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A REVIEW OF THE ROLE OF RESEARCH IN CAPTURE FISHERIES*

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ABSTRACT

Starting with the Zoological Survey of India and establishment of the Central Marine Fisheries Research Institute, research on fish and fisheries of the seas around India has been conducted in several institutions, the activities of whom, have been outlined in the main paper. Indian fisheries has progressed to the saturation point in the inshore waters and exploitation of off-shore areas has started. This has required larger and more sophisticated vessels with considerable investments. The investors require considerable guidance in many aspects including areas of economic fishing, best size of economic vessel, product and market information, optimum gear, etc. In the absence of correct guidance there is wastage of capital and manpower, the ultimate result being that the Industry cannot be self-generating. Observations on the ecological factors in mathematical terms correlated with the fluctuations in the year groups of selected species for a number of years enable various models to be formed which can be gradually revised to simple ones using only the most sensitive parameters to be monitored on a permanent basis. In other words a synoptic approach can be taken up from year to year. This can only be achieved by participation in National programmes by several institutions. The paper details the nature of work and possible programmes along with priority problems faced by investors in capture fisheries.

INTRODUCTION

STARTING with the Zoological Survey of India several institutions have been established to conduct research and exploration of Capture fisheries. The Central Marine Fisheries Research Institute (CMFRI) is the key body for this research. Work done has covered aspects of taxonomy and biology of a large number of species, exploratory surveys of demersal and pelagic fishes, annual landings at various points from year to year. Periodic enumeration of fishermen, crafts and gear, etc. have been made. A few experiments have been conducted on migration of sardines, mackerel and prawn. Periodic oceanographic studies include current patterns, ecological parameters, upwelling and primary productivity. Preliminary attempts have been made to have survey programmes utilising relevant data from the Space Application Centre and National Remote Sensing Agency.

Dr. P. S. B. R. James, Director of CMFRI in his Keynote address at the National Symposium on Research and Development in Marine Fisheries in India, held in September, 1987 at Mandapam Camp has advocated co-ordination among the various organisations with facilities of vessels, evolution of a *modus operandi* with a clear demarcation of the work programme to determine the causes of fluctuations in major fisheries. He details study of environmental parameters as part of exploratory fishing, simulated commercial fishing operations for important stocks off the continental shelf, development of diversified fishing methods including those for deep sea Tuna, estimation of rate of replenishment of new resources, monitoring of the fish resources within the 50 m line and determination of factors responsible to enable appropriate management decisions. The studies should also utilise the commercial fishing data from the larger vessels and remote sensing information on locations of fish resources.

Research thrust should be on estimation of population parameters, assessment of stocks

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and their response to fishing and to changes in environmental factors.

Dr. S. N. Dwivedi, in the National Symposium on Utilisation of Living Resources of the Indian Seas in December, 1987 on Frontiers for Research and Utilisation of Marine Living Resources has suggested a judicious distinction between Science and Technology in institutions concerned, closer linkages between fisheries research and industries, real time data to determine the Maximum Sustained Yield (MSY) and Maximum Economic Yield (MEY), stock studies of sardines and mackerels in the SW Coast, Ghol, Dara, Pomfret along Maharashtra Coast and prawns off Kerala Coast and in the Bay of Bengal, incentives for ship board research and data collections, processing of information at a National centre for Population Dynamics and creation of 2 Ocean Technology and Marine Science laboratories, one for each coast.

Dr. Dwivedi has concluded 'However, whatever we have done so far is not enough to guide the Government and the Fishing Industry for management of these resources'.

The subsequent paragraphs indicate the current status, define the needs of Industry, discuss some of the opinions expressed and suggest an approach to meet the Industries' requirements.

Extent to Which Industry has Benefitted from Fisheries Research Resulting in Current Status

The traditional fishing industry has not yet benefitted from fisheries research except use of synthetic twine. The industry has developed, almost entirely with private capital and has sustained itself as it is mostly self employed.

Mechanised sector owes its existence to research in introduction of improved craft and gear, training and Government or institutional credit. Processing and export by private enterprise mostly have helped in raising the economy. The industry to some extent has been self generating and is on its own going in for medium shrimp trawlers. One significant development has been mechanised purse seining from small boats. It will be seen that most of the research has been on craft, gear and pattern of financing.

Off-shore fisheries beyond 50 m are hardly exploited as commercial ventures introduced sporadically during the past 4 decades have been discontinued. Notable among these are the operation of 90 ' vessels in the east coast by the Govt. of West Bengal, Bull trawling by New India Fisheries for a number of years with Japanese collaboration, trawling in Wadge Bank by large trawlers of the Govt. of Sri Lanka and lately operation of 100 or more chartered vessels doing paired trawling off the Gujarat Coast. Some 120, 23.5 m vessels, euphemestically called ' deep sea trawlers ' shrimp mostly within 50 m.

There have been several economic implications, mostly arising out of the increase in traditional fisher-population and negligible offtake to other industries. In some areas small mechanised vessel fishing has affected the economy of traditional fishermen, the same, in its turn, has happened to small mechanised vessel fishing where the 23.5 m vessels have concentrated.

There has been hardly any economic research on these socio-economic developments.

Needs of the Industry

A socio-economic study on the implications of mechanised fishing on traditional fishermen should be conducted.

To develop capture fisheries in the offshore area mere exploitable stock available in the different zones is not sufficient. There has to be delimitation of the economic areas and practical demonstration of profitable fishing with different gear.

Industry should be informed through one source in clear cut terms the concentrations of different stocks in well defined areas from year to year so as to finalise its fishing and marketing plans.

Since the offshore industry is still a 'risk' venture and investors find safer outlets for their capital, the Research and development measures by the Government have to be greatly augmented and capital more liberally invested by Government directly. Special attention has to be given to market promotion measures by the Government inside the country.

Practical demonstrations should be given on use of new craft and equipment like squid jigging, light fishing for whitebait, etc. This is also applicable to fishing for deep sea Tuna in the newly recorded grounds off the coast of Karnataka.

Discussion

There is general agreement that capture fisheries research is now to concentrate on assessment of stocks, including delimitation, mortalities, recruitment, abundance of year groups from year to year and synoptic assessment of the fishery as a whole. This will form the main guide lines to Government and Industry in order to decide on conservation measures or intensification of fishing in certain areas. This is a problem of immense magnitude considering the multi-species fisheries of the Indian Coast. Obviously species like prawns get priority. Other species are the migratory species of rock fish and carangids which contribute substantially to capture fisheries. This research, with the limitations of infrastructure like vessels, equipment, manpower and funds cannot be taken up on many species at a time. At least 1 or 2 species can be selected using all the available resources specially ear marked for this project. It has to be considered that the multiple parameters to be studied on a continuing basis have to cover the entire stock area and not by depth zones.

Present data from all sources processed by a central organisation will be useful to the extent of supplying a lot of collated information which will be disjointed and not objective. Data collected on this subject has to have inter-relationship with one another.

Stock assessment in parts or state wise is not meaningful. It has to be done over the entire distribution.

Conclusions

1. Primary need of Capture Fisheries Research is to provide synoptic information on fisheries to the industry.

2. Considering the limitations, only a few stocks be selected for assessment depending on the pooled resources of infrastructure and man power available.

3. A central body has to be set up for assessment of resources for stock assessment research, augmentation of facilities, formulation of programmes on a national basis involving the industry, division of responsibilities among various executive organisations, and monitoring of results.

4. For intensification of fishing different stocks greater attention has to be paid to craft and gear study.

5. Semi-commercial fishing should be taken up for demonstration and training of the Industry in new fields.

6. Socio-economic research on the effect of fishing effort of different types should be a continuing activity.

7. Research on market promotion has been done on a low key. This section has to be given priority.