

A Search for New Methods for Fish Stock Assessment and Management: the FSA-CRSP Overview and Philippine Activities

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Abstract

A brief account of the USAID-funded fish stock assessment Collaborative Research Support Program is given, with emphasis on its Philippine module, devoted to empirical analyses, modelling and field studies aimed at improved management of exploited multispecies fish stocks.

Fisheries managers in developing countries generally find themselves tackling very complex situations with a very limited set of appropriate tools. The Fish Stock Assessment Collaborative Research Support Program (FSA-CRSP) is a long-term effort aimed at providing a set of new tools.

The FSA-CRSP is funded by USAID (Washington) through a management entity at the University of Maryland. The principal US institutions involved in research are the University of Maryland, the University of Washington, and the University of Rhode Island. Collaborating US institutions include the University of Delaware and the University of Miami. In Costa Rica, the collaborating agency is the University of Costa Rica's Centro de Investigacion en Ciencias del Mar y Limnologia (CIMAR). Research in the Philippines involves primarily the University of the Philippines Marine Science Institute, the University of the Philippines in the Visayas College of Fisheries, and ICLARM. Cooperative agreements are in place for collaborations with the Research Institute for Marine Fisheries of the Agency for Agricultural Research and Development, Indonesia, and the Division of Marine Fisheries of the Department of Fisheries, Thailand.

The FSA-CRSP is one of a series of CRSP programs designed to find solutions to global problems involving food production. Other programs have focused on a variety of problems, including the management of tropical soils, the culture of peanuts, and the aquaculture of tilapia. The general problem identified for the FSA-CRSP,

which started in July 1985, was the development of new methods to assess and model tropical multispecies fisheries.

Activities in Costa Rica include the monitoring and analysis of fisheries in the Gulf of Nicoya. Previous FSA-CRSP fieldwork there has included developing new applications for shallow water acoustics in coralline waters, and field studies of fishery sampling problems. A center has been set up for the analysis of otoliths for the ageing of tropical fish. Costa Rican researchers are collaborating with US scientists in the mathematical modelling of age and size relationships in fishes and in studies of the timing of fish fecundity and recruitment.

Work in Southeast Asia currently falls into two projects: Empirical Analysis and Modelling, and Multispecies Field Studies. Both projects are concerned with the prediction and management of catch composition. The work stems from the realization that fishery managers dealing with a multispecies system must be concerned not only with the total production, but with the economic and nutritional value of the catch as it varies over time. Research in this area is very rudimentary, and a variety of promising approaches are being investigated. The collaborative approach has been highly successful with efforts and authorships shared between US participants and host country counterparts.

The Empirical Analysis and Modelling Project is aimed at using the large volumes of research data which have been accumulated in Southeast Asia as a basis for developing new analytical approaches, and for obtaining information on the nature of tropical fish communities which can be usefully incorporated into future management schemes. FSA-CRSP researchers have found patterns of fish distributions of importance in minimizing interactions between small-scale and commercial fishermen. They have developed new methods to

analyze fish community structure, to identify optimal mesh sizes in multispecies fisheries, and to predict catch composition based on time series records. Supplemental work has involved the estimation of fish growth parameters, and investigations into fish mortalities due to blast fishing.

There is, unfortunately, very little long-term information on the complex problems of coral reef fisheries. Obtaining such data is the focus of the Multispecies Field Studies project. A full-time staff based in Bolinao, Philippines, is conducting an intensive study of a coral reef fish community and a diverse array of associated fisheries. Daily information is obtained at 11 landing sites. Fishing effort is mapped weekly, and major gears subsampled monthly. Data on the fish community is gathered on alternate months from 24 visual transects and 12 seagrass trawling stations. The data are related to environmental features identified *in situ*, and from images from satellites and cameras mounted on an ultralight aircraft. The data are stored on microcomputer diskettes and distributed

in summary tables as a 3-volume annual report. The project has led to new methods for field studies, community structure analysis, remote sensing, and village-level resources management.

The data sets from the coral reef field studies are intended for general use by the scientific community. The data set for the first year of full-scale monitoring, covering July 1987 to June 1988 and some earlier data, has been deposited at the principal FSA-CRSP institutions in the USA, Costa Rica, and the Philippines. The second set is expected in a few months. The data sets are quite bulky, although over 90 diskettes of spreadsheet files have been condensed by archiving to a distribution set of twenty-two 5.25" diskettes. Interested researchers are encouraged to contact FSA-CRSP investigators for information on how to obtain access to the data.

The FSA-CRSP Working Paper series consists primarily of preprints of papers subsequently submitted for publication. Copies have been deposited with ICLARM and may be requested from the NTFS secretary.

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