

# Bay of Bengal Programme

Development of Small-Scale Fisheries

TRADITIONAL MARINE FISHING CRAFT  
AND GEAR OF ORISSA.

BOBP/WP/24



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FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS

BAY OF BENGAL PROGRAMME  
Development of Small-Scale Fisheries

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TRADITIONAL MARINE FISHING CRAFT  
AND GEAR OF ORISSA

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By P. Mohapatra  
Additional Director of Fisheries, Orissa

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Mailing Address: Post Bag No. 1054, Madras 600018, India.

Street Address: 91, St. Mary's Road, Abhiramapuram, Madras 600 018, India.

Cables: FOODAGRI Telex: MS-311FISH. Phone: 71294, 71296, 71587, 77760..

In August and September 1980, a survey was carried out in the Balasore, Cuttack, Puri and Ganjam districts of Orissa, to obtain information on the type of traditional fishing craft and gear, their methods of operation, cost, and possibilities for improvement and introduction of new prototypes and innovations. All the important villages engaged in marine fisheries were visited.

This working paper presents the results of the survey. A brief summary of the types of fishing craft and gear is followed by detailed data on materials and construction of craft and gear. The document may serve as a guide for specific extension work among small-scale fishermen and also provide a basis for experiments to improve fishing craft and gear.

The survey and this paper are an activity of the Project for Small-Scale Fisheries Development of the Bay of Bengal Programme. The project is funded by the Swedish International Development Authority (SIDA) and executed by the Food and Agriculture Organization of the United Nations (FAO). The main goal of the project is to develop, demonstrate and promote technologies and methodologies to improve the conditions of small-scale fisherfolk in five countries that border the Bay of Bengal – Bangladesh, India, Malaysia, Sri Lanka and Thailand.

The project and the FAO express their gratitude to the Orissa Government for making available the services of Mr. P. Mohapatra, Additional Director of Fisheries, to carry out the survey.

The views expressed in the paper are those of the author and do not necessarily represent the official views of the Government of Orissa or the FAO.

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## 1. PRINCIPAL TYPES OF FISHING CRAFT AND GEAR

Fishing along the 480 km coastline of Orissa is mostly small-scale.

Marine fish production has shown a steady increase, mainly due to the introduction of mechanized boats, yet the traditional marine fishing craft and gear are still responsible for the major part of the present annual catch.

The continental shelf off the southern coastline of Orissa is narrow; there are broad sandy beaches and open surf-beaten shores. The northern coastline is much shallower—with a broad shelf, a gradual slope and a greater tidal range.

The rivers along the northern coastline covering Babasore and North Cuttack districts provide sufficient shelter and deep enough water to allow the operation of plank-built displacement boats. The most common craft north of Hansua in Cuttack district are the Danga and the Dhingy—the former clinker-built, the latter carvel-built. Other types include the Sabti, Chhoat, Patia and Sabado.

The Patia, the Danga and the Dhingy are made of sabwood (*Shorea robusta*), have a nearly vertical stem and stern and a full midship section. Patia and Danga are clinker-built while Dhingy is carvel-built. The names Patia and Danga are sometimes used synonymously. Their lengths range from 6 m to 9 m. They operate mainly from August—September to March—April, though occasional trips are made in Balasore district even in June and July if the weather is favourable. The main fishing gears used are polyamide or polyethylene pelagic driftnets of 95 mm to 120 mm stretched mesh, 600 to 1000 m in length.

The Salti boats are also made of sabwood 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. Driftnets similar to those above and shore seines are mostly used.

The Chhoat, a carvel-built boat with raised stem and slightly over-hanging stern, has an average length of 10.4 m. This boat is also constructed of salwood. It is used mostly in north Babasore. It is used for fishing with driftnets and shore seines as well as encircling nets.

On the coastline further south i.e. South Cuttack, Puri and Ganjam districts, log rafts or kattumarams operate from the beach. They are locally known as Teppa. Other boats in the south are the bar boat and the Nava.

The length of the kattumarams ranges from 4.2 m to 8.5 m. They are made of three or four, sometimes even five bogs. The 2-section four-logged Teppas are boat kattumarams and have to be handled by three to four men, whereas the smaller ones are operated by only two. The solid bogs are the only source of buoyancy; wood of low density, such as *Albizia stipulata* and *Brithryna* sp. (the latter locally known as Padhua), is preferred. These crafts are the only solution so far developed for operating off the surf-beaten sandy beaches; they are used almost throughout the year, except during the rough season when the surf is not negotiable during the period April to August.

The main fishing gears are nylon bottom driftnets of 55 mm to 62 mm stretched mesh, measuring up to 400 m. Cotton boat seines and smaller meshed cotton driftnets of 20 to 40 mm stretched mesh for sardines and anchovies are also used.

The bar boat, locally known as Padhva, is made from mango planks (*Mangifera indica*) without frames, lengths ranging from 7 to 9 m. This craft is mainly used for beach seining.

Navas are plank-built boats bought from Andhra Pradesh and operated during the fair season for fishing mainly with driftnets up to 1200 m long.

All the craft, with the exception of the Nava, are built locally with simple tools. They have been developed over the centuries to suit local requirements and conditions.

The predominant fishing method throughout the coastline is drift gillnetting, represented on the northern coastline for example by the driftnet for shad (Phasi Jab and Ilishi Jab), the small-meshed driftnet (Bhasani Jab), the gillnet for prawn and small fish (Behendi Jab), the large-meshed shallow water gillnet (Nakuda Jab), the inshore seine-cum-gillnet (Khia Bada Jab) and the inshore encircling gillnet (Gheri Jab). Other nets in the north are shore seine (Sarini Jab), encircling net (Jangal Jab), and tidal wallnet (Mabo Jab).

In the south, there are such gillnets as the high-depth bottom-set gillnet for shrimps (Jagawala), bottom-set gillnets for shrimps (Kilumala or Silkiwala) and driftnets for sardines, anchovy and white bait (Katlala). Other fishing gears in the south are the boat seine (brrgali), handlines (Burdu and Kata), small bonglines (Suti), and beach seines (Bada Jab); two-man hand seines (Khadi Jab) are occasionally used by coastal fishermen.

All the traditional craft are non-motorized and their range of operation is limited to a coastal belt up to 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, leaving early in the morning and banding the same afternoon.

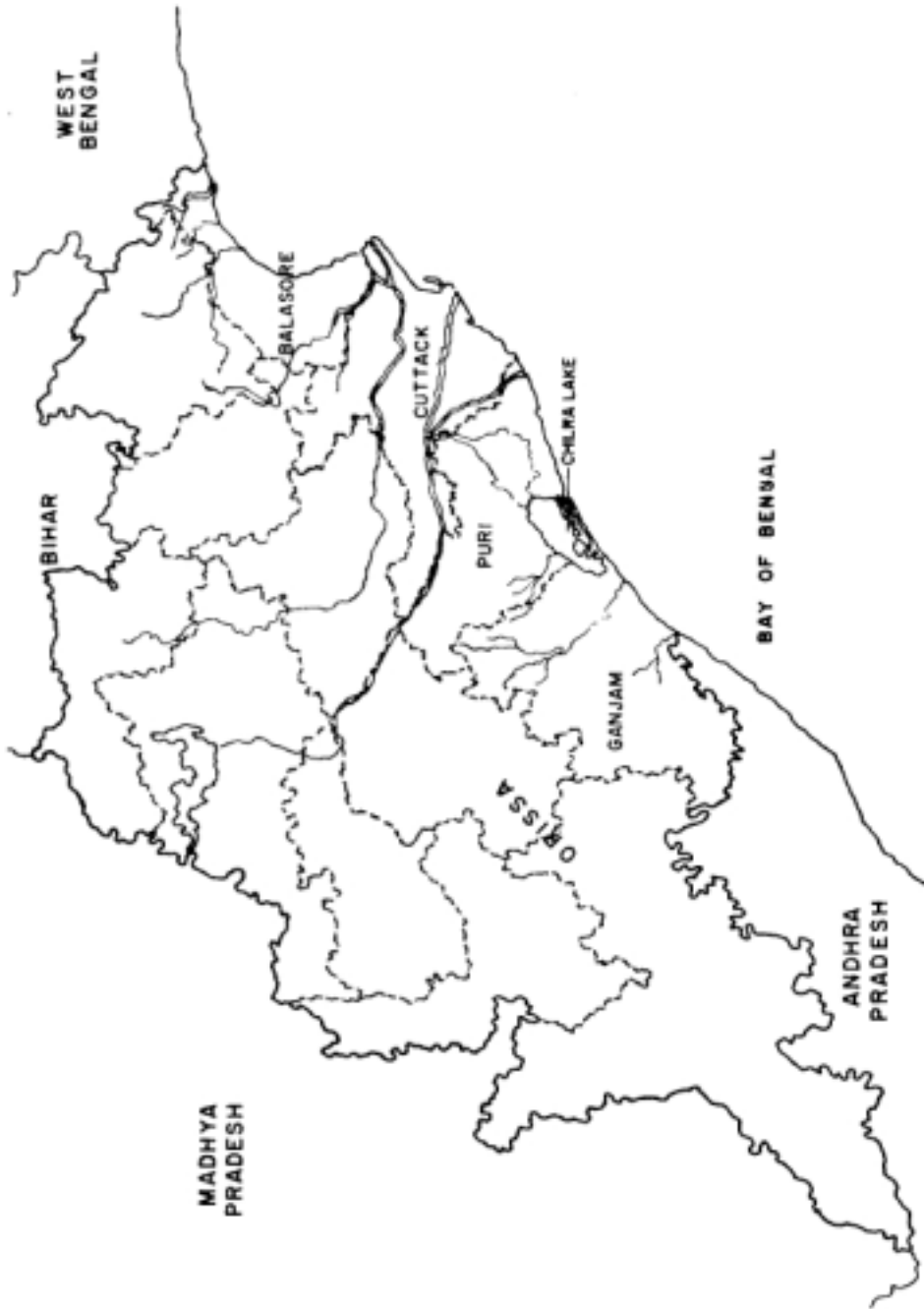
Technical improvement of the existing craft and gear can help improve the earnings and working conditions of the fishermen. Documenting details of craft and gear is essential to identify specific deficiencies and problems so that recommendations can be made regarding possible improvements and innovations.

This working paper summarizes the results of a study of the different types of craft and gear in use in the four coastal districts of Orissa.

The fishing gears are grouped firstly according to their technical name and secondly according to their local name.

While classifying the fishing gears, it was found that the same technical type of gear (for example a bottom driftnet), with only slight modifications in depth and mesh size, is called by different Oriya or Telugu names in different regions. Further, it was found that even the gears bearing the same Oriya or Telugu name differ from village to village as far as details of design, material and accessories are concerned. *Therefore the gears described in this paper should not be regarded as standard designs but just as examples.*

COASTAL DISTRICTS OF ORISSA





## 2. THE FISHING CRAFT

### 2.1 Displacement crafts of north Orissa

#### 2.1.1 Chhoat

<b>Wood</b>	<i>Shorea robusta</i> , sal
LOA range	10 m to 11 m
<b>Typical dimensions</b>	10.4 m x 2.41 m x 1.51 m
Construction	: Carvel planked, transverse framed
Planking	: 35 mm
Fender	: 30 mm x 50 mm deep
Frames	: Transverse 50x80 mm
Floor timbers	55 mm x 80 mm deep, each 50 mm in front of frames. Stepping block between 8th and 9th planks.
Thwarts	5, 160 mm x 50 mm thick. Ends slotted through planking.
Decks	: Fore deck 800 mm from stem, deck planking 25 mm with 110 mm x 40 mm deck beams. Aft deck 2.26 m from stern deck, planking similar to fore deck. Loose planks fitted to provide a temporary platform.
Sheer and bilge clamps	Sheer clamp 20 mm x 85 mm. Bilge stringer 20 mm x 50 mm, 500 mm below sheer clamp.
Mooring bits and thole pins	: 4th frame extended 360 mm above sheer as mooring bit, 760 mm x 50 mm thick thole pins 190 mm above sheer, two on either side.
Rowing oars	: Blade 900 mm x 140mm x 25 mm; bamboo shaft 3.66 m x 50 mm dia.
Steering oars	: Blade 2.3 m x 150 mm x 50 mm. Shaft 4 m x 180 m.
Mast	: 8.6 m x 200 m dia, wood.
Preservation	: Coal tar
Sail	: Rectangular, 6.4 m x 6 m, cotton.
Fishing area	: North Balasore, up to 25 km offshore.
Fishing season	September-October to March-April
Cost	: Rs. 9,000
Annual maintenance	: Rs. 900
Life	: 15 years

## 2.1.6 Sabado

Wood	<i>Shorea robusta</i> , sal
LOA range	9.75 m to 13.5 m
Typical dimensions	13.41 m x 2.41 m x 0.97 m.
Construction	Carvel, more sheer aft
Planking	67 mm, keel 200 mm wide, 67 mm thick, 75 mm in middle.
Fender and sheer clamp	2.25 mm x 75 mm.
Frames	62 mm x 62 mm
Floor timbers	62 mm x 75 mm thick, 100 mm at centre
Thwarts	15, 130—150 mm x 30 mm thick.
Thole pins and mooring	200 mm above sheer, 4 on either side, abaft pair for mooring.
Rowing oars	6, one piece wood, 3.20 m x 70 mm thick x 200 mm width but 75 mm of upper end, shaft 120 mm dia bamboo, extends 1 m beyond blade.
Steering oar	One piece wood, 3.50 m x 75 mm thick and 250 mm wide.
Mast	5.75 m x 160 mm dia. bamboo.
Preservation	Coal tar
Sail	4.5 m head x 4.3 m foot x 5.5 m buff x 3 m leech, sides reinforced with 6 mm PA rope; corners with extra 8 mm PA rope.
Fishing area	South Babasore and north Cuttack within 10 km and 25 m depth.
Fishing season	October to February
Cost	Rs. 9,000
Annual maintenance	Rs. 900
Life	15 years

### 2.1.7 Flat—bottom Danga

Wood	Shorea robusta, sal
LOA range	10m to 11m.
Typical dimensions	10.67 m x 1.05m x 1.07m.
Construction	Clinker.
Planking	: 25 mm, keel plank 100 mm thick.
Fender	: 20mmx20mm
Thwarts	: 8, 200 mm x 40—50 mm thick, below gunwale ends slotted through planking. Each thwart supported by two vertical pieces above floor timber and another transverse piece. Also two additional transverse pieces below thwart level.
Gunwale	: 125 mm wide x 60 mm deep, forms platform at aft.
Thole pins	: 4 to 6 places on both sides.
Rowing oar	: Blade 1.60 m x 130 mm x 50 mm thick in middle and 12 mm at sides. Shaft 1.70 m x 68 mm dia.
Steering oar	: Blade 1.30 m x 350 mm x 30 mm thick. Shaft 3.20 m x 350 mm dia.
Mast	5mx200mflldia.
Sail	: Thick cloth, rectangular 4 mx3 m.
Fishing area	: North Cuttack, inshore area within 5 km.
Fishing season	: November to March
Cost	: Rs. 8,000
Annual maintenance	Rs. 800
Life	: 10 years
Remarks	Primarily estuarine, adopted for sea by a few fishermen.

### 2.1.8 South Balasore Danga

Wood	: Shorea robusta, sal
LOA range	: 9m 10m
Typical dimensions	: 9.45 m x 2.03 m x 0.75 m
Construction	: Carvel
Planking	33 mm, keel 75 mm x 75 mm
Frames	: 40—45 mm
Floor timbers	40 mm x 100 mm deep, 50 mm behind frames.
Wash strake	: 200 mm above planking.
Sail	: Triangular
Mast	5.19 mx90 mm dia. bamboo.
Fishing area	: South Balasore, within 10 km offshore.
Fishing season	: October to February
Cost	: Rs. 7,000
Annual maintenance	: Rs. 700
Life	: 15 years

### 2.1.9 North Cuttack Dhingy

Wood	<i>Shorea robusta</i> , sal
LOA range	6m to 7m.
Typical dimensions	6.85 m x 1.54 m x 0.48 m.
Construction	Carved
Planking	25 mm, keel: 90 mm width.
Fender	25mm x 25 mm.
Frames	50 mm x 37 mm deep.
Floor timbers	50 mm x 37 mm deep, thicker in middle.
Thwarts	9, 300—400 mm x 30 mm, hole for mast in No. 4.
Decks	Fore deck, aft deck.
Wash strake	150 mm above sheer
Bilge clamp	18 mm x 75 mm deep.
Sail	Triangular, 7 m x 5 m x 5 m.
Fishing area	North Cuttack, within 2 km from estuary.
Fishing season	November to March
Cost	Rs. 3,000
Annual maintenance	Rs. 300
Life	8 years

### 2.2 Log rafts, bar boats and navas of south Orissa

#### 2.2.1 2-section boat kattumaram or teppa (four bogs)

Wood material	: <i>Abyzzia stipulata</i>
LOA range	: 6 m to 8.5 m.
Dimensions	: 8.3 m x 1.5 m x 0.54 m.
Construction	: Two halves. Each half comprising of two bogs with a wash strake. Both halves are lashed together with a crossbeam for additional stiffness.
Rowing oars & Steering oar	: 2.5 m x 90 mm x 50 mm, 30 mm at sides.
Sail	: Lateen about 8 m <sup>2</sup>
Fishing area	: Southern coastline, from Paradeep southwards, up to 15 km offshore.
Fishing season	: Almost all the year round, except during bad weather.
Cost	: Rs. 5,000
Annual maintenance	: Rs. 300
Life	: 4 to 5 years.

### 2.2.2 3-bog kattumaram

Wood material	<i>Erythryna indica</i> (alt <i>A/byzzia stipulata</i> )
LOA range	4.2mto5m.
Dimensions	<b>4.2 m x 0.76 m x 0.42 m.</b>
Construction	Three bogs lashed and pegged. Outer 250 mm wide, centre bog 200 mm wide but deeper.
Rowing oars & steering oar	1.7 m x 70 mm (40 mm at the edges) x 25 mm thick.
Mast	<b>4 m x 30</b> mm dia. bamboo.
Sail	Lateen rig
Fishing area	Up to 8 km offshore in the southern coastline.
Fishing season	Almost throughout the year, whenever surf is negotiable.
Cost	Rs. 3,000
Annual maintenance	Rs. 200
Life	3 years

### 2.2.3 4-bog kattumaram

Wood	<i>Erythryna indica</i> (alt <i>A/b yzzia stipu/ata</i> )
LOA range	4.5 m to 5.5 m
Dimensions	<b>4.8 m x 0.75 m x 0.40 m.</b>
Construction	Four bogs lashed and pegged. Inner logs 140 mm wide, outer logs 230 mm wide.
Rowing oars & steering oar	1.8 m x 70 mm (35 mm at the edges) x 25 mm thick.
Mast	4.5 m x 35 mm dia. bamboo.
Sail	Lateen rig
Fishing area	Up to 8 km offshore in the southern coastline.
Fishing season	Almost throughout the year, whenever surf is negotiable.
Cost	Rs. 1,200
Life	<b>3 years</b>

### 2.2.4 Bar boat/Padhva

Wood material	<i>Mangifera indica</i>
LOA range	7mto8.3m
Dimensions	<b>7.42 mx2.2 mx 1.14 m.</b>
Construction	Planks stitched to each other by coir ropes with straw caulking. No frames
Planking	<b>25 mm</b>
Thwarts	<b>6, 1 m to 2.2 m, the 4th largest.</b>

## 2.1.2 Patia

Wood	<i>Shorea robusta</i> , <b>sal</b>
LOA range	8.5 m to 10.5 m
<b>Typical dimensions</b>	<b>8.95 m x 1.81 m x 1.32 m</b>
<b>Construction</b>	Clinker, chine type, stem and stern nearly vertical.
<b>Frames</b>	<b>3, 85 mm x 120 mm</b>
Thwarts	9, 70 mm to 115 mm wide x 25 mm to 50 mm thick, excepting ninth, 270 mm wide.
Thole pins and mooring bits	Thole pins 4 on each side, 80 mm x 80 mm protruding 250 mm above sheer. One mooring bit 100 mm x 80 mm and 200 mm above sheer.
Rowing oars	Blade 800 mm x 130 mm x 25 mm, convex on one side, bamboo shaft 3.60 m x 50 mm dia.
Steering oar	Blade 2.20 m x 150 mm x 50 mm. Shaft 3.80 m x 175 mm dia.
Mast	8 m x 200 mm dia.
Preservation	<b>Coal tar</b>
Sail	Rectangular, 6.4 m x 6 m, cotton.
Fishing area	North Balasore up to 20 km.
Fishing season	September/October to March/April, also July and August when weather permits.
Cost	Rs. 8,000
Annual maintenance	Rs. 800
Life	14 years.
Ownership and financing	Individual, self-finance, sometimes from money lenders.

### 2.1.3 Dhingy

Wood	<i>Shorea robusta</i> , sal
LOA range	6m to 7m
Typical dimensions	6.5 m x 1.63 m x 0.97 m
Construction	Carvel
Planking	17 mm, 9 each side of keel, keel 80 mm wide, 80 mm deep
Gunwale	110 mm x 30 mm
Sheer clamp	120 mm x 20 mm
Frames	60 mm x 60 to 80 mm
Floor timbers	65 mm x 70 mm
Thwarts	5 nos 100 mm to 175 mm wide x 25 mm to 35 mm thick. Excepting 3rd, 230 mm wide with mast hole.
Thole pins	2 on either side 150 mm above sheer.
Rowing oars	Blade 1.01 m x 200 mm x 10 mm. <b>Shaft</b> to 4.5 m x 160 mm dia.
Steering oar	Blade 780 mm x 210 mm x 10 mm. Shaft 4.5 m x 45 mm dia.
Mast	4.57 m x 50 mm dia.
Preservation	Coal tar
Sail	Rectangular 6.4 m x 5.9 m, cotton, bamboo sprit 6.4 m x 30 mm dia.
Fishing area	Balasore, up to 10 km.
Fishing season	September/October to February/March.
Cost	Rs. 4,000
Annual maintenance	Rs. 400
Life	12 years
Ownership and financing	Individual and self-finance, also from banks with government subsidy.

#### 2.1.4 Danga

Wood	<i>Shorea robusta</i> , sal
LOA range	7.5m to 9m
Typical dimensions	8.3 m x 1.91 m x 1.26 m.
Construction	Clinker, chine type, near vertical stem and stern, maximum beam forward of midship.
Planking	25 mm. Plank overlaps by 60—70 mm. Keel 150 mm wide, 25 mm deep and 45 mm in middle.
Fender	25 mm x 25 mm.
Frames	80 mm x 135 mm
Thwarts	8, fixed below sheer. 116 mm—i 40 mm wide x 30 mm deep. First and eighth are smaller and larger respectively. Thwarts protrude outside planking.
Thole pins and mooring	4 pins on either side 200 mm above sheer and extending up to one plank below chine, 1 mooring bit 250 mm from sheer on port side.
Rowing oars	Blade 750 mm x 120 mm x 25 mm convex on one side, Shaft 2.75 m x 50 mm dia.
Steering oar	Blade 750 mm x 150 mm x 37 mm. Shaft 2.75 m x 160 mm dia.
Mast	7 m x 200 mm dia. bamboo.
Preservation	Coal tar
Sail	Rectangular cloth 5.5 m x 5 m, sides reinforced with 4 to 6 mm dia. PA rope.
Fishing areas	Balasure, up to 20 km offshore.
Fishing season	September to March/April, also July and August when weather permits.
Cost	Rs. 7,000
Annual maintenance	Rs. 700
Life	15 years



### 2.1.5 Salti

Wood	: <i>Shorea robusta</i> , sal
LOA range	7 m to 10 m
Typical dimensions	: 9.78 m x 2.08 m x 1 m.
Construction	Carvel
Planking	25 mm, keel 100 mm wide, 25 mm thick, 60 mm in middle.
Wash strake	: 150 mm above gunwale.
Fender and sheer clamp	: 15 mm x 50mm on both sides of wash strake and planking.
Frames	50 mm x 50 mm.
Floor timbers	: 19, 50 mm x 65 mm thick, 80 mm at centre.
Thwarts	: 9, 130—140 mm x 25 mm thick, excepting no. 4. 170 mmx60 mm with mast hole.
Decks	Fore deck 1.07 m from stem with transverse support. Aft deck 1.95 m from stern with similar support.
Thole pins and mooring	: 200 mm above shear, 4 on either side, abaft pair for mooring.
Rowing oars	: 6, one piece wood 2.96 m x 68 mm thick x 175 mm width, but 75 mm at upper end, shaft 100 mm dia extends 1 m beyond blade.
Steering oar	: One piece wood, 3 m long x 75 mm thick x 225 mm wide
Mast	: 5.19 m length x 90 mm dia. bamboo.
Preservation	Coat tar
Sail	: 4.1 m head x 4 m foot x 5.09 m luff x 2.8 m leech. Sides reinforced with 6 mm PA rope; corners with extra 8 mm PP rope.
Fishing area	: Balasore and north Cuttack up to 10 km.
Fishing season	: October to February.
Cost	: Rs. 5,000—Rs. 8,000
Annual maintenance	Rs. 500—Rs. 800
Life	: 15 years

Deck

Rowing oars

Steering oar

Mast

Preservation

Sail

Variation

Fishing area

Fishing season

Cost

Annual maintenance

Life

### **2.2.5 Nava**

Wood

LOA range

Typical dimensions

Construction

Planking

Frames

Clamp

Thwart

Decks

Rowing oars

Steering oar

Mast

Preservation

Sail

Fishing area

Fishing season

**Cost**

Annual maintenance

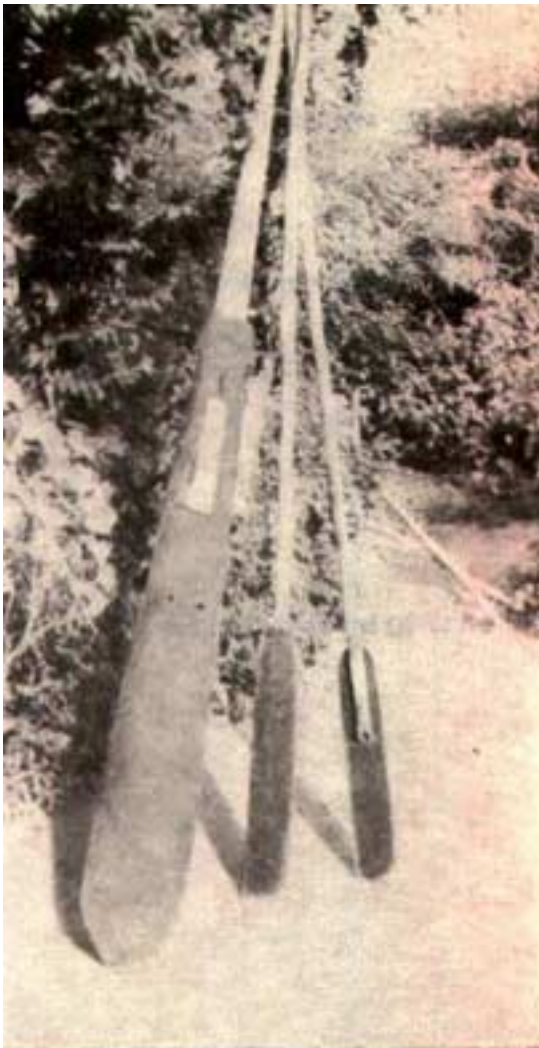
Life

ORISSA'S FISHING CRAFT IN PICTURES



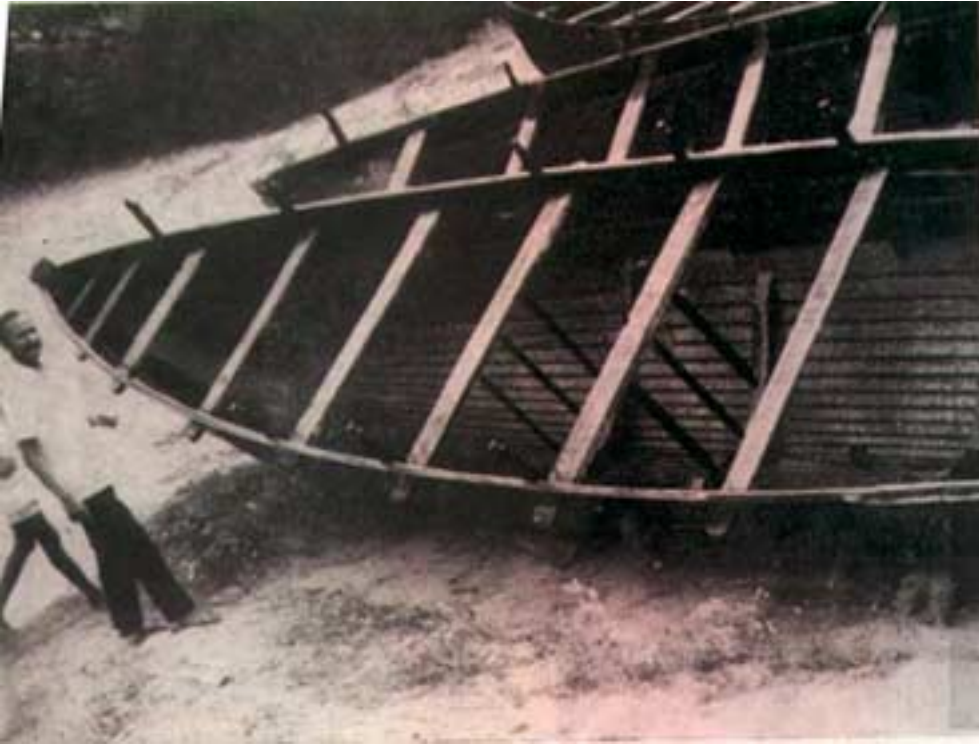
*Chhoat - side view*

*Steering oar and rowing oars*



*Chhoat*





Left: Patia—  
inner view

Below: patia—  
side view





*Dhingy: inner view*

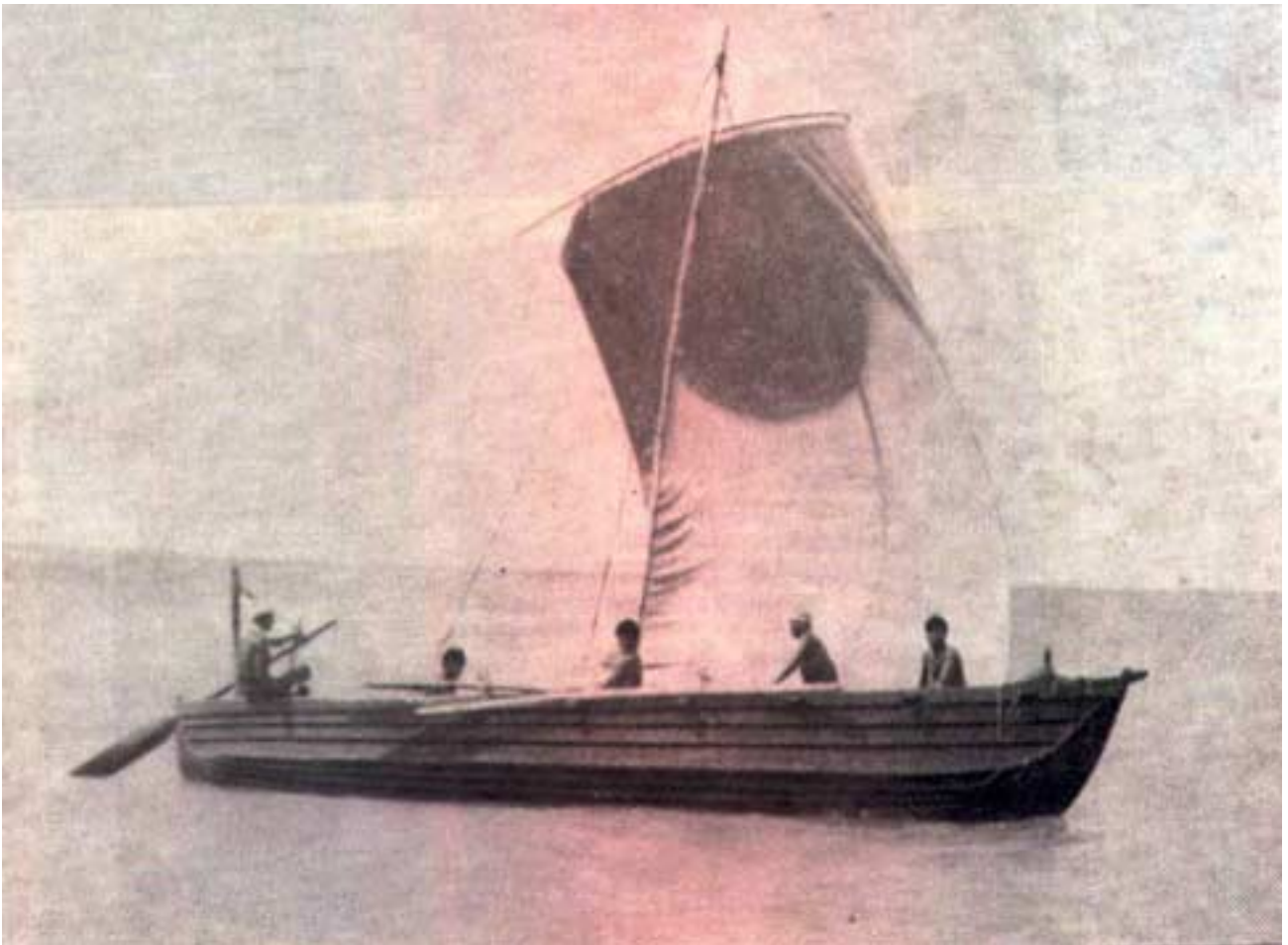
*A row of dhingies beached*





*Above: Danga—inner view.*

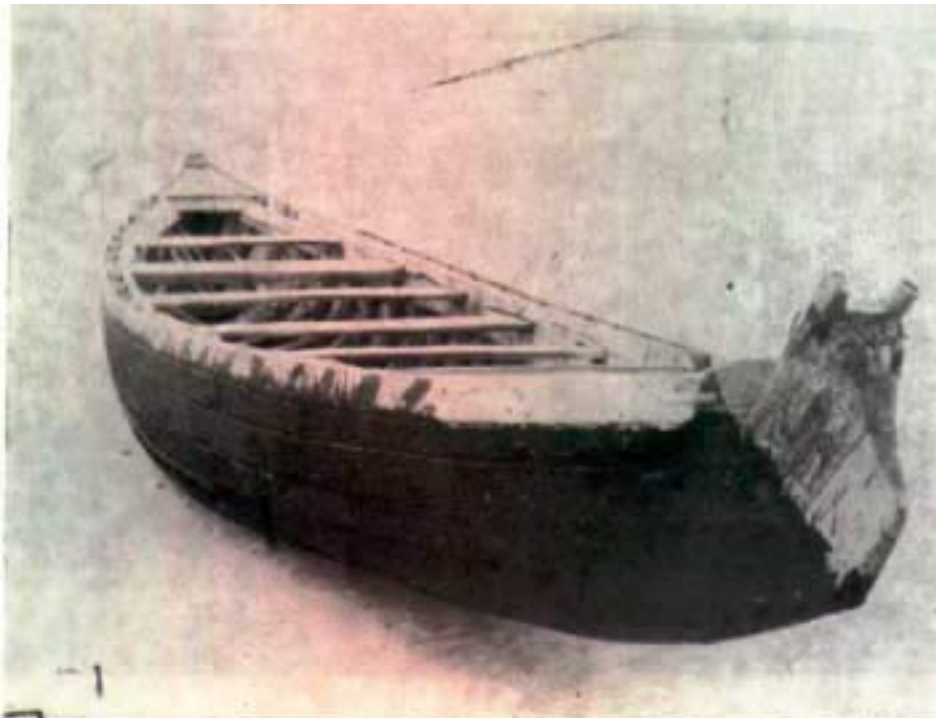
*Below: Dang4a with sail.*





*Above: Sabada*

*Right: Nava*





*Above: Padhva bar boat (side view).*



*Left: Safti*

*Two-logged kattumaram*

