

CLASSIFICATION OF FISHING GEARS AND FISH CATCHING METHODS

- **Von Brandt (1972) classified fish catching methods of the World based on how fish are caught.**
- **International Standard Statistical Classification of Fishing Gear (ISSCFG, 1980) classified fishing gears based on Internationally recognized standard.**
- **Von Brandt classification is most popular & is universally used.**

- **Detailed classification (A Von Brandt)**
- Andres Von Brandt classified fish catching methods of the World into 16 major groups on how fish are caught.
- Sub-groups made on the basis of materials used in construction of gear & method of their operation.
- **1. Without gear :**
- Simplest form of fishing without gear.
- Fish & other aquatic animals are caught either grasping by hand, by diving or using trained animals like dogs, cormorants, otters etc.

- **2. Grappling & Wounding gear :**
- **Grapple & wound fish prior to capture.**
- **Hand instruments or sharp projectiles.**
- **Hand instruments : clamps, tongs, rakes etc.**
- **Clamps used for mussel & snails.**
- **A stick with one end split into few branches.**
- **Tongs like scissors with long handle operate at slightly deeper water.**
- **Rakes used to catch mussel. These rake & dig animal.**
- **Sharp projectiles : instruments with sharp points.**
- **Catch fish in damaged/injured condition.**

- **Eg. Spears. Metal weights with barbed point called fish plummets pierce flat fish over bottom.**
- **Fish combs with prongs which pierce fish when pressed into mud.**
- **Used for eel fishing.**
- **Bows & arrows - primitive gears used to catch whale.**
- **Harpoons consists a shaft & a point connected by line.**
- **When it is thrown or pushed pierce a fish.**



Air rifle

Harpoons





Rake



Hook



Tong



Squid jig

• 3. Stupefying devices :

- Devices made use of stupefying fish either mechanically, chemically or electrically.**
- Mechanical stupefying is done by throwing stones at fish, beating with clubs or mallets & by using explosives.**
- Use of explosives are harmful to environment, fishes & also for fishing grounds.**
- Chemical – lime, copper are used to poison fish.**
- Plant poisons extracted from ichthyotoxic plants contain saponin used to poison fish.**
- Electrical – exposing fish to electric field & then collecting by scoop net. Popular in fresh water.**

- **4. Lines :**

- **Fishes are lured by offering a natural/ artificial bait. fish when takes the bait, it becomes difficult for it to escape.**
- **Bait may be with/without hook.**
- **Hooks facilitate capture of fish by ripping.**
- **A) Hand lines : simplest form of fishing line.**
- **Operated with or without pole or rod.**
- **A line with few hooks operated by single man.**
- **B) Set lines : several hooks set in a fixed position.**
- **A main line to which baited/unbaited hooks are fixed at regular intervals.**

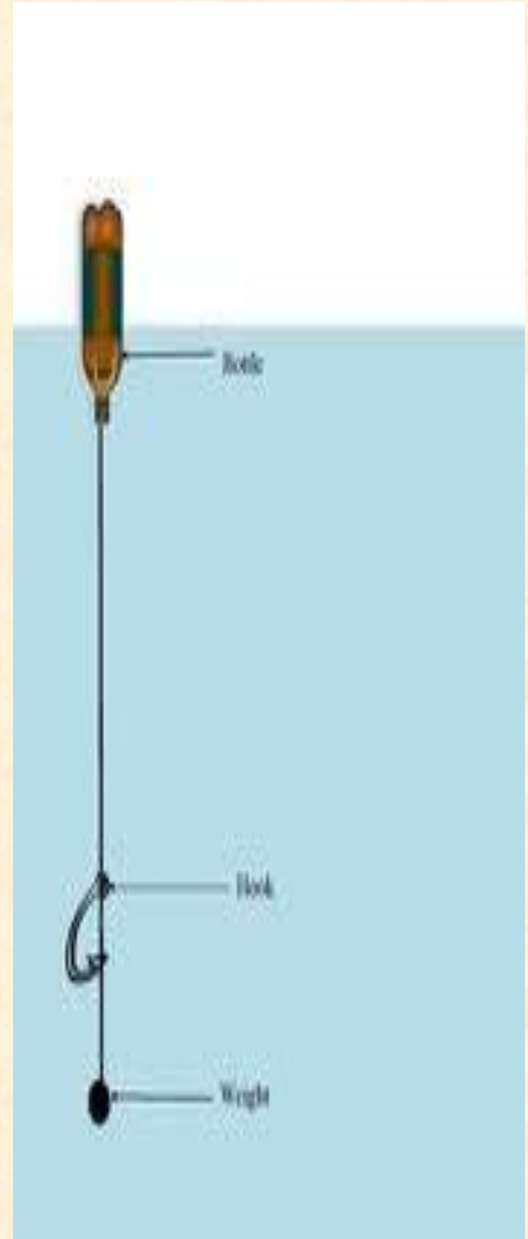
- **C) Drift lines : fishing lines which drift alone or fastened to a vessel. Operated over large area.**
- **Large length of line with long snoods placed more widely.**
- **D) Troll lines : several lines are towed from a boat using outriggers to catch predatory fishes.**
- **Trailed near surface or a certain depth by a vessel**
- **E) with rip hooks : fishes are caught by jigging. Hooks fastened to the end of wooden bamboo pole & used for catching in the vicinity of water. The technique is called jigging or pilking. Fish is pierced anywhere in body with mostly an unbaited device called pilk/ ripper/jig. Eg. Squid jigging**

Rip hooks





Troll line



Hand line

- **5. Traps :**

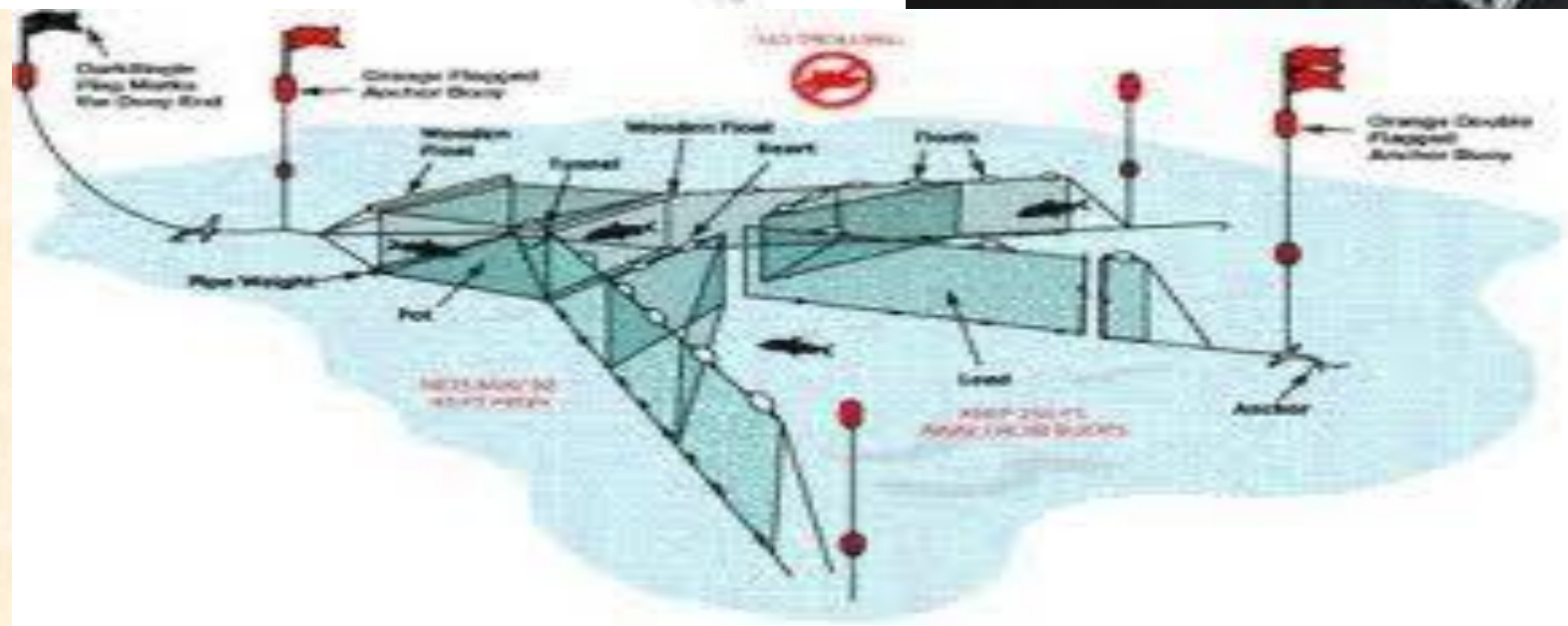
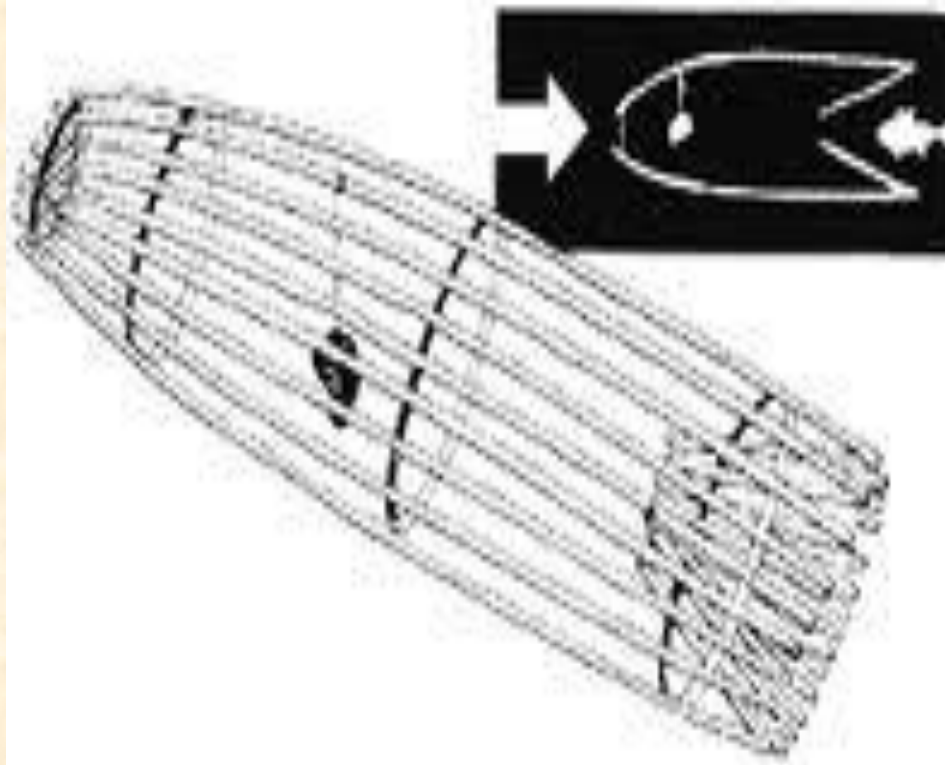
- **Fish enters trap voluntarily but prevented from coming out.**
- **A) Hiding places : eels, octopus & crabs have the habit of hiding among branches of trees, bundles of twigs, hollow bamboo reeds etc.**
- **These may sometimes baited to lure fish.**
- **They are hauled up & hiding fishes removed.**
- **B) Barriers : walls or dams made of stones, mud, netting or split bamboo pieces used to trap fish during tides.**
- **In water with no currents fences are used to guide fish into pockets.**

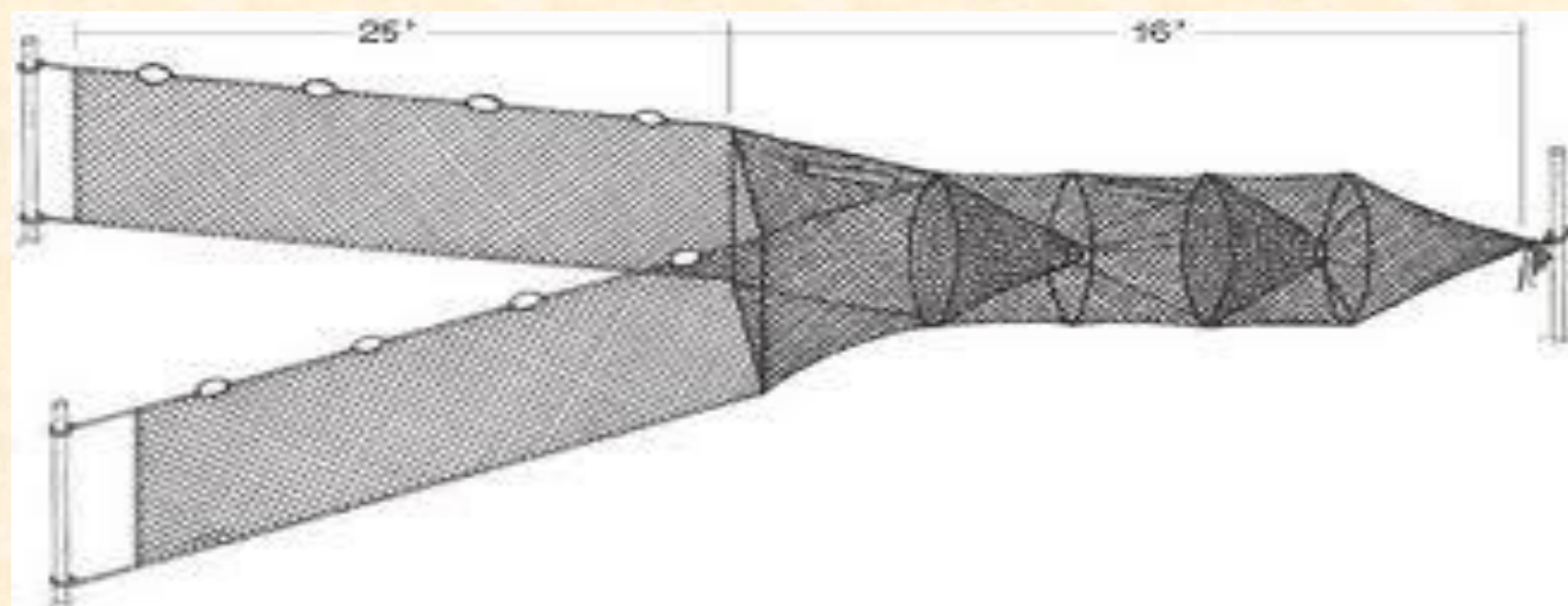
- **In rivers where strong currents are there, fishes are guided on to a slanting screen of gratings constructed in river & ascending in the direction of current.**
- **Migrating fishes are best caught in a watched catching chamber which is large & open on three sides.**
- **These require constant watch so as to close entrance when fish enters.**
- **Normally done by pulling up the netting from bottom & trapping fish.**
- **C) Mechanical traps : similar to mouse trap.**
- **Victim itself releases a mechanism which prevent its**

Escape.

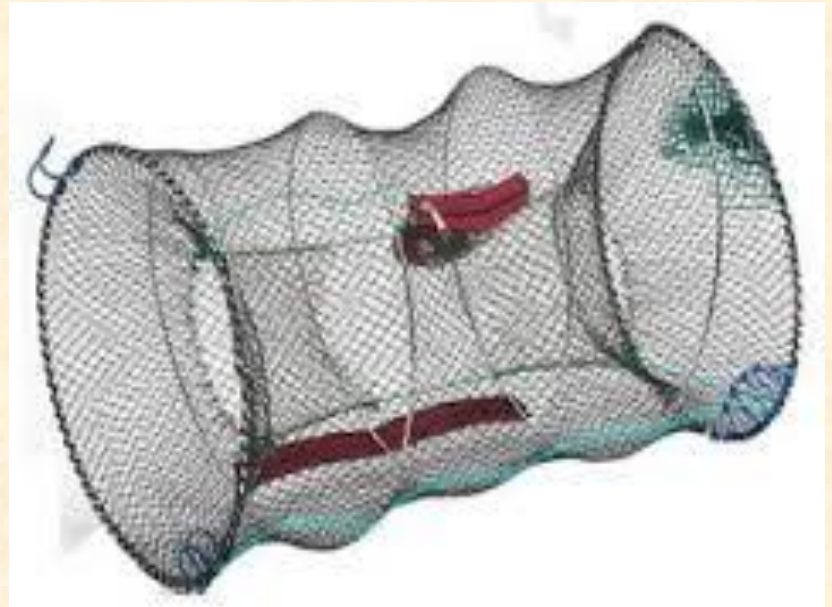
- **Gravity traps – weight is suspended which when released by fish prevents its escape.**
- **Elastic power of a bent rod is made use of a bent rod trap.**
- **Torsion trap – strength of twisted twine is used to close trap.**
- **D) Tubular trap : long tubes without valves.**
- **Narrow & fish held in tubes by fins or thorny twigs fastened inside.**
- **E) basket trap : mostly have small entrance.**
- **Made of wood, wire, netting, plastic etc.**

- **Fyke nets : made of netting used in shallow water.**
- **Consists of a cylindrical /cone shaped bag mounted on rings & provided with wings or leaders that guide fish towards the opening of bag.**
- **F) trap nets : large uncovered gears anchored or fixed on stakes.**
- **Set/floating with various types of fish herding & retaining devices.**
- **Weirs made of wood & pound net made of netting.**
- **Pound net divided into chambers closed at the bottom by netting.**





Trap nets



- **6) Aerial traps :**

- **a) Box trap : salmon box trap are well known.**
- **Salmon jump over the obstacle & find themselves in a box trap.**
- **A roof at the other end prevent their escape.**
- **b) Raft trap : either moored/driftng.**
- **Considered obstacle by mullets.**
- **They are caught in raft while trying to escape.**
- **The edges of the raft are either bent upward or their surface is covered with twigs.**
- **c) Boat trap : used for catching jumping fish.**
- **Fishes while jumping over an obstacle find**

- themselves in a boat held at angle.
- d) Verandah net : popular in Mediterranean, China & India.
- Consists of two parts– a vertical barrier netting & a horizontal verandah for collecting fishes.
- Can be a movable one or stationary.
- d) Scoop net for jumping fish : Flying fishes are caught directly from air.
- A display of torchlight is used to attract fish towards the surface & fish caught in scoop net as they fly through air.
- e) Pitfall trap : made near the water spreads to trap fish which make their way over the land.



Box trap



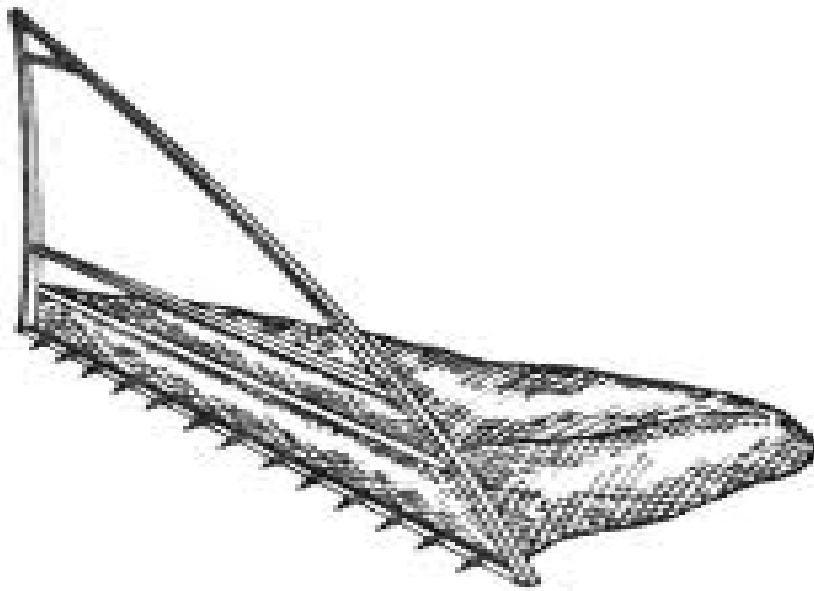
Scoop net



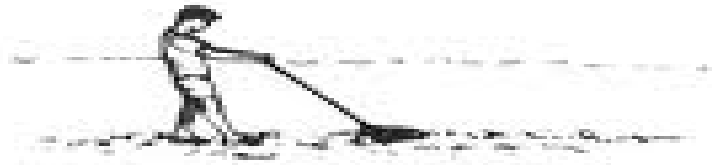
- **7) Bag nets :**
- **Fish enter voluntarily & are caught by filtering. They are kept open vertically by a framed mouth & horizontally by current.**
- **Scoop net : small bag nets operated by hand & are moved through water. Fishes are caught by scooping action.**
- **Various shapes are there :**
- **Landing net → round frame, Skimming net → triangular**
- **Push net → triangle or semicircular frame. Pushed by hand / operated from boat.**
- **Scrape net : fishes are caught by skimming. Large**

- **framed bag net operated with help of s lever or over edge of a boat or on the bank of a river.**
- **Gape net without ring : large bag net set either on stakes in shallow water or on anchors when fishing in deeper waters.**
- **Used in water where tidal current is strong. Mouth of the net is kept open against current by means of stakes driven to bottom.**
- **Used popularly in river where currents are strong.**
- **Also called stow net.**
- **Gape net with ring : either fixed on stakes or anchors. In some cases, end of these are connected to bank & otter board to keep mouth open.**

- **Wings act as guiding device to direct fish to bag net.**
- **8) Draggled gear :**
- **These are active gears which are towed through water & fish is caught by filtration.**
- **Draggled gear with oblong iron frame attached to a bag net operated either near bottom or in pelagic region. Includes trawls & dredges.**
- **i) Dredges : dragged along the bottom to collect mussels, oyster, scallop, clams etc.**
- **Conical shape with a rigid frame in front.**
- **Operated from shore/ from boat.**
- **Sweep trawl : sheets of webbing made of single or.**

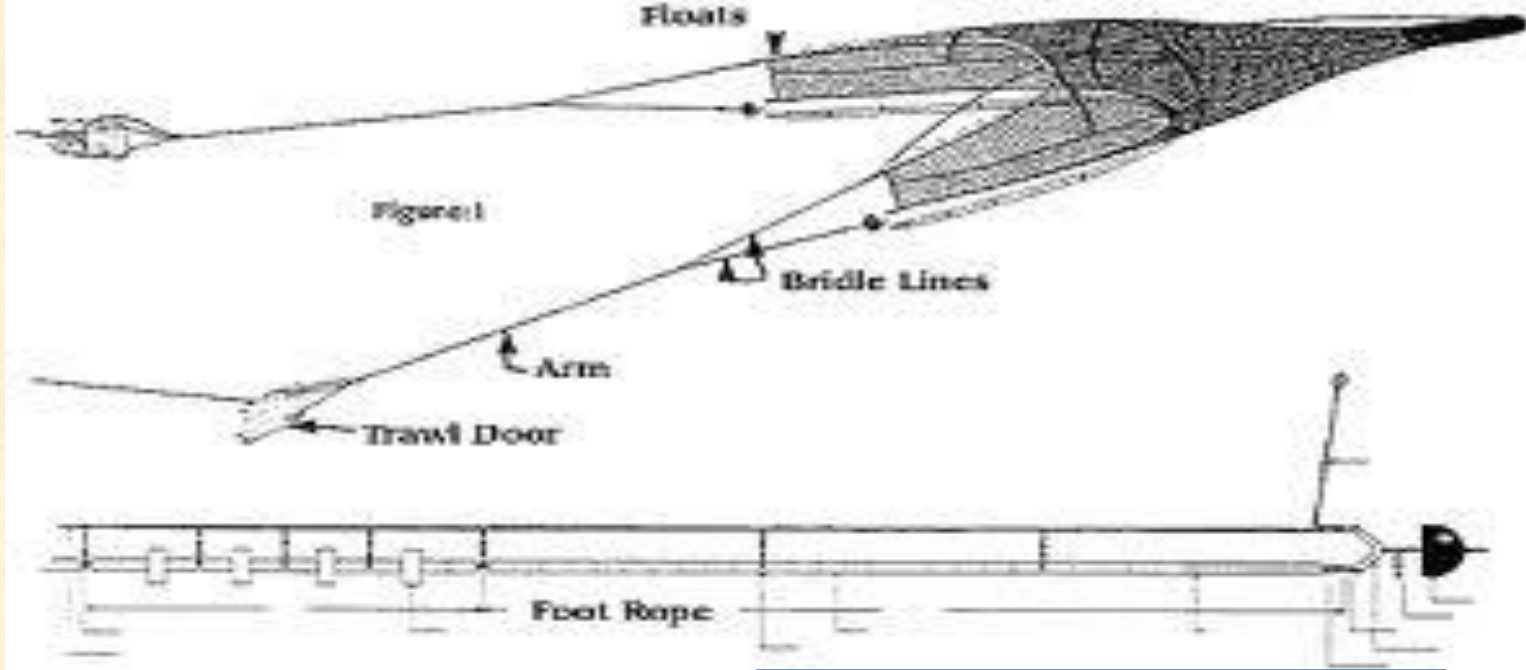


Hand dredge



Sweep net





Mid water trawl



Otter trawl

- **triple wall towed over the bottom**
- **Bottom trawl : conical shaped nets towed over the bottom.**
- **Mouth is kept open by beam, otter board or two boats pulling apart.**
- **Mid water trawl : trawl net operated in the pelagic region from single/ two boats.**
- **9) Seine nets :**
- **Long wall netting with or without a bag, supported by floats & sinkers.**
- **Operated by surrounding an area of water with potential catch.**

- **Two long ropes are tied to the ends of net used for**
- **herding & hauling the fish.**
- **Both ends of gear is fixed on shore or on a boat.**
- **Double stick net : winged bags of netting held between two sticks. Held in river currents, then encircled & the catch is lifted.**
- **Genuine seine net : beach seine & boat seine.**
- **Beach seines/shore seine are operated from shore & generally used in shallow water. These may or may not have bag in centre. Used for bulk fishery.**
- **Eg. Rampani in south-west India**
- **Seines operated from boat are boat seines.**
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Seine net without bag

Seine net with bag

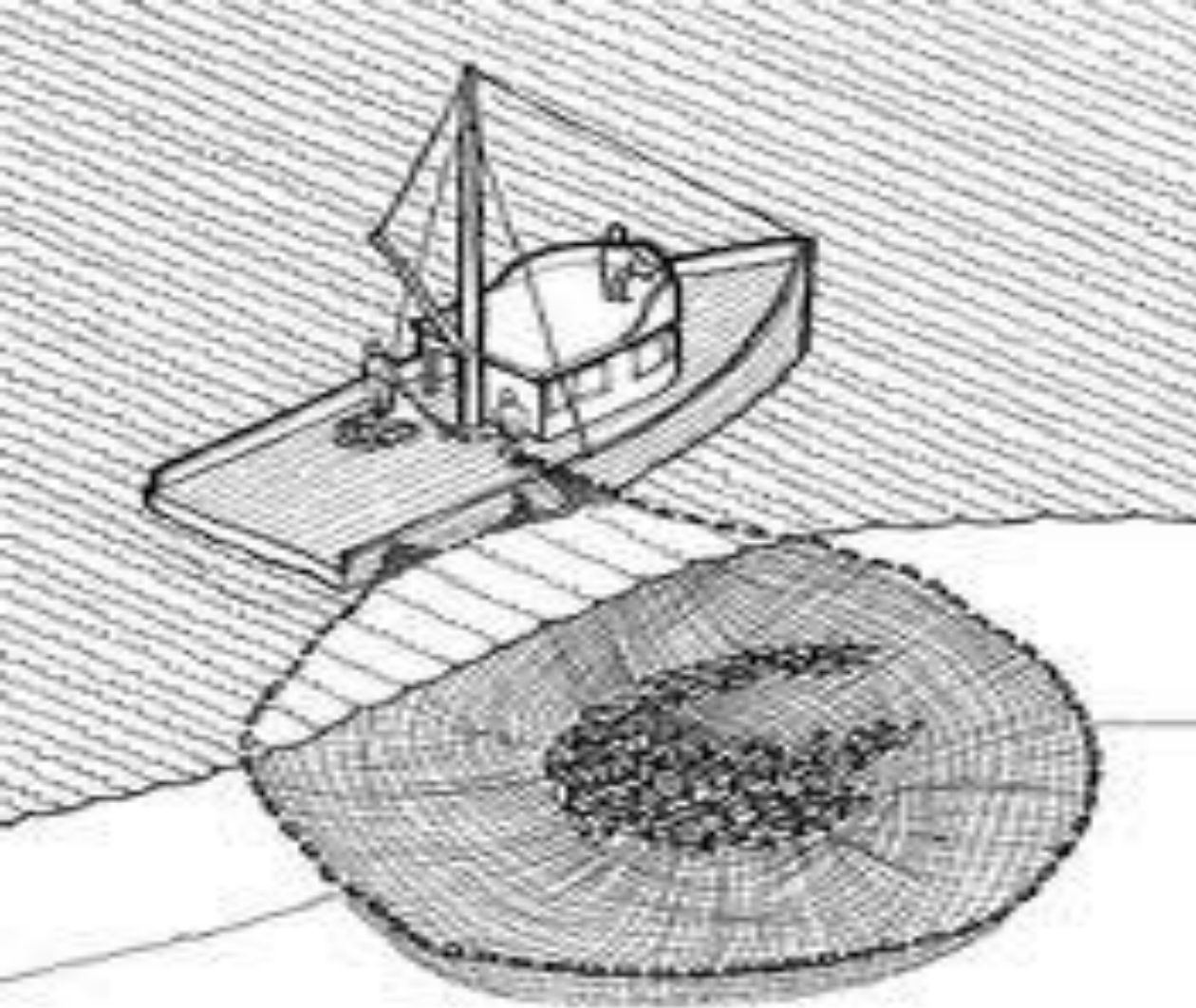


Danish seine is well known. Operated on bottom from single boat.

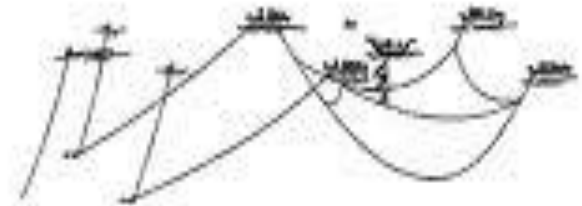
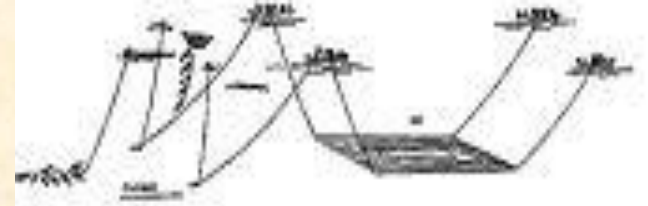
10) Surrounding nets :

- **Rectangular walls of netting rigged with floats & sinkers which after detection of fish are cast to encircle the fish shoal.**
- **Fish is surrounded not only from sides but also from bottom. Operated generally in surface layers.**
- **Lampara net : dust pan shape. Central bent portion is in the form of spoon & two lateral wings. After encircling fish shoal foot rope is pulled to prevent escape of fish.**

- **Purse seine : predominant type.**
- **Provided with a purse line at the bottom which pulled through purse rings to prevent escape of fish**
- **Can be operated from single or two boats.**
- **Based on target sps these are sardine purse seine, cod purse seine, mackerel purse seine etc.**
- **Based on scale of operation – small, medium, large**
- **Ring nets : shaped like purse seine but has diff mesh size. A hybrid between lampara & purse seine.**
- **Operated by single boat.**



Purse Seine



Drive-in net

- **11) Drive-in net :**

- Fishes are driven into a stationary or movable fishing gear either by frightening or swimming or by diving fishermen.
- More applicable in case of coral reefs or near volcanic islands where other gears can't be operated.
- Usually a dust pan shaped seine or gill net.

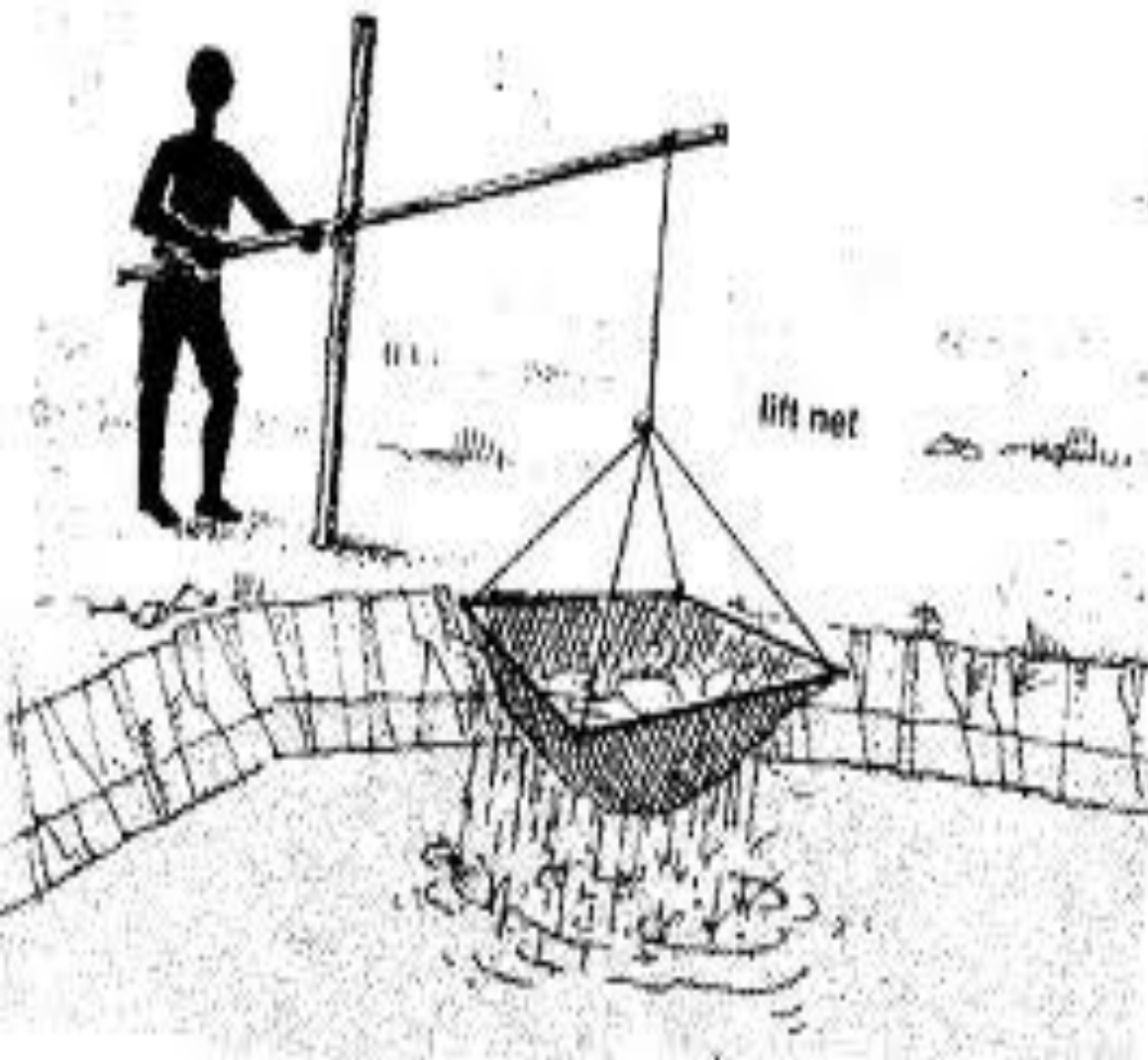
- **12) Lift net :**

- Horizontal netting panel or cone shaped bag with mouth facing upward.

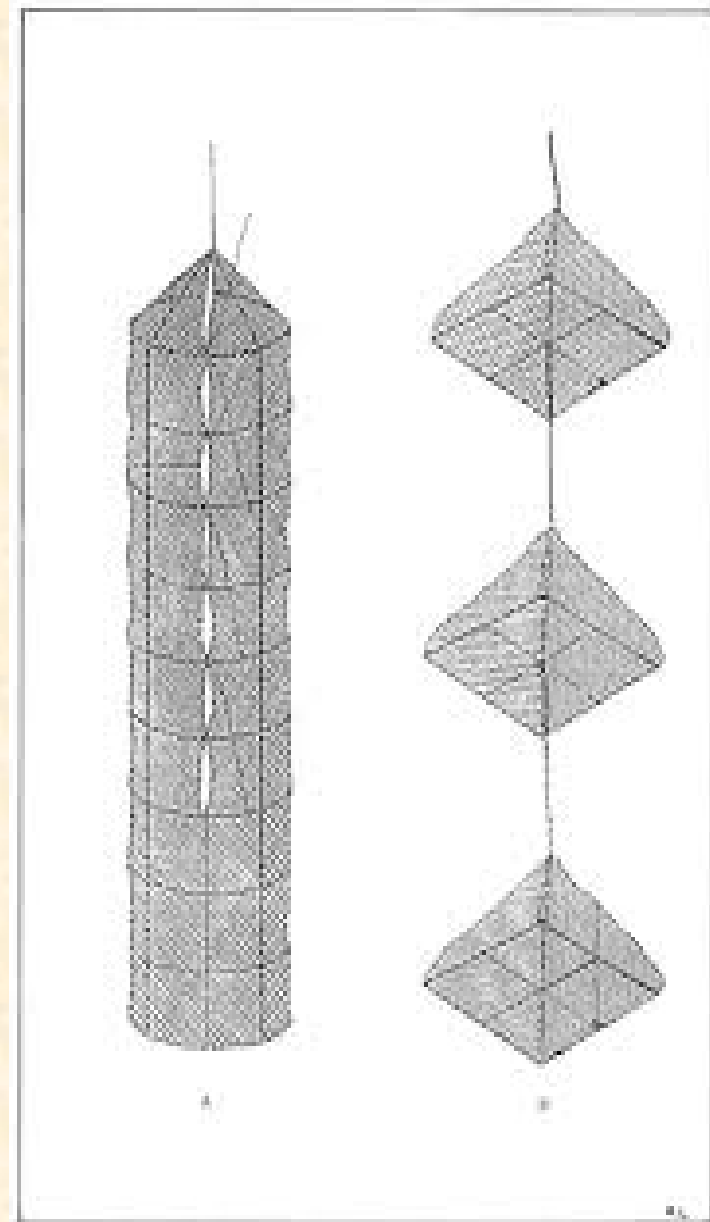
- **Capture fish by lifting the gear submerged at the required depth by hand or mechanically.**
- **Shore operated & boat operated.**
- **Hand lift net : small , operated with hand with no fixed installation. Used for catching crabs.**
- **Mechanized lift net : larger one. Mechanized installation along the shore.**
- **Chinese dip net along Kerala back waters is a mechanized lift net.**
- **Operates on a principle of a lever.**
- **Blanket net : larger lift net which can't be stretched by frames or rods but held by piles on shallow water. Stationary gear or movable on boat .**

- **Fish wheels : large water wheels rotating in the current to catch fish.**
- **Wheels with shovels are arranged in such a way that when fishes are lifted by wheel from river they fall into a collecting box.**
- **13) Falling gear :**
- **Manner of capture is to cover the fish with a gear from above.**
- **Mostly operated in shallow waters & with difficulty in deeper waters.**
- **Based on material for construction these are cover gear or cast net.**

- **Cover gear : include wooden cover pot or plunge basket which are gears used for catching single fish in turbid waters.**
- **Lantern nets – netting with wooden frame. Basket with opening at top is clapped over the fish by fishermen & is removed from above.**
- **Cast nets : circular nets cast from shore or boat. Nets thrown in such a way that fall flat on water surface.**
- **They fall over fishes due to their weighed edges & close in on them.**
- **Great skill is required for casting this gear.**



Lift net



Lantern net



Chinese dip net

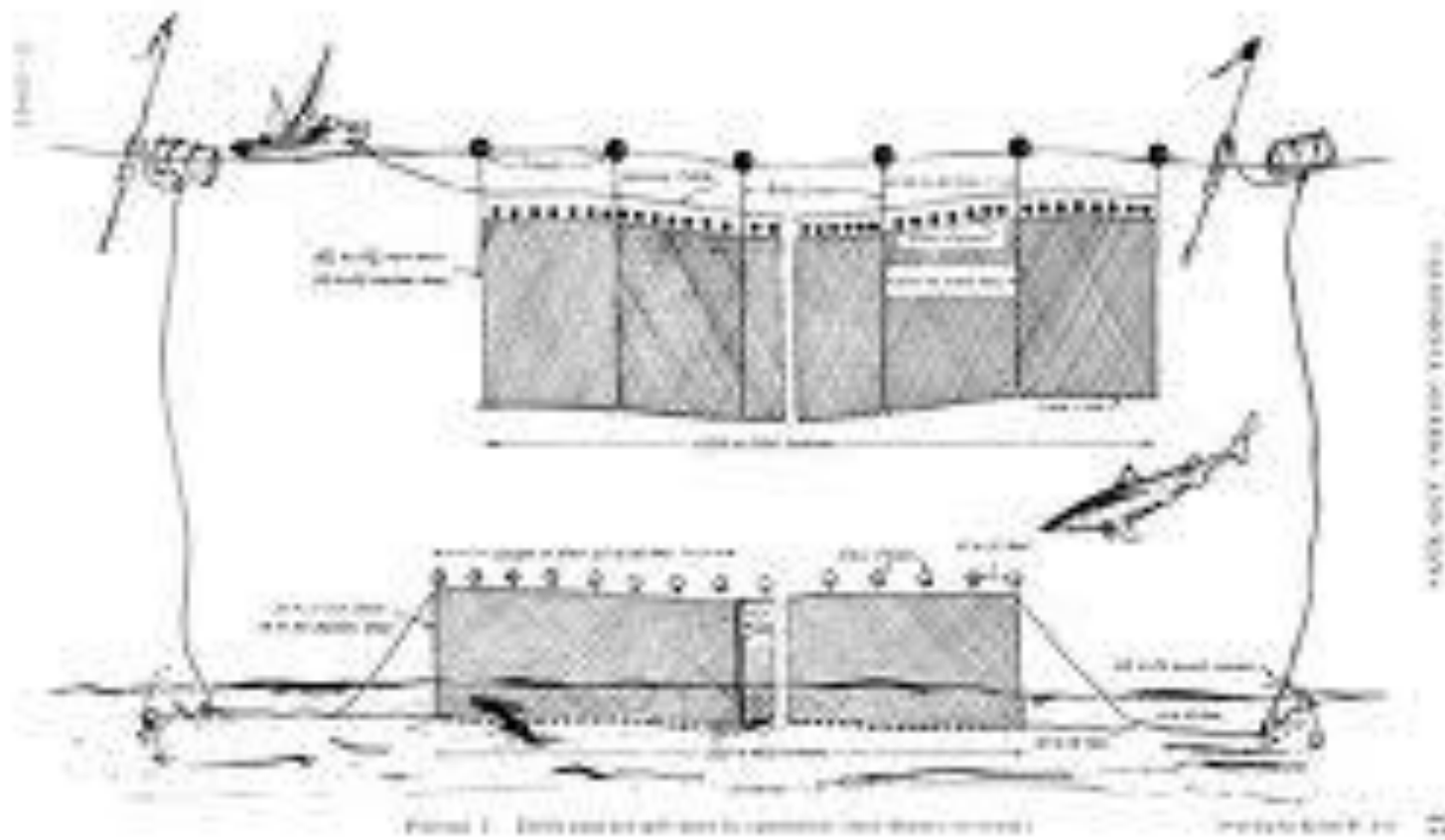


Cast net

Cast netting



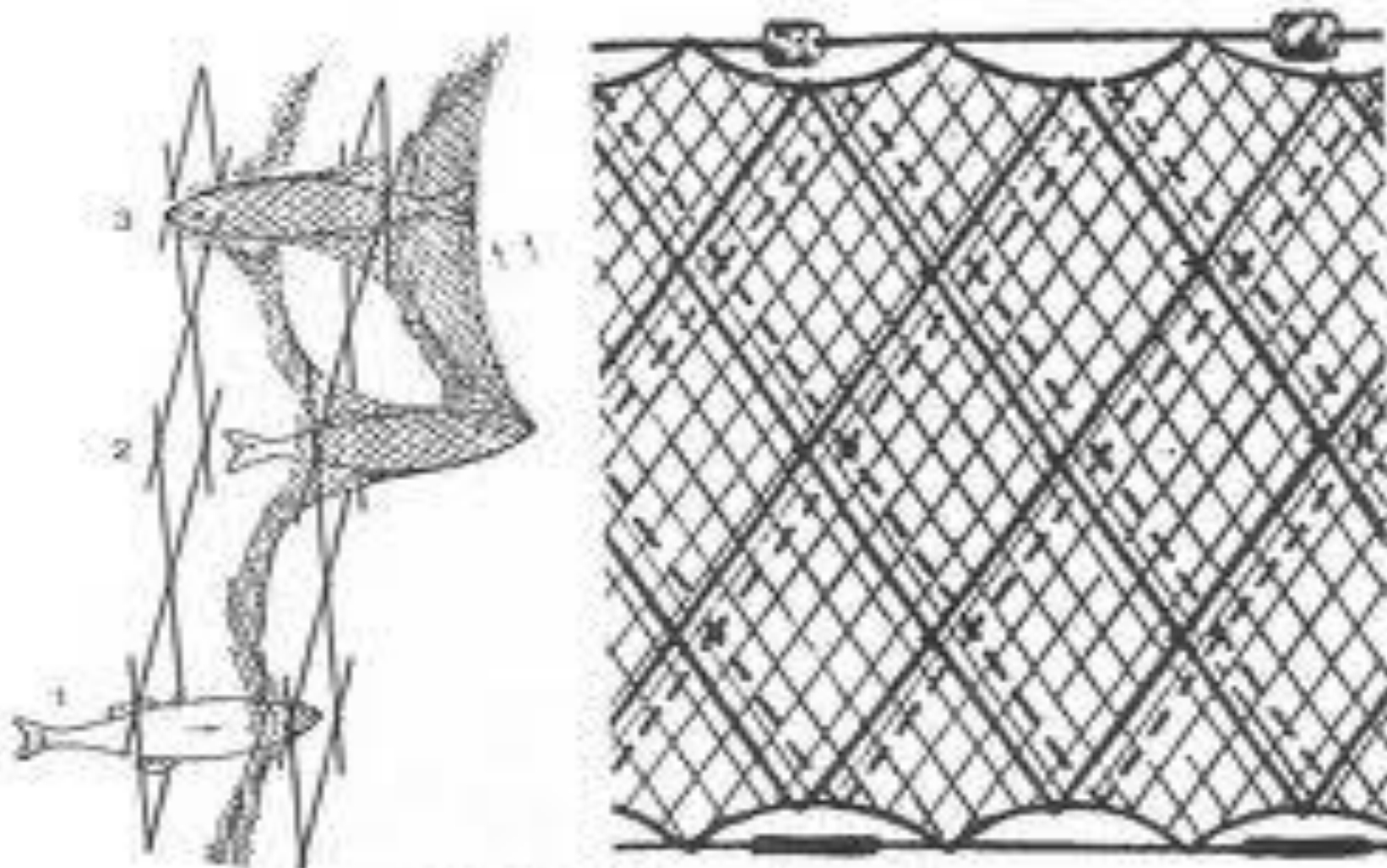
- **14) Gill nets :**
- **Rectangular wall of netting kept erect by means of floats & sinkers.**
- **Positioned in the swimming layer of target fish & catch fish by holding them in mesh by gilling.**
- **Based on method of operation these are 3 types :**
- **Set gill net : fixed at the bottom or at a distance above bottom by anchors or ballast.**
- **Operated in shallow coastal water.**
- **Drift gill net : gill nets which are allowed to drift with current or from boat to which attached.**
- **Operated on surface layer.**



Drift & Set gill net in operation

- **Encircling gear : operated on surface layer.**
- **After encircling fish noise or other vibrations are used to drive the fish towards net so that they are gilled / entangled.**
- **15) Tangle net :**
- **Method of capture is to entangle the fins, scales, teeth etc. in the mesh.**
- **Based on structure these are :**
- **Single walled : single walled net supported by floats & sinkers.**
- **Double walled nets : double walled tangle net with one large meshed layer & other small meshed.**

- **Set in such a manner that large meshed layer is on the side from which fish is expected.**
- **Tripple walled net / trammel net : consists of 2 outer layers of large meshes & a loosely inner layer of small mesh.**
- **Fish get entangled in the inner wall after passing through outer wall.**
- **In combined form of gill net-trammel net, lower part fabricated as trammel net & upper part as simple gill net.**
- **Entangling nets loosely hung single/multi-walled netting held vertically in water by floats & sinkers.**
- **Nets are attached end to end to form large fleet.**



Left: Sketch of trammel net operation.
Right: Sketch of three-walled construction of trammel net

Trammel net

- **16) Harvesting machines :**
- **Includes all the fishing gears which extract fish from water & then transport it on board the vessel.**
- **Use limited to a small no. of sps.**
- **Fish pumps : sophisticated, modern system of fish pumps used to mechanically transfer fish attracted & concentrated by light in the proximity of vessel.**
- **Popular for squids.**
- **Hydraulic dredges : gear digs up molluscs & shrimps out of water by means of powerful under-water jets**
- **They are then trapped in bag of the dragged dredge.**
- **Catch conveyed on board the vessel by conveyor belt type device or by suction.**

INTERNATIONAL STANDARD STATISTICAL CLASSIFICATION OF FISHING GEAR (ISSCFG)

- **Popular & accepted by FAO.**
- **Classes are characterized by various methods of fish capture & sub-divided into gear types based on the str. Of the fishing gear & method of its operation.**
- **(1) Surrounding nets :**
Rectangular in shape without a distinct bag, set vertically in water to surround the school of fish, generally of pelagic nature from sides & below.
- **The nets are subdivided into three categories:**

- **one-boat seine, two-boat seine; and surrounding net without purse line.**
- **Eg. Purse seine, ring seine & lampara net.**
- **(2) Seine nets**
Seine nets are cone-shaped net with two wings wherein the wings are normally larger than those of trawl nets.
- **The net is pulled towards a stationary boat or onto a beach with the help of a line.**
- **Eg. Beach seine & boat seine.**
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- **(3) Trawl**

A conical bag-shaped net with two or more wings, pulled by one or two boats for a period, to catch mainly demersal fish or other aquatic animals.

- **Dragged through the water from a craft.**
- **The trawl is subdivided into three major types: bottom trawl, pair trawl and beam trawl.**

- **(4) Dredges**

- **Rigid str. Dragged over seabed to separate molluscs, crustaceans. Fish etc. from water, mud, sand.**
- **Eg. Hand dredge & boat dredge.**

- **(5) Lift net**

A sheet of net, usually square, is mounted either by several rods and ropes, or on a frame and is either at the bottom or in mid-water.

- **Submerged in water and then lifted to trap the fish lying above it by straining water.**
- **eg. Lift net, hoop net, blanket net.**

- **(6) Falling gear**

A cone-shaped net that is dropped to cover aquatic animals and trap them. Generally hand-operated in shallow waters but some are operated from a boat like the stick-held cast net for catching squid.

- **Fish is covered & then gathered when net is lifted by straining water.**
- **Eg. Cast net, cover pots, cover baskets & lantern net**
- **(7) Gill nets & entangling nets**
Curtain-like net that are fitted with sinkers on the lower end and floats on the upper end and are set transversely to the path of migrating fish.
- **Fish trying to make their way through the net wall are entangled, gilled or enmeshed in the mesh.**
- **eg,. Set gill net, drift net, trammel net & encircling drive in net.**

- **(8) Traps**

The gear is set or stationed in the water for a certain period to trap moving fish in the water.

Trapping is made with the use of a non-return valve fitted in the entrance of the gear. The gear may or may not include a netting material.

Eg. Pound net, fyke net, stow net, barriers, fences, weirs & aerial traps.

- **(9) Hook and Line**

The gear generally consists of line(s) and hook(s) to which artificial or edible baits are attached to lure and catch fishes or other aquatic animals.

- **Eg. Hand line, pole line, long line & trolling line.**

- **(10) Grappling & wounding gear :**
- **Fishes wounded & grappled by some means.**
- **Eg. Harpoons, spears, clamps, tongs, rakes, bow & arrow.**

- **(11) Harvesting machines :**
- **Transfer fish mechanically from water.**
- **Eg. Pumps, mechanized dredges.**

- **(12) All other fish capture device :**
- **Include hand & landing nets, drive-in nets, simple hand implements, stupefying materials & explosives, trained animals & electrically induced narcosis.**