Editorial

Networking in Fisheries Social Science Research

The recent establishment of the Indonesian Fisheries Socio-Economics Research Network (IFSERN) re-emphasizes the importance and usefulness of networking. Plucknett, Smith and Ozgediz (1990), in their book "Networking in International Agricultural Research", write: "Networking - a new name for an ancient practice - has become common in virtually every field of human endeavor... It (networking) has gained momentum because it promises increased efficiency in research. By dividing up the task and sharing information on results, networks can make research more efficient." Networking is most highly developed in agricultural research particularly at the international level.

A network can be defined as an association of independent individuals or institutions with a shared purpose or goal, whose members contribute resources and participate in two-way exchanges or communications.

Plucknett et al. have developed a network typology which comprises the following categories: information exchange, material exchange, scientific consultation, and collaborative research. The authors further specify fourteen main principles underlying the overall success of networks. To be successful, networks should incorporate the following main principles:

"(1) the problem is widely shared, (2) participants are motivated by self-interest, (3) participants are involved in planning and management of the network, (4) the problem or focus of the network is clearly defined, (5) a baseline study is undertaken to produce an authoritative founding document, (6) a realistic research agenda is drawn up, (7) research and management are flexible, (8) the network is constantly infused with new ideas and technologies, (9) regular workshops or conferences are held to provide opportunities for assessing progress and discussing problems, (10) collaborators contribute resources, (11) external funding is provided to facilitate travel, training, and meetings, (12) collaborators have sufficient training and expertise to contribute effectively, (13) the network's membership is relatively stable, and (14) leadership is efficient and enlightened."

As the Asian Fisheries Social Science Research Network enters its second decade of existence, we all need to think back on our successes and failures, the lessons learned and the support we have received from IDRC. I wish the Indonesian Fisheries Socio-Economics Research Network success. We will all need to work together if fisheries social science research in Asia is to continue and strengthen. *R.S. Pomeroy*

A Bio-Socioeconomic Model for the Management of the Small Pelagic Fishery in Northwest Peninsular Malaysia

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Editor's Note: The author recently obtained his Ph.D. in Fisheries Economics at Simon Fraser University, Canada. He is a member of the UPM-AFFSRN team. The following was extracted from his dissertation entitled, "Management of small pelagic fisheries on the northwest coast of Peninsular Malaysia: a bio-socioeconomic simulation analysis."

Introduction

The fishing industry in Peninsular Malaysia is beset with a number of problems. First, the resource stock, particularly in the west coast of Peninsular Malaysia, is overfished. Second, the excess capacity of fishing fleets, in pursuit of limited resources, has caused crowding externalities on the fishing grounds. This has led to intense competition for the limited resources among various gear types, resulting in gear conflicts. And third, poverty persists among fishing households. These problems point to the need for effective management of fishery resources in Peninsular Malaysia. Although this need has long been recognized, the obstacle to practical management is the determination of the types and levels of control appropriate to a fishery to best attain some predetermined biological, social and economic objectives.

This research was conducted to examine the extent of overexploitation and to evaluate the bio-socioeconomic impacts of several management regulations for the small pelagic fisheries on the northwest coast of Peninsular Malaysia. The regional approach was emphasized in the study owing to the differences in the resource stock and the characteristics of the fishing industry in the different regions of the country. The small pelagic fisheries were chosen because they are among the most important species groups harvested in the region, contributing about 37% annually of the total fish caught and over 90% of total pelagic landings from 1980 to 1989. Four most important small pelagic

species groups, namely, the Indian mackerel, scads, sardine and tuna were considered in the study. These species are predominantly caught by purse seines, trawls and drift nets. Thus, the study also took into account the behavior of these dominant gear types.

The Model

To achieve the objectives of the study, a simulation model was developed. The simulation approach, as opposed to optimization techniques such as dynamic programming or optimal control, is more tractable and allow for considerable detail in model specification. Furthermore, this approach allows for relative realism in modelling a complex fisheries system such as the one in this study, and will be more relevant in determining appropriate management regulations in practice.

In order to realistically portray a tropical fishery system, a model involves numerous estimated relationships and should incorporate many components (e.g., biological, economic, social, political and institutional and their interactions). Due to lack of adequate data and/or complexity of interactions among the various components, it may not be empirically possible to incorporate them all in a single model. However, it has been recognized that the biological, social and economic, and management components should be considered in any fishery system model. These components and their interfacing variables are shown in Fig. 1.

The biological submodel describes the population dynamics of the small pelagic species groups. The surplus production model was used since it demands less data. Three functional forms of the surplus production model are specified for various species. They are: the Schnute model (1977) for Indian mackerel, the Fox model (1970) for scad and sardine species and the Schaefer model (1957) for tuna.

The socioeconomic submodel describes the benefits and costs of fishing operations. The benefits include resource rent and producer surplus (which together constitute social profit) and consumer surplus. Besides revenue from the small pelagic species, the computation of social profits also includes revenues from by-catches which are not modelled explicitly. The consumer surplus is derived from the estimated Marshallian demand curves for Indian mackerel and scad species since these species are consumed primarily by domestic consumers. The fishing costs include fixed, variable and opportunity costs.

The management submodel describes the management regulations that might be instituted and modelled the behavior of fishing effort in response to these regulations. The management regulations considered in this study include: (1) reduction in fishing effort, (2) fishing effort reduction and levy of license fees, (3) increased nonfishing employment, and (4) combinations of (1), (2) and (3).

Simulations and Results

The model was used to simulate the fisheries under the present condition. This constitutes the base-run. Sensitivity analyses were conducted to evaluate the effects of estimation errors and uncertainty about model parameters. The model was then used to simulate the fisheries under various management scenarios. These simulations were conducted as follows:

(1) Fishing effort was reduced in steps of 10% from the base-run level.
(2) Fishing effort was maintained at the desired level and license fees are levied to appropriate 50%, 75% and 100% of the rent in the fishery.
(3) The opportunity costs of fishing effort were increased at rates of 50%, 100% and 200% of the base-run level.
(4) Combining fishing effort reduction to the desired level, complete appropriation of rent and increased opportunity costs of effort by 50%.

The following conclusions were drawn from the analyses:

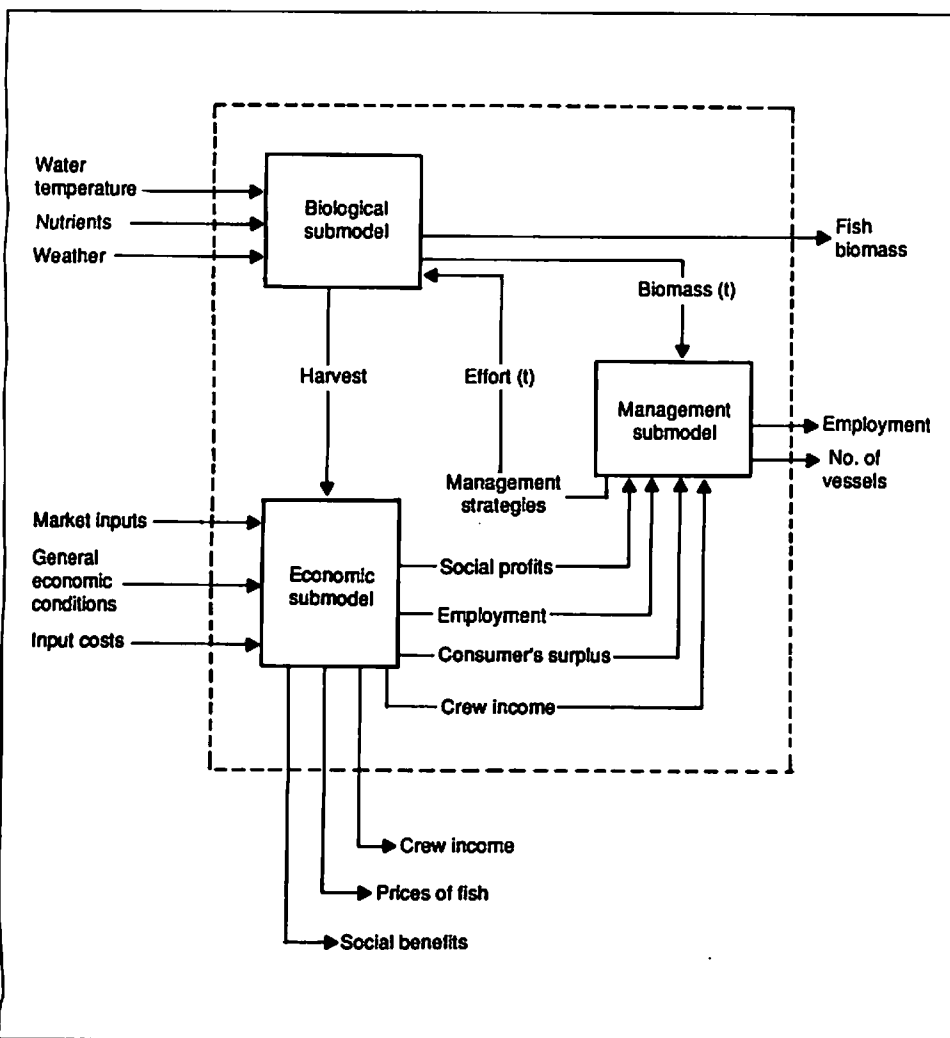(1) At the present level of fishing effort, the small pelagic fisheries in the study area have been biologically

Fig. 1. *Basic structure of the system model.*

and economically overfished. A 50% reduction in fishing effort would result in achieving approximately maximum sustainable yield. The economic optimum may be achieved if effort is reduced by 60% of the base-run level.

(2) Complete appropriation of rent by license fees can maintain fishing effort at the desired level. However, the license fees appear to be high and may not be socially and politically acceptable.

(3) Fishing effort would be reduced from the present level only if the opportunity costs were raised by more than 100%.

(4) A regulation that combined effort reduction by 60% of the base-run level, increased opportunity costs by 50% and complete appropriation of rent by license fees is biologically and economically viable and socially and politically more acceptable.

References

Fox, W.W. 1970. An exponential surplus yield model for optimizing exploited fish populations. Trans. Am. Fish. Soc. 99: 80-88.

Schaefer, M.B. 1957. Some considerations of population dynamics and economics in relation to the management of the commercial marine fisheries. J. Fish. Res. Board Can. 14: 669-681.

Schnute, J. 1977. Improved estimates from the Schaefer production model: theoretical considerations. J. Fish. Res. Board Can. 34: 583-603.

News Items

AFSSRN Coordinator Meets with Canadian/Scandinavian Donors

IN LATE JULY TO MID-AUGUST, Dr. Bob Pomeroy made trips to Canada, Norway, Denmark, Sweden and the Netherlands to meet and discuss with donors complementary funding for the AFSSRN.

On 31 July, he met with Dr. Ziad Shehadeh, Executive Secretary, Strategy for International Fisheries Research (SIFR), in Ottawa, Canada, and discussed the necessity of identifying co-donors for the Network's expansion into new countries and the possibility of initiating a social science network in Africa. It was felt that the latter is a useful activity given the limited capability of Africa in the area of fisheries social science.

Dr. Brian Davy of IDRC, meanwhile, reiterated his and IDRC's support for the AFSSRN. IDRC has been funding the Network since its establishment in 1983.

On 1-11 August, Dr. Pomeroy met with donors based in Northern Europe. Among those he met with are Ms. Kirsten Bjøru, Norwegian Agency for Development Cooperation (NORAD); Mr. Klaus Winkel and Mr. Ebbe Schiøler, both of DANIDA; Dr. Anders Granlund, Swedish Agency for Research Cooperation with Developing Countries (SAREC); Dr. Magnus Torrell, Swedish International Development Agency (SIDA); and Mr. Frans Neuman, International Agricultural Centre, Netherlands. A common theme in the discussions was support for proposed expansion of Network activities in Bangladesh and Vietnam. Donors consider these countries of high priority when it comes to funding. They reacted positively to the Network's plans to include them in future activities. Social science institution-building was specially considered to be a high priority in Vietnam. Also, there is a need to establish fisheries research priorities in this country and to have a coordinated effort among donors in fisheries and resource management.

Dr. Pomeroy felt that the potential for obtaining financial support for the Network within the next year from one or more of these donors is high.

Indonesian Teams Hold National Workshop on Research Priority Setting

ON 23-24 AUGUST, the AFSSRN Indonesian teams (CRIFI, RIMF, UNDIP and KEPAS) conducted a national workshop on Priority Setting for Fisheries Socioeconomic Research Programme in Sukabumi, West Java. The objectives of the workshop were to identify and evaluate the current status of fishery socioeconomic research and to identify additional research needs for both the government and private sectors. Fourteen academic and research institutions and 32 scientists from Indonesia were represented at the workshop.

Dr. Bob Pomeroy gave a presentation on fisheries socioeconomic research priorities worldwide and in Asia. He also discussed the ICLARM Coastal Fisheries Co-Management Research Project. Mr. Sofian of CRIFI gave a presentation on the need for an Indonesian fisheries social science research network and research priority setting.

After open discussions, the participants agreed to establish the Indonesian Fisheries Socioeconomics Research Network (IFSERN). The objectives of the IFSERN will be information exchange, training, collaborative research and institutional development.

Each of the academic and research institutions attending the workshop gave a short presentation on their fisheries socioeconomic research program. Ms. Clare Hall of the University of Bath,
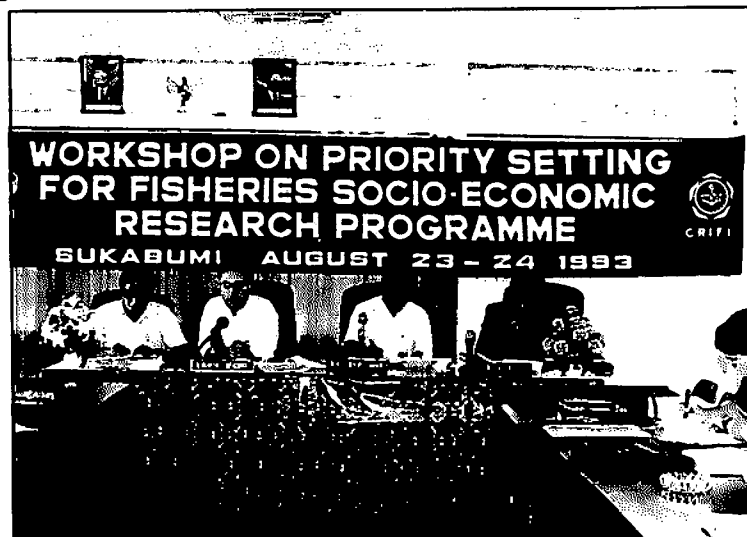
An outcome of the Indonesian national workshop was the establishment of the Indonesian Fisheries Socioeconomics Research Network.