

**BASIC CLASSIFICATION OF FISHING GEARS- PRINCIPLE, SUBSIDIARY AND AUXILIARY GEARS. A. VON BRANDT CLASSIFICATION OF FISHING GEAR AND METHODS OF THE WORLD, CLASSIFICATION OF FISHING GEAR BY INTERNATIONAL STANDARD STATISTICAL CLASSIFICATION OF FISHING GEAR (ISSCFG).**

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**INTRODUCTION:**

There are different systems of fish harvesting used in the world which is ranging from primitive to highly sophisticated systems. Fishing gear vary with structure, materials used, principle of capture process and method of operation. The selection of fishing gears mostly dependent on fish species, environmental factors and fishing ground condition. Fishing gear use five mechanism to capture fishes i. e.

1. Gilling and Tangling
2. Trapping
3. Filtering
4. Hooking and spearing
5. Pumping

The most commercially used fishing gears are – Purse seine and Trawl net followed by gillnet, entangling nets and traps. Based on the usage of material of construction the fishing gears are grouped into –

1. Net fishing gear – Fishing with netting which is constructed with webbing – Gillnets, Trawl nets, Purse seines etc.
2. Tackles – fishing gear in which hooks are an important part and catch fish individually – Hooks and lines
3. Miscellaneous gears – Traps, Grappling and wounding, stupefying methods and 3electrical fishing.

Fishing gears may be either Passive or active fishing gears. Passive fishing gears: The fishing gear which do not move in water for harvesting of fish. Fish comes in the way of net and het harvested

Example – Gillnets and entangling nets, hook and line, traps etc.

**Active fishing gears:** - The gear which moves in the way of fish to capture it. Active fishing gears consume more energy during fishing more productive than passive type of gears.

Example – Trawl net, purse seine, Troll line etc.

Based on the degree of selectivity the fishing gear are more selective like gillnets, hook and lines and traps. The less selective fishing gears are – trawl net, seine nets, entangling nets etc.

Depending on the sector in which they are used are:-

1. Small scale or artisanal fishing gears
2. Large scale/industrial/ mechanized/ commercial fishing gears.

Based on the water bodies in which they are used are :-

1. Inland fishing gears
2. Marine fishing gears

Based on the area of operation the fishing gears are:-

1. Coastal fishing gears
2. Offshore fishing gears
3. Deep sea fishing gear

Depending on the fishing position in the water column are:-

1. Pelagic fishing gear
2. Mid water fishing gears
3. Demersal/bottom fishing gears

Hardy (1947) classified the fishing methods into 3 groups:-

1. Luring
2. Snaring
3. Attacking

Umali (1950) classified the fishing methods into 2 groups:-

1. Non – textile devices
2. Textile devices

Kajeswski (1957) classified the fishing gear into 2 groups based on evolution of living organisms.

1. Simple gears
2. Complex gears

Davis (1958) tried to classify fishing gears of the England without any definite line of demarcation.

Dumont and Sundstrom (1961) classified the fishing gear of the United States based on similarity of types.

Treshev (1970) classified the fishing gear based on construction and principles of operation.

A. Von. Brandt (1972) classified the fish catching methods of the world on the basis of how the fish get caught. The enlargement in this classification was taken place in 1984.

ISSCFG (International Standard statistical Classification of Fishing Gears) – 1980 classified the fishing gears in accordance with the internationally recognized standard. This classification also gets accepted by FAO.

### A.VON. BRANDT CLASSIFICATION

#### DETAILED CLASSIFICATION OF THE FISH CATCHING METHODS OF THE WORLD

Andres Von. Brandt has classified the fish catching methods of the world into 16 major groups based on how the fish are caught. Sub-groups are made on the basis of materials used in the construction of gear and method of their operation. The 16 major groups are:-

#### **1. Without Gear**

This is the simple form of fishing where no gear gets involved. Here, fish and other aquatic organisms get caught either grasping by hand (hand Picking), or by diving or by using trained animals such as – dogs, otters, cormorants etc.



**Hand picking**



**Fishing by diving**



**Fishing by cormorants**

#### **2. Grappling and Wounding Gear**

Here, hand instruments or sharp projection gat used to capture fish.

##### **Hand Instruments**

Clamps, tongs and rakes are the hand instruments used for fishing. Clamps are mainly get used to harvest mussel and snails. A stick with one end split into a few branches form a simple clamp. Tongs are similar to scissor. It gets operated deeper than clamp. Rakes are used to catch mussel.



### Sharp Projections

Instruments with sharp points are used. Here, catching of fish takes place in damaged or in injured condition. Spears is the simplest form of sharp projection. It may be single prolonged stick or prolonged barbed stick. Metal weight with barbed points i.e. called fish plummets pierce the flat fish over the bottom as they are dropped down. Fish combs provided with prongs which pierce the fish when pressed into the mud are mainly used in eel fishery. Bows and arrows, harpoons are also get used in fish harvesting.



### 3. Stupefying devices:-

The fish can also be get harvested by stupefying the fish either mechanically, chemically or electrically. Mechanical stupefying is done by –

- Throwing stone on fish body.
- Beating the fish with bamboo stick.
- By using explosives

Explosives are environmentally harmful for the entire fish population and also the fishing ground. Chemical stupefying like use of lime, copper which is poison in nature. The plant poison extracted from ichthyotoxic plants containing saponin used to poison or stupefy the fish. Electrical stupefying means exposing the fish to electrical field. When the fish come in the electric field area, the fish get stupefy and then it get collected by scoop net. This method is very much popular in fresh water sector for fish catching.

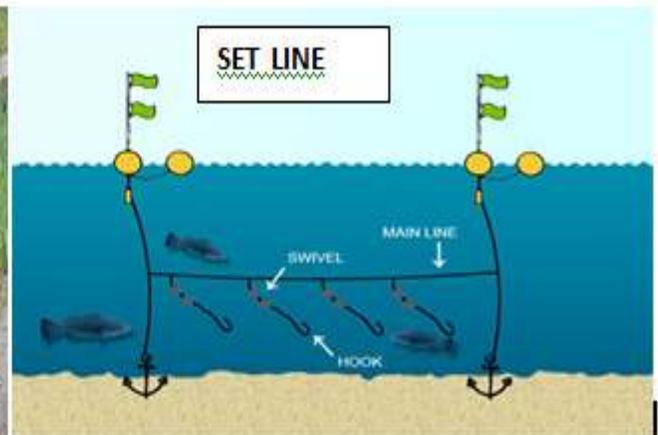


#### 4. Lines

In this method the fish get attracted by natural or artificial baits. The bait is used with hook so when fish take the bait inside the mouth, it is difficult for fish to escape.

##### Hand line

Hand line is the simple form of fishing line. Hand line can be operated with or without the hook. Hooks helps to capture the fish by ripping.



##### Set line

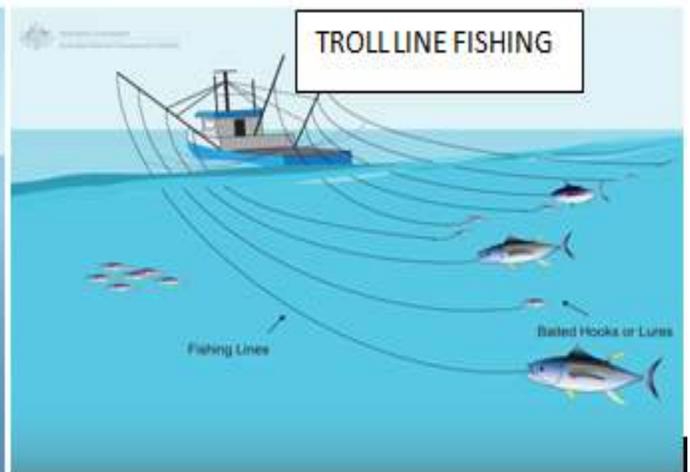
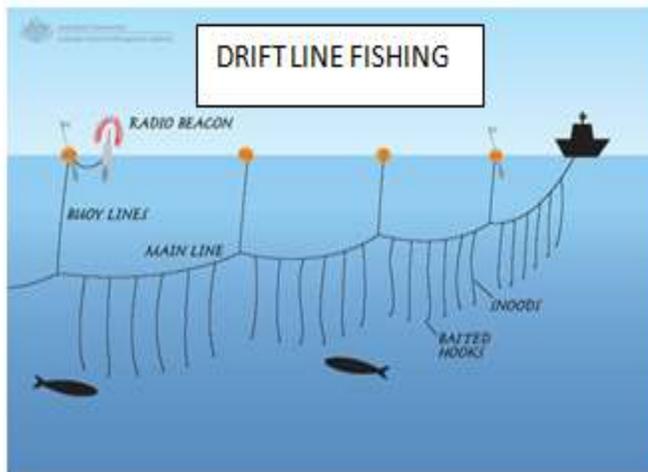
In this line several hooks are used in a single line. The set line is consists of main line, branch line, snood wire and hooks. The branch line gets attached with main line at regular interval.

##### Drift line

In this line the one end of line gets fastened with floats, buoys and markers (Flag) whereas other end is tied with boat. It gets operated on surface of the water body.

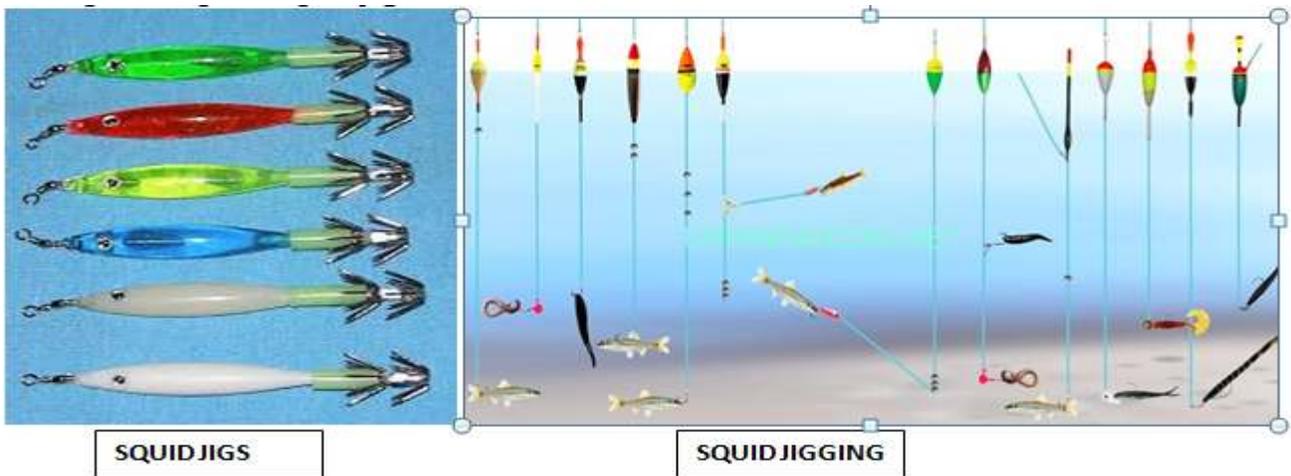
##### Troll lines:

Here, several lines are attached along with hooks on outrigger of the boat. Only predatory fishes get caught by this line. This line gets operated on surface water body. It is the only line which is active in nature.



### With rip hooks

In this method jigs are used for fishing. The technique of catching fish with hand line and ripping hooks is called PILKING OR JIGGING. Here, there is no bait get used for fishing. The unbaited device is called PILK, RIPPER OR JIGS. To capture squid, squid jigs are used.



## 5. Traps

In this method of fishing fish enter inside the trap voluntarily but cannot escape due to certain arrangement.

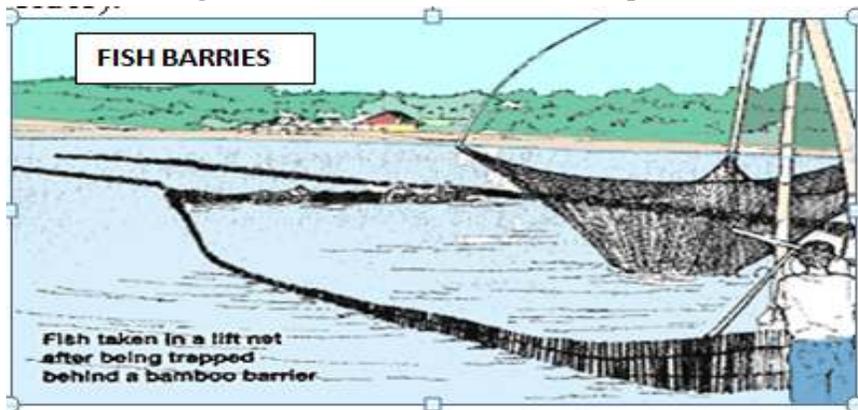
### Hiding places

Some fish like eels, octopus and crabs have the habit of hiding among the branches of trees, bundles of twigs, hollow bamboo, etc. If we provide then hiding place artificially then these fishes will come and accumulate. After removal of hiding place the fishes will get caught.



### **Barriers**

The barrier like walls or dams which is made up of stones, mud, netting or split bamboo pieces are used to trap the fish during tidal condition. In the water body where there is no current in water; fences are used to guide the fish towards traps/pockets. In river where there is strong current, slanting screen get used to trap the fish. The migrating fishes are caught in a watched catching chamber ( a chamber which is open from three sides).



### **Mechanical trap:**

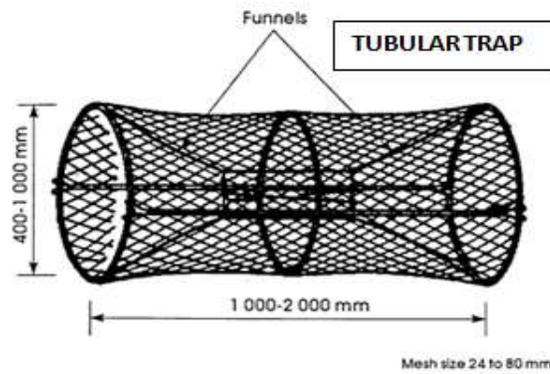
These are similar to mouse trap. In gravity trap, a weight is suspended which when released by the fish itself and get captured. In torsion trap, the strength of twisted twine is used to close the trap mouth.

### **Tubular trap:**

These are long tubes without valves. Due to narrow opening the fish get entered inside but due to fins they cannot escape back.

### **Basket trap:**

The trap has small entrance and is made up of wood, wire, netting, plastic etc. Fyke net is made up of netting and gets used in shallow water. These traps consist of cylindrical or cone shaped bag mounted on rings and which guide the fish towards opening of the bag.

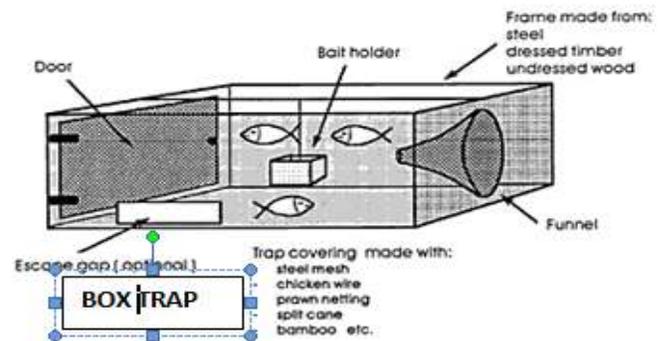
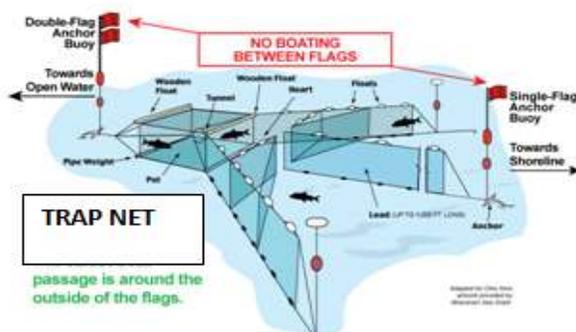


### Trap nets

These are large uncovered gear anchored or fixed on stakes. Weirs are made up of wood. Pound nets are made up of netting. Pound nets are divided into chambers which are closed at bottom by netting.

### Box trap:

Salmon box trap get used to capture salmon in northern Europe. When salmon jump they found itself in a trap. Due to presence of roof on other end they cannot escape.

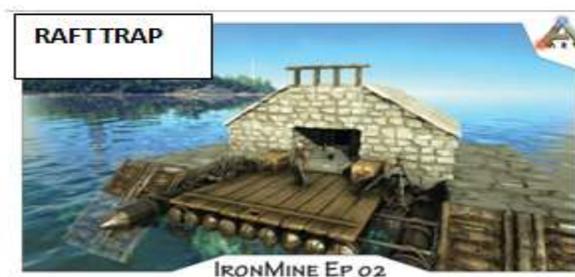


### Raft trap

Mostly get used to capture mullet

### Boat Trap

These traps get used to capture jumping fishes

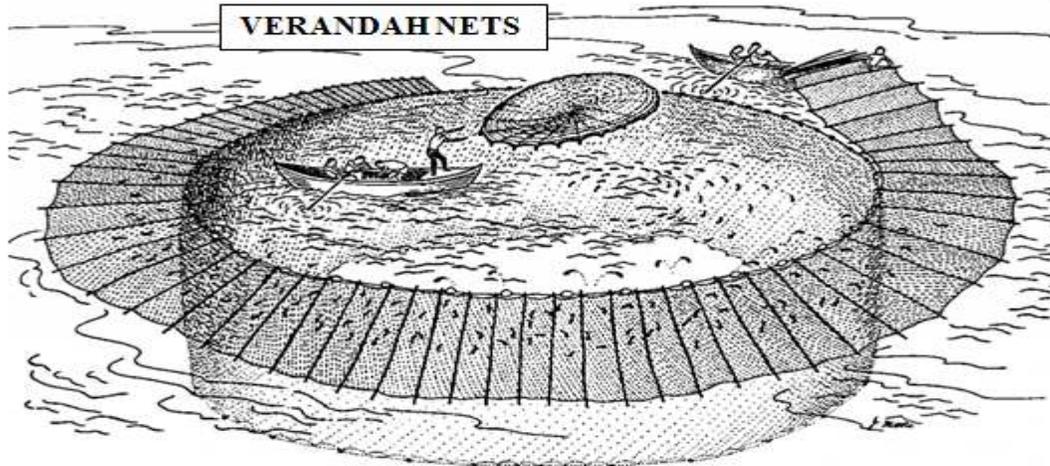


### **Verandah nets**

They are popular in China India and some part of Africa.It consists of two parts:

1. A vertical barrier netting
2. Horizontal verandah

Verandah gets used for collecting the fish. Verandah net may be either movable or stationary.



### **Scoop net for jumping fish**

Flying fish get caught in scoop net directly from air. A torch is used to attract the fish toward the surface.



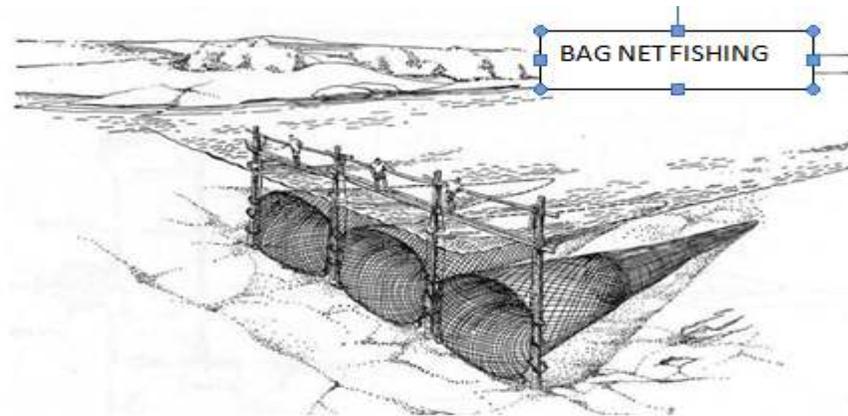
### **Pitfall traps**

It gets used near the water spread area to trap fish which make their way over the land.



### Bag net

In this net fish get entered voluntarily and get caught by filtering. They kept open in vertical direction.



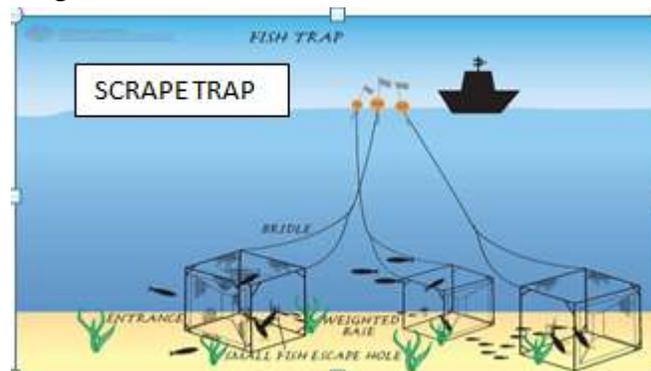
### Scoop net

They are smaller bag net operated by hand and are move through the water. Here, fish get caught by scooping action. Available in various shapes. Landing nets have almost round frame. Skimming nets are triangular nets. Push net have triangular or semi – semicircular frame and get operated by hand or boat.



### Scrape nets

Here, fish get caught by skimming. They are large framed bag nets operated with the help of lever over the edge of the boat or on the bank of river.



### **Gape net without wings**

Large size bag net. Get operated in shallow water. If we operate this trap in deep water then an anchor must be get attached. They are very much popular in Riverine condition. May or may not have frame. They are also called stow nets.

### **Gape nets with wings**

It is bag net with wing. Either anchored or fixed on stakes. In some cases one end of net is connected with bank of river and other end is with otter board.

## **6. Dragged Gear**

It get towed trough water and catching of fish takes place by filtration method. They get operated on the bottom of the water body. This category includes trawl and dredges.

### **Dredges**

The dredges get dragged along the bottom to collect mollusks such as mussels, oysters, scallops, clams etc. The gear consists of conical shaped net with a rigid frame in front. The size and weight are varying and get operated either from shore or from boat.

### **Sweep trawls**

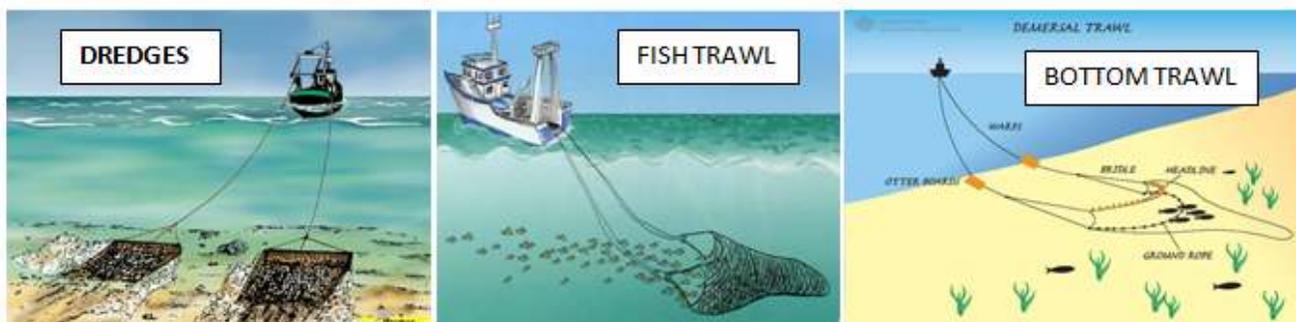
Sheets of webbing made up of single or triple walls are towed over the bottom.

### **Bottom trawls**

It is conical shaped net get towed over the bottom. The mouth of the net is kept open either by beam, otter board or two boats pulling apart.

### **Midwater Trawls**

This is a trawl net get operated in pelagic region either from single or two boats.



## **7. SEINE NETS:**

These nets used to surround the water area to capture fish. The net may or may not have bag like structure at the centre. The two ropes get tied along both the sides for net hauling purpose.

### Double stick net

These nets are binged bag like structure gets tied between two sticks. Most commonly used in river. This net get encircled net river water current and then get lifted up from water by which fish get caught.

### Genuine seine net

It includes beach seine and boat seine. Beach seine get operated from shore in shallow water area. Beach seine may or may not have bag like structure at the centre. Boat seine also get operated in shore area but deeper than beach seine. Boat seine get operated by boat only.



## 8. Surrounding nets

### Lampara net

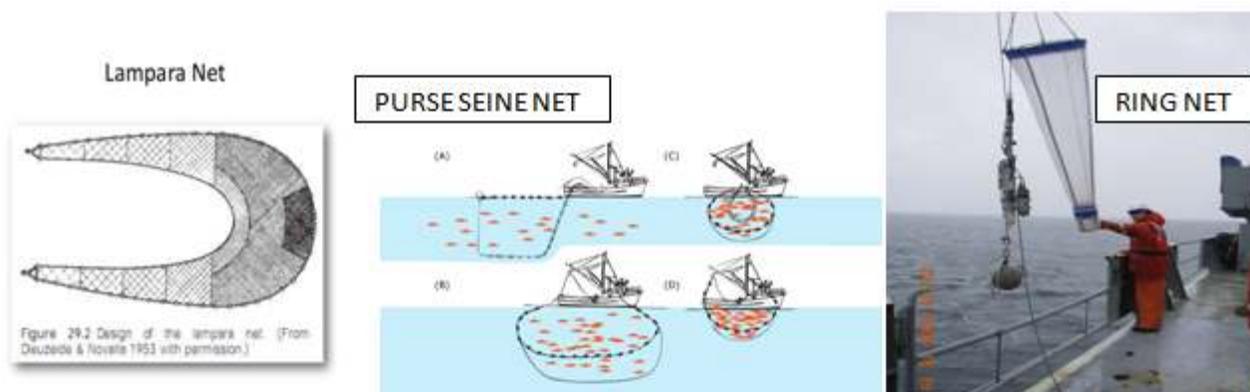
It looks like dust pan. The central bent portion is in the form of a spoon and there are two lateral wings. There is no purse line used in this net. After catching the shoal, the foot rope is pulled to prevent the fish from escaping.

### Purse seines

It is surrounding gear having purse line at the bottom. When purse line gets pulled, the net get closed from bottom side and prevent the fish from escaping. It can be operated either from single or two boats. Mostly for single boat operation skiff gets used.

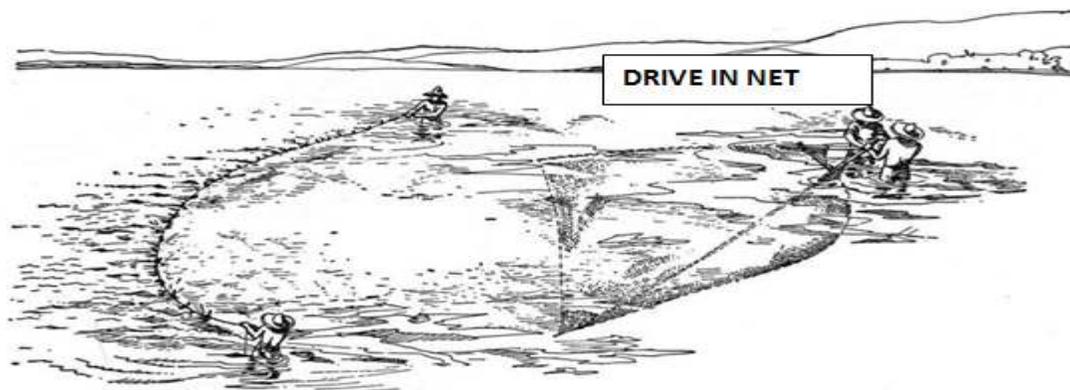
### Ring nets

The shape of this net is just like purse seine but the difference in the mesh size. It is a hybrid type bet between lampara net and purse seine net. It gets operated by single small boat.



## 9. Drive – in- net

In this method of fishing, the fishes are driven to a stationary or movable fishing gear by some means. Driving of fish takes place either by frightening, by swimming or diving fishermen. This method is very useful in coral reef and ground volcanic area where net operation is not easy. These gears are usually dust pan shaped seine net or gill nets shaped.



## 10. Lift Nets

These nets get lifted from water after submerging it in water for some time. They get operated either by hand or mechanically from shore or from boat.

### Hand Lift Net

It is a small hand net mostly gets used to capture crabs.

### Mechanized lift nets

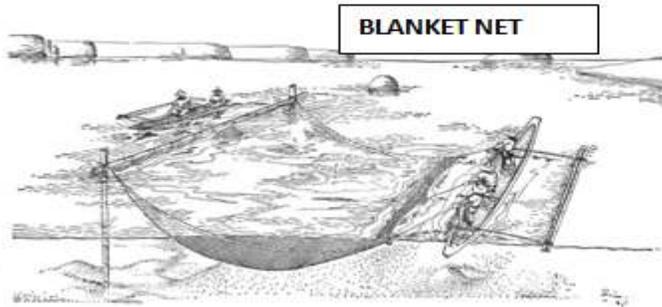
It is a large size lift net, cannot be get operated by hand. Chinese dip net get operated along kerala coast backwater (vembanad lake) is the best example of mechanized lift net.

### Blanket net

It is a large size lift net either gets operated as stationary or movable.

### Fish wheels

They are large water wheels rotating in the water current of river. The wheel get arranged in such a way that when wheel lift the fish it get collected in a box.



## 11. FALLING GEAR:

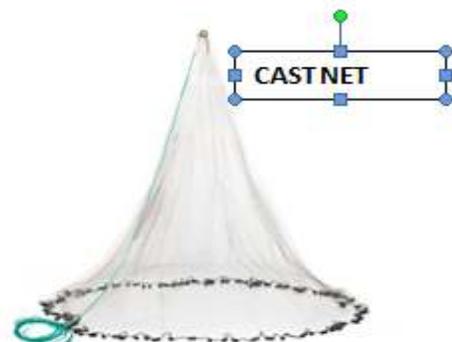
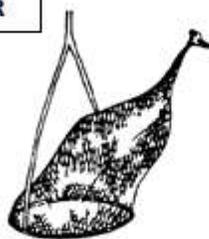
Here, the fish get covered by gear from above. These gears are mostly getting operated in the shallow water area. Difficult to operate in deeper water. According to material of construction it gets classified into cover gear and cast nets.

### COVER GEAR:

It includes wooden cover pots or plunge basket. It used to catch single fish in turbid waters and lantern nets.

### CAST NET:

It is a circular net get operated from shore or from boat. The net is thrown in such a way that it fall flat on water surface. It uses to cover fish from surrounding due to heavy weight. Great skill is required to cast the gear.



## 12. GILL NETS:

They are long wall of webbing hung vertically in water.

### **SET GILL NETS:**

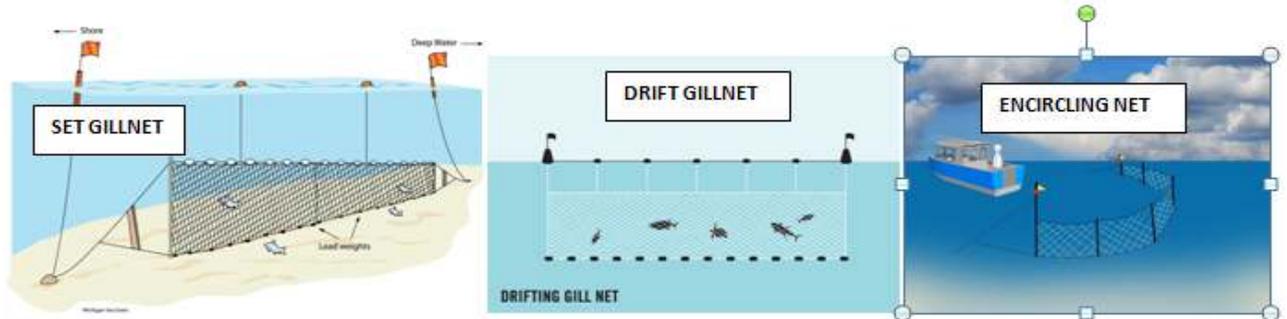
It gets set in water surface, mid water or at bottom by means of an anchor and floats to provide proper shape.

### **DRIFT GILL NETS:**

The gill net which is allowed to drift along with water current. The one end of net either get attached with boat or both the ends get marked with buoys or any floating object.

### **ENCIRCLING GEAR:**

It is also a long wall of webbing which use to encircle the fish by some means.



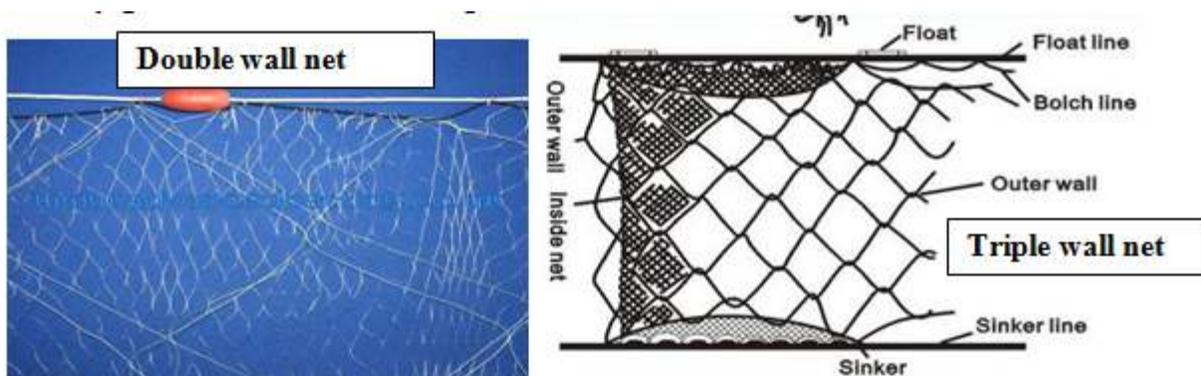
## **13. TANGLE NETS:**

### **DOUBLE WALLED NETS:**

It is a double wall tangle net. One wall having large mesh and other wall is having small mesh. It get set in such a way that the large mesh placed in the side from where fish is expected to come.

### **TRIPLE WALLED NET/TRAMMEL NETS:**

This net is consists of two wall of large mesh and one wall of small mesh. The fish get entangled in small mesh netting. Here, the inner wall mesh enters inside the outer wall mesh for capturing of an organism. Mostly get used to catch shrimp.



## **14. HARVESTING MACHINE:**

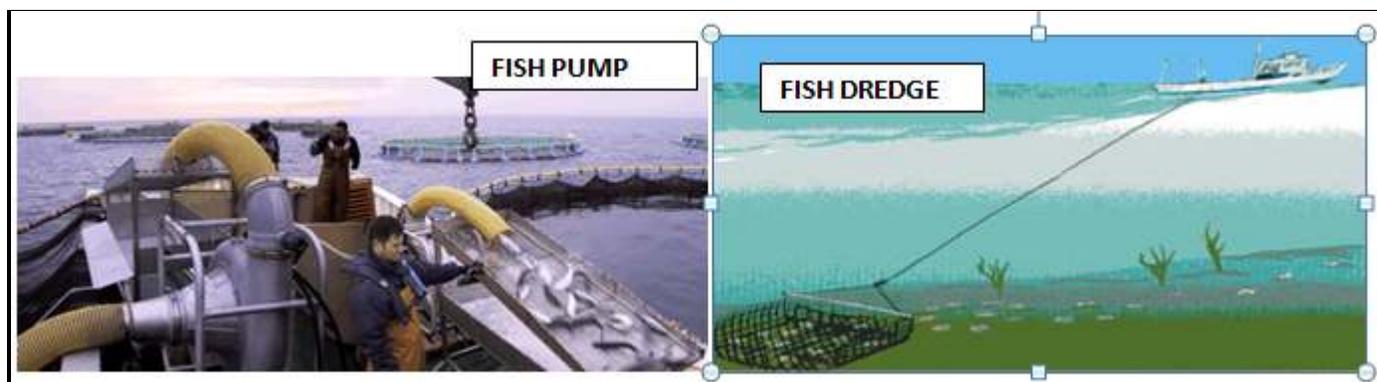
This group includes all the fishing gear which extracts fish from water and transports it to the boat. Very limited to smaller species of fish.

### **FISH PUMP:**

Pumps are used to catch fish which are attracted by means of light. It is very much popular for squid.

### **HYDRAULIC DREDGES:**

Here, under water jet get used to extract mollusks and shrimp from water. After that the catch gets dragged in bad of dredge. Here, the catch gets transported in board by means of conveyor belt or by suction device.



### **FAO CLASSIFICATION**

### **ISSCFG CLASSIFICATION OF FISHING GEAR.**

### **ISSCFG (INTERNATIONAL STANDARD STATISTICAL CLASSIFICATION OF FISHING GEAR)**

- ✓ This classification of fishing gear gets accepted by FAO.
  - ✓ Here, the gears get classified based on the gear structure.
  - ✓ ISSCFG classified the fishing gear into 12 classes:
- 1. SURROUNDING NETS:**
    - ✓ Here, the fish get surrounded from sides and from below.
    - ✓ Example – Purse seine, Ring seine and Lampara nets.
  - 2. SEINE NETS:**
    - ✓ These nets surround the particular water area usually coastal or shallow water.
    - ✓ The net get set with the help of line either from shore or from boat.
    - ✓ Example - Beach seine and boat seine
  - 3. TRAWL NETS:**
    - ✓ The net get dragged through water with the help of fishing craft.
    - ✓ They either get operated on bottom or in mid water of an ocean.
  - 4. DREDGES:**
    - ✓ They are rigid structure dragged over the bottom of the sea to separate mollusks, crustaceans, fish etc. from water, mud and sand.
  - 5. LIFT NETS:**

✓ The net which are submerged in water and get raised above the water level to catch the fish.

✓ Example – Lift nets, Hoop nets, Blanket nets etc.

#### **6. FALLING GEAR:**

✓ Operated mostly in shallow water.

✓ Here, the fish get covered with net and when the net get lifted the fish get caught in the net and water gets stained.

✓ Example – Cast nets, cover pots, Cover baskets, and lantern nets.

#### **7. GILLNETS AND ENTANGLING NETS:**

✓ The net either gilled or entangle the fish.

✓ Example – Set nets, Drift nets, trammel nets, and encircling drive in nets.

#### **8. TRAPS:**

✓ It gets set in water and escaping of fish get prevented by some means.

✓ Example – Pound nets, Fyke nets, Stow nets, Barriers, fences, Weirs and aerial traps.

#### **9. HOOK AND LINES:**

✓ Here hooks get used.

✓ A bait is fixed with hook to attract the fish

✓ When fish take the bait into mouth, fish get caught

✓ Example – hand lines, Pole lines, long line and trolling line

#### **10. GRAPPLING AND WOUNDING GEAR:**

✓ Here, the fish get caught by grappling and wounding.

✓ Example – Harpoons, Spears, Clamps, Tongs, Rakes, Bow and arrows.

#### **11. HARVESTING MACHINE:**

✓ The machine which is used to transfer fish from water to boat by some means.

✓ Example – pumps. Mechanized dredges etc.

#### **12. ALL OTHER FISH CAPTURE GEAR:**

✓ It includes hand and landing lines; drive in nets, simple hand implements, stupefying devices, explosives etc.

✓ Some trained animals can also be get used for catching of fish.

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