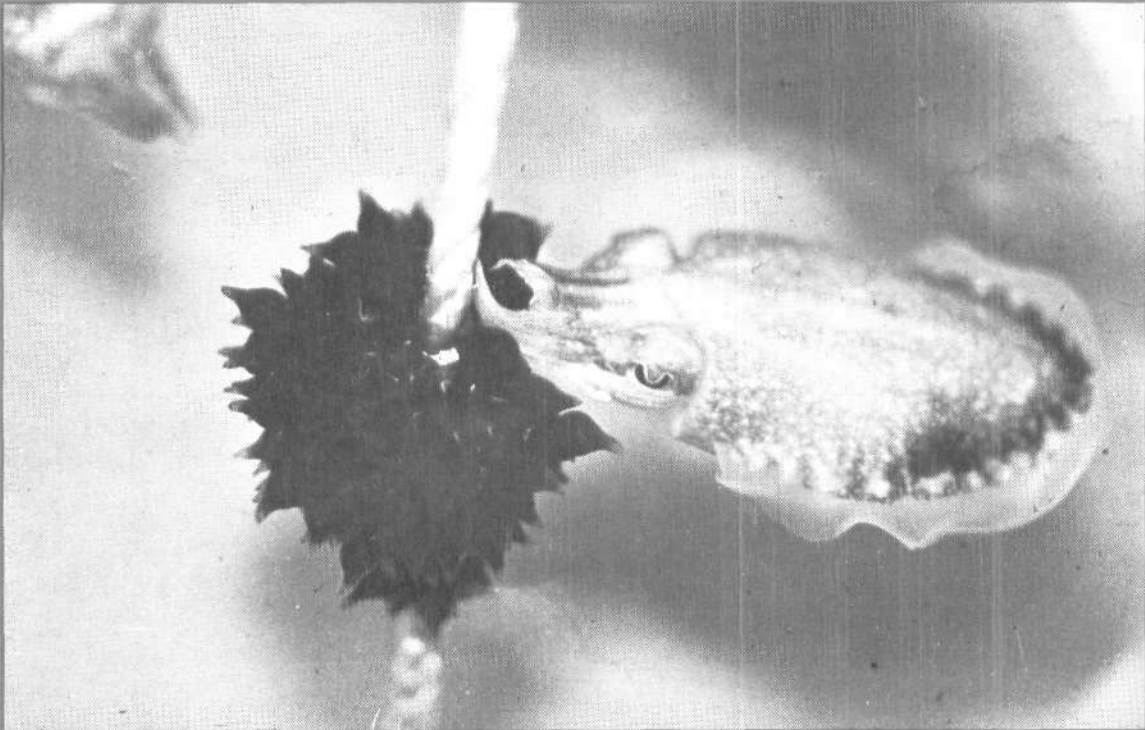




# समुद्री मात्स्यकी सूचना सेवा MARINE FISHERIES INFORMATION SERVICE

No. 159

JANUARY, FEBRUARY, MARCH 1999



तकनीकी एवं TECHNICAL AND  
विस्तार अंकावली EXTENSION SERIES

केन्द्रीय समुद्री मात्स्यकी CENTRAL MARINE FISHERIES  
अनुसंधान संस्थान RESEARCH INSTITUTE  
कोचिन, भारत COCHIN, INDIA

भारतीय कृषि अनुसंधान परिषद्  
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

## 893 CRAFTS AND GEAR USED FOR MARINE FISHING ALONG THE ANDHRA PRADESH COAST

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Until the middle of nineteen sixties fishing for marine finfishes and shellfishes along the Andhra Pradesh coast used to be carried out employing indigenous non-mechanised crafts. Subsequently trawlers and later mechanised vessels operating gillnets came into use which resulted in the increased fish production. Use of outboard engine on indigenous crafts for reaching fishing grounds is a recent feature of near the coast fishing. The different kinds of non-mechanised and mechanised crafts and gear employed in the region are dealt with in this article.

### Non-mechanised crafts

**Theppa (Catamaran):** It is a simple type of craft consisting of three to five wooden logs tied together firmly with hemp rope near the front and back ends. The size of the theppa varies from 4.2 to 7.6 m. Theppas are the most suitable craft for the Andhra coast where there is strong wave action. The theppas are operated with oars and sail. Drift gillnets, bottom set gillnets, disco nets, boat seines and hooks and line are operated from this craft.

**Nava/Kakinada nava (Plank built non-mechanised boat):** This is a wide wooden boat built using wooden planks and strengthened with wooden frame or ribs. It is a flat bottomed boat. The common Nava measures 9.45 m, in length, beam 2.10 m, and draught 0.85 m. These crafts are operated with oars and sail in the open and far off waters. Drift gillnets and bottom set gillnets are operated from these crafts.

**Padava/Kuttupadava (Masula boat):** These are wooden boats built with light wooden planks without frame or ribs. The planks of the boat are tied together with rope. The boats which can withstand heavy waves are 3-12m in length and are operated in inshore waters using oars. Shore seines and gillnets are operated with these crafts.

**Dhoni (Shoedhoni):** This is a peculiar craft made of teak wood planks and is shoe shaped with wide flat forward, short stern and bow section strongly flared. Small keel is fitted in the fore front. The dhoni measures 7.60 m, in length. It is propelled by paddling or pushed by long bamboos or sail. These crafts are operated only at Kakinada Bay with stake nets.

### Mechanised crafts

**Mara nava (Mechanised Kakinada nava) (Fig. 1):** These are teak wood navas fitted with 10 H.P inboard engine which can steer the craft in the forward direction only. There is no rudder in this motorised nava but a lengthy oar is used as rudder to change the direction of the boat. A suitable metal propeller is fitted to the stern portion to propel the nava. A mast and sail are provided in these navas as reserves and are put to use in emergency. The navas conduct fishing using synthetic drift gillnets.

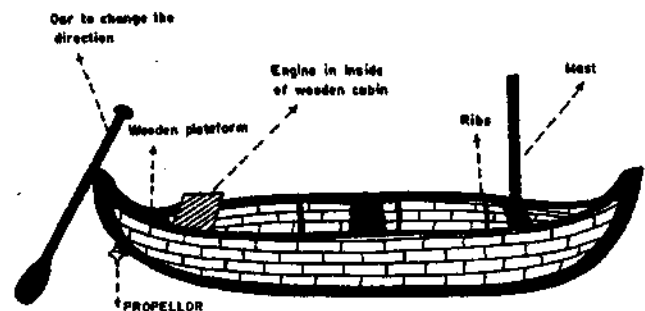


Fig. 1. Mara Nava (Mechanised Kakinada nava).

**Mara Padava (Mechanised fibre - glass boat) (Fig. 2):** These are built with synthetic fibre-glass material, have flat bottom and are fitted with 10 H.P inboard diesel engine. The length of the boat is 8.45 m, beam 2.27 m, depth 0.828 m, and draught 0.45 m, and has a gross tonnage of 2.5 t. There is no gear system to reverse the boat. A mast and sail are provided in this craft as reserves and used if the engine fails.

The boats use synthetic drift gillnets for fishing. These crafts are manned by four fishermen. The boat does not require any jetty or wharf facilities to land.

**Mara theppa (Mechanised fibre- glass theppa/Mechanised fibre- glass catamaran):** These are theppas or catamarans fitted with 6.5 H.P. outboard engine to conduct fishing at distant fishing grounds using different meshed synthetic drift gillnets. The crafts are built with fibre- glass. The length of the craft is 8.50 m, width, 1.85 m, width at the engine fitting place 0.80 m, width in the front of the craft 0.30 m, and depth of fish hold 0.90 m. These fibre- glass theppas (fibre - glass catamarans) are operated throughout the year.

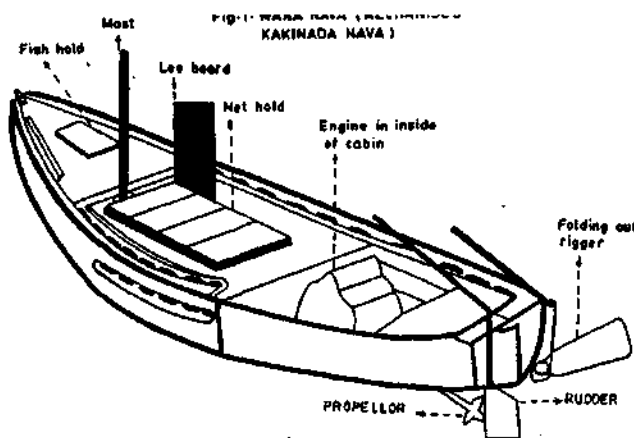


Fig. 2. Mara Padava (mechanised fibre - glass boat).

**Gillnetter :** The mechanised gillnetters are wooden pablo type boats of 9 m, in length and fitted with inboard engine. They are operated in deeper and distant fishing grounds to catch quality fishes. These gillnetters use synthetic drift gillnets of larger meshes.

**Royya boat, Sorrah boat and Sona boat (small mechanised boats) :** These are wooden boats which operate shrimp trawls. The Royya boat is 9.6 m, in length, beam 2.9 m, draught 1.07 m, and is fitted with an engine of 63-68 H.P. The length of Sorrah boat is 11.2 m, beam 3.2 m, and draught 1.25 m, with an engine of 68-93 H.P. The length of Sona boat is 13.1 m, beam 4.1 m, and draught 2.8 m, with an engine of 100-120 H.P. These small mechanised boats

carry ice in the fish hold to keep the catch fresh. They are provided with engines of sufficient power to tow the net at the appropriate trawling speed and are fitted with trawl winches and equipment necessary to haul the net onboard and lift the cod-end of the net over the deck.

Royya and Sorrah boats conduct voyage fishing lasting 3-5 days whereas Sona boats go for 10-12 days. Good quantities of fish, prawns, cephalopods and crabs are caught by these boats using shrimp trawlnets. These are generally operated along the Andhra coast and fish in the depths ranging 10-70 m.

**Mini trawlers :** These are mini trawlers made of wood and the overall length is 16 m, breadth 5.08 m, and draught 2.15 m, fitted with an engine of 145 H.P. They do not have freezing facility. They carry ice in the fish hold and store the catch in ice. They can stay for 10-15 days during voyage fishing. The vessels operate two identical shrimp trawl nets simultaneously from the outriggers on both sides of the boat for prawns. A good quantity of fish and cephalopods are also caught. These are generally operated between Pentakota in the south of Visakhapatnam and Sunderbans in the north including the vast area of Sandheads. These vessels generally fish in the depth range of 40-80 m.

**Big trawlers / Large trawlers :** These are steel trawlers with an OAL of 23.19 m, breadth 7.33 m, and draught 3.08 m, fitted with 380 H.P. diesel engine. The vessels are provided with sophisticated fishing and navigational equipments. They have freezing facility onboard the vessels and can stay at the sea for 18-28 days during voyage fishing. They operate two identical shrimp trawls simultaneously from outriggers on both sides of the vessel. They conduct fishing for about 15-20 hours daily with a duration of 6 hours per haul. These vessels conduct aimed trawling for penaeid prawns. However, a good quantity of fish and cephalopods are also caught. These vessels are operated between Pentakota in the south of Visakhapatnam and Sunderbans in the north including the vast areas off sandheads. These vessels generally

conduct fishing in the depth range of 40-80 m.

**Big trawlers Large trawlers ("A.S.I. model" Trawlers) :** These are steel trawlers with an OAL of 24.95 m, breadth 7.44 m, and draught 2.8 m, fitted with 500 H.P engine. These vessels are provided with sophisticated navigational and fishing equipments. They have freezing facility on board the vessels and could stay at sea for about 2 months during voyage fishing. These vessels operate four identical shrimp trawl nets simultaneously from the outriggers on both sides of the vessel. The mode of operation, fishing duration and area of fishing are the same as given for the other big/large trawlers.

### Artisanal gear

**Pedda Vala:** The Pedda vala is a shore seine fabricated with cotton twine (Fig. 3). A

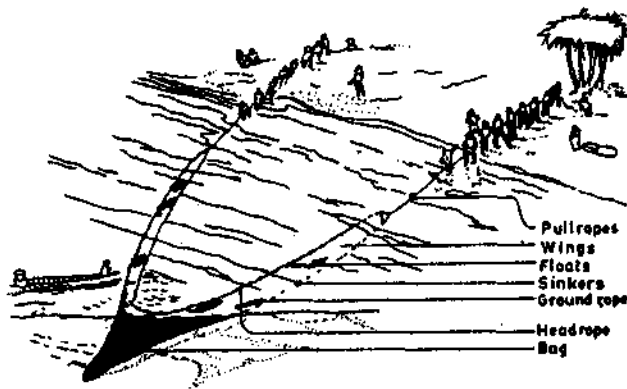


Fig. 3. Pedda vala (shore seine).

funnel shaped netting with a mesh size of 2 to 3 cm, forms the mouth and central portion of the net. A rectangular bag of 18 m length and 9 m width with a mesh size of 1 cm is attached to the tapering side of the funnel shaped netting. Two wings of coir rope each 450 m, in length are attached to either side of the mouth. Outer rope of 600 to 800 m, in length is tied to each wing at the time of operation of the net. Wooden floats are tied to the head rope and stones to the foot rope to get vertical spread of the net. The net is shot near the surf beaten shore from a Kuttupadava known as Masula boat and a fish shoal is covered by rowing the boat in a circle

and trapped. Afterwards the net is dragged towards the shore by two groups of fishermen. The duration of each haul is 2 hours. *Stolephorus* spp., sardines, carangids, mackerel, *Thryssa* spp., seerfishes, ribbonfishes, silverbellies, mullets etc. are caught in these nets. These nets are operated from November to April.

**Alivi vala:** This is a shore seine made out of a number of pieces of cotton nets. The length and width of the net are 540 and 13.5 m, respectively. The mesh size at the central portion of the net is 1.6 cm. Two pieces of webbing with a mesh size of 3.2 cm are tied to either side of the central portion of the net. The warp is made up of coir rope of about 800-1,000 m. The head and foot ropes are coir made. Wooden floats to head rope and cement sinkers to the foot rope are attached to obtain vertical spread of the net. The net is shot near the surf beaten shore from a Nava (plank built boat) and by rowing round in a circle, a fish shoal is encircled and trapped. Afterwards the net is dragged towards the shore by two groups of fishermen. The duration of each haul is 4-5 hours. Sardines, carangids, *Stolephorus* spp., mackerel, *Thryssa* spp., seerfishes, ribbonfishes, silverbellies, mullets etc. are caught in these. These nets are operated from November to April.

**Nylon alivi vala :** This is a shore seine fabricated with nylon twine. This shore seine enables the fishermen to catch more fish than the ordinary one. The light weight of the net facilitates easy operation and handling. The time required for operating the net also is less. In this way the fishermen can increase the number of hauls during the time of visibility of fish shoals. The transparent twine makes it invisible to the fish and therefore chances of fish escaping from the net are also less.

The nylon alivi vala consists of 61 webbed pieces laced together, each piece being of different dimensions to give an almost tapering finish to the net from the centre to both ends. The total length of the net is 507.6 m. A large marker buoy is attached to the centre piece for locating the net in the sea. Cement sinkers are

attached to the foot rope and synthetic floats to the head rope. Two wooden sticks of 50 cm length are tied to each end of the foot and head ropes.

Fishing is done at depth of 10- 15 m. The fishes caught in this gear are pelagic fishes such as *Sardinella* spp., mackerel, *Stolephorus* spp. and other clupeids, carangids, silverbellies and penaeid prawns like *Metapenaeus dohsoni*. These shore seines are operated from October to April.

**Iraga vala :** This is a boat seine consisting mainly of three parts i.e. two wings and a short wide mouthed bag called *vala* made of cotton twine netting (Fig. 4). The two long wings are attached on either side of the mouth. A stout

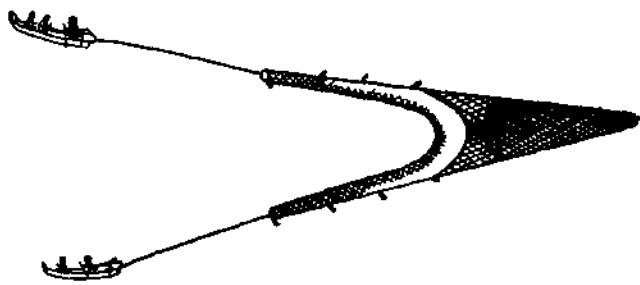


Fig.4. Iraga vala (boat seine).

rope is attached to the free end of each wing, with the other end on board the craft. The length of each wing is 45 m. The cod end portion of the net is more or less with a uniform mesh size of 1 cm. The length of the bag is 17 m. Synthetic floats are tied to head rope and cement sinkers to foot rope. Nylon rope is attached on each side of the wing during operation. The mouth of this net is kept stretched by two theppas (catamarans) sailing in a parallel course at an appropriate distance apart. The net is first shot across the current. The catamarans then turn about, row parallel to each other in the direction of the current while the net is dragged along the sea bottom. Ribbonfish, prawns, silverbellies, sciaenid, white bait and other fishes are caught in these nets. Generally these nets are operated from February to May.

**Kavvalla vala/Katla vala/Vaddivala:** The theppas conduct day fishing using these synthetic sardine gillnets with varying mesh sizes

i.e. 18, 20, 23, 25, 28, 30, 33 mm. The length of these gillnets varies from 165 to 250m, with 700 to 1,000 meshes vertically (Fig. 5). Each net

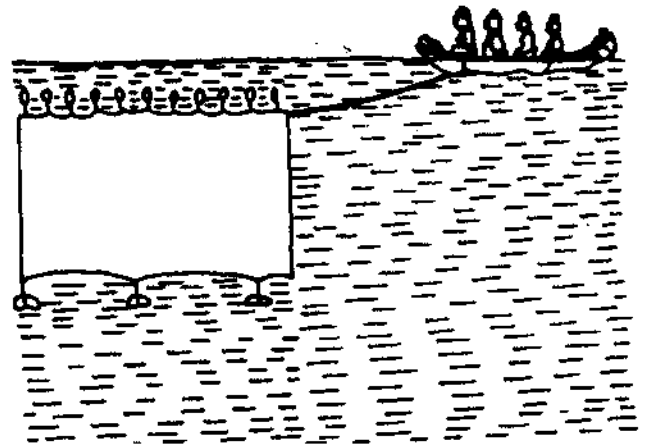


Fig. 5. Kavvalla vala / Katla vala / Vaddi vala (Sardine gill net).

consists of a single piece of webbing with uniform mesh size. The net is fabricated with count No. ½, transparent, dark green coloured monofilament twisted twine. Stone sinkers are used to keep the net vertical in water. These sinkers are tied to the foot rope and thermostat floats are tied to the head rope. The operation of this net is similar to any other gillnets and the duration of fishing is 2 to 3 hours. The pelagic fishes passing through these nets get gilled. *Sardinella* spp., *Dussumieria* spp. and *Thryssa* spp. are caught in these nets. These gillnets are operated from October to June.

**Disco vala :** This is a three-walled synthetic nylon trammel net designed for setting at the sea bottom (Fig. 6). It has an inner fine net

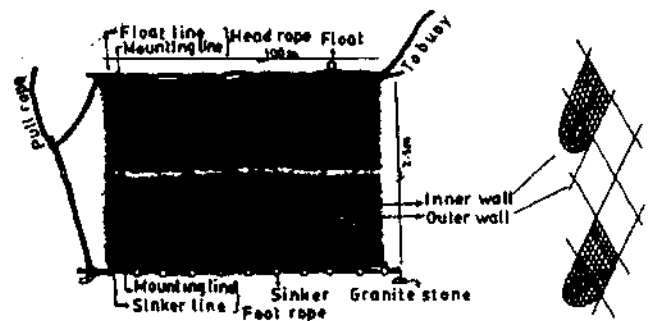


Fig. 6. Disco vala (Trammel net).

of smaller meshes (4 cm) hung loosely between two outer vertical walls of coarser net of much

larger meshes (26 cm). All the three layers of webbing are tied on a single head rope and foot rope. This net is operated by 3 to 4 fishermen from a single catamaran. These nets are used throughout the year to catch larger prawns and demersal fishes.

**Naram vala :** It is a rectangular shaped monofilament drift gillnet used to catch fishes swimming in midwater or near surface layer (Fig. 7). The net is drifted by the force of the

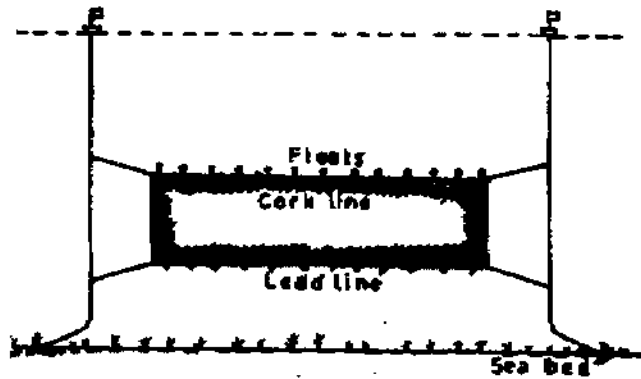


Fig. 7. Naram vala (drift gill net).

wind or current. During operation, one end of the net is tied on to the theppa. A buoy is tied to the net to indicate the location of the net. The entire net has a uniform mesh size of 4 cm. The fish passing through the net and other shoaling fishes are caught in these nets. These nets are operated throughout the year.

**Silk vala/Nylon vala :** This is a bottom set gillnet mostly used for catching demersal fishes (Fig. 8). In this net more number of

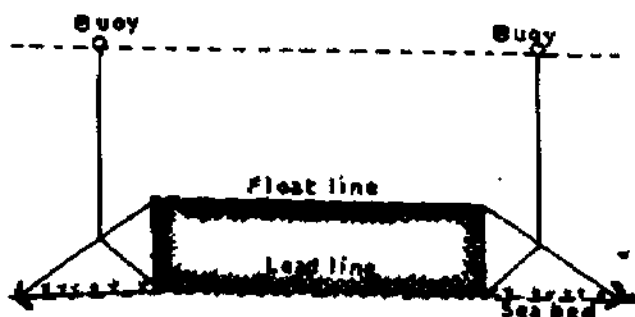


Fig. 8. Silk vala / Nylon vala (bottom set gillnet).

cement sinkers are attached to foot rope to keep the net in position. Generally, the length of the

net ranges from 360 to 540 m with a height of 4 m. The net has a uniform mesh size of 4 cm. The unit is operated by 3 to 4 fishermen from a theppa or nava. Large size prawns, sciaenids, other demersal fishes and crabs are caught in these bottom set gillnets. Sometimes the fishermen operate these nets as drift gillnets using more number of floats to catch pelagic fishes. These nets are in use throughout the year.

**Joga vala :** The catamarans conduct fishing operations using this synthetic drift gillnet consisting of 15-20 machine made webbing pieces laced together. The entire net has a uniform mesh size of 5 cm. The total length of the net varies from 495-660 m, with a height of 4.8 m. Cement sinkers and synthetic floats are used to keep the net vertical in the seawater. A large buoy is attached to one end for locating the net in sea water. The operation of these nets is mostly confined to subsurface waters varying from 30-40 m. The unit is operated with a single craft by 4 fishermen. Mackerel, *Hilsa keele*, carangids, seerfish and other shoaling fishes are usually caught. Sometimes the fishermen operate these nets as bottom set gillnets using more number of cement sinkers to catch demersal fishes. These nets are operated throughout the year.

**Pedda silk vala :** This is a drift gillnet/ bottom set gillnet used for catching large sized fishes. The net is set in position with one anchor. The net consists of 20-26 webbing pieces. The length of the net ranges from 600-800 m, with a height of 8 m. The entire net has a uniform mesh size of 9 cm. Cement sinkers and synthetic floats are used to keep the net vertical in seawater. The depth of operation of varies from 40-70 m. The net is operated with a single Kakinada nava by 5-6 fishermen. Seerfishes, tunas, carangids, sharks and other large fishes are caught by these nets. Sometimes the fishermen operate these nets as bottom set gillnets using more number of sinkers to catch demersal fishes. Pedda silk vala is used for fishing throughout the year.

**Pandu vala :** Kakinada nava, Mechanised navas and Mechanised fibre-glass boats are used

to conduct fishing with these types of synthetic drift gillnet / bottom set gillnets. The entire net has a uniform mesh of 10 cm. Cement sinkers and synthetic floats are used to keep the net vertical in the sea. Generally the length ranges from 800-1,000 m, with a height of 8 m. The operation of these nets is mostly confined to sub-surface levels varying from 40 to 70 m. The net is operated with a single fishing craft by 5 to 6 fishermen. Seerfishes, tunas, carangids, sharks and other large fishes are caught in these drift gillnets. Sometimes the fishermen use these nets as bottom set gill nets using more number of cement sinkers to catch demersal fishes. The operation of this net is similar to any other gill net and the duration of fishing for each haul is 5-6 hours. These are used for throughout the year fishing.

**Sanduva vala/Peethala vala :** This is a synthetic bottom set gillnet used to catch demersal fishes. The operation is carried out by fixing the net with anchor. The length of the net ranges from 400 to 500 m with a height of 7 m. The entire net has a uniform mesh size of 12 cm. Cement sinkers and synthetic floats are used to keep the net vertical in the sea. The net is operated using a single Kakinada nava by 5 to 6 fishermen. These nets are operated throughout the year. Pomfrets, other demersal fishes and crabs are caught.

**Synthetic drift gillnet:** The mechanised fibre-glass boats (beach landing craft) and mechanised navas conduct night fishing using synthetic drift gillnets fabricated with count No. 5 or No. 6 dark blue multifilament twisted twine. Each net consists of 45-75 webbing pieces with a uniform mesh size of 15 cm. The total length of the net varies from 1,000-1,600 m with a height of 9 m. Round cement sinkers are tied to the foot rope and synthetic floats to the head rope to keep the net vertical in the sea. The depth of operation is confined to 70-90m. The net is operated by a single fishing craft with 5 to 6 fishermen. Seerfishes, tunas, pomfrets, carangids, sharks and other large fishes are caught in these synthetic drift gillnets. Sometimes the fishermen operate these nets as

bottom set gillnets using more number of cement sinkers to catch demersal fishes. These nets are used throughout the year for fishing.

**Moravala :** It is a large, square shaped bag net made of nylon twine. In the middle of the net the mesh size is 4 mm and at the sides, it is 15 mm. Stones are suspended at the centre and the four corners to ensure sinkage of the net flat in the sea. The net is carried by a theppa and operated by three more theppas, each manned by two men. The fishing operation takes about 45-60 minutes. The fishes caught in moravala are mackerels, sardines, mullets, silverbellies and penaeid prawns.

**Needa vala :** This is a bag net fabricated with nylon twine (Fig. 9). The net is a shallow

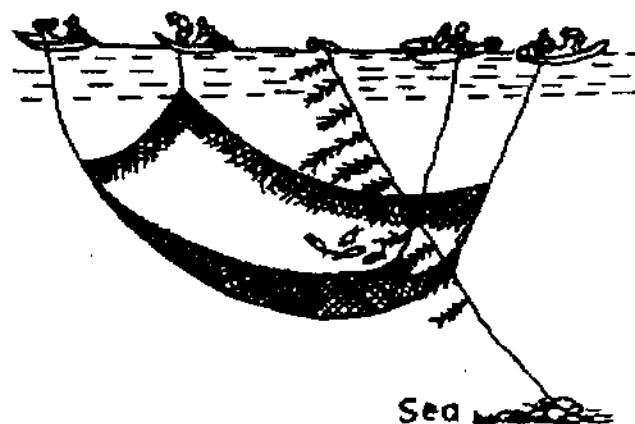


Fig.9. Needa Vala (Bag net).

bag with a wide rectangular mouth. The mesh size of the net is 4 mm in the middle and 15 mm along the sides. Foot rope is provided on one side which carries two stone sinkers at the two ends. Head ropes along the remaining 3 sides and 2 hauling-in lines attached to two loops in the foot rope complete the equipment. The net is used in conjunction with "fish-lures" called kambi. These consist of strings of coconut leaves attached to a rope and moored in the sea at the commencement of the fishing season. The kambi is kept in position with wooden buoys and stone sinkers. Fish are attracted and aggregated towards the kambi which provides shade and shelter. Four catamarans are used to operate the Needa vala. By clever manoeuvring, the fisherman slip the net un-



der the kambi rope and haul the net quickly along with the kambi. There would be more than a dozen kambi for each net. These nets are operated at a depth of 15-25 m. Pomfrets, sardines, mackerels, carangids and other pelagic fishes are caught by these nets. These nets are operated from January to June.

**Ila vala :** This is an encircling net fabricated with nylon twine. It has a long wall of webbing without prominent bunt or bag. The main body of webbing usually is of uniform mesh size of 1.5 cm. The height of the net is 13.5 m and the length is 45 m. The essential feature of this net is the presence of thread line which pass through a series of rings along the bottom of the net below the lead line. This closes the bottom of the net and completely impounds the catch before hauling the net. The net is operated with two theppas or two navas. The depth of operation varies from 10-15 m. Prawns, mullets, silverbellies and other fishes are caught by these nets. These nets are operated throughout the year.

**Kadhuru vala :** This is also an encircling net but fabricated with cotton twine. The main body of webbing usually is of uniform mesh size of 1.5 cm. The mouth of the net is kept open with the help of 50 wooden sticks connected to the head and foot ropes along with a number of wooden floats attached at regular intervals to the head rope and sinkers attached at regular intervals to the foot rope. During the fishing operation two catamarans start from the same point and go in opposite directions each carrying half of the net and make a circle by laying the net and again join together, thus encircling a pelagic shoal. The wing of the net prevents the shoal from scattering. The depth of operation varies from 10-20 m. Half beaks, full beaks and flying fishes are caught by these nets. Fishing is conducted during May-July.

**Gidasa vala / Thoka vala:** This is a stake net fabricated with cotton twine. It consists of a conical bag 12 m in length with a rectangular opening of 3.5 m wide and 1.5 m height. Average mesh size is 20 mm and decreases gradually from the opening towards the bottom of the

bag. The mesh size at the cod end is 10 mm. This net is fixed in the tidal regions of inshore waters at subsurface level during low tide with two stakes, floats and sinkers. The mouth of the bag always faces the shore. The fish aggregated during high tide are trapped when the tide recedes. The nets are often fixed in groups. These stake nets are operated with shoe dhonies at Kakinada Bay only. Prawns, mullets, flat fishes, eels, gobbies, sciaenids, crabs and other fishes are caught in these nets. These are operated throughout the year.

**Jamu thradu :** This is a long line with which fishes are attracted towards baited hooks. The long line consists of a synthetic main line with branch lines. The length of the main line ranges from 4,000 to 6,000 m. The distance between two branch lines ranges from 5 to 6 m. There are about 600-900 hooks tied to the synthetic branch lines. Normally the hook number is 7 or 8. The number and size of hooks and length of lines differ from place to place. Species of lesser sardines or *Loligo duvaucelii* are used as baits. A marker with a flag is attached to one side and the other side of the jamu thradu is attached to the fishing craft. It can be operated by Kakinada Nava or Theppa and the depth of operation varies from 70 to 90 m. The duration of fishing for each haul is 5 to 6 hours. Catfishes, sharks and other large fish such as perches, seerfishes and tunas are caught by these long lines. These are operated from November to April.

**Galapu thradu :** This is a hand line made of synthetic thread. Generally the length of the main line varies from 100 to 150 m, 5 to 7 iron hooks are attached to one end of the main line through the branch lines. The number of hooks is 7 or 8. The number and size of hooks differ from place to place. The hand line can be operated by Theppa. Pieces of lesser sardines or the squid, *Loligo duvaucelii* are used as bait. Each hand line can be set and hauled manually by 1 to 2 fishermen. These hand lines are operated at a depth of 40-60 m and the duration of fishing is 3 to 4 hours. Seerfishes, other larger fishes like perches, tunas and carangids are caught with these hand lines. The hand lines are operated throughout the year.



## **Modern gear**

**Trawl net :** The trawl net is a large rectangular shaped net with four parts, the upper, the lower and the two lateral sides. Both the upper and lower parts and the two lateral sides are with identical dimensions. The size of the trawl net varies with the size of the trawlers from which they are operated. The mesh size of wings and the the body vary according to the size of the net. The cod end mesh size ranges from 1.5 to 2.5 cm. A mechanical winch with G.I. wire rope is used for operation of the net. Flat rectangular type of otter boards are used to achieve the horizontal opening of the net. The vertical rise of the net is effected by the use of small iron chains for the foot rope

and synthetic floats at the head rope. The trawling speed generally ranges from 1.5 to 3.5 knots. The length of warp required to be released for trawling the net depends upon the depth of fishing ground, the nature of bottom and the towing speed. Ribbonfish, sciaenids, prawns, silverbellies, threadfin breams, lizardfishes, goatfishes, carangids, whitebaits, catfishes, cephalopods and elasmobranchs are caught in these nets. These nets are operated throughout the year.

The authors wish to thank Dr. K. Satyanarayana Rao, Principal Scientist (Retired) and Mr. K.M.S. Ameer Hamsa, Senior Scientist, C.M.F.R.I. for the help rendered in writing this report.

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