated with feet by steer man sitting at the aft
- The balance board is exceptionally long.

7) Three masted plank built canoe

- Three masts are present

8) Kalla Dhoni

- Heavy transom stern
- Carries the largest and heaviest balance board
- Rigged with three masts and lug sails

9) Coromandal coast

- Catamaran
- Masula boat

10) Catamaran

- Made up of 1-1.6 m logs tied together raft wise. The logs are cut square at the stern and tapered at the bow with a little raise.
- The logs do not end in one line at the aft
- Bamboo mast is used with triangular sail. Five types are identified mostly depending upon the
- number of logs used.

11) Periyamaram

- 8 m long and 1 m wide consisting of 4 logs
- Middle pair project 1.2 m beyond outer logs

12) Irukumaram

- Made up of five logs, middle being the longest
- Used for gill net fishing

13) Kolamaram

- Made up of seven logs
- Two masts are used.

14) Thundilmaram

- Made of five logs without beaked prow

15) Chinnanaram

- Made of three logs

16) Masula boat

- Size measures 9 x 2.4 x 1.2 m
- Open boats without ribs
- Planks are sewn with coir rope and inter space is filled with dry straw
- Stem and stern are raked, keel narrow
- High free board
- No mast or sail, long paddles are used
- Used for operation of shore seiners.

Colachel to cape Comorin is a surf beaten coast where boat catamarans are popular. Gulf of mannar is also surf-beaten coasts with sheltered areas and coral beds. Fishing grounds are far away. In this region, boat canoe, boat catamaran, Tuticorin and Kilakarai boats are in operation. Though the physical conditions are similar in palkbay fishing craft operating are different. Popular craft in palk bay are fishing canoe, Adiram patnam canoe three masted plank-built canoe and kalla dhoni. Coromandel coast is surf beaten without shelter. Here surf landing catamarans and flexible, masula boats are predominant.

Fishing boats of Andhra Pradesh

Being surf beaten coasts without shelters, the following surf – landing crafts are predominant

1) Catamaran (Teppalu)

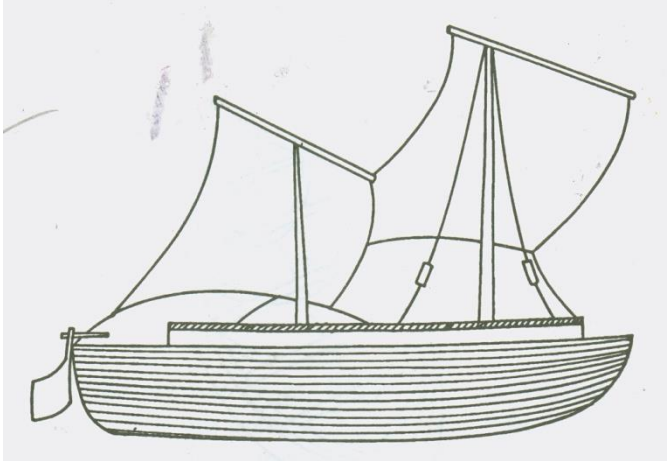
- Made of 4 logs, it is 6.6 m long and 1.35 m broad.
- All logs end in a line unlike coromandel catamarans. Wash boards are attached at the sides.
- Triangular sails are used from bamboo mast. Paddles of 1.5 m long are used.
- Used for operating gill nets, lines and boat seines

2) Masula boat

- Similar to the one described under coromandel coast excepting some minor details its planks are made of mango wood and stitched with palmirah leaf fibre keeping a continuous rope in between the seams.

3) Nava

- It measures 10 x 2 x 0.7 m
- Narrow round bottom boat without keel, heavy framed and carvel planked with a short fore deck and longer aft deck
- Carries one mast and a lateen sail
- Mainly used for operation of gill nets



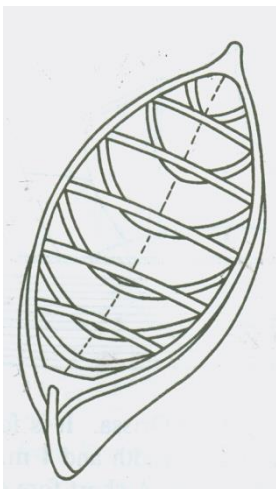
Fishing boats of Orissa and West Bengal

Fishing boats of Orissa:

Two regions can be differentiated along the Orissa coast. The southern part is surf beaten, whereas the northern part has sandy bottom extending far out into the sea. The boats used are

1) Botali

- It measures 7 x 1.5 x 1.5 m
- Vertical and pointed stem and stern with full amidships section
- Both carvel and clinker planking are seen
- Used for operation of gill nets



2) Catamaran

- Five logs are tied in a boat shape, front portion being narrowed to a point and aft part abruptly truncated.
- Used for the operation of gill nets, boat seines are also operated occasionally.

3) Nava

- An ideal surf landing craft similar to the one described under fishing boats of Andhra Pradesh.

4) Bar boat

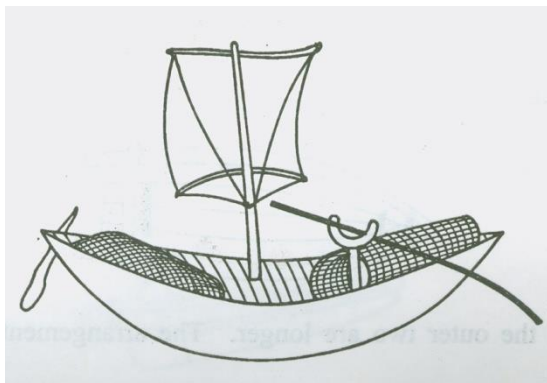
- It measured 8 m long and 2.5 m broad
- Similar to masula type
- No ribs or frames and planks are stitched with coir ropes

Fishing boats of West Bengal:

The physical conditions of the coast line are similar to those of northern Orissa. The following two boats are used.

1) Batchari boat

- It measures 13.5 m x 1.3 m x 0.5 m
- The stern is as high as bow and they are sharp and raked.
- They are partly decked without keel
- Propelled by sails and oars
- Used for operation of variety of gears like drift net, bag net, dip net etc.,



2) Chot boat

- It measures 10.2 x 2.5 x 1.1 m

- It has short overhangs and high freeboard
- Mostly propelled by oars though it carries a sprit sail
- There is only a loose decking of split bamboo rods
- Used for operation of heavier fishing gears like seine nets and bag nets

Fishing boats of Andaman and Nicobar Islands

Influence of Australian design is seen in the fishing craft of these Islands. Dugout and out rigger canoes are common. However, the shape of dugouts is different and the outrigger canoes have more than two out riggers attached in a different manner. These are described below.

1) Dugout

- Length varies from 2.75 m – 10.5 m
- The bow and stern are prolonged horizontally to form an overhang shelf platform which gives
- footing for the harpooners on look out for fish.
- Propulsion is by means of oars, steering with paddle
- Holes are made in the gunwale on each side and a piece of wood is thrust through them as a sort of thwart. This is to provide a means of fastening the end of harpoon line.

2) Out rigger canoe

- It is provided with multiple booms varying from 3-12 m. These booms are slender poles secured at their inner ends by being passed through the holes on the sides of dugout close to the edge. This is similar to the design found in Australia.
- Floats are connected to the booms by means of three short stanchions.

3) Flat bottom

- It measures 6.5 m Over All Length
- There is no keel and the bottom is shaped into curve
- Carvel planking painted with coal tar
- Small fore and aft deck
- Not suitable for operation during monsoon.

4) Round bottom

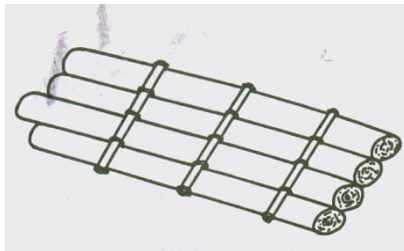
- Length ranges from 4.5 – 7.5 m
- Keel is present and the bottom is shaped round
- Carvel planking
- Found suitable for operation even during monsoon.

The outrigger canoe used in Nicobar Islands is different from that of Andaman's described above. These are better built and more elegant with not more than two booms. They are fitted with 3-4 vertical bamboo masts each carrying a lateen sail.

Fishing boats of Lakshadweep Islands

Raft (Kathufathi)

- 5-6 logs are tied into raft by means of two coconut poles and fastened by coir ropes
- Propulsion is by paddles
- Used for hook and line operation.



Plank built boat (Kalundhoni)

- Both stem and stern are slightly curved. Stern is broader than the bow.
- Keel is a single piece of coconut palm or wood
- Oars and sails are used for propulsion. Rudder is fixed over the skeg.
- The boat is divided into seven compartments by transverse planks.
- Used for pole and line fishing.

Masodi

- It measures 12.5 m in length and 3 m broad
- The stern is broader than the bow and is provided with a fishing platform
- The boat carries two lateen sails and 18 oars for rowing
- The hull is divided into 12 compartments and two bait tanks are provided
- Used for pole and line fishing.

Mechanization of fishing craft

Definition

According to Mr. Gurtner, mechanization means the simple addition of motive power to the otherwise unchanged indigenous boat. The propulsion power would be in the form of an outboard or an inboard marine engine. On the other hand Mr. Paul B Zeiner has defined mechanization as installation of engine for propulsion and mechanical devices for handling of fishing gear.

Fishing boat mechanization in India

Till 1945, the traditional craft with sails and oars were the main stay of the fishermen. The mechanization was initiated by the erstwhile Madras presidency by constructing 6 m hard chine

open boat powered by a single cylinder 5 HP diesel engine. The Government of India took a decision to develop fisheries on modern lines at national level in the early fifties. National and International agencies actively involved in this programme were Central Institute of Fisheries Technology, The Fisheries Department of some of the maritime states, FAO and INP (Indo-Norwegian project). Initially the mechanized fishing vessels were used mainly for the operation of gill nets. Subsequently, with the location of rich shrimp grounds along the south-western coast, larger and more powerful stern trawlers were developed.

The mechanization of fishing boats in India followed a step by step approach keeping in view the traditional attitude of the fisher men. Starting from a base (country craft) four stages can be identified in the mechanization programme.

- First stage – Mechanization of country craft
- Second stage – Introduction of simple small mechanized boats
- Third stage–Improvement of newly designed boats and introduction of bigger specialized boats
- Fourth stage – Broadening into fishing fleet

Hornell (1920) has investigated and published a detailed account of indigenous boats in the memoirs of Asiatic society of Bengal. Technical aspects of these boats were studied by Paul B Ziener, FAO expert who had been in India during 1953-1958. The suitability of mechanization was studied and the types of boats amenable to mechanization identified.

a) First stage – mechanization of country craft:

A few indigenous boats were found suitable for mechanization with a little modification. They were mechanized successfully under the supervision and guidance of Paul B Ziener and K. Rasumsson, FAO experts. The fishing boats of Gujarat and Maharashtra especially were found ideally suited for mechanization. The boats to be mechanized under the programme were,

- Lodhiyas and machwas of Saurashtra coast
- Versova/Satpati boats of Maharashtra
- Tuticorin boats of Tamil Nadu
- Kakinada Navas of Andhra Pradesh
- Batchari boats of West Bengal

By the end of 1969, about 3,000 indigenous boats were mechanized.

b) Second stage – Introduction of simple small mechanized boats:

Some of the states like Kerala, Karnataka and Orissa did not have suitable indigenous craft for mechanization. Secondly the country craft which were mechanized in the first stage were found suitable mainly for gill netting and long lining. Moreover, their operational range has not increased considerably beyond inshore water. Under these circumstances it was found necessary to introduce simple small mechanized boats.

Under this programme, a few new types were introduced as well as certain stable craft were developed for full mechanization. Both yielded encouraging response, many of the country crafts were redesigned by FAO experts. During 1955-58, about 10 new designs 7.5 m Pablo boat was found to be extremely successful and popular.

c) Third stage - Improvement of newly designed boat and introduction of bigger specialized boats:

Large sized specialized boats were introduced to meet the demand of the industry and to extend the operations in deeper waters. Some of the new designs introduced in the second stage of development were designed on the basis of operational performance to suit local conditions. Large commercial designs of advanced countries were studied carefully by the experts and were modified according to Indian requirements. The U.S.A. designs and construction methods were found most suitable for Indian conditions and hence were adopted with certain modifications. This programme was initiated by FAO followed by INP which developed 14 m design and C.I.F.T. which developed 15.5 m design. The next step was the introduction of offshore vessel. During the fourth five year plan, 17.5 m steel trawlers were introduced to conduct exploratory surveys and commercial fishing in the offshore waters. The experience gained in operating these vessels paved the way to the next generation of large trawlers.

During the fifth five year plan the Government of India gave permission to private entrepreneurs to import 30 Mexican double rig shrimp trawlers on the condition that an equal number of craft will be constructed in India. The double rig-Mexican trawlers were found extremely successful for capture of shrimps. The deep-sea fishing fleet has increased after the declaration of EEZ up to 200 miles in August 1976. Industrial fishery surveys were carried out by large imported deep sea vessels. Besides this private entrepreneurs were encouraged to charter and import vessels to carryout commercial operations. Some of the important mechanized and deep sea fishing boats introduced during various stages of mechanization programme in India.

d) Fourth stage–Broadening into fishing fleet:

After successful mechanized fishing in inshore, offshore and deep sea waters in EEZ, efforts were made by the Government of India to increase the number of fishing vessels and broaden as fleet to exploit the available marine resources. At the end of the eighth five year plan, the strength of mechanized boats and deep-sea vessels stood at 47,000 and 180 respectively.