BOX 4.3

Signs of willingness to share responsibility and authority

1. Develop the fisher's identification card and thereby implement the "politics of identity".
2. Inform people that fishery co-management is in accordance with the national, democratic political system.
3. Always tell people that government officials are willing to share authority and responsibility.
4. Help to erase a lack of confidence or a lack of independence on the part of fishers and fish farmers. Do this by developing the habit of making their decisions count, especially decisions that have an impact on their lives and livelihoods.
5. Celebrate the birthdays of fishers or fish farmers.
6. Facilitate a visit to the community by a representative of the people (e.g. a member of the national or regional parliament).

THE THEORY OF COMMUNITY ORGANIZATION

In order to participate meaningfully in co-management, certain stakeholders need to form an organization that will achieve the objectives and goals of the co-management process. An organization is needed to support people who intend to participate in the process and form a dynamic partnership in the fisheries co-management project.

In some parts of Indonesia, traditional organizations, such as religious or cultural organizations, have been able to encourage their members to participate directly in a fisheries co-management project. But in other parts of the country, it has been necessary to develop or strengthen community organizations. In both cases it is necessary to have a person elected by all the members of the organization as the key individual. This person's role is to orientate the members of the organization towards the activities of co-management.

Although fishers' co-operatives or fishing associations may exist in the community, they may not be suited to playing a leading role in a co-management project. This is because these types of organizations typically have as their major objective the extension of fisheries utilization, the improvement of members' income or the improvement of the fish marketing system. It would be necessary to change the objectives of these organizations if they are to play an important role in the management of fisheries resources. Changing the objectives of such organizations may be difficult, especially if the members are determined to maintain the original objectives of organization (Pomeroy 2005).

IMPORTANT COMPONENTS IN ORGANIZING THE COMMUNITY

There are some important components in the organization of the community. These are detailed in Box 4.4.

BOX 4.4

Components of community organization

1. Preparation, involving the following activities:
   a. Appoint the core groups and leaders.
   b. Analyze the conditions of the area.
   c. Conduct discussions to determine the vision of the organization.
   d. Determine the mission of the organization.

2. Leadership development: A leader usually develops from within the community and generally becomes a role model for the members of the organization. According to Pomeroy (2005) effective leaders have certain characteristics, such as:
   a. They possess a pioneering spirit, are always looking for opportunity, are willing to experiment and take a risk.
   b. They generate ideas for the vision of an organization and dream of the future.
   c. They practice the local knowledge and provide examples.
   d. They train and show appreciation for the achievement of the members of organization.
   e. They are open to criticism.

3. Mobilize the community organization towards certain activities, such as:
   a. Gather the support of the people.
   b. Organize meetings to discuss the vision and mission of the organization.
   c. Develop the organizational structure, objectives, goals and work plan.
   d. Appoint the organizational representative.
   e. Perform training on environmental issues, capacity building and social communication.
   f. Develop organizational networking.
   g. Ensure the sustainability of the organization by focusing on membership and financial resources.

4. Evaluation: Evaluation is used to measure the success or failure of the organization in achieving its objectives and goals. Therefore, it is important to monitor the performance of the organization by gathering information about its management. The members of the organization should be involved in the evaluation and monitoring process. Evaluation should bring modification and improvements to the organization.

TECHNIQUES FOR MOBILIZING THE FISHERIES USER GROUP

If a fisheries user group is already established, it must be strengthened or mobilized in order to play a meaningful role in fisheries co-management. Mobilization techniques include:

1. After the core group within the organization is formed, this group should seek community support by collecting individual inputs or suggestions on the mission and activities of the organization.
2. The members of the organization should be encouraged to discuss their reasons for participating in the organization, possibly by raising related topics such as costs and the benefits of joining the organization. This process has the added advantage of providing an opportunity to gather information about the perceptions and needs of stakeholders which may finally be identified as the general needs and reduce the potential for conflict.
3. It is necessary to hold meetings to discuss the objectives of the organization,

reach agreement about the organization's development and the reasons for joining the organization. The core group within the organization should organize these meetings with the stakeholders to discuss the organization's mission and share their views on the mission.

4. Certain individuals should be encouraged to join the organization and understand the purpose of the organization. It is important to understand that sometimes the power structure of the community and the organization may prohibit stakeholders from providing contributions. Therefore, the role of facilitator is very important. Meetings can be successful if they are well run by facilitators who provide stakeholders with ample opportunity to listen to inputs and appreciate them.
5. After organizational agreement is reached, it is necessary to conduct special purpose meetings related to the objectives, goals and structure of the organization, its leadership, funding, work plan and so forth.
6. Organizational structure is a working framework which shows the members how the leaders are elected and decisions are made. There are some aspects required to form an organizational structure, namely:
   a) a governance system and a system of decision-making;
   b) rules for the organization's management;
   c) distribution of tasks.
7. Good organizational structure is determined internally through critical thinking and a thorough discussion process. According to Pomeroy (2005), successful implementation of organization structure is usually determined by:
   a) elected leadership;
   b) routine meetings;
   c) routine news or information on the organization;
   d) sharing of duties and responsibilities;
   e) trainings new members;
   f) allocating time for social gatherings;
   g) conducting a proper planning process;
   h) fostering good working relationships between decision makers and the organization's resources.

When an organization is involved in a negotiation process leading up to the implementation of a co-management system, the organization should appoint one or more of its members to act as negotiator. Their appointment can be based on criteria such as honesty, knowledge of the local area, negotiation skills, personality and status in the community.

TECHNIQUES FOR STRENGTHENING THE COMMUNITY ORGANIZATION

In order to achieve sustainability, it is necessary to strengthen the organization and its members. Strengthening may be needed to improve knowledge about resources, identify attitudes towards the utilization of resources and hone skills required for managing resources. Strengthening an organization may be achieved by providing training or environmental education, capacity building and social communication activities.

Training and environmental education could be provided through modules on, for instance, environmental conditions of a watershed, its ecology, bio-diversity, resources, resource, conservation, etc. Other topics that might be added to a training course include:

- sustainable utilization of resources;
- improvement and maintenance of fishing habitat;
- relationship between land and the marine environment;
- relationship between humans and natural resources;
- environmental laws or regulations;
- implementation of regulations;
- conflict management.

When providing environmental training, there are some points that should be considered. These points are explained in Box 4.5.

BOX 4.5

Points to be considered in the provision of environmental training

These are some general guidelines for providing environmental training or education:

1. Allocate time, a venue and nominate those who will participate in the training.
2. Appointment a facilitator to administer the training.
3. Produce comprehensive documents on the training and its expected results.
4. Local participants must be given an opportunity to discuss and facilitate certain topics during the training.
5. Information about the marine environment should be presented in language that is easy to understand.
6. The training can use the local knowledge of the participants as a starting point and add to it by offering scientific knowledge.
7. Participants must be given an opportunity to share knowledge in order to explain the ideas and new concepts that can be used in the daily community life.
8. The training can be done formally, via the presentation of materials, and informally, via discussions, exchange visits, etc.
9. Sharing of local knowledge can play an effective role in the informal educational program.

Other training methods include allowing the stakeholders to become involved in research activities, using television programs, videos, radio programs, posters, story books and site visits, etc.

METHODS OF CAPACITY BUILDING

The capacity of individuals within the organization to participate effectively in fisheries co-management must be enhanced. Some strategies that can help to strengthen capacity include:

1) Understanding co-management.
2) Understanding how to organize and participate.
3) Communicating information about business administration to stakeholders.
4) Understanding how to participate in the negotiation process.

5) Determining mission and strategy.
6) Developing the organizational culture and structure (management methods, organization structure, and competence).
7) Developing the organizational interaction process (communication, planning, building consensus, research/development of policies, monitoring and evaluation, etc).
8) Developing the management of human resources (relationships between staff and members).
9) Understanding the source of information, understanding infrastructure and finances.
10) Developing techniques in conflict management.

CAPACITY BUILDING IN A COMMUNITY ORGANIZATION

Capacity building is often conducted with a view to improving organizational performance. In a system of co-management, capacity building can be undertaken at the individual, organizational and system (or enabling environment) levels. Capacity building can include:

1) dissemination of information;
2) training to develop knowledge, skills and attitudes;
3) development of networks through the exchange of information and learning about the experiences of other people who have similar duties and by practicing communication skills;
4) facilitation by experienced external organizations.

CRITERIA FOR STAKEHOLDERS' ORGANIZATIONS TO BECOME INVOLVED

Using the lessons learned through the implementation of fisheries co-management projects in Indonesia, several criteria that can assist organizations to get involved in fisheries management have been identified (Box 4.6). In the past, the pattern of fisheries management in Indonesia has been to treat the fishing community as the object of development rather than the subject of development. Fishing organizations or groups of fish farmers have often been established purely for the purpose of assisting government to implement fisheries development projects. As a result, many community organizations in Indonesia have failed to fulfil their function in the framework of fisheries management. An analysis of the failures of fisheries organizations is detailed in Box 4.7.

BOX 4.6

Criteria for fishers' and fish farmers' organizations to get involved in fisheries co-management

1. The community organization already exists. It was elected in a democratic manner and has office bearers such as a chairperson, a secretary, treasurer, etc.
2. There is a list of members containing personal information about the fishers.
3. Each member of the organization has a fisher identity card.
4. Regular meetings are held (when appropriate, but at least once every two months). Minutes are taken at every meeting.
5. The work plan is formulated in a participatory manner.
6. Membership fees are determined, together with a plan for utilizing the fees.
7. The Article of Association is in existence.
8. A process for resolving conflicts between members of the group is in place.
9. The organization has been active for a minimum of two years.

Source: Hartoto (2006)

BOX 4.7

The cause of failure in fishery organizations

1. The organization's objective is not properly formulated and the organization is not operated cooperatively by all members.
2. The organization was established for the purpose of facilitating certain government implemented projects.
3. In the process of developing the organization, the government played the dominant role, especially with respect to managing the organization's finances.
4. The organization failed to develop a system for generating its own funding, i.e. it failed to become self sustaining.
5. The selection and/or replacement of members is not conducted democratically.
6. There is a poorly developed mechanism for resolving conflicts within the organization.

CONFLICT CAN TRIGGER THE DEVELOPMENT OF A FISHERIES CO-MANAGEMENT REGIME

In Indonesia, history has taught us that conflict over access to resources can trigger the development of a fisheries co-management regime. An example of this kind of experience is detailed in Box 4.8.

BOX 4.8

Conflict related to illegal fishing can trigger the establishment of a co-management regime

Background

Ever since the colonial era, the 2500 ha Rawa Pening Lake, situated in Central Java, has attracted the attention of government. The Lake was polluted and destructive fishing practices, such as the use of poison and small mesh fishing nets, was pervasive. As a result, the lake's fisheries production dropped steadily from 531 kg/ha/year to 17 kg/ha/year. In addition, serious conflicts occurred between about 300 people who fished illegally on the lake and the 1 400 fishers who used legal fishing methods to land their catch.

The establishment of co-management

The legal fishers finally established a fisher group called *Sedyo Rukun*, meaning "willing to live peacefully". The local government fisheries structure gave the authority to this organization to patrol the lake every night using about 50 boats. The government subsequently issued a local regulation prohibiting illegal fishing. To enforce the regulation, *Sedyo Rukun* was given the authority to confiscate illegal gear and take the perpetrators of illegal fishing to the police. The conflict reached a peak one night when 150 illegal boats were prevented from fishing by about 500 boats affiliated to *Sedyo Rukun*. There was no violence between the two groups and eventually, after a period of two years, all illegal fishing practices in Rawa Pening Lake were stopped.

Lessons learned

Some lessons were learned from this case. These were, *inter alia*:

1. A co-management organization can grow quickly and become well established if it grows out of conflict in the community.
2. The willingness of government to share responsibility with the co-management organization is a critical requirement for settling problems in fisheries management.

Source: Hartoto (2007)

MONITORING AND EVALUATION OF FISHERIES CO-MANAGEMENT

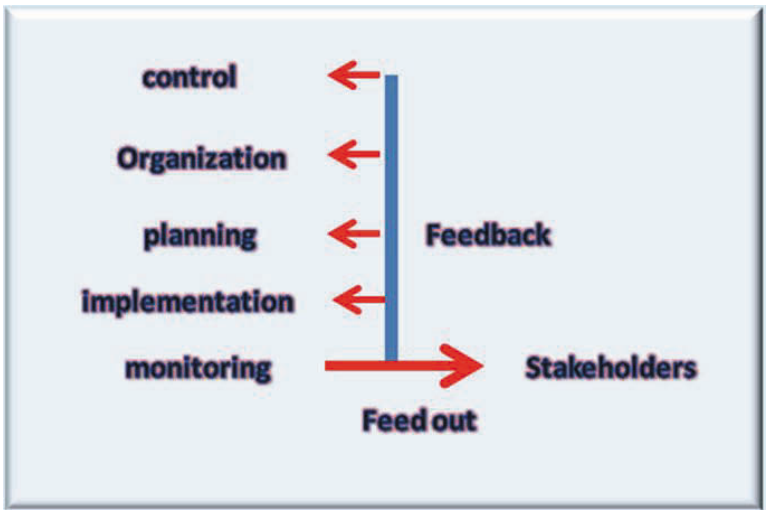
WHAT IS MONITORING AND EVALUATION?

Fisheries co-management is interactive, adaptive and participatory and consists of a set of inter-related duties that should be conducted in order to achieve the stated objectives (Pomeroy and Rivera-Guieb, 2006). In this context, the process must be monitored and evaluated so that lessons are learned (from past and current successes and failures) and may inform the current system. Monitoring and evaluation (ME) processes consequently form an important part of fisheries co-management.

Jacoby *et al.* (1997) stated that, within the fisheries co-management process, monitoring and evaluation (ME) is a sustained effort which creates the "feedback" and "feed out" for the fisheries stakeholders. Jacoby's framework emphasizes that the management process takes place in an ordered sequence and that each stage of the process creates feedback and eventually, feed-out to the stakeholders. Figure 4.11 below, explains the framework of ME according to Jacoby *et al.* (1997).

FIGURE 4.11

The role of monitoring and evaluation within the framework of fisheries co-management (adapted from Jacoby *et al.*, 1997)



What is monitoring?

Monitoring is defined as the sustainable process of reviewing positive indicators (progress) or negative indicators (lagging behind) during the implementation of co-management (adapted from UNDP, 1999). The purpose of monitoring is to study and measure the implementation of the co-management process in order to effectively manage the output and outcomes.

In order for constructive monitoring to take place, there are some key principles to observe, such as (1) focus on the results and follow-up; (2) ensure good design; (3) conduct regular field visits; and many others. UNDP (1997) explains the key-principles of monitoring in Figure 4.12 below. Explanations are provided in Table 4.4.

FIGURE 4.12

Key principles of monitoring

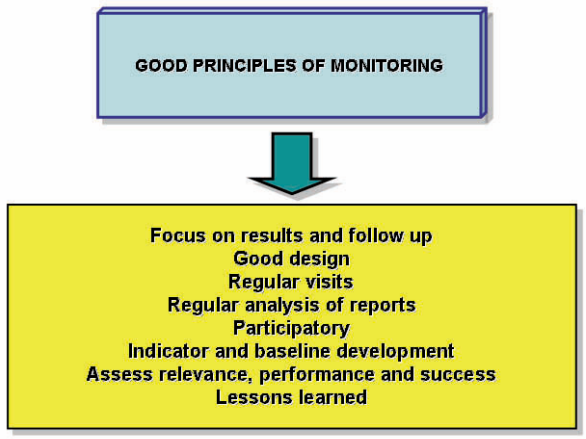


TABLE 4.4

Key principles of monitoring

No	Principles	Particulars
1	Follow up on the results	The emphasis is on the analysis of results and a process of following up so that the analysis becomes input for future management activities
2	Good design	Monitoring is based on good operational design
3	Regular visits	Monitoring is conducted regularly, not in a sporadic or partial way
4	Regular analysis of reports	The monitoring report is produced and analyzed regularly, according to a set schedule
5	Participatory	Monitoring is designed and conducted in such a way that all stakeholders participate in the monitoring process
6	Development of indicators and data base	Monitoring involves the development of measurable indicators
7	Identify the performance, success and failures	Monitoring is focused on assessing the performance of the system, through the gathering of stories of success and failure
8	Lessons learned	Monitoring is conducted with the purpose of achieving future objectives through lessons learned

Source: Adapted from Adrianto (2005)

A good monitoring process will make it easier to move a fisheries co-management regime from the planning and strategy phase to the point where it is making a difference to the environment and to human beings. Monitoring can become the basis for measuring performance and judging whether fisheries management has been conducted well.

As explained by Pomeroy and Rivera-Guieb (2006), the monitoring process is conducted to ensure that the programme that has been initiated is running according to plan. There are two reasons why it is necessary to have a monitoring plan; firstly, to assure stakeholders that the planned activities are implemented and measured in a systematic way; secondly, to learn whether the action taken is based on stated objectives. Corrective actions can be taken if the activities are not proceeding according to the plan.

What is evaluation?

In general, evaluation means reviewing whether the actions that take place within the framework of fisheries co-management achieve the stated objectives. Evaluation is a routine activity for the planning and implementation of fisheries co-management.

According to UNDP (2007), evaluation is defined as a selective process which determines the progress of implementing a programme in a systematic way.

Evaluation consists of a range of parameters, namely (1) outcome status, which gauges the major impact of the activities, not the output; (2) factors that influence the performance of the system; (3) the contribution of the organization to the implementation of the system; and (4) partnership strategy.

Evaluation may be categorized into two different types. Formative evaluation is conducted during the implementation of the programme, whereby the performance indicator is identified and compared with the results of the programme. The result of this evaluation will become the basis for the future corrective actions. Summative evaluation is the evaluation conducted after the co-management programme is implemented. The objective of this type of evaluation is to conduct in-depth analysis of the results and outputs of the programme and to determine the level of success that has been achieved with respect to the objectives of the programme. The results of this type of evaluation will be used in future planning.

According to Pomeroy and Rivera-Guieb (2006), there are a number of evaluation approaches that may be taken. These are performance evaluation; process evaluation; management capacity evaluation; and outcomes evaluation. Table 4.5 describes each of these approaches.

TABLE 4.5

Different approaches to evaluation

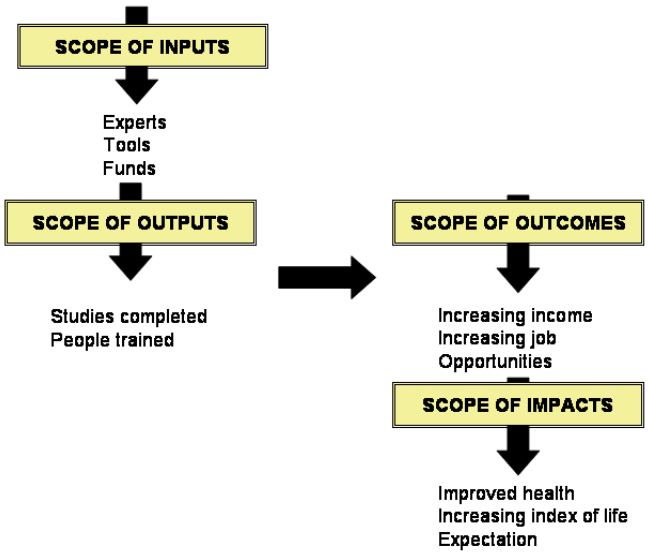
No	Approach	Details
1	Performance evaluation	This evaluation is designed to determine the quality of implementation of certain activities. Accountability, quality control and terms of reference are the focus of this approach to evaluation.
2	Process evaluation	This evaluation focuses on the achievement of the stated objectives in the fisheries co-management project. For instance, the clarity of the objectives statement, the legislative mandate, the analysis of the organization's structure, and many others.
3	Management capacity evaluation	The focus of this evaluation is whether the implementation of the plan is adequate from the point of view of the framework and institutional policy. The management process, policy tools, management election and strategy are also a focus of this evaluation.
4	Outcomes evaluation	The evaluation of the environmental and socio-economic impact of the fisheries co-management project.

Source: Pomeroy and Rivera-Guieb (2006)

The two elements of monitoring and evaluation are connected during the reporting process. Reporting provides a connection between the level of output and the level of outcome. Reporting is conducted periodically, according to a schedule that has been agreed to by all the stakeholders. Therefore, the tasks of monitoring and evaluation are conducted according to a well defined schedule. This schedule is illustrated in Figure 4.13 below:

FIGURE 4.13

The chain of performance based monitoring and evaluation



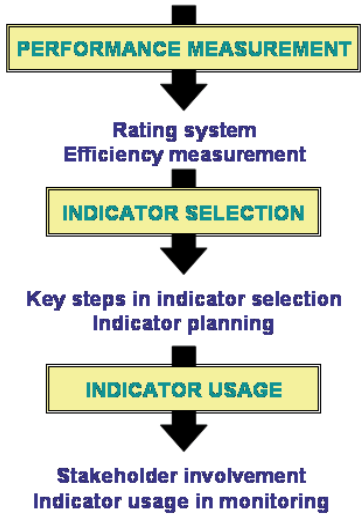
What is the performance measurement?

In a fisheries co-management project, the concept of performance measurement has three main elements, namely (1) performance measurement; (2) selection of indicators and (3) usage of indicators. Figure 4.14 below, illustrates the process of performance measurement and some of its important elements, within the framework of monitoring and evaluation.

As is evident in Figure 4.14, performance measurement is conducted using the rating system which is connected to the selection and planning of the key indicators. The use of indicators involves the stakeholders (monitoring and evaluation is participatory).

FIGURE 4.14

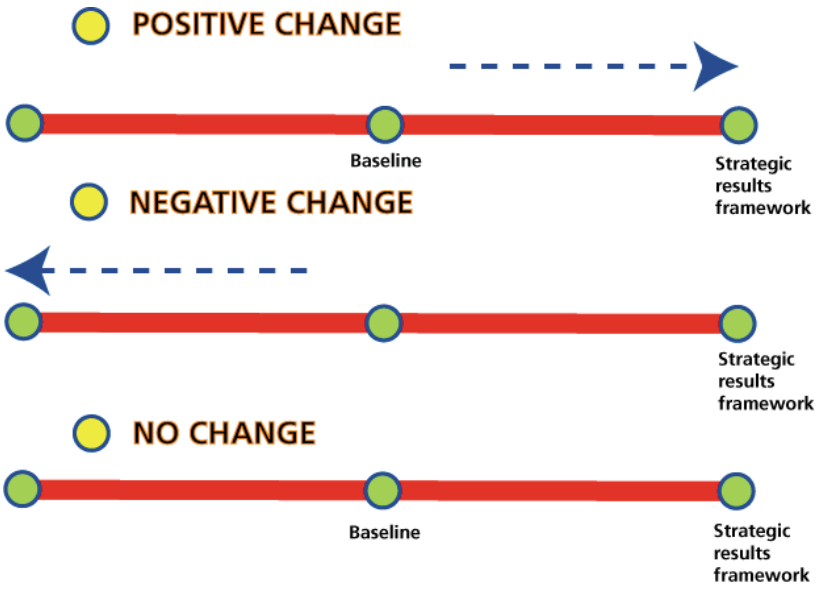
Performance measurement in the framework of monitoring and evaluation



Theoretically, performance measurement has three important characteristics, namely (1) positive changes; (2) negative changes; and (3) no change (please refer to Figure 4.15).

FIGURE 4.15

Important elements in performance measurement



The positive change moves from the baseline point to strategic outcomes, whereas the negative change moves away from the baseline point to the non-strategic outcomes. The *status quo* is maintained when the system does not move towards the strategic outcome or away from the baseline point to the non-strategic outcomes.

A critically important aspect of performance measurement is whether the objective has been achieved, i.e. whether it is completely achieved, partially achieved or not achieved at all. This concept is illustrated in Figure 4.16 below.

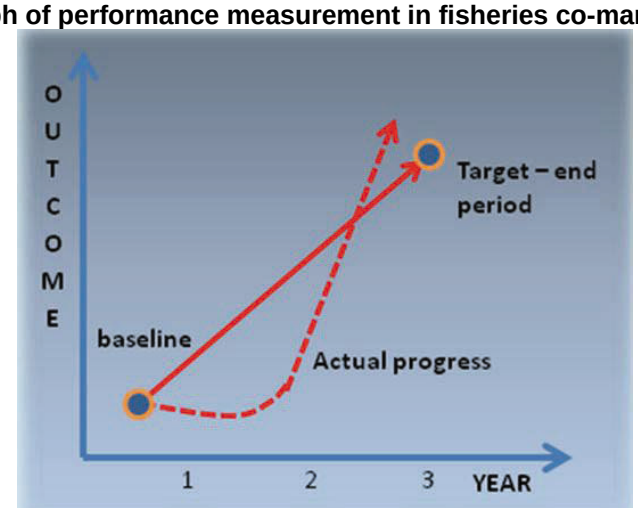
FIGURE 4.16

Possible outcomes in the context of monitoring and evaluation

Achievement occurs when the whole plan is achieved through the outcomes. Partial achievement occurs when only some parts of the plan are achieved. Non-achievement occurs when the overall plan is not achieved through the outcomes. Another way of looking at performance measurement is illustrated in the performance graphic in Figure 4.17 below.

FIGURE 4.17

The graph of performance measurement in fisheries co-management



As shown in Figure 4.17 above, performance measurement can be conducted by way of tracking actual progress, which is subsequently compared to the plan. In the beginning of the project, few outcomes will be shown on the graph, but after the learning process is underway, it is expected that the outcomes will become more obvious.

HOW TO IDENTIFY INDICATORS

An indicator is defined as a tool or a way to measure, indicate or refer to something with more or less accuracy. According to Hart Environmental Data (1998), an indicator is used to measure progress; explain the continuity of a system; provide lessons learned to the stakeholders; motivate stakeholders, focus on the activities; and show links between the activities.

In the context of fisheries co-management, an indicator is regarded as a good indicator if it is able to fulfil some criteria such as (1) show ecosystem improvement; (2) support the objectives of co-management; (3) be understood by all the stakeholders; (4) be useful for monitoring and evaluation purposes; (5) provide a long-term view; and (6) show the relationship within the fisheries co-management system (Hart Environmental Data, 1998).

Pomeroy and Rivera-Guieb (2006) identify a good indicator as one that fulfils the following criteria:
1. Measurable: noted and analyzed quantitatively and qualitatively;
2. precise: equal definition by all stakeholders;
3. consistent: stays permanent over time;
4. sensitive: changes as a response to changes in the society.

In some of cases, the selection of indicators is related to the objectives that will be achieved by the process of monitoring and evaluation. When an indicator is selected, the next process is to select the method that will be used to measure this indicator. On the whole, the selection method should be (1) accurate and reliable, meaning that it is possible to minimize the level of error during data collection; (2) cost effective; (3) feasible, meaning that it is possible to conduct the measurement of indicators; i.e. in terms of human and financial resources; and (4) appropriate, whether the method selected is in accordance with fisheries co-management goals and objectives. Some examples of indicators used in the implementation of the monitoring and evaluation process (in the context of fisheries co-management) are shown in Table 4.6 below.

TABLE 4.6

A sample of indicators used in the monitoring and evaluation of fisheries co-management

No	Indicators	Methods
1	Fish production	Measured by the logbooks of the fishers and farmers in the fisheries co-management area.
2	Fish size	Measured by recording the size of the fish at the fish market.
3	Price of fish in the production area	Measured by recording the price of fish per kilogram at the fish market.
4	Income of fishers and fish farmers	Measured by recording the expenditure and income pattern of the fishers' and farmers' households.
5	Participation by members of the community	Measured by looking into the number of people participating at the stakeholders meetings.

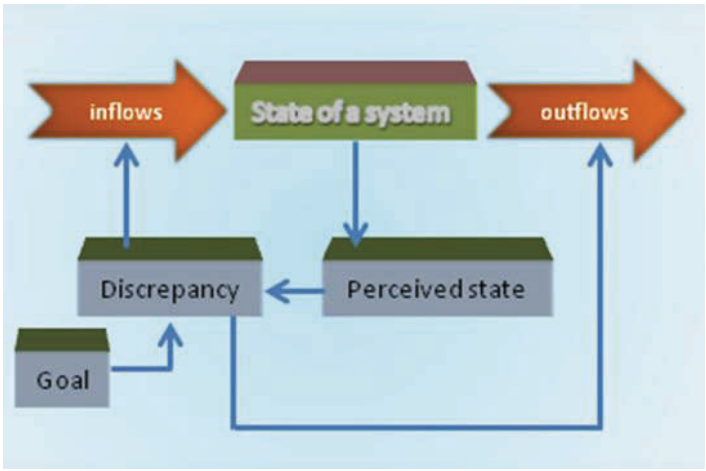
Source: Adrianto (2005)

SUSTAINABILITY INDICATORS IN FISHERIES MANAGEMENT

Hart Environmental Data (1998) generally defines an indicator as a way to measure, indicate, point out, or point to with more or less exactness. Other definitions describe an indicator as something used to visually show the condition of the system. The position of an indicator in a system is described by Meadows (1998) in the following diagram, Figure 4.18.

FIGURE 4.18

Position of an indicator (the perceived state) in a system (Meadows, 1998)

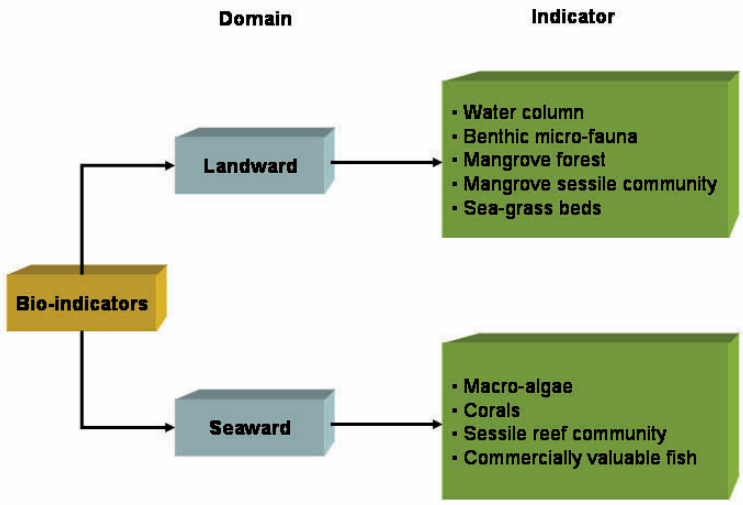


A special edition of the Ocean and Coastal Management Journal (Volume 46, 2003) on Integrated Coastal Management (ICM), discussed in detail the

sustainable indicators of fisheries management. It included in its description, a biological indicator (Linton and Warner 2003), an ecological indicator (Kabuta and Laane, 2003), a socio-economic indicator (Bowen and Riley, 2003) and a governance indicator (Ehler, 2003).
Linton and Warner (2003) define a biological indicator as an important aspect in ocean and coastal management, particularly with respect to monitoring and mitigation actions related to coastal waters pollution. Linton and Warner (2003) identify a total of 11 indicators that are divided into two groups, namely five landward indicators and six seaward indicators. These indicators are illustrated in Figure 4.19.

FIGURE 4.19

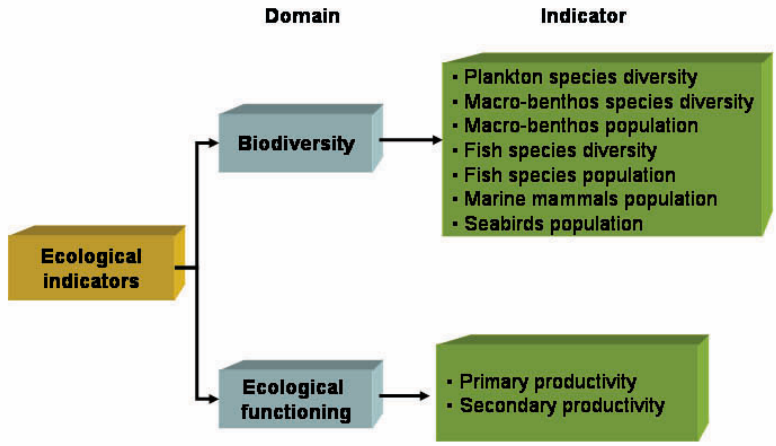
Bio indicators of fisheries management (Linton and Warner, 2003)



Meanwhile, Kabuta and Laane (2003) identified the importance of ecological indicators in ocean and coastal management. There are two groups of indicators in their framework, namely a biodiversity indicator and an ecological function indicator. The biodiversity indicator focuses on the sustainability of the ocean and fisheries species, such as plankton, benthos and fish. The ecological function indicator includes primary and secondary parameters of productivity. Figure 4.20 shows Kabuta and Laane's (2003) ecological function indicator.

FIGURE 4.20

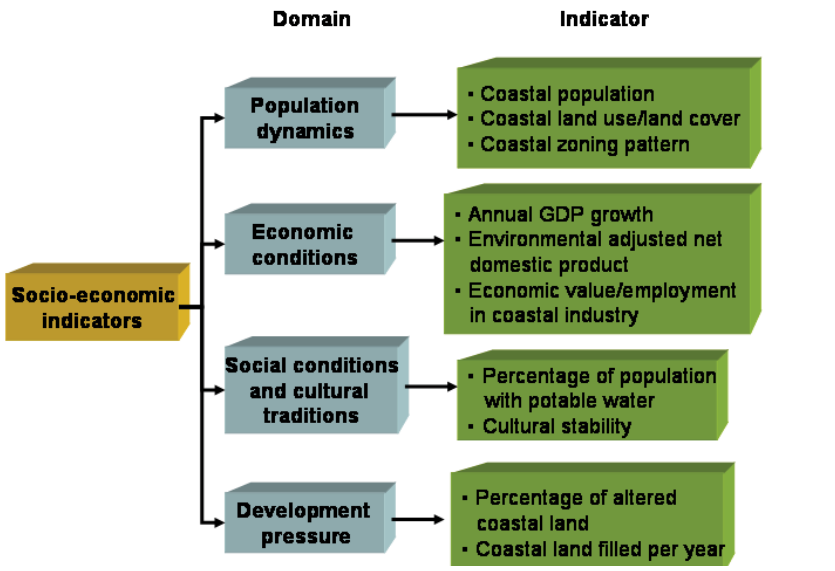
Ecological indicators in fisheries management (Kabuta and Laane, 2003)



Bowen and Riley (2003) describe socio-economic indicators in the context of ocean and coastal management by using the pressure, state, impact and responses (PSIR) approaches developed by Turner *et al.* (1998). According to Bowen and Riley (2003), there are at least four main socio-economic domains that provide a basis for identifying a sustainability indicator, namely (1) population dynamics; (2) economic conditions; (3) social and cultural conditions; and (4) development pressure (Figure 4.12).

FIGURE 4.21

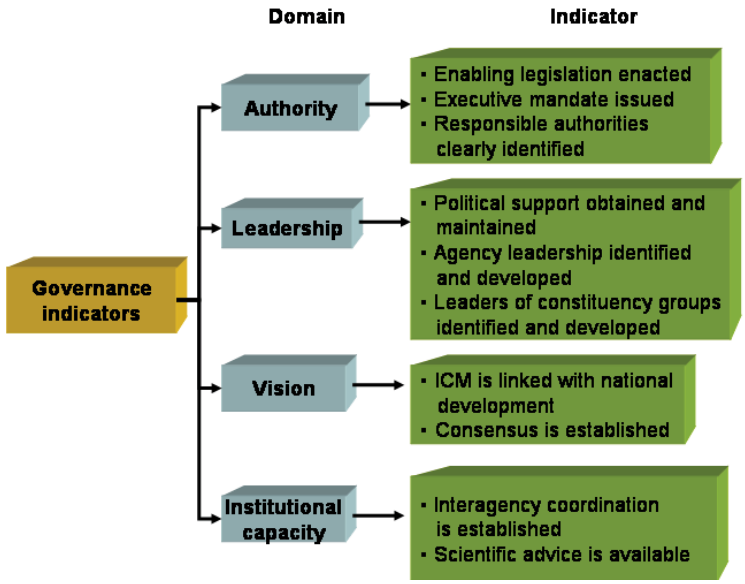
Socio-economic indicators in fisheries management (Bowen and Riley, 2003)



The other important indicators of ocean and fisheries management are governance performance indicators. Ehler (2003) identifies sustainability indicators by using an institutional approach. In Ehler's framework, there are at least 17 domains; these are shown in Figure 4.22 below.

FIGURE 4.22

Fisheries governance performance indicators (Ehler, 2003)



HOW TO DEVELOP A LOCAL FISHERIES CO-MANAGEMENT PLAN

INTRODUCTION

After more than five decades of centralized fishery management in Indonesia, it is time for local fishery users (fishers and fish farmers) to be involved in decision-making. One of the fundamental tasks of fisheries management is to prepare a fisheries management plan.

Some of the current weaknesses of fisheries management in Indonesia are the lack of success indicators in the fishery management system; the lack of a well defined management programme; and the domination of the decision-making process by government. When formulating a fishery co-management plan, government and fisheries resource users need to work together. Usually a mediator is required to assist the two stakeholders to formulate a co-management plan, at least in the early stages. The mediator is generally an individual or working group who originates from a research organization or a non-governmental organization. The role of a mediator is shown in Box 4.9, below.

BOX 4.9.

The role of the mediator in the formulation of a fisheries co-management plan

- To explain the benefits of a co-management plan.
- To prevent any one party from becoming dominant during the discussions between the government and local fisheries community.
- To diminish the cultural obstacles that may arise between the two main stakeholders in fisheries co-management.
- To assist with conflict resolution.
- To provide technical information.
- To assist the fisheries users to receive fair treatment in decision-making.
- To assist with the implementation of regulations as agreed in the local management plan.
- To encourage the sharing of experience and local knowledge.
- To ensure participation in the discussion process leading up to the formulation of a fisheries co-management plan.

As a fisheries co-management plan is implemented, so the role of mediator may be reduced, provided that the relevant government officials have understood the democratic spirit in which the plan is being implemented and the concepts of decentralization, transparency and participation.

Through the involvement of fishers and fish farmers, the principles of good governance, transparency and accountability are more likely to be incorporated in the fisheries co-management project. Past failures of Indonesian fisheries management were largely due to the over emphasis of "the short term top-down project based approach" during the development process (Figure 4.23).

FIGURE 4.23

A coordination instrument in the development of fisheries co-management

THE FORMULATION OF A LOCAL MANAGEMENT PLAN

The method that is described below, which explains how to formulate a management plan for a local fisheries co-management system, has been tested in lake and reservoir systems in the province of West Sumatra (Lake Maninjau, Central Kalimantan (Lake Sembuluh) and Bangka Belitung Island (Delta Layang River). The method used focused on questions and answers, whereby the mediator - acting as a facilitator – prepares an open-ended set of questions to be answered in the discussion between the government and the fishers or fish farmers (Box 4.10).

BOX 4.10

Examples of questions used to formulate a management plan for the local co-management of fisheries. (These questions should be posed in sequence, in a dynamic and flexible manner)

1. Where do the fishers usually catch the fish, what tools are used, at what time are the fish caught and where are they caught, etc?
2. What are the fisheries related problems? What problems are faced by the fishers or fish farmers, and what problems are encountered by the government officials?
3. What changes in the fisheries system are necessary? (The answers to this question will be used to formulate the objectives of a local fisheries co-management system).
4. What are the opinions of the fishers or fish farmers about how to achieve these changes, i.e. the objectives of the local fisheries co-management system? (The answers to this question must be used to formulate the fisheries co-management program, which will eventually become the activities and projects).
5. If the fisheries co-management program is implemented, how will its successes and failures be measured? (The answers to this question will form the basis of the fisheries co-management success indicators. What is important is that the indicators are agreed to in a participatory manner.)

When fisheries co-management was first introduced in Indonesia, government officials involved in the management of fisheries were sometimes reluctant to participate. Under these conditions, the process of formulating a local management plan was managed by conducting separate discussions on the

formulation of the plan, first with government officials and secondly with the groups of fishers or fish farmers. If this pattern of formulating a local management plan is used, the results of the separate discussions must be evaluated by the mediator to see if there is a significant gap between the plans formulated by the two groups of stakeholders. The government officials and the fisheries user groups must then get together to strengthen and harmonize the plan.

An example of this way of formulating a local management plan is taken from the Regency of Bangka in the Province of Bangka Belitung. The plan was formulated by government officials – consisting of the regional marine and fisheries office and other, related offices (Figure 4.24) – and fishers from the villages of Rambang, Bernai, Tirus, Gedong and Tanjung Batu (Figure 4.25). The government officials and the fishers' groups worked separately. A researcher from the Institute of Limnology acted as the mediator or facilitator in the process of formulating the plan for local fisheries co-management.

From the experience gained so far, the participatory process of formulating a management plan is always welcomed by the fishers or fish farmers. Using sound communication techniques, the community groups were able to formulate a good fisheries co-management plan.

FIGURE 4.24

Focus group discussion for local government officials in the Regency of Bangka

FIGURE 4.25

Focus group discussion for the local fisher community using a map and calendar of fishing activity

The next stage of the planning process

Although a mediator may be necessary, if the government officials have understood the concept of fisheries co-management, discussions around the formulation of a plan for local fisheries co-management may be conducted jointly between the government officials and the fisher groups. If this strategy is adopted, the two main stakeholder groups work together in the decision-making process. This is an essential feature of fisheries co-management.

Basic information needed

The information needed for the formulation of a plan for local fisheries co-management includes information about fisheries resources, environmental conditions, the current situation in the fishery and the management of the fishery itself. In Indonesia, this basic information may be acquired by asking the stakeholders simple questions. These questions will guide the stakeholders to formulate the objectives of management, the management plan and the indicators that will gauge the success of the implementation of the management plan.

The same questions can be directed to the government officials and fisher community but must be adjusted according to the activities and abilities of those stakeholders. The information acquired from this question and answer session can reveal the profile of the local community and will form the basis of planning activities for marine and inland fisheries.

The questions posed to the fisher groups must be as simple as possible in order for all members of the group to understand the questions and participate in the discussion process. In the example of the Regency of Bangka, the results of the focus group discussions showed that the local government officials and the fisher groups were able to formulate the local fisheries management plan, although differences occurred in the objectives of the plan.

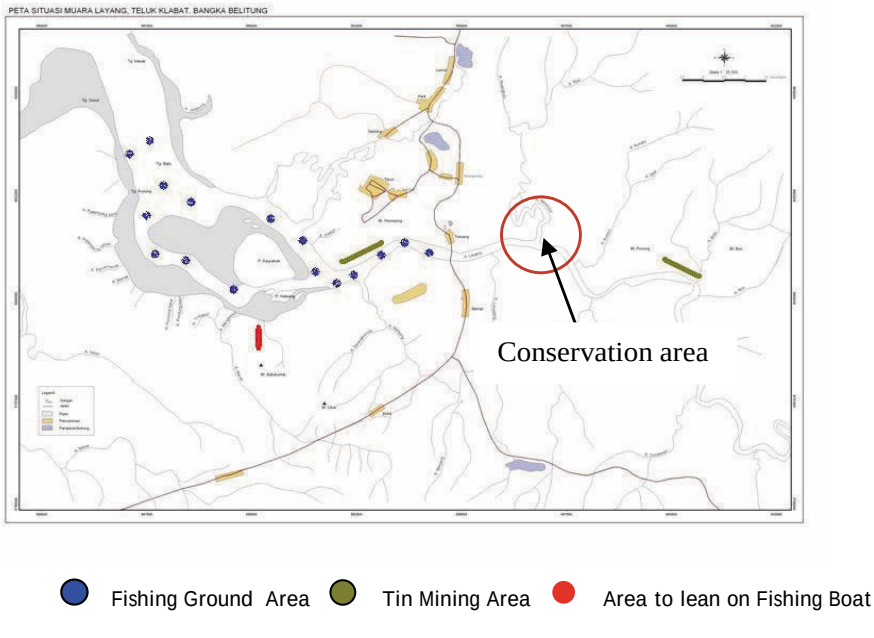
THE RESOURCES MAP AND ACTIVITIES CALENDAR

The fisher groups may provide information for the map of fisheries resources, such as the areas where fish are caught by the different villages and related information such as the condition of the surrounding environment. This information is based on their direct observations. The area that is experiencing environmental degradation can also be shown on the map.

For instance, during the formulation of a management plan for the co-management of fisheries in the Muara Layang river (Figure 4.26), the location of the fishing grounds of every village was pinpointed. It then became evident that all the fishing grounds, with the exception of grounds used by fishers from the village of Tirus, were located outside the conservation area proposed by the Center for Limnology Research (LIPI) (Figure 4.26).

FIGURE 4.26

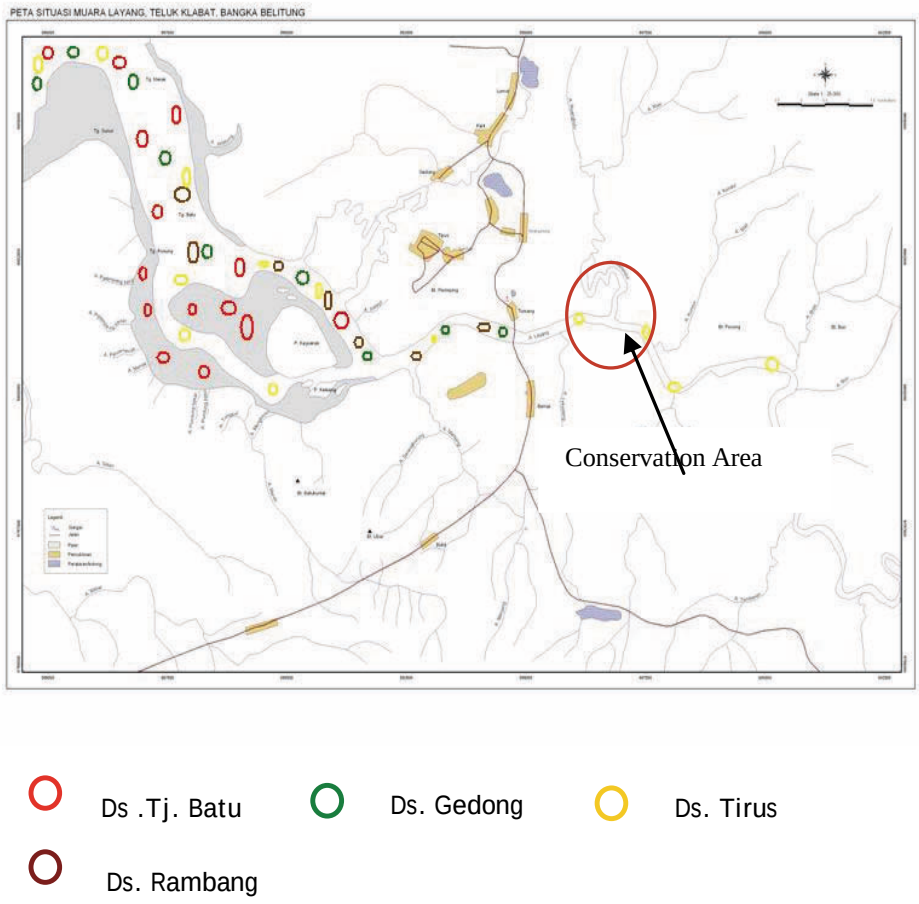
The fishing grounds of the fisher groups living on the Muara Layang River. The map was compiled after discussions with fisher groups



The resources map that was compiled for the Village of Rambang, not only shows the location of the fishing grounds, but also shows the location of tin mines and the jetty for the villagers' boats (Figure 4.27).

FIGURE 4.27

The fishing grounds of fisher groups from the village of Rambang



The daily and yearly fisher activities calendar can provide information about the quantities of fish caught and thereby help to formulate indicators of success for the local fisheries co-management plan. The calendar can also assist local government officials to formulate the plan and determine the policies for local management, such as the timing of the open fishing season.

The data that is gathered by utilizing a calendar of activities generally include the timing of the fishing season, the condition of the fish when they are caught, the spawning season and the type of fishing gear that is most commonly used. An example of a daily and yearly calendar of activities is provided in Table 4.7 and Table 4.8 and an example of problems identified by stakeholders is provided in Box 4.11.

The use of visualization tools may encourage interaction between the members of the fisher groups during the focus group discussions.

TABLE 4.7
An example of a yearly calendar of activities, based on the results of discussions with the fishers of the village Rambang in the Province of Bangka Belitung

ACTIVITIES Fishing gear & fish species	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Hand line: *sembilang* fish	*	*	*	*	*	*	* ●	* ●	* ●	* ●	* ●	* ●
Bottom long line: ray fish	*	*	*	*	*	*	*	*	*	*	*	*
Pintor: crabs	*						* ☺ ●	* ☺ ●	* ☺ ●	* ☺ ●	* ●	* ●
Net: shrimp, mullet, groupers	*	*	*	*	*	*	*●	●	● *	● *	● *	●
Trawl net	☼	☼	☼	☼	☼	☼	☼	☼	* ◙	* ◙	* ◙	* ◙

Key:

* = Setting fishing gear
● = Spawning season
☺ = Very good catches (large sizes)
☼ = Fishing during the day time
◙ = Fishing at night time

TABLE 4.8
An example of a yearly calendar of activities based on the result of discussions with the fishers of the village of Rambang in the Province of Bangka Belitung

Activities	SPECIES																								
	06.00	07.00	08.00	09.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	01.00	02.00	03.00	04.00	05.00	06.00
Catching fish	*	*					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wooden hand line	*												*	*	*	*	*	*	*	*	*	*	*	*	*
Bottom longline	*												*	*	*	*	*	*	*	*	*	*	*	*	*
Trawl (in the dry season)	*	*																							
Pintor (caught in large swells)	*	*	*	*	*	*	*	*	*	*	*	*	*	*										*	*
Trawl net		*	*	*	*																				
Collecting bait							▲	▲	▲	▲	▲														
Setting nets												*	*												
Shooting fish using iron spears														*	*	*	*	*	*	*	*	*	*		

BOX 4.11

Examples of problems identified in the inland fisheries

Identified by government officials

- Pollution from unconventional mining area
- Fish capture using poisons
- No limits on fishing gear
- A lack of social welfare in the fishing communities
- Low community awareness of environmental issues
- A lack of knowledge about modern fisheries management techniques
- Difficulties in acquiring the *selanget* fish

Identified by fishers groups

- Pollution from unconventional mining area
- Fish capture using poisons
- No limits on fishing gear
- Shallow river

THE IMPORTANCE OF PROTOCOL DURING THE PARTICIPATORY PROCESS

Some points that must be taken into account when formulating a plan for local fisheries co-management are as follows:

- The venue selected for this activity should be close to the community of fishers or fish farmers.
- The people who will assist with the discussion process must be selected. It is necessary to discuss who will open the activity (in accordance with the local tradition) and who will provide explanations about the purpose and objectives the discussion. The facilitator and note taker must also be appointed.
- Determine what kind of information is needed and how to use that information.
- Create a list of easily understood, open-ended questions for all the stakeholders. It is best to test the questions.
- Determine the stakeholders that will participate in the discussion process.
- Determine the agenda and the venue for this activity. Arrange the room so that the participants can sit in a relaxed manner and form groups. During the focus group discussions in the community of Muara Layang, the discussions were conducted in people's homes or in religious places, such mosques.
- Provide snacks and beverages as well as lunch or dinner.
- The facilitator will ask questions and gather information necessary to support the plan of local management. The assistant facilitator will record or take notes on every answer given.
- The facilitator must prepare the supporting tools such as maps, a calendar of activity, etc.
- Analyze the results of the discussions that are captured by the assistant facilitator immediately after the end of the activity. An example of the changes expected by stakeholders and methods to achieve such changes is presented in Box 4.12 and 4.13.

BOX 4.12

Examples of expected changes: The objectives of fisheries co-management

By the government officials

- Improve the income and welfare of the fishers.
- The tin mining activities must be environmentally friendly.
- Increase the awareness of people towards the environment.
- Improve the fishers' ability (home industry).
- Increase the number of human resources involved in the fisheries sector (crab processing, private lenders).

By the fisher groups

- Improve the income and welfare of the fishers.
- Area allotment for the protection of the area from the illegal tin mining.
- Encourage tin mining that is environmentally friendly.
- Increase catches.
- Utilize other areas once the illegal tin mining has been stopped.

BOX 4.13

Examples of detailed methods to achieve change in fisheries co-management programs

By the government officials

- Development of fisheries sanctuary area.
- Training for fishers and the family of fishers.
- The enactment of rules and regulations.
- Research to develop fish farming activities.
- Reseeding to increase fish population.
- Space management to utilize the fisheries resources.
- Formulation of fishers groups.
- Increase the number of fisher households.

By the fisher groups

- Development of a special fisheries area.
- After the illegal tin-mining is stopped, the area is used for shrimp farming.
- Develop the seeding places.
- Determine the areas where reseeding will take place.
- Monitor fisheries resources to prevent pollution.
- Control the number of fishers.

LESSONS LEARNED FROM THE CASE OF MUARA LAYANG

The inland fisheries system in Indonesia is generally characterized by a number of traditional people who are involved in fisheries activities. As a result, it can be difficult to establish a fisheries co-management process in inland fisheries. Although the following experience is acquired from the fisheries activities in the Muara Layang River, there are some lessons to be learned from it that may be implemented in other areas of Indonesia (Box 4.14).

BOX 4.14

Fisheries success indicators in the case of Muara Layang

Government officials

- Increase in the income level of the fishers.
- A decrease in the number of poor fishers.
- Improvement in the fishers' households.
- Fisheries support tools are used.
- *Selanget* fish can be caught once again.

Fisher groups

- There is an increase in catches.
- Fishers are able to put their children in schools.
- The welfare of the fishers is improved.

THE CASE OF MANINJAU LAKE: AN EXPERIMENT IN THE USE OF GENDER AND A SPIRITUAL APPROACH IN FISHERIES CO-MANAGEMENT

The fisher groups in the area surrounding Lake Maninjau are a unique community, characterized by a matrilineal system and influenced by Islamic tradition. Women hold a unique position in the society because they, rather than the male members of the community, always inherit the ownership of the land. On the other hand, the obligation to work and provide for the family is the responsibility of the man. Therefore it is male fishers who capture Bada fish (*Rasbora argyrotaenia*) in Lake Maninjau. This species of fish is caught by a group of fishers calling themselves *Mina Bada Lestari*. The group was formed in 2005 through the process of institutional empowerment developed by the Center for Limnology Research (LIPI).

BOX 4.15

Lessons learned in the formulation of a co-management plan in local fisheries

1. Data collected through the participatory method is the most efficient for a large research area and when limited time is available.
2. The questions posed to the fisher groups during the focus group discussions must be as simple as possible so that each member of the group can understand and participate by providing their opinions.
3. By using the participatory approach, we are not only collecting information but also providing knowledge or understanding about certain problems or matters to the fisher groups.
4. The officials and fishers are assisted to form groups and prepare the plan for local management.
5. The use of an area map is effective for marking the fishing grounds of the fishers from different villages.
6. The villages with different ethnic groups (such as Chinese people) require a different approach when it comes to fisheries data collection.
7. For the ethnic Chinese villages, data collection is entrusted to the person who has the biggest influence in that community.
8. The use of visualization tools such as resources maps and an activity calendar encourages interaction between members of the group.
9. The location of data collection (in the focus group discussions) must be in accordance with the local culture.

The fisher group of Mina Bada Lestari (MBL) where lessons learned are presented in Box 4.15 has succeeded in formulating a local fisheries co-management plan, but the women folk in this group are better able to determine the success indicators of fisheries co-management for the Bada fishery (Box 4.16). This is because the women are responsible for smoking the Bada catch and selling it to the grocers. The women know the exact daily income of the family because the money is used to pay for their daily living expenses and to pay for their children's tuition fees.

BOX 4.16

The experience of formulating a local fisheries co-management plan with the fishers of *Mina Bada Lestari*

1. The process of institutional empowerment must be conducted thoroughly and involve a recognition of the fishers identity and an agreement on the ethical (spiritual) basis that will be used.
2. The meeting with the experts on fisheries management is part of the institutional empowerment process.
3. The plan for collecting fisheries data must be an inseparable part of the plan for local fisheries co-management. The organization of the fisher groups or fish farmers must be facilitated in the process of formulating a fisheries co-management plan.
4. The gender approach, whereby the assistance of women folk is requested when formulating a plan for fisheries co-management must be encouraged.
5. The process of formulating a plan for local fisheries co-management also becomes the instrument for improving transparency and honesty in fishery governance.

Explanations were given to the women folk about the objective of monitoring the size of the Bada fish stock. It was explained to them that when the average size of fish declines, it means that the stock is being overfished. After they understood the importance of fish size, they were willing to cooperate with the Institute of Limnology in collecting information about the size of the fish caught by their husbands every day. This is an example of how to successfully utilize a gender approach in fisheries co-management.

During the empowerment process, it was explained to the fishers of Mina Bada Lestari that human beings have an obligation to utilize natural resources in a responsible way, optimizing their use through the spirit of entrepreneurship, but preventing greediness. Consensus was later reached among the community to build ten *Rasau* (fish attracting devices) to increase the productivity of the capture fishery. Out of the ten *Rasau*, three are used as a fishery reserve. The success of this fisher group has attracted the attention of members of the Parliament of the Republic Indonesia who visited the group in October 2006, while the area around the *Rasau* was being restocked with fingerlings of Bada fish hatched by the Institute of Limnology. This process shows that through proper institutional empowerment, the participatory formulation of a co-management plan, using the democratic system and implementing the Politics of Identity, the fisher groups as the partner of government can do more in the area of fisheries co-management.

The development of a local fisheries co-management plan with a log frame application is a new approach to Indonesian fisheries management. This technique has been tested and applied in the area of Sembuluh Lake (in Central Kalimantan), the inland waters of Muara Layang in Bangka Belitung province and Riam Kanan Waters Reserve in South Sumatra Province.

CONCLUSION

The key criterion for both government and fisheries communities to participate in a fisheries co-management regime is that both stakeholders must demonstrate a willingness to participate in a democratic way and, through deliberation, achieve consensus.

In the first part of this Module, we learned about the important process of integrating the community into the fisheries co-management regime. The role of the community organizer was highlighted and a series of fundamental tasks – from paying a courtesy call to local leaders, to jointly formulating a working plan – were outlined.

In the second topic, the Participatory Action Research Approach to fisheries co-management was outlined. This approach constitutes an alternative to the failed "top-down" approaches that were standard academic practice for many years and generally hampered the development process. The different types of participation were explained and the technique of initiating a Participatory Rural Appraisal (PRA) was explained in detail.

In the third topic, the theory and benefits of community organization were highlighted. It was suggested that fishing communities need to be organized in order to take up their rightful role in fisheries co-management. The process of organization includes education, empowerment, developing or revitalizing values and ethics systems, developing notions of independence and partnership, developing organizational and leadership skills, and assisting the community to take action.

The importance of monitoring and evaluation (M&E) in fisheries co-management was the subject of the fourth topic of the Module. Clearly defined monitoring and evaluation procedures, as well as a suite of indicators, are required to benchmark the sustainability of fisheries co-management. The process of M&E was outlined in detail.

Finally, the nuts and bolts of how to develop a fisheries management plan were elucidated. The development of a fisheries management plan is one of the fundamental tasks of fisheries management. It was suggested that a mediator can play an extremely useful role in helping government and communities to reach consensus on a fisheries management plan; the roles and functions of a mediator were explained at length. The importance of protocol was also highlighted in the final topic so as to ensure that outsiders who deal intimately with fishing communities do not cause offence.

There are a number of highly useful tools that can be used in the process of formulating a fisheries management plan. These include a resources map and a calendar of activity. An explanation of both tools was given, together with some examples from rural areas in Indonesia where fisheries co-management has successfully been implemented.

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Participatory landing site development for artisanal fisheries livelihoods provides guidance on landing site development planning. This manual helps those working at artisanal fisheries landing sites to identify, collect and analyse information in a participatory way, and consequently to create and seek support for a development plan. It goes beyond simple data collection to explain how to write a project proposal and gives pointers on how to find funding, as well as technical and other support. In addition to well-known participatory methods of data collection and analysis, the manual includes transects in the fisheries production chain. This unique tool was adapted from the agricultural transect walk. The material is based on a number of cases in West Africa but the principles are applicable worldwide.

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