

Community Fishery Resources Management in Malalison Island, Philippines

Renato F. Agbayani

SEAFDEC Aquaculture Department
Tigbauan, Iloilo 5021, Philippines

Agbayani RF. Community fishery resources management in Malalison Island, Philippines, pp. 209-219. In: Bagarinao TU, Flores EEC (eds) Towards Sustainable Aquaculture in Southeast Asia and Japan. SEAFDEC Aquaculture Department, Iloilo, Philippines.

Abstract

The Community Fishery Resources Management Project, launched in 1991 in Malalison Island, Philippines is a development-oriented research project integrating biology, economics, sociology, engineering, and public administration. The general objective is to support, and learn from, the collaboration of people's organization, biologists, and social scientists in applying community-based techniques in fishery management. During Phase I, the Project concentrated on community organizing, institution building, and the introduction of seaweed farming as alternative livelihood. Studies were made on the marine resources of the island, the traditional boundaries and territorial use rights, the economic utilization of resources in the island, and the cultivation techniques for seaweeds. Phase II started in 1994 with the implementation of the territorial use rights in fisheries and the test deployment of prototype concrete artificial reefs. Phase II includes impact assessment (environmental, social, and economic), institutional arrangements in fishery co-management, ethnographic studies, economics of Seafarming techniques, and management of fishery cooperatives.

Introduction

The Community Fisheries Resource Management (CFRM) Project was launched in Malalison Island off western Panay, Philippines in 1991 by the SEAFDEC Aquaculture Department with support from the International Development Research Centre of Canada. The CFRM Project addresses two main issues: the degradation of coastal resources and the poverty of fisherfolk (Lacaniño 1989). Declining productivity in marine ecosystems is caused primarily by the conversion of mangroves swamps to ponds, destructive fishing practices, and siltation due to forest denudation. SEAFDEC AQD felt the need to undertake socially oriented developmental research focusing on the issues of poverty and marine resource degradation.

Research conducted under CFRM is development-oriented and multi-disciplinary. Biological studies are integrated with economics, sociology, enterprise management, public

administration, and engineering to accomplish community-based resource management. Fishery co-management through community self-regulation of fishery resources is an alternative strategy to 'top-down' policy-making (Hviding and Jui-Larsen 1993, Pomeroy 1993). The active involvement of the community and the legal support of the local and national government in the protection of fishery resources make possible sustained harvests. The CFRM Project provides the poor fisherfolk of Malalison opportunities to improve their livelihood and quality of life through appropriate interventions such as community organizing and institution building, alternative livelihood, territorial use rights in fisheries, deployment of concrete artificial reefs, and searanching.

Malalison was selected from among five candidate sites on the basis of socioeconomic and biophysical criteria. Socioeconomic criteria included income and dependence on fishing, (destructive) fishing practices, use of credit for fishing activities, potential for alternative livelihood, and presence of a non-government organization in the locality. The biophysical criteria evaluated were the presence of live coral cover, other hard substrate, seagrass beds, mangroves, water 10-30 meters deep, and protection from the southwest monsoon.

Figure 1 shows a topographic-nautical map of Malalison Island. Under the CFRM Project, socioeconomic and biological studies were conducted to obtain baseline data about Malalison's natural resources and the user community.

Socioeconomic Situation

A demographic census taken at the start of the project showed 74 households with an average of 5-6 members (SV Siar, personal communication). About 72% of the households lived below the poverty level of P2,500/month as defined by the National Economic Development Authority, and 52% earned less than P1,250/month (US\$1=P25). Income from fishing accounted for 60-100% of the total income of 65% of the households. About 49% of the households had 1-2 working members, and another 42% had 3-4 working members. Among the household heads, 84% reported fishing and related occupation (net mending, fish vending, boat making) as their main livelihood. The rest of the household heads were engaged in swine-raising, construction work, coconut-lumber making, or farming.

The educational attainment of the household heads in Malalison was very low (SV Siar, personal communication). About 72% reached various grades in elementary school, 15% had two years secondary education, and 5% had three years of college. Of the only two college graduates, one is the incumbent barangay (village) captain.

Malalison has a young population: in 1991, 68% were younger than 30 years, 19% were 30-50 years old, and only 13% were older than 50. The population increased from 431 in 74 households in 1991 to 485 in 94 households in December 1994, a 3% annual growth rate. This is higher than the national growth rate of 2.1% estimated by the National Census and Statistics Office.

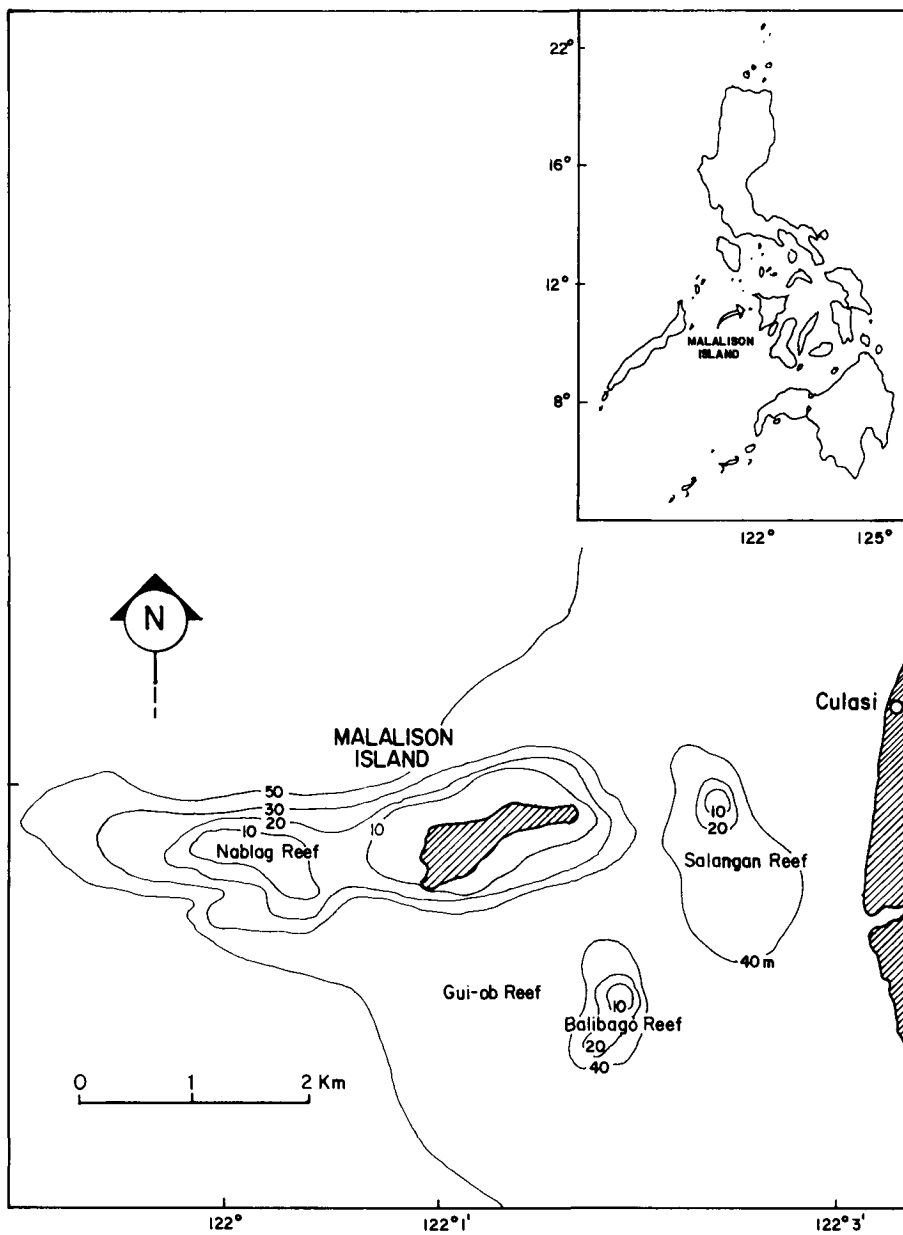


Fig. 1. Map of Malalison Island, showing the major reefs.

Economic Utilization of Resources

An agro-fishery village transect was prepared with rapid rural appraisal techniques (Conway 1989, Lamug 1989) to determine the land and marine resources, economic activities, agricultural and fishery products, problems, and opportunities in Malalison. The transect was divided into coral reefs, lowland rice fields, upland, village, and nearshore. Some of the economic opportunities identified were capture of ornamental Fishes from the coral reefs, vegetable farming and salt-making near the rice fields, planting of fruit trees in the uplands, establishment of a cooperative-managed consumer store in the village proper, and seaweed farming near shore (Agbayani and Siar 1994).

The waters around Malalison are a shared resource. In 1992, the Malalison waters supported a population of 6,820 in 1,364 households in 16 coastal barangays in Culasi and nearby Batbatan Island (SV Siar, personal communication). Commercial (large-scale) fishers from other provinces have also encroached on the waters of Malalison to the disadvantage of the municipal (small-scale) fishers. Of the 74 households in Malalison, 37% have non-motorized boats and 22% own motorized boats. Hook-and-line is the most common fishing gear, followed by spears and nets. Women and children gather mollusks, sea urchins, sea cucumbers, and other reef products.

Because of the monsoon winds in July-November, fishing is seasonal in Malalison, particularly among the fishers using spears and hook-and-line. Lack of alternative income sources during the off-season has forced fishers to use efficient but destructive fishing methods to maximize the catch during the peak season (SV Siar, personal communication). Blast fishing was rampant during the 1980s until the initiator and source of dynamite died in 1991. Malalison fishers now allege that fishers from other islands and provinces do blast and cyanide fishing around the island. The Malalison version of the 'muro-ami' (locally called 'duldog'), introduced by Japanese fishermen before World War II, became a source of conflict both within and outside the island. 'Duldog' has been prohibited since 1986, but the ban has been commonly ignored. Overfishing and destructive fishing practices have degraded the marine resources, particularly the coral reefs around the island.

The small-scale reef fisheries in Malalison have been described and the yield of the coral reefs was estimated at 5.8 tons/km²-yr (Amar et al. in press). A two-year survey (Apr 1992 to Mar 1994) documented the average monthly catch, sales, net income, number of fishing hours per day and fishing days per month of 38 fishers using different gears (Table 1; Agbayani, unpublished data). In year 2, the average monthly catch of net fishers and hook-and-liners decreased by 17-25% due to fewer fishing days per month and also because of the substantial decrease in 'duldog' fishing as a result of the active information campaign in year 1 and the social pressure among the fisherfolk. Sales and net income increased due to the higher value of the species caught in year 2.

State of Living Marine Resources

The living marine resources in Malalison were assessed during 1991-1994. Many species of mollusks, echinoderms, and other invertebrates are found in Malalison, and many are used as food or sold for additional income. Five species of seagrasses and 74 species of macrobenthic algae were recorded around Malalison (CL Marte, personal communication). The biomass of these benthic plants was highest in March-May.

Table 1. Average fishing effort, catch, and income of 38 Malalison fishers in April 1992-April 1994 (Agbayani, unpublished).

| Gear | Fishing (d/mo) | Fishing (h/day) | Catch (kg/mo) | Sales (pesos/mo) | Net income (pesos/mo) |
|---------------|-------------------|--------------------|------------------|---------------------|--------------------------|
| Year 1 | | | | | |
| Spear | 16 | 5 | 38 | 935 | 886 |
| Net | 11 | 6 | 53 | 1107 | 916 |
| Hook & line | 15 | 6 | 28 | 808 | 725 |
| Year 2 | | | | | |
| Spear | 12 | 5 | 39 | 1154 | 984 |
| Net | 10 | 6 | 44 | 1148 | 1042 |
| Hook & line | 11 | 8 | 16 | 949 | 825 |

Over 120 species of corals in 49 genera were found in nine sampling stations around the island (CL Marte and YH Primavera, personal communication). Coral reef cover was 5-15% on the southeast (Kawit and Talisay) and 29-58% on the northeast side (Amihanan) (Fig. 1). The fish census along 50-meter transects at the 10-meter depth contour showed over 70 species (LMB Garcia and EC Amar, personal communication). The highest number of fish species (85) was seen in Amihanan and the highest standing biomass (67 t/km²) in the southwest side (Nablag).

Causal Model of Poverty

The fisherfolk are among the poorest of the poor in developing countries like the Philippines. Their incomes almost exclusively depend on the fishery resources adjacent to their village. Such is the case of the Malalison fisherfolk. In order to improve the social and economic conditions of a poor fishing community, developmental projects like CFRM must examine the causes of such poverty.

During the past three years of immersion in the community, the CFRM research team built a causal model of poverty in Malalison (Fig. 2). A causal model is a simplified representation of reality; it is a communication tool for use in identifying the causes and mechanisms of a problem under consideration (Eusebio et al. 1991). Such models are often site-specific and may be changed or improved during the course of a project. The causal model of poverty in Malalison has been discussed in several meetings and workshops in and outside Malalison and SEAFDEC AQD in order to reach a consensus.

The direct causes of poverty in Malalison are: (1) the degraded condition of marine and land resources, (2) limited livelihood opportunities, (3) low educational attainment of the island residents, and (4) lack of people empowerment. The marine and other natural resources have been degraded because of the high rate of use, high population growth, destructive fishing practices, and poor enforcement of fishery laws and regulations.

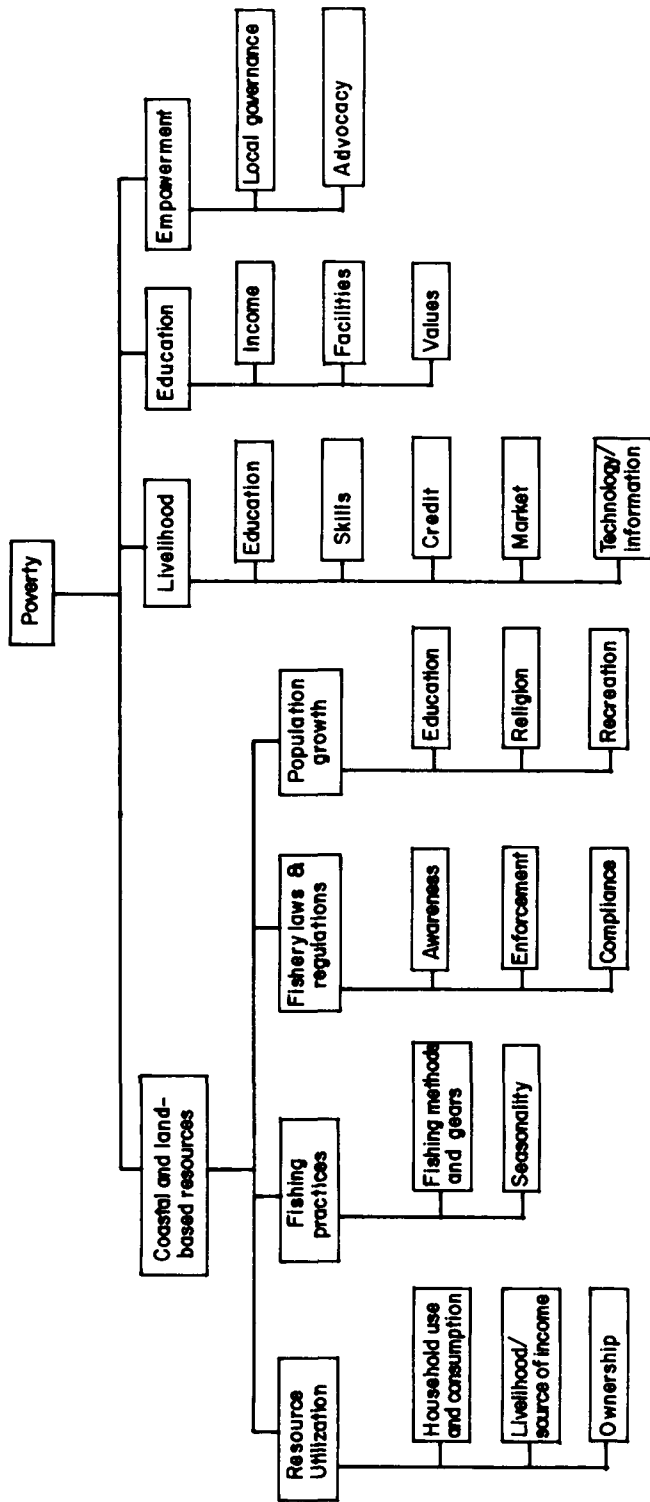


Fig. 2. Causal model of poverty in Malalison Island, Philippines.

The direct causes of the high population growth are the low educational attainment of household heads, the religious prohibition against artificial birth control, the lack of recreational facilities in the island, and the tendency to view children as workers, caregivers, or insurance against adversity. High population growth is thus both an effect and a cause of poverty.

Lack of alternative livelihood is another direct cause of poverty in Malalison. Residents lack education, skills, information, and technology. Lack of credit prevents or limits other economic activities. The inability to access the market for non-traditional products, e.g., shellcraft has prevented the community from pursuing some alternative livelihood.

Low educational attainment limits the ability of the Malalison fisherfolk to understand and properly use their resources, do business, learn new skills, get what they want, and rise above poverty. The children are unable to go to school because of lack of funds and educational facilities on the island, and because many parents undervalue education.

The passive posture of the fisherfolk in managing the coastal waters is due to the 'top-down' strategy of policy formulation and implementation (Agbayani and Hurtado-Ponce 1993). The fisherfolk are not educated about their natural resources and are not trained in local governance and policy advocacy.

Logical Framework of the Interventions under CFRM

Research and development projects such as CFRM require a conceptual model or logical framework to focus on the effects of interventions on the resources and on the socioeconomic status of the target beneficiaries. In 1991, several development interventions were formulated for Malalison (Fig. 3). Foremost was the social preparation through community organizing and institution building to empower the fisherfolk. The community was to be encouraged to lobby for territorial use rights in fisheries. Seafarming and other livelihood were to be introduced to improve incomes. Artificial reefs were to be deployed to increase underwater habitats and increase fisheries production. Finally, searanching was to be done also to improve the fisheries.

Effective evaluation of the CFRM Project requires identification of realistic environmental, social, and economic indicators (Ramos and Garcia 1993). These qualitative and quantitative indicators allow us to determine whether project objectives are met, and if not, to analyze the reasons for the failure so that corrective steps can be made. Analysis of the impact of CFRM will use the following indicators:

Social and economic

- Active participation of FAMI members in the organization
- Self-reliance of FAMI as an organization, e.g., in financing livelihood projects and making representations with government agencies on their own
- Elimination of illegal fishing
- Increased incomes
- Diversified income sources
- Higher average education of the children
- Increased knowledge

- Improved job skills
- Better health

Environmental

- Increase in fish stocks and other fishery species
- Regeneration of corals
- Conservation of seagrass beds
- Reforestation of the uplands

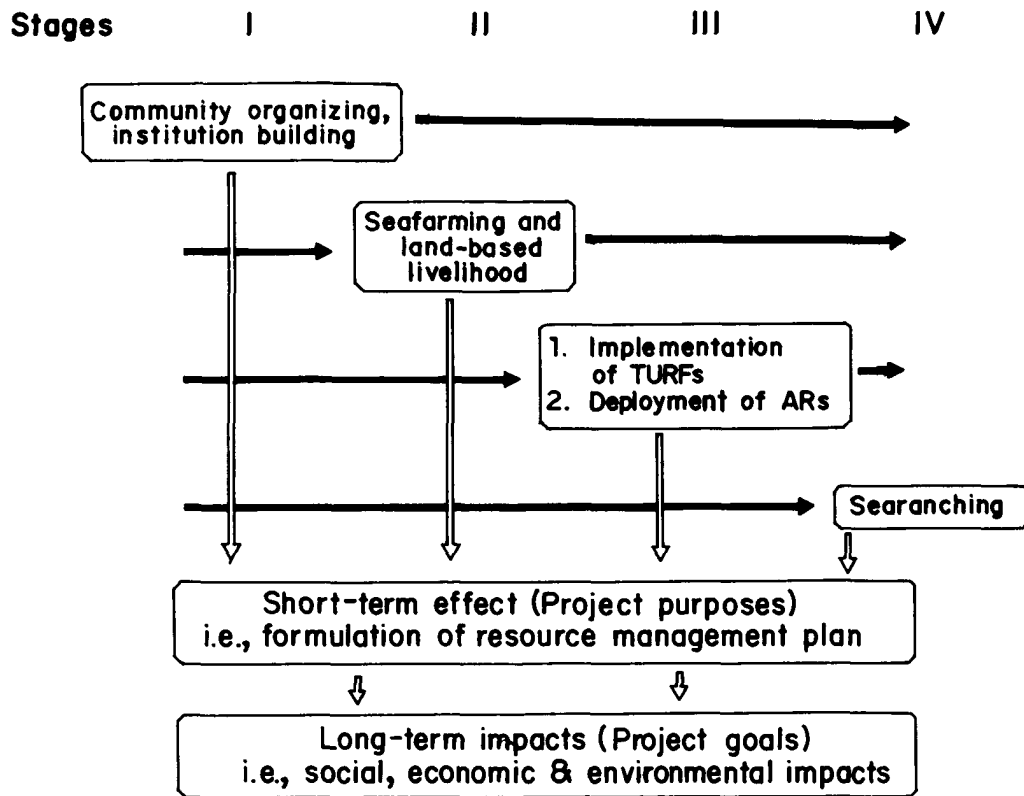


Fig. 3. Logical framework of the developmental interventions under CFRM in Malalison Island, Philippines.

Community Organizing

Community-based resource management hinges on the formation of a strong and sustainable fishers' association. In 1991, the Fishermen's Association of Malalison Island (FAMI) was organized with the support of the Culasi municipal government. PROCESS Foundation, Inc., a non-government organization was tapped to facilitate the community organizing and the training of FAMI members since 1991. At first, coordination between PROCESS and SEAFDEC AQD was ineffective but this was soon corrected. The problem now is that FAMI members expect too much too soon in terms of improved livelihood and incomes under CFRM (Agbayani and Siar 1994).

A Resource Management Committee has been created comprising representatives of different groups of fishers (hook-and-line, net, and spear), the local government units and concerned agencies, SEAFDEC AQD, and PROCESS Foundation. FAMI is expected to: (1) improve enforcement of fishery laws through self-regulation and vigilance, (2) stop illegal fishing, (3) develop skills in alternative livelihood, and (4) improve access to appropriate technology.

FAMI's plans, targets, accomplishments, and gaps are assessed in annual seminar-workshops. At these workshops, the FAMI members assess and evaluate the strengths, weaknesses, opportunities of, and threats to, the CFRM Project.

TURFs in Malalison

Resource ownership is a burning issue in resources management. The open access character of a resource leads to uncontrolled and destructive exploitation and environmental deterioration (Ostrom 1990, Oakerson 1992). As a management strategy, the granting of territorial use rights in fisheries (TURFs) to a community provides them a sense of ownership of, and responsibility for, the fishery resource (Lacanilao 1989, Siar et al. 1992, Bojos 1992, Garcia 1992, Fellizar 1992).

The Local Government Code of 1991 includes the policy delegating the local government units and peoples' organizations to manage their own resources. *"Municipalities have the exclusive authority to grant fishery privileges in the municipal waters (15 km from the coastline) and impose rentals, fees, or charges."*

The Culasi Sangguniang Bayan (Municipal Council) passed Municipal Ordinance No. 5-90 designating a 1 km² area between Malalison and Culasi as a TURFs area. This version of the ordinance was questioned by the Provincial Council of Antique because of its 'class' character, i.e., the ordinance favors the Malalison community over other communities and sectors in the town of Culasi. There is also a need to recommend to the municipal government a modification of the ordinance: the actual TURFs area in Malalison waters must be specified.

The Resource Management Committee will prepare a resource management plan that defines the rules and rights of the members of the community in the use and management of the resources in the TURFs area. Effective implementation of TURFs will help ease the fishing pressure and ultimately increase the catch and income of *individual* fishers, if not the total for all fishers.

Artificial Reefs and Searanching

Prototype concrete artificial reefs or ARs were deployed in Guiob (Fig. 1) in May 1994 (CL Marte, personal communication) to test the technical feasibility in terms of design, strength, and deployment with local labor. At the initiative of its members, FAMI will declare Guiob as a fish sanctuary where no fishing will be allowed. ARs in a fish sanctuary will help rehabilitate the coral reefs and lead to increase in fish stock. Full deployment of concrete ARs will be done at selected sites in 1995, taking into consideration the biophysical characteristics and the socioeconomic effects on the resource users. As a complementary strategy, searanching of appropriate species in the ARs will increase the fish stocks.

Seaweed Farming and Other Livelihood

FAMI cooperated with SEAFDEC AQD researchers in culture trials with the seaweed *Kappaphycus*. Seaweed farming was generally successful in terms of production, profit, and FAMI management. FAMI also revitalized a consumer store in the island. Management of the enterprise, particularly of the finances, was improved.

Conclusion: CFRM to 1997

The CFRM project will continue the capacity-building activities of FAMI members during the next three years. Needs assessment by the FAMI members will guide the types of training activities to be undertaken. The sustainability of the community-based approach to coastal resource management will depend largely on the capacity of the fisherfolk organization to implement the provisions of the resource management plan. The supportive roles of government, non-government institutions, and other stakeholders as co-managers of the resource will greatly influence the success of community-based resource management.

Economic activities will be both marine- and land-based and will be determined by the FAMI members. Capture of coral reef fishes with environment-friendly techniques was suggested during the last assessment forum as another potential livelihood as the demand for marine aquarium fishes continues.

Research will focus on the analyses of the social, economic, institutional, and environmental impacts of the development interventions.

References

- Agbayani RF, Hurtado-Ponce AQ. 1993. An integrated approach to community-based fishery resource management: SEAFDEC/AQD experience in multidisciplinary research. *Out of the Shell* 3(2): 5-8.
- Agbayani RF, Siar SV. 1994. Problems encountered in the implementation of a community fishery resource management project, pp. 149-160. In: Pomeroy RS (ed) *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods, and Experiences*. ICLARM Conference Proceedings 45. International Center for Living Aquatic Resources Management, Manila.

- Amar EC, Cheong RMT, Cheong MVT. In press. Small-scale fisheries of coral reefs and the need for community-based resource management in Malalison Island, Philippines. Fisheries Research.
- Bojos RM Jr. 1992. Territorial use rights in fisheries: policies and strategies for coastal area management, pp. 25-32. In: Garcia MP (ed) Policies and Issues in Philippine Fisheries and Aquatic Resources. Philippine Council for Aquatic and Marine Resources Research and Development, Los Baños, Laguna.
- Conway GR. 1989. Diagrams for farmers, pp. 73-76. In: Chambers R, Pacey A, Thrupp LA (eds) Farmer First. Farmer Innovation and Agriculture Research. Intermediate Technology Publications, London.
- Eusebio JS. 1991. Field Guide on Comprehensive Planning, Monitoring and Evaluation of Nutrition-Oriented Rural Development Program at Local Levels. UP-College of Human Ecology, Los Baños, Laguna, 23 pp.
- Fellizar FP. 1992. Community-Based Resource Management: Perspectives, Experiences and Policy Issues. Environment and Resource Management Project and Institute of Environmental Science and Management, University of the Philippines at Los Baños, 152 pp.
- Garcia MP. 1992. Territoriality in the use of coastal resources: The Philippine experience, pp. 15-24. In: Garcia MP (ed) Policies and Issues in Philippine Fisheries and Aquatic Resources. Philippine Council for Aquatic and Marine Resources Research and Development, Los Baños, Laguna.
- Hviding E, Jui-Larsen E. 1993. Community-Based Resource Management in Tropical Fisheries. Centre for Development Studies, University of Bergen, Bergen, Norway, 60 pp.
- Lacanilao F. 1989. Countryside development through small-scale fisheries. *Diliman Rev.* 37: 3-7.
- Lamug CB. 1989. Community appraisal among farmers, pp. 77-86. In: Chambers R, Pacey A, Thrupp LA (eds) Farmer First. Farmer Innovation and Agriculture Research. Intermediate Technology Publication, London.
- Oakerson RJ. 1992. Governing the commons: a framework, pp. 41-59. In: Bromley DW (ed) Making the Commons Work: Theory, Practice and Policy. Institute for Contemporary Studies, San Francisco.
- Ostrom E. 1990. Governing the Commons: the Evolution of Institutions for Collective Action. Cambridge University Press, Cambridge, 280 pp.
- Pomeroy RS. 1993. A research framework for coastal fisheries co-management institutions. *Naga ICLARMQ.* 16(1): 14-16.
- Ramos CP, Garcia LO. 1993. Social indicators: the UPLB-BIDANI experience. Proceedings of the Seminar-Workshop on Social Indicators for Evaluating Development Projects. Professional Development Program, Asian Institute of Journalism, Manila.
- Siar SV, Agbayani RF, Valera JB. 1992. Acceptability of territorial use rights in fisheries: towards community-based management of small-scale fisheries in Philippines. *Fish. Res.* 14: 295-304.