

The Use of Science in Environmental Advocacy for Coastal Resource Management

Maria Maida S. Aguinaldo and Liana Talaue-McManus

Marine Science Institute, College of Science
University of the Philippines, Diliman, Quezon City 1101 Philippines
Tel. No.: (632) 922-3921; TelFAX.: (632) 924-7678; E-mail: maguinaldo@upmsi.ph

ABSTRACT

Environmental advocacy in Bolinao has played an important role in the prevention, remediation, and rehabilitation of potential and felt impacts of the various activities in the coastal zone. Most initiatives have been spurred by the sharing of knowledge and information in mobilizing community advocates. Facilitating action in four key areas—development planning, coastal aquaculture, concession systems, and tourism—involved the provision of venues for information transfer. These included the conduct of orientations and consultations, sharing of results of research project undertaken, lobbying, and use of primers, newsletters, and theater. Mechanisms for sustaining these actions and upholding the Coastal Resource Management (CRM) principles (sustainable, equitable, empowering) long after projects have been phased out were initiated through the establishment of a Coastal Resource Management Center, and the institutionalization activities through existing institutions, such as the local government, academic institutions, and peoples' organizations.

Maximizing knowledge and information, popularizing information, and sharing this with members of the community and getting them to use it, as well as enjoining them to act, are the challenges that must be faced. Environmental advocacy, as a tool for empowering different community sectors in evolving a consensus for CRM has become an integral feature of development work in Bolinao.

Keywords: environmental advocacy, information transfer, coastal zone management, CBCRM, resource management

INTRODUCTION

Community-based coastal resource management (CBCRM) projects have been undertaken in Bolinao, Pangasinan since the late 1980's. Initiatives and activities spanning ten years have gained a number of victories for both Bolinao's coastal resources and its people. Various programs have been conducted with various sectors of the municipality. Significant success in coastal resource management (CRM) have been facilitated by the popularization of science and its dissemination.

The identification of habitats was used as a basis for zoning the municipal waters. Data on water quality and on fish production were used as basis for policy reforms in regulating the aquaculture industry. In addition, levels of catch and income derived from fishery resources have helped policy makers formulate possible reforms on the existing concession systems. The Bolinao Coastal Development Plan (CDP) was based on community practices and perceptions and on scientific research and technical advice from the Marine Science Institute (UP-MSI) of the University of the Philippines in Diliman.

CBCRM action plans begin when stakeholders evolve into advocates, with the knowledge and information they receive through environmental advocacy. An advocate is defined as one “who defends, maintains, publicly recommends, or raises his voice in behalf of a proposal or tenet,” (Oxford English Dictionary 1989). Thus, a CBCRM-oriented advocacy activity encourages community members to publicly take a stand as a group, a prerequisite to implementing action as a collective steward.

This paper discusses key advocacy activities which were implemented in Bolinao for the period 1998-1999 and facilitated by the Marine Fishery Resources Management Project (MFRMP) based at the MSI. This period was crucial in that substantive CBCRM action plans integral to the Municipal Coastal Development Plan were to be carried out. An advocacy program was formulated to develop the broad-based mass support needed to effectively implement the CDP. This support was also critical in rationalizing what was an unregulated coastal aquaculture and in reconfiguring the traditional concession systems that have dominated the rabbitfish and milkfish fry fisheries since the post-war years. The proposal to open the local tourism industry to multi-national ventures was a nascent issue that required the formation of a local group that could engage in forward planning.

The nature of each advocacy activity, and its strengths and weaknesses, are discussed and evaluated in order to identify replicable strategies that promote advocacy

toward sustained collective action. In addition, the extent to which scientific information was used and popularized in each activity are underscored.

CONCEPTUAL FRAMEWORK

Environmental advocacy as practiced in Bolinao has evolved into an empirical framework (Fig.1) which may not be much different from what is being practiced in other areas (O’Malley 1999). Issues and problems in the community are either perceived and expressed by the locals (e.g., declining catch, use conflicts) or are identified through scientific research (e.g., impact of gear use, causes and impact of water quality deterioration). When issues have been identified, information and data are gathered and shared with target sectors through different activities that provide a venue through which stakeholders can publicly declare their stand and make a call for collective action.

Environmental advocacy has three main objectives: (1) the generation of awareness; (2) the enhancement of knowledge; and 3) the mobilization of community sectors (people’s organizations, local government units both at the municipal and barangay levels, academic institutions, communities) to participate in the public declaration of CBCRM as a means to sustainable development. Different activities were used to meet these objectives and were designed and chosen based on their relevance and potential to realize the targeted action program (Table 1).

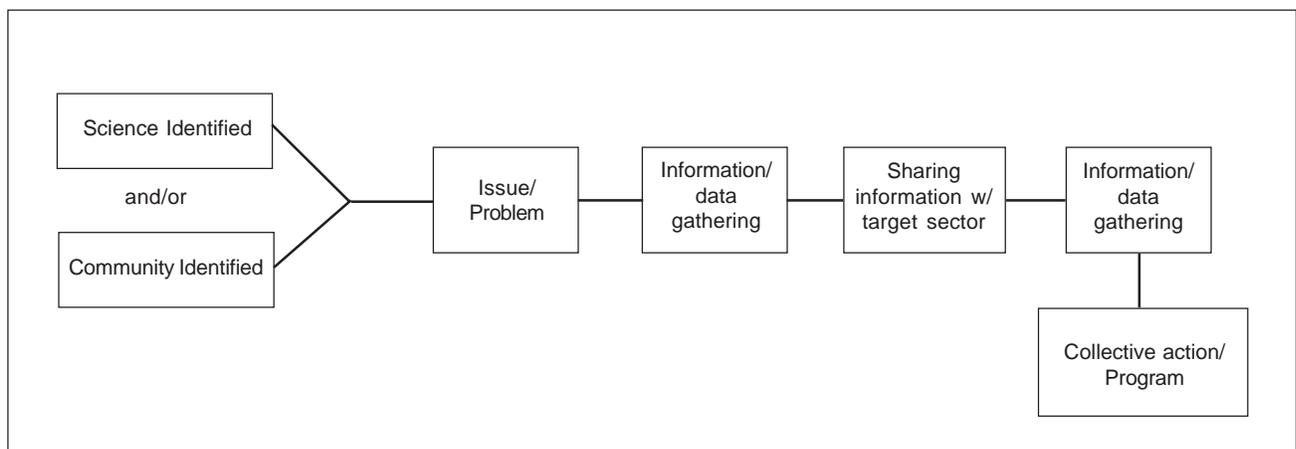


Fig. 1. Conceptual framework for the advocacy program of the Marine Fishery Resources Management Project (MFRMP)

Table 1. Advocacy program for community-based coastal resources management in Bolinao, Pangasinan

Target Action	Major Issues	Information & Data Needs	Target Sectors	Advocacy Activities
1. Implement the Coastal Development Plan (CDP)	<ul style="list-style-type: none"> > lack of popular support > lack of understanding by municipal legislative and executive branches > lack of political will to implement the CDP 	<ul style="list-style-type: none"> > popularize the aim and substance of the plan > popularize the legal provisions and their relationship with regional plans and national laws 	<ul style="list-style-type: none"> > all sectors 	<ul style="list-style-type: none"> > CDP forum > primers and leaflets > sectoral orientation > school-based municipal newsletter on the environment > community theater > CRM center > lobbying
2. Rationalize coastal aquaculture	<ul style="list-style-type: none"> > deteriorating water quality > unregulated proliferation of fishpens and cages > reduced culture production > blocked navigation routes and reduced fishing grounds 	<ul style="list-style-type: none"> > Impacts of coastal aquaculture on water quality and fisheries > sustainability of coastal aquaculture > mitigation measures > experience of other coastal communities in aquaculture 	<ul style="list-style-type: none"> > pen and cage operators > local government > marginal captures fisheries > local fisheries school 	<ul style="list-style-type: none"> > Aquaculture forum > zonal orientation > primers > lobbying > sharing of results of participatory monitoring activities to target sectors > school-based municipal newsletter > formation of monitoring team
3. Modify concession systems for milkfish fry and siganid fisheries	<ul style="list-style-type: none"> > inequitable resources access > overexploitation > low returns for marginal fishers 	<ul style="list-style-type: none"> > status of and impact on the fisheries > status of and impact on income generation > options to improve status of access and resources 	<ul style="list-style-type: none"> > marginal fishers > local government > concessionaires and fish dealers 	<ul style="list-style-type: none"> > Fisheries fora > sharing of results of participatory monitoring activities to target sectors > formation of a zonal action team for zone 1 > lobbying
4. (Regulations) for the local tourism industry	<ul style="list-style-type: none"> > unregulated tourism > pollution > entry of external players > destruction of resources > resource use conflicts > anticipated entry of socio-cultural problems (i.e., prostitution, drugs, etc.) 	<ul style="list-style-type: none"> > potential impacts on resources and livelihood > options for regulation 	<ul style="list-style-type: none"> > resort owners > local government > federation of fisherfolk org., transportation sector, health sector 	<ul style="list-style-type: none"> > multi-sectoral orientation > primers and leaflets > formation of Municipal Tourism Council and Bolinao Hotel, Resort, and Restaurant Owners Association > community theater

Advocacy program

The following activities sought to enhance awareness and enjoin public participation in four key areas: development planning, coastal aquaculture, concession systems, and tourism. They were conducted from 1998 up to the first quarter of 2000 within MFRMP in the municipality of Bolinao, Pangasinan.

Engender participation in the implementation of the Coastal Development Plan The Bolinao CDP, which started from the initiatives of a federation of local

fisherfolk organizations, went through a two-year process of community consultations and validation. On January 19, 1998, through the collaboration of the local government unit, the federation, and the different sectors, the CDP of Bolinao was adopted by the Municipal Council. Its implementation hinged on its passage as an ordinance by both the Municipal and Provincial Councils. A multi-sectoral technical working group (CDP-TWG) started drafting the implementing rules and regulations of the Municipal Fisheries Ordinance immediately after its enactment in December 1999. Between its adoption as a plan and its passage

as an ordinance, the Municipal Council required that the document be validated again in all the coastal villages. It was during this period that advocacy for the immediate implementation of the CDP needed to be intensified. It was also then that those most involved in the plan formulation realized how unfamiliar most of the community sectors, including the Municipal Council, were with the plan.

Pooling together information that needed to be disseminated to all sectors, as well as planning for advocacy activities, followed. The local government sponsored a CDP Forum for the village councils and sectoral representatives in March 1998. The forum aimed to inform the sectors of the salient features of the plan, as well as to provide a venue to clarify controversial provisions. The forum also took advantage of the representation of the participants to lobby for its immediate implementation. Prior to the forum, village-level meetings were conducted to present the CDP and to get initial recommendations on how the plan would best be implemented. The pre-forum meetings were also a mechanism to ensure the attendance and active participation of all the sectors in the forum itself. It also helped the facilitators get a sense of the concerns and controversial issues that needed to be discussed in the forum. Information on the fishery status, technical information on coastal resources, as well as a working knowledge on national laws and fishery rules and regulations were helpful in facilitating the discussions. Experts on the field of environmental law were invited to help ensure that the CDP conformed to national laws and appropriate legal processes. The forum proved to be an effective strategy because it started off another phase in the process of CDP implementation—the drafting of the ordinance and its implementing rules and regulations.

After the forum, a CDP primer was prepared in Tagalog (the CDP was originally drafted in English), a language understood by a majority of the citizens. The primer contained the major provisions of the CDP, the issues in the zones which the CDP hoped to address, and pertinent national fisheries laws. Copies of the primer were disseminated to the coastal villages, peoples' organizations, local government units, fisheries schools, and government agencies. Village-level CDP orientations were continually conducted after the forum

to ensure that the citizens were well-informed. The CDP was set to be implemented as soon as the ordinance and its implementing rules and regulations were approved.

CDP advocacy also utilized existing programs and structures such as student bodies and school papers. In the second quarter of 1999, a CBCRM orientation and a popular education workshop were conducted by the MFRMP for 50 youth representatives from different schools in Bolinao. It aimed to orient the youth on environmental and popular education. It also hoped to provide a venue for the formation of an environmental advocacy group for Bolinao. A follow-up training on popular education, which focused on theater, journalism, public speaking, and production of information materials, was conducted in June 1999 to help the participants hone their skills to enable them to undertake environmental advocacy initiatives.

An advocacy group was formed in June 1999 with the objective of advancing environmental awareness through the use of their skills in theater and journalism. Although the group was supposed to include students from different schools, only the students from the Bolinao School of Fisheries (BSF) comprised the advisory group. Instead of a representation of different schools, the formation of a youth advocacy group was taken up only by the BSF. Establishing linkages with school officials to formalize the organization and to seek institutional support was explored. What followed was the forging of the memorandum of agreement in December 1999 which included the recognition of, and support for, the youth advocacy group, and the promotion of collaboration in other CBCRM-related activities, such as participatory aquaculture monitoring, community activities on environmental protection, review and enforcement of environmental and fishery laws, and operations of the CRM Center. The school also agreed to devote one of three issues of their school paper, which they have been able to produce yearly, to environmental advocacy. Linking with the fisheries school for specific CBCRM-related activities, such as advocacy, was deemed strategic in engendering the active participation of more CBCRM advocates. Institutionalizing programs such as this increases the likelihood that the activities would be sustained beyond the lifespan of the MFRMP.

In April 2000, specific provisions of the CDP which were already being implemented, such as aquaculture monitoring and the establishment of a marine protected area, were featured in a school newsletter which was circulated in the municipality. From the last quarter of 1999 to April 2000, other CRM issues were featured in a play by the youth advocacy group. The group performed in the village plazas of Patar, Estanza, Liwaliwa, and in the church grounds in the town center. The group also performed in BSF school programs and in a youth camp sponsored by Plan International for youth representatives of Region 1.

CBCRM activities in Bolinao, which have CDP for their framework, were sought to be institutionalized through the establishment of a CRM Center in December 1999. The center aimed to aid in sustaining these activities in Bolinao by providing a structure, a system, and a CBCRM program which would facilitate the flow of information, activities, and support from the various groups existing in Bolinao. The CRM Center was preceded by efforts to establish an Ecology Center. The operation of the Ecology Center, which was put up in March 1999, entailed coordinating with the local government, soliciting support from the local schools and from different local and national organizations, and setting up a program to start off its operations. Its functional use was never maximized because of lack of financial and institutional support and a non-conducive environment. In December 1999, construction of the CRM Center began just after a memorandum of agreement was signed by the Municipal Government, through the Mayor, and the MFRM Project. The creation of the CRM Center and a position for a CRM Officer are provided for in the Municipal Fisheries Ordinance (Article 15, Bolinao Coastal and Fisheries Resource Management Ordinance of 1999). Operations of the CRM Office began in February 2000.

Rationalized Coastal Aquaculture. Milkfish aquaculture in Bolinao started in 1995 (Verceles and McManus, this issue). It reached its peak in 1997, with over 3000 units in operation (LGCAMC reports); it dwindled to about 1000 units spread over 88 hectares of municipal waters in 1998 (Bolinao Municipal Records 1998). Among the issues that surfaced were deteriorating water quality, reduced culture production, fishkills, and use conflicts between the aquaculture

operators and the marginal fishers and boat owners; conflicts which are the results of unregulated proliferation of fishpens and cages blocking navigational routes, thereby reducing fishing grounds. All these issues that were experienced and expressed by the locals clearly needed to be addressed.

To share information on the impact of coastal aquaculture on water quality, fisheries, and culture production, measures to mitigate their effects and help sustain the industry-stimulated initiatives to address issues attendant to coastal aquaculture, an orientation on sustainable aquaculture was conducted in November 1998. It was attended by fishpen and cage operators, local government units, marginal fishers, and representatives from the local fisheries school. It aimed to orient the participants on sustainable and environment-friendly aquaculture practices, to share technical studies on the milkfish culture industry in Bolinao, and to provide a venue to encourage cooperation and participation in the management of the Caquiputan Channel. The orientation resulted in the realization of a need to regulate and monitor the industry. A follow-up training on monitoring was held soon after the orientation. The training was participated in by pen and cage owners and operators and students from the fisheries school. Resource persons from the Bureau of Fisheries and Aquatic Resources (BFAR) and the Marine Science Institute (MSI) were invited to train the participants in basic water quality monitoring and sustainable milkfish culture. The training facilitated the creation of a sectoral monitoring body for the aquaculture zone. A monitoring scheme was drafted and regular monitoring of water quality, production, and zoning of the area was conducted starting December 1998. Results of the monitoring activities were shared quarterly with the villages, the fisheries school, and the local government unit. These were used by the local government unit (LGU) as bases for drafting policies on aquaculture. The results, as well as the technical studies done by experts at the MSI were often referred to in zoning and regulating aquaculture structures in the area (CDP Appendix B 1998). The results also provided guidance to aquaculture operators in addressing problems in their culture operations. The sharing sessions served as venue for the village councils and residents to generate awareness on the status of the industry and milkfish culture practices. It also aimed to

encourage participation of the community sectors in the management of their zone, as well as in other CRM-related initiatives. As a result of the sharing sessions, some participants also requested assistance in the monitoring of the growing grouper industry in the area.

In the second half of 1999, primers were produced and disseminated to the coastal villages in the zone, as well as to the policy makers. At present, sustainable aquaculture advocates are being encouraged to participate more actively through the creation of a zonal body that would oversee the management of the aquaculture zone.

Modify concession systems for milkfish fry and siganid fisheries. The milkfish fry and the siganid resources, which are major fishery resources in Bolinao, are managed through a concession system. The concession is a system through which user rights are conceded by a management body to an applicant. In Bolinao, the highest bidder gains exclusive rights over fishery resources for a year. The concessionaire, having paid a considerable sum to the Municipal Government for exclusive rights to the area for a year, implements certain management prerogatives in the use of the fishery resource (Rodriguez 1997). This practice has elicited issues of resource accessibility and sustainability, as well as social equity.

The need to modify the existing concession systems for both the milkfish fry and the siganid fisheries was borne out of a realization that there were inequities in access and income derived from these resources. Furthermore, catches were declining. Advocacy activities included fora and orientations on fisheries monitoring. Sharing information on yearly catch based on monitoring studies, impact of unsustainable use, and on the biology and life cycle of the fish coupled with their indigenous knowledge, gave the stakeholders an understanding of how the milkfish fry and the siganid resources may be managed for sustainable use.

Reef fisheries. To facilitate action on issues on the reef fisheries, including the siganid concession system, a Reef Fisheries Forum was conducted in September 1998. Representatives from the different fisheries sectors and local government units participated in discussions on the status of the reef fisheries, the siganid fishery and

the concession system, and resource management strategies for the zone. Results of technical studies on the reef resources (i.e., seaweeds, sea urchins, siganids) and of fisheries monitoring activities conducted by the project were shared. The monitoring results included a resource-use map, seasonality of the resource, and volume and catch composition. The information helped in planning for management interventions in the zone. Among the identified management interventions were participation in fishery monitoring activities, establishment of marine protected areas, and mangrove reforestation, as well as implementation fishery regulations as stipulated in the CDP. A core group was initially formed to pursue the planned actions. Because many issues beset a multi-gear reef fishery, the task of forming a zonal action team proved daunting. Coordination between sectors was difficult. This problem was coupled with a lack of follow-up activities on the part of the facilitators. Interest groups have now been formed. Different views on approaches concerning the siganid concession system caused temporary inaction. At present, an experimental culture of siganids is being undertaken by the MFRMP with a local partner to find new practices that would hopefully lead to changes in the concession system and ultimately, in the sustainable use of the resource.

Milkfish fisheries. A Milkfish Fry Forum was held in November 1998 to facilitate information sharing among milkfish fry gatherers on fry management and to promote the concept of sustainable management of the resource. Lectures on the status of the resource, its biology, life history, and seasonality, as well as trends on milkfish fry catch and gear-use and a review of the concession system, from bidding to trading, were substantial inputs to the discussions that followed. The participants focused on concerns regarding the inequity of the concession system. This stimulated lobbying for reforms to the municipal government in the existing system at the level of the municipal government. A follow-up forum in March 1999 provided a venue for the fisher group to draft plans for the legislation of policy reforms in the concession system. The forum also resulted in the drafting of an alternative system that proposed the changing of the concession system to a "permit system". The permit system would mean the removal of the concessionaire and the use of licenses and permits for the milkfish fry gatherers. The

alternative system hoped to provide the gatherers more opportunity to increase income through the removal of fees and other shares the concessionaire usually imposes. Despite the Municipal Council's refusal to implement the proposed system in the coming year, changes in the concession system that were also included in the CDP were made. Transparency in buying and selling prices, monitoring of the fishery resource, and closed and open seasons were among the provisions that were to be implemented in the coming year. In November 1999, representatives from the village councils and the people's organizations from the villages of Patar, Ilog Malino, Balingasay, Arnedo, Pilar, (Zone I under the CDP) sought an audience before both the legislative and executive branches of the local government requesting that the concession for the following year be awarded to a fisherfolk organization. As a result of their lobbying efforts and in conformity with Sec. 17 of the Fisheries Code of 1998 (Grant of Fishery privileges in Municipal Waters) and Sec. 24 of the Bolinao Coastal and Fisheries Resource Management Ordinance of 1999, the concession for the year 2000 was awarded to a federation of people's organizations, the KAISAKA.

Provide regulations for the local tourism industry.

The municipality of Bolinao has been a favorite destination of a moderate number of tourists. The number of resorts has increased from 23 in 1998 to about 40 in 1999. Multi-million dollar proposals to develop and operate a tourism estate and retirement village have been submitted to the municipality. In anticipation of the eventual boom of the tourism industry, provisions for its regulation, though in broad terms, have been included in the CDP of Bolinao; The municipality has been divided in its opinions regarding tourism. Some see it as a welcome infusion of capital and livelihood opportunities; others are anxious of the possible effects on their resources (i.e., drinking water, corals and beaches, landscape) and their way of life (i.e., congestion, pollution, increase in incidences of drug use, prostitution, crime).

Advocacy initiatives would prove to be difficult given that no sector had any strong feeling regarding tourism. No issues were pressing and views were varied. Even among the MFRMP staff, there were differing stands. In February 1999, a resource person from the Asian

Institute of Tourism of the University of the Philippines (UP AIT) was invited by the MFRMP to help orient the staff on tourism and ecotourism concepts and principles, issues on and impact of the industry, and the limits of ecotourism development. The orientation also hoped to give the staff a unified vision for the development of tourism in Bolinao. In May 1999, a multi-sectoral forum on tourism was planned with the Municipal Planning and Development Coordinator (MPDC). It aimed to bring out issues (felt and anticipated), identify stakeholders and their roles in the tourism industry and level off on where the industry was at and what their vision for it was. Unfortunately, the forum was repeatedly postponed by the MPDC. It seemed to be a low priority compared to other pressing concerns (i.e., conflicts arising from the use of a new fishing gear, reentry of a cement plant project, formation of Barangay Fishery and Aquatic Resource Management Councils, public hearings for the municipal ordinance, and drafting of a land-use plan) which the MPDC also had to facilitate.

To stimulate discussions among stakeholders and to get a sense of stakeholder perceptions about tourism, questionnaires were fielded in April 1999 to the different sectors involved: resort owners, the transportation sector, media, LGUs in the tourism zone, academic institutions, and people's organizations. The results were to become part of the multi-sectoral consultation on tourism. In July 1999, a tourism class from the UP-AIT visited Bolinao to assist in drafting a micro-tourism plan for Bolinao. The class presented their micro-plans to the MFRMP and the MPDC in October 1999. A multi-sectoral orientation was held in September 1999. It aimed to share information on the potential environmental, sociocultural and economic impact and control measures; and to surface issues on the existing tourism industry. A resource person from the UP-AIT discussed the different aspects of the tourism industry. A speaker from the Department of Environment and Natural Resources (DENR) briefed the group on DENR policies on tourism, underscored the importance of the Environmental Impact Assessment (EIA) system, and clarified regulations regarding the construction and development of tourism structures.

In the last quarter of 1999, primers were disseminated to give the stakeholders and the general public

information on the industry, so that they could make more informed decisions and influence policies on local tourism. Information on social considerations, development and sanitation standards and guidelines, and on laws governing tourism concerns was given to major stakeholders through orientations and seminars from October 1999 to March 2000. A youth advocacy theater group conducted a play on the entry of development projects in an area from December 1999 to April 2000 in four villages to surface these concerns. The LGU, through the Office of the Municipal Planning and Development Coordinator, facilitated the creation of the Bolinao Municipal Tourism Council and the Bolinao Hotel, Resort, and Restaurant Owners Association (BHRROA).

The Municipal Tourism Council was first convened in July 1999. Its primary objective was to oversee the sustainable development of the tourism industry. This included recommending policies, reviewing, evaluating, and monitoring tourism projects, and promoting a sustainable tourism plan for the municipality. To aid the council, orientations and lecture-meetings with resource speakers from the Department of Health (DOH), the Department of Tourism (DOT), and the Protected Area Management Board (PAMB) have been held to access as much information and technical advice as possible. The target of the Municipal Tourism Council was to formulate a draft tourism plan by December 2000. Before then, a series of planning sessions and consultations would be conducted as soon as an Executive Order tasking the Council to draft the plan is given.

The BHRROA was formed in August 1998, and since then has been working on organizational strengthening, and on small projects such as the putting up of information billboards. They, too, have been recipients of information since September 1999. The BHRROA members are currently working on meeting the respective standards and guidelines of the DOT and DOH for tourism facilities. This followed orientations given by the two departments from October to March 2000 to the sector. The continued assistance by the DOT and the DOH is the result of the efforts of the BHRROA to regularly coordinate with the departments. The possible-ill effects of unregulated tourism are not yet apparent to the residents of Bolinao, while its positive

contributions are evident. Information and advocacy on appropriate tourism are needed for the effective management of the industry.

Institutionalizing initiatives

To sustain CBCRM advocacy for various issues in the management and use of coastal resources in Bolinao, it was deemed strategic to institutionalize major activities. The establishment of a CRM Center, which was provided for in the municipal fisheries ordinance, resulted from collaborations between the local government, the federation of peoples' organizations, and the MFRMP.

The CRM Center aimed: (1) to coordinate the CRM actions undertaken by various groups and advocates; (2) provide a venue for the provision of information and technical support needed to strengthen existing groups; (3) enhance the knowledge and skills of these groups; (4) enjoin the participation of more advocates.

Utilizing existing systems, such as a school paper, and widening its theme (environmental advocacy vs. school concerns) and reach (municipal-wide vs. school level) were also explored. Enjoining student organizations to participate in environmental advocacy and encouraging school officials to support the initiatives were pursued. These were done by enhancing their knowledge and skills and capitalizing on their interests. Collaborations with the Bolinao School of Fisheries (BSF) in activities, such as environmental theater, newsletter production, and aquaculture monitoring were formalized through a memorandum of agreement.

The participation of peoples' organizations in traditional systems, such as the milkfish fry concession, was a significant step in realizing changes in the traditional practices which exacerbate unsustainable and inequitable use of resources. Lobbying and information dissemination efforts aided in influencing policies and in gaining advocates and supporters. Significant CRM activities, such as the monitoring of fishery resources, were legally provided for in the municipal fishery ordinance and were institutionalized in peoples' organizations and sectoral groups. The monitoring activities have enhanced the capability and knowledge of groups in the multiple-use zone have resulted in a better understanding of their resource base.

The federation of peoples' organizations, KAISAKA, five active people's organizations, the Municipal Fishery and Aquatic Resources Management Council (MFARMC), and village-level FARMCs that evolved from being resource users to CBCRM advocates and that have been implementing and advocating CBCRM actions for the last six years will ensure that the use of Bolinao's coastal resources adhere to the CBCRM principles of sustainability and equitability.

The role of science and information in CBCRM advocacy

The use of science and information through advocacy initiatives has contributed significantly to the management of Bolinao's coastal resources. Institutions such as the MSI and the BSF have been valuable sources of information and technical support that have provided the scientific bases for policy, resolution of issues and conflicting interests, and community action. Actions such as the zoning of municipal waters, regulating fishery activities (closed season, number, type), and the establishment of MPAs have relied on scientific advice. The resolution of the cement plant issue in Bolinao in 1996 used scientific data. Accessing different agencies such as the Bureau of Fisheries and Aquatic Resources (BFAR), the Department of Environment and Natural Resources (DENR), the Protected Areas Management Bureau (PAMB), the Department of Tourism (DOT), and other groups (peoples' organizations, non-government organizations, etc.) for information and technical advice has contributed to the success of advocacy initiatives.

Science and information as preventive measures for tourism. Science and information have served as an eye-opener to an otherwise uninformed community. Issues or impacts of community practices such as unregulated tourism that the community may not have been aware of have been put forward by the sharing of information. Information dissemination facilitated the action of the community on such issues even before the negative impacts could be observed. In Bolinao, the effects of tourism have yet to be felt and perceived by the whole community. The formation of the Municipal Tourism Council and the BHRROA, and the formulation of plans and regulations for the local tourism industry, started from the dissemination of information

on the possible negative consequences of tourism activities and the establishment of tourism facilities on the environment, the community, and on the economy. The information disseminated to the stakeholders was prepared by the facilitators using various materials (e.g., Libosada C 1997, Urquico C 1998, National and Regional Tourism Master Plans-Department of Tourism 1992-2010, Economic and Social Commission for Asia and the Pacific 1992, Whelan 1991). The choice of information used was based on what the facilitators deemed appropriate, given the status of the industry in Bolinao, existing policies, practices and perceptions, and the potential impacts based on the experiences in other areas. Consultations concerning the information were held with community members, the project staff, as well as external consultants. Information sources were the DOT, the UP-AIT, non-governmental organizations with community-based sustainable tourism projects (i.e., ASSET, Inc., Haribon Foundation), the DOH, and secondary literature gathered from libraries and from the network of CBCRM practitioners. Resource persons from the AIT, DENR, PCMARD, and DOT as well as the experiences of other communities in tourism helped give a more realistic perspective to tourism development.

Science and information for remediation of unregulated aquaculture. In seeking solutions to current issues, science found its role in enhancing the knowledge and capability of stakeholders to enable them to understand the nature of the issue and options to mitigate it. In the case of the aquaculture industry, the community did not need to be warned of the potential damage because they were already experiencing the negative consequences of unregulated aquaculture. What they needed was a means to remedy their situation. Information gathered from secondary literature and from technical studies on the impacts of congested aquaculture structures in an area, unregulated aquaculture practices in feeding and stocking, the need for monitoring water quality and production were highlighted in an orientation held in November 1999. Stakeholders were trained to use water quality monitoring instruments. They were taught to monitor their production and to take account of their stocking densities and consumption of feeds. These data were later analyzed for use in policy formulation. Aside from the advocacy facilitators, resource persons from the

BFAR, UP-MSI, and Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC) helped in the transfer of knowledge and skills in aquaculture. Valuable sources of information that were used in the advocacy activities came from site specific studies (e.g., Aliño and Villanoy 1997, Meñez and others 1991, Verceles and Talaue-McManus this volume). Other sources included materials from BFAR, FAO, and SEAFDEC, and secondary literature on topics such as water quality, feeds and chemicals, environmental impacts, trade and marketing, social equity, and advances in aquaculture. As in tourism advocacy, information used in the form of primers, newsletters, orientations, and sharing sessions for aquaculture advocacy were processed and packaged by the facilitators.

Science and information for rehabilitation of declining capture fisheries. Science has been looked upon as a source of alternative strategies for traditional practices that have caused significant negative impacts on the resource base and on cultural structures. Information on the fishery resources of Bolinao, status of habitats and the biology and life cycles of the fisheries, interaction of ecosystems, and impacts of activities on the resources were bases for management interventions in the CDP. The need for and importance of establishing marine protected areas was facilitated by advocacy. The identification of areas for protection depended on the expertise of scientists from the MSI. Results of fisheries monitoring have influenced policies on the management of the reef resources. Solutions of issues in the concession systems, dwindling catch, destruction of habitats, and pollution were sought through technical research and scientific advice. Impacts and issues, such as dwindling fishery, destruction of habitats, and inequitable resource use, that arose from traditional practices may take some time before rehabilitative solutions take significant effect. Identifying alternative strategies for the management of the concession systems entailed gathering information and conducting advocacy activities. Significant sources of information for the capture fisheries were mostly site-specific studies (e.g. Talaue-McManus and others 1992, Estepa 1997, Ochavillo 1998, Rodriguez, 1997) and results of the MFRMP's fishery monitoring activities (1997-present). All the site-specific information was simplified and presented in fora, meetings, and sharing sessions

with the affected fisherfolk sectors and representatives of the local government. As mentioned above, these sessions provided venues for the participants to identify strategies and alternative options to address both the inequitable access to the resources and the dwindling fisheries. Advocacy activities that followed were limited to lobbying the Municipal Council and the LGU to influence changes in policies in the use and management of the capture fisheries.

Challenges

Environmental advocacy in Bolinao has not been without challenges (Table 2). The project, having access to technical information and the means to share this with the larger community, was responsible for facilitating the advocacy process toward constructively addressing negative impacts of unregulated use of coastal resources.

In identifying issues and problems, there is the challenge of non-issue perception if the issue or problem is not perceived by the community. This is usually the case when common practices or economic activities are the sources of negative impacts (e.g., decline in siganid fish catch, concession system, deteriorating water quality). An issue must be accepted by the community as an issue before a sector or community can act on that issue. It must prove to be pressing enough for the community members to put in their time and resources. Otherwise, the initiatives to act on the issues would eventually lose momentum. Mobilizing stakeholders to establish regulations for the tourism industry entailed almost a year of advocating and coordinating with the local government, BHRROA, the transportation sector, health sector, local media, academic institutions, and

Table 2. Challenges faced in mobilizing community advocates

Identifying an issue/ problem	Gathering Information	Sharing Information	Participatory action
<ul style="list-style-type: none"> > not anticipated > non-issue 	<ul style="list-style-type: none"> > choosing appropriate information > unpopular forms > naccessible sources 	<ul style="list-style-type: none"> > inability to identify target sectors > heterogeneity of views within a sector 	<ul style="list-style-type: none"> > non-use of information > biased use of information

religious groups. Having engaged even a fraction of all these sectors to participate in the drafting of a plan, in practicing information they have received, and in advocating a precautionary approach in the development of tourism in the area is proof of that the challenge has been met.

In gathering information, the challenge to the facilitator lies in choosing the information to use, popularizing the data, and finding the most appropriate method and venue to transfer the information. Data and information must be related to the present conditions of a community for it to want to act on the issue. In addition, the information must be simple enough to understand and use. There are times when what science deems important (e.g., research objectives) is different compared to what the community perceives. Science has a natural bias for ecological concerns. Communities are almost always concerned about livelihood and basic survival. It usually takes a compromise between these two concerns to evolve an effective management strategy. Information may be very powerful if it is clear and simple and connected to the realities a community is faced with. Finding the most appropriate venue to transfer valuable information is a balance between available resources, time, and scope of target sectors. The most often used strategy was the conduct of orientations and meetings. While orientations and meeting gave opportunities for deepening the discussions and information exchange, these required financial resources that were most often provided by the MFRMP, and at times by the local government. The sessions were at times too long for participants to stay for the duration of the activities because of economic and familial responsibilities. Venues that required less mobilization of finances and were less time-consuming would allow a wider reach of information.

In sharing information, given constraints on funding, time, and manpower, identifying target sectors has been a challenge. Should an issue be shared by the whole community or should one take heed of opinions of other sectors not directly affected but nevertheless part of the community? It was expected that not everyone would be equally receptive to available information when this would require them to rethink their practices. It may also take time for the community to accept and act on the information that has been disseminated,

sometimes taking years or however long it would take for negative impacts to be observed. Identification of recipients and potential advocates was crucial to the sustainability or even the progress of an action on an issue.

Issues on reef fisheries affected various sectors in the island. Identified interventions for the management of the reef (e.g., regulating fish corrals and implementing a closed season for the siganid fishery) required consultations with the different resource users (e.g., gleaners, fish corral owners and operators, hook and line, net, fishtrap, and other marginal fishers), the village councils, and the community members. Advocacy initiatives involved the conduct of orientations and validation sessions that took a long time and did not amount to any real action that would address the issue. Sometimes it was because the participants to the meetings had neither a direct stake on the issue nor the means to implement the actions. There were also times when the sessions were participated in by representatives of various sectors who had various interests, causing the discussion to veer from issue to issue. Focusing on one issue would mean the exclusion of the other sectors. Advocacy strategies shifted from village-level consultations to focused sectoral discussions. Though the reach may not be as wide, the focused sectoral discussions have resulted in a number of initiatives that were being taken on by small partner groups. At present, there are five groups initiating action on mangrove reforestation, marine protected area establishment, experimental siganid culture, and lobbying for regulations on the use of the municipal waters.

After the information had been shared, the next challenge was how the community would use the information. Groups or individuals who facilitated the flow of information have taken a social responsibility to maximize and exhaust means to make the community or the affected groups act on the information with equal responsibility. If the community would use the information, would they use the information properly, or would they just use it for their own motives? A common perception would be that the community had only one stand on issues and that a community consultation would validate this. In reality, the demands or opinions of all sectors of the community when given a voice and the chance to participate reflected different

views on issues. The greatest challenge was resolving these differences and arriving at a consensus to pursue appropriate action. An example was the advocacy for the establishment of a marine protected area (MPA) in Malilinep Channel. Efforts toward this end have taken more than five years of information dissemination and consultations. The proposed MPA site has been transferred and its size reduced and enlarged a number of times to accommodate all affected users. Until now, the MPA has yet to be established.

Effective strategies in facilitating the flow of information

LGUs, peoples' organizations, and CBCRM practitioners from other areas have considered Bolinao as a valuable and rich source of replicable CBCRM strategies in coastal development planning, resource enhancement, capability building, networking, and issue advocacy. Ten years of CBCRM work in Bolinao has given both the community and CBCRM facilitators and stakeholders the opportunity to try out a suite of strategies that would be most effective in sustainably and equitably managing the municipality's coastal resources. The advocacy efforts of the different groups in the area for the past three years have had its share of both unsuitable and effective strategies. Strategies which have been effective in the use of science to mobilize CBCRM actions have been cognizant of the following:

1. Issues should be both community-related and scientifically grounded. If an issue is identified by the community, utilize science to help the community understand its nature. If an issue is identified by science, show the community how it relates to them and their resources.
2. Popularize scientific information, but be transparent about the state of the art of scientific knowledge. Use the precautionary principle when scientific evidence is equivocal, and act with preference for the protection of the environment and marginal users.
3. Among the most appropriate methods of dissemination are: (1) written materials for wider reach and longer duration of use; (2) community theater for the novelty of audio-visual appeal from

fellow community members; and (3) sectoral orientations and meetings for deepening knowledge and understanding of issues.

4. Target sectors should include those who are negatively affected and those who can do something constructive about the issues (i.e. peoples' organizations and LGUs). Also, include sectors along the chain of resource production (aquaculture) or distribution (capture fisheries) who directly use the coastal resources.
5. Action must represent a process of consensus, to sustain the action and to minimize conflict.
6. Institutionalize initiatives when possible (i.e., CRM Office) to ensure that initiatives are sustained.
7. Work within existing structures and programs in different sectors of the community instead of creating new ones. Sometimes existing structures may need to be reconfigured, but this will be less resource-intensive (time, material, manpower) compared to creating new ones. It also ensures sustainability while creating a venue for CRM.

The capability of the MFRMP and other groups to make information accessible to the communities and the local government, and to train stakeholders in looking after their own resources through monitoring, have more often than not helped provide solutions. Bridging the communities with agencies, groups and organizations, experts who have the knowledge, technical know-how, and experience has spelled the difference between talking about solutions and actually doing them.

REFERENCES

- Aliño P, Villanoy C. 1997. Technical considerations for the evaluation of the sustainable management of fishpens and fishcages in Bolinao and Anda, Pangasinan. In *The Coastal Development Plan of Bolinao*.
- Estepa B. 1997. Assessment of siganid concession as baseline information for community-based coastal resources management. (Unpublished).

- Libosada C. 1997. Ecotourism in the Philippines. Makati City: Bookmark, Inc. 203 p.
- McManus J, Nañola C, Reyes R, Kesner K. 1992. Resource Ecology of Bolinao. Manila, Philippines: International Center for Living Aquatic Resources Management (ICLARM). 117 p.
- O' Malley S. 1999. Environmental education and IEC: information, education and communication of environmental messages in Palawan. In: Community-based strategies in natural resources management. Philippines: Volunteer Service Organization.
- Rodriguez S. 1997. The Barangen fishing concession in Bolinao: an ethnographic study of a customary marine tenure system [dissertation]: Quezon City, Philippines: University of the Philippines.
- Talaue-McManus L, Yambao A, Salmo S, Aliño P, 1999. Participatory planning for coastal development in Bolinao, Philippines: a powerful tool for conflict resolution. In: Buckles D, editor. Conflict and collaboration in natural resource management. IDRC/Worldbank. p 149-157.
- Urquico C, editor. 1998. Community-based sustainable tourism. Quezon City, Philippines: ASSET, Inc. 92 p.
- Verceles L, Talaue-McManus L, Alino PM. 1999. Participatory monitoring and feedback system: an important entry towards sustainable aquaculture in Bolinao, Northwestern Philippines. Science Diliman (this issue).
- Whelan T. 1991. Nature tourism. Washington D.C.: Island Press. 223 p.
- The Bolinao Coastal and Fisheries Resources Management Ordinance of 1999. 2000. Northern Journ 4: 38.
- Bolinao Municipal Records, 1998.
- Coastal Development Plan of Bolinao, 1997. (Unpublished)
- Fisheries Code of the Philippines, 1998.
- Lingayen Gulf Coastal Area Management Commission (LGCAMC) Reports. 1997. (Unpublished)
- Lingayen Gulf Coastal Area Management Commission (LGCAMC) Resolution no. 12 s. 1996. Lingayen, Philippines.