

TRADITIONAL BOAT-BUILDING AND NAVIGATIONAL TECHNIQUES OF SOUTHERN ORISSA

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Abstract

The Ganjam district of Southern Orissa is known for its ports since early historical period to recent days, such as Ganjam, Gopalpur, Palur and Sunapur. Archaeological findings corroborate literary references of its overseas trade and commerce of the region. No written records on ancient boat-building and navigational aids of the region are available for the reconstruction of the technique of boat-building.

Boats of this area has been classified into two categories, namely planked and log boats. The construction pattern, size and material differed from those of other regions in India. The navigational proficiency of sailors and boat-building is also referred to.

The current boat-building techniques studied by the author is dealt with in this paper. Besides dealing with boat-building technology, the navigational pattern and the technical terms used and how the boat-building pattern is different from other parts of Ganjam district of Orissa and India are also discussed here.

Orissa has 529 km long coastline extending from subarnarekha.river in the north to Sunapur in the south (fig.1). The existing small scale boat-building industry of coastal Orissa has been inherited. The people of the littoral districts have been building boats for coastal transportation and fishing. The country crafts of southern region are different from those of northern region due to different

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geomorphological features of the coast. The main crafts of southern Orissa are raft-type Kattumaram called *Teppa*, plank built boat called *Padhua* and *Nava*. Kattumaram is very common all along the Southern Orissa and South India. *Padhua* and *Nava* are found in some pockets of Puri and Ganjam districts of Orissa. The Oriya fisherfolk of Southern Orissa are known as *Keotas* or *Kaibaratas*. They use *Padhua* and live in Sunapur, a minor port in 18th century under the Dutch rule in India. Sunapur served as harbour for anchorage and it is also a traditional *Padhua* building centre. An attempt is made here to analyse the construction pattern of *Padhua*, the navigational techniques and the terms used by the builders.

Sunapur as a Port

The Ganjam district of Southern Orissa is known for its ports such as Palur, Ganjam, Gopalpur and Sunapur (fig.2). Among them Sunapur located on the river Bahuda is under study. The river Bahuda was five metre deep and had a wide opening mouth, providing easy access for the small ships having capacity of one to two tonnes. These boats used to enter the river for berthing. The onshore exploration of the region revealed terra-cotta ringwells, glazed and Chinese ceramics of historical period. The temple of the goddess *Thakurani* and the Custom House are said to have been submerged during the flood of 1968, (A. Behera personnel communication). Even today the Dutch iron pillar served as a land mark is standing on the shore. In course of time river Bahuda has shifted towards north and its mouth became too narrow for the boats to enter. Consequently the port was slowly deserted.

Description of Padhua

Padhua is a flat bottomed craft (fig.3) used for fishing. In ancient times, *Padhua* also carried men and cargo from the harbour to the mother ship. Its carrying capacity is eight to ten quintals in terms of fish load. The approximate cost of *Padhua* is about eight to ten thousand rupees and it takes 20 to 28 man days to build. *Padhua* -builders are illiterate and their skill of building is passed on through generations.

Construction of Padhua

The chief carpenter gives oral instructions to his assistants regarding the size of different parts. The annual maintenance cost of *Padhua* is four hundred rupees and it serves for four to five years. It can be rowed by oars and has no sails. It is operated within 15 to 20 fathoms depth, (Mohapatra, 1986).

Padhua is simple in construction and without keel and frame. The general dimension of *Padhua* is 8m in length, 2.5m in breadth and 1.5m deep. The thickness of each plank is 5cm. The dimension of different parts of *Padhua* are to be in proportion to the length of the lower most plank. All the plank and the wooden shaft are stitched both on the interior and exterior. The *Padhua* of Coromandal coast is similar to Sunapur, (Hornell, 1920).

Selection of Raw Material

The builders of *Padhua* are supplied with wood, preferably teak, by the local forest department. But due to scarcity and high cost of teak the builders prefer mango (*mangifera indaca*) and sal (*terminalia tomentosa*) which are strong and durable in seawater. Jamun (*syzyquim cumini*), nilgiri (*eucalyptus sp*), tamarind (*tamarindus indicus*), berry (*zizupus zizuba*) and casurina (*casurina sp*) are other types used for planking.

The building activity of *Padhua* starts with the laying of the lower most plank, (*Ara*). The bottom of the *Padhua* is flat. Two other lower planks (*Magaba and Nengutu*) are stitched with the central log (fig.3). These planks are narrower at the fore and aft side. The construction of the bottom part is completed after stitching the three logs together (fig.3). Afterwards, the stem post and stern post (*Manga*) are stitched with the central log. Occasionally wooden chips are used for further strengthening of the bottom. Planks are laid edge to edge beginning from the bottom. There are no ribs and frame to reinforce the hull. Three planks are stitched with the hull on each side (fig.4). The lower most side plank (*Munda Marugu*) extends up to stem and stern posts, and bent

near the stem to form the bow. The second side plank (*Anda Marugu*) is stitched with the lowermost plank, and the third side plank (*Meram*) joined with the second plank for reinforcing the body of the *Padhua* (fig.4). Afterwards, seven horizontal casurina shafts (*Uari*) of different sizes are tied across to the third plank to provide additional strength to the *Padhua* (fig.5). Four wooden pegs (*Uti*) are tied to these casurina shafts at four places where oars are tied for rowing. Another plank (*Pati Bala*), tied at the horizontal shaft, is used for sitting. The deck consists of three planks stitched to the top plank of the stern which is meant for keeping cargo (fig.5).

Sewing

The sewing of planks of boats in southern Orissa is similar to that of Andhra Pradesh. It is difficult to date the sewing method in India as it prevails since ancient past. Periplus mentions the use of sewn crafts in Persian Gulf ports and in Egypt (Schoff, 1974). Dry grass and coir fiber (*Nuluka*) are used for sewing the craft with needle (*Aranamupula*). As the region falls in surf beaten zone, sewing crafts are more useful than the nailed crafts. Generally, the sewing crafts starts from the amidship. When the planks are to be stitched, holes are made in the planks by hand-drill bits (*Agara*) at regular intervals of 4 inches. Metal needle of standard size with a double lined coir are inserted in the eye of the needle, and then the sewing starts. The sewing starts from hole 'A' of the lower plank from outboard inserted in hole 'B' of the upper plank, then diagonal opposite to the first inserted hole 'A'. The needle is now inserted into hole 'C' which is opposite to 'A'. The outboard receives and inserts through the lower plank opposite to 'B' which received and passing through the hole 'E' in the upper plank of the inboard. Again, the needle is inserted and passed through the hole 'D' in lower plank which is again inserted and passed through hole 'B' in the upper plank (fig.6). The look of the sewing from in board will be like some lines over the plank where, as outside, the sewing will be like horizontally placed 'X' with two side lines. The sewing crafts of Sunapur is different from the nailed crafts of southern Orissa (Raut and Sila, 1993).

Water Proofing

Dry grass and straw are used as water proofing material for the *Padhua*. Water proofing material is used in between each joint and in the holes. *Sundikaya*, a tool, is used to put water proofing material inside the holes.

Oar

The Oar is known as *Kahala*. *Padhua* is rowed by five oars which are 3.5m to 4.5m in length. *Kahala* are named as *Tala Kahala*, *Mara Kahala*, *Pakahala*, *Paru Kahala* and *Tandel Kahala*. The blade of the oar is known as *Reku*. It is triangular and circular in shape (fig.5). Steering (*Tandel Kahala*) is done with a long and strong paddle suspended in a coir grommet from the projecting head of stern post.

Preservation and Decoration

Coal tar is used to preserve the *Padhua*. This work is generally carried out during off-season. Occasionally lime, red ochre and white coloured varnish are also used along with other colours to protect the *Padhua* from the marine borers. It is decorated with a national flag and painted with diamond symbols, sea animals and the mother goddess. The coir used for sewing is changed every year.

Navigational Techniques

The navigation and fishing method depends upon the physical structure of the coast. The southern coastline of Orissa has wide surf-beaten shores and sandy beaches like southern India. The navigators of Sunapur possess sound knowledge of wind, wave, current and tides.

Wind

Wind plays an important role in the life of the sailors and boat. The southern Orissa mariners have the knowledge of eight types of wind

which are locally known as *Darigali* (west), *Faigali* (east), *Turpgali* (north), *Parotogali* (south), *Molagali* (northwest), *Turppagali* (northeast), *Wadagali* (southwest), and *Salcumpaigali* (southeast) (fig.7). Probably these local terms have been derived from Telugu. *Darigali* and *Faigali* blow between October to February. *Darigali* blows in the night and morning which helps fishermen to move into the sea. *Faigali* which blows during day in the evening helps to return from the sea. *Molagali* blows during December. *Turppaigali* generally blows from November to January and hinder the sailors going into the sea (Cunningham et. al., 1985).

Tide

The Influence of the moon on the tides are known to most of the fisherfolk. The ebb tide or low tide is known as *Ganya* or *Sukhani* while spring tide or high tide as *Pura Pania*. Tide is helpful for towing the *Padhua*.

Current

The Current is known as *Sua*. Two currents prevail in the Bay of Bengal throughout the year. The northeast current flows from January to July, and the southwest current from August to December (Fairbridge, 1966). The surface currents prevail due to wind. Fisherfolk of this region are aware of four types of currents generating from four directions such as *Turupuodi* (north), *Tendodi* (south), *Karakutodi* (east), and *Newarodi* (west), (fig.8). *Turupuodi* is the north current flowing from October to January bringing good catch of fish. *Tendodi* follows the *Trupuodi* and flows during March to September but *Karakutodi* and *Newarodi* currents prevail during the rest of the period.

Future Prediction

Fishermen predict a cyclone in a day or two if dark clouds are seen in the northeast or the northwest. Particularly cyclones are expected if jelly fishes are entangled in the nets. The sound of breaking waves

in the near shore region is also an indicator of a cyclone. Cyclones are also predicted if crabs float and heads of the fishes are seen on the surface of the water.

Depth Measurement

The people of Sunapur estimate the depth of the water by seeing the colour of the water, and measure the depth with a bamboo. Their routine work helps them to know the depth at different places in the sea.

Calculation of Time

Fisherfolk of the region calculate their time by observing the position of the Sun, Moon and Stars. They opine that morning star *Kuana tara*, *Kurtika tara*, *Punji tara* would be seen at about 3 to 4 a.m. in the east. Two *Badaddeulia tara* are seen in north sky about 10 p.m to midnight and *Sanjua tara*, the evening star in the west between 7 p.m to 9 p.m.

Rudder Operation

In traditional crafts rudder is common but in the case of *Padhua*, the *Tandel Kahala* serves as rudder. The *Tandel* controls the crafts and changes the direction according to the wind, wave and current. Usually an experienced fishermen acts as the *Tandel* of the *Padhua*.

Results and Discussions

The design and construction of sea crafts have a long history but literary reference and archaeological evidence for ascertaining the origin of the vessel and craftsmanship are lacking. Sewn crafts bear the load of waves and, hence, are preferred in sandy beaches and open surf-beaten coastline of southern Orissa. Nailed crafts are not suitable for this environment. As there are no nails, *Padhua* does not corrode by the sea water. The nailed crafts may crumple on the open surf beaten regions due to wave thrusts. This vessel is generally used throughout the year except in rough weather. Statistics also show that the use of *Padhua* is greater in Ganjam than in Puri and Cuttack districts.

Planked boat is more popular than the *Kattumaram* and *Nava*. The *Padhua* is the result of greater experience in building bigger vessels for more comfort and large capacity. The *Padhua* of Sunapur have no sail or keel but those in Andhra and Karnataka coasts have keel and sails. The modern vessels have changed the traditional crafts in neighbouring provinces, but *Padhua* of Sunapur is still in demand and retains its past glory.

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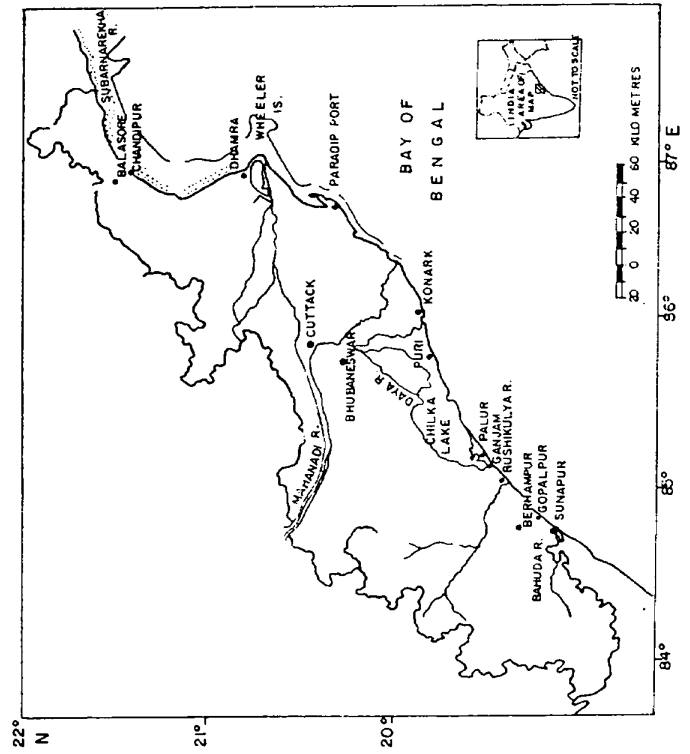


FIG.1. SHOWING THE STUDY AREA

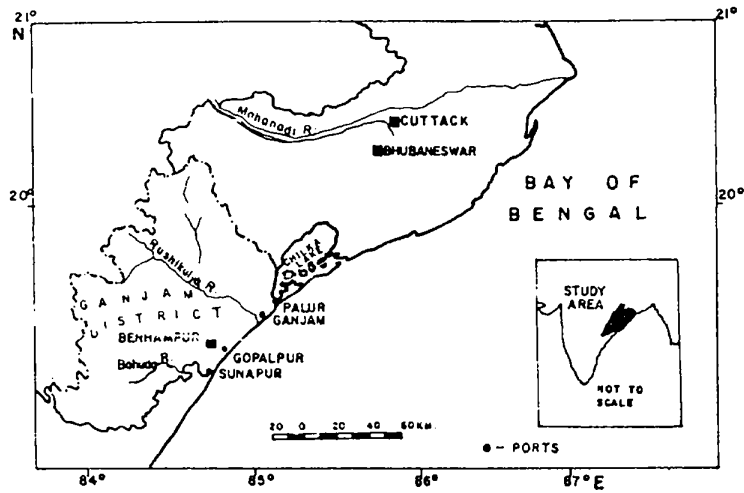
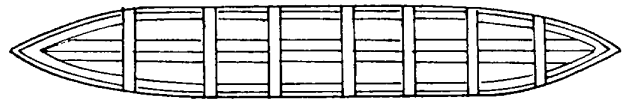
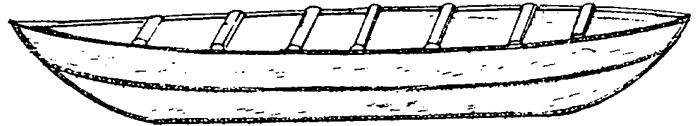


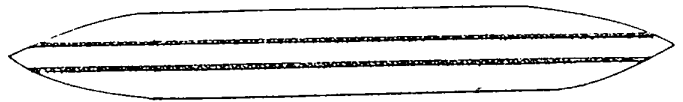
FIG. 2. SHOWING THE PORTS OF SOUTHERN ORISSA

PADHUA

TOP VIEW



SIDE VIEW



PLAN

FIG. 3. VIEWS OF PADHUA

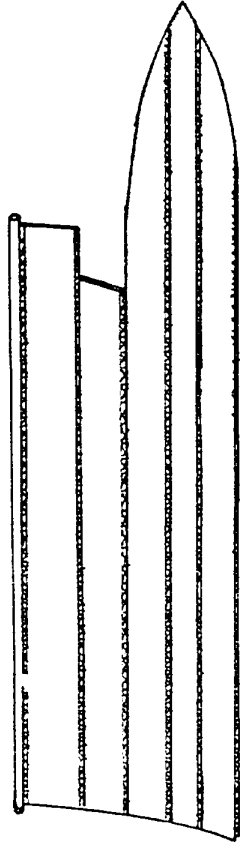


FIG. 4. Joining of Planks, Pothua

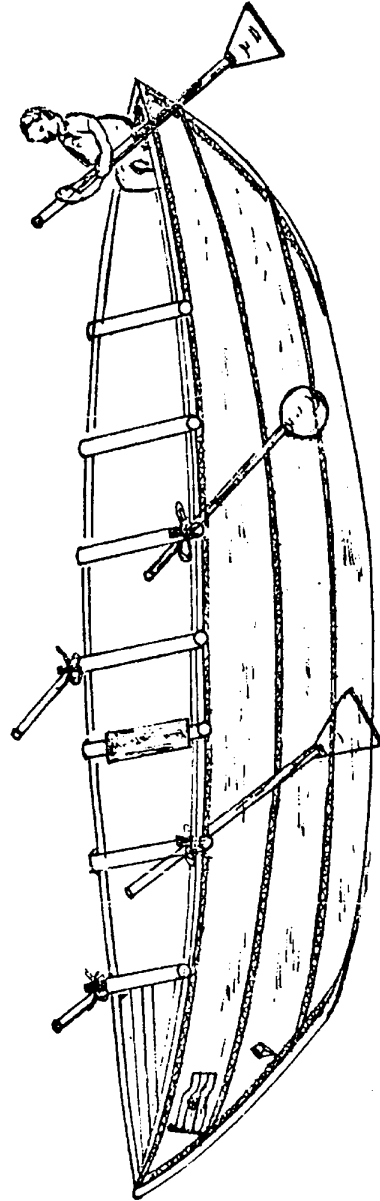


FIG: 5. ARTISTIC VIEW OF PADHUA

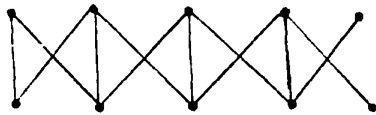


FIG: 6. SHOWING THE SEWING PATTERN OF PADHUA.

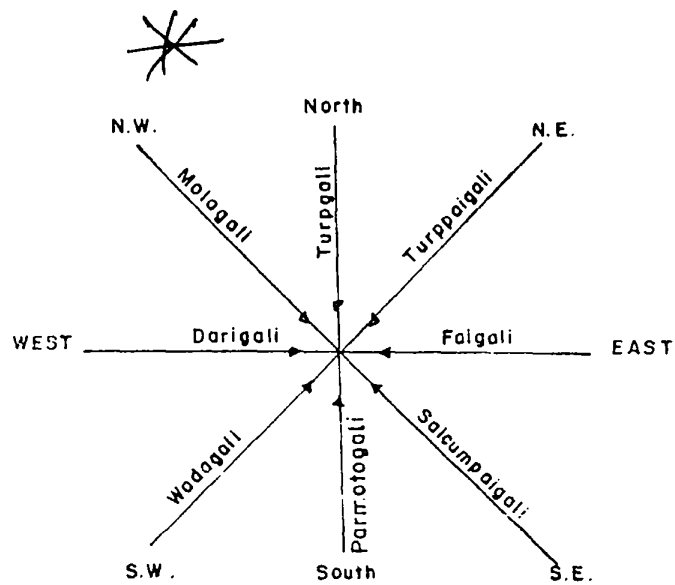


FIG:7. Diagram shows the blow of wind from all directions.