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NATIONAL SYMPOSIUM ON RESEARCH AND DEVELOPMENT IN MARINE FISHERIES

MANDAPAM CAMP

16-18 September 1987

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(Indian Council of Agricultural Research)
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ROLE OF SOCIAL SCIENCE RESEARCH IN THE INTEGRATED DEVELOPMENT AND MANAGEMENT OF MARINE FISHERIES

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ABSTRACT

The importance of fisheries in the national economy needs no emphasis. The reasons for the development of fisheries in India are the same as in many of the Third World countries: the need to a) increased fish production, b) secure income and foreign exhcange, and c) provision of employment opportunities. This paper intends 1. to review and examine the current pace of social science research in marine fisheries, 2.to evaluate the performance of fishery policy and planning in India, and 3.to emphasise the need for sustained contribution of social science research for the integrated development and management of marine fisheries.It is found that the pace of social science research in the fisheries sector has hither to been rather limited. Excepting a few studies sponsored by Government and also some pioneering attempts by individual social scientists, systematic analytical research is lacking. The efforts of fishery policy and planning in India, so far, resulted in realising some of the national objectives in terms of growth of marine fish production and exports. Information about the improvement of the socio-economic conditions of fishermen is scanty. Due to absence of social science research interms of periodical evaluation of planning strategy, implementation mechanism and the resultant benefits, the desired results could not be achieved. Therefore, it is necessary to concentrate on problem oriented research to integrate the same with fisheries planning, and also to strengthen the social science research capacity for better development and management of marine fisheries.

INTRODUCTION

At the present stage of economic development, India relies heavily on its natural resource including fisheries. Since the principal objective of resource development is to achieve maximum sustained contribution to national output, it is imperative that natural resources should be harnessed in the process of production. This would help to achieve an optimum utilisation of resources resulting in a maximum increase of national income. The guiding principle of resource development applicable to renewable resources like fisheries, emphasis the need of using natural resources in such a way that a high technically and economically supportable level of national output may be sustained for an indefinite period (Datt and Sundharam, 1985 and Subba Rao, 1986).

The significance of fisheries development lies in its contribution to national economy. Fish, a staple food, supplies animal protein to 70% of the Indian population and the per capita consumption is 4 kg as against the actual requirement of 11 kg per annum. The contribution of income is estimated at Rs. 1,118 crores (1982-'83) which is 0.77% to the Gross Domestic Product (GDP) and forms 2.13 % to the primary sector. Overseas trade in fish and fish products secures

for the country Rs. 385.50 crores (1984) in foreign exchange accounting for 3.3% of the national foreign exchange earnings. Further, it provides employment directly to 1.8 million people besides to many more indirectly.

India, with an extensive coatline of 6,500 km and a continental shelf area of 5.8 million sq.km, has endowed with rich fisheries potential. Started as an avocation in the distant past, the marine fishery sector has risen to the status of an industry. Consequently, the marine fish production in India has almost trebled in a period of three and a half decades from 5,34,000 tonnes in 1951 to 16,31, 000 tonnes in 1984 (Table 1). Although, the annual rate of fish production is not in higher order when compared with the resource potential the achievement of the same was due to the concerted efforts of the multitude of marine fishermen, fishery scientists, fishery technologists and Government. The Seventh Five Year Plan has set an ambitious target of 2 million tonnes of marine fish production and Rs. 7,000 million worth of marine products exports (Table 2). It is envisaged to achieve these targets through judicious exploitation and management of the inshore fishery resources and extension of fishing operations into the Exclusive Economic Zone, besides some production through brackishwater aquaculture.

An attempt is made in this paper to analyse the possible contribution of social science research for the integrated development and management of marine fisheries. Specifically, it intends

1. to review and examine the current pace of social science research in the Indian marine fisheries,
2. to evaluate the performance of fishery policy and planning in India, and
3. to emphasise the need for sustained contribution of social science research for the integrated development and management of marine fisheries.

PRESENT STATUS OF SOCIAL SCIENCE RESEARCH IN INDIA

Research forms the backbone of development of fisheries on scientific lines and it needs no emphasis. Most of the advanced nations of the world have developed and achieved 'Fisheries Revolution' because of sustained and systematic research. The impact of this has been keenly felt even in India also. But the whole thrust of fisheries research in India so far has been centered round on biological and technological aspects, mainly aimed at the exploitation of fisheries resources.

On the other hand, the social and economic aspects of fisheries research has been completely ignored. The welfare of the fishermen, their investment and returns, the utilisation, marketing and distribution of fish and a host of other problems have not been taken care of. In this context, the observations of a distinguished natural fishery scientist, G.L. Kesteven, are worth noting. He says that "events in the fishery world over the past few decades have shown us that our natural sciences account of resources does not give us an adequate understanding of the behaviour of those resources, so that, in consequence, most changes take us by surprise and only rarely are we confident that we are acting for the best - any best - in our utilisation of resources. Yet, even more forcefully those events have shown us that our strategy of resource use is not a matter merely of how a resource reacts to what we do. There are technological, human and social elements to be taken into account, and for these we need a social sciences contribution" (Kesteven, 1972).

As outlined above, the current pace of social science research in the country in respect of fishery sector has hither to been rather negligible. There were no attempts prior to 1940 and immediately after, either by the Govenment or by the individual social scientists to promote social science research in fisheries. The only earlier reference was the unpublished report on 'Marketing of Fish in India' prepared in 1941 and published later in 1951 and again in 1961 (Government of India) with suitable modifications and improvements. Even today also it serves as a bench mark and valuable reference guide in the absence of other national fish marketing surveys. The Fish Sub-Committee (1945) emphasised the need for recruitment of the research staff by Central as well as Provincial Governments in order to conduct research studies on the aspects of marketing and distribution of fish, socio-economic conditions of fishermen, cooperatives, etc. But serious attention was not paid on these recommendations since the basic research in fisheries itself was in infancy at that time and even after. Seperate institutions were not created for the promotion of social science research in fisheries either by the Central Government or by the

Table 1 Marine fish production and exports in India

Year	Annual marine fish production (000'tonnes)	Share in total fish production (%)	Quantity in exports (000'tonnes)	Value in Rs crores	Average unit value realisation
1951	534	71.00	19.65	2.46	1.25
1956	719	71.00	18.14	3.72	2.05
1961	684	71.20	17.30	4.13	2.39
1966	890	65.10	19.15	13.52	7.06
1971	1161	62.70	34.03	39.17	11.51
1976	1353	61.50	62.15	170.86	28.96
1981	1378	56.40	75.37	286.71	38.04
1984	1631	57.20	89.91	385.50	42.88

Sources: 1. Various publications of Central Marine Fisheries Research Institute, Cochin.
2. Annual Statistics of Marine Products Exports, Marine Products Export Development Authority, Cochin.

Table 2 Targets for selected fisheries programmes in the Seventh Five Year Plan

Item	Unit	Base level 1984-85	Target 1989-'90
1. Marine fish production	M.Tonnes	17.50	22.00
2. Mechanised boats	numbers(cumulative)	20,000	25,000
3. Deep sea vessles	-do-	75	350
4. Habours/landing centres	-do-	86	140
5. Marine Products exports	Rs.in crores	385.50	700.00

Source: Seventh Five Year Plan 1985-'90, Vol. II, P.36.

Table 3 Percentage share of marine fish catch by mechanised and non-mechanised boats along the Indian coast.

In 000'tonnes

Year	Total catch by mechanised vessels	Share (%)	Total catch by non-mechanised vessels	Share (%)	Total marine fish production	Total (%)
1961	7	1.02	677	98.98	684	100.00
1966	13	1.46	877	98.54	890	100.00
1971	238	20.50	923	79.50	1161	100.00
1974	374	30.71	844	69.29	1218	100.00
1981	839	60.90	539	39.10	1378	100.00
1984	1150	71.16	466	28.84	1616	100.00

Source: Marine Fishery Information Service, T&E Services, Various Issues, Central Marine Fisheries Research Institute, Cochin.

State Governments. The Agro-Economic Research Centres set up in various parts of the country by the Ministry of Agriculture were confined to studies on agriculture, animal husbandry and dairying. However, it is striking to note with some satisfaction that the fisheries extension wing of the Central Marine Fisheries Research Institute, Cochin, undertook few studies on the socio-economics of fishermen. Recently a fishery economics unit is also started in the extension wing to carry out studies on eocnomics of fishing units following the recommendations of the National Commission on Agriculture (Anon, 1976). Further, excepting the study by Planning Commission (1971) on 'Evaluation Study of Mechanised Fishing Boats' and later by Naitonal Council of Applied Economic Research (Anon, 1980) on 'Demand for Fish and its Transportation and Storage' and also by IIM, Ahmedabad (1982) on 'Marketing', the Government did not sponsor any other study.

However, of late, some pioneering attempts have been made by individual social scientists like P.S. Rao, John Kurien and others including the author working in different universities and other social science research institutes spread over various parts of the country mainly from the coastal states to study on different aspects of fisheries like marketing of fish, costs and returns of fishing units, role of cooperatives. The studies serve as benchmark and provide background information for future studies. By and large, excepting the above few studies, there exists no plan for the development of social science research capacity to work on problems of fisheries development in the country.

PERFORMANCE OF FISHERY POLICY AND PLANNING IN INDIA

This section mainly deals with the performance of fishery policy and planning in India and highlights the need for social science research for the development and management of marine fisheries. It has been increasingly recognised that in any sector of development, the social science research contributes heavily for the sectoral policy and planning process. Therefore, this section firstly, reviews and examines the fisheries policy and planning process in India and highlights some of its achievements. Later, it discusses about the need based and possible areas of studies that the social scientists themselves or in association with natural scientists or technologists can undertake.

At present, social scientists in India are not making large contributions to the planning fisheries developemnt either in providing information to the planning process or in plan evaluation. In other words, the social science research support to fisheries development planning is small, and professional social scientists are not much involved in evaluating the possible implications of plan implementation. This is largely due to the lack of economists and other social scientists trained to work on problems of fisheries planning and developemt. However, given an opportunity, social scientists can more effectively structure their programmes to contribute to national development. In this context, the observations of renowned resource and fishery economist, Harlan C. Lampe (1976) is worth mentioning. He suggests that national interests might be well served by directing attention of social and other scientists to fisheries planning.

The Government policy regarding the development of marine fisheries envisages the exploitation of seafood fish potential in view of the nutritive food shortage in the country and also to derive other economic gains for the larger benefit of the nation as a whole. Therefore, the fisheries planning in the country is directed to achieve these ends. The successive Five Year Plans have three common objectives for fisheries development. They include:

a. to intensify and increase fish production,

b. to earn foriegn exchange through exports of marine products, and

c. to increase employment potential and income of the fishermen and to improve their socio-economic conditions.

The various marine fisheries development programmes which have so far been under taken to achieve the above objectives consist of: 1) mechansiation of fishing craft, 2) exploratory and experimental fishing to locate new grounds, 3) improvement of fishing methods, 4) increasing the suppply of fishery requisites, and 5) provision of facilities for landing, preservation, transport and marketing of fish. Besides, the Government has also attempted to step up fish production through exploitation of deep sea resources by deployment of deep sea trawlers in the areas of EEZ by encouraging the Indian entrepreneurs and also by joint ventures with foreign firms on chartering basis.

Now we are in the middle of the Seventh Plan. Attempts are just initiated to prepare a suitable approach for the Eighth Plan. Hence, a close perusal of the achivements of the earlier Plans in relation to the stated objectives in respect of fisheries development seems necessary to take stock of the situation.

A close examintion of trends of marine fish production in different periods indicates that in general, there has been a continuous increase of fish production, although it falls short of plan targets. Threefold increase can be noticed from 1951 to 1984. One important reason for this rise in fish catches in recent years may be attributed to increase in the number of mechanised boats and also to excessive fishing effort by them. Until 1970, the total marine landings were caught by the traditional craft and the share of mechanised boats was only 1.3%. With gradual increase in the number of mechanised boats in the subsequent years/plans, the share of their catch has also gone up. It can be seen from Table 3 that the contribution of mechanised boats was 30% in 1974 which has went up further to 70% in 1984. But the same was reversed in case of traditional craft. The most disquieting feature that can be noticed from Table 3 is that the productivity of traditional boats has deeply gone down. This suggests the need for a careful and indepth study.

As regards the exports of marine products also there has been continuous increase both in respect of quantity and value from 1961 onwards. While the quantum has registered a fivefold increase during the period 1961 - 1984, the value has jumped up 93 times. This is mainly due to higher unit value realisation in the market, which has also increased 18 times during the same period. Further, shrimp has been the major item of exports, and Japan and U.S.A. have been the major markets both together sharing 80% of the value of total marine products exports.

Coming to the third objective, i.e. increase in employment potential and incomes and improvement of the soci-economic conditions of fishermen, Dr.G.S. Dhillon, Union Minister for Agriculture, states that a number of Centrally sponsored schemes have been initiated recently, of which, some of these are production oriented while others are welfare oriented (Dhillon, 1987). However, the beneficial impact of these programmes have not been adequately studied inorder to intensify or modify the programmes to extend the benefits to majority of the fishermen.

It emerges from the above that during the period of three and half decades, a good number of schemes have been conceived and implemented for the promotion and development of marine fisheries. An essential prerequisite, in this context, is the thorough periodical evaluation of plan objectives and the implementaion mechanism and assessment of resultant benefits derived therefrom. Unless it is done, it is highly difficult to imagine to which direction the policy or the planning process is moving. It is here that social science research can play a key role in identifying the weakspots and set the things on right path.

In planning to achieve the objectives, there may be some national policy guidelines that impinge upon approaches used. Fisheries planning must essentially plan for national objectives and within national policy constraints. Lampe argues that "the lack of clearly stated fisheries policy is not necessarily a problem. What has been a problem is that fishery development plans have frequently overestimated the possible contribution of fisheries to national objectives. There is a certain propensity to plan for what is wanted, e.g. in terms of growth rates, rather than what might be achieved".

NEED FOR PROBLEM ORIENTED RESEARCH

We further stretch the discussion for highlighting the potential contribution of social science research. It is also to provide a clearer view of how social scientists can more effectively structure their programmes to contribute to national fisheries development. In general, there may be some good reasons for not attaining the plan objectives as envisaged. Firstly, there may be a possibility to overestimate or underestimate the resource potential and the potential performance of vessels and gear. Three factors contribute to those productivity estimates: 1) stock density, 2) technology, and 3) operation of the fishing unit. If the stock density is over estimated obviously catch rates are likely to be overestimated. The designed technology (the complex of vessels and gear) may not perform as anticipated, particularly if it involves a significant departure from techniques with which experience has been gained. Fishing operations may not be conducted as planned or with the intesity expected. The anticipated number of days at sea may not be achieved due to lack of incentives, failure of the organisation to provide leadership,

lack of replacement parts, and a veriety of other reasons. It is not surprising that errors are made in the information given with which planners have to deal. Where information is weak or lacking, assumptions are made which subsequently prove to the inconsistent with the facts.

The second important contributing factor is the inadequate data base. Fisheries statistics, accurately collected and complied, do provide information on the production performance of the sector and changes in vessels and gear, and can provide insights into developing problems and also helps to improve management decisions. At present, somewhat reliable statistics are avaiable on fish production and seafood exports. Statistics relating to fishing villages, landing centres, population, workers, craft and gear are simultaneously collected periodically by Fisheries Departments, Directorates of Economics and Statistics and by the CMFRI. Unfortunately, these are not comparable with each other. No economic data is available with regard to utilisation pattern, marketing, fish prices, infrastructural facilities, etc., based on scientific surveys or estimates. And this should not be delayed further.

The typical fisheries statistics which are collected annually/periodically, do not provide sufficient data base for analytical research either in the natural or social sciences. This emphasises the need for special surveys to provide the data base for problem oriented research, mainly in five ways;

1. One of the areas that needs attention is studies on costs and earnings and economic efficiency of fishing units. In India, there are 1,54,000 traditional craft, 20,000 mechanised boats and 128 deepsea trawlers. Even among the traditional craft, which vary in size and type, various types of gears are used depending upon various factors. Similarly, mechanised boats, varying in size and horse power of engine, use trawl, gill and purse seine nets. Large trawlers also vary in size and adopt different techniques. But in terms of cost, the gap is very large between one another. A number of studies are needed from time to time to identify in each category, a better craft-gear combination for a given area, season, fish, etc., which absorbs less costs and yields higher returns with higher economic efficiency and economic viability.

2. Normally, the marine fish are disposed at the points of production. Even the retailers could go little interior. While there may be sourse changes in these conditions in certain pockets in and around the fishing harbours and landing centres near urban areas through Government intervention but in majority of areas this situation continues to be the same. This is because of non-availability of transport, storage and processing facilities. While the people near the landing center feel glut of fish, those in interior places face fish famine. In general, consumption of fish varies from state to state and within each state from region to region to demand for specific species and quantities of fish are needed from time to time to ascertain and plan for the supply of fish and the infrastructural facilities. Besides, studies are required to understand the nature and structure of fish marketing, channels of marketing, number and type of agencies involved, price spread from producer to consumer and the role of Government in this regard.

3. Whenever Government proposes to undertake a project or a scheme relating to fisheries, the involvement and participation of fishermen are essential. Experience shows that introduction of nylon nets and mechanised boats met with resistance from the fishermen in the initial period and led to clashes between fishermen operating mechanised and traditional boats. Simlarly, the implementation of rural development programmes often met with little sucess. This is because people were not taken into confidence before the initiation of programme. Therefore, there is every need to conduct studies before hand with regard to their casts, tradition, value systems, community way of living, needs and aspirations and these should be taken care of while studying the socio-economic conditions. Besides, the studies also should include the impact of mechanisation or other projects on employment, income, consumption pattern and levels of living. Then only they can derive the intended benefits. Fishermen are subjected to occupational health hazards which needs attention.

4. In the course of time, a number of institutions have came into existence in India such as co-operative societies, joint public and private enterprises, fisheries corporations, fisheries development authorities, fishermen's associations, and contacts aid with international organisations also increased under various programmes. These institutions were required to speed up the innovative processes and increases output, to improve utilisation and also to increase fishermen's income. But hardly any information

is available regarding the progress and performance of these institutions and no studies were undertaken to find out the impact of these institutions on the sector economy, its structure and on the welfare of the fishermen.

In consequence, the kind of feedback for corrective action in plan implementation and future planning is not provided. As a matter of fact, the natural scientists do not undertake this type of research and it is only social scientists who can perform these tasks jointly with the natural scientists or technologists.

5. Finally, there is the need for efficient management of fisheries resources, their exploitation and utilisation. Hither to fisheries management is viewed only in the narrow sence of maintaining fish stocks (maximum sustainable yield) in the sea through a number of regulations. But efficient use of post harvest resources is also an important aspect that needs attention. Manageament is needed in every aspect of the fisheries sector till the product is reached to the ultimate consumer. Efficient management in processing, marketing and distribution of fish, control of fish prices, management of cooperatives, finance, exports, and so on. Experience of other countries showed that the natural scientists alone cannot tackle this problem. But joint efforts of both natural and social scientists, as an interdisciplinary group, shall go a long way for evolving suitable mechanism towards this end. Therefore, an integrated approach is necessary for efficient development and management of marine fisheries by strengthening the fishery based social science research. There is a need for setting up of a National Social Science Research Institute for fisheries which provides remedies to many - a - ills of the fishery sector.

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