



FISH AND FISHERIES

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INLAND FISHERIES : MANAGEMENT, NON-MANAGEMENT OR MISMANAGEMENT?

Tamilnadu used to pride itself that it is second only to West Bengal in Inland Fish Production of India. But now, it has taken a dive to the sixth place. Statistics is perhaps the villain. Inland fish production of the State was estimated as 1,60,000 tonnes in 1984-85 and 75,000 tonnes in 1989-90. The latter appears to be more realistic. Prior to 1984-85, a growth rate of 10% per annum was 'produced', on paper. For rivers (and other running waters) a production of 60,000 t was recorded in 1984-85, which is 80% of total inland production of 1989-90. Even the best of the rivers has not yielded 1t/km. The catches of Ganga system are less than 50 kg/ha. Yet Tamilnadu managed to estimate a catch of 60,000 t.

If we take reservoir fisheries, the estimated production for 1992-93 was 3,100 t, but the actual figure was only 1258 t. There has been a gradual decline from 1653 t during 1988-89 to 1258 t during 1992-93. A reservoir like Mettur which yielded 660 t/yr in the fifties, when stocking was negligible and management aspects were not well known, touched a rock bottom of about 120 t in 1991-92, 1990-91 etc. After stocking 33.05 lakh fingerlings, if the catches are only 120 t, something is amiss. The revenue in Mettur was Rs. 3.22 lakh, but the cost of stocking (at current prices) would be about Rs. 11.00 lakh. Krishnagiri was stocked with 12.36 lakh 'seed' but over 90% of catches were 'trash fish'. The revenue ranged from Rs. 1.72 to 2.23 lakhs but the cost of stocking would have been at least Rs. 4.00 lakhs. Even TNFDC reservoirs, which were once 'gold mines' are now loss making units. Reservoirs like Bhavanisagar are not giving their 'potential yield'. Catches and revenue are declining but expenditure is going up. Scientific approach

and management inputs are therefore urgently needed to change this trend.

In aquaculture projects, unit production increased to nearly 1900 kg/ha/yr. Innovations were made and fish farmers developed their own vertically integrated culture systems. Proper research support to development extension programmes with motivation and clear public policy on leasing water bodies are required to sustain the production. But even this good project has suffered because of poor personnel management. Dedicated, devoted and motivated staff are the key to success of the FFDA concept.

The 'Intensive Fish Culture' project in tanks has not yielded the anticipated results. In brackish waters we are going nuts about shrimp forgetting all about Chanos, mullets, *Lates*, Pearlsport etc. As regards shrimps, seed supply is still the bottleneck. Shrimp seed (*Penaeus* and *Macrobrachium*) are not yet available in required numbers. Environmental impact of large scale shrimp culture has yet to be assessed.

Cold water fisheries have been neglected. Modern technologies like cage culture, pen rearing, cove culture etc. in reservoirs etc. have not been adopted in Tamilnadu. In Tanjore, 'Trench cutting' in paddy fields is making good impact. Sewagefed fisheries have also to be developed. Because of the FFDA, there is awareness of profitability of aquaculture. Many fish-culturists have taken to fish seed production (including latest breeding technologies and hatchery practices) and fish culture, marketing etc. They have developed 'appropriate' technologies too.

A. SREENIVASAN

AQUACULTURE AND ENVIRONMENTAL SUSTAINABILITY

Shrimp aquaculture has a history of perhaps a decade. It has been locally accepted almost in all types of ecological scenerios in the beginning. But the tremendous expansion which took place in this sector soon began producing negative effects due to lack of sustainability element in the planning package. In fact in the many areas of

'Aquaculture concentration' there was no planning as such. The important factors of interaction of aquaculture and environment may be grouped under four major heads as 1. Management 2. Infrastructure 3. Socio-economic impacts and 4. Factors of biology: sustainability in relation to Environment.

The major thrust is the aquaculture planning itself with emphasis on

- i. Carrying capacity of a particular zone of aquaculture concentration.
- ii. Multiple-user conflict may be solved by bringing together in discussion, the main users and allow them to sort out the conflict. In this connection a set of new guidelines applicable to the individual areas of high concentration are to be drawn up.
- iii. Thirdly the aquaculture management itself where environmentally friendly measures are adopted as far as possible; lessen the use of drugs and medicines. Mode of culture is to limit oneself for a production target not exceeding 2 t/ha so that use of medicines and drugs might be avoided and prophylaxis adopted.
- iv. Shrimp/fish farming on the coastal zone is part of the legitimate use of a coastline and this

should be brought to the attention of all and sundry. A comprehensive Rural Water Resource Management must stipulate the freshwater use; conflicts do not arise if measures to sustain the human population are available.

- v. In mangrove zones, it is high time, total prohibition on conversion of mangrove beds to aquaculture might be necessary. Although there is no set of research or other criteria to set up guidelines, one new visible impact from removal of mangroves is the soil erosion in the river course where large chunks of barren coastal bunds breakdown in monsoon floods.

T. RAJYALAKSHMI

(Excerpts from the paper published in the Souvenir released on the occasion of National Seminar on 'Current and Emerging Trends in Aquaculture and its impact on Rural Development' held during 14-16th February, 1995 at Berhampur).

THE RESEARCH NEEDS

For future development and management of marine fisheries in the Bay of Bengal region

The interactive nature of most fisheries in the Bay of Bengal region demands that management of a particular resource or a fishery requires examination of the role and impact of all interactive fisheries exploiting the same resource of resources—both from the biological and economic angles. Considering the relative effects of these interactive fisheries on the life and living conditions of the fisherfolk engaged in the respective fisheries, it has become essential to understand the socioeconomic implications of the interactions. Therefore, an integrated multi-disciplinary approach to the assessment is required for fisheries and fishery resources management purposes.

Those at the lower end of the income scale, often struggling for survival, will fail to heed the cry of management unless they are made to understand why fisheries management is necessary and how it could be done. This requires understanding of their attitudes, perceptions, educational levels etc. to identify appropriate media/material and approaches to awareness-building. Achieving this is vital to any success in the implementation of management measures, because without the fisherfolk's understanding, cooperation and participation management cannot be achieved.

The experience gained over the last two years under the UNDP-funded regional (BOBP) project on 'Bioeconomics of Small-Scale Fisheries in the Bay of Bengal Region' (RAS/91/006) reveals various shortcomings of the institutional setups which severely hinder appropriate approaches to, and effective implementation of, fisheries management studies, plans and measures in the region.

First and foremost is the weakness of that most essential tool, fisheries statistics, in the detail and reliability

necessary for the assessments envisaged. This lacuna has been repeatedly voiced over the years, but progress has not been satisfactory in many of the countries in the region. Consequently, the Project has had to spend considerable time, labour and funds to collect data and estimate production of relevant species and effort applied, according to seasons, areas, type and size of craft and gear. It is the same with economics of the fishing operations. Even socio-economic baseline information related in time to the production by the fisheries is lacking. Data collected by projects are seldom incorporated into a general database for continuous, or periodic, updating and use in the future. Hence, future studies too will have to keep repeating these time-and effort-consuming baseline information-gathering exercises. All the countries around the Bay of Bengal are aware of the deficiencies of fisheries statistics and the steps necessary to be taken to improve the situation. But they have yet to act to raise the standard of fisheries statistics to the level necessary.

Secondly, fisheries research or survey institutions in most of the countries are not yet organised for present-day needs which call for an integrated, multidisciplinary approach. Our attempts in the bioeconomics project to draw different institutions together to combine such discipline as fishery biology, fishing technology, environmental studies, economics, sociology and extension, so that a coordinated execution of workplans becomes possible, have not been successful. As a result, some surveys had to be redone in a number of countries. Project arrangements for coordinated work also tend to be temporary, with very weak linkages, and insufficient of continuation of an integrated approach on a long-term basis.

Thirdly, economics, and particularly socioeconomic surveys as required in the present context, must deviate from traditional ways. The specific pattern of fisheries operations—seasonality, craft-gear combinations and ownership, catch composition, geographic locations, etc.—influence incomes. Stratified sampling of income on a monthly or seasonal basis from various fisheries and stratified sampling of households must be matched to link the fisheries with the households. Socioeconomic issues and alternative fisheries or nonfishery income activities must also be identified before management measures can be introduced and fisherfolk enlightened on the alternatives available to them. Income distribution should be highlighted, because it determines welfare or the material well-being of the fisherfolk. Such a biosocioeconomic approach has to begin with micro-community level studies and lead to macro-level policy determination.

Many publications on socioeconomic aspects of fisheries were found to be contrary to the actual situation because of the failure to draw conclusions in the light of the resource status. Further, consensus is also needed on the manner in which such interdisciplinary parameters can be incorporated into basic biosocioeconomic models for management decision-making. Most of the existing bioeconomic models fail to take the socioeconomic aspects into consideration. The few biosocioeconomic models that have been proposed are based on conditions in the developed world and are not appropriate to the conditions in the Bay where small-scale and traditional fisheries still play a dominating role. It is accepted that there are many qualitative parameters, but there are quantifiable parameters which have to be incorporated.

Fourthly, appropriate media and material have to be identified for preparation and dissemination of information to fisherfolk on resources and management issues. Good scientists must also have the knowledge and skill to communicate with the fisherfolk and the public. Extension workers involved in this work should be associated with fisheries research institutions. The lack of an efficient linkage between research and extension workers is one of the weaknesses in this region and the need for inputs in this area is very high.

Fifthly, institutions should provide a suitable working atmosphere for researchers and should shield them from external disturbances and problems. In some cases, the uncongenial working atmosphere has led to senior researchers leaving the institutions. Then there are prevailing recruitment, transfer and promotional schemes which have, in many cases, contributed considerably to the lack of senior scientists required for today's complex multidisciplinary assessments and management of fisheries. In some countries in this region, senior scientists with specialized knowledge are often transferred or promoted to nonscientific or even nontechnical posts. The cadre for fisheries research has also been stagnant in many countries. And management training during the early career of a

researcher has been lacking. Consequently, some countries will, as long as the present system exists, continue to be dependent on external technical support in such matters.

Sixthly, the research priorities of, and allocation of national staff to, projects need to be improved. Most of the participating countries requesting project inputs are unable, or fail, to provide national staff from relevant institutions, to participate in the work. As a result, temporary staff have to be hired to execute the project's field activities and the training and experience provided these casual staff is often lost because, subsequently, they do not necessarily find employment relevant to the field of training and experience. Even in the few cases where national staff have been provided by the Fisheries Directorates, there have been cases where the background, training and experience of these officers were so different from the requirements for the kind of research and assessments involved that it became extremely difficult to achieve even a reasonable degree of success of meeting the objectives of the case study.

An issue related to this point is that of the degree of involvement of the few appropriate national staff assigned to the Project. Only 25 per cent of the participants from the six countries to the Regional Meeting and Workshop on Bioeconomics were directly involved in the subsequent execution of the Project activities. A large number of the national participants from the appropriate government institutions were simultaneously engaged in various other official activities outside the Project. Consequently, there was discontinuity in the monthly sampling of catch, effort and income and seasonal testing of gear and other devices. Part-time input by the staff also resulted in the piling up of unprocessed data and incomplete analysis.

Seventhly, in view of the limitations in staff and funds in national fisheries institutions in the region, urgent short-term investigations should be preferred to long-term fundamental research programmes. Breakthrough research of a fundamental nature is common in many fields, including fisheries science, but, by and large, many of the demands of fisheries research in this region are applications of known principles and techniques for immediate development and management needs. Unlike the former, which requires long-term projects, the latter are often issue-oriented, for which solutions are required at relatively short notice.

Last but not least is the necessity to improve library facilities for fisheries research and to establish an information service to meet the growing needs of the fishing industry. Fisheries libraries in some countries are starved of necessary reference material essential for research. This is reflected in the poor references made to available literature in a number of publications coming out of the region. It also exposes the deficiencies in the inputs into the research planning. With subscriptions for journals being costly, getting them in exchange for the

national fisheries research journals/bulletins published in the countries of the region is one way of fulfilling this need to some extent. Sadly, several fisheries research journal/bulletins published for many decades by national institutions in the region have ceased to come out. In other cases, opportunities for establishing a bulletin/journal are being overlooked.

The capacity of research personnel and the research output of the national fisheries institutes/agencies would be enhanced significantly with better access to updated information and reference material on multidisciplinary approaches to fisheries development and management.

With weaknesses in the organization and in the strength of relevant institutions, with limitations in the output of research and the instruments of management, sociopolitical influence appears to sway most decisions on development and management in the region. Many, or ALL, of the points listed above apply to most of the participating

countries—and with most projects that have been, or are being, implemented in them. The situation becomes even more difficult when there are several projects at the same time, all competing for qualified national staff. Yet, as these projects have the primary objective of institutional strengthening, the recipient countries should ensure that their inputs are provided with this objective in mind. Half-hearted responses result in national staff not taking their roles seriously.

If the needs listed are not improved, the attainment of institutional strengthening necessary for appropriate assessment and the readiness for coping with the development and management plans already awaiting action will be inordinately prolonged. The fisheries resources of the region can ill-afford such delay.

K. SIVASUBRAMANIAM

(Reprinted by courtesy from article (part) published in BAY OF BENGAL NEWS, June 1993)

FISH AND CHIPS

- * FAO schemes are such dismal failures that they have been conveniently forgotten....these monuments to incompetence are exhibited with pride by Government officers. It is common to find that an entire long term policy has been formulated on the basis of an initial survey carried out by an inexperienced expatriate. The legacy of FAO's own disastrous flirtations with failure is all around and many countries are still paying the cost of failed projects.

—Douglas Cross, FAO Consultant. *Ecology Asia*, 1(3), 1993.

- * There are also several instances of pseudo consultants providing wrong advice to (fish) farmers.

—*Fishing Chimes*, 14(10) : 11, 1995.

- * It is a matter of surprise that learned Scientists differed so much, unable to distinguish between virus and bacteria.

—*Fishing Chimes*, 14(10) : 12, 1995

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