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FISHING CHIMES

Aquaranching

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Aquaranching is the art of reaping richer crop of fish, shrimp, or other aquatic organisms from open waters. It can be defined as a technique of resource enhancement, by stocking open waters with seeds of desired species of aquatic organisms and providing them with appropriate artificial shelters, enabling the organisms to guard themselves against natural hazards, so that they could reach a size when predation and juvenile mortality are much reduced.

Aquaranching is generally used to enhance resource potential of streams, brooks, rivers, lakes, reservoirs, bays, backwaters, estuaries, lagoons and even seas and oceans. The resource potentials of many of these open water bodies are seen to be reflecting depleting trends. The reasons are many. Some of these are: over-exploitation of existing resources, ecological topsy-turvy caused as a result of construction of dams and barrages over river courses, environmental degradation due to pollution, siltation and shallowing of river beds. Aquaranching, which is an emphatic mix of culture and capture fisheries, holds solution for revival of resources through rehabilitatory measures.

Development of Aquaranching

The technique of present day aquaranching evolved through three stages.

Stage I : In the early programmes of aquaranching, the seed of desired aquatic organisms used to be released in open waters and the resulting heavy mortality of them used to be taken as a phenomenon that could not be avoided.

Stage II : Learning lessons from the losses of initial trials, as a recourse to minimize mortality possibilities, the programme of interim rearing was introduced in subsequent trials of aquaranching. In this pursuit, seeds of desired aquatic organisms were first grown to slightly bigger size in net enclosures or tidal ponds, canvas tanks etc. and then released into open waters. The approach gave good results and encouraged establishment of a large number of aquahatcheries world over solely to meet the requirements of stocking material for aquaranching programmes.

Stage III : In an effort to obtain results that reflect greater impact of aquaranching programmes, the practice of providing artificial habitat (=reef) was introduced so as to enable the aquatic organisms to use them as hideouts for evading predatory attacks. The device worked well and became an integral component of aquaranching technique.

Use of Artificial Habitats

The idea of using artificial habitat (=reefs) in aquaranching was conceived taking cue from the habits of fishes to congregate around the remains of sunken ships and other such structures. In fact, in some parts of the world, creation of such artificial shelters along river courses, tidal creeks and shallow seas to lure fishes for fishing has been in practice since ages in geographic locations as in West Africa, Madagascar, Sri Lanka, Bangladesh, Cambodia, China and even in India (*Viz.*, in Sunderbans).

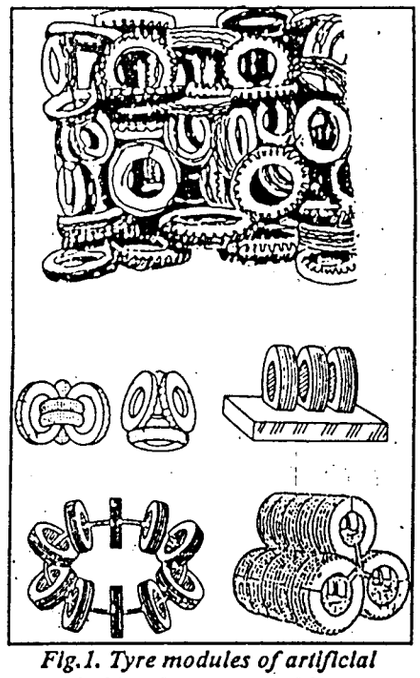


Fig.1. Tyre modules of artificial habitat for aquaranching

In earlier attempts of using artificial habitats, the most ingenious device was perhaps made by the Japanese people, when fisheries of that island nation became over-taxed and its distant water fishing ran into increasing opposition from foreign governments. In order to meet the protein requirements of its vast population, besides developing culture and propagational know-how of various aquatic organisms (sea urchin, octopus, squids, mussels, clams, oysters etc.) they even took to dumping old unserviceable street cars, buses etc., in the off-shore waters in the hope of providing '*aparto*' (=apartments) for fishes to take shelter and protect themselves against predators till they grow to big enough size for venturing into open waters for being exploited.

Now a days, use of artificial habitats is common in fisheries. A variety of items such as stones, old motor tyres, concrete drainpipes, steel or concrete modules, wooden and HDPE rafts, ballasted trees, plastic seaweeds, etc. are used as construction material for artificial habitats (Fig. 1 to 3).

Installation of artificial habitats on sea bottom requires serious study since all areas are not necessarily suitable for the purpose. Before making a move in this direction, it is desirable to take an inventory of the major fish species of

the area and their life history, and gather data on the topography and geology of the sea bottom. Also, answers to following questions are to be found out :

* Whether the installed artificial habitat will be compatible with other attributes of the aquatic environment,

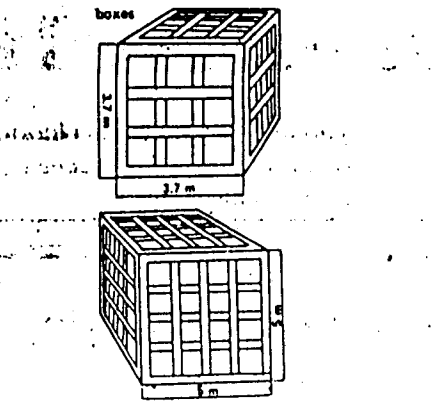
* How the artificial habitat will interact hydro-dynamically with the environment, specially currents,

* How much will be the stability of artificial habitat after placement, and

* How will be the effect of waves and land subsidence on artificial habitats.

Besides the above, water analysis would also be necessary with particular emphasis on temperature, salinity, dissolved oxygen, pH, direction and speed of currents and wave action. Likewise, information on the fishing gear used in the area will also be necessary. All these data help in determining the design of artificial habitat to be set up.

Artificial habitats are fabricated in various shapes and sizes. To be effective, it is to be seen that artificial habitats placed in an area must facilitate catching of enough fish to compensate for the investments made in the venture.



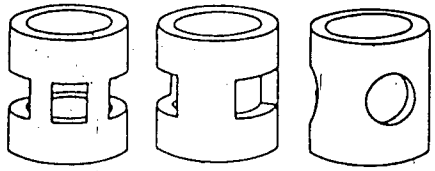


Fig.2. Steel and concrete modules of artificial habitat for aquaranching

Prospects in India

Of all the available open water resources of the country, reservoirs hold immense potential for improving their potentials for fish production through aquaranching. Likewise, hill streams and lakes could also be ranched to improve the scope of sport fisheries in the country.

Fisheries of nearshore waters in most areas of the east and west coasts have touched the MSY level and there is hardly any scope to improve the production unless ranching measures are resorted to.

The key to the success of aquaranching programmes in India, however, lies in the setting up of large numbers of aquahatcheries so as to facilitate easy availability of seed for stocking.

(This paper is dedicated to the memory of late (Dr.) N.K.Thakur.)