

Applied sustainable fishing techniques over artificial reef sites

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*A management that pushes aquatic systems in the direction of their primal states, when the predators controlled the primary consumers, rebuilding **and restoration of ecosystems should be the overreaching goal of new fisheries management** (Ludevig et al., 1993).*

As it is very well known that the artificial reefs aggregate several fish species, which settle and recruit therein, the resultant biomass becomes very lucrative for the local fishers to capture the maximum due to increased pressure and competition. This may tend to be unhealthy and lead to overexploitation in due course. A well-managed reef fishery involves self-restrained, regulated and selective gear fishing practices.

Fishing methods and practices in the AR:

1. Hooks and line:

- a. **Long lining:** mainly used for trevallies, lethrinids, snappers, groupers, cobia, seerfish, seabass, grunters, sweetlips, croakers, gholis and other sciaenids. Surface lines/mid-water lines and bottom lines are employed, all using bait.
- b. **Mid-water hand lines:** mostly used for small-sized fishes using small baits and live shrimps. The line has 25-30 hooks tied at intervals to a main line and is used to catch scads, mackerel, trevallies, small tunas, sweet lips, grunters, breams, and snappers.
- c. **Bottom hand jigging:** used for the capture of squids and cuttlefish. It consists of a line with a lead weight and hooks fixed amidst glittering paper stuck on the rod.
- d. **False bait hooks:** These are vertically lowered lines with a dead weight (iron rod) with at least 20 small hooks. The line is tied at intervals with glitter paper and gilt folds. This unit is just moved up and down to attract the small fishes like scads, other small carangids, lethrinids and small perches to get hooked onto the line. These gears bring in the fish in fresh, live condition. An interesting fishing technique that has opened new avenues for the reef-dependent fishers is the collection of small fishes and juveniles of scads and mackerel which are used as **live baits** to catch large pelagics in deeper waters, such as seerfish, tunas, barracudas, sailfishes, dolphinfish etc. This fishery, locally called “**Panjil**” fishery (in Tamil Nadu) has proved to be very beneficial for fishermen.

Fresh live baits are collected by altering a boat design making an extra fish hold tank inside the FRP unit which can support nearly 300 numbers of 100-150 gm sized fishes for nearly two hours as the boat runs into the deeper waters. These fishers get better catch rates for tuna/seerfish and dolphin fish/sail fish. This method has reduced their operation costs towards frozen baits (Rs 3000-4000 per trip) and also has permitted elderly fisher to go to the AR sites and catch live baits and hand them over to the young fishers who venture to deeper waters.

Advantages: Reduced use of destructive gears, reduced efforts for juvenile fishing, collective management process and proprietary resource adoption.

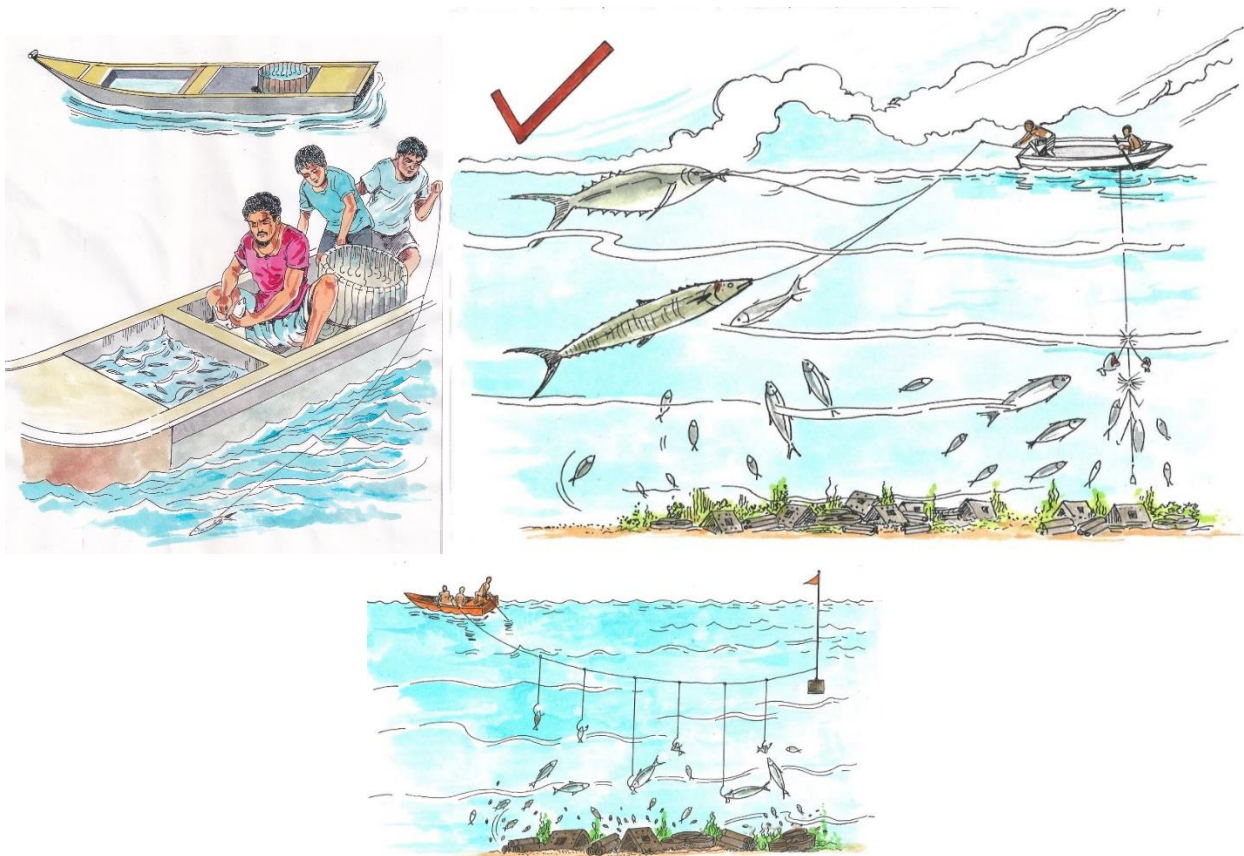


Fig.52. Hook & line and longline fishing using live baits in the artificial reef site

2. Gill nets:

Gill nets are set drifting along the outer boundaries of the area of the AR such that the natural currents will bring the fishes towards the nets. These are surface drift gill nets

with a maximum hanging depth of 10 meters. They are used to capture mackerel and scads and small tuna and barracuda shoals over the reef.

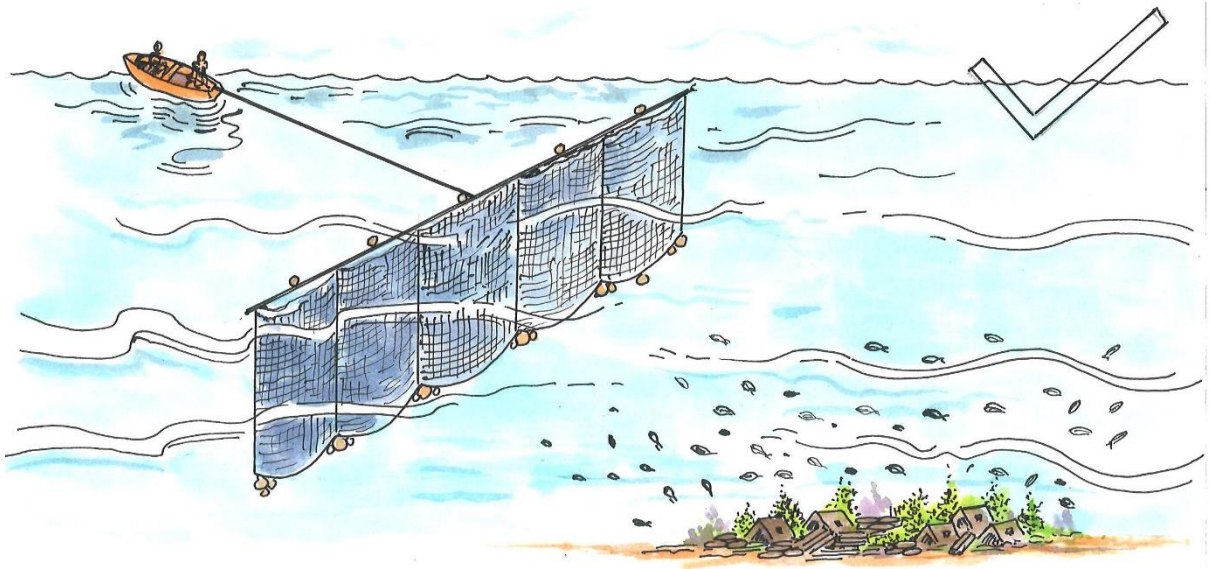


Fig.53. Drift gill net fishing in the artificial reef site

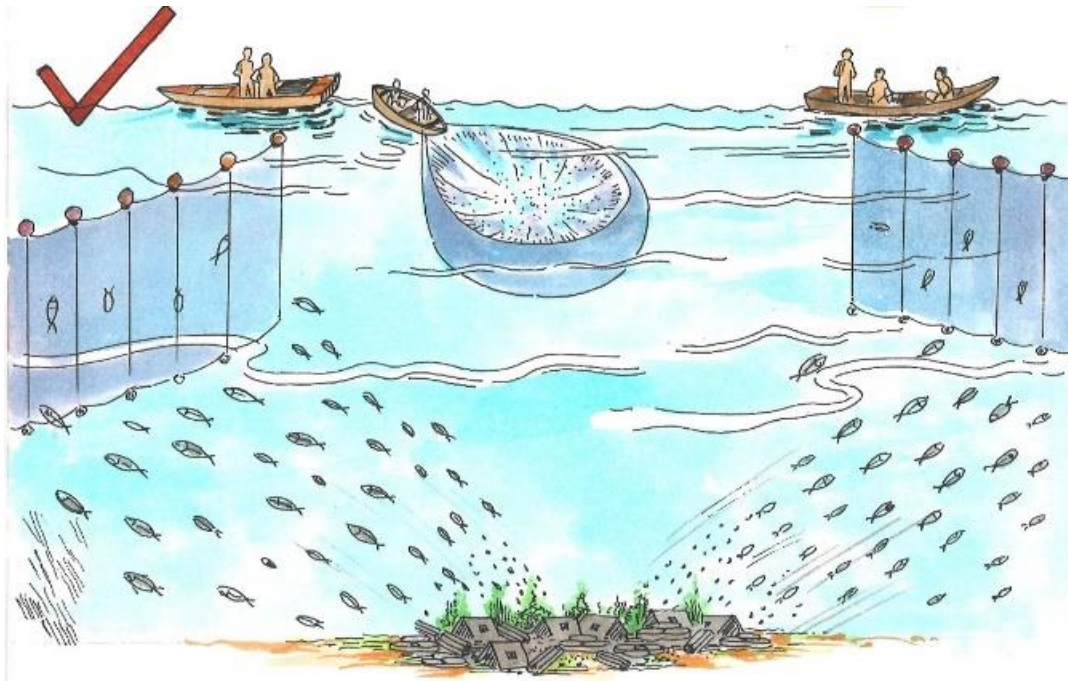


Fig.54. Encircling net fishing for forage fishes in the artificial reef site

3. Small bag nets:

Two small FRP boats operate encircling nets on the surfaces of the AR areas during the forage fish abundance - sardines, mackerel, scads, barracudas, small tunas and small carangids.

4. Gears such as traps, pots and spearguns by divers could also be options in the coming years.

Fishing in the AR sites is occasional and on rotation; often, when the other options are reduced, the fishers work over the reef areas.

How has the AR fishing turned more sustainable?

1. The capture of select species of utility and recommended sizes.
2. Maximum utility to the commodities captured over the reef.
3. Highly reduced scouting time and fixed destinations have improved access for the elderly to fish.
4. Reduced fuel consumption and reduced dependency on extra manpower.
5. The craft can be steered using sails and paddles and the units can be a very small canoe too – 3m unit, catamaran.
6. The fishing is optional and rotational and depends on the spatial availability; overcrowding is not possible as it is mostly first to come basis.
7. Release of the live ones of unwanted species back to the site.
8. Sensible fishing practices avoiding breeders and fresh recruits of big commercial varieties can see a fortune shift in the resource stocks.
9. Reduced use of plastic and nylon nets and reduced investments.
10. Reduced dependence on fuel subsidies and fuel, tending towards “green fisheries”.
11. Improves the carbon footprint of coastal fisheries.
12. Improves biodiversity and the reserves of vulnerable and near-threatened species and sheltering stocks.
13. Opens opportunities towards sea ranching and stock rebuilding, transplanting.
14. Opens opportunities for marine ornamental stock reserves and trade.
15. Creates opportunities for alternate options for the fisher youth in sports, SCUBA, recreation and tourism.