

Introduction

Sea ranching refers to the system under which marine species are artificially reared to fingerlings, released directly into the open sea, then later recaptured after growing to market size. This may include modification of the physical environment, such as the construction of artificial reefs, or protection and enhancement of nursery and growout areas to improve the survival rate of the released fingerlings. Thus, this system combines private property management during the rearing of fingerlings and common property management in capture fisheries at the time of recapture.

Sea ranching has evolved rapidly in Japan, partly as a result of the adoption of the 200-mile exclusive economic zone (EEZ) among coastal nations, thus limiting the fishing area available to Japanese fishers. The oil crises in the 1970s also discouraged fishing in the high seas. These made the Japanese maximize the use of their coastal waters.

Japan is now considered the leading nation in mariculture, especially sea ranching. Primary importance is given to the government's policy of coastal resources enhancement to increase primary production. At present, there are 16 sea ranching centers in Japan subsidized by the national government (Fig. 1). In addition, sea ranching centers have been established by the prefectural and city/town governments to promote sea ranching.

A lot of subsidies from the national, prefectural and local governments are pumped into these activities, such as through construction of fish hatcheries for rearing the organisms for sea ranching. Likewise, budgets are allocated to support programs for other activities related to sea ranching, such as intermediate culture,

tagging and fingerling release. Some private organizations like the Japan Oil Company and the Shiroyama Group also give monetary contributions for sea ranching. The full cooperation and support of Prefectural Fisheries Experiment Stations, Marine Ranching Associations and Fisheries Cooperative Associations contribute to the success of the activity.

Implications of Sea Ranching in Developing Countries

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The Present Situation in Developing Countries

An increase in the demand for fish and other fisheries products as a result of an increase in population and the immediate need for foreign exchange have led to the rapid depletion of fisheries resources in many developing countries.

Most fishing populations belong to the poorest among the poor in society. Limited job opportunities, lack of skills and lack of education force unskilled labor to depend on the fishing industry as a result of its open-access nature. It is one of the few options that can absorb them. As a consequence, the use of fisheries resources

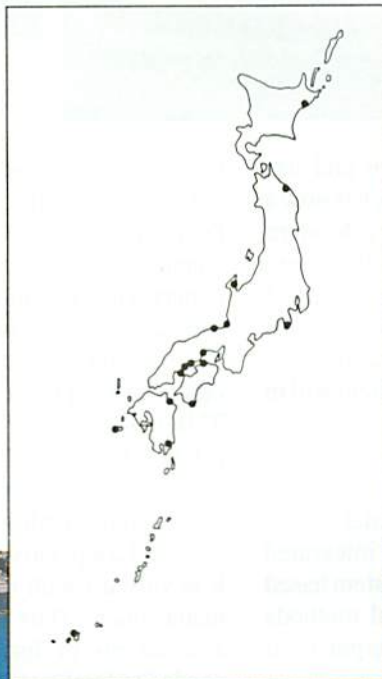
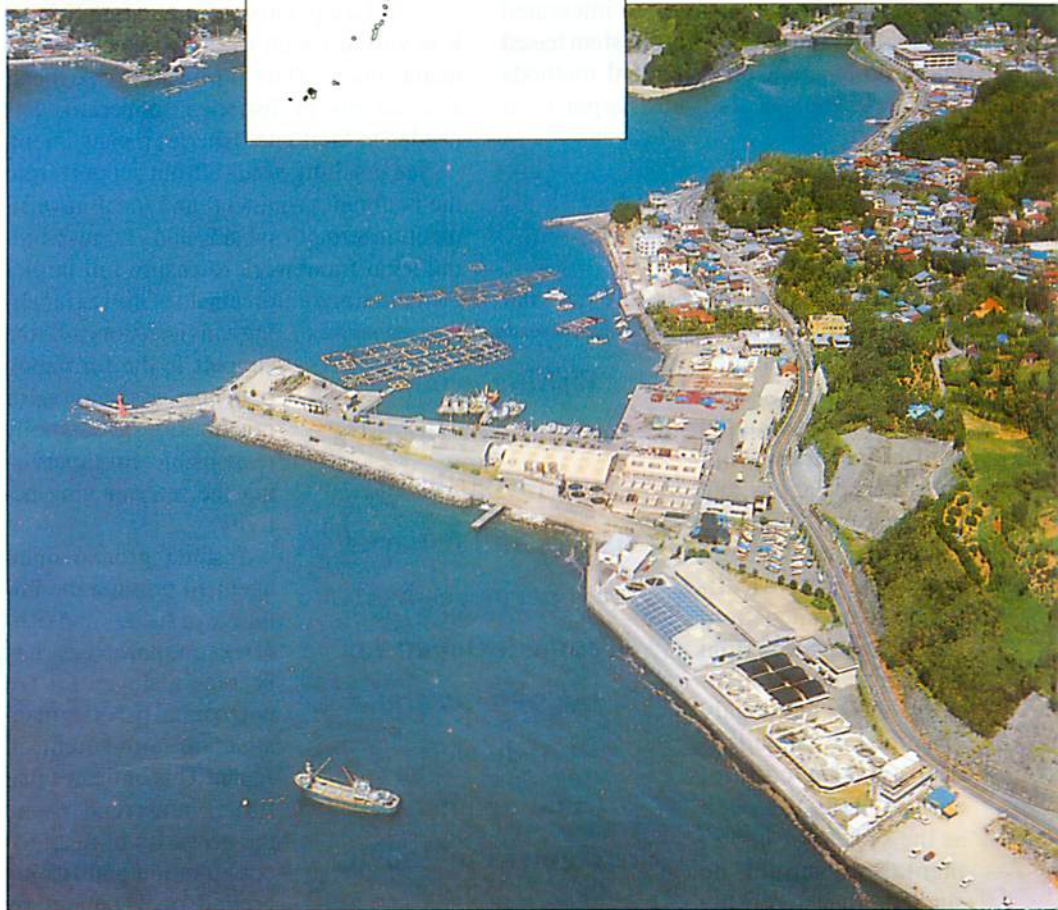
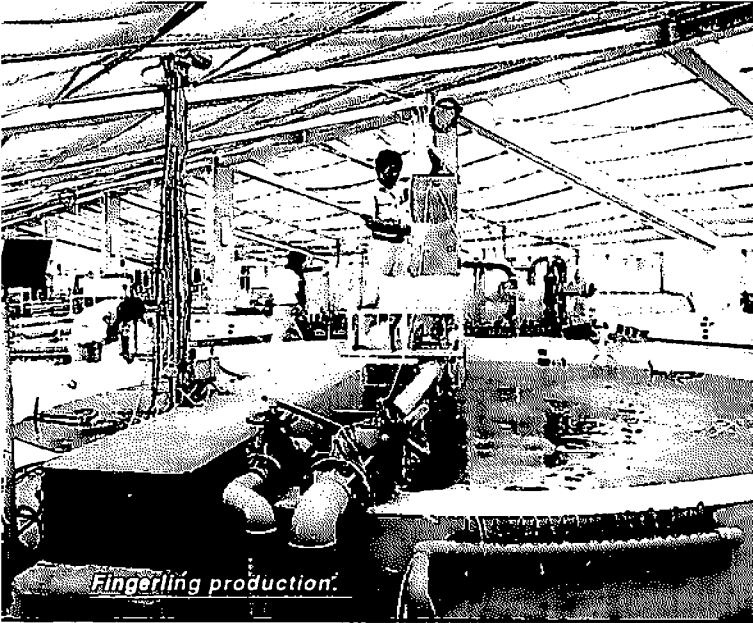


Fig. 1. Location of national sea ranching centers in Japan.

Shizuoka Prefecture Sea Ranching Center.

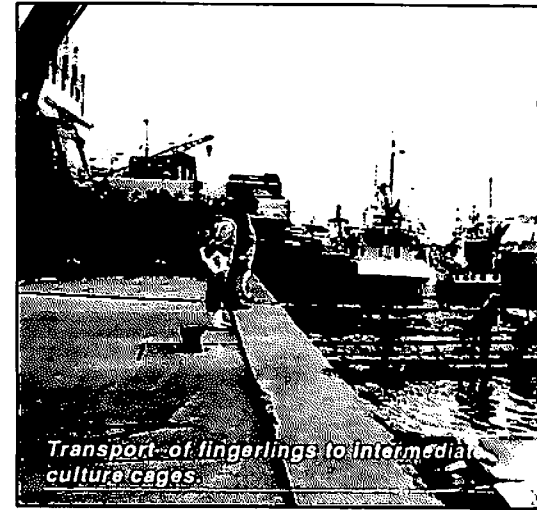




Fingerling production.



Transport of fingerlings to intermediate culture area.



Transport of fingerlings to intermediate culture cages.

has become highly competitive and has resulted in overexploitation which is now a big problem faced by the industry. Modern technology and improvement of fishing techniques has worsened the problem of overfishing. Destruction of fishing grounds with the use of explosives and toxic substances and lax law enforcement add to the problem.

Considering the overfishing problem, governments could initiate a system to enhance the productivity of coastal waters through the development of an integrated aquaculture and sea ranching system based on a combination of traditional methods and new technological advances as practiced in Japan.

Suitability of Sea Ranching

In Japan, sea ranching is initiated and subsidized by the government, implemented by Sea Ranching Associations in collaboration with the Fisheries Cooperative Associations, and managed by the latter.

Inasmuch as developing countries have a different environment from that of Japan, adoption of sea ranching technology should be thoroughly examined for its applicability. The culture, norms and values as well as the system of implementation should be studied exhaustively be-

fore any action is initiated.

Considering the numerous problems facing the fishing industries in developing countries, it is important to start with the fishers. Their prevailing notions and values such as "catching more fish means more money" and "if you don't catch the fish, others will get them" should be corrected. This makes it more difficult to restrict catches. It is also difficult for the fishers to reduce the cost of operations under such a competitive condition. Unless there is a joint and cooperative effort among fishers, it is very difficult to implement fisheries management. Thus, the creation of fishers' associations or fisheries cooperatives is needed to facilitate fisheries management.

Sea ranching needs all-out support from the national, provincial and local governments in terms of subsidy and a corresponding legal framework to ensure full implementation and enforcement of the sea ranch-

ing activity. Alongside the support is the formation of fishers' associations or organizations to be wholly responsible in supervising the sea ranching activity.

Fishing ground management through the initiative of fishers and fisheries cooperatives has become a slogan for the new coastal fisheries management movement in Japan. This indicates that fishers must understand the necessity of resource conservation and fishing ground management by

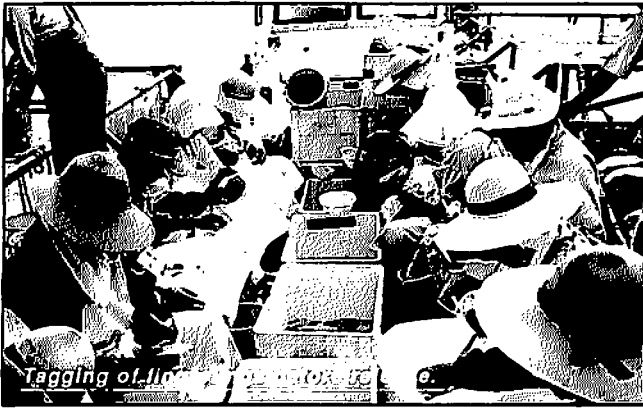
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themselves and implement these at their own initiative. This type of management lends itself to mutual surveillance. Since they work in the same fishing ground using the same fishing method, breaches or violations of the regulations, if any, will be readily identified.

In fisheries management, legal institutions of the central and/or provincial government are required. It will not succeed, however, if fisheries management is left to the discretion of the fisher only, without any enforcement of regulations. If fishers are not aware of the importance of such regulations, and there is no management organization for that purpose, successful fisheries management will not be possible.

Sea ranching is a public investment; cost effectiveness is more important than

Sea ranching is a public investment; cost effectiveness is more important than high profitability.



high profitability. Sea ranching seems to be a justifiable public investment in developing countries faced with resource depletion as a result of overfishing and illegal fishing. This is one of the few alternatives left to revive the resource which is vital for the survival of the fishers.

Development Center (SEAFDEC), a leading aquaculture research institution, has developed a new research thrust on sea farming and coastal enhancement. The success of this program will depend on the full support of the government and the fishers.

The government should now focus its attention on and give enough funding to research on the biological, technical, and socioeconomic aspects of sea ranching. As had been said earlier, fishers should not be forgotten. Any technological innovation that affects the lives of fishers should consider the values, norms and culture of fishers for it to succeed.

Taking into account the success of the Japanese experience in fisheries management, it is imperative for Filipino fishers

resource can be imbued in the minds of fishers through fishers' associations, then the idea of sea ranching is worth considering.

Conclusion

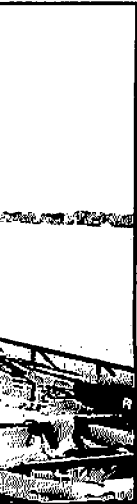
Sea ranching is one of the few alternatives left in answering the problem of how to increase coastal productivity in an ecosystem faced with the rapid decline of fish catch as a result of overfishing and destruction of fishing grounds. The key for the success in sea ranching is the quality of investment, rather than the quantity. The importance of fishers' cooperation and initiatives should not be undervalued. It took over a century for Japan to develop sea ranching, overcoming many problems similar to those in presently developing countries. The latter should now take advantage of the merit of starting late and skip the stages of failures in sea ranching experienced by other countries around the world.



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to develop a cooperative spirit through the formation of fishers' associations or fisheries cooperatives to achieve the maximum use of their main source of livelihood, the coastal environment. This can be done through proper education from designated agencies like the Bureau of Fisheries and Aquatic Resources (BFAR), state universities, etc. Establishing resource allocation by exclusive use rights in fisheries as practiced in Japan would also help. If the cooperative spirit and the need to conserve the



It is very important to consider economic effectiveness of public investment projects as well as to minimize the social cost of private economic performance. Public activities are frequently discontinued or just operated at the minimum level due to lack of enough operating funds. To be successful, such investment projects should seek enough funds for their maintenance and operating costs to assure an efficient and continuous operation, until the operation reaches a self-sustainable level.

Despite the high initial cost involved in sea ranching, it is still worthwhile to invest in if its effects are traceable and the management concept is well understood by all groups concerned.

The Philippines as a Case Study

Sea ranching in the Philippines is still in the experimental stage. The Aquaculture Department of the Southeast Asian Fisheries