

The Realities of Fishery Management in the Southeast Asian Region

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MARR, J.C. 1982. The realities of fishery management in the Southeast Asian region, p. 299-307. In Pauly, D. and G.I. Murphy (eds.) *Theory and management of tropical fisheries*. ICLARM Conference Proceedings 9, 360 p. International Center for Living Aquatic Resources Management, Manila, Philippines and Division of Fisheries Research, Commonwealth Scientific and Industrial Research Organisation, Cronulla, Australia.

Abstract

Fishery management, particularly in Southeast Asia, is concerned primarily with people-problems rather than resource-problems. It cannot be successful unless viewed in the context of rural development. Conventional constraints to management include lack of theory, lack of data, lack of trained personnel, lack of institutional infrastructure, lack of physical infrastructure and gear conflicts. Unconventional constraints include large numbers of artisanal fishermen distributed over exceedingly long coastlines, responsibilities diffused throughout government, intra-government conflicts, international competition for the same resources and a close identity with nature leading to a fatalistic view about the course of events. Requirements for a successful fishery management system are listed. In spite of constraints and requirements, there are nevertheless reasons for optimism including the establishment of EEZs and examples, of which three are cited, of the ability and willingness of responsible individuals in government to identify critical problems and to take difficult decisions/actions with respect to such problems.

Introduction

Fishery science, and fishery management based upon the findings of fishery science, have been conceived and have evolved mainly in the context of economically developed countries, in which fishery development has been carried out almost entirely by the private sector. As such, the approaches have been resource-oriented, usually concerned with the preservation of the resource and the production of the maximum biological yield from it. They have not, at least until comparatively recently, been fishery-oriented and certainly have not been people-oriented.

However, about 25 years ago fisheries were discovered by economists and then, with some time lag to be sure, the concepts of economics as they relate to fisheries were discovered by fishery scientists (then primarily biologists) and to some extent by fishery managers. The ensuing evolution away from a strictly resource-orientation has made it possible for Crutchfield (1980) to recently state that: "The basic problem of rational utili-

zation of marine fisheries is not scientific ignorance. The real weakness lies in our institutional mechanisms for getting something done, and for making the regulated fishing industry itself a part of the analytical and decision-making process . . .". Also, this evolution made it possible for one of the major economically developed fishing countries to promulgate a comprehensive law relating to the fishery resources of the 200-mile extended economic zone (EEZ) established by that law (U.S.A. 1976). The law provides a mechanism for producing fishery management plans concerned with "optimum yield" and states as one of its purposes "to take into account the social and economic needs of the States".

While in a broad sense fishery management is concerned with people-problems, this is true in a more particular sense in Southeast Asia where about 50% of the fishery production arises from the small-scale fisheries carried out by some 3.5 million artisanal fishermen. With an average family size of six, this means that some 21 million people are directly dependent for their livelihood upon the income produced by such fishermen (Smith 1979). In this context, the objective of fishery management is clearly to improve the standard of living of the fishermen and their families. As Smith et al. (1980) have pointed out, small-scale ". . . fisheries must be viewed as part of the larger, particularly rural, economy." Unfortunately, the artisanal fishing communities are rarely effectively included in rural development schemes. But, as Panayotou (1979), and others, have pointed out, "the solution to the problems of resource management are to be found outside of the resource sectors." Thus, fishery management cannot be expected to be successful in improving the quality of life for fishermen unless it is imbedded in the broader matrix of rural development. What follows should be viewed in this context.

The extent to which effective fishery management can be included in rural development in Southeast Asian countries depends in part upon government perception of the need for technical advice on fishery management. Obviously, this perception will vary according to the part of, and level of, government at which the question is raised. The technocrats—fishery biologists and fishery economists—undoubtedly perceive a great need for such advice; planners, who are concerned primarily with "growth", may feel less need; and those in government who make political decisions and must be responsive to public reaction, may recognize even less need since short-term considerations most frequently prevail at this level. Clearly, this suggests an important constraint to effective management.

Conventional Constraints

What may be considered conventional constraints to fishery management include lack of theory, lack of data, lack of trained personnel, lack of institutional infrastructure, lack of physical infrastructure and gear conflicts. These constraints have long been recognized and require only brief mention here.

Lack of theory relates to the fact that the modern theories of population dynamics (which must be taken into account in the management decision-making process) are largely based upon single-species fisheries of

high latitudes in which the species are usually long-lived, whereas the fisheries of Southeast Asia are multispecies fisheries based upon a large number of species which are usually short-lived. However, in recent years it has been recognized by Andersen and Ursin (1977) and others that single-species are part of a complex multispecies ecosystem; the present volume is evidence of increasing interest in the "multispecies problem."

Generally speaking, in the Southeast Asian countries there do not exist long series of catch, effort and age data for the species which are the objects of fisheries such as exist for many higher latitude species (see Simpson, this vol.). This lack tends to be a two-sided problem; there are no data to examine in the light of existing theory and there are no data to analyze for the development of theory relevant to multispecies fisheries. However, Pauly (1979) has suggested that there may, in fact, be more sources of data than are generally appreciated and, further, that there may be appropriate methodology for at least their preliminary analysis.

The lack of adequate numbers of trained personnel is frequently commented upon and the provision of training facilities urged. This is a somewhat simplistic approach, to say the least. In most Southeast Asian countries there are, in fact, many individuals with training in fishery science who are not effectively involved in fisheries owing to inadequate government pay scales. Such individuals may leave government fishery service altogether or may remain nominally active while actually devoting most of their time to more profitable activities.

In many cases the institutional infrastructure necessary to supply the essential scientific information, identify the broad problems of fishery management in an appropriate context, take the necessary policy decisions and put management plans effectively in place are simply not present. However, with increased interest in fisheries, increased awareness of resource limitations and the virtually universal establishment of 200-mile EEZs, there is some reason for optimism in this regard (see below).

While the establishment of EEZs makes fishery management feasible by establishing national resource ownership, and thus making it possible to deal with the problem of unlimited access, it has at the same time created enforcement problems of unanticipated magnitude. Countries all over the world, including those in Southeast Asia, simply do not have the physical infrastructure with which to effectively enforce management regimes.

Gear conflicts are almost protean components of fisheries. Usually, but not always, they involve two or more different kinds of gear taking not only the same species but the same species at essentially the same life-history stage. However, the major gear conflicts in Southeast Asia often involve the same species at somewhat different life-history stages. These conflicts involve, on the one hand, the "inshore" artisanal fishermen using beach seines, traps, gill-nets, etc. and, on the other hand, the "offshore" commercial fishermen most commonly using trawls. This conflict is a major problem, since the artisanal fisheries involve so many people. Draconian measures may be required to deal effectively with this problem (Sardjono 1980), but it is most commonly attacked by measures requiring the trawlers to stay outside of waters of a certain depth or a specified distance from shore (Khoo 1980; Pathansali and Jothy 1974). The effectiveness of the

latter measures as far as the resources are concerned is questionable, since the species caught commonly occur on the inshore grounds as juveniles and on the offshore grounds as adults. Such measures may be effective in eliminating or at least reducing physical confrontation between inshore and offshore fishermen (Goh 1976), but even this often fails.

Unconventional Constraints

What may be characterized as unconventional constraints include some which are geographic/demographic, institutional, international and cultural.

Geographic/demographic constraints are especially important in Southeast Asia, particularly in the archipelagic States of Indonesia and the Philippines. Exceptionally long coastlines with very large numbers of artisanal fishermen distributed along them pose management problems of overwhelming magnitude.

Among the institutional constraints, two in particular should be noted. First, the responsibility for the various components of fishery management may be widely spread throughout government, so that it may be difficult or impossible to put management plans into effect (Marr et al. 1976). Second, fishery departments and other departments frequently do not communicate very well with each other at best, and may actually be in conflict, at worst. One responsible official has told me that in his country the planning department will not accept any resource information other than that which would indicate the possibility of substantial increases in yield. Another official in another country stated that the foreign ministry frequently made decisions on fishery matters without consulting the fishery department.

In Southeast Asia an almost universal international constraint has been the planned expansion of fisheries by a number of countries based upon the same resources in the South China Sea (Marr 1976). Even with the establishment of EEZs, as the result of which there is no remaining high seas area in the South China Sea, competition for these resources will remain an important problem because some migratory species will occur in the EEZs of two or more countries and because the EEZ boundaries will not be respected by some fishermen. An official of yet another country has ventured the view that some governments, including his own, would not be willing to enter into international management systems because of their unspoken intent that their nationals fish in the EEZs of other countries.

Finally, there are cultural constraints to fishery management. One of these is possible loss of face. The last individual mentioned above also said that it would be difficult for his government to participate in an international management body, since this would have the consequence of requiring a public statement or admission that the requisite data for management had not been collected. A more widespread constraint is the sense of identity with nature. This leads to what might be termed a "fatalistic" view about what happens including what happens to fishery resources, rather than to the more western view that the course of events can be altered by human actions.

Management Requirements and Future Outlook

A successful fishery management system in Southeast Asia would have a number of requirements, most of which appear to be so obvious as to be

truisms. Yet such a system is not yet in place, in part because some of the elements are frequently overlooked and in part because it is easier by several orders of magnitude to specify such a system than it is to put it into operation. In any case the requirements for a successful fishery management system include the following:

- Explicit establishment of specific management goals. Frequently goals are selected tacitly rather than explicitly and frequently conflicting or opposing goals are selected, i.e., to maximize biological yield and to maximize employment in the capture sector.
- The establishment of appropriate institutional and physical infrastructure.
- The recognition that the problems of coastal small-scale fishing communities are part of the broader problems of rural development.
- Realistic planning taking into account the finite, but renewable, nature of the resources.
- Management on a logical basis that takes into account the nature of multispecies fisheries and the general lack of conventional data.
- Management on a basis that is culturally acceptable, as well as physically possible.

As a result of the many biological and socioeconomic constraints to effective fishery management in Southeast Asia and of the requirements for an effective management system, it would be easy to be pessimistic about the future course of events. But, on the contrary, I am optimistic. Before citing examples of my reasons for optimism, I would make the point that no matter how great our interest, concern and involvement, we who are not Southeast Asians should not expect Southeast Asians to adopt management measures that would be appropriate in our own countries. I believe that the Southeast Asian countries will find unique solutions to their unique problems.

The reasons for optimism include, first of all, the declarations of the EEZs which establish national resource ownership and therefore the possibility of effective management. Secondly, there are examples, of which three will be mentioned, of the ability and willingness of those in government to identify critical problems and to take difficult decisions and actions with respect to such problems.

The establishment of the 200-mile EEZs found Thailand with a large distant-water trawling fleet which supplied in the order of 60% (660,000 t) of the Thai "domestic" landings by virtue of catches made in waters now included in the EEZs of other countries. The effects of the loss of such a large proportion of the landings obviously could have substantial political effects beyond the immediate losses to producers and consumers. Government joined with the fishing industry (in this case, the owners of the trawlers) in successful attempts to develop cooperative ventures between the Thai companies and entities (government or private) in neighboring and even some more distant countries, thus avoiding at least some of the loss of protein in the Thai market, economic disaster for vessel owners and increased fishing pressure in Thai waters of the Gulf of Thailand, already seriously overfished. In addition, the government, with bilateral and development bank assistance, is attempting to stimulate the further development of

aquaculture as a source of additional protein, employment, investment opportunity and export products.

In Indonesia the conflict between the coastal artisanal fishermen and the trawlers around densely populated Java and the southeastern end of Sumatra has been an important, and at times violent, problem since the introduction of trawling. Attempts were made to solve the problem, or at least reduce it, by reserving an inshore zone for the sole use of the artisanal fishermen. This regime was difficult to enforce and was not effective. Therefore, trawling around Java has been prohibited completely as of September 1980 and the southeastern end of Sumatra as of 1 January 1981 (Sardjono 1980), reserving the entire resource for the use of the artisanal fishermen.

A common approach to small-scale fishery development (an aspect of management) has been to attempt to increase total catches and catch rates by the mechanization of boats and introduction of synthetic nets. This approach in its most simplistic form ignored possible limitations to growth imposed by the magnitude of the resource, i.e., made the tacit assumption that the resource was infinite. This has been true in the Philippines as it has been elsewhere. However, there is now increasing recognition in the Philippines of the fact that many of the coastal resources are already overfished and that additional/alternative sources of income are necessary if the quality of life of the artisanal fishermen is to be improved. As Smith et al. (1980) have pointed out, a shift in attitude from "development" to "management" is taking place.

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Discussion of Mr. Marr's Paper

The initial reaction by the group to Mr. Marr's paper was a pessimistic one. One discussant observed he was struck by the author's ability to maintain his optimism in light of the list of conventional and unconventional constraints. The question was asked whether it is too late to make the required changes or whether our efforts are too small to make any significant impact. Considering the rate of increase in fishing effort in the region over the last decade, the slight possible improvement in constraints to good management appears small indeed. It was suggested that the situation could be described as "not enough, early enough" rather than "too little, too late". The complex of social, political, economic, ethical and bureaucratic constraints is of such dimensions as to completely overshadow the biological considerations and to discourage research on biological aspects.

Several discussants took a more optimistic viewpoint, however, noting that recognition of the need for change and the need for management are beginning to be recognized and that some examples of effective management steps had been identified in the paper. Regarding the "fatalistic" philosophy in Asia, the observation was made that the paper makes it sound as though a one-way flow of philosophical understanding was called for. Rather, an exchange of points of view or a two-way flow seems more appropriate. The people in the developed countries who have these notions of highly sophisticated management are going to have to get used to some of the "fatalistic" attitudes in the East. On the other hand, over the last decade or two there has been a dramatic dissemination of the technological attitudes of the West by people in the East resulting in marked changes in knowledge and attitudes.

A discussant took exception to the term "fatalistic" used by Marr. Its frequent use with reference to Asian peoples implies they won't change when in fact they are changing and will have to continue to change. He stated that fisheries management changes are only a part of the changes required by society as a whole. The biological problems are not as large as the social problems and good fisheries management requires much more than good biological data. It is less a question of knowing enough than one of being able to use what we already know. Others took exception to the assumption that we will be able to change many of the social factors influencing fisheries. Another participant noted the existing biological problems were very big ones and should not be minimized.

Exception was taken to the feeling that we should be pessimistic if fishery management measures cannot be implemented during the next few months or years. The North Sea example was cited where 30 years ago it was fairly clear that fishing mortality on cod should be reduced by 50% and that mesh size should be increased from 50 mm to 90 mm. Mortality rates were gradually reduced over a period of 20 years and mesh sizes have been changed from 50 to 70 mm (and in some cases are approaching 90 mm) over 30 years. We can be optimistic if our time scale is appropriate, a reasonable time scale being of decades rather than of months. A comparison was made of the situation in Southeast Asia in 1950 and today. Important progress has been made during this period including training of scientists and the building of research capabilities in several countries.

Progress has been made on all the constraints. The more serious constraints are the political and social will on the part of fisheries management and fishermen. However, even there a lot of progress has been made. In Thailand, for example, fishermen will not anymore quarrel with the fact that too many trawlers exist; they only quarrel with the idea of giving up their own fishing rights. Thinking need only progress slightly beyond this to permit beneficial action.

An additional voice of optimism was sounded by a participant who noted considerable advances in a number of aspects. Administrators, Fishery Director Generals and others have a much better approach to and understanding of the subject now than they did 5 years ago. The general understanding of the scientists is also steadily improving. There is a recognition in many countries that rural problems, including fisheries, have to be faced in a multifaceted way. There is progress but significant improvements will take a long time.

A question was raised concerning the statement, "in this context the objective of fishery management is clearly to improve the standard of living of the fishermen and their families". Is this the objective of fishery management? An example was cited in which fishermen were being trained for other trades in a "fisheries" high school since the only means of achieving a long-term improvement of the standard of living of fishermen is to reduce their total number.

Discussion of economic versus total yield or social objectives led to no resolution of this point. Even an optimum species mix cannot be defined in a biological sense at present and decisions will have to be made on the basis of economics and local preferences.

Mention was made of the assumption reiterated by Marr that artisanal fishermen catch the young of fish harvested by offshore trawlers. It was stated that this may not always be the case and instances were cited where the opposite is true.

A question was raised concerning whether or not joint fishing ventures are going to help the overall fishery problems. Examples were given of recent joint ventures and international sharing of resources that are not working well primarily because of dishonest practices. It was suggested that only limited benefits can be expected from international cooperation in fishing and that the real problems of overfishing will not be solved by these activities.

Discussion returned to the point that some positive action has been taken in Indonesia with the trawler ban there. The effectiveness of enforcement of this ban was questioned and other examples of enforcement problems were cited. The general impression however, was that Indonesia was likely to enforce this action.

As a follow-on to the trawling ban discussion, the point was made that we don't know from a biological standpoint what the impact of reduced trawling will be. Biologists cannot say with certainty that the ban is justified because it is not known whether overfished tropical stocks will return to their original state when fishing is reduced.* At what point in the exploitation of multispecies stocks are irreversible changes made? It is important that biologists be able to answer this question, but at present they cannot. Biologists are continually confronted with surprising events even in thoroughly studied situations, such as the North Sea. Close monitoring of the Indonesian fisheries will be of great importance.

The history of fishery management around the world has been one of waiting until things have gone seriously wrong, then realizing the need for management. Experience in fisheries has been that management is easy only if you are putting the brakes on something that is moving into deep trouble. Generally, the Southeast Asian countries feel they are not yet in serious trouble.

It was noted that one type of activity is never legitimate, that is activity that results in fish-habitat destruction. Examples are use of dynamite, crushing of corals or destruction of mangroves. Participants noted, however, that the value of mangroves to fisheries may have been overestimated in the past and that overstating the case for mangrove preservation could be damaging to fisheries interests in the long run.

Attention was called to the difference between making management decisions and giving scientific advice on biological aspects of fishery management. Marr's paper paints a realistic picture of how management decisions are made, and even though we may not like the process, that is how things happen. The scientist's business is giving scientific advice, not making management decisions. In the scientific arena, there is room for optimism because we are making progress. As long as the advice we provide is improving we are doing our part of the job. A supplement to this statement is that a big responsibility of scientists is to educate administrators.

A final point made was that many of the trained fishery scientists in developing countries are not effectively involved in fisheries for economic, bureaucratic or other reasons. A common problem is that their incomes from government jobs are inadequate and they are forced to expend their energies on non-fisheries employment.

*Editorial note: since the workshop was held, a brief paper was published which suggests that stocks of the type discussed here may recover remarkably fast when fishing pressure is reduced. See: Saeger, J. 1981. Do trawling bans work in tropical waters? ICLARM Newsletter 4(1): 3-4.