
FISH FARMING

INDUSTRY

IN INDIA

THOUSANDS of years ago men had to change from being hunter of wild animals to farmer and stock-breeder. Today we have reached the stage where commercial deep-sea and inshore fishing will have to be converted to fish farming and marine livestock breeding. It is no longer a question of whether this change is possible, it is simply a matter of how should it happen and where should it happen.

In a country like India, with a population of about 75 million which is expected to reach 100 million by the end of this century will provokend to make an intense search for alternative sources of food. In this search for new food supplies and their more equitable distribution, attention will naturally be centred on the basic commodities such as wheat, rice etc. However, it is clearly recognised that these commodities should be supplemented by high quality protein food. Sea food makes an important contribution to the supplies of protein. Ofcourse, sea alone cannot easily meet the total food requirements of a very large sector of human population. But it is an excellent source of protein in human food. Already some 15 percent of world's supply of animal protein comes from the sea and it has been calculated that the potential yield, given the appropriate technology, is likely to be increased between 8 to 34 times the requirements.

PRESENT STATUS

Fish farming is already contributing very significantly to the food production and to the economy of a number of Asian countries. India has a vast potential for the production of fish and aquatic animals by marine farming. The most recent estimates put the world harvest

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of farmed fish at about 8 million tones, of which 80 percent is produced in Asia and the Far East. This means that only about 10 percent of the total fish yield is contributed by aquaculture.

Despite the immense potential which the aquaculture offers for generating extra food resources, it is surprising to note that it has been extremely slow in its growth and development. Lack of scientific methods to illustrate the usefulness of aquaculture, and the absence of relevant data to show the monetary returns it can give, have been the main factor for its restricted application. Perhaps the main factor which has contributed to the slow growth of aquaculture has been due to the unrealistic appraisal of the potentialities of biosphere to produce food for growing population, as it was earlier thought that

the food resources of the sea are simply inexhaustible and the desired increase is always possible by intensifying the exploitation of wild stocks.

FUTURE DEVELOPMENT

The technical feasibility of farming different aquatic organisms in Indian waters is highly promising (Table 1), and some of the production figures, especially for Indian carp, mixed culture and green mussels are comparable and even higher than those reported from the developed countries. Cost benefit analysis also indicates a high rate of return which is 181% in the case of mussel culture and more than 100% in traditional fish farming in Goa. The techniques developed in India are low cost and practicable. Thus, the success, so far achieved, clearly indicates the possibilities of fish farming on commercial scale.

TABLE I
ANNUAL YIELD FOR DIFFERENT AQUACULTURE SYSTEMS
DEVELOPED IN INDIA

SPECIES/WATER	LOCATION/SYSTEM	ANNUAL YIELD kg/ha
Indian carp/Fresh	Cuttack (Orissa)/Average for 132 ponds	4000
Mixed/Fresh	CIFRI, Barrackpor/Fish farm (West Bengal)	8750
Mixed/Brackish (Fish and prawn)	Kakinada (Andhra Pradesh) Fish farm	2250
Mixed/Brackish (Fish and prawn)	Goa/Traditional fish farms, paddy fields and salt pans	1060
Green mussel/Brackish	Dona Paula (Goa)/Rope culture on floating rafts.	4,80000

It would be hazardous to venture into a forecast of which type of fish farming system would likely to contribute most to future development. The objectives associated with aquaculture development schemes are different for different places and depend on national policies, environmental and technological factors, as well as economic and social aspects. Fish farming may be primarily developed to provide low cost food or to create employment in rural communities, thus contributing to rural development and reducing their drift to large cities. It may be set up to produce a product which would generate foreign exchange and will also provide recreational and tourist attraction. It may also be developed a business propagation to generate profit.

However, the future role of fish farming must be judged on its capability to provide additional supplies of low cost food. In saying this, we do not wish to neglect the possibilities existing in raising high value products for the luxury class market, but the large volume of food supplies which may people hope to obtain from aquaculture can only be achieved if production cost can be kept low. Prices for farmed fish must be on a level which low and medium income group can afford.

Several projections of possible increases in farmed fish production have been made and it is generally believed that a five-fold expansion by the end of this century should be feasible. It is estimated that the area under pond culture (swamps and low lying areas with the adjoining sea) can be increased many fold. This however, will have to be confirmed by ecological studies and site investigations. Further more, it is known that the

harvest of oysters and mussels at present is just below ten thousand tons, but sheltered and relatively shallow areas of lakes, reservoirs, lagoons and foreshore areas of suitable site for open water systems of oysters and mussel farming may be at least 2 to 3 million hectares.

The optimism regarding future production systems from the considerable rise in yields which have been obtained through improved techniques. In some areas of India, the average production of Indian carp was raised within a few years from 600 to 4000-5000 kg/ha through the adoption of moderately intensive polyculture techniques. Under favourable conditions, raft culture of mussel in India can produce 5000 kg/ha/year.

However, these estimates only give an indication of potential for future production. If these figures were to come anywhere nearer to reality, two considerations should be given i) The application of low-cost technology for sea farming and ii) Utilisation and marketing of the product rationally.

There are economic data available it appears that the cost of stocking artificial feed to be used during culture must be reduced drastically.

Thus it is through improved technology and more efficient organisation and management practices in fish culture, cheaper production can be expected to be achieved.

Further development will critically depend on the effective demand for fish and the extent to which farmed fish is able to generate consumer preference. The interesting example is of mussel culture. Mussels can easily be produced at a low cost and its production can also

be expanded very rapidly. However, it would be difficult to sell large additional production in our present market of mussels. This would mean that more efforts are needed on product advertisement and market promotion.

While the need to do something about the utilization and marketing of farmed fish was perhaps less pressing upto now, any future large scale expansion of the industry will have to give this sector its utmost attention. It must be clearly recognised that it is the market where the success or failure of new aquaculture ventures will ultimately be decided.

In future, fish farming operations will, therefore, have to be much more closely integrated into the processing of sea food and its marketing. It is not only necessary to ensure a feed back from the market on matters such as consumer responses, product concepts, price policies etc., but information from the market will ultimately determine the production scale and

harvesting schedules. While in fisheries, in general people are accustomed to market what the sea and the fisherman make available - a production oriented market offers one of the many challenges in aquaculture.

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