Traps, Pots and Squid Jigs

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A fishing gear is designated according to the type of fish sought for and its behaviour as well as to the mode of operation of the gear. Traps are impounding devices into which an organism is lured and from which the escape is made difficult. They may have one or more chambers, which will retain the catch. Small pots or Fyke nets or larger weirs and pound nets come under trap, which is used for fishes, crabs, lobsters or even molluscs. The advantages of trap fishing are:

- Trap fishing is economic and low energy is required when compared to active fishing method.
- Organisms caught in the trap can be retrieved alive in an undamaged condition.
- Traps can fish continuously day and night and require only periodical attending.
- They can be left in the sea during unfavourable weather conditions and can be collected when favourable conditions set in.
- Capital investment is relatively low and many traps show a high degree of selectivity.

Several types of traps are available based on the method of trapping, shapes, position of entrance, and material of construction. Any animal is made to enter the trap voluntarily and prevented from escape. Bait is optional to attract the fish to enter different varieties of pots/traps. Different varieties like pot, box-type, rectangular, cylindrical, semi cylindrical, ink-well type, disc shaped or cone shaped traps are available throughout the world.

1. Fish traps

The indigenous method of fishing prevalent in Gulf of Mannar, Palk Bay and in some parts of southwest coast of India is by employing indigenous traps locally

known as *koodu*. These traps are intended to catch perches and perch like fishes. In areas where seines or gill nets could not be operated, perch fishing developed using traps. Fishermen of Rameswaram have evolved extremely elaborate stellate form of this trap with a roomy side chamber in each of the arm and even with 5 entrances to the interior. These traps are made of splinters of babul tree or with thin bamboo reepers or palmyrah leaf stalk fibers. The meshes are hexagonal in shape with each side of the mesh having a length of 3 to 4 cm. The length of the trap varies from 60 to 150 cm and breadth from 60 to 120 c, and height from 15 to 45 cm. In rocky bottoms traps are operated singly and in flat sandy bottom, they are operated serially. Normally bait is introduced and the trap is ballasted with stones and are taken to the fishing ground in a boat or catamaran. Setting and retrieval of trap is done manually. Resorting to skin diving. Baits generally used are dried and decaying holothurians or fishes or crabs.

2. Kalava trap

Kalava traps used in rocky sea bottom and in submerged reefs in depths ranging 60-150 m along the west and east coast of India, which have good population of kalavaa and perches like *Epinephelus chlorostigma, E. tauvina, E. diacanthus, Pristipomoides sp.* etc. Traditional Rameswaram type traps are still in use at Mandapam area for catching kalava. Modern traps have developed for kalava in recent years. This rectangular trap is made of 10 mm dia MS rods with strengthening ribs. These rods are joined together with coil hinges so as to collapse the trap when not in use. The frame is covered with Polyethylene netting. The trap is open on one side and is provided with two consecutive funnels or valves made of webbing inside the frame. Bait is used to attract the fish. At the end of the funnel the bait bag or bait is hung. Traps are set individually. A country craft is used to carry the traps to fishing ground in coastal waters and mechanized boats are used in deeper waters. As soon as suitable ground is located the trap is released to the sea marked with a float on a line. The trap is hauled after desired soak time and the catch retrieved.

3. Tubular traps

Tubular traps are slender funnels into which fish may enter but from which they cannot retreat because the exit is made impossible by a narrow neck. From bell shaped mouth the trap quickly narrows down to a hinder region 25 to 30 cm in length and a diameter just equal to that of an adult murrel (*Ophiocephalus sp.*), the fish the trap is designed to entrap. It is made of palmyrah fibres extracted from leaf stalks and worked in double ply into a mesh work of netting. Each trap is anchored between tufts of reed or grass and mouth attached with short cords either to pegs or to adjoining tufts of grass.

4. Filter traps

When a bund area is emptied by draining the water through small openings, small filter traps are used in the sluices. Different types of filter traps are in vogue. Typically it is a simple cylinder of closely set mid-rib slivers of palm leaflets. One end of the cylinder is open where as at the other end has the ends of slivers bunched together and tied. A couple of bamboo hoops encircle it at the out side. To stop the slivers from opening under pressure, six or seven encircling lacings made of palmyrah fibres are added. The total length of the trap is 55-60 cm and 25-30 cm dia.

5. Aproned filter traps

This filter trap is an improvement on the one described above and consists of a large sized cylinder with curved fan shaped apron at the mouth. This is called 'aproned cone cage'. Water flows on to the apron and small fishes or prawns that enter are led by the converging sides of the apron into the cylinder where they are entrapped. Length of the cylinder portion is about 80 cm and diameter of the mouth is about 25 cm.

6. Basket traps

The traditional fishermen of southern India use basket traps for catching fresh water fishes from low lying deltaic regions of major rivers. These traps vary widely in shape from conical and cylindrical to box shaped. In swamps of Kolleru Lake in Andhra Pradesh telescopic two piece conical bamboo basket cages or traps called *Gampa garre* and rectangular basket traps called *Mavulu* are used to capture small prawns. In small irrigation canals the rectangular basket traps made of bamboo splinters are used to collect carp fingerlings and other small fishes. They have one or two valves made of converging splinters situated at the lower side of the trap which will give in when pushed in but do not allow to escape.

7. Lobster traps

In southwest coast of India, spiny lobsters are conventionally caught by traps. The technique is to entice the lobsters into the traps by employing baits through a tapered narrow entrance through which it is difficult to escape. Traditional local traps used for fishing spiny lobsters in south west coast of India are called Colachal traps. They are heart shaped pr arrow headed traps locally fabricated with palmyrah leaf stalk fibre or date palm leaf stalks of 1.5 – 2 m length, 3 cm wide and 3-3mm thick. Traps are woven in hexagonal meshes and consists of floor, side and roof. And flapper. Trap measures 75cm in length, 60cm in width and 50 cm in height.

Modern lobster trap

The Central Institute of fisheries Technology has developed modern lobster traps which is semi-cylindrical in shape and measures 75x55x40 cm with rectangular frame and semicircular ribs made of 10 mm dia MS rod. MS welded mesh (2.5 cm square mesh) is used as covering material on the skeletal frame work. The trap is single entry type with a trunk shaped funnel of 35 cm in length located at one end. The funnel is designed and attached in such a way that lobsters are guided by

gradual inclination of the internal opening through which they fall into the trap. Hexagonal chicken wire netting is used to cover the funnel. An escape gap of 150x30 mm is provided at one side as a conservation measure. A lid is also provided at the upper middle portion for baiting and removal of the catch. The trap is plastic coated in full for preventing corrosion in seawater.

Traps are laid and retrieved by resorting to skin diving. Fishing craft employed is 4 logged boat catamaran with a crew of 2 or 3 men. On reaching the ground, bait is introduced and the trap is set underwater by a fisherman who dives down and keeps it in position. 24 h soaking tine is given and the traps are retrieved next day and the catch collected.

8. Octopus pot

In Palk Strait between India and Sri Lanka large number of octopus re caught using gastropod shells. Long lines with short branch lines at intervals with gastropod shells (*Pterocera sp.*) are set under water. These lines when lifted next day morning to collect the small octopus which seek shelter in the shells. The lines are set in 5-8 m depth and buoyed with wooden floats.

9. Crab pots

Crabs are caught with pots similar to lobster traps. Crab traps are cone shaped bamboo device in Thailand used commonly in mangrove areas and the fishing craft used is a small wooden boat. Crab pots in Queensland are either rectangular or round with openings at both ends. Dome shaped crab pots with entry at the top are used in reef areas of south west coast of India. Crab pots are used to commercially fish for king crab in Alaska. Large vessels withcirculating sea water facility to keep crabs alive are used for this. Stone crab *Homalaspis plana* supports an important artisanal pot fishery along the coast of Chile. The pots are let down in a series or singly and left for some hours under water and then pulled up and catch

collected. The pots are baited with small fishes or fish discards. Pots are rebaited and thrown over again.

10. Aerial traps

Some fishes when excited or in danger or confronted by obstacles, leap out of water. A horizontal floating net, a raft or even boat or box can be used to collect the fish as they fall back. Mullets and milk fish were being caught by this method in backwaters of Kerala, parts of Andhra Pradesh and Tamilnadu. Such raft trapping which was in practice in the backwaters of Kerala is called *Changala payikkal or Changadam pachil.* In this method two long narrow dugout canoes are connected by two poles of 2.5 and 3.5 m in length in such a way that hulls diverge forward from the stern. A net extending out upon sticks slanting upwards run the whole length of the outer side of each canoe. The netting is tied at both the head and foot of the projecting sticks to form a bag like portion between sticks. Brushwood and webbings are put into the craft in which fish get entangled. A dragging device made of pieces of chain connected by ropes is stretched between boats with its middle region lying in water touching the ground. As the canoes are poles or paddled slowly, the disturbances caused by rough passage of chain over the bottom frighten the fish, which leap out in the air and land into the boat or the net.

11. Plunge basket

This is employed to catch fish in knee-deep waters, particularly in inundated paddy fields and channels. It is typically semi spheroid in shape and is constructed using sub-conical, closely set ribs made either from branches of hard wood tree or splinters of bamboo. Both the ends are open, the upper being narrower just wide enough to admit the hand. The lower end of the mouth is widely spread encircled by free termination of the ribs. To keep the ribs in position the trap is hoped at intervals, with split cane or cord. The common size varies between 50 to 60 cm in height and with a diameter 50-60 cm at the lower end. Bamboo splinters used are

10 mm in width. The fisherman plunges the basket into water every few steps forcing the spike rimmed mouth into mud with one hand while groping around with the other for any fish that may have trapped in it. In shallow backwaters, fishing is conducted after sunset with the help of a torch, the glare of the light attracts the fishes and when once they come within the striking range, they plunge the basket skillfully over them.

12. Fish aggregation and trapping

Submerged bundles of twigs or branches of trees make hiding places for fishes from where they can be easily caught. Piles of leafy branches are placed in backwater channels with stakes around to keep them from displacement by currents. After a lapse of few days these are surrounded by circle of bamboo screens and the bushes are removed. The fish are caught by dip nets.

13. Pound traps

They are large enclosures with a retarding device. Such large sized fishing traps are called weirs or pound traps. In places where considerable rise and fall of tide is observed, huge semi permanent pounds are built up by poles and bamboo screens. Long leaders of converging screens lead the fish and prawns to the openings in the outer pound traps, while others with in lead them towards smaller inner chambers. The catch is collected during low tide.

A wide variety of impounding or trapping devices used in our country stood out as testimony to ingenuity of traditional fishermen in developing fishing gear appropriate to different fishing conditions and fish behaviour. Majority of them are not in use now a days. Several factors such as thinning out of fish population and diminution of natural shallow water sheets leading to poor returns, erosion of skills and attitudinal changes among the practitioners might have contributed to their obsolescence.

Squid jigging

For squid jigging artificial jigs or lures are used and a great variety of jigs have evolved. They consist of a stem made of a sufficiently flexible plastic with one to three rings of sharp, barbless hooks at the lower end. Stem and hook rings are held together by a steel rod or wire with eyes at both ends for the attachment of the line. One jigging line may carry upto 30 such jigs, which may be of the same or of different colour and shape. Adequate pull and hauling speed of the line is required to prevent the attached squid from disentangling its arms and tentacles from the barbless hooks. Jigging lines are made of polyamide (nylon) monofilament. The line should ideally not be visible and the thinner the line, the better its transparency and it is less visible. Jigging is done with single hand line jigs or in serial jigs. By the introduction of hand operated line reels and later developed to automated squid jigging machines.

The individual design of squid jigs reflects the practical fishing experience of the fishermen regarding the reaction of the target species and also regional differences in fishing conditions, traditional fishing methods and availability of materials.

1. Hand line and pole and line jigging gears

Operated in one rod in each line. The boat will go in search of suitable fishing ground and the ground is selected according to experience. When the ground is set hand lines are operated with or without bait to entice the squids and jig them. The gear may consist of hand line with one or two branch lines. The stem of the jigs is made of wood, bamboo or steel and will have some weight to sink in water.

2. Serial jig

Each fishing line carries several jigs instead of one. The jigs are not baited and have two rings of hooks. The gear is lowered to the desired depth and jigged until a squid is caught. The immediately the line is hauled into the boat. Twenty to

thirty jigs are arranged in line with about one metre distance between each other and connected with nylon monofilament and a sinker at the end.

The wear and tear of a jigging line has an effect on the catching efficiency. Synthetic monofilaments are susceptible to abrasion on the outboard roller and on the line drum and they may have to be replaced.

3. Hand operated jigging reel

This is developed to increase smooth jigging and catching efficiency and reducing labour. A winding gear or drum with a handle is used to unwind and haul back the fishing line and for jigging. This facilitates the operation of longer lines with more jigs reaching into deep water. A wire mesh frame with downward inclination toward the boat is placed between the out board roller and the rail to collect the squids which fall off the hooks and guide them into the boat. A simple hand operated jigging reel could be fabricated in local workshops and used in small boats and also multi purpose vessels. They are also used in large squid jigging vessels along with automated jigging machines for test fishing.

4. Automated jigging machines

The automated jigging machine operates two drums one on each of the central power and steering unit. In order to simulate the jigging or jerking movement of line and jigs, the drums have elliptical or oval cross section. The power requirements for one jigging machine are about ½ hp (0.4kW). Electric drive with 220 volts or hydraulic drive also is used. The machine lowers and retrieves the lines from a desired depth at a predetermined speed. A wire mesh frame is positioned in such a way that the squid falling off the jigs after passing over the leading roller slide directly into boxes on deck or to a conveyer system which takes the to the hold for icing or freezing. The automated squid jigging machine enable considerable savings in crew and labour and are indispensable in larger vessels.